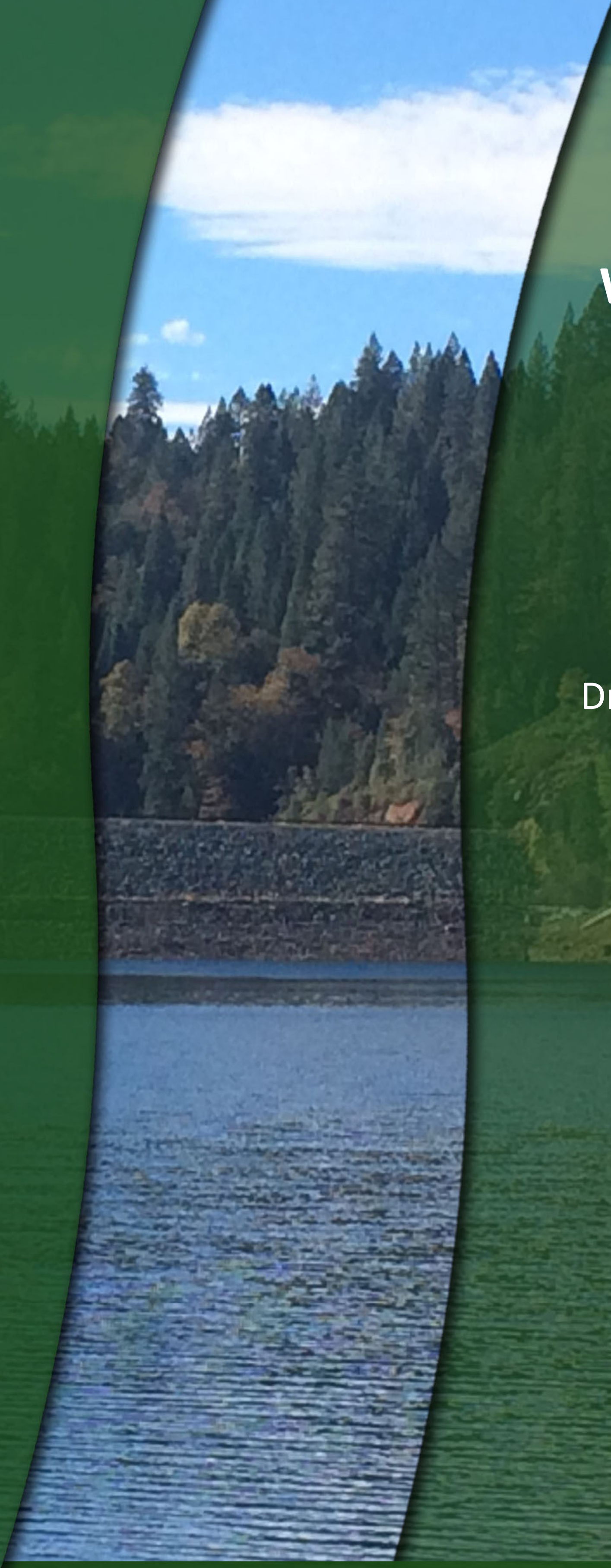

Sugar Pine Project: Water Right Permit 15375 Extension and Radial Gates Installation

Volume I:

Draft Environmental Impact Report/ Environmental Impact Statement

CEQA Lead Agency:

Foresthill Public Utility District

and

NEPA Lead Agency:

United States Forest Service

June 2021

ECORP Consulting, Inc.

ENVIRONMENTAL CONSULTANTS

Sugar Pine Project: Water Right 15375 Extension and Radial Gates Installation

Draft Environmental Impact Report/ Environmental Impact Statement

December 2020

Lead Federal Agency: U.S. Forest Service, Tahoe National Forest

Lead State Agency: Foresthill Public Utility District

ABSTRACT:

Foresthill Public Utility District (FPUD) proposes to extend its current Water Right 15375 and install radial gates at the District's Sugar Pine Dam located in Tahoe National Forest in unincorporated Placer County, California, near the community of Foresthill. This Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS) has been prepared by FPUD and Tahoe National Forest (TNF) in accordance with the requirements of the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA), respectively.

Sugar Pine Dam and Reservoir serve as the FPUD's primary source of raw water supply. The existing concrete spillway at Sugar Pine Dam was originally designed and constructed to receive the radial gates. Installation of the gates would increase storage capacity at Sugar Pine Reservoir from approximately 7,000 acre-feet (AF) to 10,658 AF. As part of the proposed project/action, FPUD is requesting a 49-year extension of its current Water Right Permit 15375. Installation of the radial gates and the replacement or modification of TNF recreational facilities affected by the expansion of Sugar Pine Reservoir will require a Special Use Permit Amendment from TNF.

RESPONSIBLE AGENCIES:

In addition to the requisite FPUD and TNF approvals, consultation with the following entities, or permits from these entities, may be required to implement the project: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife (Region 2), California State Office of Historic Preservation, Central Valley Regional Water Quality Control Board, California Division of Dam Safety and Placer County Air Pollution Control District.

Public Review of the Draft EIR/EIS:

The FPUD and TNF issued this Draft EIR/EIS for public review on June 11, 2021. The 60-day review period concludes on August 10, 2021. The Draft EIR/EIS is available online at:

https://www.foresthillpud.com/reports.html

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EXECUTIVE SUMMARY

ES.1 INTRODUCTION

The Foresthill Public Utility District (FPUD) and the U.S. Forest Service (USFS) have prepared a joint environmental document for the proposed extension of time for FPUD's Water Right 15375 and the installation of radial gates within the spillway of FPUD's Sugar Pine Dam (proposed project/action). The document is an environmental impact report (EIR) for FPUD, the state Lead Agency pursuant to the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] Section 21000 et seq.) and the State CEQA Guidelines (California Code of Regulations [CCR] Section 15000 et seq.). For the USFS, the document is an Environmental Impact Statement prepared pursuant to the National Environmental Policy Act (NEPA) (42 U.S. Code 4321-4347), the Council on Environmental Quality (CEQ) Regulations Implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Forest Service Handbook 1909.15.

This Draft EIR/EIS (DEIR/EIS) will be used by the FPUD and USFS to render decisions regarding approval of project elements within their jurisdiction and selection of an alternative.

ES.1.1 Project Location and Background

FPUD was formed in 1950 pursuant to the provisions of Section 15501 et seq. of the California Public Utilities Code for the purpose of providing public water service. The District's service area comprises the unincorporated community of Foresthill, California, located in Placer County approximately 60 miles northeast of Sacramento. The District's service area currently encompasses approximately 13,000 acres and contains primarily residential development.

The Sugar Pine Dam was completed by the U.S. Bureau of Reclamation (Reclamation) in 1981. Reclamation conveyed the Sugar Pine Project to FPUD in 2003. The Sugar Pine Project is located on the American River Ranger District of the TNF within portions of Sections 13 and 24, T15N, R10E and Sections 18 and 19 T15N, R11E, Mt. Diablo Meridian and situated on North Shirttail Creek approximately nine miles north of the community of Foresthill. It is within the Sugar Pine Management Area according to the Tahoe National Forest Land and Resources Management Plan (Forest Plan, 1990), as amended. The Sugar Pine Reservoir currently has a storage capacity of approximately 6,922 acre-feet (AF). However, the Sugar Pine Dam spillway was designed to accept two radial gates that would increase the reservoir's storage capacity to 10,872 AF. The Sugar Pine Project is located entirely within the Tahoe National Forest.

On December 26, 2011, FPUD petitioned the State Water Resources Control Board (SWRCB) to extend Water Right Permit 15375. Execution of the water right extension is needed in order to allow the District more time to diligently construct the water supply project and use that water supply permitted by the SWRCB. The water supply developed by the Sugar Pine Project is needed to meet anticipated growth in consumptive water demand within the District's service area under the Foresthill Divide Community Plan that Placer County's Board of Supervisors approved in 2008. The proposed water right permit extension would enable the District to complete the Sugar Pine Project by installing radial gates in Sugar Pine Dam's existing spillway to expand the storage capacity of Sugar Pine Reservoir. Approval of the extension would complete construction and put the Sugar Pine Project yield to beneficial use. As required by the SWRCB, the District was required to file for an extension of time to complete the Project and allow for the development and use of the full water supply.

The installation of radial gates at Sugar Pine Dam and beneficial use of the resulting water supply constitute, in part, the proposed project under the California Environmental Quality Act (CEQA) for purposes of this DEIR/EIS.

To implement the proposed project, the District has submitted a request to the USFS, specifically Tahoe National Forest (TNF), to amend the Special Use Permit (SUP) it previously approved for the Sugar Pine Dam and Reservoir Project. The SUP amendment would authorize completion of the Project by: (1) increasing water storage capacity of Sugar Pine Reservoir by installing radial gates in the existing spillway of the dam to achieve the Sugar Pine Project's full potential water storage capacity; and (2) implementing project design features and mitigation measures to avoid or reduce associated impacts to National Forest System (NFS) resources as administered by USFS. The issuance of the SUP amendment and related activities is considered the proposed action under the National Environmental Policy Act (NEPA) for purposes of this DEIR/EIS.

FPUD is the project applicant proposing to implement the proposed project and, as the primary state/local agency responsible for the review and approval of the proposed project, FPUD is designated as the Lead Agency for CEQA compliance (State CEQA Guidelines Section 15051). Because the proposed project requires a federal action in the form of the amended SUP, the project must also comply with NEPA. USFS is the designated federal Lead Agency for the proposed action under NEPA.

ES.1.2 Purpose, Need, and Project Objectives,

ES.1.2.1 USFS Purpose and Need for the Proposed Action

Applications for use and occupancy of NFS lands must be consistent with the Forest Plan for those lands. FPUD has submitted an application for the project consistent with the federal Sugar Pine Dam and Reservoir Conveyance Act of 2000 (Public Law 106-566). The TNF's purpose in responding to FPUD's SUP Permit amendment application is to achieve Forest Plan desired conditions for issuance of permits, or permit amendments by assuring such uses maximize public benefits and impacts to NFS resources are mitigated (Forest Plan, p. V-10). The Forest Plan recognizes the importance of Sugar Pine Reservoir as a source of domestic water supply for the FPUD and describes the future potential for installation of radial gates in the existing spillway of the dam (Forest Plan, p. V-489). The Forest Plan emphasizes recreation management for the Sugar Pine Reservoir basin (Forest Plan, p. V-490), while acknowledging that the reservoir's primary function and purpose is to provide adequate water supply to existing and future water customers of FPUD.

The TNF must respond to FPUD's application in order to comply with Title V of the Federal Land Policy Management Act and related Forest Service land use regulations. Amendment of the permit to authorize installation of the radial gates would be consistent with provisions of the Public Law 106-566 which require that changes in use or operation of Sugar Pine Reservoir facilities comply with all applicable laws and regulations at the time of the changes.

ES.1.2.2 FPUD Project Objectives

FPUD is requesting a 49-year extension to its current water right to complete construction of Sugar Pine Reservoir and develop the water supply necessary for M&I and other consumptive uses within the District's service area. Continued diversions and the expansion of Sugar Pine Reservoir storage capacity are necessary to meet current and projected future water demand. FPUD's primary objectives for completing the proposed project include:

- Ensure that water supply needs for current and future municipal, industrial and agricultural users within the FPUD service area are met in an environmentally sound and economically sustainable manner;
- Replace any and all TNF recreational facilities that are directly affected by the proposed expansion of Sugar Pine Reservoir with facilities as determined by TNF;
- Continue to operate Sugar Pine Reservoir to maximize recreational use at the reservoir to the extent possible given the primary use of the reservoir for water supply;
- Continue to provide surplus water to downstream users in the form of periodic temporary water transfers for municipal, industrial, agricultural or environmental use when such water is not needed to meet FPUD customer demand;
- Allow for possible future long-term transfers of stored water for downstream beneficial use for municipal, industrial, agricultural or environmental purposes when such water is not needed to meet FPUD customer demand;
- Expand water storage capacity at Sugar Pine Reservoir to help mitigate potential decline in project yield due to climate change and potential regulatory changes requiring bypass flows in accordance with the SWRCB's Bay-Delta Water Quality Control Plan, and to supplement the overall water supply reliability and ecosystem health for the state of California in keeping with the Statewide Water Action Plan; and
- Implement compensatory mitigation measures to reduce or avoid the potential adverse effect of proposed project activities on downstream legal users of water, and recreational, biological, cultural, and visual resources

ES.2 SUMMARY OF PUBLIC INVOLVEMENT

ES.2.1 Public Scoping Process

In accordance with NEPA regulations (40 CFR Section 1508.22), the Forest Service initiated the scoping comment period by publishing a notice of intent in the *Federal Register* on September 2, 2016. Two public scoping meetings for the project were held. The first meeting was conducted by FPUD and occurred on September 19, 2016 at Foresthill Veterans Memorial Hall in Foresthill, CA. The second was conducted by USFS and was held on September 20, 2016 in Rocklin, CA. Subsequent to those meetings, public scoping comments were submitted by 27 individuals/groups.

The notices and scoping materials for the FPUD and USFS scoping sessions are included with this DEIR/EIS as Appendices N and O, respectively.

ES.2.2 Resources Addressed in the DEIR/EIS

Based on the results of project scoping process, coordination between state and federal Lead Agency staff and EIR/EIS preparers, FPUD and USFS have determined that the proposed project/action has the potential to result in significant environmental impacts on the following resources, which are addressed in detail in this DEIR/EIS (see Sections 4.2 through 4.12):

- Aesthetics/Visual Resources
- Air Quality and Climate Change
- Biological Resources
- Cultural Resources
- Geology, Soils and Paleontological Resources
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Noise
- Recreation
- Traffic and Transportation

"Key issues" that helped inform the development of alternatives include biological resources and water quality. For example, Alternative 1 (Layne's Butterweed Trail Realignment) was developed in order to avoid known occurrences of Layne's butterweed (a federally listed threatened species) along the proposed alignment for reconstruction of the Josh Hardt Memorial Trail included as part of the proposed project/action. Alternative 2: Helicopter Harvest was developed as a means to avoid the construction of bench-cut trails needed to accommodate timber harvest in areas where the slope exceeds 35 % under the proposed project/action, and potential soil erosion and water quality impacts associated with such construction.

ES.2.3 Areas of Controversy

Based on comments received during the scoping period, the major areas of interest associated with the project/action warranting further analysis included:

- Recreation;

- Water Supply;
- Project Purpose and Need;
- Aesthetics/Visual Resources;
- Health and Safety; and
- Economic Impact.

A more detailed discussion of the comments received is provide in Appendices N and O of this DEIR/EIS.

ES.2.4 Issues to be Resolved

As it relates to Forest Service approvals, the TNF Forest Supervisor will decide whether to require implementation of the proposed project/action or one of the project alternatives evaluated herein. Also, the precise content of the amendment of FPUD's Special Use Permit with TNF will require agreement by both parties prior to project initiation. In addition, various other permits and approvals will be required prior to project construction as shown in *Table 1-1* of the DEIR/EIS.

ES.2.5 Public Review of the Draft EIR/EIS

This Draft EIR/EIS was circulated for public review on June 11, 2021 and distributed to interested agencies, stakeholder organizations, and individuals for a comment period of 60 days. The comment period for the DEIR/EIS closes on August 10, 2021. This distribution was meant to ensure that interested parties had an opportunity to express their views regarding the environmental effects of the project and to ensure that information pertinent to permits and approvals was provided to decision makers. The DEIR/EIS is available for review by the public during normal business hours at Foresthill Public Utility District Headquarters and Tahoe National Forest offices in Foresthill, California. The document is available online at:

https://www.foresthillpud.com/reports.html and
https://www.fs.usda.gov/projects/tahoe/landmanagement/projects

ES.3 SUMMARY DESCRIPTION OF ALTERNATIVES

NEPA and CEQA require the analysis of a reasonable range of alternatives that meet the purpose and need/objectives of the project (40 CFR Section 1502.14[a] and 14 CCR Section 15126.6[a]). FPUD and the USFS have identified the following five alternatives: No Project Alternative: No Action Alternative; Proposed Project/Action Alternative; Alternative 1 (Layne's Butterweed Trail Realignment); and Alternative 2 (Helicopter Harvest). These alternatives are described in greater detail in Chapter 3, "Description of the Alternatives."

As noted above, alternatives were developed, in part, in response to issues identified internally by the Forest Service and Placer County, and externally by the public during the scoping process.

No Project Alternative

Under CEQA, the No-Project Alternative must also be analyzed (see CEQA Guidelines § 15126.6(e)). This requirement encourages a Lead Agency to compare the environmental effects of approving a proposed project with the effects of not approving it. Unlike the no action alternative, the No Project Alternative generally assumes that the land area or current environment would remain in its existing state. This is typically prefaced by the continuation of current plans and ongoing operation of existing available infrastructure, and community services. Under the No Project Alternative for this EIR/EIS the following would occur:

- FPUD's Water Right 15375 would be extended to allow time for the District to put to beneficial use the water supply developed by the existing Sugar Pine Dam and Reservoir;
- Radial gates would not be installed on Sugar Pine Dam; and
- Maximum storage capacity and maximum area of inundation of Sugar Pine Reservoir would remain unchanged from current conditions.

As the No Project Alternative does not include the expansion of storage or area of inundation of Sugar Pine Reservoir, the development of replacement recreational facilities or compensatory mitigation measures would not be needed.

No Action Alternative

The No Action Alternative as defined by NEPA reflects future conditions that are likely to occur without the Proposed Action [40 CFR § 1502.14(d)]. The No Action Alternative should reflect existing management and operational conditions that would cause current activities to continue without significant change: activities that directly or indirectly affect resources that, in turn, could be affected by the Proposed Action. The No Action Alternative also should include future actions that are likely to proceed regardless of implementing the proposed action. In keeping with NEPA requirements, the No Action Alternative, in most cases, serves as a basis of comparison for determining potential effects on the human environment of the proposed action and other project alternatives.

For this EIR/EIS, the proposed action is USFS approval of an amendment to FPUD's existing Special Use Permit for the operation of the Sugar Pine Project. The proposed amendment would allow an increase in the Sugar Pine Reservoir maximum area of inundation, tree and brush removal from within the expanded inundation area, replacement of USFS recreational facilities affected by the action, and implementation of compensatory mitigation measures, as a result of the installation of radial gates on Sugar Pine Dam. None of these activities would occur under the No Action Alternative.

Under the No Action Alternative, existing Sugar Pine Reservoir management and operational conditions would continue. The No Action Alternative also incorporates foreseeable future actions likely to occur in the absence of the project that could affect these conditions. Key among these future actions is the proposed extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers as well as new customers that will be created as a result of future planned growth and development under Placer County's Foresthill Community Plan, which identifies FPUD as the public water supplier to serve the Community Plan area.

To fully define the No Action Alternative and thus help establish the parameters for the NEPA environmental baseline, current reservoir operations, past and ongoing water transfer activities by FPUD, and expected future increases in water demand within the FPUD service area must be described. These conditions are described below.

Proposed Project/Action

The proposed project/action includes the 49-year extension of the FPUD's Sugar Pine Project Water Right Permit 15375, completion of unconstructed Sugar Pine Project facilities, i.e., installation of radial gates, and the associated expansion of Sugar Pine Reservoir storage capacity from approximately 7,000 AF to 10,658 AF to ensure sufficient safe yield to meet existing and future residential, municipal and industrial uses and other consumptive demands arising under the 2008 Foresthill Community Plan and FPUD's service area. The replacement of reservoir-related recreational facilities adversely affected by the storage expansion and the implementation of measures to compensate for adverse project effects are also considered elements of the proposed project/action.

The existing concrete spillway was designed and constructed to receive the radial gates. Other than installation of the gates, no further modifications to the spillway or dam are anticipated. Following installation of the gates, the FPUD would continue to operate the dam to comply with the existing minimum pool requirements and the existing fishery flow release schedule that are incorporated into the Project's water right Permit.

With installation of the radial gates and expansion of the area of inundation of Sugar Pine Reservoir, various TNF recreational facilities located adjacent to the reservoir will require removal and replacement. In addition, various compensatory measures to avoid or reduce project effects on recreational, biological, and visual resources would be implemented by FPUD and TNF as part of the proposed project/action. Additionally, various USFS "management requirements" associated with issuance of the SUP are included within the project description for the purpose of avoiding or reducing potential adverse effects on environmental resources, particularly, biological resources. The proposed action encompasses the issuance of the Special Use Permit (SUP) Amendment which will facilitate Sugar Pine Dam radial gate installation, associated increase in Sugar Pine Reservoir storage capacity, recreational facilities construction and compensatory mitigation implementation. The proposed extension of Water Right Permit 15375 by the SWRCB pursuant to the California Water Code is not part of the federal proposed action because it is not a federal approval.

Alternative 1 - Layne's Butterweed Trail Realignment

Under Alternative 1, all elements of the proposed project/action described above would be implemented with the following exception. Under Alternative 1, the proposed alignment for the reconstruction of the JHMT described in Section 2.2.5 above, would be modified. This modification would affect the portion of the proposed realignment between Forbes and upper Shirttail creeks. Under Alternative 1, the trail would not run adjacent to Forbes Creek and the expanded inundation area for Sugar Pine Reservoir as proposed.

The trail would instead extend up the hill immediately east of the bridge at Forbes Creek with the placement of a series of switchbacks as shown in *Figure 3-1* in Chapter 3. Beyond these switchbacks, the trail will run along the hillside, gradually descending to join the proposed action alignment at the location shown in the figure.

The alternative alignment for the trail for Alternative 1 was developed in order to avoid direct disturbance to a population of Layne's Butterweed (a federally listed threatened species) located adjacent to the east shore of Forbes Creek.

Alternative 2 - Helicopter Harvest

All elements of the proposed project/action described herein would be implemented under Alternative 2 with the following exception relating to proposed timber harvest operations within the reservoir expansion area. Under Alternative 2, those areas within the reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine of the 44 acres to be cleared under the proposed project/action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. Under Alternative 2, the remaining 35 acres with slopes less than 35 percent, would be harvested mechanically as would occur under the proposed project/action.

ES.4 COMPENSATORY MITIGATION MEASURES AND MANAGEMENT REQUIREMENTS

The proposed project/action, Alternative 1 or Alternative 2 each would require the implementation of Compensatory Mitigation Measures and TNF Management Requirements.

ES.4.1 Compensatory Mitigation Measures

This DEIR/EIS identifies TNF recreational features that will be adversely affected by the proposed action, proposed action design features intended to replace/relocate those features, and the projected environmental effects of replacing or relocating those features. Measures required to replace TNF recreational features and measures to mitigate the impact of these activities on sensitive environmental resources are identified in this DEIR/EIS as "Compensatory Mitigation Measures." A comprehensive list of Compensatory Mitigation Measures is included in *Table 2-7* of this DEIR/EIS. All measures listed in *Table 2-7* would be implemented for the proposed project/action, Alternative 1 and Alternative 2 unless otherwise noted in the table.

ES.4.2 TNF Management Requirements

Implementation of TNF Management Requirements (MRs) would be mandatory with implementation of the proposed project/action, Alternative 1 or Alternative 2. A complete list of MRs is presented in *Table 2-8* of this DEIR/EIS. These measures are designed to ensure compliance with current USFS and TNF management direction and to reduce or prevent adverse effects of proposed actions on wildlife and aquatic species and upland and aquatic habitats.

ES.5 ENVIRONMENTAL EFFECTS AND MITIGATION MEASURES

Chapter 4, "Affected Environment and Environmental Consequences," of this DEIR/EIS describes in detail the environmental effects that would result from implementation of the project alternatives. For the NEPA analysis, environmental effects are concluded to be: (1) no effect, (2) adverse when there are detrimental or negative effects, or (3) beneficial when there are positive effects. For some NEPA effects conclusions, "minorly" is used to characterize adverse and beneficial effects (i.e., minorly adverse or minorly beneficial), in an effort to further distinguish the effects of the action alternatives. For the CEQA analysis, environmental effects are determined to be: (1) no impact; (2) less than significant; (3) less than significant with mitigation incorporated; and (4) significant and unavoidable (changes in the environment that cannot be feasibly reduced to a less-than-significant levels with mitigation measures).

As described above, the project/action and Alternatives 1 and 2 include Compensatory Mitigation Measures and Management Requirements developed to avoid, minimize, or compensate for the potential environmental effects of the project. The Compensatory Mitigation Measures and TNF Management Requirements are considered part of the project and will be conditions of approval of the USFS SUP Amendment. Where potentially adverse effects are identified in this DEIR/EIS that are not reduced to less than significant (CEQA) or minorly adverse (NEPA), additional mitigation measures are recommended to reduce effects to less-than-significant levels where feasible.

Table ES-1 (at the end of this chapter) summarizes the potential environmental effects that would result from implementation of the alternatives; lists applicable TNF Management Requirements, Compensatory Mitigation Measurement, other proposed mitigation to address significant and potentially significant environmental effects; and identifies the significance of effects both before and after mitigation.

ES.6 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

CEQA requires that the environmentally superior alternative be selected from a range of reasonable alternatives that could feasibly attain the basic objectives of the project. As discussed in Section 4.1 of this DEIR/EIS, the assessment of the environmental superiority of alternatives in this DEIR/EIS does not consider whether the proposed project/action would improve existing environmental conditions and does not consider the beneficial impacts of any alternative above and beyond its ability to reduce or avoid significant effects of the proposed project/action. Therefore, based on the analysis presented in Sections 4.2 through 4.12, and the comparison of alternatives presented above, the environmentally superior alternative was determined under CEQA to be the No Project Alternative. Under the No Project Alternative, the proposed project would not be constructed. All environmental impacts associated with the construction and operation of the proposed project would be eliminated and existing environmental conditions would be unaffected and the associated benefits of the proposed project/action discussed in Section 1.5 (Proposed Project Objectives) would not be realized.

CEQA Guidelines, Section 15126, subd. (d)(2) further stipulates that "if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." In keeping with the discussion in Section 5.3.1.4 of this DEIR/EIS, the proposed project/action is found to be environmentally superior to both Alternative 1 and 2. Both Alternative 1 and 2 are found to result in significant and unavoidable impacts that would be avoided under the proposed project/action. Implementation of neither Alternative 1 or Alternative 2 would serve to avoid any impacts identified as significant and unavoidable under the proposed project/action.

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
4.2 Aesthetics and Visual Resources					
Impact VIS-1: Adverse effect on a scenic vista	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact VIS-2: Damage to scenic resources	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact VIS-3: Degrade the existing visual character or quality of the site and its surroundings	Short-term Impact: Project/Action, Alt 1, and Alt 2 = S Long-term Impact: Project/Action, Alt 1, and Alt 2 = SU	Short-term Impact: Project/Action, Alt 1, and Alt 2 = Adv Long-term Impact: Project/Action, Alt 1, and Alt 2 = Adv	Short-term Impacts: Mitigation Measures VIS-1 through VIS-5. Long-term Impacts: None feasible.	Short-term Impact: = LTS Long-term = SU	Short-term Impact: = NE Long-term Impact = Adv
Impact VIS-4: Creation of a substantial new source of light or glare that would adversely affect day or nighttime views in the area	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure VIS-6	LTS	NE
Impact VIS-5: Result in an inconsistency with applicable visual quality objectives of the TNF Land and Resources Management Plan	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure VIS-3	LTS	NE
4.3 Air Quality and Climate Change					
Impact AIR-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable	Project/Action and Alt 1 = LTS Alt 2 = SU	Project/Action and Alt 1 = MA Alt 2 = Adv	Management Requirement AQ1 for prescribed burns to occur under the project/action, Alt 1 and 2. No feasible mitigation measures are available to reduce Alt 2 helicopter emissions to levels considered LTS.	Project/Action and Alt 1 = LTS Alt 2 = SU	Project/Action and Alt 1 = MA Alt 2 = MA

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
federal or state ambient air quality standard					
Impact AIR-2: Result in the exposure of sensitive receptors to substantial pollutant concentrations	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure AIR-1	LTS	NE
Impact AIR-3: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact AIR-4: Conflict with or obstruct implementation of the applicable air quality plan	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact AIR-5: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact AIR-6: Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
4.4 Biological Resources					
Impact BIO-1: Adversely affect, either directly or through habitat modifications, species identified as	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Compensatory Mitigation: L1, M1, N1, O 1-2, P 1-2, Q1.	LTS	MA

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
a candidate, sensitive, or special-status species			Management Requirements: IS 1-6, BOT 1-4, TW 1-16, WAR 1-3, RCA 1-4, PFA 1-3, WSU 1-11.		
Impact BIO-2: Adversely affect native habitats through the introduction of invasive, non-native, or noxious plant species	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = MA	Management Requirements IS 1-6.	LTS	MA
Impact BIO-3: Adversely affect riparian habitat and other sensitive natural communities	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = MA	Compensatory Mitigation: P2. Management Requirements: IS 1-6, BOT 1-4, TW 1-16, WAR 1-3, RCA 1-4, PFA 1-3, WSU 1-11.	LTS	MA
Impact BIO-4: Adversely affect federally protected wetlands	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = MA	Compensatory Mitigation: O 1-2 and P2. Management Requirements: WAR 1-3, RCA 1-4, WSU1-13, PFA 1-3, and IAW1.	NA	NA
Impact BIO-5: Affect movement of native resident or migratory fish or wildlife species, established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = MA	No mitigation measures are required for project/action and Alt 1. Management Requirements: TW 1-6 and TW9 are applicable to Alt 2.	NA	NA
Impact BIO-6: Conflict with the goals and policies of TNF and Sugar Pine management plans	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	Management Requirements IS 1-6 and TW 6-7.	NA	NA
Impact BIO-7: Adversely affect fish resources in Sugar Pine Reservoir and lower North Shirttail Creek	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = MA	No mitigation measures are required.	NA	NA

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
4.5 Cultural Resources					
Impact CUL-1: Result in a substantial adverse change in the significance of a historical or archaeological resource or result in an effect to a historic property	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Compensatory Mitigation Measures CR1 through CR9. Mitigation Measure: CUL-1	LTS	NE
Impact CUL-2: Disturb any human remains, including those interred outside formal cemeteries	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure: CUL-2	LTS	NE
4.6 Geology and Soils					
Impact GEO-1: Result in the potential for substantial soil erosion and/or loss of topsoil	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measures: GEO-1 and GEO-2.	LTS	MA
Impact GEO-2: Potential geologic hazards related to construction in unstable soils	Project/Action and Alt 2 = LTS Alt 1 = S	Project/Action and Alt 2 = NE Alt 1 = Adv	No mitigation required for Project/Action and ALT 2 Mitigation Measure: GEO-2 required for Alt 1.	Project/Action and Alt 2 = NA Alt 1 = LTS	Project/Action and Alt 2 = NA Alt 1 = NE
Impact GEO-3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure: GEO-3.	LTS	MA
Impact GEO-4: Cumulative geologic hazards related to substantial soil erosion and/or loss of topsoil	Project/Action, Alt 1, and Alt 2: Less than cumulatively considerable.	Project/Action, Alt 1, and Alt 2 = Less than cumulatively considerable.	No mitigation measures are required.	NA	NA

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
Impact GEO-5: Cumulative geologic hazards related to unstable soils	Project/Action, Alt 1, and Alt 2: Less than cumulatively considerable.	Project/Action, Alt 1, and Alt 2 = Less than cumulatively considerable.	No mitigation measures are required.	NA	NA
4.7 Hazards and Hazardous Materials					
Impact HAZ-1: Require the transport, storage and use of hazardous materials common for such activities and could result in their inadvertent release to the environment	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	WSU 2, 3, 4, and 5; Mitigation Measures GEO-1 and GEO-2	LTS	NE
Impact HAZ-2: Require heavy machinery and personal in an area that is currently forestlands	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
4.8 Hydrology and Water Quality					
Impact HYD-1: Could violate any water quality standards	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure: HYD-1	LTS	NE
Impact HYD-2: Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure: HYD-1	LTS	NE
Impact HYD-3: Result in substantial erosion or siltation in and around to future reservoir and downstream of the dam	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
Impact HYD-4: No features of the would be constructed within 100-year flood hazard area	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact HYD-5: Installation of radial gates will not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a dam	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
4.9 Land Use and Planning					
Impact LU-1: Disturb existing land uses at or near Sugar Pine Dam and Reservoir during construction	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measures: LU-1 and LU-2.	LTS	NE
Impact LU-2: Divide an established community or result in disproportionately high adverse effects on minority or low-income populations	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact LU-3: Conflict with applicable land use plans, policies, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect	Project/Action, Alt 1, and Alt 2 = S	Project/Action, Alt 1, and Alt 2 = Adv	Mitigation Measure: LU-3.	LTS	NE

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
4.10 Noise					
Impact NOISE-1: Generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact NOISE-2: Result in the excessive groundborne vibration or groundborne noise levels	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
4.11 Recreation					
Impact REC-1: Require the replacement of camping, day use, trail and boat ramp facilities	Project/Action and Alt 2 = LTS Alt 1 = S	Project/Action and Alt 2 = MA Alt 1 = Adv	No mitigation measures are required for Project/Action. No mitigation available for Alt 1.	Project/Action and Alt 2 = NA. Alt 1 = SU	Project/Action and Alt 2 = NA. Alt 1 = Adv
Impact REC-2: Affect user/guest recreational experience at Sugar Pine Reservoir for recreation activities	Project/Action and Alt 2 = LTS. Alt 1 = S	Project/Action and Alt 2 = MA. Alt 1 = Adv	No mitigation measures are required for Project/Action. No mitigation available for Alt 1.	Project/Action and Alt 2 = NA. Alt 1 = SU	Project/Action and Alt 2 = NA. Alt 1 = Adv
Impact REC-3: During project construction, Sugar Pine recreational facilities would be closed to the public in order to avoid potential safety hazards to recreational users that could result from timber harvest, radial gate installation, and recreational facilities construction.	Project/Action, Alt 1, and Alt 2 = NI.	Project/Action, Alt 1, and Alt 2 = Adv.	Impact Determination: no impact (CEQA) and adverse (NEPA) for the proposed project/action and Alternatives 1 and 2.	Project/Action, Alt 1, and Alt 2 = NA,	Project/Action, Alt 1, and Alt 2 = NA.

Table ES-1. Summary of Resource Topics with Impacts and Mitigation Measures

Resource Topics/Impacts	Environmental Effects before Mitigation (by Alternative)		CEQA/NEPA Mitigation Measures and applicable Compensatory Mitigation and Management Requirements	Environmental Effects after Mitigation (by Alternative)	
	CEQA	NEPA		CEQA	NEPA
Adv = Adverse S = Significant LTS = Less than significant MA = Minorly Adverse NI = No Impact NE = No Effect SU = Significant & unavoidable N/A = Not Applicable					
4.12 Traffic and Transportation					
Impact TRA-1: Potential to result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks	Project/Action, Alt 1, and Alt 2 = NI	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact TRA-2: Potential to result in inadequate emergency access	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA
Impact TRA-3: Potential to result in short-term traffic impacts	Project/Action, Alt 1, and Alt 2 = LTS	Project/Action, Alt 1, and Alt 2 = NE	No mitigation measures are required.	NA	NA

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Foresthill Public Utility District
and
U.S. Forest Service

Sugar Pine Project: Water Right Permit 15375 Extension and Radial Gates Installation

Draft Environmental Impact Statement/ Environmental Impact Report

June 2021

Foresthill Public Utility District
P.O. Box 266
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U.S. Forest Service
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Nevada City, California 95959

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Attachment L2: ECORP 2016. California Red-Legged Frog (*Rana draytonii*) Habitat Assessment and Foothill Yellow-Legged Frog (*Rana boylii*) and Western Pond Turtle (*Actinemys marmorata*) Survey Results for the Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Placer County, California. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L3: ECORP. 2018. Foothill Yellow-legged Frog and Northwestern Pond Turtle Monitoring Results in Support of the Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp.

Attachment L4: ECORP 2019. Biological Evaluation: Birds, Mammals, Amphibians, Reptiles, Fish, Invertebrates: Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp.

Attachment L5: ECORP 2019. Biological Evaluation: Forest Service Sensitive Plants and Fungi for the Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp.

Attachment L6: ECORP 2019. Delineation of Waters of the U.S. for the Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L7: ECORP 2019. Other Botanical Resources Report: Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L8: ECORP 2019. Invasive Species Risk Assessment: Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L9: ECORP 2019. Management Indicator Species Report: Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L10: ECORP 2019. Migratory Landbird Report: Sugar Pine Project Water Right Permit 15375 Extension and Radial Gates Installation. Prepared for Foresthill Public Utility District, Foresthill, California.

Attachment L11: Sugar Pine Reservoir Radial Gate Installation Project: Layne's Butterweed (*Packera layneae*) Compensatory Mitigation Measures - Draft by Courtney Rowe, USDA Forest Service.

LIST OF ACRONYMS AND ABBREVIATIONS

AF	Acre-feet
AP Act	Alquist-Priolo Earthquake Fault Zoning Act
ACI	American Concrete Institute
AISC	American Institute of Steel Construction
ASCE	American Society of Civil Engineers
AB	Assembly Bill
ADT	Average daily trips
dBA	A-weighted
BVI	Blade vortex interaction
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CAAQS	California Ambient Air Quality Standards
CBC	California Building Code
CCAA	California Clean Air Act
CCR	California Code of Regulations
CDFG	California Department of Fish and Game
CAL-FIRE	California Department of Forestry and Fire Protection
DTSC	California Department of Toxic Substances Control
CalEEMod	California Emissions Estimator Model
Cal EPA	California Environmental Protection Agency
CGS	California Geological Survey
CHRIS	California Historical Resources Information System
NPPA	California Native Plant Protection Act
Cal/OSHA	California Occupational Safety and Health Administration
CRPR	California Rare Plant Rank
CWHR	California wildlife habitat relationships
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
CO	Carbon monoxide
CVRWQCB	Central Valley Regional Water Quality Control Board
CWA	Clean Water Act
CNEL	Community Noise Equivalent Level
PM_{10}	Coarse particulate matter
CFR	Code of Regulations
dB	Decibel
DSOD	Department of Water Resources, Division of Safety of Dams
EPCRA	Emergency Planning and Community Right-to-Know Act of 1986
ESA	Endangered Species Act
EO	Executive Order
FCAA	Federal Clean Air Act
FLPMA	Federal Land Policy and Management Act
FDCP	Foresthill Divide Community Plan
FPUD	Foresthill Public Utility District
FPUD	Foresthill Public Utility District
GWP	Global warming potential
G2	Globally threatened

GHG	Greenhouse gas
HAP	Hazardous Air Pollutants
HRCAs	Home range core areas
IBC	International Building Code
I-80	Interstate 80
JMHT	Joshua M. Hardt Trail
LRMP	Land and Resource Management Plan
LOS	Level of service
LOP	Limited operating period
MA	Management Area
CH_4	Methane
MBTA	Migratory Bird Treaty Act
mg	Milligrams
MIS	Management Indicator Species
MLD	Most Likely Descendant
MCAB	Mountain Counties Air Basin
NAAQS	National Ambient Air Quality Standards
NEHRP	National Earthquake Hazards Reduction Program
NEHRPA	National Earthquake Hazards Reduction Program Act
NFMA	National Forest Management Act
NPDES	National Pollutant Discharge Elimination System
NAHC	Native American Heritage Commission
NRCS	Natural Resources Conservation Service
NOA	Naturally occurring asbestos
NOS	Naturally Occurring Asbestos
NO_2	Nitrogen dioxide
N_2O	Nitrous oxide
NCIC	North Central Information Center
NOI	Notice of Intent
NOP	Notice of Preparation
OSHA	Occupational Safety and Health Administration
OHV	Off highway vehicle
OES	Office of Emergency Services
OEHHA	Office of Environmental Health Hazard Assessment
OPR	Office of Planning and Research
O_3	Ozone
PPV	Peak particle velocity
PCAPCD	Placer County Air Pollution Control District
PCARC	Placer County Archives and Research Center
PCTPA	Placer County Transportation Planning Agency
PACs	Potential activity centers
PRC	Public Resources Code
ROS	Recreation Opportunity Spectrum
RTP	Regional Transportation Plan
RNA	Research Natural Area
M	Richter magnitude
ROW	Right-of-way
RCA	Riparian Conservation Areas

RCO	Riparian Conservation Objectives
RMS	Root mean square
SDC	Seismic Design Category
SNFP	Sierra Nevada Forest Plan
SIAs	Special interest areas
SOI	Sphere of influence
SIP	State Implementation Plan
SIP	State Implementation Plan
RWQCB	State Water Resources Control Board
SWPPP	Stormwater Pollution Prevention Plan
SAA	Streambed Alteration Agreement
MA 96	Sugar Pine Management Area 96
SO_2	Sulfur dioxide
TNF	Tahoe National Forest
TACs	Toxic air contaminants
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USEPA	U.S. Environment Protection Agency
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
UCMP	University of California Museum of Paleontology
VQO	Visual Quality Objectives

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CHAPTER 1 INTRODUCTION AND OVERVIEW

This report is entitled Water Right 15375 Extension of Time and Sugar Pine Dam Radial Gate Installation Project and Special Use Permit Amendment Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS). This chapter of the report includes a general introduction to the proposed project/action and environmental review process (Section 1.1), project background (Section 1.2), project overview (Section 1.3), purpose and need for the project as it applies to the federal agencies and tribal lands (Section 1.4), the project applicant's objectives for pursuing the project (Section 1.5), and the intended use of the joint DEIR/EIS by the state and federal lead agencies (Section 1.6). The organization and content of the DEIR/EIS are described in Section 1.7.

1.1 Introduction

Foresthill Public Utility District (FPUD or the District) was formed in 1950 pursuant to the provisions of Section 15501 et seq. of the California Public Utilities Code for the purpose of providing public water service. The District's service area comprises the unincorporated community of Foresthill, California, located in Placer County approximately 60 miles northeast of Sacramento. The District's service area currently incorporates approximately 13,000 acres and contains primarily residential development.

The Sugar Pine Project, consisting primarily of Sugar Pine Dam and Reservoir, serves as the District's primary source of raw water supply. The Sugar Pine Dam was completed by the U.S. Bureau of Reclamation (Reclamation) in 1981. Reclamation conveyed the Sugar Pine Project to FPUD in 2003. The Sugar Pine Reservoir currently has a storage capacity of approximately 6,922 acre-feet (AF). However, the Sugar Pine Dam spillway was designed to accept two radial gates that would increase the reservoir's storage capacity to 10,872 AF. The Sugar Pine Project is located entirely within the Tahoe National Forest.

On December 26, 2011, FPUD petitioned the State Water Resources Control Board (SWRCB) to extend Water Right Permit 15375. Execution of the water right extension is needed in order to allow the District more time to diligently construct the water supply project and use that water supply permitted by the SWRCB. The water supply developed by the Sugar Pine Project is needed to meet anticipated growth in consumptive water demand within the District's service area under the Foresthill Divide Community Plan that Placer County's Board of Supervisors approved in 2008. The proposed water right permit extension would enable the District to complete the Sugar Pine Project by installing radial gates in Sugar Pine Dam's existing spillway to expand the storage capacity of Sugar Pine Reservoir. Approval of the extension would complete construction and put the Sugar Pine Project yield to beneficial use. As required by the SWRCB, the District was required to file for an extension of time to complete the Project and allow for the development and use of the full water supply.

The installation of radial gates at Sugar Pine Dam and beneficial use of the resulting water supply constitute, in part, the proposed project under the California Environmental Quality Act (CEQA) for purposes of this DEIR/EIS.

To implement the proposed project, the District has submitted a request to the United States Forest Service (USFS), specifically Tahoe National Forest (TNF), to amend the Special Use Permit (SUP) it previously approved for the Sugar Pine Dam and Reservoir Project. The SUP amendment would authorize completion of the Project by: (1) increasing water storage capacity of Sugar Pine Reservoir by installing radial gates in the existing spillway of the dam to achieve the Sugar Pine Project's full potential water storage capacity; and (2) implementing project design features and mitigation measures to avoid or reduce associated impacts to National Forest System (NFS) resources as administered by USFS. The issuance of the SUP amendment and related activities is considered the proposed action under the National Environmental Policy Act (NEPA) for purposes of this DEIR/EIS.

FPUD is the project applicant proposing to implement the proposed project and, as the primary state/local agency responsible for the review and approval of the proposed project, FPUD is designated as the Lead Agency for CEQA compliance (State CEQA Guidelines Section 15051). Because the proposed project requires a federal action in the form of the amended SUP, the project must also comply with NEPA. USFS is the designated federal Lead Agency for the proposed action under NEPA.

After considering results from pubic scoping processes carried out by FPUD and USFS, and after the evaluation of the context and intensity factors contained in 36 CFR §1508.27, USFS, in collaboration with FPUD, determined that a joint EIR/EIS is the appropriate means to review, analyze and document the effects on the human, physical, and biological environment anticipated with the issuance of a SUP Amendment and installation of radial gates in the spillway of Sugar Pine Dam in the TNF.

1.2 Project Background

Construction of the existing Sugar Pine Project including the Sugar Pine pipeline was completed by Reclamation in 1983 as part of the Central Valley Project pursuant to a water right Permit approved by the SWRCB in 1967. The existing reservoir occupies approximately 160 acres. In 1985, Reclamation entered into an agreement with the TNF for administration of NFS and Reclamation resources, including recreation facilities, at the Sugar Pine Project site (1985 Agreement). Pursuant to the Sugar Pine Dam and Reservoir Conveyance Act of 2000 (Public Law 106-566), the United States, in 2003, conveyed the Sugar Pine Project, its water right, rights and responsibilities of Reclamation under the 1985 Agreement and other interests to FPUD. In 2003, the USFS issued the Permit authorizing use and occupancy of public lands to FPUD for the dam, reservoir and appurtenant facilities pursuant to Public Law 106-566.

The Sugar Pine Project was constructed to provide a reliable water supply for existing and future users within the FPUD service area located in and around the town of Foresthill in Placer County, California. FPUD, in turn spent $817,000 to construct the drinking water treatment plant and $3.4 million for upgrades to its potable water distribution system.

The spillway for Sugar Pine Dam was originally designed by Reclamation to accommodate the future installation of radial gates to increase water storage capacity of the reservoir. Installation of the radial gates would flood approximately 44 additional acres by raising the reservoir's maximum water surface elevation by 20 vertical feet to an elevation of 3,638 feet above sea level, which would increase the reservoir's storage capacity by approximately 57 percent to 10,872 AF, up from the existing capacity of 6,922 AF.

The entire dam, reservoir and surrounding basin are located entirely on NFS lands. In support of the Sugar Pine Project, Reclamation acquired for the United States several parcels of private land comprising a total of approximately 700 acres within and adjacent to the project site. 380 of these acres were acquired as wildlife mitigation for permanently impacted habitat and 320 acres were acquired for siting the dam, reservoir and appurtenances; portions of the 320 acres acquired for project construction remain unencumbered by infrastructure and provide additional wildlife habitat and recreation resource values in the reservoir basin. The wildlife mitigation lands were intended to offset permanent impacts from construction of the original 160 acre reservoir and appurtenances, without radial gates installed (Sugar Pine Dam, Reservoir and Conduit Final Environmental Statement, pp. 33, 37, 50). Management jurisdiction for the acquired lands was subsequently transferred to the TNF.

In addition to construction of the dam, Reclamation developed several recreation facilities adjacent to the reservoir as part of the project including: two family campgrounds, a group camp, a day use area, a swimming beach, a boat ramp and a multi-use trail. Pursuant to the 1985 Agreement, the above recreation improvements were transferred from Reclamation to TNF management upon their construction. Since that time the TNF has made additional investments in recreation facility infrastructure in the area, such as surfacing and dedication of the accessible Joshua M. Hardt Memorial Trail (JHMT). Based on visitor use and recreation fee revenue data collected from the reservoir campgrounds and day use area by the TNF, the recreation facilities at Sugar Pine Reservoir have become popular.

In 1983, the SWRCB approved an expansion of the “place of use” for the Sugar Pine Project's water supply to encompass 36,152 acres based on "present or future potential for agricultural and/or subdivision development." In 1985, approximately two years after the existing Sugar Pine Project facilities were completed and the reservoir was filled, consumptive use of the Project's yield for municipal and industrial (M&I) purposes was approximately 674 AF per year (AFY). As of 2001, M&I use had grown to approximately 991 AFY. However, because an "economic recession reduced Foresthill rate of growth," the State Board approved an extension of time to December 31, 2011, to complete the project and put its yield to beneficial use. To comply with CEQA, the SWRCB adopted a Notice of Exemption for the time extension.

In 2003, FPUD as the Permittee, acquired ownership and control of the Sugar Pine Project from Reclamation, and M&I use of Sugar Pine Project rose to 1,090 AFY. By 2008, M&I use rose to 1,284 AFY. That same year, the County of Placer adopted the Foresthill Divide Community Plan (Community Plan) to guide future growth and development in the region encompassing the District's service area and sphere of influence. The water supply chapter of Placer County’s environmental impact report (EIR) for the Community Plan analyzed actual historic hydrology from 1957 through 2003, identified 1975-1978 as the critical dry period (Critical Period), and projected that in the last year of the Critical Period the existing reservoir would yield 2,150 AFY as is and 3,450 AFY with the radial gates (i.e., the Project’s safe yield with and without the gates). The safe yield reflects a minimum pool requirement ranging from 1,100-3,560 AF, a downstream fishery flow release schedule ranging from natural reservoir inflow to 5 cubic feet per second (cfs), and a requirement to release flows for any downstream prior rights.

FPUD has indicated that the additional water storage capacity which would be achieved by installing the radial gates is necessary to ensure a reliable long-term water supply for the community of Foresthill under the Community Plan that the County of Placer approved in 2008. The water supply impacts analysis in the EIR certified for the Community Plan concluded that installation of the radial gates and the associated increase in water storage would avoid significant water supply impacts by ensuring adequate supplies to meet water demand from build-out under the Community Plan despite anticipated climate change and droughts effects on water supply availability.

The EIR certified for the Community Plan analyzed growth-related impacts arising from the development authorized by the Community Plan. The County EIR identified the District's Sugar Pine Project as the principal source of water supply available to serve the Community Plan area. The EIR projected that existing development and new development of planned future land uses in the District's existing service area would demand up to approximately 3,069-3,269 AFY of water to serve a population of approximately 13,750. The EIR concluded that additional demand from development of a then-pending 2,200-unit senior housing and mixed-use project proposal would cause cumulative demand for District water to exceed the Sugar Pine Project's safe yield, unless the Sugar Pine Project's existing storage volume were augmented as mitigation (i.e., by installing the radial gates). The Community Plan was approved by the County in 2008.

FPUD has indicated that prior to full implementation of the Community Plan, FPUD anticipates that it would continue to temporarily transfer stored water from the Sugar Pine Project to reduce water shortages in downstream communities or for other beneficial purposes approved by the SWRCB pursuant to the state's water transfer programs and policies. For example, in 2018 FPUD transferred 932 AF of water to Kern County Water Agency and Dudley Ridge Water District, and in 2015 FPUD transferred 2,000 AF of stored water for use to reduce water shortages in communities served by the Santa Clara Valley Water District.

1.3 Overview of the Proposed Project and Action

FPUD proposes to extend its Water Right 15375 and install radial gates at the dam's spillway to increase reservoir storage. This increase in storage will enable FPUD to meet the water needs of anticipated growth and development under the approved 2008 Foresthill Community Plan.

The existing concrete spillway was designed and constructed to receive the radial gates. Other than installation of the gates, no further modifications to the spillway or dam are anticipated. Following installation of the gates, the FPUD would continue to operate the dam to comply with the existing minimum pool requirements and the existing fishery flow release schedule that are incorporated into the Project's water right Permit.

FPUD is requesting a 49-year extension of its current water right Permit to complete construction of Sugar Pine Reservoir and develop the water supply necessary for M&I and other consumptive uses within the District's service area. Continued diversion and use of water from the reservoir is necessary to meet current and projected future water demand. The proposed project includes the 49-year extension of the FPUD's Sugar Pine Project Water Right Permit 15375, completion of unconstructed Sugar Pine Dam facilities, i.e., installation of radial gates, and the associated expansion of Sugar Pine Reservoir storage capacity from approximately 7,000 AF to 10,658 AF to ensure sufficient safe yield to meet existing and future residential, M&I and other consumptive demands arising under the 2008 Foresthill Community Plan and FPUD's service area. The replacement of reservoir-related recreational facilities adversely affected by the storage expansion and the implementation of measures to compensate for adverse project effects are also considered elements of the proposed project/action.

With installation of the radial gates and expansion of the area of inundation of Sugar Pine Reservoir, various TNF recreational facilities located adjacent to the reservoir will require removal and replacement. In addition, various compensatory measures to avoid or reduce project effects on recreational, biological, and visual resources would be implemented by FPUD and TNF as part of the proposed project/action. Additionally, various USFS "management requirements" associated with issuance of the SUP are included within the project description for the purpose of avoiding or reducing potential adverse effects on environmental resources, particularly, biological resources. The proposed action encompasses the issuance of the SUP Amendment which will facilitate Sugar Pine Dam radial gate installation, associated increase in Sugar Pine Reservoir storage capacity, recreational facilities construction and compensatory mitigation implementation. The proposed extension of Water Right Permit 15375 by the SWRCB pursuant to the California Water Code is not part of the federal proposed action because it is not a federal approval.

1.4 Purpose and Need for the Proposed Action

Applications for use and occupancy of NFS lands must be consistent with the Forest Plan for those lands. FPUD has submitted an application for the project consistent with the federal Sugar Pine Dam and Reservoir Conveyance Act of 2000 (Public Law 106-566). The TNF's purpose in responding to FPUD's SUP Permit amendment application is to achieve Forest Plan desired conditions for issuance of permits, or permit amendments by assuring such uses maximize public benefits and impacts to NFS resources are mitigated (Forest Plan, p. V-10). The Forest Plan recognizes the importance of Sugar Pine Reservoir as a source of domestic water supply for the FPUD and describes the future potential for installation of radial gates in the existing spillway of the dam (Forest Plan, p. V-489). The Forest Plan emphasizes recreation management for the Sugar Pine Reservoir basin (Forest Plan, p. V-490), while acknowledging that the reservoir's primary function and purpose is to provide adequate water supply to existing and future water customers of FPUD.

The TNF must respond to FPUD's application in order to comply with Title V of the Federal Land Policy Management Act and related Forest Service land use regulations. Amendment of the permit to authorize installation of the radial gates would be consistent with provisions of the Public Law 106-566 which require that changes in use or operation of Sugar Pine Reservoir facilities comply with all applicable laws and regulations at the time of the changes. FPUD proposes to increase the water storage capacity of Sugar Pine Reservoir to ensure the availability of a reliable long-term water supply for existing development and planned future land uses within the existing water right place of use for SWRCB Water Right Permit 15375 and the Foresthill Community Plan. The additional water storage provided by the proposed project is also intended to enhance water supply reliability needed to protect FPUD's customers (homes, schools, workplaces and public amenities) from a prolonged drought; climate change concerns and state initiatives to increase water storage in California are other factors which support the need for action on Foresthill's requested water right Permit extension.

Prior to full implementation of the Foresthill Community Plan, or build-out, FPUD may continue to carry out short-term water transfer contracts of stored reservoir water to help mitigate water shortages in downstream communities, to provide ecological benefits or to provide for other beneficial uses consistent with the California Water Code and SWRCB's water transfer program. FPUD used revenue generated from a 2015 water transfer to help fund replacement of an aging drinking water storage tank used to provide potable water for the Foresthill community and to maintain water system pressure necessary to comply with state requirements for firefighting. Similarly, revenue generated by FPUD from future water transfers under the proposed project/action could be used to help fund construction of the proposed project/action as well as the repair and replacement of aging water system infrastructure and thus avoid or reduce the need to raise water service rates on FPUD customers.

1.5 Proposed Project Objectives

As noted above, FPUD is requesting a 49-year extension to its current water right to complete construction of Sugar Pine Reservoir and develop the water supply necessary for M&I and other consumptive uses within the District's service area. Continued diversions and the expansion of Sugar Pine Reservoir storage capacity are necessary to meet current and projected future water demand. FPUD's primary objectives for completing the proposed project include:

- Ensure that water supply needs for current and future municipal, industrial and agricultural users within the FPUD service area are met in an environmentally sound and economically sustainable manner;
- Replace any and all TNF recreational facilities that are directly affected by the proposed expansion of Sugar Pine Reservoir with facilities as determined by TNF;
- Continue to operate Sugar Pine Reservoir to maximize recreational use at the reservoir to the extent possible given the primary use of the reservoir for water supply;
- Continue to provide surplus water to downstream users in the form of periodic temporary water transfers for municipal, industrial, agricultural or environmental use when such water is not needed to meet FPUD customer demand;
- Allow for possible future long-term transfers of stored water for downstream beneficial use for municipal, industrial, agricultural or environmental purposes when such water is not needed to meet FPUD customer demand;
- Expand water storage capacity at Sugar Pine Reservoir to help mitigate potential decline in project yield due to climate change and potential regulatory changes requiring bypass flows in accordance with the SWRCB's Bay-Delta Water Quality Control Plan, and to supplement the overall water supply reliability and ecosystem health for the state of California in keeping with the Statewide Water Action Plan; and
- Implement compensatory mitigation measures to reduce or avoid the potential adverse effect of proposed project activities on downstream legal users of water, and recreational, biological, cultural, and visual resources.

1.6 Agency Use of this Draft EIR/EIS and Permits Required

1.6.1 FPUD Decision Framework

FPUD is the lead agency for CEQA compliance in evaluation of the Water Right Permit 15375 extension and Sugar Pine Dam radial gate installation project and, along with TNF, has directed the preparation of this EIR/EIS. In this role, FPUD is responsible for compliance with CEQA and for coordinating with other state, local and federal agencies that will use this EIR/EIS in their permitting processes.

This EIR/EIS will be used by the FPUD, in conjunction with other information developed in the FPUD's formal record, to implement the proposed project. Under CEQA requirements, the District will determine the adequacy of the Final EIR/EIS and, if adequate, will certify the document as complying with CEQA and make a final decision whether to approve the proposed project.

1.6.2 USFS Decision Framework

The USFS is the federal lead agency for the preparation of this EIR/EIS in accordance with the Council on Environmental Quality regulations for implementing the National Environmental Policy Act at 40 Code of Federal Regulations (CFR) 1501.5. Consistent with its obligations under the Sugar Pine Dam and Reservoir Conveyance Act (Public Law 106-566), and using the analysis in the EIR/EIS and supporting documentation, the Forest Supervisor will determine how to condition a Special Use Permit Amendment authorizing the use of TNF lands as needed to allow installation of radial gates at Sugar Pine Dam and the expansion of reservoir storage capacity and area of inundation, vegetation removal from the expanded area of inundation, and the removal and replacement of existing USFS recreational facilities affected by the expanded inundation area. Approval of the SUP Amendment would also be contingent on the implementation of compensatory mitigation measures and management requirements for the proposed action. Approval of any of the action alternatives considered would require a project-level plan amendment to the TNF Land and Resource Management Plan (1990, as amended) to address impacts to visual resources.

Following issuance of the Draft EIR/EIS, public comments will be accepted and considered in preparing a Final EIR/EIS. Following or concurrent with issuance of the Final EIR/EIS, the Forest Supervisor will issue a Draft Record of Decision (Draft ROD). The Draft ROD may contain requirements that reduce or eliminate adverse environmental impacts from the proposed project on TNF lands.

1.6.3 Permits Required

As listed in Table 1-1, several other state and federal agencies may rely on information in this EIR/EIS to inform their decisions regarding issuance of specific permits related to project construction or operation. In addition to FPUD, state agencies such as California Department of Fish and Wildlife, Regional Water Quality Control Board, and the Office of Historic Preservation would be involved in reviewing and/or approving activities associated with the construction and operation of the proposed project/action. In addition to the USFS, federal agencies such as the U.S. Fish and Wildlife Service (USFWS) and U.S. Army Corps of Engineers (ACOE) are also federal agencies with potential reviewing and/or permitting authority.

FPUD is responsible for obtaining any permits necessary for its activities. Table 1-1 lists the federal, state, and local permits and authorizations that FPUD anticipates requesting for the proposed project prior to construction. Section G.6 lists all applicable federal environmental regulations and policies.

Table 1-1. Permits or Other Actions Required by FPUD Prior to Construction

Agency	Jurisdiction	Permit Regulatory Requirement
Federal		
U.S. Forest Service	Federal Land Policy and Management Act (FLPMA), 43 U.S.C. 1701 et seq.	• Special Use Permit Amendment
U.S. Fish and Wildlife Service	Endangered Species Act, 16 U.S.C. 1531–1544; Migratory Bird Treaty Act; Fish and Wildlife Coordination Act	• Section 7 Consultation
Army Corps of Engineers	Clean Water Act	• Clean Water Act Section 404 Nationwide Permit or Individual permit
State		
California Department of Water Resources: Division of Safety of Dams	Manage the enlargement of existing dams under DSOD jurisdiction. California Water Code Sections 6200-6206	• Dam enlargement application approval.
California Department of Fish and Wildlife	Manage fish, wildlife, plant resources, and habitats; California Endangered Species Act, California Native Plant Protection Act, California Fish and Game Code Section 1601	• Streambed Alteration 1601 Permit • Incidental Take Permit for foothill yellow-legged frog (FYLF)
California Office of Historic Preservation	Potential to affect cultural or paleontological resources	• National Historic Preservation Act, Section 106 Consultation
Regional Water Quality Control Board, Region 5	Clean Water Act, Sections 401 and 402; Porter-Cologne Water Quality Control Act; California Water Code Division 7. Water Quality	• Clean Water Act Section 401 Certification • General Permit for Storm Water Discharges Associated with Construction Activities
Local		
Placer County Air Pollution Control District	Enforces federal and state air quality requirements and establishes County air quality rules and regulations	• Asbestos Dust Control Plan

1.7 Organization of this Draft EIS/EIR

This EIR/EIS is organized as follows:

Executive Summary. A summarized description of the proposed project, proposed action and alternatives; a summary of their respective environmental impacts; a listing of recommended mitigation measures; and determinations of the Environmentally Superior Alternative under CEQA and Agency Preferred Alternative under NEPA.

Chapter 1 (Introduction/Overview). A discussion of the background of the proposed project, an overview of the key elements of the proposed project and proposed action; the purpose and need for the federal action; the project objectives under CEQA; a discussion of the public agency use of the EIR/EIS; and a description of the DEIR/EIS organization.

Chapter 2 (Project Description). This section contains a detailed description of the proposed project and proposed federal action including project location, construction and site preparation requirements and assumptions; project operations; and anticipated compensatory mitigation measures to be carried out with project implementation.

Chapter 3 (Alternatives). A description of the alternatives to the proposed project/action evaluated in this DEIR/EIS and the process of deriving those alternatives. Section 3 describes the statutorily mandated alternatives under CEQA and NEPA, namely the No Project and No Action alternatives, respectively. The section also lists the alternatives considered but eliminated from further analysis and the rationale for that elimination in accordance with CEQA and NEPA requirements.

Chapter 4 (Affected Environment and Environmental Consequences). A comprehensive analysis and assessment of impacts and mitigation measures for the proposed project/action and alternatives, including the No Project and No Action Alternatives. This section is divided into nine (10) environmental issue areas: Aesthetics/Visual Resources; Air Quality and Climate Change; Biological Resources; Cultural Resources; Geology, Soils, and Paleontological Resources; Hazards and Hazardous Materials; Land Use and Planning; Noise; Recreation; and Traffic and Transportation. The evaluation of each issue contains a description of the environmental setting/affected environment pertinent to that issue and an assessment of the environmental consequences of proposed project/action and each alternative. In addition, each section describes relevant regulations, plans, and standards applicable to that issue.

Chapter 5 (Comparison of Alternatives). An analysis of the relative advantages and disadvantages of the proposed project/action in comparison with the proposed alternatives and identification of the "Environmentally Superior Alternative" as required under CEQA and "Agency Preferred Alternative" in accordance with NEPA. Consistent with Section 15126.6 of the CEQA Guidelines, the alternatives analysis includes "a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project" (14 California Code of Regulations [CCR] 15000 et seq.). Similarly, consistent with CEQ's NEPA Regulations (40 CFR 1502.14), the environmental impacts of the proposed action and alternatives are provided in comparative form, defining the issues and providing a clear basis for choice by decision makers. Ultimately, the analysis includes identification of the CEQA "Environmentally Superior Alternative," consistent with CEQA Guidelines, Section 15126.6(e)(2), and the NEPA "Environmentally Preferred Alternative" consistent with the Forest Service NEPA Handbook, Section 23.3 (USFS 2011).

Chapter 6 (Cumulative Impacts). A summary/synthesis of the cumulative context and cumulative impact assessments presented in Section 4.

Chapter 7 (Required CEQA/NEPA Topics). A discussion of topics required by CEQA and NEPA that are not covered in previous sections of this DEIR/EIS, include growth-inducing effects, irreversible and irretrievable commitment of resources and environmental changes, adverse unavoidable impacts, the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity, effects not found to be significant, and compliance with applicable federal environmental regulations and policies.

Chapter 8 (List of Preparers). A listing of individuals who contributed to the preparation of this DEIR/EIS.

Chapter 9 (Public Participation). An explanation of the distribution of the DEIR/EIS and opportunities for public comment and a description of the project scoping process and future opportunities for public participation in the environmental review process.

Chapter 10 (References). A compilation of all citations included in the DEIR/EIR.

CHAPTER 2 PROJECT DESCRIPTION

2.1 Introduction

FPUD is requesting a 49-year extension to its current water right Permit to operate Sugar Pine Reservoir to provide a public water supply meeting the needs of its customers, including their homes, workplaces, schools and other public amenities within the District's service area. Continuing and increasing use of water developed by the Sugar Pine Project's reservoir is necessary to meet current and projected future water demand. The proposed project includes the 49-year extension of the FPUD's Sugar Pine Project Water Right Permit 15375, completion of the Sugar Pine Project facilities (i.e., installation of radial gates), and the associated expansion of Sugar Pine Reservoir storage capacity from approximately 6,922 AF to 10,872 AF. The completion of Sugar Pine Dam facilities is needed to ensure sufficient safe yield to meet existing and future customer water demand within the District's service area. The replacement of recreational facilities affected by the reservoir expansion and the implementation of measures to mitigate adverse project effects are also elements of the proposed project.

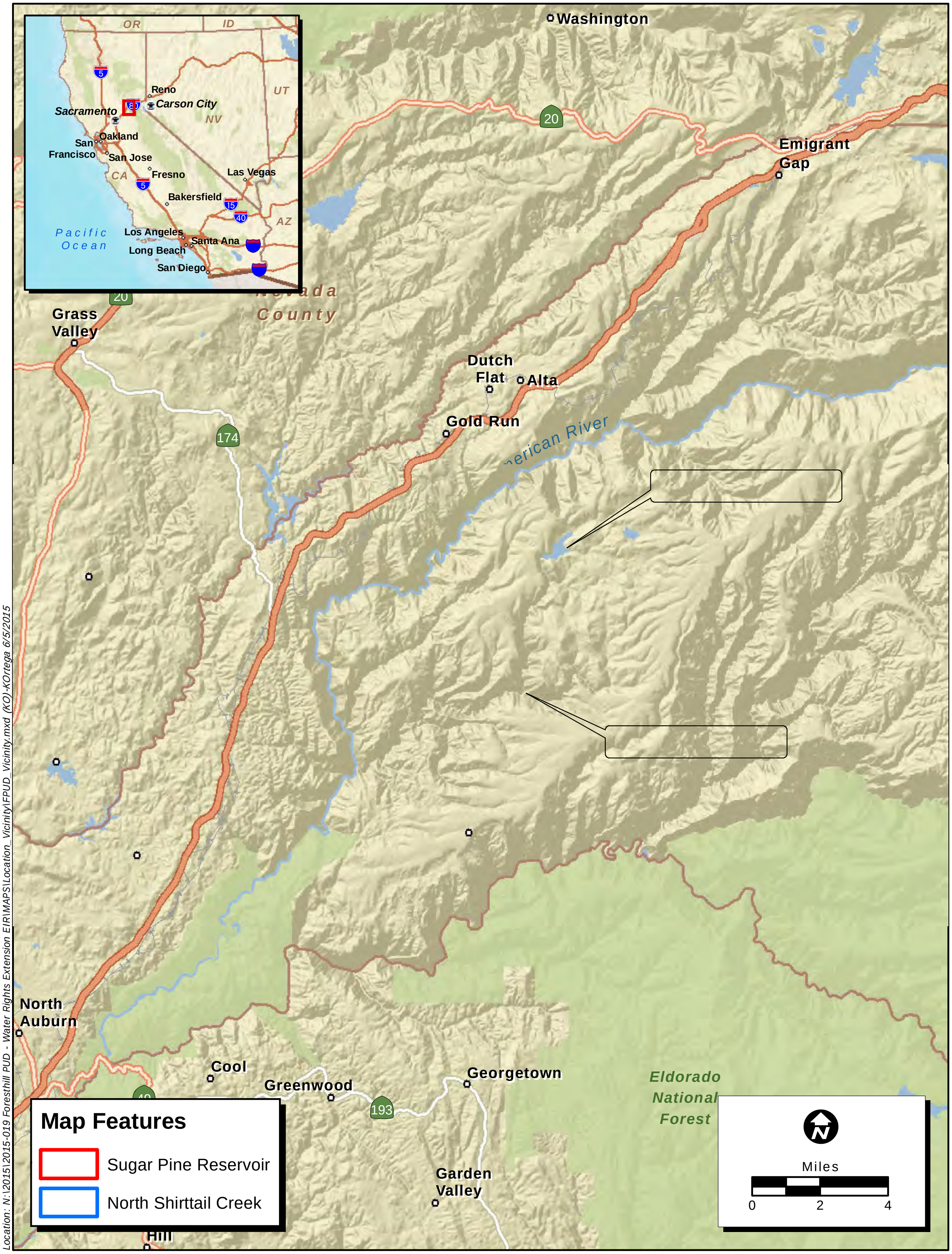
With installation of the radial gates and expansion of the area of inundation of Sugar Pine Reservoir, various TNF recreational facilities located adjacent to the reservoir will require removal and replacement. In addition, various compensatory measures to mitigate project impacts on recreational, biological, cultural, and visual resources will be implemented by FPUD and TNF. The proposed action encompasses the issuance of the SUP Amendment which will facilitate Sugar Pine Dam radial gate installation, associated increase in Sugar Pine Reservoir storage capacity, recreational facilities construction and compensatory mitigation implementation. The proposed extension of Water Right Permit 15375 is not part of the federal proposed action under NEPA because the SWRCB decides whether to approve water right permit extensions based on California law, not federal law.

As noted, FPUD has submitted an application to the TNF to amend its SUP for the Sugar Pine Dam and Reservoir Project (Sugar Pine Project). The Permit amendment is (1) to increase municipal water storage capacity by installing radial gates in the existing spillway of the dam to achieve the Sugar Pine Project's full potential water storage capacity and (2) to implement project design features and mitigation measures to offset associated impacts to NFS resources.

2.2 Proposed Project/Action

2.2.1 Project Location

The Sugar Pine Project is located on the American River Ranger District of the TNF within portions of Sections 13 and 24, T15N, R10E and Sections 18 and 19 T15N, R11E, Mt. Diablo Meridian and situated on North Shirttail Creek approximately nine miles north of the community of Foresthill (see **Figure 2-1 Project Vicinity** and **Figure 2-2 Project Location**). It is within the Sugar Pine Management Area according to the Tahoe National Forest Land and Resources Management Plan (Forest Plan, 1990), as amended (see **Figure 2-3 Sugar Pine Management Area**).



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Map Date: 6/5/2015 Service Layer
Credits: Sources: Esri, USGS, NOAA

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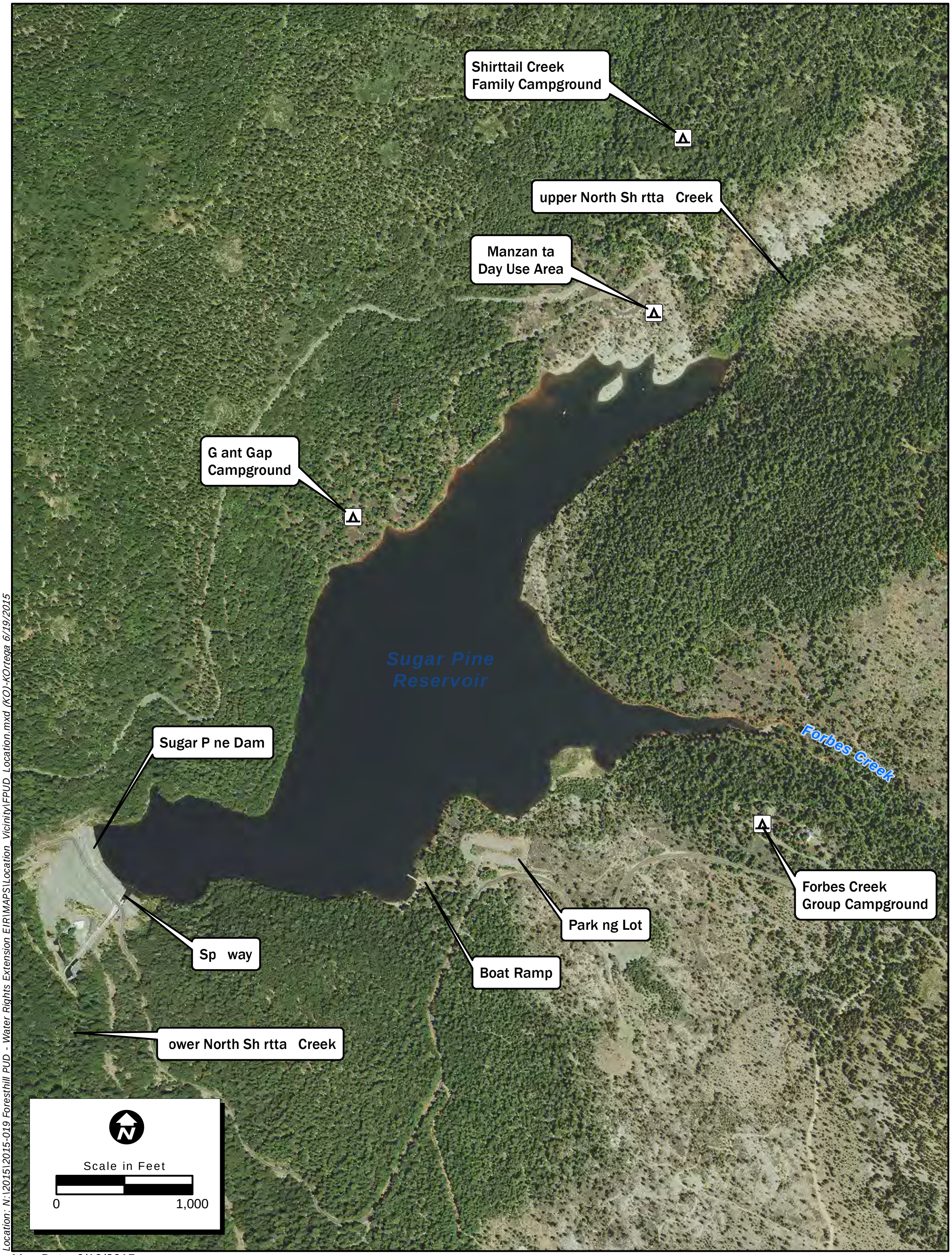
Figure 2-1 Project Vicinity

2015-019 FPUD Sugar Pine Reservoir



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Map Date: 6/19/2015
Photo Source: Google Earth (2013)

Figure 2-2 Project Location

2015-019 FPUD Sugar Pine Reservoir

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T15N, R11E

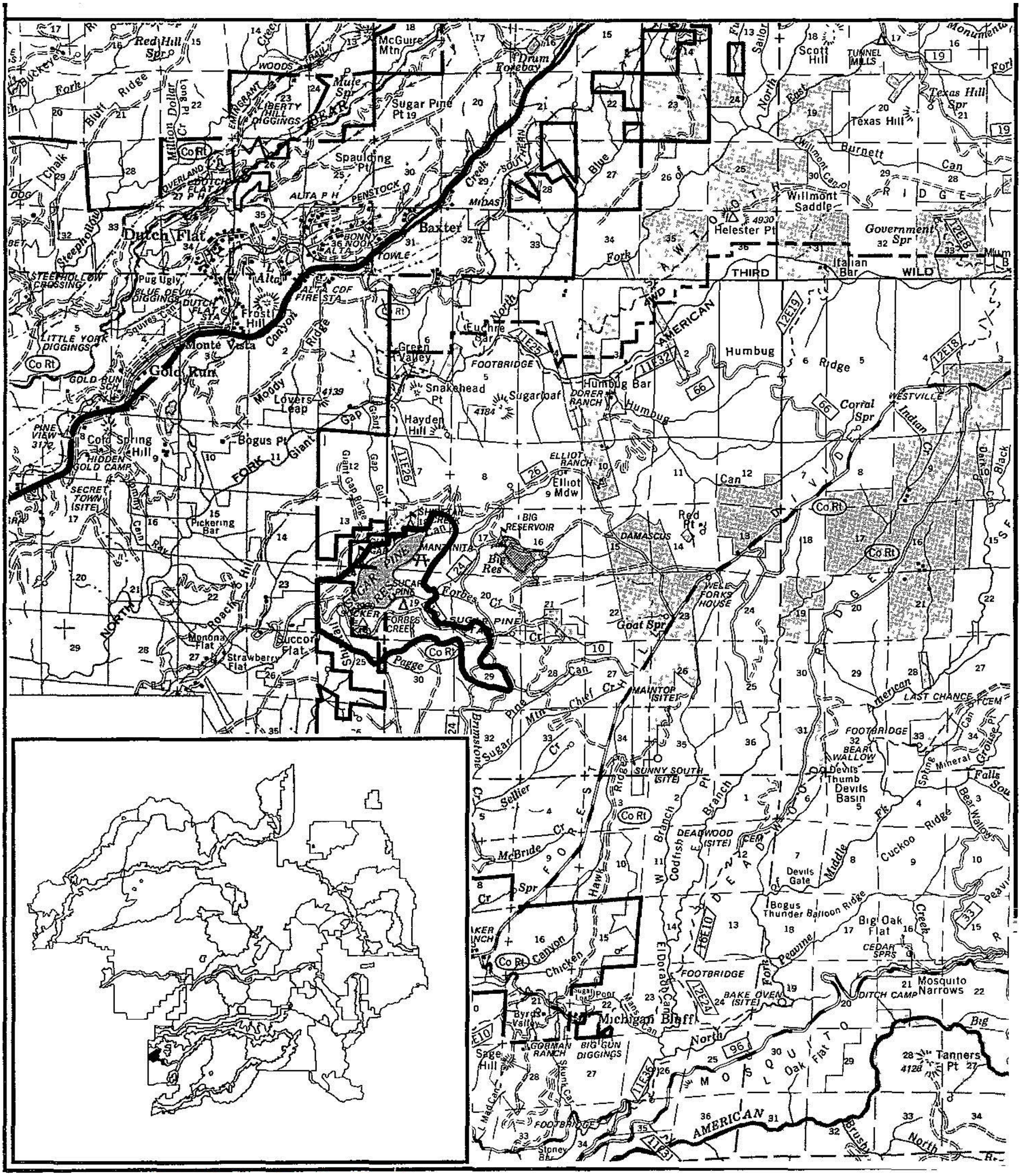

Figure 2-3 Sugar Pine Management Area

2015-019 FPUD Sugar Pine Reservoir

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2.2.1.1 Radial Gates Installation and Construction Activities

The existing concrete spillway was originally designed and constructed to receive radial gates and raise the maximum water level in the reservoir by 20 vertical feet and increase the footprint and maximum surface area of the reservoir by approximately 44 acres (see **Figure 2-4 Existing and Proposed Maximum Area of Inundation**). Other than installation of the radial gates, no further modifications to the spillway or dam are anticipated. Radial gate installation will be accomplished in three phases: 1) Pre-installation site preparation, 2) gate installation, and 3) site cleanup and equipment removal.

2.2.2 Pre-Installation site preparation

The spillway at Sugar Pine Dam was designed and constructed with a three-foot-wide center pier to accommodate the future installation of radial gates (see **Figure 2-5 Sugar Pine Dam Spillway**). Stainless steel sill beams and side rubbing plates are currently in place, as are the concrete anchors to which the trunnion arm brackets of the radial gates will attach. Pre-installation activities within the spillway will be limited to debris removal and cleanup of the sill beams and side rubbing plates. These activities may require traffic control at the dam or access restrictions to the dam parking lot if the activities present a safety risk to the general public. The dam parking lot will serve as the temporary staging area for gate installation. Prior to the start of installation activities, it may be necessary to remove fencing that currently restricts public access to the spillway. Prior to the start of construction activities, one or two portable toilets will be placed in the staging area for use by construction personnel.

2.2.3 Gates Installation

Both radial gates will be transported to the dam site fully assembled with side and bottom seals in place and the trunnion, gate arms, brackets, pins and bearings already installed on the gate assembly (see **Figure 2-6 Radial Gates General Design**). Once in place, each gate will be operated by a hoist assembly. The hoist assembly will include a wire rope system with stainless steel cables (one per side of each gate), machine grooved drums, drum support bearings, cross shaft, couplers, main gear box, electric motor and brake. Each hoist assembly will be mounted on a bridge that will span the spillway.

Both radial gate assemblies and both hoist assemblies will be transported to the staging area at the dam by truck. In addition, one crane will be transported to the site to accommodate gate installation and placement of the hoist assemblies. Transport of gates, hoist assemblies, and crane may require traffic management activities and/or temporary road closures. Consideration will be given to scheduling gate installation during the off-season when traffic on Iowa Hill and Sugar Pine roads is relatively low. During gate installation, public access to the parking areas on Sugar Pine Dam will be prohibited.

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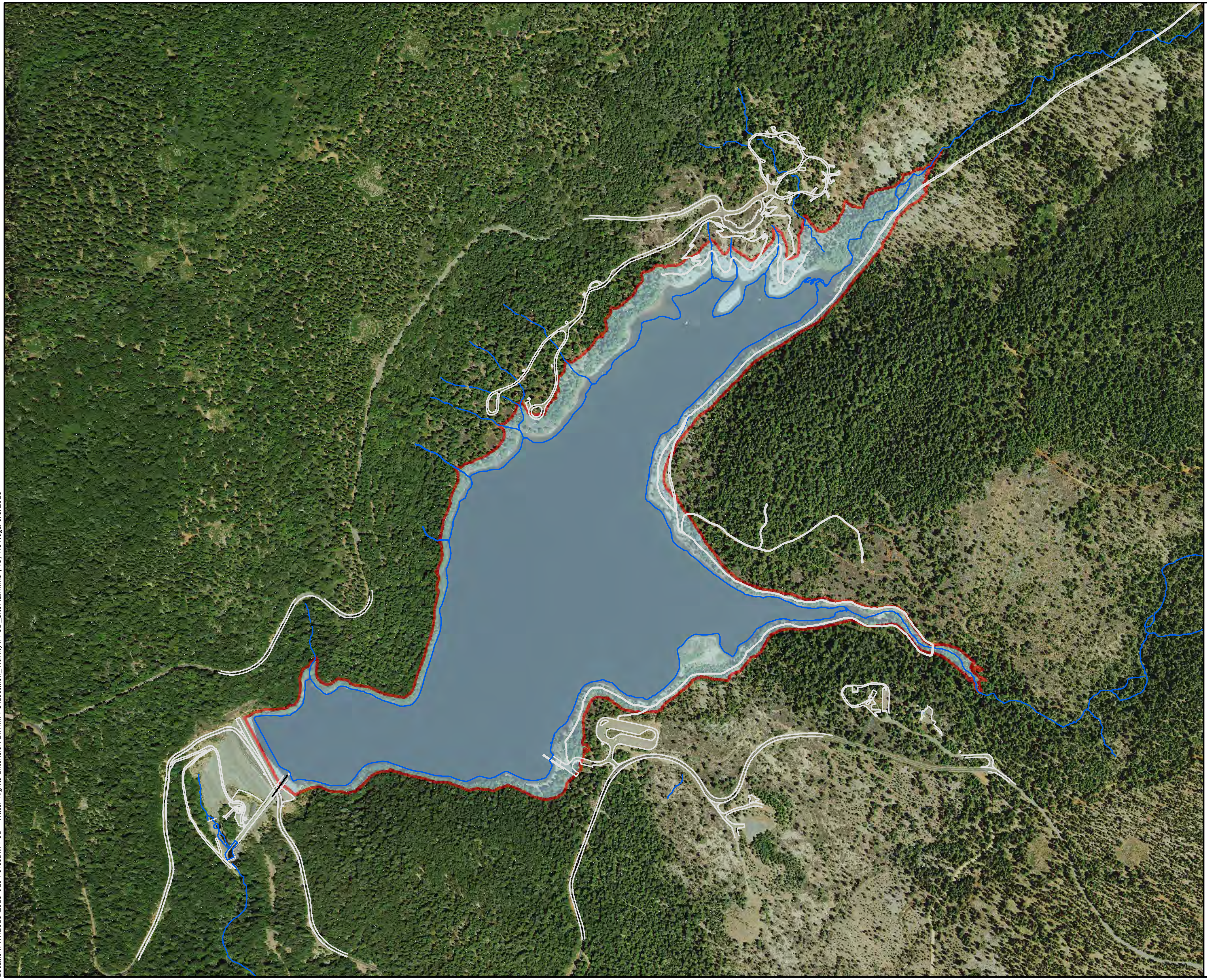
Figure 2-4 Existing and Proposed Area of Maximum Inundation



Man Made Feature
Existing Water
Proposed Area of Maximum Inundation

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Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Location_Vicinity\FPUD_SitePlan.mxd (KO)-KOrtega 6/5/2015

Map Date: 6/5/2015

Photo: From King and Associates 07 Nov 2014

Scale in Feet
0 800

2015-019 FPUD Sugar Pine Reservoir

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Figure 2-5 Sugar Pine Dam Spillway

2015-019 FPUD Sugar Pine Reservoir

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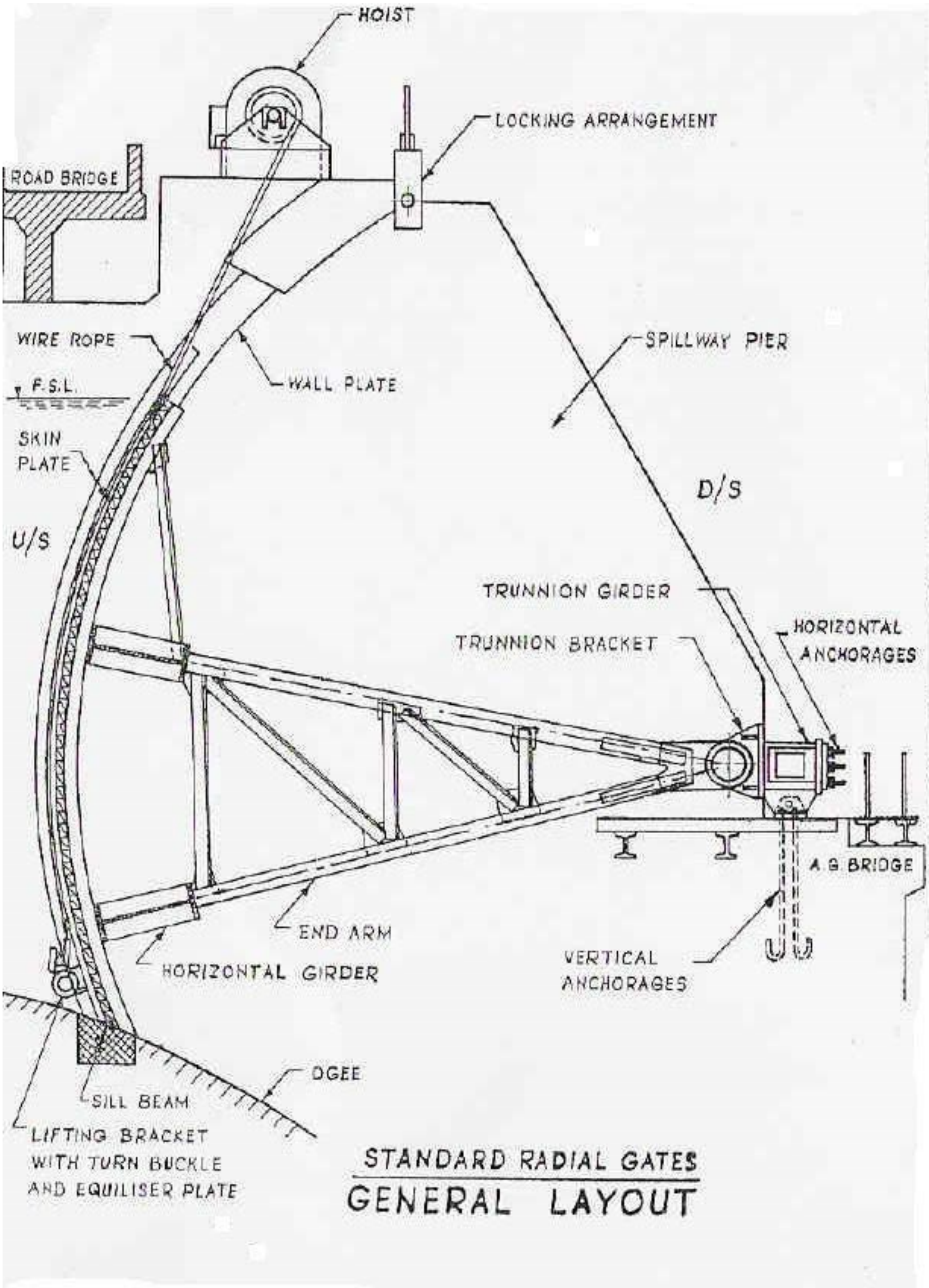

Figure 2-6 Radial Gates General Design

2015-019 FPUD Sugar Pine Reservoir

With equipment and materials in place at the project staging area, installation of the gates and hoist assemblies is expected to take three to five days. Each gate will be lowered into place by crane and the gate trunnion attached to the existing concrete anchors. After both gates are in place, the hoist assemblies will be lowered into place. The hoist assembly bridge will then be attached to the top of the spillway walls. With hoist assembly installation complete, the hoist cables will be attached to each side of the radial gates. The final step of gate/hoist installation will be to provide each hoist with electrical power from facilities currently in place at the dam site.

2.2.4 Site Cleanup and Equipment Removal

Following installation of radial gates and hoist assemblies, all construction equipment and materials will be collected and removed from the project site. Any fencing that was removed to accommodate gate installation will be reinstalled. The parking area will be returned to pre-project conditions.

2.2.5 Reservoir Operations

The operation of Sugar Pine Reservoir is currently subject to the direction and guidance contained in several key documents; these documents are attached as **Appendices A through E** with this DEIR/EIS. **Appendix A**, the 2016 Sugar Pine Reservoir Operations Plan, includes: FPUD's State Water Right Permit 15375 (**Attachment A**), the 1967 Memorandum of Agreement between Reclamation and the California Department of Fish and Game (CDFG) (**Attachment B**), the 1985 Memorandum of Agreement between Reclamation and the TNF (**Attachment C**), the 2000 agreement between FPUD and the USFS (**Attachment D**), and the Key Sugar Pine Reservoir Storage and Elevation Levels for Long-Term Operations (**Attachment E**). Operations described in Appendix A served as the basis of evaluating the effects of the proposed project/action on hydrology and water-dependent resources. In the course of that evaluation, proposed operations were refined. These refinements are reflected in description of reservoir operations in this section (Section 2.2.5) of the DEIR/EIS.

Appendix B includes the 2003 Special Use Permit issued by the TNF authorizing use and occupancy of NFS lands. **Appendix C** includes the USFS TNF Land and Resource Management Plan (LRMP) section for region 096 Sugar Pine. **Appendix D** includes Public Law 106-566. **Appendix E** includes the California Water Action Plan. The obligation to operate Sugar Pine Reservoir according to requirements contained in these documents was transferred to FPUD upon purchase of the project. The following description of reservoir operations was developed using these documents, as appropriate, for guidance and direction.

Maximum storage capacity of Sugar Pine Reservoir as gauged from the dam's spillway sill is currently 6,922 AF. With the proposed installation of radial gates, reservoir storage capacity at Sugar Pine would be increased to 10,872 AF: an increase of 3,950 AF compared to existing conditions. Average annual inflow to the reservoir is approximately 14,000 AF. Typically, the reservoir fills (achieving maximum storage capacity to the dam's spillway) and spills (passes water over the spillway and into lower Shirttail Creek). This occurs even in years with extended drought conditions such as was experienced recently from 2012 through 2016.

Under the proposed action and based on historical hydrology within the Sugar Pine watershed, it is likely that the reservoir would fill in the first year following the installation of the gates. During that first year, spills to Shirttail Creek would be substantially reduced relative to conditions that would occur without the gates as the additional storage capacity established by gate installation (3,950 AF) is filled via inflow from, primarily, upper Shirttail Creek and Forbes Creek.

As part of the proposed action, the 2003 SUP would be amended to accommodate installation of the radial gates, expansion of the reservoir's area of inundation and the replacement of affected recreational facilities. Visual Quality Objectives contained within the USFS TNF LRMP section for region 096 Sugar Pine would also need to be amended to ensure consistency of the proposed action with the LRMP. Current minimum flow requirements for releases to Shirttail Creek downstream of the dam that are referenced in FPUD's existing water right would remain unchanged under the proposed project.

2.2.5.1 Minimum Shirttail Creek Release Requirements and Minimum Reservoir Storage Requirements

Currently, the water right permit requires compliance with the January 26, 1967, Memorandum of Agreement with the CDFG for the Protection and Preservation of Fish and Wildlife and Recreational Resources of North Shirttail Canyon Creek, which includes minimum release requirements and minimum pool requirements as follows:

- 5 cfs or natural inflow from February 1 to May 31, whichever is less, must be released to Shirttail Creek at Sugar Pine Dam;
- 2 cfs or natural inflow from June 1 through January 31, whichever is less must be released to Shirttail Creek;
- a minimum of 0.5 cfs must be released to Shirttail Creek at all times, regardless of the natural inflow;
- 3,560 AF storage at Sugar Pine Reservoir should be maintained during the recreation season from May 1 through September 30, subject to District water use; and
- at no time should FPUD maintain a minimum pool less than 1,100 AF of water.

For reference purposes, the reservoir has two boat ramps: An upper boat ramp that operates at water level elevations down to 3,590 feet (3,159 AF of water storage), and a lower boat ramp that operates at water level elevations down to 3,565 feet (1,106 AF of water storage).

The 1985 Memorandum of Agreement between Reclamation and the TNF contains some additional instruction on reservoir operations. Paragraph 5 includes a statement that Reclamation reserves the right to vary, as it deems necessary, the water surface elevation of the reservoir. The normal level of operation will be between 3,618 and 3,639 feet. Those elevations correspond to approximately 6,922 and 10,872 AF, respectively. The design minimum elevation of 3,530 feet corresponds to approximately 92 AF. This is the lower limit beyond which the reservoir cannot physically be drawn down.

2.2.5.2 Water Deliveries to the FPUD Service Area and Tahoe National Forest

FPUD's water right permit authorizes direct diversion of up to 18 cfs to serve customers within its service area. In addition, FPUD may divert to storage up to 15,400 AF annually. Total authorized diversion and use of water from Sugar Pine Reservoir is 24,076 AF annually under FPUD's water right permit. "Use of water" includes deliveries to customers within the FPUD service area, deliveries to TNF, and the transfer of "surplus" water" to downstream users or for environmental purposes. As discussed in Section 2.2.5.3 (Water Transfers under the Proposed Project) below, "surplus" water is water that can be withdrawn from storage without impairing minimum required releases to Shirttail Creek, water demand within the FPUD service area and TNF, and minimum pool requirements for Sugar Pine Reservoir.

Between July 1 and November 1, FPUD relies on rediversion of Sugar Pine Reservoir storage to meet consumptive demands. In recent years, consumptive demands within FPUD's service area have averaged about 1,200 AF per year. The TNF may take up to 50 AF per year from the reservoir for water-based public recreation uses, including dust abatement on roads, and for fire control, and may use the existing power and water system located at the Dam.

FPUD's long-term plan is to secure the water supply necessary to meet existing and future demand from anticipated growth within the service area under the Foresthill Community Plan approved in 2008 by the County of Placer. **Figure 2-7. Sugar Pine Reservoir Place of Use Analysis** shows the FPUD's Place of Use for Sugar Pine water, the boundary of the Foresthill Community Plan, the current FPUD service boundary and the FPUD Sphere of Influence. As build-out under the Foresthill Community Plan occurs, more reservoir water will be delivered for consumptive use each year, which will result in greater seasonal variation in reservoir water levels particularly during the spring-to-fall dry season, when water demand within Foresthill peaks every year. With greater drawdowns of the reservoir relative to historical conditions, the ongoing operation of the existing Sugar Pine Reservoir Project will increase exposure of bare unvegetated areas between the reservoir's annual high water line (in late winter/early spring), and its annual low water line (in late fall, before winter rains start refilling the reservoir). This will occur increasingly over time, with or without the proposed installation of radial gates at Sugar Pine Dam.

2.2.5.3 Water Transfers under the Proposed Project

California Water Code sections 109 and 475 encourage water transfers to help efficiently meet California's evolving water needs. In accordance with guidance from the California Water Code and state policies like the 2014 California Water Action Plan and subsequent updates, FPUD has temporarily transferred to other public water supply agencies stored water from the Sugar Pine Project that is not presently needed to meet FPUD service area demand. Such transfers help the buyer/transferee agencies avoid or reduce water shortages, which can threaten existing levels of economic activity or even jeopardize human health and safety. California Water Code section 1745.07 provides that use of transfer water by a buyer/transferee counts as use of this water by a seller/transferor.

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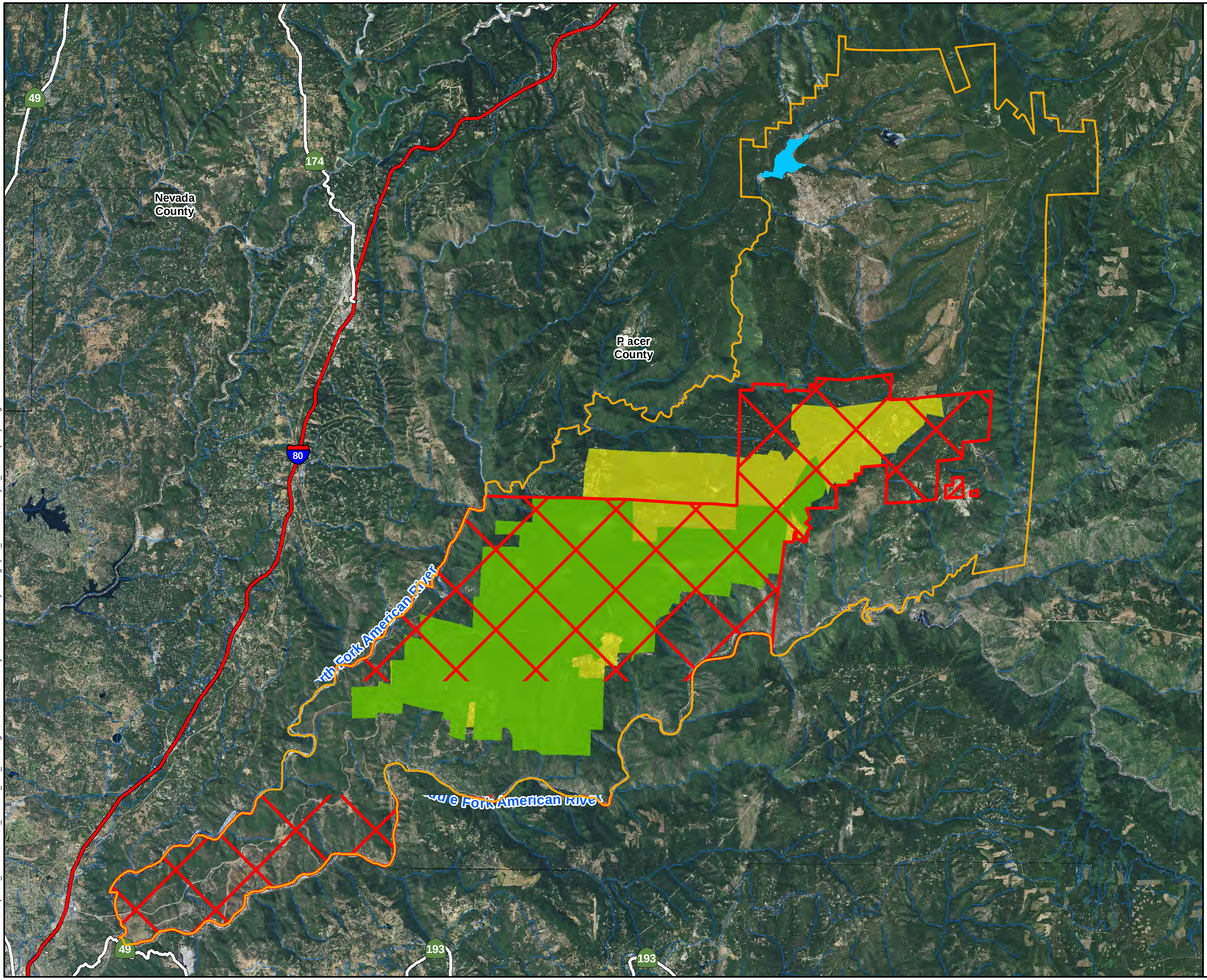

Figure 2-7
Sugar Pine Reservoir
Place of Use Analysis

Map Features

- Place of Use - P#15375 (36,152 ac.)
- Community Plan Boundary (72,820 ac.)
- Foresthill PUD Boundary (13,350 ac.)
- Foresthill PUD Sphere of Influence (19,080 ac.)
- Sugar Pine Reservoir

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Map Date: 10/31/2013
Photo Source: NAIP, 2012

1 inch = 2 miles

Miles
0 1 2 3 4 5

2015-019 FPUD Sugar Pine Reservoir

Location: N:\2013\Proposals_2013\P-13-485_Foresthill_PUD_WaterRightsExtension\MAPS\Hydro\ReservoirAnalysis\Sugarpine_AreaOfUseAnalysis_v3.mxd (ECK) -dwagnon 10/31/2013

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The first water transfer by FPUD was carried out in spring of 2015. FPUD released 2,000 AF of water to Shirttail Creek which enters the North Fork American River which in turn flows to Folsom Reservoir. From Folsom Reservoir, the transferred water entered the lower American River for ultimate delivery to the Santa Clara Valley Water Agency. A second transfer was carried out in late summer/early fall of 2018. For that transfer, 932 AF was released from Sugar Pine Reservoir between September 8th and September 26th for ultimate delivery to Kern County Water Agency and Dudley Ridge Water District.

As discussed above, FPUD only transfers stored water that is not needed to meet service area demand and is thus considered "surplus." Surplus water is water that can be withdrawn from storage without impairing minimum required releases to Shirttail Creek, water deliveries to meet demand within the FPUD service area and TNF, and minimum pool requirements for Sugar Pine Reservoir. FPUD also must comply with any applicable refill agreements formed in connection with undertaking a water transfer. To accommodate transfers, water would be released from Sugar Pine Reservoir to Shirttail Creek for storage in, or delivery through, Folsom Reservoir. That water would be diverted from Folsom (i.e., to a local water agency buyer) or released to the American River for delivery to a downstream buyer to meet consumptive use and/or environmental water needs. (**Figure 2-7**).

At the present level of water demand within the FPUD service area, the proposed installation of radial gates and increased reservoir storage capacity under the proposed project would allow for periodic water transfers of up to 5,000 AF. This would exceed by approximately 3,000 AF the historical transfer maximum of 2,000 AF. The potential frequency of transfers of up to 5,000 AF under the proposed project/action is dependent on a number of variables including, but not limited to: the availability of a willing buyer; local hydrology; spill conditions at Folsom Reservoir: the ability of FPUD to timely complete regulatory permitting requirements through the SWRCB's water transfer procedures; and expected future growth in water demand within the FPUD service area. These conditions preclude a precise prediction of the frequency and amounts of potential future transfers with implementation of the proposed project/action. Assuming consistently ideal conditions (i.e., conditions that would support the highest possible frequency of transfers of up to 5,000 AF), a transfer of up to 5,000 AF could occur as often as once every three-years. Transfers of less than 5,000 AF could possibly be performed more frequently than once every three years but, again, that frequency would be contingent on a number of unpredictable variables that FPUD does not control.

Upon buildout of the approved Foresthill Community Plan for which Placer County has identified FPUD as the public water supplier, it is expected that the Sugar Pine Project would not produce sufficient water supplies to meet service area demand while also performing water transfers, in which case transfers would not be performed. Prior to Community Plan buildout, FPUD anticipates that implementation of the proposed project/action would make water available for transfers in some years.

There are two annual water transfer timing scenarios: early-season and late-season transfers. When transfers would occur in spring under the proposed project/action (early-season transfers), the resulting operation would draw the reservoir down prior to or during the peak recreation season (May to September). The extent of this drawdown will depend on variables such as local hydrology in that given year and the size of the transfer. Releases in support of early-season transfers will likely occur in the late spring and be completed by June 1. The June 1 target date is based on established requirements of the

United States Bureau of Reclamation (USBR), the operator of Folsom Reservoir. Folsom provides multiple benefits to the Sacramento and Delta areas. Those include flood control, water supply and environmental releases for the protection of anadromous salmonids and contributing to the Delta's ecological health.

Reclamation is required to operate Folsom Reservoir from October 1 through June 1 to protect the greater Sacramento area from flooding. Reclamation is required to make flood releases if the storage at Folsom encroaches into the flood reservation space once the flood threat is over. The risk of flood control releases diminishes as the calendar approaches June 1 when USBR is allowed to fill Folsom Reservoir to its capacity. This also means that transfers that occur earlier in the year have the potential to encroach on the Folsom flood space increasing the flood risk. Reclamation is also required to keep Lower American River water temperatures as cool as possible through the fall to support the health of anadromous salmonids. Historically, Reclamation has required operators upstream of Folsom to release all transfer water by June 1 to maximize the cold water pool at Folsom. The intent of this June 1 requirement is to meet the criteria of the Modified Flow Management Standard for the Lower American River for the protection of anadromous salmonids. The following link provides detailed information: https://www.waterforum.org/the-river/flow-management-standard/

Early-season transfers that would occur under the proposed project action, would reduce reservoir water levels during much of the recreation season at the Sugar Pine Project, which increases distances between campgrounds and day use areas, on one hand, and the reservoir's waterline, on the other hand, in comparison to non-transfer years. As noted, transfers of up to 2,000 AF have been previously carried out by FPUD. Any future transfers greater than 2,000 AF would exceed that established baseline for transfers.

Under the proposed project/action, FPUD may also execute "late–season" transfers as was carried out in 2018. These late season transfers would begin in mid- to late-August and continue through late September, depending upon the purpose of the transfer and other factors. The storage space created by the transfer would be refilled during the following winter and spring runoff period, reducing reservoir spills compared to operations without a transfer. As noted, releases to meet the current minimum flow requirements will continue during the reservoir refill. In years where FPUD does not transfer water, reservoir elevations will be as much as 20 feet higher than currently occurs at maximum storage with existing facilities (i.e., no radial gates). This higher elevation results in a larger reservoir water surface and expanded shoreline available for recreational use. Additionally, transfers made under the proposed project/action that are comparable in size to historical transfers (e.g., approximately 2,000 acre-feet), would result in substantially less noticeable change in the reservoir water surface area and extent of exposed reservoir bed around its perimeter, because these smaller transfers would be made from a substantially larger reservoir.

It should be noted that the Folsom Reservoir cold water pool is used to achieve flow and temperature goals of the Modified Flow Management Standard (MFMS) for the improvement of habitat for salmonids in the lower American River. As a result of any late season transfer USBR claims there could be, under certain circumstances, an overall loss of power generation at the Folsom Power plant. This condition occurs when there is a need to release both the Central Valley Project water and the transfer water from the cold water pool. This cold water pool slowly diminishes in size over the summer months as Folsom Lake is operated to meet the MFMS. Water released from Sugar Pine Reservoir late in the season is warmer than the cold water pool at the bottom of Folsom Lake. To achieve the desired temperatures in the lower American River, the warmer transfer water entering Folsom Lake, must be exchanged for the colder water at the bottom of the lake.

Depending upon the size of the cold water pool, releases from levels in the reservoir lower than the intake used to generate power may be needed. This condition results in the need reduce or shut down the Folsom Power plant. This operation can significantly limit the volume of water for transfer, making them difficult to execute.

As discussed above, the District has previously carried out transfers of Sugar Pine Project stored water to users downstream of Folsom Reservoir and, with or without the proposed project/action, anticipates continuing to perform periodic water transfers in the future. The volumes of these future transfers would be limited by then existing water demand in FPUD's service area, the minimum pool requirements specified in the 1985 Agreement and 1967 MOA, and fishery flow releases specified by the MOA.

Operational considerations for potential transfers under various conditions are described below.

Spill-Year Transfers (Early Season)

As noted, future anticipated transfers would typically occur in spring and conclude by June 1st. These transfers are referred to as "early season" transfers. Transfers occurring in years where inflow to Sugar Pine Reservoir is large enough to cause the reservoir to fill and spill are referred to as "spill year" transfers. As noted, Sugar Pine Reservoir fills and spills in most years. In spill years, FPUD would begin the release of water to be transferred while the spill is occurring. This will allow the transition from the spill event to the transfer water release rates. This is done in order to avoid significant fluctuations in flow rates and resulting water surface elevations in Shirttail Creek caused by transfer releases. Such fluctuations, i.e., the repeated raising and lowering of the creek's water surface could have an adverse effect on aquatic resources such as foothill yellow-legged frog, particularly during critical life stages such as egg-laying, larval development, and metamorphosis.

To minimize the potential effects of future spring transfers on aquatic resources within Shirttail Creek, operating criteria for conducting such transfers would be implemented under the proposed project/action. These criteria are described below. It is important to note that water release rates during future transfers would remain well-within the range of historic release/spill rates from the reservoir. The purpose of this approach is to provide a smooth transition from uncontrolled spill to a controlled release.

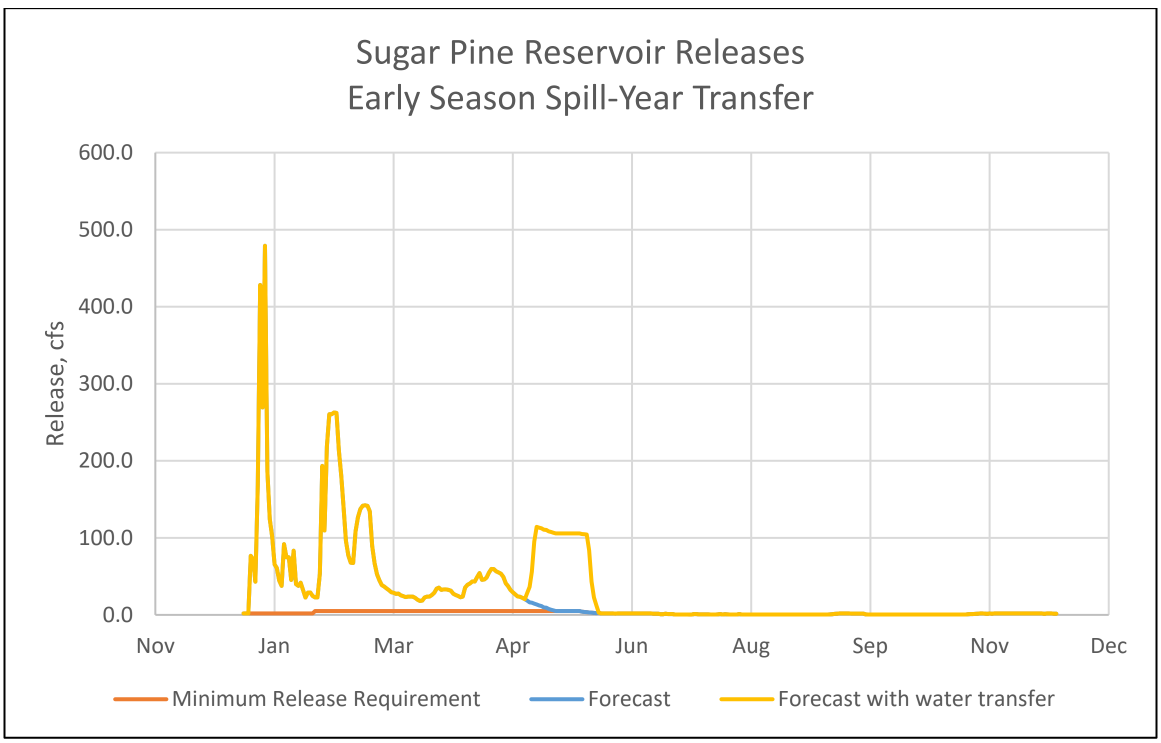
In years when downstream Folsom Reservoir is also spilling, the transfer release may need to be delayed until the Bureau of Reclamation regains control of Folsom releases, so that Sugar Pine Reservoir transfer water is not spilled at Folsom. In some cases, only water released at Folsom (not spilled) can be transferred to a purchasing party. Once most of the transfer water is released from the Sugar Pine Reservoir, the remainder of the transfer water will be released over a multi-day period to ramp down to the minimum fishery flow release specified by the MOA. The following Table 2-1 illustrates the ramp down schedule from 40 cfs.

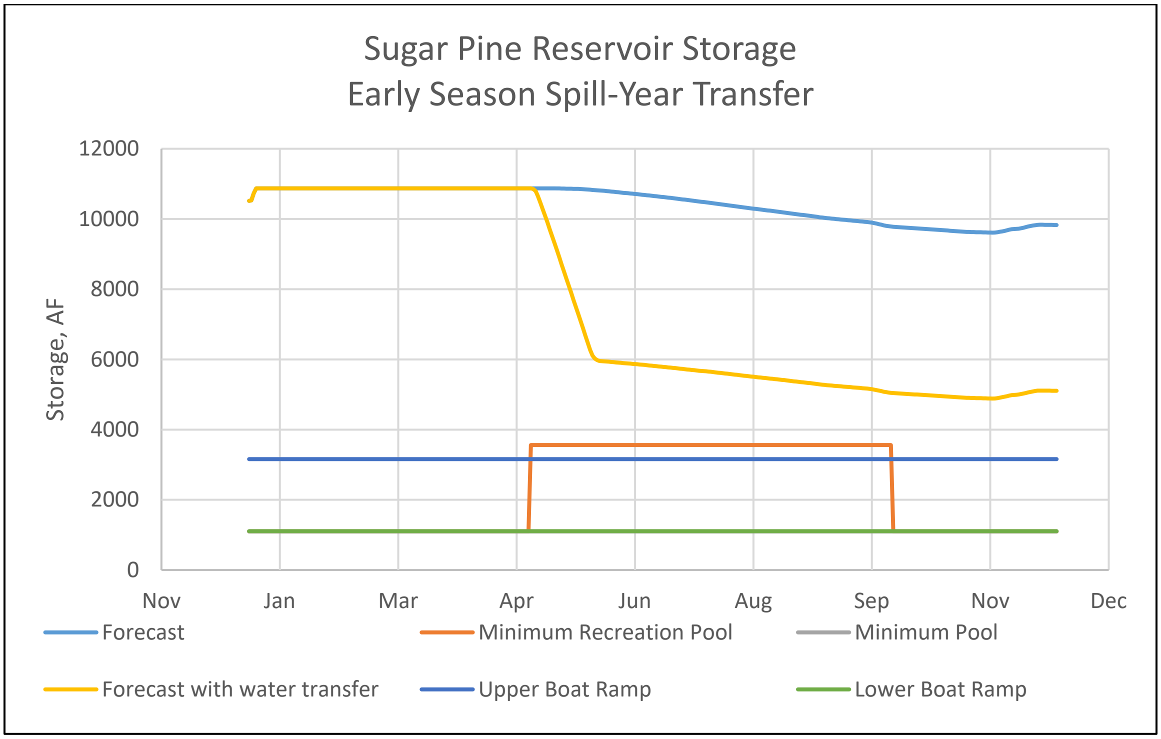
Table 2-1. Ramp Down Schedule

Ramp Down	Flow, cfs
Day 0	40
Days 1 – 6	20
Days 7 – 11	15
Days 12 – 17	10
Days 18 – 22	5
Day 23	Minimum flow

Figure 2-8. Early Season Spill-Year Transfer shows the change in reservoir storage and reservoir elevation, respectively, that would occur during a typical early-season transfer (yellow line) and reservoir storage/elevation that could be anticipated in the absence of a transfer ("baseline operation indicated by the dark blue line). **Figure 2-8** also shows minimum storage/elevation to accommodate use of the upper and lower portions of the boat ramp (light blue and green lines, respectively) and the storage required to maintain the mandatory minimum recreation pool (red line).

Figure 2-8 Early Season Spill-Year Transfer




Sugar Pine Reservoir Storage
Early Season Spill-Year Transfer
Storage, AF
12000
10000
8000
6000
4000
2000
0
Nov
Jan
Mar
Apr
Jun
Aug
Sep
Nov
Dec
Forecast
Minimum Recreation Pool
Minimum Pool
Forecast with water transfer
Upper Boat Ramp
Lower Boat Ramp

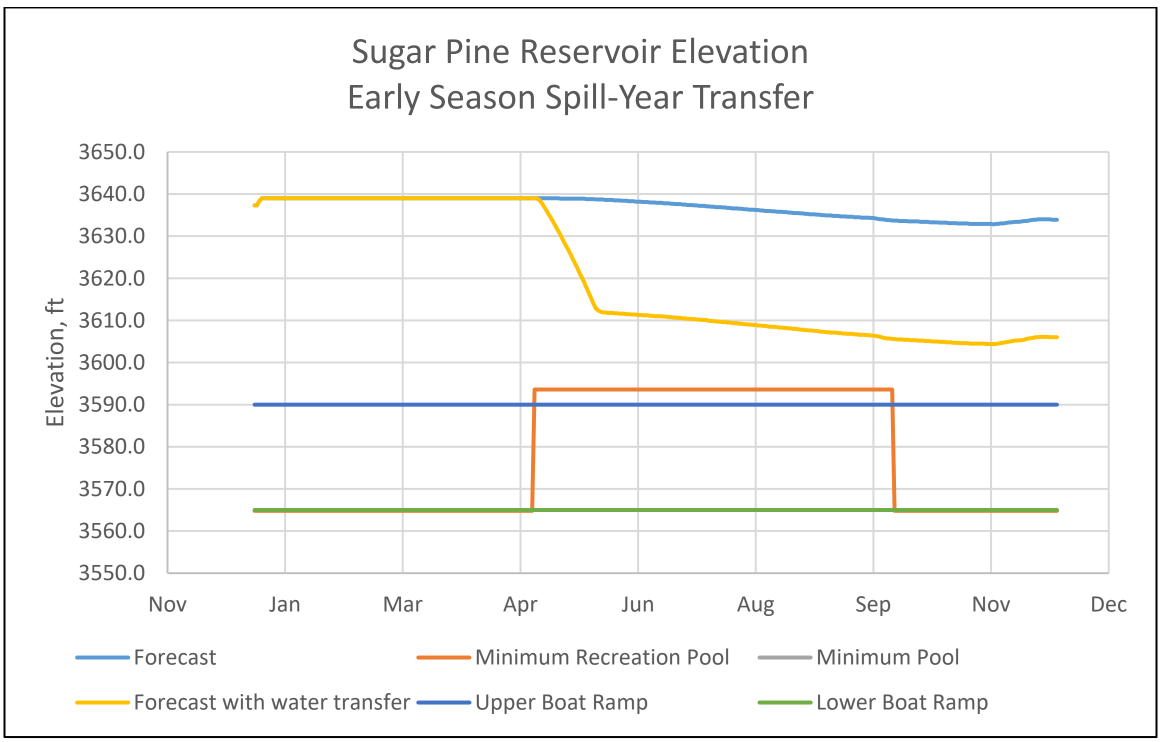
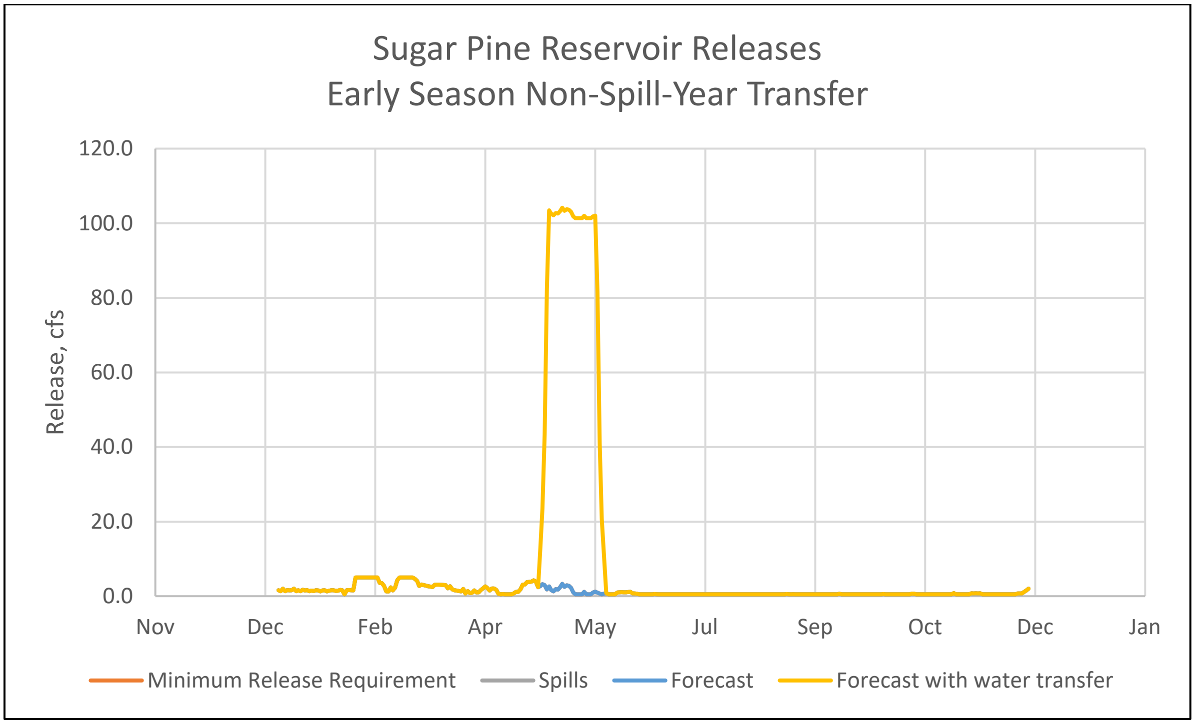
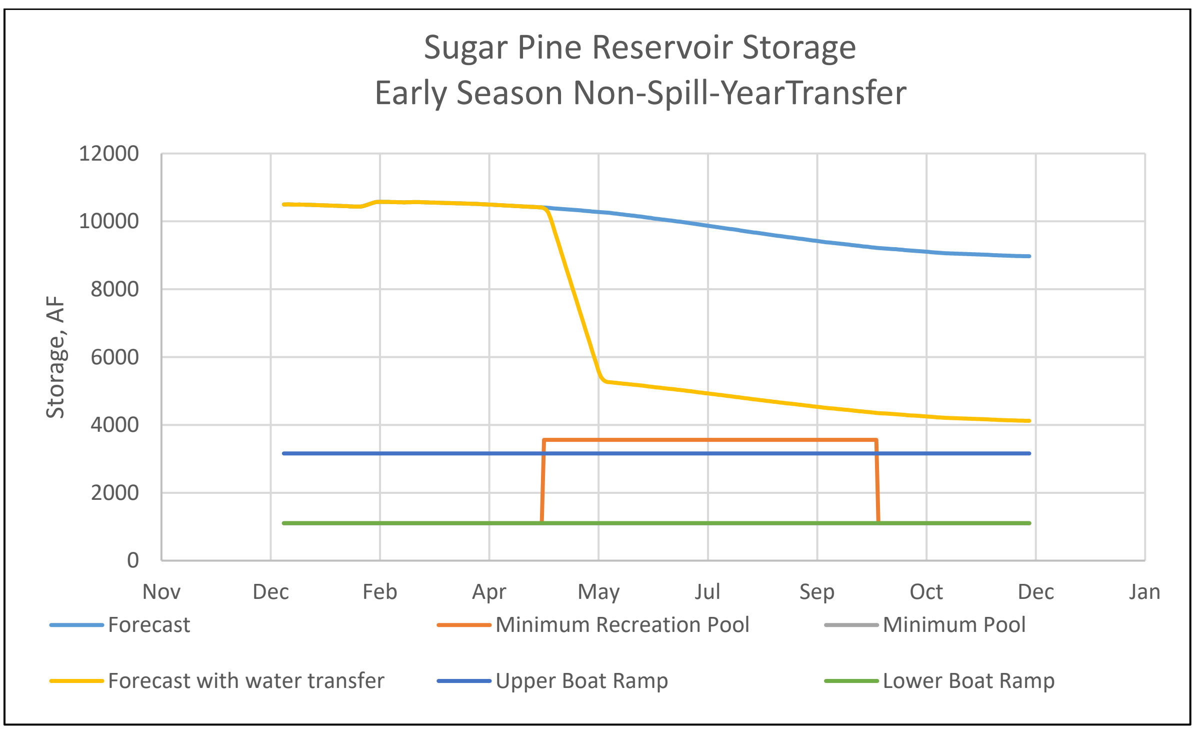
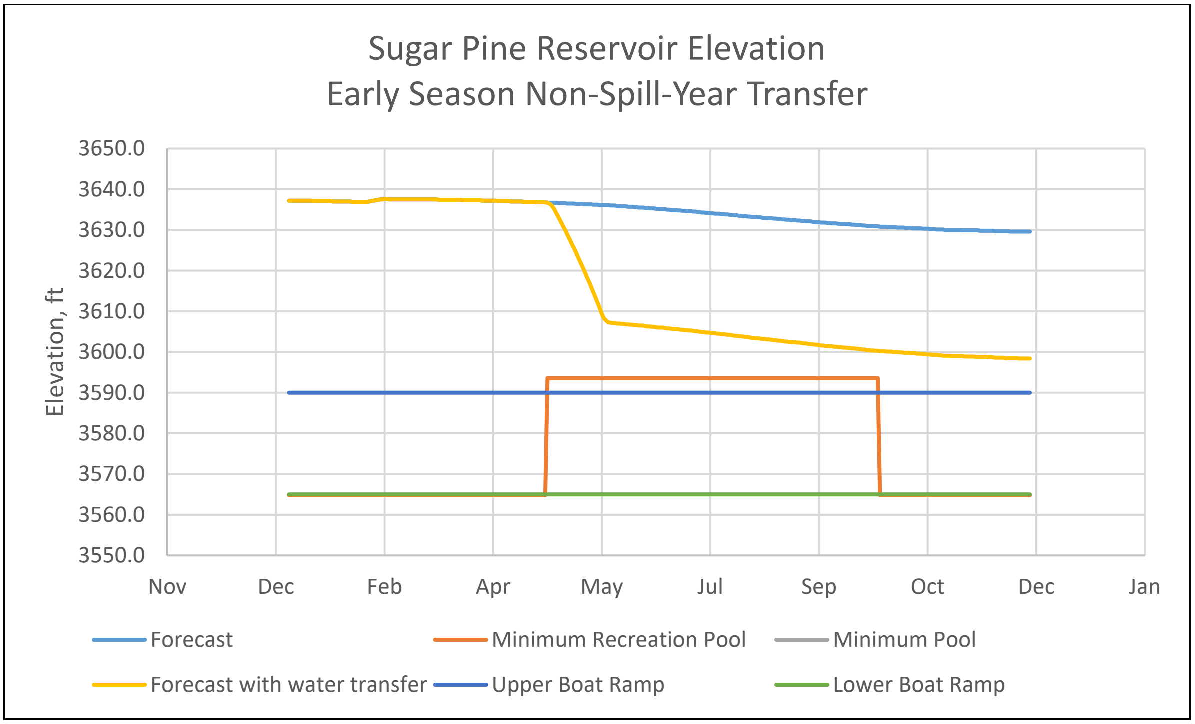

Sugar Pine Reservoir Elevation
Early Season Spill-Year Transfer
Elevation, ft
3650.0
3640.0
3630.0
3620.0
3610.0
3600.0
3590.0
3580.0
3570.0
3560.0
3550.0
Nov
Jan
Mar
Apr
Jun
Aug
Sep
Nov
Dec
Forecast
Minimum Recreation Pool
Minimum Pool
Forecast with water transfer
Upper Boat Ramp
Lower Boat Ramp

Figure 2-9. Early Season Non-Spill-Year Transfer]







Non-Spill Year Transfers (Early Season)

In a year when Sugar Pine Reservoir does not spill, FPUD would use the transfer water to gradually ramp up releases to Shirttail Creek from the minimum flow requirement to the calculated transfer flow rate, then carefully ramp down to the minimum flow requirement to provide a smooth transition from minimum flow to transfer rates and back down again. Table 2-2 illustrates the Ramp Up Schedule in a Non-Spill Year. The Ramp Down Schedule would be the same as shown in Table 1.

Table 2-2. Ramp Up Schedule

Ramp Up	Flow, cfs
Day 0	2
Day 1	27
Day 2	52
Day 3	77
Day 4	102
Day 5	122

An example of how an early-season, non-spill-year transfer would occur is illustrated in **Figure 2-9. Early Season Non-Spill-Year Transfer**.

Late Season Transfers

As noted above, the District carried out a water transfer in late summer/early fall 2018. This transfer and future proposed transfers carried out in roughly the same timeframe are referred to as "late season" transfers. The way these transfers would be executed under the proposed action are described below and would be the same in both spill and non-spill years.

Under the proposed action, late season transfer releases to Shirttail Creek would begin no earlier than August 15 and not extend beyond September 25. Transfers to buyers taking delivery south of the Sacramento-San Joaquin River Delta (Delta) currently are limited by a July 1 through September 30 "transfer window"; this is imposed by the operational constraints at the Central Valley Project and State Water Project export pumping facilities as a result of certain biological opinions issued by the U.S. Fish and Wildlife Service and National Marine Fisheries Service pursuant to section 7 of the Endangered Species Act. If there is a willing buyer north of the Delta, this transfer window would not apply as a limitation on the timing of delivery transfer water. The actual start date for future late season transfers will be contingent on conditions within Shirttail Creek relative to sensitive aquatic biological resources. These conditions and proposed restrictions on transfer release dates are detailed in **Section 4.4. Biological Resources** of this DEIR/EIS.

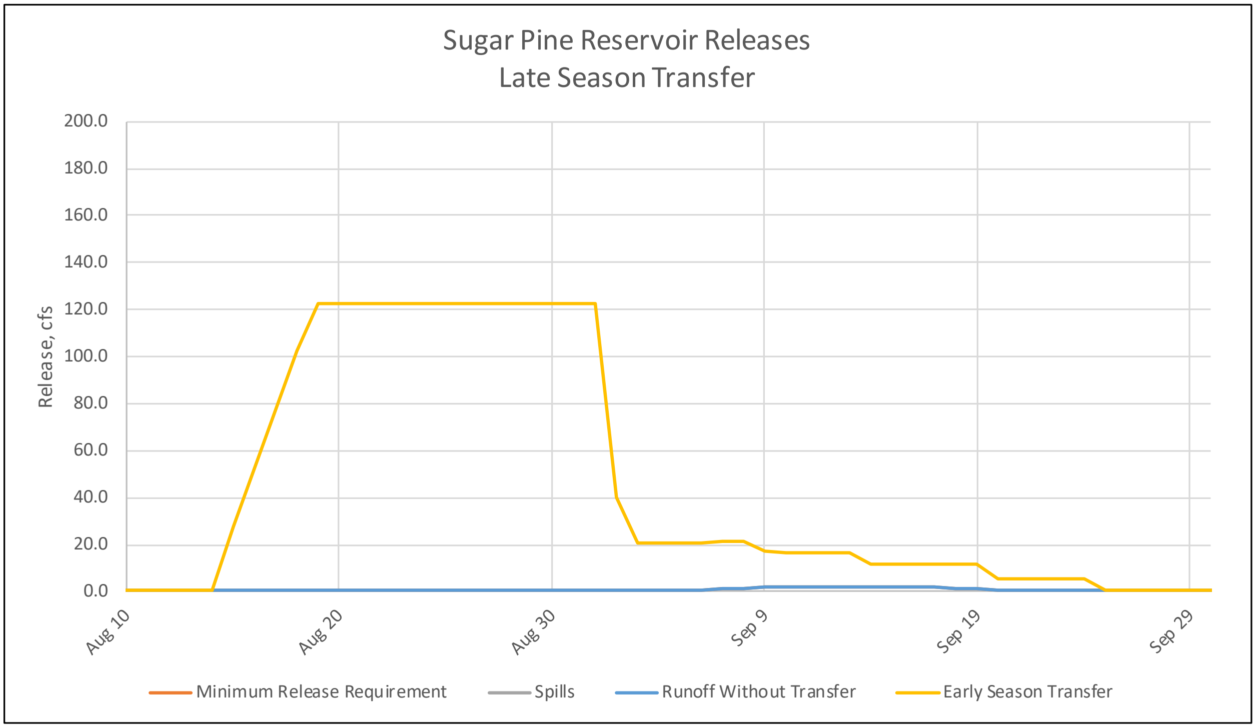
Future late season transfers would be carried out in a manner similar to non-spill year transfers described above. The District will use the transfer water to carefully ramp up from the minimum flow requirement to the calculated transfer flow rate, then carefully ramp down to the minimum flow requirement to provide a smooth transition from minimum flow to transfer rates and back down again. Ramping rates up to the transfer rate will be per the Table 2 – Ramp Up Schedule. Ramping rates down to the minimum flow requirement will be per the Table 1 – Ramp Down Schedule..

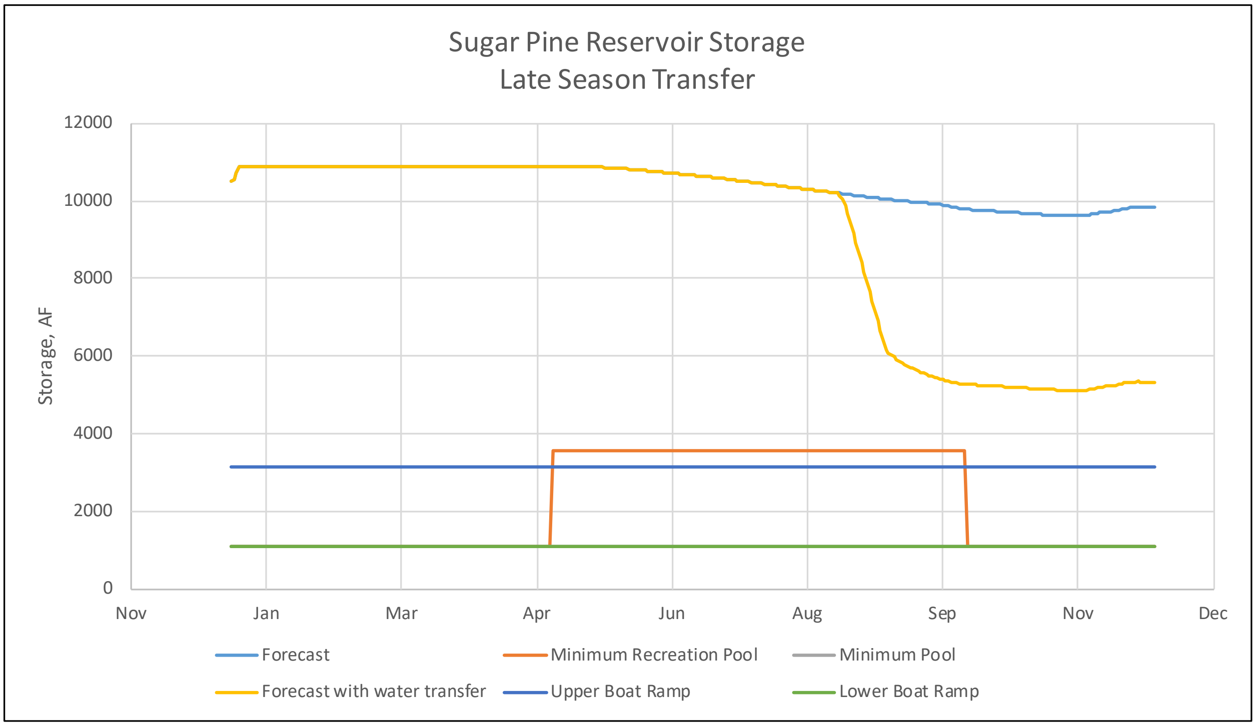
Within the parameters discussed above, the District will have some flexibility in determining actual release rates for future late season transfers relative to the duration of transfers, maximum release rates, and ramping rates to the extent that ramping rates could be lower than the prescribed maximum. For purposes of this DEIR/EIS, the effects of a "worst-case" late-season transfer scenario are evaluated to determine potential impact and mitigation requirements. Under this scenario, the maximum allowed ramping rate would be employed to execute a short duration (30-day) transfer of 5,000 AF (the maximum annual transfer volume under the proposed action). During this transfer, Sugar Pine Reservoir release rates would reach approximately 120 cfs , which is considered the maximum release rate that would occur during any future late-season transfer under the proposed action. The effects of this transfer on Sugar Pine Reservoir storage and elevation and its effect on releases to Shirttail Creek are illustrated in **Figure 2-10. Late Season Maximum Transfer**.

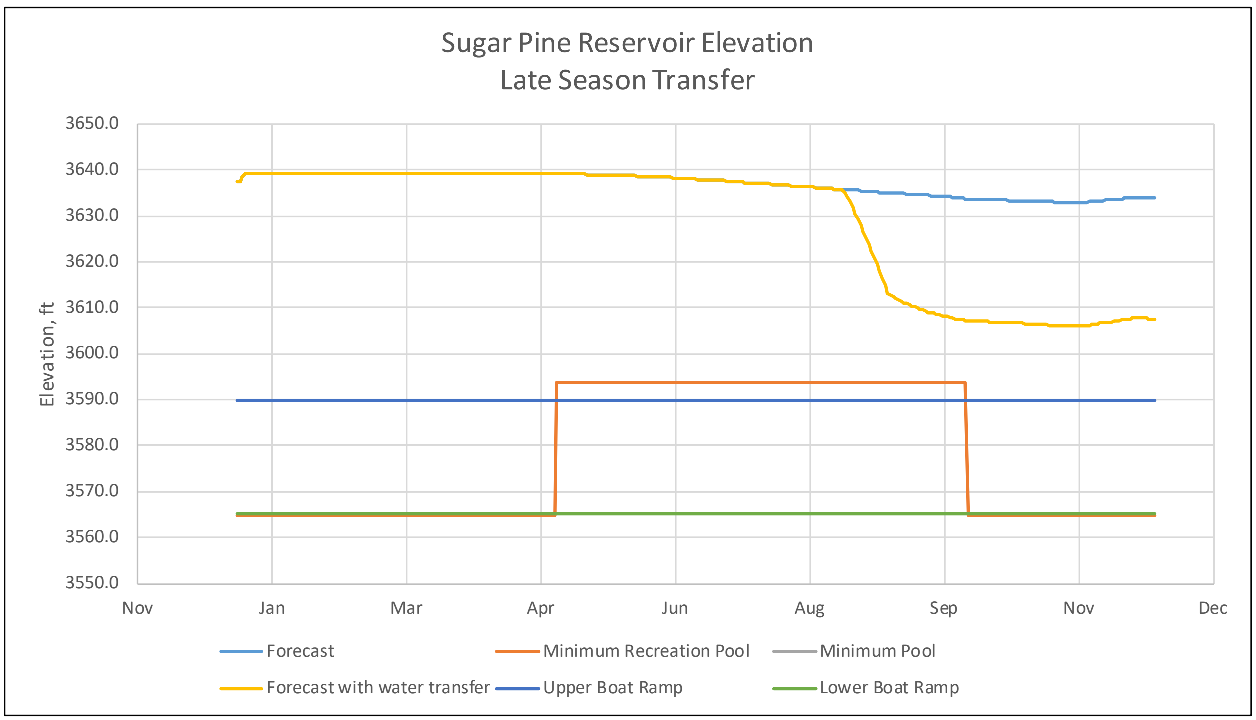
Refill Operations

Any water transfer executed by FPUD must be water that would not have been released without the transfer (sometimes referred to as "new water"). For FPUD this means additional storage withdrawals from Sugar Pine Reservoir equal to the transfer volume. After a transfer, FPUD will seek to refill Sugar Pine Reservoir as soon as possible, while making fishery flow releases specified in the MOA and diverting water from the reservoir to meet FPUD service area demand. As the reservoir fills, FPUD will monitor hydrologic conditions to identify whether the conditions specified in the transfer's refill agreement allowing Sugar Pine Reservoir to refill are met. Typical conditions include adequate inflow to cause a spill at Folsom Reservoir. Generally, once Folsom spills, any water flowing into Sugar Pine Reservoir that is stored will not reduce water available for storage at Folsom Reservoir. If the conditions are met, FPUD may return to normal Sugar Pine Reservoir operations. If the conditions are not met, FPUD will need to release to Folsom Reservoir an amount of Sugar Pine Reservoir water equal to the deficiency in Folsom caused by refilling the storage deficit at Sugar Pine resulting from the transfer. To date, FPUD has re-filled Sugar Pine Reservoir completely after each water transfer while complying with all refill requirements.

Figure 2-10. Late Season Maximum Transfer




Sugar Pine Reservoir Storage
Late Season Transfer
Storage, AF
12000
10000
8000
6000
4000
2000
0
Nov
Jan
Mar
Apr
Jun
Aug
Sep
Nov
Dec
Forecast
Minimum Recreation Pool
Minimum Pool
Forecast with water transfer
Upper Boat Ramp
Lower Boat Ramp


Sugar Pine Reservoir Elevation
Late Season Transfer
Elevation, ft
3650.0
3640.0
3630.0
3620.0
3610.0
3600.0
3590.0
3580.0
3570.0
3560.0
3550.0
Nov
Jan
Mar
Apr
Jun
Aug
Sep
Nov
Dec
Forecast
Minimum Recreation Pool
Minimum Pool
Forecast with water transfer
Upper Boat Ramp
Lower Boat Ramp

2.2.5.4 Spills

The proposed action will affect the frequency and general volumes of spills in both the short term and long term. As discussed above, the annual average inflow to Sugar Pine Reservoir is about 14,000 AF. The addition of the radial gates will increase storage by about 3,950 AF to a total of about 10,872 AF. Assuming the inflow following the installation of the gates is near the average, filling the newly created storage will reduce the anticipated spill by 3,950 AF in the first year. In the short term, after the initial fill there will be no change in the volume of spills at the reservoir unless a water transfer is executed. In the year, following a transfer, the spill will be reduced by the volume of the transfer. It is likely that the volume of future transfers will be between about 1,000 and 5,000 AF. Historic hydrology data indicates that volume can be refilled in a few days to a few weeks, depending upon the hydrology at a particular point in time. Water transfers will occur periodically contingent on whether there is a need and opportunity, i.e., a willing buyer. Anticipated future transfers may occur on average every three years until local demand approaches build out. In the long-term, the transfers will become less frequent or be reduced in magnitude as local water demand increases through implementation of the Foresthill Divide Community Plan approved by Placer County. Growing consumptive demand and the corresponding reservoir draw down to support that growth will result in reduced spill volumes and frequency relative to historic conditions.

2.2.5.5 Other Operational Considerations

FPUD must consider potential growth within the service area as it develops plans for the future. As part of that process, FPUD has anticipated the need for additional storage capacity at Sugar Pine Reservoir and is thus pursuing implementation of the proposed action. The installation of two radial gates at Sugar Pine Dam will increase storage capacity from 6,922 to 10,872 AF. Additional storage would provide opportunities to perform water transfers while water supply is in excess of local consumptive demand. The following list includes operational considerations that would be evaluated in determining annual operations:

- Hydrology;
- Local consumptive demand;
- Current storage capacity (existing facility);
- Increased storage capacity (installation of radial gates);
- Potential water transfer opportunities;
- Appropriate timing of releases to Shirttail Creek and ramping rates for those releases; and
- Maximizing reservoir recreation opportunities to the extent possible.

These considerations will necessitate flexibility in Sugar Pine Reservoir operations to best serve the interests and needs of FPUD’s service area customers while conserving TNF resources and recreation opportunities. This flexibility of operations will be particularly crucial as local water demand increases. As demand increases, the availability of surplus water to execute water transfers will decrease. The projected increase in water demand was evaluated in the utilities/water supply chapter of Placer County's Foresthill Divide Community Plan EIR. That EIR uses the period from March 1975 – March 1978 in the historical record as the critical dry period in determining the safe yield of the FPUD's Sugar Pine Project. The safe yield is the amount of water that can be delivered in a repeat of the critical period hydrology. If a repeat of this hydrology occurred when the local consumptive demands reach the projected maximum at build out, there is only enough water supply to meet local demand, limiting or eliminating transfer opportunities. As a public water supplier, FPUD cannot risk a water transfer at full build out knowing that a repeat of the critical period hydrology may occur the following year, preventing full delivery to its customers. Until the consumptive demand reaches project yield, however, there will be opportunities in most years to transfer stored Sugar Pine Reservoir water both with and without radial gates installed. The draw down schedule for transfers in any particular year will be dependent upon the combination of operational considerations in the bulleted list above.

2.2.6 Timber Harvest and Vegetation Management Activities

Implementation of the proposed action will require a variety of timber harvest, vegetation removal and vegetation management activities. Timber and other non-saleable vegetation occurring within the expanded reservoir inundation area will be removed, to the extent practicable. This is needed in order to reduce the potential for adverse water quality impact to the reservoir that may result from the decomposition of submerged vegetation and to reduce potential safety hazards to recreational users of the expanded reservoir. Additionally, the proposed action will require the expansion of USFS's ongoing Hazard Tree Abatement Program designed to help protect the users of recreational facilities and trails at Sugar Pine from tree and branch fall from dead, diseased or damaged trees in high-use areas. The expansion of the hazard tree abatement program is needed because of the proposed relocation of the JHMT and various campsites at GGCG under the proposed action. Lastly, fuel management activities in and near the project area will be expanded as part of the compensatory mitigation program to compensate for lost forest and riparian habitat that would result from the proposed action.

2.2.6.1 Timber and Vegetation Removal from the Expanded Inundation Area

Under the proposed action, the area inundated by Sugar Pine Reservoir at maximum storage would be expanded by approximately 44 acres relative to current conditions. Timber and other vegetation within these 44 acres would be removed to the extent practicable. These areas would be clear-cut and all trees, shrubs and biomass with stems 1 inch or greater below the proposed new high-water line for the reservoir would be removed. Narrow strips of small trees, shrubs and biomass may be left in place along North Shirttail Creek and Forbes Creek stream channels to provide structural fish habitat after inundation.

Stumps of felled trees within the inundation area would be left in place and "flush cut" to afford enhanced soil stability and reduced erosion potential. Stumps located within 300 feet on either side of Giant Gap Campground, Manzanita Day Use Area and the Sugar Pine Boat Ramp will be removed to enhance views and safety at high-use areas. In these areas, stumps greater than eight inches in diameter would be removed and disposed of off-site. Some stumps may be used for project-related stream restoration mitigation measures for habitat enhancement.

To carry out timber harvest/vegetation removal operations, FPUD would retain the services of a private contractor to prepare and execute a timber harvest/vegetation removal plan to clear vegetation from the proposed area of inundation in advance of radial gate installation and reservoir reoperation. While the details of such a plan have not yet been fully developed, reasonable assumptions can be made concerning the likely timber harvest system(s) to be employed by the future contractor, equipment to be used, duration of harvest activities, road construction requirements, number of truck trips to haul merchantable timber and waste material from the project site, and haul routes in order to assess the potential environmental effects of these activities.

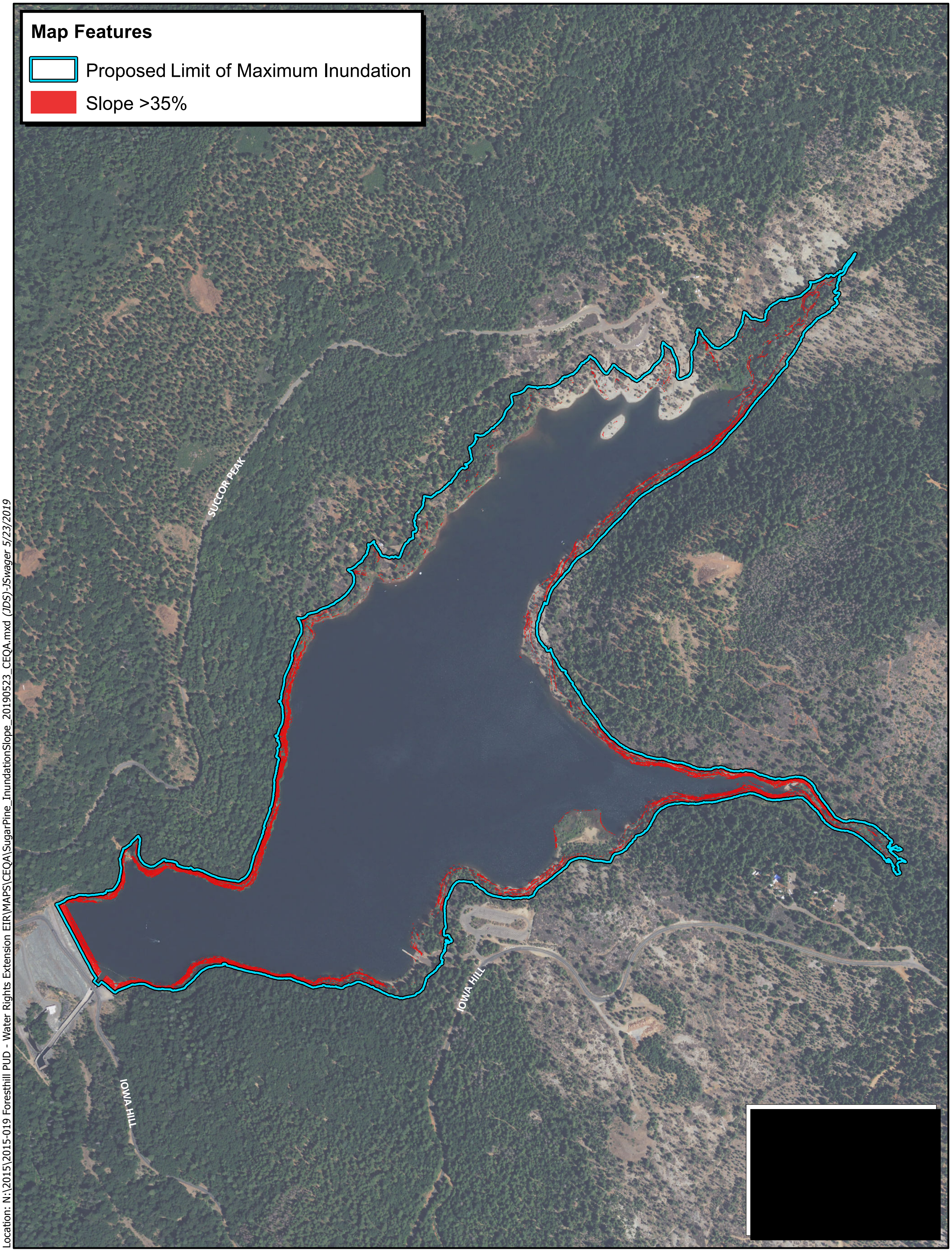
2.2.6.2 Logging Systems Considered for the Proposed Project/Action

Three logging systems for tree removal are considered under the proposed project/action: mechanical logging, cable logging, and helicopter logging. Each of these options has constraints and advantages that are discussed below.

Mechanical Harvest System

This system involves felling trees either by hand or by mechanical means (generally a "feller buncher", a tractor with a special grabbing and cutting head), packaging a bundle of trees (a doodle), and skidding it to a landing with either a rubber tired skidder or a track laying skidder. This is a conventional harvest system in California, with the main constraint being the slope that a skidder can haul trees across. With appropriately cut skid trails, however, steeper sections, i.e., areas with slopes greater than 35 percent can still be worked using this harvest system. The timber harvest contractor may also chose to employ a "winch assist" method to move felled timber. With this process, mechanical equipment may be attached to a winch or cable system that assists movement up and down the slope to move timber from the fell site instead of a skidder. Without the use of skidders, the need for "bench cut" construction (see below) is reduced or eliminated. For purposes of this DEIR/EIS, however, we assume that contractor will use skidders to move felled timber.

Approximately nine acres of the inundation area is situated on slopes greater than 35 percent (see **Figure 2-11. Inundation Area on Slopes Greater Than 35%**). In these locations mechanical logging operations would require construction of bench cut skid trails to facilitate access for mechanical harvesting equipment and "directional felling" of timber. Where possible the bench cut would be located on the existing accessible and multi-use trails, which would later be inundated below the new high waterline. The remaining approximately 35 acres within the expanded inundation area is situated on slopes less than 35 percent and skid trails in these areas would not require bench cuts to facilitate access by feller-bunchers and rubber tired skidders. Landing areas and skid-trails will be located below the new high waterline where practical. Upon completion of vegetation removal, harvested areas would be graded and contoured as needed to approximate pre-harvest conditions.



Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\CEQA\SugarPine_InundationSlope_20190523_CEQA.mxd (JDS)-JSwager 5/23/2019

Map Date: 5/23/2019

Sources: NAIP (2018), King and Associates (2014)

Figure 2-11 Inundation Area on Slopes Greater Than 35%

2015-019 FPUD Sugar Pine Reservoir

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Cable Harvest Systems

Cable harvest requires that trees and vegetation be cut exclusively by hand (i.e. felled with a chainsaw), with "choker setters" and ground workers setting up bundles of harvested materials or "doodles" and attaching them to the cable yarding system to be removed from the site. For a cable yarder to be deployed there must be slopes greater than 35 percent, an appropriate tail-hold tree(s), and a great enough span to allow for the right deflection on the cable system. The tail-holds are placed on the far side of the span furthest from the landing areas or roads to which the harvested materials will be delivered. It is uncertain that terrain on the south side of Sugar Pine Reservoir would provide enough "lift" to provide an adequate angle of deflection for a cable system to operate. It is assumed therefore that operation of a cable system would be limited to areas of 35 percent slope or greater north of the reservoir. In general, cable harvest systems are substantially more expensive to implement than mechanical harvest systems.

Helicopter Harvest Systems

Helicopter harvest was considered for inclusion in the proposed project/action but was rejected for reasons discussed below. Helicopter harvest is however, evaluated herein as an alternative to the proposed project/action and is discussed in greater detail below. Helicopter harvest is much faster and efficient relative to mechanical and cable harvest methods, requiring less preharvest ground preparation and ground disturbance, but is more expensive and, in many applications, found to be prohibitively expensive and, is some applications, could have adverse effects related to air quality and noise that could be avoided by using mechanical harvest methods.

2.2.6.3 Proposed Action: Mechanical Timber Harvest

For purposes of this DEIR/EIS, timber harvest and vegetation removal within the proposed expanded reservoir inundation area would be carried out using a mechanical harvest system exclusively. FPUD would solicit the services of a private contractor to prepare and execute a timber harvest/vegetation removal plan to clear vegetation from the proposed area of inundation in advance of radial gate installation and reservoir reoperation.

As noted, the details of such a plan have not yet been fully developed, but for purposes of this DEIR/EIS, reasonable assumptions have been made concerning the likely timber harvest and vegetation removal activities to be employed, duration of harvest activities, road construction requirements, number of truck trips to haul merchantable timber and waste material from the project site, and haul routes in order to assess the potential environmental effects of these activities.

Mechanical harvest under the proposed action will involve felling trees either by hand or by a feller buncher, packaging a bundle of trees (a doodle), and skidding it to a landing with a rubber tired skidder. To accommodate harvest in areas where slope exceeds 35 percent, bench cut skid trails will be constructed, as needed, and directional felling of large trees employed. All removed material including timber and vegetation will be taken to one of three wood sorting and utilization landings to be located at selected locations around the reservoir. In these landings, the biomass may be put to the following uses, in order of priority:

- Conifer logs: Once harvested softwood logs will be taken to the landing to be limbed, cut to length, decked, and loaded onto log trucks to be hauled to a sawmill for milling. Softwood log markets are active in California and there are multiple mills available which will accept the logs for domestic processing.
- Firewood: Logs not suitable for milling can be bucked, split and loaded off-site for sale or give-away as firewood if determined to be practicable by the selected contractor.
- Biomass Chips (mixed): Both softwood and hardwood pieces not suitable for logs or left over from log processing will be chipped and removed off-site and delivered to a licensed commercial facility for composting.
- Disposal: Waste wood generated from vegetation removal activities such as stumps, brush and other non-merchantable materials will be exported from the site and delivered to an appropriate location for composting. Some stumps will be left in place or moved to upper Shirttail Creek and Forbes Creek for the purpose of fish habitat enhancement.

Timber harvest and vegetation removal operations for the proposed action will require the use of a variety of work crews and equipment. **Table 2-3** below lists the equipment requirements and projected operational periods for the proposed action:

Table 2-3. Timber Harvest/Vegetation Removal Equipment and Operations

Harvest System	Operational Period	Equipment Required	Quantity/ side
Mechanical Harvest	4-6 months	Hand falling crew	1
		Feller Buncher	1
		Skidder	1
		Shovel Loader	1
		Log Trucks	3
		Chip Van	2
		Tub Grinder	1
		Masticator	1

2.2.6.4 Wood Sorting and Utilization Yards

To facilitate the sorting of saleable timber, timber loading, and the treatment and transport of non-saleable vegetation, a maximum of three areas will be designated as temporary wood sorting and utilization landings. We estimate that timber storage, sorting, processing, chip piling, preparation for transport and loading will require approximately one acre at each site. For purposes of this DEIR/EIS we assume that each two-acre landing will be located within the proposed expanded inundation area and above the current maximum reservoir elevation. Prospective locations for each of the three landings are shown in **Figure 2-12 Wood Sorting and Utilization Yards** and were selected based on suitable topography, proximity to harvest areas, and reduced need for stream crossings at Forbes and upper Shirttail creeks.

The execution of processing and loading activities at existing Giant Gap Campground/Manzanita Day Use Area parking areas and the Sugar Pine Boat Ramp was considered and ultimately rejected due to the prospect of pavement damage.

2.2.6.5 Project Construction Schedule

Timber harvest and vegetation removal within the expanded inundation area would require four to six months to complete. Timber harvest would be conducted in three phases. Phase 1 would begin with preparation of a landing on the north side of the reservoir at Giant Gap Campground. This landing would accommodate timber and vegetation processing and transport of material removed from the area extending from Sugar Pine Dam to the north bank of upper Shirttail Creek. Prior to any ground disturbing activities in Phase 1, the contractor would install erosion control and water quality best management practices (BMPs) measures downslope of all proposed Phase 1 activities in keeping with TNF Standard Management Requirements. The landing at Giant Gap Campground would be cleared and prepared for use. Once ready, timber harvest, processing and sorting equipment would be transported to the site and timber harvest operations would commence.

Prior to the completion of Phase 1 harvest operations, the Phase 2 landing will be prepared for use in a manner similar to that described for Phase 1. Upon completion of Phase 1 harvest, processing and transport operations, equipment would be relocated to the Phase 2 landing. Likewise, upon completion of Phase 2 sorting and utilization activities, equipment would be relocated to the Phase 3 landing located adjacent to the Sugar Pine Boat Ramp. Although the actual year of potential project implementation remains uncertain, **Table 2-4** presents a projected schedule for timber harvest activities and implementation of compensatory mitigation features included as part of the proposed action.

As shown in Table 2-4, Phases 1, 2, and 3 of timber harvest operations will require up to 236 days to complete. The construction of compensatory mitigation features (i.e., trail replacement and campground and boat ramp modifications) would take approximately 11 months, The construction of these features would occur concurrently with ongoing timber harvest activities to the extent practicable, but could not commence until Phase1 of the timber harvest is complete. Radial gate installation and replacement of the potable water pipeline would occur concurrently with compensatory mitigation feature construction.

In summary, completion of proposed timber harvest operations, radial gate installation, and recreational facilities replacement will require approximately 14 months from the initiation of Phase 1 timber harvest operations to the completion of all facilities replacements. Project construction would be initiated in the fall after closure of Sugar Pine campground and day use areas. Construction activities, therefore, will span a maximum of one recreation season.

Projected Yard Location

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Location_Vicinity\FPUD_Location.mxd (KO)-KOrtega 6/19/2015

Map Date: 6/19/2015
Photo Source: Google Earth (2013)

Figure 2-12. Wood Sorting and Utilization Yards
(Yard Locations shown in yellow)

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

2015-019 FPUD Sugar Pine Reservoir

Table 2-4. Estimated Construction Timeline for Sugar Pine Reservoir Project

Construction Activities	Duration
Phase 1: North Shore / Giant Gap Campground (Timber harvest)	
BMP Placement	One Week
Landing Development	One Week
Equipment Import and Setup	Three Days
Road/Skid Path Development	Two Weeks
Salable Timber Harvest and Sorting	Two Weeks
Timber Transport for Milling	Ongoing during harvest activities plus two weeks
Non-salable vegetation removal/processing/transport	Ongoing during Timber Transport plus two weeks
Road removal and regrading	One week
Landing area cleanup and repair	One Day
TOTAL: PHASE 1 (Timber Harvest)	**81 days**
Phase 2: Shirttail/Forbes Creeks (Timber harvest)	
BMP Placement	One Week
Landing Development	One Week
Equipment Import and Setup	Three Days
Road/Skid Path Development	One Week
Salable Timber Harvest and Sorting	Two Weeks
Timber Transport for Milling	Ongoing during harvest activities plus two weeks
Non-salable vegetation removal/processing/transport	Ongoing during Timber Transport plus two weeks
Road removal and regrading	One week
Landing area cleanup and repair	One Day
TOTAL: PHASE 2 (Timber Harvest)	**74 Days**
Phase 3: Boat Ramp Area	
BMP Placement	One Week
Landing Development	One Week
Equipment Import and Setup	Three Days
Road/Skid Path Development	Two Weeks
Salable Timber Harvest and Sorting	Two Weeks
Timber Transport for Milling	Ongoing during harvest activities plus two weeks
Non-salable vegetation removal/processing/transport	Ongoing during Timber Transport plus two weeks
Road removal and regrading	One week
Landing area cleanup and repair	One Day
TOTAL PHASE 3 (Timber Harvest)	**81 Days**
Compensatory Mitigation Implementation	
Recreational Facilities Construction[1]	**11 Months**
Potable Water Supply Line Installation	Three Weeks
Habitat Restoration and Management	To be Determined
Radial Gate Installation	One Week

[1] Facilities include: recreational trails replacement (JHMT, Sugar Pine Multi-Use Trail, North Shirttail Creek bridge, Forbes Creek bridge improvements, interpretive displays, and benches); Campground improvements at Giant Gap and Shirttail Creek; Manzanita Day Use Area improvements; swimming and boat access improvements; and Sugar Pine Boat Ramp replacement.

2.2.6.6 Estimated Biomass of Timber and Other Vegetation within the Inundation Zone

In order to estimate the biomass (i.e., the weight of vegetative material) of vegetation within the projected future Sugar Pine Reservoir Project inundation zone, the EIR/EIS preparer used information from the Forest Inventory and Analysis (FIA). This database is created and maintained by the USFS (see Woudenberg et. al 2010). The FIA database compiles data collected from standardized plots located throughout USFS lands. All FIA data are publicly available in the online FIA DataMart (HYPERLINK "https://apps.fs.usda.gov/fia/datamart/CSV/datamart_csv.html"https://apps.fs.usda.gov/fia/datamart/CSV/datamart_csv.html). The CA_Plot database within the FIA database was used to identify the plots that exist within the same elevation band (3,500-4,000 feet above mean sea level) and within counties that encompass the western slope of the northern Sierra Nevada Mountains. The CA_Plot database within the FIA database was used to identify the plots that exist within the same elevation band (3,500-4,000 feet above mean sea level) and within counties that encompass the western slope of the northern Sierra Nevada Mountains.

There are eight vegetation community types mapped by USFS within the inundation zone: Barren, Douglas-fir, Montane Chaparral, Montane Hardwood, Montane Hardwood-Conifer, Montane Riparian, Ponderosa Pine, and Sierra Mixed Conifer. We assigned a vegetation community type to each selected FIA subplot based on the identity and abundance of trees recorded in each subplot. There were no FIA plots representative of Barren or Montane Chaparral vegetation communities.

USFS estimates the dry above ground biomass for every censused tree within each FIA subplot. The total above ground biomass was calculated by summing the values for every tree within each subplot. These values were then converted from lbs/24th acre to tons/acre. With that information, the average above-ground biomass per acre for each vegetation community type was calculated with the variation within each type represented in terms of standard error. These biomass estimations were then used to calculate a range of total potential aboveground biomass for all vegetation within the expanded inundation zone. **Tables 2-5 and 2-6** list the results of this analysis for both "bole" biomass, (i.e., merchantable timber), and non-bole biomass (i.e., trunk, top, and branches, chipped onsite).

Table 2-5. Estimation of the total bole biomass (i.e., whole log, merchantable timber) for each vegetation type within the inundation zone

Vegetation Community Type	Acres in Inundation Area	Low Biomass Estimate (tons)	Average Biomass Estimate (tons)	High Biomass Estimate (tons)
Douglas Fir	0.61	191.2	251.5	311.8
Montane Hardwood	0.48	32.8	38.1	43.4
Montane Hardwood-Conifer	5.84	1,237.9	1,518.3	1,798.7
Ponderosa Pine	5.04	909.1	1,240.1	1,571.2
Sierra Mixed Conifer	29.04	10,238.3	11,516.3	12,794.3
Montane Chaparral	1.22	-	-	-
Perennial Grassland	0.63			
Barren	0.65	-	-	-
Total	**43.51**	**12,609**	**14,564**	**16,519**

Table 2-6. Estimation of the total non-bole biomass (i.e. trunk, top, and branches, chipped onsite) for each vegetation type within the inundation zone

Vegetation Community Type	Acres in Inundation Area	Low Biomass Estimate (tons)	Average Biomass Estimate (tons)	High Biomass Estimate (tons)
Douglas Fir	0.61	36.9	48.2	59.5
Montane Hardwood	0.48	9.6	11.1	12.5
Montane Hardwood-Conifer	5.84	257.0	310.2	363.4
Ponderosa Pine	5.04	169.3	232.3	295.3
Sierra Mixed Conifer	29.04	1,954.72	2,190.0	2,425.3
Montane Chaparral	1.22	-	-	-
Perennial Grassland	0.63			
Barren	0.65	-	-	-
Total	**43.51**	**2,428**	**2,792**	**3,156**

Based on the results presented in **Tables 2-3 and 2-4**, a total range of 15,037-19,675 tons of dry aboveground biomass exists within the inundation zone of Sugar Pine Reservoir. This represents the amount of vegetative material that would be removed from the inundation zone, processed, and transported from the project area for sale or disposal. The estimation does not include the biomass of 6.75 acres of Montane Chaparral vegetation, 0.63 acres of annual grassland or 1.36 acres of Barren vegetation. These vegetation types will contribute relatively little to the total overall biomass within the inundation zone.

2.2.6.7 Hazard Tree Abatement

Hazard trees pose risk to the safety users of recreational facilities at Sugar Pine Reservoir. USFS TNF currently conducts a hazard tree abatement program at the Sugar Pine recreational area under which hazard trees that are within 150 feet of high-use areas such as the JHMT, Sugar Pine multi-use trail, campgrounds, day-use areas and the boat ramp are removed or otherwise managed to protect public safety. Under the proposed project, some recreational facilities will be relocated and, as a result, the current hazard tree abatement area would need to be expanded. This expansion would cover approximately 110 acres. Hazard trees within the abatement area would be cut using directional felling; end-lining from a skidder below would pull the trees downslope for removal through the clear-cut inundation area. Furrows created during tree removal would be filled in and re-contoured to match the existing slope as needed, particularly on steeper slopes. These activities would be carried out by the U.S. Forest Service as part of their ongoing hazard tree abatement program for the Sugar Pine recreational area.

For the affected campgrounds, day use area, parking areas, boat ramp and other locations where public occupancy would be expected to be stationary for extended periods of time, all hazard trees would be removed consistent with direction according to the Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region (USFS 2012). Stumps from hazard trees would be flush cut and treated with a borate compound to prevent spread of Annosus root disease. Slash from hazard tree removal would be removed and disposed of as appropriate.

2.2.6.8 Fuels Treatments

To mitigate for the projected loss of 37.1 acres of forest habitat under the proposed action, vegetation management would be carried out on approximately 195.5 acres selected by the USFS to reduce fire risk and improve habitat value for spotted owl. Treatment activities would include hand thinning of material less than 6 inches diameter at breast height (dbh) and prescribed burning. These activities would be carried out by the USFS under a funding collection agreement with FPUD.

2.2.6.9 Water Drafting

Although specific quantities and methods for water use during timber harvest and compensatory mitigation facilities construction has not been determined, this DEIR/EIS recognizes the possibility that these activities may require water drafting from the Sugar Pine Reservoir during project construction. Types of equipment to be used and operational procedures for this equipment will be managed through implementation of TNF Management Requirements included as part of the proposed project/action.

2.2.6.10 Recreational Facilities Closures

All reservoir public access and reservoir recreation facilities, including the campgrounds, day use area, trails and boat ramp would be subject to closure to protect public health and safety during vegetation management operations. Closures are expected to span one recreation season.

2.2.7 Project Design Features and Compensatory Mitigation Measures

This DEIR/EIS identifies TNF recreational features that will be adversely affected by the proposed action, proposed action design features intended to replace/relocate those features, and the projected environmental effects of replacing or relocating those features. These features and mitigation measures are included as part of the proposed action in order to comply with Forest Plan direction, the terms and conditions of FPUD’s current Permit, and other laws, regulations and policies governing management of TNF lands.

Resources mitigation ratios and locations for proposed habitat mitigation measures are fully described and analyzed in **Section 4** of this DEIR/EIS. A summary of the proposed project design features and mitigation components of the proposed action which respond to projected impacts are described below in **Table 2-7**. A more detailed description of the proposed replacement of recreation facilities, including preliminary recreation facility design drawings and a narrative describing those facilities are included in **Appendix F** of this DEIR/EIS.

The facilities described in **Appendix F** served as the basis for the evaluation of project effects presented in this DEIR/EIS. In the course of evaluation, various modifications were made to the facilities or facilities construction described in **Appendix F**. These modifications are reflected in the Project Design Features and mitigation measures presented in **Table 2-7**.

Table 2-7. Compensatory Mitigation Measures

Resource Value	Projected Impacts	Project Design Features and Mitigation Measures
Recreation Trails	**A.** Recreation Trails and related facilities would be inundated or otherwise adversely affected by the proposed expansion of Sugar Pine Reservoir. Affected trails and associated features include Joshua Hardt Memorial Trail (2.8 miles), Sugar Pine Multi-Use Trail (1.5 miles), Trail Bridge on N. Shirttail Creek and Trail Bridge on Forbes Creek, Interpretive Displays, and Seating Benches.	**A1.** Reconstruct the paved accessible portion of Joshua Hardt Accessible Trail (between the Sugar Pine Boat Ramp and Giant Gap Campground) within a new alignment above the post-project projected high water line for Sugar Pine Reservoir. Replace unpaved multi-use trail segments between Sugar Pine Dam and Giant Gap Campground and Sugar Pine Dam and the boat ramp upslope of the existing trails above new high water line. **A2.** Relocate accessible trail terminus from the end on the lower loop road in Giant Gap Campground to the entrance to Giant Gap Campground because of siting limitations within the campground. A3. Install signage at the trail terminus at the west end of GGCG informing users of the end of the paved accessible trail and signage along the road indicating a shared vehicle and pedestrian route. A4. Install signage at the trail terminus at the west and east borders of GGCG that informers users how to continue the loop trail through GGCG. A5. Install speed bumps along the portion of the road to be shared with pedestrians accessing the remaining unpaved length of trail to the dam. **A6**. Decommission existing accessible paved trail sections by ripping asphalt and covering it with soil or rock. Asphalt on segments of the accessible trail within 300 ft. of recreation sites will be removed entirely. **A7**. Relocate and/or replace as needed 10 existing interpretive displays and narratives. **A8**. Relocate and/or replace 12 existing benches along the existing trail system to similar locations along new trail alignments. **A9**. Relocate or reconstruct N. Shirttail Creek trail bridge above new high water line. **A10.** Reinforce bridge abutments on Forbes Creek trail bridge to protect from partial inundation, if determined to be necessary. **A11.** Hazard tree abatement mitigation 150 ft. upslope of new trail alignments would be carried out by USFS as part of its existing hazard tree abatement program within the Sugar Pine Management Area. **A12.** Short segments of existing trails that would not be inundated by the project (totaling approximately ¼ mile) would be used as part of the new trail alignments wherever possible.
	B. The quality of the recreation experience along the trails would be affected: 1) Relocation of the trail south of Manzanita Day Use Area would result in a change in character of the trail with the proposed alignment changing from partially shaded to exposed in sparsely vegetated serpentine soils and outcroppings and 2) Reservoir operations after installation of the radial gates resulting in a more dynamic shoreline view of	**B1**. Relocate benches to shaded areas with interesting views and scenic quality will help offset losses of some trail attributes. **B2**. Install interpretive display describing the importance of serpentine habitat for rare plants to highlight this new section of trail. **B3**. Construct shade structures at two relocated picnic sites at Manzanita Day Use Area to help offset the lack of shade along the relocated section of trail through the exposed serpentine soils and outcrops adjacent to N. Shirttail Creek.

Table 2-7. Compensatory Mitigation Measures

Resource Value	Projected Impacts	Project Design Features and Mitigation Measures
	exposed soil/reservoir bed as well as periodically greater distances from the trail to access reservoir waters.	
Campgrounds	C. Portions of Giant Gap and Shirttail Creek campgrounds would be affected by inundation.	**C1.** Decommission 700 ft. of the lower loop road and six campsite parking areas in Giant Gap CG and one campsite parking area in Shirttail Campground. **C2.** Reconfigure 300 ft. of roadway in Giant Gap CG to connect the lower loop road with the upper loop road. **C3**. Relocate six campsites/parking spurs (including one host site and associated improvements) affected in Giant Gap Campground and one campsite in Shirttail Campground. **C4**. Replace one double vault toilet with two single vaults to better serve reconfigured campground. [A narrative description and conceptual drawings of proposed recreation facilities are included in **Appendix F** of this DEIR/EIS.] **C5**. Hazard Tree mitigation to be carried out by USFS in relocated campground and boat facilities, and trails.
Manzanita Day Use Area	**D.** Portions of Manzanita Day Use Area would be inundated or affected.	**D1.** Relocate nine single picnic sites and one double picnic site. **D2.** Resurface / repair pavement as needed after timber harvest operations.
	E. Increased density of picnic sites because of inundation and topographical limitations, and loss of trees with the new reservoir footprint would adversely affect the recreation setting.	**E1.** Implement Measure **B1** and **B3** above to help mitigate this impact as well as provide scenic seating and shade nearby but outside the existing footprint of Manzanita Day Use Area.
Boat ramp	**F.** The boat ramp, boat ramp access road and parking would be inundated or affected.	F1. Boat ramp, boat ramp access and parking would be reconfigured to accommodate new high water line. F2. Hazard tree mitigation around reconfigured facilities will be carried out by USFS as part of their ongoing Hazard Tree Abatement Program for Sugar Pine Management Area. F3. Paved surfaces at the boat ramp and parking area will be repaired and/or resurfaced after timber harvest operations as needed.
Potable Water Supply Line	**G.** The potable water supply line to Giant Gap and Shirttail Creek Campgrounds and Manzanita Day Use Area would be partially inundated.	**G1.** Relocate affected portions of water supply line totaling approximately 1.25 miles of pipeline and fixtures. The supply line originates at a storage tank on Succor Hill approximately ¼ mile southeast of Sugar Pine Dam and terminates at Giant Gap Campground. The existing alignment is located predominantly within the existing multiuse and accessible trail alignments. The replacement line will be installed within the new proposed trail alignments.
Small Boat/ Swimming Access	**H.** Muddy shoreline from increased demand from County–approved growth or potential future water transfers affect access to reservoir waters for small boats and swimmers at recreation sites.	**H1.** Following implementation of the proposed action (i.e., gate installation and expansion of the Sugar Pine Reservoir inundation area), FPUD and USFS will coordinate proactively to mitigate impacts by informing the recreating public in advance as much as possible when a water release or low water conditions are imminent by posting notices and/or signs in the campgrounds and day use facilities and posting notices online on Forest Service webpages. Any additional needs for

Table 2-7. Compensatory Mitigation Measures

Resource Value	Projected Impacts	Project Design Features and Mitigation Measures
		mitigation will be informed by direct observation of recreational use and/or user interviews and/or surveys. If the need for improved access due to project effects is determined, FPUD will implement access improvements. Options for such improvements may include installation of a removable mat surface or a permanent hardened surface to facilitate water access.
	I. The scenic and popular island adjacent to Manzanita Day Use Area would be affected by inundation and from falling water levels under more dynamic reservoir operations.	**I1.** Implement Measures **A1** to **J1** to maintain a high quality recreation setting as much as possible by replacing and adding recreation amenities to offset project impacts.
Visual Quality and Recreation Setting	**J.** Stumps remaining after clear cut of timber below new high water line would degrade visual quality of the reservoir and pose a safety hazard for reservoir recreation users. The existing conditions are that very few stumps remain below the high water line as nearly all were removed during construction of the reservoir.	**J1.** Remove all stumps 8-inches diameter or more occurring within 300 feet of Giant Gap and Shirttail Campgrounds and Manzanita Day Use Area. Some of the stumps to be removed may be used for habitat improvements in N. Shirttail and Forbes Creeks.
	K. The recreation setting and character of Sugar Pine Reservoir would be improved by a larger reservoir at full pool; however, the recreation character and setting would be periodically affected negatively by more dynamic reservoir operations and changing water levels as a result of the proposed action. The setting would shift from a reservoir with a largely static water line immediately adjacent to the tree line to a reservoir with a more dynamic water line that exposes more bare soil or lake bed on a periodic basis depending on FPUD service area water demand growth, any water transfers, or both.	**K1.** Even without the proposed action, some adverse effects to the recreation setting are unavoidable as demand growth occurs under Placer County's Foresthill Community Plan, which will cause increased draw-dawn in reservoir water levels every year. With the proposed action, changes in reservoir operations with the additional storage capacity from installing the radial gates would increase draw-down to meet FPUD service area demand growth and/or perform water transfers. Mitigation measures **A1** to **J1** above strive to maintain a high-quality recreation setting as much as possible by replacing and adding recreation amenities to offset project impacts.
Biological Resources	**L.** Permanent loss of habitat, biomass productivity and carbon storage of approximately 37.1 acres of Forest Vegetation and habitat for the California Spotted Owl (Forest Service Sensitive).	**L1.** Improve approximately 195.5 acres of forest habitat for the California Spotted Owl by hand thinning material less than 6 inches dbh and prescribed burning. This activity to be carried out by USFS.
	M. Permanent loss of habitat for approximately 1.6 acres of Emergent Riparian Vegetation.	**M1.** Construct 3.2 acres of pond habitat offsite. FPUD would coordinate with USFS to determine location and pond design. Vegetation removal on the 1.6 acres of emergent riparian vegetation shall be avoided during project construction and operation unless that vegetation adversely affects FPUD's potable water supply.

Table 2-7. Compensatory Mitigation Measures

Resource Value	Projected Impacts	Project Design Features and Mitigation Measures
	N. Permanent loss of approximately 6.4 acres of Montane Chaparral habitat, including serpentine soils.	**N1.** Improve approximately 18 acres of off-site montane chaparral habitat via a one-time eradication of non-native invasive plants (NNIP). Activities to be designed and executed by USFS.
	O. Permanent loss of approximately 2000 feet of stream habitat in N. Shirttail and Forbes creeks, including habitat for foothill yellow-legged frog (Forest Service Sensitive) and rainbow trout spawning. Suitable habitat for California red-legged frog is located in this area (Federally Threatened Species).	**O1.** Improve existing stream habitat along upper Shirttail Creek. Improvements will include onetime fuel management along 10,000 linear feet of upper Shirttail Creek, bank erosion protection at one at-risk location on upper Shirttail Creek, and road improvements to reduce erosion and water quality impairment to upper Shirttail Creek. **O2.** The proposed action would leave localized strips of non-merchantable biomass untreated at stream inlets to enhance lacustrine habitat.
	P. Habitat for resident populations of foothill yellow legged frog (Forest Service Sensitive/California ESA Threatened) and rainbow trout habitat below Sugar Pine Dam would likely be affected. Suitable habitat for California red-legged frog is located in this area (Federally Threatened Species).	**P1.** Implement a temporary monitoring program in association with future early season water transfer activities to assess status of foothill yellow legged frog (Forest Service Sensitive/California ESA Threatened) during transfers that exceed 2,000 AF. The program will use separate protocols for "spill-year" and "non-spill-year" transfers, as appropriate. These protocols are specified in Section 4.4.3.3 of this Draft EIR/EIS. P2 Implement 10+ years of bullfrog suppression in compensation for the loss of 1,000 ft of Forbes Creek habitat and .35 acres of pond creation for California red legged frog for the projected loss of instream habitat associated with loss of 2,032 linear feet of stream habitat.
	Q. Approximately 0.11 acre of a population of Layne's butterweed, a federally listed "threatened" species, would be permanently lost due to inundation. Up to 2.46 acres would be directly affected by relocation of the JMHT recreational trail that surrounds the reservoir. Up to 4 acres of Van Zuuk's morning-glory (CNPS 1 B) would be lost due to inundation.	Q1. Establish permanent protection of 0.5-acre of an existing Layne's population and 8.5 acres of surrounding habitat through conservation easement, fee title, or other mechanism to assure permanent protection of the population and adjacent habitat. In addition, FPUD will provide a $150,000 endowment to the Pine Hill State Ecological Preserve for the enhancement and management of Layne's butterweed populations at the preserve. Under Compensatory Mitigation Measure N1,18 acres of off-site montane chaparral habitat would be enhanced thus benefiting Van Zuuk's morning-glory.
Cultural Resources	**R.** Cultural resource sites would be inundated or affected.	**R1.** Tahoe National Forest will complete any remaining cultural resource surveys needed for the proposed action. No further tribal consultation is needed per concurrence from SHPO.
Public Safety	**S.** All reservoir recreation facilities would be subject to closure for up to several months during timber harvest and recreation facility reconstruction operations for public safety.	**S1.** Public outreach and notification of closures would be made several months in advance and continue for the duration of closures to minimize impacts on the recreating public and maintain public safety.

2.2.8 USFS Management Requirements

The USFS has identified "Standard Management Requirements" (SMRs) that are being integrated into the proposed action to avoid or reduce environmental effects, based on USFS experience overseeing timber harvests as another routine projects within the Tahoe National Forest. These measures are designed to ensure compliance with current USFS and TNF management direction and to reduce or prevent adverse effects of proposed actions on wildlife and aquatic species and upland and aquatic habitats. For the proposed project/action addressed in this DEIR/EIS, a number of SMRs were determined by USFS staff to be applicable to the proposed project/action and resources potentially affected by the project. These SMRs were refined and modified to make them more specific to the proposed project/action by USFS staff in coordination with DEIR/EIS preparer's technical specialists. These refined measures are referred to herein as Management Requirements (MRs) Implementation of the MRs would be mandatory and, as such, are incorporated into this description of the proposed project/action. A complete list of MRs is presented in **Table 2-8**, below. The MRs presented in **Table 2-8** are organized by issue area (e.g., Terrestrial Wildlife, Water and Aquatic Resources). Each requirement is designated with an acronym signifying the specific issue and a number.

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension

Terrestrial Wildlife	
TW1:	If federally-listed or sensitive species are detected in or within 0.5-mile of the project area prior to or during project activities, the District Wildlife Biologist will be notified and an appropriate limited operating period (LOP) or other protective actions will be applied, as needed. Measures can include, but are not limited to, flagging and avoiding a sensitive site, implementing a species-specific LOP, or designating a protected activity center.
TW2:	Where overstory forest canopy must be removed, apply compensatory mitigation measures to improve stand conditions in surrounding areas. Compensatory mitigation would include up to 196.5 acres of fuels treatments in spotted owl PACs.
TW3:	Where chaparral habitat must be removed, apply compensatory mitigation measures to improve stand conditions in surrounding areas. Compensatory mitigation would include up to 18 acres of invasive plant species treatments in chaparral habitats near the Project.
TW4:	Where emergent riparian habitat must be removed, apply compensatory mitigation measures to create 3.2 acres of wetland habitat offsite
TW5:	Where stream channel habitat would be removed, apply compensatory mitigation measures to 1) suppress bull frog expansion in 8,500 feet of Shirttail and Forbes creeks; 2) stabilize ongoing sedimentation risks on Shirttail Creek; 3) create 0.35 acres of wetland habitat offsite; and 4) provide 70 acres of fuels treatments in North Shirttail Creek RCA.
TW6:	Maintain a yearly limited operating period (LOP) within 0.25-mile around known osprey nests during the breeding season (March 1 to August 31) unless surveys confirm they are not nesting. Retain nest trees and existing trees over 12 inches dbh within 200 feet of nest tree if possible.
TW7:	Bald eagles are not known to occur near Sugar Pine Reservoir, but if a nest is found prior to project implementation, a 0.5-mile buffer would be subject to a LOP from January 1 to August 31. If there is a nest tree in the inundation area or that poses a hazard to roads or facilities, retain until after young birds have fledged and develop appropriate compensatory mitigation measures.
TW8:	The Project is adjacent to several California spotted owl Protected Activity Centers. Therefore, an LOP from March 1st to August 15th will be maintained for those portions of the project area within 0.25-mile of PAC boundaries unless surveys confirm that California spotted owls are not nesting. Project-related disturbances such as tree removal, radial gate installation, and hazard tree removal would be prohibited during the LOP.
TW9:	Northern goshawks are not known to occur near Sugar Pine Reservoir, but if a nest is found prior to project implementation, an LOP from February 15th to September 15th will be maintained annually prohibiting mechanical

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension

	activities within approximately 0.25-mile of northern goshawk nest sites unless surveys confirm that northern goshawks are not nesting.
TW10:	Implementation of stand thinning, mastication, piling, burning, or road maintenance will not occur in suitable habitat for spotted owls or northern goshawks with unknown occupancy until protocol surveys are completed. If spotted owls or northern goshawks are detected in inundation areas that would be cleared, additional compensatory mitigation may be required.
TW11:	Incidental detections of federally-listed or sensitive aquatic or terrestrial species will be reported to the District Fisheries or Wildlife Biologist prior to or during project implementation for protection in accordance with management direction for the Tahoe National Forest.
TW12:	Retain shrubs, riparian vegetation, and hardwoods, such as oaks, madrone, alder, willow, and cottonwood whenever possible.
TW13:	Do not locate log processing landings or skid trails for timber operations in northern goshawk or spotted owl PACs.
TW14:	A preconstruction survey for bats will be conducted by a qualified biologist before removal of any structures with potential for roosting or breeding. If there is evidence of current use, removal should occur in the fall (between September 15th and November 15th), when bats can escape because young of the year can fly and bats are not yet hibernating. Loss of habitat occupied by sensitive bat species will require short-term compensatory mitigation such as installation of suitable bat boxes. If a biologist determines that bats do not appear to be using the structures or it appears to be used as a night roost only, i.e. not occupied during the day, removal may proceed between April and September.
TW15:	A preconstruction survey would occur prior to initiation of timber removal in the inundation area. If a northwestern pond turtle is found it will be relocated out of the construction area. If a nest is found, exclusionary fencing would be installed around the nest providing a migratory corridor outside the construction area.
TW16:	A preconstruction nesting bird survey would occur prior to construction activities in the inundation area and a 100-foot buffer around these areas, within 14 days prior to commencement of construction if construction occurs during the nesting season (February 1 through August 31). If active nests are found, a no-disturbance buffer around the nest shall be established. The buffer distance shall be established by a qualified biologist in consultation with USFS. The buffer shall be maintained until the fledglings are capable of flight and become independent of the nest, to be determined by a qualified biologist. Once the young are independent of the nest, no further measures are necessary.
Water and Aquatic Resources	
WAR1:	Limited Operating Period. During the wet season (defined as starting with the first frontal rain system that deposits a minimum of 0.25 inches of rain after October 15 and ending April 15), do not perform mechanical operations within 300 feet of suitable habitat for California red-legged frog (e.g., intermittent or perennial streams, ponds, springs, and seeps).
WAR2:	If any California red-legged frogs are found during the pre-activity survey or at any time during the Project, vacate the immediate area and leave the frog alone. No activity will occur in that area until such time as the frog has left the area on its own. Do not handle California red-legged frogs during any activity related to the Project.
WAR3:	If any foothill yellow-legged frogs are sighted during the pre-activity survey or at any time during the Project, cease operations in the sighting area, and inform a Forest Service aquatic biologist or a timber sale administrator of the sighting immediately.
Riparian Conservation Areas	
RCA1:	Establish a Riparian Conservation Area (RCA) for North Shirttail Creek, upstream of the inundated reach, encompassing 300 feet on each side of the creek, measured from bank-full edge.
RCA2:	Limit removal of hazard trees from RCAs. If removal is required, consult with a riparian specialist to develop an approach resulting in the least disturbance to remaining habitat.
RCA3:	Consult with a riparian specialist when selecting the alignment for the relocation of Joshua M. Hardt Trail (and footbridge) within the North Shirttail RCA.
RCA4:	Designated skid trails crossing ephemeral stream channels may be approved for access to otherwise inaccessible areas, but only upon consultation with a riparian specialist.

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension

Water Source Use	
WSU1:	Project area maps developed during the project preparation process will identify stream courses and other sensitive habitats to protect, as well as project boundaries, specified roads, road use restrictions, structural improvements to protect, water sources, and other relevant features.
WSU2:	To prevent pollutants such as fuels, lubricants, and other harmful materials from being discharged into watercourses or into natural channels leading thereto, service and refueling areas shall be located outside of RCAs unless there are no other alternatives. In case of a hazmat spill, the material shall be immediately contained and the Forest Service shall be immediately notified.
WSU3:	All construction equipment (including water-drafting vehicles) shall have petroleum spill kits onboard and operators will know how to effectively deploy them. Absorbent pads will be disposed of according to the Hazardous Response Plan.
WSU4:	To reduce the potential for adverse cumulative watershed effects, implement state certified Best Management Practices as defined in the State Water Pollution Prevention Plan to be implemented for the proposed action.
WSU5:	Native seed will be broadcast across all exposed soils prior to the anticipated first date of fall precipitation.
WSU6:	Armor road approaches as necessary from the end of the approach nearest a stream for a minimum of 50 feet, or to the nearest drainage structure.
WSU7:	Where overflow runoff from water trucks or storage tanks may enter the stream, effective erosion control devices shall be installed.
WSU8:	All construction equipment (including water-drafting vehicles) shall be checked daily and shall be repaired as necessary to prevent leaks of petroleum products from entering RCAs or water.
WSU9:	Survey all proposed drafting locations for sensitive and listed amphibians and receive approval from a biologist prior to use. Use drafting devices with 2-mm or less screening and place hose intake into bucket in the deepest part of the pool. Use a low velocity water pump and do not pump ponds to low levels beyond which they cannot recover quickly (approximately one hour). If a sensitive or listed amphibian is sighted within the project area, cease operations in the sighting area, and inform a Forest Service aquatic biologist of the sighting immediately.
WSU10:	Document each load of water drafted from the Sugar Pine Reservoir in terms of gallons per project per truck per day and provide a written report to the Public Services Officer every two weeks.
WSU11:	Any spill into the water shall be immediately contained and reported to the Forest Service dispatch.
Prescribed Fire Activities (PFA)	
PFA1:	To minimize the spread of fire into riparian vegetation during prescribed fire activities, no direct ignition will occur within riparian buffers, unless otherwise agreed by the District Hydrologist, Botanist, or Aquatic Biologist. Fire may back into the riparian buffer.
PFA2:	Place burn piles a minimum of 100 feet away from perennial and intermittent streams and 25 feet from ephemeral streams. Locate piles outside areas that may receive runoff from roads.
PFA3:	Within CRLF habitat (less than 5,200 feet and within 300 feet of perennial or intermittent streams), prescribed burning would not take place during rain or within 4 days following a rain event depositing more than 0.25 inches. Directional hand pile lighting – all hand piles must be ignited on only one side of the pile, not to exceed half the circumference of the pile, on the side furthest from the nearest aquatic feature.
Invasive Aquatic Wildlife (IAW)	
IAW1:	Develop an invasive aquatic species control and prevention plan as required by CA state regulation 14 CCR 672.1. The regulations require a vulnerability assessment and monitoring program. This plan would be a component of the annual Operating and Maintenance Plan that would be approved by the Forest Service.

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension
Botanical (Sensitive Plants, Fungi and Watch List Species (BOT))
BOT1: Surveys a) If selected for implementation, the Layne's butterweed alternative trail alignment (Alternative 3) will be subject to protocol-level floristic surveys and the results of such surveys will inform the final layout of the proposed trail. b) Protocol-level floristic surveys will be conducted in the following areas prior to implementation: offsite compensatory mitigation wetland creation sites and compensatory mitigation fuels treatment sites.
BOT2: Layne's Butterweed[2] a) Outside the limits of permanent losses (inundation area & proposed Josh Harte trail alignment), completely avoid all Layne's butterweed occurrences during all project activities with a buffer of at least 200 feet. These areas will be flagged in the field and indicated on project maps. b) Employ a biological monitor during Project implementation to assist with minimizing impacts to Layne's butterweed. The biological monitor will be present during initial ground disturbing activities. c) During layout and construction of the Josh Harte trail, consult District Botanist or designed representative to adjust trail alignment and operations to minimize impacts to Layne's butterweed plants. d) Within the inundation area & proposed Josh Harte trail alignment (i.e. occurrences that will be irrevocably lost): i. Collect as much viable seed as possible from Layne's butterweed plants; collection should occur in all growing seasons prior to inundation (at least one required). Bank seed with a conservation seed bank; seed bank to be approved by District Botanist. ii. Collect voucher specimens of Layne's butterweed and submit to a minimum of two herbaria within the California Consortium of Herbarium; herbaria be approved by USFS biology staff. iii. Document occurrence, including at a minimum geospatial extent, photographs, census, phenology and habitat data; submit all documentation to USFS and California Natural Diversity Database (CNDDB)
BOT3: Other Forest Service Sensitive and Watchlist Avoidance a) Known occurrences: There are two occurrences of Sierra bluegrass and four occurrences of Sanborn's onion in the project area. For known occurrences that will not be inundated, occurrences will be flagged in the field and identified on contractor maps. These occurrences will be completely avoided during construction. b) Incidental: Incidental detections of Threatened, Endangered and Sensitive (TES) Plants or Watch List species prior to or during Project implementation will be reported to the District Botanist for development of a recommendation regarding how to conserve (e.g., flag and avoid) a discovered TES/Watch List species in accordance with management direction for the TNF.
BOT4: Van Zuuk's Morning-Glory a) Flag and avoid any occurrences of Van Zuuk's morning-glory outside the limits of permanent impacts. b) Employ a biological monitor during Project implementation to assist with minimizing impacts to Van Zuuk's morning-glory. The biological monitor will be present during initial ground disturbing activities. c) During layout and construction of the Josh Hardt Memorial Trail, adjust alignment and operations to minimize impacts to Van Zuuk's morning-glory plants to the extent feasible. If conflict arise between Layne's butterweed avoidance and Van Zuuk's morning glory avoidance, Layne's butterweed takes precedence. d) Collect viable seed from Van Zuuk's morning-glory plants in the Project area. Collection should occur during as many growing seasons prior to inundation as feasible (at least one is required). Bank seed with a conservation seed bank to be approved by District Botanist. e) Collect voucher specimens of Van Zuuk's morning-glory and submit to a minimum of two herbaria within the California Consortium of Herbarium; herbaria to be approved by USFS biology staff. f) Document occurrence, including at a minimum geospatial extent, photographs, census, phenology and habitat data; submit all documentation to USFS and California Natural Diversity Database (CNDDB)

[2] TNF Management Requirement BOT2: Layne's Butterweed is based on mitigation ratios, rationale, and conditions presented in the June 30,, 2016 draft memorandum titled *Layne's butterweed (Packera layneae) compensatory mitigation measures* by Courtney Rowe, District Botanist, American River Ranger District, USFS. The draft memorandum is included in Attachment L-11 of Appendix L of this DEIR/EIS.

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension	
g)	Van Zuuk's Morning Glory. The USFS district botanist has identified 13 occurrences of Van Zuuk's morning-glory within ½ mile of the Project Area that are at risk from off-route recreational use. USFS shall establish protective measures on up to 6 acres of these occurrences. Measures will include exclusionary fencing or other forms of barricade (e.g., rock placement).
Invasive Species (IS)	
1.	Equipment Cleaning—All equipment and vehicles (Forest Service and contracted) operating off-road must be free of invasive plant material before moving into the project area. Equipment will be considered clean when visual inspection does not reveal soil, seeds, plant material or other such debris. Cleaning shall occur at a vehicle washing station or steam-cleaning facility before the equipment and vehicles enter the project area. Reference standard contract provision B6.35 Equipment
2.	Weed-free construction materials—All gravel, aggregate, fill, mulch, topsoil, erosion control materials and other construction materials are required to be weed-free. When possible, use onsite materials, unless contaminated with invasive species. Otherwise, obtain weed-free materials from sources that have been certified as weed-free.
3.	Project-related disturbance—Minimize the amount of ground and vegetation disturbance. As necessary, reestablish vegetation on disturbed bare ground to reduce invasive species establishment; revegetation is especially important in staging areas.
4.	Revegetation—Seed and plant mixes must be approved the District Botanist. Neither invasive species nor persistent non-natives (e.g., *Agropyron cristatum*, *Dactylis glomerata*, *Lolium* spp.) will be used in revegetation. Seed lots will be tested for weed seed and test results will be provided to District Botanist. Seed and plant material should be collected from as close to the Project area as possible, preferably from within the same watershed or at similar elevation.
5.	Early Detection—Any additional infestations discovered prior to or during project implementation should be flagged and avoided. Report new infestations to District Botanist.
6.	All weed infestations will be "flagged and avoided" during construction according to the species present and project constraints. If they cannot be avoided during construction, they will be treated prior to the commencement of construction.
Air Quality (AQ)	
AQ1:	For all vegetation management activities to be carried out by USFS as mitigation for the proposed project/action, USFS will complete a site and project-specific smoke management plan (SMP) as required by the Placer County Air Pollution Control District (PCAPCD) prior to any proposed prescribed burns. Prescribed burns will be subject to consultation and approval by PCAPCD.
AQ2:	For all vegetation management activities to be carried out by USFS as mitigation for the proposed project/action, abate dust caused by vehicle traffic on unpaved roads by using water or dust palliatives such as lignin sulfonate or magnesium chloride.
Cultural Resources (CR)	
CR1:	Management of Sites: Protect cultural resource sites designated on the ground with flagging and identified on maps provided by the cultural resource specialist. If any new cultural resources are discovered during project implementation, cease operations in the area of new discovery until District Archaeologist is notified and adequate protection measures are agreed upon. Local Native American Tribes shall be notified of any new prehistoric cultural resources discovered during project implementation. No tracked equipment, excepting snowmobiles, shall be operated off of existing NFS Routes within cultural resource site boundaries. Snowmobiles may be operated off of existing NFS Routes within cultural resource site boundaries only when there is at least 12 inches of snow depth or enough snow cover to prevent resource damage. No mechanized piling of vegetation shall be done within site boundaries. Rubber tired equipment may be allowed within specific areas of sites, only with written approval of the Heritage Program Manager (HPM) or Designated Heritage Preservation Specialist (DHPS). Cultural resource sites shall not be used as staging areas or for parking vehicles and equipment.
CR2:	Project administrator and/or DHPS will review all affected sites with contractors prior to the start of activities in the vicinity. Interested Tribes will be notified of planned activities in prehistoric sites prior to start of activities in the vicinity.
CR3:	Management of linear features: Existing breaches may be used to cross linear features. New breaches may be designated by the HPM/DHPS. Trees should be directionally felled parallel to or away from linear features. Isolated trees inside of linear features may be felled on a case-by-case basis and with on-the-ground approval of the HPM/DHPS, only if removal benefits the feature.

Table 2-8. Tahoe National Forest Management Requirements for the Sugar Pine Radial Gates Installation and Water Right Extension

CR4:	Hand Cutting and hand piling within sites: Hand cutting of vegetation less than 10 inches in diameter is permissible within site boundaries. Hand piles may be constructed and burned within site boundaries only in specific areas designated by the HPM/DHPS.
CR5:	Felling and removal of trees greater than 10 inches dbh within sites: Implement on-site removal of trees greater than 10 inches dbh only upon written approval of the HPM/DHPS. All trees greater than 10 inches dbh should be directionally felled and fully suspended during removal from site. Removal of trees greater than 10 inches dbh would follow the guidelines established in the Regional PA 2018, which allow the use of rubber tire equipment, crane self-loaders or helicopters.
CR6:	Prescribed fire within sites: Cultural resource sites shall be protected from adverse effects from prescribed fire. The HPM/DHPS will determine which sites can be burned over. It is preferred that fire control lines stay outside of site perimeters. In cases where there is a large fuels buildup inside of a site, it may be necessary to burn within the site and/or construct fire control lines within the site perimeters. The HPM/DHPS, will provide direction when such burning or fire control lines are necessary.
CR7:	System road work within sites: Maintenance and repairs of NFS Routes may be conducted within site boundaries within the existing road prism. Adjacent or surrounding cultural resource site areas will be flagged for avoidance during road work implementation. Installation of road closures or road obliteration within site boundaries may be conducted only upon written approval of the HPM/DHPS.
CR8:	Non-System Road Work within Sites: Reconstruction or obliteration of non-system routes shall not occur within cultural resource sites without written approval of the HPM/DHPS. Adjacent cultural resource sites will be flagged for avoidance during road work implementation.
CR9:	Additional Survey: Prior to implementation, additional surveys for cultural resources are required for fire lines and areas of proposed ground disturbance (such as landings or staging areas) outside of planned treatment units. Proposed contractor camps outside of previously surveyed areas and treatment areas need to be cleared with the HPM/DHPS prior to use.

CHAPTER 3 ALTERNATIVES TO THE PROPOSED PROJECT/ACTION

3.1 Introduction

This section presents the process by which alternatives to the proposed project/action were developed, considered and carried forward for analysis in this EIR/EIS. It includes descriptions of statutorily mandated alternatives including the No Project Alternative (CEQA) and the No Action Alternative (NEPA). The section includes a description of the initial range of possible alternatives; the screening process used to evaluate these alternatives; the alternatives eliminated from further analysis and the rationale for their elimination; and a description of those alternatives selected to be carried forward in this EIR/EIS for further detailed environmental review.

3.2 No Project Alternative

Under CEQA, the No-Project Alternative must also be analyzed (see CEQA Guidelines § 15126.6(e)). This requirement encourages a Lead Agency to compare the environmental effects of approving a proposed project with the effects of not approving it. Unlike the no action alternative, the No Project Alternative generally assumes that the land area or current environment would remain in its existing state. This is typically prefaced by the continuation of current plans and ongoing operation of existing available infrastructure, and community services. Under the No Project Alternative for this EIR/EIS the following would occur:

- FPUD’s Water Right 15375 would be extended to allow time for the District to put to beneficial use the water supply developed by the existing Sugar Pine Dam and Reservoir;
- Radial gates would not be installed on Sugar Pine Dam; and
- Maximum storage capacity and maximum area of inundation of Sugar Pine Reservoir would remain unchanged from current conditions.

As the No Project Alternative does not include the expansion of storage or area of inundation of Sugar Pine Reservoir, the development of replacement recreational facilities or compensatory mitigation measures would not be needed.

In consideration of the No Project Alternative, § 15126.6(e)(3)(b) of the CEQA Guidelines states in part:

> If disapproval of the project under consideration would result in predictable actions by others, such as the proposal of some other project, this “no project” consequence should be discussed. In certain instances, the no project alternative means “no build” herein the existing environmental setting is maintained. However, where failure to proceed with the project will not result in preservation of existing environmental conditions, the analysis should identify the practical result of the project’s non-approval and not create and analyze a set of artificial assumptions that would be required to preserve the existing physical environment.

Under the No Project Alternative, it is reasonable to assume that the State Water Resources Control Board would approve an extension of time to put to beneficial use the existing water supply developed by Sugar

Pine Dam and Reservoir. Failure to approve the extension would allow FPUD to continue serving existing customers in its service area but would eliminate the water supply identified to serve the economic development (workplaces, housing, and other public amenities) approved by the County of Placer when it adopted the Foresthill Community Plan in reliance on water supplies available from completing FPUD's Sugar Pine Project. With the requested extension, FPUD would serve water to existing and planned future homes, workplaces, schools and other public amenities anticipated by the Community Plan. As analyzed in Placer County's Foresthill Divide Community Plan EIR, the existing Sugar Pine Project's firm water supply yield is 2,150 AF, which is the same yield used for purposes of this DEIR/EIS. Under the No Project Alternative, FPUD would continue to execute the transfer of surplus water, as available, to downstream users for water supply or environmental purposes in keeping with current practice.

3.3 No Action Alternative

The No Action Alternative as defined by NEPA reflects future conditions that are likely to occur without the Proposed Action [40 CFR § 1502.14(d)]. The No Action Alternative should reflect existing management and operational conditions that would cause current activities to continue without significant change: activities that directly or indirectly affect resources that, in turn, could be affected by the Proposed Action. The No Action Alternative also should include future actions that are likely to proceed regardless of implementing the proposed action. In keeping with NEPA requirements, the No Action Alternative, in most cases, serves as a basis of comparison for determining potential effects on the human environment of the proposed action and other project alternatives. Using the no action alternative allows the analysis to contrast the impacts of the proposed action with the current condition and expected future condition if the proposed action were not implemented. In other words, conditions anticipated to occur under the no action alternative serve as the environmental baseline for determining the environmental impact of the Proposed Action (and project alternatives) under NEPA.

For this EIR/EIS, the proposed action is USFS approval of an amendment to FPUD's existing Special Use Permit for the operation of the Sugar Pine Project. The proposed amendment would allow an increase in the Sugar Pine Reservoir maximum area of inundation, tree and brush removal from within the expanded inundation area, replacement of USFS recreational facilities affected by the action, and implementation of compensatory mitigation measures, as a result of the installation of radial gates on Sugar Pine Dam. None of these activities would occur under the No Action Alternative.

In keeping with NEPA requirements, the No Action Alternative for this EIR/EIS encompasses the continuation of existing Sugar Pine Reservoir management and operational conditions. The No Action Alternative also incorporates foreseeable future actions likely to occur in the absence of the project that could affect these conditions. Key among these future actions is the proposed extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers as well as new customers that will be created as a result of future planned growth and development under Placer County's Foresthill Community Plan, which identifies FPUD as the public water supplier to serve the Community Plan area.

To fully define the No Action Alternative and thus help establish the parameters for the NEPA environmental baseline, current reservoir operations, past and ongoing water transfer activities by FPUD, and expected future increases in water demand within the FPUD service area must be described. These conditions are described below.

3.3.1 Reservoir Operations

The operation of Sugar Pine Reservoir is currently subject to the direction and guidance contained in several key documents; these documents are attached as **Appendices A through E** with this DEIR/EIS. **Appendix A**, the 2016 Sugar Pine Reservoir Operations Plan, includes: FPUD's State Water Right Permit 15375 (**Attachment A**), the 1967 Memorandum of Agreement between Reclamation and the California Department of Fish and Game (CDFG) (**Attachment B**), the 1985 Memorandum of Agreement between Reclamation and the TNF (**Attachment C**), the 2000 agreement between FPUD and the USFS (**Attachment D**), and the Key Sugar Pine Reservoir Storage and Elevation Levels for Long-Term Operations (**Attachment E**). **Appendix B** includes the 2003 Special Use Permit issued by the TNF authorizing use and occupancy of NFS lands. **Appendix C** includes the USFS TNF Land and Resource Management Plan section for region 096 Sugar Pine. **Appendix D** includes Public Law 106-566. **Appendix E** includes the California Water Action Plan. The following description of reservoir operations takes into account all applicable laws, agreements, policies and practices used to guide current and historic operation of Sugar Pine Reservoir.

Sugar Pine Reservoir has an existing storage capacity of 6,922 AF. FPUD's water right permit authorizes direct diversion of up to 18 cfs. In addition, FPUD may divert to storage up to 15,400 AFY. The season of diversion for both is November 1 to July 1. Total authorized diversion and use is 24,076 AF annually. Between July 1 and November 1, FPUD relies on rediversion of Sugar Pine Reservoir storage to meet consumptive demands. In recent years, average consumptive demands with FPUD's service area have averaged about 1,200 AFY. As discussed below under "Projected Future Water Demand", maximum water demand at full build-out within the FPUD service area ranges from 3,069 to 3,269 AFY.

FPUD was formed to obtain and deliver the water supply necessary to meet existing and planned development approved by the County of Placer within the District's service area. As build-out under the Community Plan occurs, more reservoir water will be delivered for consumptive use over time, which will generally result in more rapid and frequent drawdowns of Sugar Pine Reservoir relative to historical conditions, particularly during the spring-to-fall dry season when water demand within Foresthill peaks every year. Future drawdowns will also generally be of greater duration as diversions from the reservoir increase over time as a result of ongoing economic growth under the County-approved Foresthill Community Plan.

Currently, FPUD's water right permit requires compliance with the January 26, 1967, Memorandum of Agreement with the CDFG for the Protection and Preservation of Fish and Wildlife and Recreational Resources of North Shirttail Canyon Creek, which includes minimum release requirements and minimum pool requirements as follows:

- 5 cfs or natural inflow from February 1 to May 31, whichever is less;
- 2 cfs or natural inflow from June 1 through January 31, whichever is less; and

- A minimum of 0.5 cfs at all times, regardless of the natural inflow.
- 3,560 AF during the recreation season from May 1 through September 30, subject to District water use; and
- At no time should FPUD maintain a minimum pool less than 1,100 AF of water.

For purposes of defining the No Action Alternative and NEPA environmental baseline for this EIR/EIS, the operational parameters for Sugar Pine Reservoir described above for past and ongoing reservoir operations would continue for the foreseeable future. In addition, FPUD will continue to meet its obligation to provide water to serve new growth and development within the District's service area until demand within the service area meets or exceeds the reservoir's "safe yield."

"Safe yield" for this EIR/EIS is a term used to define the amount of water that could be diverted from Sugar Pine Reservoir during a "critical dry period" without violating existing minimum pool requirements, minimum flow requirements in lower Shirttail Creek, and reservoir release requirements to protect any prior rights downstream of the dam. In 2008, M&I use within the FPUD service area was recorded as 1,250 AF. In that same year, the County of Placer adopted the Foresthill Divide Community Plan (Community Plan) to guide future growth and development in the region encompassing the District's service area and sphere of influence. The County completed an EIR for the Community Plan, which analyzed whether water supplies from the District would be adequate to continue meeting demand from existing customers plus new demand arising from the economic activity and growth authorized by the Community Plan. The County EIR's utilities/water supply chapter analyzed actual historic hydrology from 1957 through 2003, identified 1975-1978 as the critical dry period (Critical Period), and projected that, in the last year of the Critical Period, the existing reservoir would yield approximately 2,150 AFY. This was determined to be the reservoir's "safe yield" without radial gates in place at Sugar Pine Dam. Under the No Action Alternative for this EIR/EIS, the approval of future water connections for new users within the FPUD would be limited to only those that could be accommodated within the projected safe yield of the Sugar Pine Project,

The reader should note that, in addition to water deliveries within the FPUD service area, the TNF may take up to 50 AF per year from the reservoir for water-based public recreation uses, including dust abatement on roads, and for fire control, and may use the existing power and water system located at the Dam.

Under the No Action Alternative, no modifications to existing reservoir boat ramps or any other recreational facilities would occur aside from normal maintenance and repair. The reservoir has two boat ramps: An upper boat ramp that operates at water level elevations down to 3,590 feet (3,159 AF of water storage), and a lower boat ramp that operates at water level elevations down to 3,565 feet (1,106 AF of water storage).

3.3.1.1 Water Transfers

In accordance with the California Water Code and guidance from the 2014 California Water Action Plan and subsequent updates, FPUD began participating in water transfers using surplus stored water in 2015.

Prior to full build-out of the Foresthill Community Plan, surplus stored water in Sugar Pine Reservoir could be transferred to downstream users, in keeping with past practices. To accommodate these transfers, surplus water would be released from Sugar Pine Reservoir to Shirttail Creek for storage in, or delivery through, Folsom Reservoir. That water would be diverted from Folsom for local use or released to the American River for delivery downstream to help meet consumptive use needs and/or to help satisfy ecological water needs.

When transfers occur, the resulting operation may draw the reservoir down to the minimum recreation pool during the peak recreation season (May to September). Releases in support of transfers will likely occur in the late spring and be completed by June 1 or may be delivered gradually over the summer months, depending upon the purpose of the transfer. However, it is also possible that some future transfers may be carried out during late summer and fall months, again, depending upon the purpose of the transfer. In all cases, it is anticipated that the storage space created by a transfer would be refilled during the following winter and spring runoff period, reducing reservoir spills and instream flows compared to the current operation. Releases to meet the current minimum flow requirements would not change.

Transfer volumes are limited by anticipated District water demand, the minimum pool requirements specified in the 1985 Agreement and 1967 MOA, and fishery flow releases specified by the MOA. Operational considerations for potential transfers under various conditions are described below:

Transfer Operations in "Spill" Years

Sugar Pine Reservoir fills and spills in most years. Under those circumstances, FPUD anticipates it will transition from the spill event to the transfer water release rates. Transfer water release rates will remain within the range of historic release/spill rates from the reservoir. The purpose is to provide a smooth transition from uncontrolled spill to a controlled release. In years when Folsom Reservoir is also spilling, the transfer release will need to be delayed until Reclamation regains control of Folsom releases, so that Sugar Pine Reservoir transfer water is not spilled at Folsom. Once most of the transfer water is released from the Sugar Pine Reservoir, the remainder of the transfer water will be released over a three- to four-day period to ramp down to the minimum fishery flow release specified by the MOA. The ramp down from the transfer release rate should be no more than half the release rate from the previous day or 10 cfs, whichever is lesser. For example, if a transfer release rate is 60 cfs, the release rate for the first day of the ramp down must be at least 30 cfs, followed by 15 cfs, followed by 5 cfs.

Transfer Operations in "Non-Spill" Years

In a year when Sugar Pine Reservoir does not spill, FPUD will use the transfer water to ramp up from the minimum flow requirement to the calculated transfer flow rate, then ramp down to the minimum flow requirement to provide a smooth transition from minimum flow to transfer rates and back down again. Ramping rates up to the transfer rate will be the maximum of 10 cfs per day or double the previous day release rate, whichever is lesser. Ramping rates down to the minimum flow requirement will be no more than half the release rate from the previous day or 10 cfs, whichever is lesser.

Refill Operations

After a transfer, FPUD will seek to refill Sugar Pine Reservoir as soon as possible, while making fishery flow releases specified in the MOA and meeting customer demand with FPUD's service area. As the reservoir fills, FPUD will monitor Folsom Reservoir operations to identify whether Folsom Reservoir meets the conditions specified in the transfer's refill agreement. If the conditions are met, FPUD may return to normal Sugar Pine Reservoir operations. If the conditions are not met, FPUD will need to release to Folsom Reservoir an amount of Sugar Pine Reservoir water equal to the Folsom Storage Deficiency caused by the transfer. In the water transfers FPUD has completed to date, the District has been able to refill Sugar Pine Reservoir during the winter wet season immediately following the transfer. That includes refilling the reservoir in 2016 during the most recent drought.

Other operational considerations

FPUD must consider potential growth within the service area as it develops plans for the future. The following list includes operational considerations that would be evaluated in determining annual operations.

- Hydrology
- Local consumptive demand
- Current storage capacity (existing facility)
- Increased storage capacity (installation of radial gates)
- Potential Water transfer opportunities
- Maximizing reservoir recreation opportunities whenever possible

These considerations will demand flexibility in Sugar Pine Reservoir operations to best serve the interests and needs of FPUD as well as conservation of USFS resources, including recreation opportunities. As the local demand increases, the opportunity for water transfers will decrease because of reduced water supply availability. The water supply impacts analysis in Placer County's Foresthill Community Plan EIR indicates that the March 1975 – March 1978 is the critical dry period for the project (meaning that is the period of least precipitation and resulting reservoir inflow for Sugar Pine Reservoir). If a repeat of this hydrology occurred when the local consumptive demands reach the projected build out, transfer opportunities will be limited. Until the consumptive demand reaches full build out, there will be opportunities to transfer stored Sugar Pine Reservoir water both with and without radial gates installed, although the volume available for transfer will diminish with time as consumptive demand increases. The draw down schedule for any particular year will be dependent upon the combination of operational considerations in the bulleted list above.

3.3.2 Future Demand within the FPUD Service Area

The EIR certified for the Foresthill Divide Community Plan (Placer County 2008) analyzed growth-related impacts arising from the development authorized by the Community Plan. The County's EIR identified

FPUD’s Sugar Pine Project as the principal source of water supply available to serve the Community Plan area. The EIR projected that existing development and new development of planned future land uses in the District's existing service area would demand up to approximately 3,069-3,269 AFY of water to serve a projected population of approximately 13,750. The EIR concluded that additional demand from development of a then-pending 2,200-unit senior housing and mixed-use project proposal would cause cumulative demand for District water to exceed the Sugar Pine Project's safe yield, unless water storage capacity were increased as mitigation.

3.4 Development of Additional Alternatives

During the preparation of an EIR/EIS, various potential alternatives to the proposed project were considered that would meet the basic project objectives and purpose and need for the proposed action, including alternative locations. This range of possible alternatives must then be reduced to a reasonable range of potentially feasible alternatives that can be carried forward for more detailed analysis in the environmental document. Typically, this winnowing of potential alternatives is best accomplished through the implementation of a screening process. Such processes are important in that they provide a balanced and unbiased means of reducing the initial number of identified alternatives to a reasonable range. Ideally, the various screening criteria are developed independent of the alternatives as well as prior to the alternatives identification process, in order to maintain an unbiased evaluation.

3.4.1 Screening Criteria

Various screening criteria were identified and developed for the initial listing of potential alternatives. These criteria are presented in **Table 3-1**.

Table 3-1. Identification and Description of Screening Criteria

Criterion	Description
A. Technical and Engineering Feasibility	An alternative must be technically and physically feasible. An alternative must be based on existing and accepted state-of-the-art engineering concepts and cannot be based on experimental technologies. Also, an alternative must not be dependent upon either the availability or acquisition of site locations that cannot be reasonably assured.
B. Raw Water Quality	An alternative must provide a water supply or, have the capability of providing a water supply that protects water quality and meets or exceeds State and federal water quality standards or other applicable water quality standards associated with its use.
C. Environmental Fatal Flaw	An alternative cannot have environmental impacts that are so significant as to negate the positive attributes of the alternative or, simply transfer potential environmental impacts from one location to another.
D. Economic – Capital and O&M	An alternative cannot be economically impractical or infeasible. An alternative should be economically attractive such that the total direct costs to the customers and purveyors are minimized and do not significantly exceed the costs of alternatives with similar benefits. Similarly, an alternative cannot result in excessive operation and maintenance costs.
E. Long-term Reliability	An alternative must be capable of supplying raw water reliably year round and on a long-term basis that accounts for reasonably foreseeable changes in conditions, like climate change.

Table 3-1. Identification and Description of Screening Criteria

Criterion	Description
F. Public Health and Safety	An alternative should be able to meet all existing and anticipated future State and federal health and safety requirements.
G. Timing	An alternative must be capable of being implemented within a reasonable timeframe such that the benefits and needs of the proposed project are not unduly delayed.
H. Institutional	An alternative cannot possess significant uncertainty that all permits, licenses, or other logistical requirements can be reasonably obtained.

In identifying viable alternatives to the proposed project/action, consideration was also given to the ability of the alternatives to fulfill the purpose and need of the proposed action, from a NEPA standpoint and the basic project objectives from a CEQA standpoint. The purpose and need for the proposed action is described in Section 1.4 above. The project objectives are described in Section 1.5, and include the following:

- Ensure that water supply needs for current and future municipal, industrial and agricultural users within the FPUD service area are met in an environmentally and economically sustainable manner;
- Replace any and all TNF recreational facilities that are directly affected by the proposed expansion of Sugar Pine Reservoir with facilities as determined by TNF;
- Continue to operate Sugar Pine Reservoir to maximize recreational use at the reservoir to the extent possible given the primary use of the reservoir for water supply;
- Continue to provide surplus water to downstream users in the form of periodic water transfers for municipal, industrial, agricultural or environmental use;
- Allow for the possible execution of a long-term service contract for the transfer of surplus water for downstream use;
- Expand water storage capacity at Sugar Pine Reservoir to help mitigate potential decline in project yield due to climate change and regulatory changes requiring bypass flows in accordance with the SWRCB's Bay-Delta Water Quality Control Plan and to supplement the overall water supply reliability and ecosystem health for the state of California in keeping with the Statewide Water Action Plan;[3] and
- Implement compensatory mitigation measures to reduce or negate the potential adverse effect of proposed project activities on recreational, biological, cultural, and visual resources.

3.4.2 Alternatives Eliminated from Further Consideration

In preparing this DEIR/EIS various potential alternatives to the proposed project/action were considered but rejected from further considerations because they did not meet the basic CEQA and NEPA criteria defining what constitutes a viable alternative. As defined under the state CEQA Guidelines (CEQA

[3] http://resources.ca.gov/california_water_action_plan/

§15126.6 et seq.) those criteria include whether the alternative has the potential to meet most project objectives; is technically, legally and economically feasible; and has the ability to avoid or substantially lessen significant environmental effects. Under NEPA (40 CFR 1502.14), a reasonable alternative must meet the purpose and need; address an issue (i.e., serve to reduce the significant environmental effect of the proposed action); and is practical or feasible from the technical and economic standpoint and using common sense, rather than simply desirable from the standpoint of the applicant.

The following alternatives were evaluated for their potential to meet CEQA and NEPA alternatives screening criteria and were ultimately eliminated from further consideration:

3.4.2.1 Alternate Location for the Proposed Project/Action

Installation of radial gates at Sugar Pine Dam and expansion of reservoir storage would literally complete the Sugar Pine Project as originally designed and would involve minor modifications to existing facilities at the dam, expansion of the existing reservoir inundation area, and replacement of existing facilities. Two of the key objectives of the proposed project/action are to expand water storage capacity at Sugar Pine Reservoir to meet future water demand from implementation of the Foresthill Community Plan approved by Placer County while using temporary surplus water (prior to Community Plan buildout) to reduce water shortages suffered by other public water suppliers (e.g., during droughts) and/or to enhance ecosystem health for the state of California in keeping with the Statewide Water Action Plan. An alternative that would create additional surface water storage at an alternate location for use by FPUD was considered but rejected from further consideration for the following reasons:

- The development of new storage facilities could reasonably be expected to result in far greater impacts on undisturbed habitat than would occur through the comparatively minor modification of existing facilities that would occur under the proposed project/action;
- Alternate sites for development of approximately 4,000 acre-feet of water storage capacity with commensurate unappropriated water that could be lawfully obtained, stored, treated and delivered by gravity (downhill, instead of pumped uphill at tremendous cost and attendant reliability risks) to meet water demand growth under Placer County’s Foresthill Community Plan do not appear to be available; and
- The modification of alternate existing facilities, Big Reservoir for example, to meet the water supply objectives of the proposed project/action, would not be consistent with the original design of those facilities and, therefore, the feasibility of such actions is questionable.

3.4.2.2 Cable Harvest for Timber and Vegetation Removal

The use of cable harvest techniques for the transport of timber and vegetation to wood sorting and utilization yards as described in Section 2.2.4 above, was considered as an option to proposed mechanical harvest methods. This alternative was rejected from further consideration because there is no clear environmental advantage to employing this methodology and because the topography of project area likely would not afford the “lift” necessary to effectively transport timber and vegetation to sorting yards via cable.

3.4.2.3 Reduced Reservoir Size

A reduction in the proposed size of Sugar Pine Reservoir was considered as a potential alternative to the proposed project/action but was rejected from consideration. As discussed in Section 1.2: Project Background, above, in 2008 the County of Placer adopted the Foresthill Divide Community Plan (Community Plan) to guide future growth and development in the region encompassing the District's service area and sphere of influence. The Community Plan EIR analyzed actual historic hydrology from 1957 through 2003, identified 1975-1978 as the critical dry period (Critical Period), and projected that in the last year of the Critical Period the existing reservoir would yield 2,150 AFY as is and 3,450 AFY with the radial gates (i.e., the Project's safe yield with and without the gates). The safe yield reflects a minimum pool requirement ranging from 1,100-3,560 AF, a downstream fishery flow release schedule ranging from natural reservoir inflow to 5 cubic feet per second (cfs), and a requirement to release flows for any downstream prior rights. The water supply impacts analysis in the EIR certified for the Foresthill Community Plan considered existing conditions, anticipated climate change and droughts, and concluded that installation of the radial gates and the associated increase in water storage would be necessary to avoid significant water supply impacts at full build-out under the Foresthill Community Plan.

The EIR certified for the Foresthill Community Plan identified the District's Sugar Pine Project as the principal source of water supply available to serve the Community Plan area. The EIR projected that existing development and new development of planned future land uses in the District's existing service area would demand up to approximately 3,069-3,269 AF per year (AFY) of water to serve a population of approximately 13,750. The EIR concluded that additional demand from development of a then-pending 2,200-unit senior housing and mixed-use project proposal would cause cumulative demand for District water to exceed the Sugar Pine Project's safe yield, unless the radial gates or other storage augmentation were installed as mitigation. The Community Plan was approved by the County in 2008.

In the absence of other feasible storage augmentation options to serve the Foresthill Community Plan Area, an alternative to the proposed project that would reduce the size of the reservoir with gates in place was rejected from further consideration.

3.4.3 Alternatives Carried Forward for Detailed Analysis

Upon completion of the alternative screening process described above, two alternatives to the proposed project/action were developed and carried forward for analysis in this EIR/EIS, in addition to the no-project and no-action alternatives. These include the Alternative 1 (Layne's Butterweed Trail Realignment) and Alternative 2 (Helicopter Harvest). Alternatives 1 and 2 are described below.

Alternative 1 - Layne's Butterweed Trail Realignment

All elements of the proposed project/action described above would be implemented under Alternative 1 with the following exception. Under Alternative 1, the proposed alignment for the reconstruction of the JHMT described in Section 2.2.5 above, would be modified. This modification would affect the portion of the proposed realignment between Forbes and upper Shirttail creeks. Under Alternative 1, the trail would not run adjacent to Forbes Creek and expanded inundation area for Sugar Pine Reservoir as proposed. The trail would instead extend up the hill immediately east of the bridge at Forbes Creek with the placement of a series of switchbacks as shown in **Figure 3-1 Layne's Butterweed Trail Realignment** below. Beyond these switchbacks, the trail will run along the hillside, gradually descending to join the proposed action alignment at the location shown in the figure.

The alternative alignment for the trail for Alternative 1 was developed in order to avoid direct disturbance to a population of Layne's Butterweed (a federally listed threatened species) located adjacent to the east shore of Forbes Creek. Under Alternative 1, the trail would extend away from the reservoir shoreline and would not be paved. This is inconsistent with nature and use of the existing section of JHMT at this location which affords trail access to persons with disabilities and provided foreground views of the reservoir.

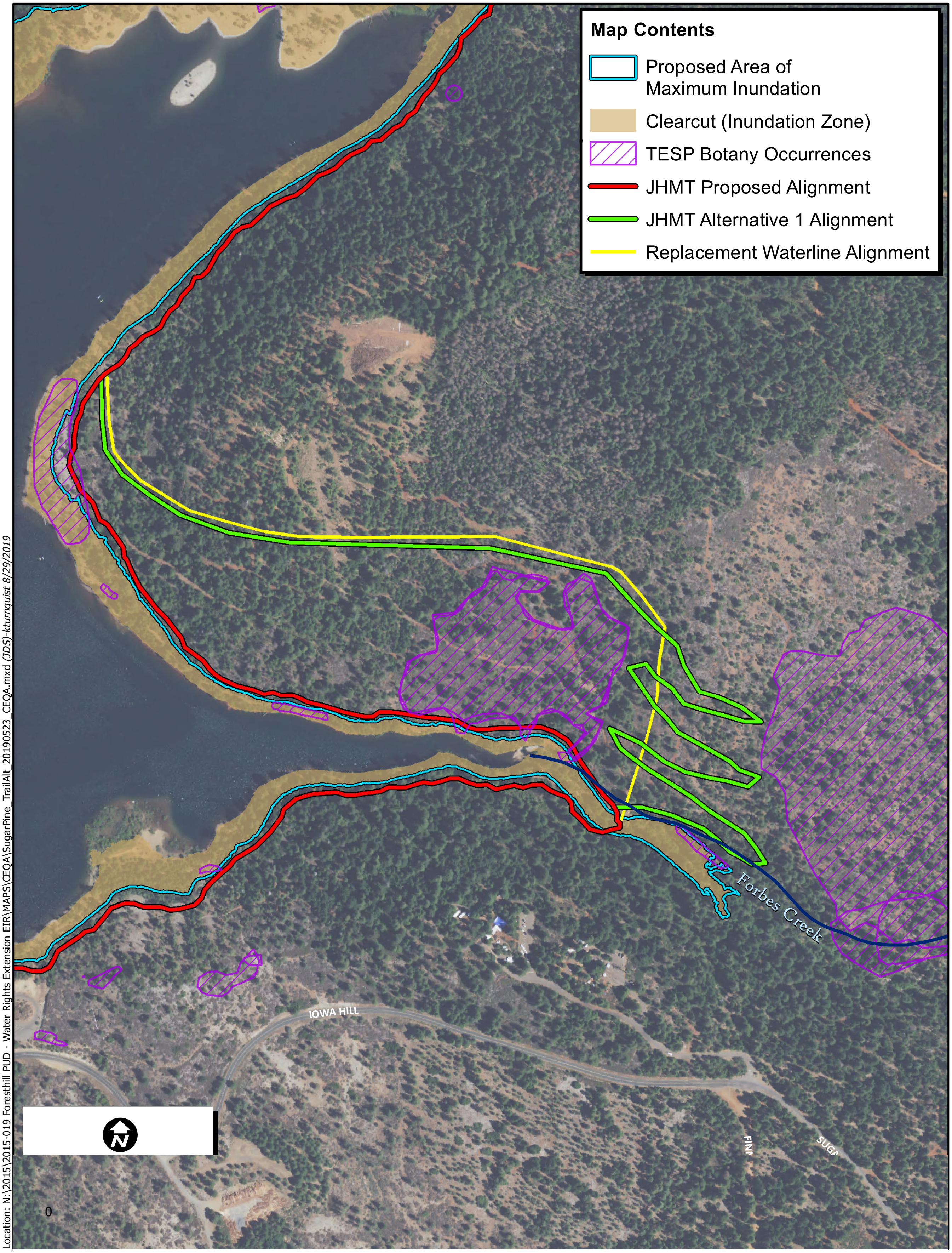
As with the proposed project/action, implementation of Alternative 1 would necessitate the replacement of FPUD's existing potable waterline that runs roughly parallel and adjacent to the JHMT. Under the proposed project/action, the new waterline would be installed parallel and adjacent to the reconstructed JHMT. Under Alternative 1, however, this approach would be impractical due to the numerous trail switchbacks associated with the alternative trail alignment. Under Alternative 1, the waterline would be constructed along the general alignment of the trail but will take a more direct path. The approximate alignment of the proposed waterline replacement under Alternative 1 is shown in Figure 3-1.

Alternative 2 - Helicopter Harvest

All elements of the proposed project/action described above would be implemented under Alternative 2 with the following exception. Under this alternative to the proposed action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine of the 44 acres to be cleared under the proposed action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. Under Alternative 2, the remaining 35 acres with slopes less than 35 percent, would be harvested mechanically.

As part of the first of three phases of timber harvest operations at Sugar Pine, trees and vegetation on slopes greater than 35 percent along the north shore would be cut exclusively by hand (i.e. felled with a chainsaw) and "choker setters" and ground workers would set up bundles (or "doodles") of harvested materials. Doodles along the north shore would be lifted and carried to the landing at Giant Gap campground for processing, loading, and transport. Helicopter harvest during Phase 1 is expected to take up to two days to complete clearance of the steep areas north of the reservoir.

With the establishment of a landing near the Sugar Pine Boat Ramp in Phase 3 of proposed timber harvest operations, a helicopter would again be used to transport bundled trees and vegetation removed from areas exceeding 35 percent, this time along the reservoir's south shore. Timber harvest and vegetation removal would occur in a manner similar to that proposed for Phase 1. Timber and vegetation removed and bundled would be lifted by helicopter and transported to the landing at the boat ramp. Helicopter harvest during Phase 3 is expected to take two days to complete.



Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\CEQA\SugarPine_TrailAlt_20190523_CEQA.mxd (JDS)-kturnquist 8/29/2019

Map Date: 8/29/2019
Sources: NAIP (2018), USFS

Figure 3-1 Josh Hardt Memorial Trail Proposed and Alternative Alignments
2015-019 FPUD Sugar Pine Reservoir

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CHAPTER 4 AFFECTED ENVIRONMENT AND ENVIRONMENTAL EFFECTS

4.1 Introduction to the Environmental Analysis

This section describes the environmental resources directly or indirectly affected by the proposed project and the extent and significance of those effects. This section also considers the comparative impacts of project alternatives relative to the proposed project.

The environmental analysis contained in this section assess the following issue areas:

- 4.2 Aesthetics and Visual Resources
- 4.3 Air Quality and Climate Changes
- 4.4 Biological Resources
- 4.5 Cultural Resources
- 4.6 Geology, Soils and Paleontological Resources
- 4.7 Hazards and Hazardous Materials
- 4.8 Hydrology and Water Quality
- 4.9 Land Use
- 4.10 Noise
- 4.11 Recreation
- 4.12 Traffic and Transportation

Within each issue area in this section, the discussion of project impacts is provided in the following format:

- Environmental setting/affected environment;
- Applicable regulations, plans, and standards;
- Methodology and assumptions;
- Environmental effects of the proposed project/action relative to the No Project and No Action Alternatives;
- Environmental effects of Alternatives to the Proposed Action;
- Mitigation Measures for environmental effects found to be significant;
- Cumulative effects of the proposed project/action; and
- Residual Impacts after mitigation.

4.1.1 CEQA and NEPA Methods for the Environmental Analysis

4.1.1.1 Environmental Baseline under CEQA

Pursuant to CEQA Guidelines (Section 15125(a)), the environmental setting used to determine the impacts associated with the proposed project and alternatives normally is based on the environmental conditions that existed in the project area at the time the Notice of Preparation was published. However, CEQA Guidelines Section 15125(a) also says that where existing conditions change or fluctuate over time, a lead agency may define existing conditions by referencing historic conditions, conditions expected when a project becomes operational, or projected future conditions beyond the date of initial project operations, if doing so would meet CEQA's objective of giving the public and decisionmakers the most accurate and understandable picture practically possible of the project's likely near-term and long-term impacts. For purposes of this EIR/EIS, conditions arising from use of the existing reservoir's storage capacity to meet increasing demand from build-out of the Foresthill Community Plan that existed at the time of NOP publication (June 26, 2015) (i.e., the No Project Alternative) constitute the CEQA environmental baseline and will be used to determine potential project impacts under CEQA. For purposes of this EIR/EIS, the impact on resources that will be directly affected by the proposed installation of radial gates, timber removal activities, recreation facilities replacement, and implementation of compensatory mitigation measures will be based on the change to these resources that will occur after implementation of the Proposed Action relative to conditions that existed at the time of NOP publication.

The CEQA environmental baseline as it pertains to hydrology and reservoir operations is defined by current reservoir operational practices as discussed above (see "Reservoir Operation") and the historical hydrologic record. Under the CEQA environmental baseline, FPUD deliveries from Sugar Pine Reservoir would be limited to FPUD service area demand that existed at the time of NOP publication, i.e., approximately 1,250 AFY. The CEQA baseline includes the execution of water transfers by FPUD to downstream users when reservoir storage conditions are such that transfers can be performed within the parameters described above under the heading "Water Transfers."

4.1.1.2 Environmental Baseline under NEPA

The No Action Alternative as defined by NEPA reflects future conditions that are likely to occur without the Proposed Action [40 CFR § 1502.14(d)]. The No Action Alternative should reflect existing management and operational conditions that would cause current activities to continue without significant change: activities that directly or indirectly affect resources that, in turn, could be affected by the Proposed Action. The No Action Alternative also should include future actions that are likely to proceed regardless of implementing the Proposed Action. In keeping with NEPA requirements, the No Action Alternative, in most cases, serves as a basis of comparison, or baseline, for determining potential effects on the human environment of the proposed action and other project alternatives. Using the no-action alternative allows the analysis to contrast the impacts of the proposed action with the current condition and expected future condition if the proposed action were not implemented. In other words, conditions anticipated to occur under the No Action Alternative serve as the environmental baseline for determining the environmental impact of the Proposed Action (and project alternatives) under NEPA.

For this EIR/EIS, the Proposed Action is USFS approval of an amendment to FPUD's existing Special Use Permit for the operation of the Sugar Pine Project. The proposed amendment would allow the installation of radial gates on Sugar Pine Dam, an increase in the Sugar Pine Reservoir maximum area of inundation, tree and brush removal from within the expanded inundation area, replacement of USFS recreational facilities affected by the action, and implementation of compensatory mitigation measures. In keeping with NEPA requirements, the No Action Alternative for this EIR/EIS encompasses the continuation of existing Sugar Pine Reservoir management and operational conditions. The No Action Alternative also incorporates foreseeable future actions likely to occur in the absence of the project that could affect these conditions. Key among these future actions is the proposed extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers as well as new customers that will be created as a result of future planned growth and development within the District's service area under the Foresthill Community Plan approved by Placer County.

In keeping with 40 CFR § 1502.14(d) referenced above, the parameters for the NEPA environmental baseline are reflected in environmental conditions anticipated to occur as a result of implementation of the No Action Alternative. Conditions relating to operation of Sugar Pine Reservoir, past and ongoing water transfer activities in both "spill" and "non-spill" years, and future planned increases in water demand within the FPUD service area are of primary importance in fully defining the NEPA environmental baseline. These conditions described in the description of the No Action Alternative presented above.

4.1.1.3 Impacts and Mitigation Measures

This DEIR/EIS analyzes the potential direct, indirect, and cumulative environmental impacts of the proposed project/action and alternatives. The determination of whether an impact is considered significant is based on specific significance criteria. Under CEQA, these criteria (sometimes called thresholds of significance) are used to make a determination of significance for each environmental impact evaluated. An adverse impact that exceeds or crosses the significance criteria is considered significant, and an impact that does not exceed or cross the criteria is considered less than significant. The CEQA significance criteria used in this DEIR/EIS are based on CEQA's mandatory findings of significance (as summarized in State CEQA Guidelines Section 15065); the checklist presented in Appendix G of the State CEQA Guidelines (Guidelines) in effect when the Draft EIS/EIR was prepared; and where appropriate, factual or scientific data and regulatory standards of federal, state, and local agencies. While the significance criteria used in this EIR/EIS are primarily defined in accordance with CEQA guidance, they also encompass the factors taken into account under NEPA to evaluate the context and the intensity of the effects of an action.

For CEQA purposes, impacts in this DEIR/EIS are classified as:

- No impact;
- Less than significant;
- Less than significant with mitigation incorporated; or
- Significant and unavoidable.

CEQA requires that a diligent effort be taken to identify mitigation measures that would reduce identified significant impacts to less than significant.

Both NEPA and CEQA require the analysis of potential impacts of a proposed project and/or action and alternatives. While CEQA requires a determination of significance for each effect discussed in an EIR based on defined significance criteria, NEPA does not necessarily require this for an EIS. Under NEPA, preparation of an EIS is triggered if a federal action has the potential to "significantly affect the quality of the human environment." All impact analyses in documents prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the Proposed Action and any alternatives that are evaluated. Under NEPA, impacts should be addressed in proportion to their significance (40 CFR 1502.2(b)), meaning that severe impacts should be described in more detail than less consequential impacts. This is intended to help decision makers and the public focus on the project's key effects. The evaluation of effects considers the magnitude, duration, and significance of the changes. For the analysis of each resource topic considered in this EIR/EIS analytical indicators are identified to assist in the characterization and evaluation of environmental effects under NEPA. Environmental effects that will improve the existing condition are noted, and detrimental impacts are characterized as adverse. For this EIS/EIR, effects described in the context of NEPA are identified as "no effect," "adverse," or "beneficial."

For the NEPA analysis, environmental effects will be described as adverse when there are detrimental or negative effects. Effects will be described as beneficial when there are positive effects. When there would be no change, a "no effect" conclusion is used. For some NEPA effects conclusions, "minorly" is used to characterize adverse and beneficial effects (i.e., minorly adverse or minorly beneficial), in an effort to further distinguish the effects of the action alternatives. RPMs may be identified to reduce adverse effects. Where the RPMs are not considered by the Forest Service to be adequate under NEPA to reduce adverse effects, additional mitigation measures may be provided.

Effects include "ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative." Direct effects are caused by the action and occur at the same time and place. Indirect effects are caused by the action and occur later in time or are farther removed in distance, but are still reasonably foreseeable (i.e., likely to occur within the duration of the project). Cumulative effects are the result of the incremental direct and indirect effects of any action when added to other past, present, and reasonably foreseeable future actions, and can result from individually minor but collectively major actions taking place over a period of time. Effects must be evaluated for the Proposed Action, the no action alternative, other reasonable courses of action (e.g., other alternatives), and connected actions, which means actions that are closely related to the proposed action and alternatives and therefore should be discussed in the same impact analysis (40 CFR 1508.25).

For both NEPA and CEQA, a determination of "no effect" can be made if the alternative results in no effect for the particular resource or topic being considered. A determination of no effect would be most common for the No Action or No Project alternatives, which typically results in a continuation of the existing physical environmental conditions as described in the Environmental Setting.

Under NEPA, all relevant, reasonable mitigation measures that could improve the project by reducing environmental effects are identified, even if they are outside the jurisdiction of the lead agency or the cooperating agencies. Under NEPA (40 CFR 1508.20), mitigation includes:

a) Avoiding the impact altogether by not taking a certain action or parts of an action.

b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.

c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.

d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.

e) Compensating for the impact by replacing or providing substitute resources or environments.

However, to ensure that environmental effects of a proposed action are fairly assessed, the probability of the mitigation measures being implemented and the effectiveness of those measures must also be discussed.

The impact analysis in this DEIR/EIS assumes implementation of all "compensatory mitigation measures" described in Section 2.2.5 (Project Design Features and Compensatory Mitigation) to occur as part of proposed project/action. In addition, the impact analysis assumes that all Management Requirements (see Section 2.2.6: Management Requirements) will be implemented as part of the proposed project/action. Where impacts are identified that are significant even with the implementation of compensatory mitigation measures and MRs, additional mitigation measures are provided where feasible.

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4.2 Aesthetics and Visual Resources

This section assesses the potential effects on visual and scenic resources that could occur from radial gate installation at Sugar Pine Dam, expansion of the storage capacity and area of inundation of Sugar Pine Reservoir, brush and tree removal from the expanded area of inundation, recreational facilities replacement, and implementation of compensatory mitigation measures associated with the proposed project/action. Section 4.2.1 provides a description of the existing visual setting. Regulations, plans, and standards that apply to the protection of visual resources within the project area are provided in Section 4.2.2, Section 4.2.3 assesses the impact of project/action on visual resources relative to the No Action and No Project alternatives and Alternatives 1 and 2. Photographs taken from key observation points (KOPs) around the reservoir and visual simulations of project effects from selected KOPs are compiled in Section 4.2.4.

4.2.1 Environmental Setting/Affected Environment

4.2.1.1 Introduction

The area of study for evaluating the potential impact of the project construction and operation is contained entirely within the Sugar Pine Management Area (Management Area 096) of the Tahoe National Forest Land and Resource Management Plan (TNF LRMP) (see *Figure 2-3*). The management area includes approximately 1,311 acres, all of which are TNF lands. The area contains Sugar Pine Reservoir, Sugar Pine Dam, USFS campgrounds, Manzanita Day Use Area (MDUA), the Joshua Hardt Memorial Trail (JHMT), other multiuse trails and the boat ramp. Sugar Pine Road provides the principal access to the reservoir and affords wide ranging views of the reservoir and surrounding lands. Segments of Finning Mill and Iowa Hill county roads are located in the Management Area 096, but views of the reservoir and lands and facilities around the reservoir from these roadways are limited or fully obscured.

As a water development facility, Sugar Pine Reservoir is large enough for recreational boating and fishing. The reservoir has a varied shoreline configuration, interesting geologic features, and, when reservoir levels are high, an island. Cultural features that can be viewed by reservoir visitors include the dam and spillway, Sugar Pine Road, the Sugar Pine boat ramp and day-use parking facilities, the JHMT and facilities and access roads associated with Giant Gap Campground (GGCG), Shirttail Creek Campground (SCCG), Forbes Creek Group Campground and MDUA.

Recreational features at Sugar Pine Reservoir have historically been popular resulting in high use during the recreation season. It is reasonable to assume that visitors traveling to the Sugar Pine Recreation Area expect levels of scenic quality commensurate with the surrounding area, including other water supply reservoirs that are natural-looking in appearance with continuously forested landscapes. These attributes serve to enhance the recreation experience when viewed from developed recreation sites. The reservoir site lacks wilderness characteristics, since it is an artificial water supply development facility with man-made recreation facilities, such as paved parking lots and a boat ramp.

4.2.1.2 Approach to Defining Affected Visual Resources

In order to define and describe the visual/scenic resources that could be affected by the proposed project/action, it is important to understand how those resources are characterized and how values are ascribed to those resources in key planning and management documents pertaining to those resources. The TNF LRMP[1] is the primary resources planning and management document for the proposed project/action study area and provides guidance in assessing the value of scenic resources in the area affected and the potential for impact.

The visual impact analysis incorporates procedures from the Forest Service Visual Management System (VMS). The VMS establishes visual quality objectives (VQO). VQO are applied to all lands within the TNF in order to establish guidelines for forest management objectives over time.

The TNF LRMP directs managers to maintain VQO level specified in each management area, at a minimum, but maintain higher visual quality wherever practical and compatible with other goals. The LRMP also contains specific management area direction for visual resources. Each management area is assigned a VQO or a range of VQOs to guide decisions and resource management activities. VQOs are expressed in terms of the amounts of visual disturbance (i.e., changes in form, line, color, texture, pattern, size or scale) to a valued characteristic landscape that are considered acceptable under the TNF LRMP. Those levels of disturbance are referred to as Visual Quality Levels (VQLs) and include: preservation; retention; partial retention; modification; and maximum modification. These terms are defined below:

> **(P) PRESERVATION** — Allows only for ecological changes. Management activities are prohibited except for very low visual impact recreation facilities. This objective applies to Congressionally-designated wilderness areas.
>
> **(R) RETENTION** — Provides for project-related activities which are not visually evident. Such activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident.
>
> **(PR) PARTIAL RETENTION** — Provides for project-related activities that remain visually subordinate to the characteristic landscape. These activities may repeat form, line, color and texture common to the characteristic landscape, but any related changes in their qualities of size, amount, intensity, direction, pattern, etc. should remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color or textures which are found infrequently or not at all in the characteristic landscape, but these changes must still remain subordinate to the visual strength of the characteristic landscape.

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[1] The Tahoe National Forest LRMP was adopted in 1990 (USFS 1990), after the Sugar Pine Project was constructed and had been operating for many years. The TNF LRMP was amended in 2001 by the Record of Decision for the Sierra Nevada Forest Plan Amendment (referred to as the 2001 SNFPA; USFS 2001), which was then replaced in its entirety by the 2004 Record of Decision for the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (referred to as the 2004 SNFPA; USFS 2004). Detailed information including specific standards and guidelines for species management can be found in the 2004 SNFPA.

(M) MODIFICATION — Project-related activities may visually dominate the characteristic landscape. Activities of vegetative and land form alteration must borrow from naturally established form, line, color and texture so completely and at such scale that its visual characteristics are compatible with the natural surroundings.

(MM) MAXIMUM MODIFICATION — Project-related activities of vegetative and landform alterations may dominate the characteristic landscape. However, when viewed as background, the visual characteristics must be those of natural occurrences within the surrounding area or character type. When viewed as foreground or middle ground they may not appear to completely borrow from naturally established form, line, color, or texture.

Context is important when applying the preceding VQLs to the VQOs for the TNF's LRMP. For example, ongoing operation of the existing Sugar Pine Project to meet water demand in the Foresthill Community Plan area served by FPUD will cause increasing water level drawdowns each year as water demand increases from ongoing implementation of the Community Plan. Increasing demand will necessarily increase the band of bare soil/reservoir bed exposed by the increasing drawdown. The VQLs specified for implementing the TNF LRMP's VQOs cannot reasonably be interpreted to impair the FPUD's ability to operate the reservoir to meet increasing demand, since the LRMP, VQOs and VQLs were all adopted after the reservoir was constructed and started operating for the primary purpose of providing a water supply. Moreover, the Sugar Pine Reservoir and Dam Conveyance Act (Public Law 106-566) provides that FPUD succeeds to Reclamation's rights under the 1985 Agreement with the USFS, which reserves to Reclamation (and now to FPUD) the right to vary the reservoir's water levels, which will change aesthetics/visual resources in different ways throughout a single year and across multiple years over time.

As noted above, levels of visual disturbance are assessed in terms of the change in form, line, color, texture, pattern, or size and scale that may be caused by a project or action relative to conditions that would occur without the project. For purposes of this DEIR/EIS, these terms are defined as follows:

Form: The dimensional shape and/or dimensional mass of an object or group of objects that appear unified in relation to the landscape.

Line: The path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture or when objects are aligned in a one-dimensional sequence, usually evident as the edge of shapes or masses in the landscape.

Color: The property of reflecting light of a particular intensity and wavelength (or mixture of wavelengths) to which the eye is sensitive. This is a major visual property of surfaces.

Pattern: Sequences and combinations of forms, lines, and/or colors that combine to form pleasing visual experience.

Size and Scale: Scale is the size of a part of a given view or landscape relative to the overall view or landscape. Scale may also be described in terms of the size of a part relative to a human form.

The significance or degree of change in the above characteristics is subjectively defined herein as "WEAK" (indicating very little observable difference between pre- and post-project conditions), "MODERATE" (indicating a noticeable difference), and "STRONG" (indicating a substantial change).

The VQLs assigned to the Sugar Pine Management Area include RETENTION for the foreground views as seen from Sugar Pine Reservoir, developed campgrounds, campground access roads, and road numbers 41, 40, 10, and 24 and PARTIAL RETENTION within the developed sites that meet the partial retention VQO when viewed as middleground from travel routes and other occupancy sites. PARTIAL RETENTION is also applicable for the remainder of the study area.

The analysis of visual impact in this DEIR/EIS is based on site reconnaissance of the study area; a review of ground-level and aerial photographs; topographic data; project area lidar (light detection and ranging remote sensing technology); and, to a limited extent, conceptual visual simulations of selected post-project views.

Other Key Terms

In addition to the terms described above, this DEIR/EIS also relies on various other means of defining and characterizing visual resources that could be affected by the proposed project/action. These include but are not necessarily limited to the following:

Visual Quality: Visual quality is a subjective term relating to the visual appeal of a landscape and is typically described according to seven contributing elements: landforms, vegetation, water, color, influences of adjacent scenery, human modifications, and scarcity. Visual quality is evaluated in the DEIR/EIS by identifying the applicable scenic integrity objectives of Forest Service lands and the vividness, intactness, and unity (generally described as low, medium, and high) displayed on other lands.

Visual Sensitivity: Landscapes are viewed to varying degrees from different locations and, subsequently, differ in their importance. Visual sensitivity is a measure of the degree of public importance placed on landscapes as viewed from travel-ways and use areas. Sensitivity is based upon the type of land uses, mount of use, accessibility of areas, public interest, adjacent land use, and special designation of lands. In addition, sensitivity may also be identified through review of public comments received during the scoping process.

Sensitivity is generally described as High, Moderate, and Low and is defined as follows:

> **High Sensitivity** - Areas designated for scenic/visual resource protection or those receiving a high degree of use. Often include primary travel ways and recreation areas.
>
> **Moderate Sensitivity** - Areas lacking designated scenic/visual protection but located adjacent or near areas with protection. This designation may include secondary roads, trails, and recreation facilities.
>
> **Low Sensitivity** - Often areas that are remote from population centers, primary travel-ways, and specially designated/protection areas. This designation may also apply to landscapes that have been visually degraded.

Viewer Groups (Number and Types of Viewers): Potentially sensitive viewers are determined based on the type and amount of use various land uses receive. Land uses that derive value from the quality of their settings are considered potentially sensitive. Land uses within the project area that are considered sensitive to visual changes to their settings include residential areas; designated recreation and natural areas; major transportation systems, travel ways, and local roadways; and designated and eligible state historic routes and scenic highways.

Distance Zones: The distance from which a project component may be viewed affects the visual dominance and clarity that a feature or component may have within the seen landscape. The Forest Service VMS generally considers four distance zones, plus seldom seen areas, for project-level planning. Distance zones described in this section include immediate foreground, foreground, middleground, and background. The characteristics of each distance are summarized below in *Table 4.2-1*.

Viewer Concern: Reflects the expectations of viewers and speaks to their interest level regarding the visual resources of an area. Viewer concern is associated with visual sensitivity as it reflects the degree of public importance placed on landscapes based on existing features including landforms, vegetation patterns, and water features.

Viewer Exposure: Assessing the "exposure" of a viewer to views depends on a variety of factors including angle of view (i.e., normal, inferior, or superior viewing angles); landscape visibility (i.e., the viewer's ability to see and perceive landscapes); and screening conditions, including whether elements in the landscape are skylined on ridgelines, back-screened by topography and/or vegetation, or screened by structures or vegetation. Landscape visibility is itself a function of multiple elements including context of viewers, duration of views, degree of discernible detail, seasonal variations, and volume of viewers. Generally, viewer exposure is described as "long-term" for residents, and "short-term" for travelers along roadways and visitors to park and recreation areas. There are no residents in the project area, so all viewer exposure relative to the proposed project/action would be considered "short-term."

Visual Contrast: Generally, the visual contrast of a proposed action reflects the amount of disruption the action will have on visual characteristics of the affected landscape such as form, line, color, texture, pattern, and scale. The consistency of a proposed action with a specific VQO may be dependent on decreasing the visual contrast of that action. For lands with Very High scenic integrity, alterations may be incapable of complying with integrity levels as the desired condition from a visual perspective is that of an unaltered landscape. For lands with High or Moderate scenic integrity, visual contrast may be reduced and scenic integrity levels may be met through repetition of form, line, color, texture, pattern, and scale common to the valued landscape character being viewed.

Table 4.2-1. Distance Zones

Zone	Distance from Source	Characteristics
Immediate Foreground	0–300 feet	Viewer can distinguish landscape detail (i.e., individual leaves, flowers, and textures) and movement of leaves and grasses in light winds.
Foreground	0–0.5 mile	Viewer has close range visibility to a given object and can distinguish small boughs of leaf clusters, tree trunks and large branches, individual shrubs, clumps of wildflowers, medium-sized animals, and medium-to-large sized birds.
Middleground	0.5–4 miles	Objects are still distinguishable from adjacent visual features. The middleground is the predominant distance zone at which National Forest landscapes are seen, and at this distance, viewers are able to distinguish individual tree forms, large boulders, flower fields, small openings in the forest and small rock outcrops.
Background	4 miles to horizon	Viewers can distinguish groves or stands of trees, large openings in the forest, and large rock outcrops. Landscapes viewed from the background distance zone are simplified as textures have disappeared and colors have flattened.
Seldom Seen	—	Landscapes are obscured by topography or vegetation and are not typically seen from selected travelways or use areas, but may be seen from aircraft or by the occasional viewer wandering through the forest.

Source: Forest Service 1995

Reservoir Storage Conditions: Maximum Pool/Low Pool

As previously noted, the Sugar Pine Project is owned and operated by Foresthill Public Utility District (FPUD or District) for the primary purpose of water supply. As is typical for manmade water supply reservoirs (as opposed to natural lakes), water levels within the reservoir vary seasonally not only due to seasonal variations in reservoir inflow, but also due to reservoir diversions and releases to provide water for consumptive use or to meet environmental requirements. In the case of Sugar Pine Reservoir, diversions are made by FPUD to meet water demand within the FPUD service area and releases are made to Shirttail Creek to meet minimum flow requirements for fish and, periodically, to facilitate water transfers to downstream water users. This is important in defining the visual resources associated with the Sugar Pine Project, because the nature and quality of views of the reservoir can vary substantially depending on the water surface elevation of the reservoir pool. That water surface elevation varies during the course of a year and between years over time. To account for that variation, the environmental setting/affected environment is described in terms of conditions at “maximum pool” and “low” pool. Maximum pool refers to the condition when the reservoir surface elevation is at or near the elevation of the Sugar Pine Dam spillway. Low pool refers to conditions that occur when diversions and/or releases from the reservoir have occurred that exceed inflow and the surface elevation has dropped substantially below the spillway elevation. Low pool conditions vary substantially from year to year and throughout the dry season. This variation is contingent on precipitation levels, level of demand within the FPUD service area, and whether the District has performed a water transfer and the timing of that transfer. As discussed in Chapter 2 of this DEIR/EIS, FPUD is required to maintain a “minimum pool” storage of no less than 3,560 acre-feet during the recreation season and no less than 1,100 acre-feet at any time.

4.2.1.3 Describing Visual Resources: Key Observation Points

Central to the analysis of the visual impacts of the proposed project/action is the consideration of views from representative observation points in the project area from which the effects of the proposed project/action would be visible. Key observation points (KOPs) were selected by the DEIR/EIS preparer in collaboration with TNF staff. KOPs represent views of areas affected by the proposed project/action afforded to various viewer groups, including recreationists, motorists and sightseers, in different landscape types and terrain and from different vantage points and distance zones.

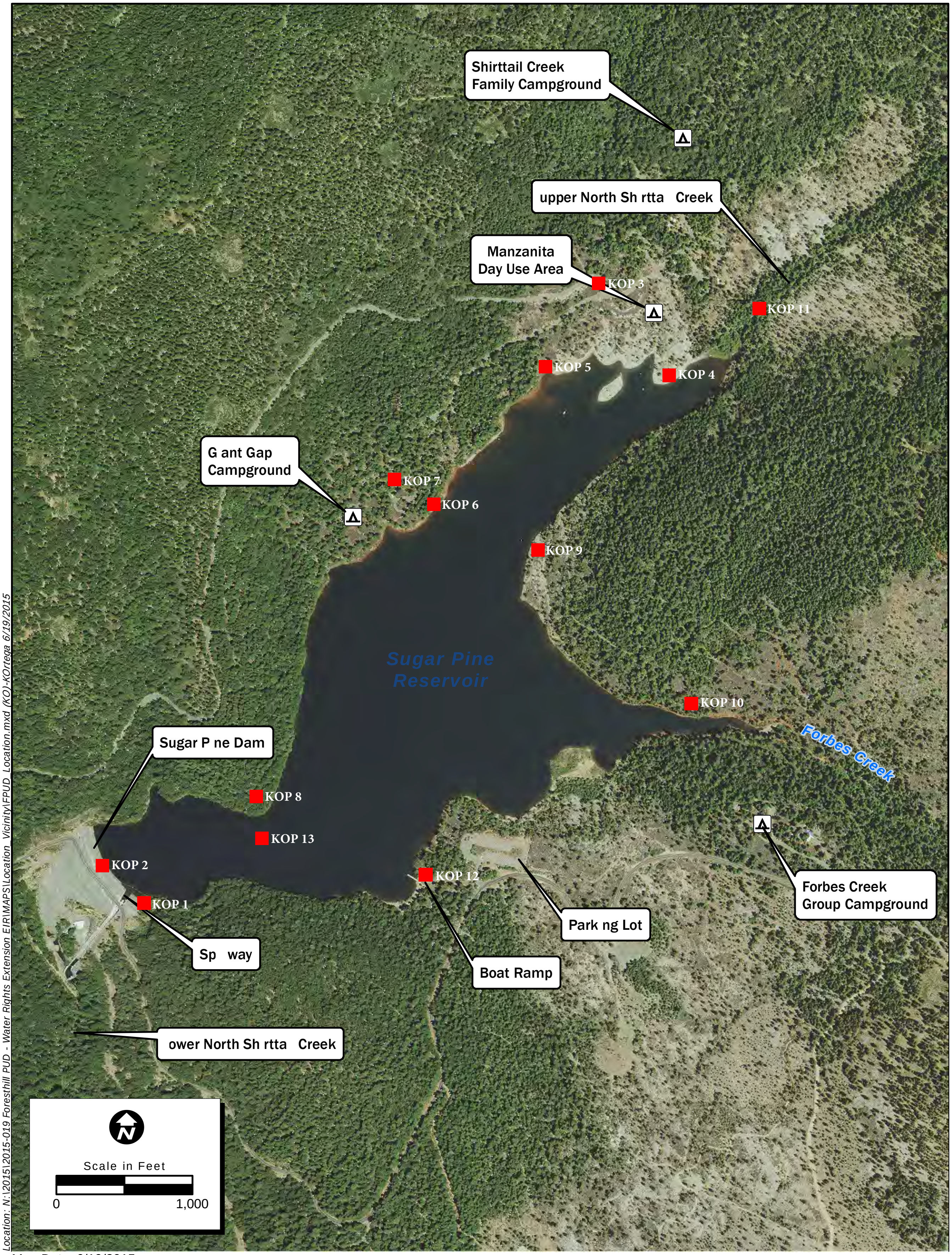
KOPs are chosen based on the range of sensitive viewers, distance zones, viewing conditions, and visual changes that would result from the proposed project/action. In total, 13 KOPs are described and evaluated. KOP locations are shown in *Figure 4.2-1*. KOP locations for this evaluation include (1) Sugar Pine Dam viewpoint; (2) Sugar Pine Road Sugar Pine Dam; (3) the entrance to Giant Gap and Shirttail Creek campgrounds; (4) MDUA; (5) the picnic area at GGCG; (6) shoreline campsite 22 at GGCG; (7) inland campsite #11 at GGCG; (8) JHMT (northwest shore); (9) JHMT (southeast shore); (10) JHMT (at Forbes Creek); (11) JHMT (upper Shirttail Creek); (12) Sugar Pine Boat Ramp; and (13) Sugar Pine Reservoir (West).

Photographs of views from each of the KOPs listed above and visual simulations of post-project views from selected KOPs are contained in *Figures 4.2-2 through 4.2-16* which are referenced throughout the following evaluation. These figures are presented at the end of this Section (4.2) of the DEIR/EIS.

For each KOP, the existing visual setting and visual quality of the landscape is described below in terms of landscape character elements including form, line, color and texture. The visual quality objectives (VQO) applicable to each KOP along with an estimate of level of viewer concern, exposure and sensitivity that can be expected at each KOP are listed in *Table 4.2-2*. For the visual impact analysis, changes to the existing visual setting resulting from construction, operation, and maintenance of the proposed project/action are described in terms of consistency with the applicable scenic integrity objective and contrast in the landscape character elements of form, line, color, and texture. The environmental setting associated with landscapes potentially affected by the proposed project/action as seen from the identified KOPs is discussed in detail below.

KOP 1—Sugar Pine Dam Observation Point

KOP 1 is located at the eastern edge of the visitor parking lot on the southern edge of Sugar Pine Dam. Looking eastward from KOP 1 as well as to the north and south, viewers are afforded views of the dam structure and reservoir water line in the immediate foreground (see *Figure 4.2-2*). Foreground views include the reservoir water surface and the forested shoreline running east from the north and south ends of the dam. The shorelines converge approximately 1000 feet from the dam to form a narrow constriction through which middle ground views of the reservoir, far shore, Sugar Pine Boat Ramp, and forested hillside to the east can be seen. From KOP 1, background views are obscured by topography.



Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Location_Vicinity\FPUD_Location.mxd (KO)-KOrtega 6/19/2015

Map Date: 6/19/2015
Photo Source: Google Earth (2013)

Figure 4.2-1 Key Observation Points (KOPs)

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2015-019 FPUD Sugar Pine Reservoir

Table 4.2-2. Visual Assessment KOPs

KOP	Location	Applicable VQO	Viewer Concern	Viewer Exposure	Viewer Sensitivity
1	Sugar Pine Dam Observation Area	Retention	High	Moderate	High
2	Sugar Pine Road at Sugar Pine Dam	Retention	Moderate to High	Low	High
3	Entrance to Giant Gap and Shirttail Creek campgrounds	Partial Retention	Moderate	Low	Moderate
4	Manzanita Day Use Area (MDUA)	Retention	High	Moderate	High
5	MDUA Picnic Area	Retention	High	Moderate	High
6	Giant Gap Campground (GGCG): Shoreline Campsite # 22	Partial Retention	High	Moderate	High
7	GGCG: Inland Site #11	Partial Retention	High	Moderate	Moderate
8	Multi-use Trail: Northwest Shore	Retention	High	Moderate	High
9	Joshua Hardt Memorial Trail (JHMT): Southeast Shore	Retention	High	Moderate	High
10	JHMT: Forbes Creek	Retention	High	Moderate	High
11	JHMT: Upper Shirttail Creek	Retention	High	Moderate	High
12	Sugar Pine Boat Ramp	Partial Retention	High	Moderate	Moderate
13	Sugar Pine Reservoir (West)	Retention	High	Moderate	High

At maximum pool, the reservoir extends to the base of forested areas on the north and south shores of the reservoir with a narrow band of bare shoreline visible. The view is natural in appearance with a pleasing balance of line, color, and texture. During low pool conditions, the band of exposed soil between the forested shoreline and water surface is extensive. This is most apparent in the immediate foreground and foreground views. It is less distinct in middleground views of the far shore. Views of the reservoir from KOP 1 at low pool tend to be dominated by the expanse of bare ground between the forested shoreline and water.

KOP 1's location on Sugar Pine Dam also affords immediate foreground and foreground views of the dam's spillway in which radial gates and support facilities would be installed (see *Figure 4.2-2*).

Applicable Visual Quality Objective: RETENTION

As noted above, the Sugar Pine Management Area section of the TNF LRMP specifies that developed campgrounds, campground access roads, and other forest service roads in the management area are designated with a VQO of RETENTION. As noted, this designation provides for management activities which are not visually evident. Activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident. The VQO for KOP 1, is considered to be RETENTION due to the prominent view to the east of Sugar Pine Reservoir from the observation point. The RETENTION designation provides for project-related activities which are not visually evident. Such activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident.

Viewer Concern: HIGH

As noted above, viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. Viewer concern is associated with visual sensitivity as it reflects the degree of public importance placed on landscapes based on existing features including landforms, vegetation patterns, and water features. The level of concern of viewers that stop to take advantage of the panoramic views of Sugar Pine Reservoir and Dam at KOP 1 is considered to be HIGH.

Viewer Exposure: MODERATE

The determination of "viewer exposure" depends on a number of factors including angle of view; landscape visibility; and screening conditions. Landscape visibility is itself a function of multiple elements including context of viewers, duration of views, degree of discernible detail, seasonal variations, and volume of viewers. In general terms, viewer exposure is generally described as long-term for residents, and short-term for travelers along roadways and visitors to park and recreation areas.

Foreground views of Sugar Pine Reservoir from KOP 1 are unrestricted. Middleground views are somewhat screened or framed by forested shorelines northwest and southeast of the reservoir. A large parking area is present at KOP 1 and it is a common stopping point for both recreationists that have come to use the various facilities and for travelers passing through on Sugar Pine Road. Views from the KOP 1 are short-term in nature and experienced by a moderate number of viewers when recreation facilities at the reservoir are open and a low number during the off-season. Viewer exposure, therefore, is considered MODERATE.

Visual Sensitivity: HIGH

As noted, "visual sensitivity" is a measure of the degree of public importance placed on landscapes as viewed from travel-ways and use areas. Sensitivity is based upon the type of land uses, amount of use, accessibility of areas, public interest, adjacent land use, and special designation of lands. Landscapes are viewed to varying degrees from different locations and subsequently differ in their importance. KOP 1 affords unrestricted immediate foreground and foreground views of the reservoir, forested shoreline and dam. Middle ground views of the reservoir, far shore and distant forest and mountains are somewhat screened/framed by the forested shoreline to the north and south of the reservoir. Viewers that stop at KOP 1 have high expectations for views of the reservoir and surrounding landscape. That expectation, in combination with the popularity of the area for recreationists in late spring, summer and early fall, supports a visual sensitivity of HIGH.

KOP 2—Sugar Pine Road at Sugar Pine Dam

KOP 2 is located on Sugar Pine Road at the center of Sugar Pine Dam. Views from KOP 2 are similar to those from KOP 1. To the east of KOP 2, travelers on the roadway are afforded views of the dam structure, spillway and reservoir water line in the immediate foreground. Foreground views include the reservoir water surface and the forested shoreline running east from the north and south ends of the dam. Middle ground views of the reservoir and far shore and boat ramp can be observed through the constriction formed by forested shorelines to the north and south of the reservoir (see *Figure 4.2-3*).

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 2 is RETENTION.

Viewer Concern: MODERATE to HIGH

As noted above, viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. Viewer concern is associated with visual sensitivity as it reflects the degree of public importance placed on landscapes based on existing features including landforms, vegetation patterns, and water features. The level of concern of travelers on the county roadway as they pass KOP 2, is likely to vary from high to moderate as they experience short-term exposure to the view from KOP 2 atop the dam. Given the nature of the view, duration, and varied interest of users of the county roadway, viewer concern at KOP 2, viewer concern is considered MODERATE to HIGH.

Viewer Exposure: LOW

Views from KOP 2 would be experienced by travelers in transit on Sugar Pine Road. As such, exposures to the view would generally be very brief. As such, viewer exposure at KOP 2 is considered LOW.

Visual Sensitivity: HIGH

As noted, "visual sensitivity" is a measure of the degree of public importance placed on landscapes as viewed from travel-ways and use areas. It is reasonable to assume the travelers on Sugar Pine Road have high expectations for views of the reservoir and surrounding landscape as they cross the dam. That expectation, in combination with the popularity of the area for recreationists in late spring, summer and early fall, supports a visual sensitivity of HIGH.

KOP 3—Entrance to Giant Gap and Shirttail Creek Campgrounds

KOP 3 is located at the intersection of the access road to GGCG and the access road to SCCG. Immediate foreground and foreground views from KOP 3 facing south include moderately vegetated areas of scrub and forest, paved roadways for access to the two campgrounds and day use area, signage, and public restrooms (see *Figure 4.2-4*). As illustrated in the figure, views of the reservoir and shoreline are patchy due to substantial screening from trees between the entrance and waterline and topography. Middle ground views from KOP 3 include the screened and limited views of the reservoir surface, far shore, and forested hillsides to the south of the reservoir. Background views from KOP 3 are obscured by topography.

Because the views of the reservoir surface and shoreline from KOP 3 are heavily screened, the contrast in appearance of the reservoir during maximum pool and low pool conditions from this observation point is low.

Applicable Visual Quality Objective: PARTIAL RETENTION

As stated in the LMRP and discussed above, the PARTIAL RETENTION VQO may be applied to areas within the boundary of each developed recreation site and any other remaining area within the management area that do not meet the criteria for a RETENTION designation. The PARTIAL RETENTION designation provides for management activities that remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color and texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color or texture which are found infrequently or not at all in the characteristic landscape, but still remain subordinate to the visual strength of the characteristic landscape.

Viewer Concern: MODERATE

The level of concern of viewers at KOP 3 is mitigated somewhat by the dominance of manmade features in the immediate foreground and foreground of KOP 3 such as paved access roads, restroom facilities, signage, paved parking areas, developed picnic sites, and portions of the JHMT. The level of viewer concern is further mitigated because only limited views of the reservoir and shoreline are available from this viewpoint. For these reasons, viewer concern at KOP 3 is considered MODERATE.

Viewer Exposure: LOW

Views from KOP 3 would be experienced by travelers in transit to either of the two nearby campgrounds or MDUA. As such, exposures to the view would generally be very brief. For this reason, viewer exposure at KOP 2 is considered LOW.

Visual Sensitivity: MODERATE

KOP 3 affords limited views of Sugar Pine Reservoir under both maximum and low pool conditions. Immediate foreground and foreground views include various manmade structures including roads, parking areas, the paved hiking trail, restrooms, and developed campsites. These conditions support a visual sensitivity of MODERATE.

KOP 4— Manzanita Day Use Area (MDUA)

KOP 4 is located at MDUA (see *Figure 4.2-5*) on the northeastern shore of Sugar Pine Reservoir approximately 100 feet from the reservoir highwater mark. Views of the immediate foreground include bare ground, trees and shrubs, and a portion of the JHMT. Foreground views include the reservoir water surface and the shoreline. Just offshore, an island feature is visible during maximum pool conditions.

From KOP 4, middle ground views include the reservoir, portions of the southern and northern shorelines and forested hills to the south and north of the reservoir. Views of Sugar Pine Dam and the boat ramp are obscured by topography. Background views are obscured by topography.

As illustrated in *Figure 4.2-5*, at maximum pool the reservoir extends to the beach area at MDUA. An expanse of light colored sand, scrub vegetation extends to the waterline. Middleground views of the north and south shorelines shore a narrow band of bare ground between the water surface and forested areas. Some bare areas with distinctive rock features are visible is various locations along the shoreline at maximum pool. In addition, a small island feature is visible just offshore from the day use area.

Under minimum pool conditions, a wide band of darker colored soil/mud extends beyond the light-colored beach area to waters-edge approximately 500 feet from the beach. During low pool conditions, the island feature is landlocked and no longer appears as an island (see *Figure 4.2-5*). At low pool, the band of exposed soil between the forested shoreline and water surface along the north and south shorelines appears much broader in middleground views. Views of the reservoir from KOP 4 at minimum pool are less natural in appearance and tend to be dominated by the expanse of bare ground between the beach and the reservoir waterline.

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 4 is RETENTION.

Viewer Concern: HIGH

Viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. Users of the day use area, perhaps more so than campground users or users of the boat ramp or JHMT, are more focused on active recreation such as picnicking, beach play, swimming and kayaking/canoeing. These viewers may place less importance on the viewing experience associated with landforms, vegetation patterns, and water features at the reservoir. Nevertheless, that importance is still likely to be high given their selection of Sugar Pine Reservoir over other regional options. For this reason, viewer concern at KOP 4 is considered HIGH.

Viewer Exposure: MODERATE

Views of the reservoir and surrounding shoreline from KOP 4 are relatively unobstructed. Given that use of this area is high in spring and summer and that typical time of use of the day use area ranges from one to several hours supporting a viewer exposure rating of HIGH.

Visual Sensitivity: HIGH

KOP 4 affords unrestricted immediate foreground and foreground views of the reservoir, beach and scrubland. Middle ground views of the reservoir, far shore and distant forest and hills are also unobstructed from KOP 4. It is reasonable to assume that users of the MDUA generally have high expectations for views of the reservoir and surrounding landscape. That expectation, in combination with the popularity of the area for recreationists in late spring, summer and early fall, supports a visual sensitivity of HIGH.

KOP 5— MDUA Picnic Area

KOP 5 occurs at the picnic area in the MDUA adjacent to the GGCG and parking area (see *Figure 4.2-6*). Facilities include a number of picnic tables situated at various locations to take advantage of views of the reservoir and natural shade provided by scattered mature fir trees amongst vegetation that is dominated by manzanita. KOP 5 is located at one of the picnic sites approximately 200 feet from the maximum pool shoreline. *Figure 4.2-6* shows the view from KOP 5 to the south. From this vantage point, views of the immediate foreground are scrub and scattered forest vegetation surrounding the picnic tables. Foreground views include the surrounding vegetation, trails, the northwest shoreline and the reservoir surface.

At maximum pool, the reservoir extends to the beach area at MDUA and to forested areas that surround the picnic area. An expanse of light-colored gravel, scrub vegetation extends to the waterline. During low pool conditions, the waterline recedes substantially from MDUA and the forest exposing substantial expanses of bare ground. While this is not particularly apparent from KOP 5 due to topography and vegetative screening, views from areas closer to the shoreline near KOP 5 are dramatically different during high and low pool conditions. *Figures 4.2-7 and 4.2-8* show views of the reservoir from the beach area adjacent to KOP 5. *Figure 4.2-7* shows conditions at maximum pool and *Figure 4.2-8* shows conditions when the reservoir has been drawn down.

Applicable Visual Quality Objective: RETENTION

The VQO for the Sugar Pine Management Area as stated in the TNF LRMP is RETENTION for all areas that are on the reservoir itself or in developed campgrounds, and campground access roads. Due to its location within MDUA, the VQO for the view from KOP 5 is RETENTION.

Viewer Concern: HIGH

Users of the picnic area may include overnight campers or day users. With either type of user, it is reasonable to assume that each expects a visually appealing, high quality, natural view of the reservoir, surrounding forest and shoreline from this location. For this reason, viewer concern at KOP 5 is considered HIGH.

Viewer Exposure: MODERATE

Views of the reservoir and surrounding shoreline from KOP 5 are moderately screened, however, use of this area is high in spring and summer and the typical time of use of the day use area ranges from one to several hours. This supports a viewer exposure rating of MODERATE.

Visual Sensitivity: HIGH

KOP 5 affords unrestricted immediate foreground and foreground views of the reservoir, beach and scrubland. Middle ground views of the reservoir, far shore and distant forest and hills are also unobstructed from KOP 5. Users' expectations for views of the reservoir and surrounding landscape in late spring, summer and early fall, support a visual sensitivity of HIGH.

KOP 6—Giant Gap Campground (Shoreline Site #22)

KOP 6 provides a representative example of typical views experienced from developed campsites at GGCG that are located in close proximity to the shoreline during maximum pool conditions (see *Figure 4.2-9*). GGCG is located adjacent to the northwestern shore of Sugar Pine Reservoir. The campground has 30 developed sites, parking areas, and two vault toilets. As is typical of most campgrounds, however, the nature and quality of views vary greatly from one campsite to another. In general, views from inland campsites at GGCG (i.e., campsites furthest from the reservoir) are limited to immediate foreground and foreground views of trees, scrub and camp facilities. Foreground or middle ground views of the reservoir are largely or fully obscured from these sites. Campsites adjacent to the reservoir shoreline, however, offer foreground and middle ground views of the reservoir that are partially or moderately obscured by trees and other vegetation. KOP 6 (site #22) was selected as a representative example of the latter. KOP 6 is located approximately 30 feet from the reservoir at maximum pool.

Applicable Visual Quality Objective: PARTIAL RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 4 is PARTIAL RETENTION.

Viewer Concern: HIGH

It is reasonable to assume that typical users of camping facilities at Giant Gap have high expectations concerning quality of views in and from the campground. Their selection of Giant Gap and its natural setting and isolated location is evidence of this. The level of concern of viewers at the campground is somewhat mitigated by the presence of cultural features in the immediate foreground and foreground of KOP 6 such as paved access roads, parking areas, the pedestrian trails, restroom facilities, and developed camp sites. Nevertheless, viewer concern for KOP 6 considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 6 would be experienced by campers using the facilities for overnight or extended stays. As such, exposures to the view would be extended but are still considered short-term by definition. As such, viewer exposure at KOP 6 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 6 affords the viewer views of Sugar Pine reservoir in the immediate foreground and foreground and views of the reservoir, far-shore, Sugar Pine boat ramp, and forested hillsides to the south in the middle ground. These views have limited obstruction from trees and scrub along the northern shoreline. Trees along the shore tend also to frame views of the reservoir adding content and perspective thus generally enhancing the viewing experience. Background views from KOP 6 are obscured by topography, i.e., the hills adjacent to the south shore. These conditions support a visual sensitivity of HIGH.

KOP 7—Giant Gap Campground (Inland Site #11)

KOP 7 was selected to provide a representative example of views experienced from developed campsites at GGCG that are located inland from the reservoir. KOP 7 is at Campsite #11 and is located approximately 200 feet from the reservoir at maximum pool. In general, views from inland campsites are heavily screened by the forest surrounding these sites. As seen in *Figure 4.2-10*, immediate foreground and foreground views from KOP 7 include the forest floor, trees, scrub and camp facilities. Middle ground views of the reservoir and background views are largely or fully obscured by forest.

Applicable Visual Quality Objective: PARTIAL RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 7 is PARTIAL RETENTION.

Viewer Concern: HIGH

Viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. It is reasonable to assume that typical users of camping facilities at Giant Gap have high expectations concerning quality of views in and from the campground. Their selection of Giant Gap and its natural setting and isolated location is evidence of this. The level of concern of viewers at the campground is somewhat mitigated by the presence of cultural features in the immediate foreground and foreground of KOP 7 such as paved access roads, parking areas, the pedestrian trail, and campsite facilities. Nevertheless, viewer concern for KOP 7 considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 7 would be experienced by campers using the facilities for overnight or extended stays. As such, exposures to the view would be relatively lengthy. For this reason, viewer exposure at KOP 7 is considered MODERATE.

Visual Sensitivity: MODERATE

KOP 7 affords only limited views of Sugar Pine Reservoir due to its location in an area of dense forest inland from the reservoir. This is true under both maximum and minimum pool conditions. For this reason, visual sensitivity at KOP 7 is considered MODERATE.

KOP 8- Multi-Use Trail (Northwest Shore)

KOP 8 is located on the unpaved hiking/multi-use trail approximately ½ mile southwest of GGCG. This observation point is located along an unpaved portion of the trail that runs between the campground and the dam. Views from the trail near this location tend to be partially to heavily screened from view by vegetation, but as seen in *Figure 4.2-11*, screening of views of the reservoir from KOP 8 is minor. Immediate foreground views from KOP 8 include the reservoir, shoreline, and shoreline vegetation. Middle ground views at maximum pool are dominated by the reservoir, far shoreline, the forested hillside beyond, and the dam to the west. Background views are obscured by topography.

At maximum pool, water is present in the immediate foreground at KOP 8. On the far-shore, the reservoir extends to the base of forested areas along the southeast shoreline with a narrow band of bare shoreline visible. As shown in *Figure 4.2-11*, foreground views during low pool conditions are dominated by exposed gravel, mud and rock exposed by the receding reservoir. On the far-shore, the band of exposed soil between the forested shoreline and water surface broadens and is noticeable. However, because the shoreline is relatively steep in areas viewable from KOP 8 the area between the forest and waterline during low pool conditions is not as broad as many other areas around the reservoir, particularly those adjacent to MDUA.

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 8 is RETENTION...

Viewer Concern: HIGH

It is reasonable to assume that typical users of this portion of the trail have high expectations concerning quality of views along the trail. The level of concern of viewers at KOP 8 is considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 8 would be experienced by hikers moving between the campground and dam or hiking the entire loop of the around the reservoir including the JHMT and the unpaved trails extending east of Sugar Pine Dam. Due to the steep terrain and lack of desirable picnic or resting areas along this part of the trail, viewer exposure at KOP 8 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 8 affords the viewer views of Sugar Pine reservoir in the immediate foreground and foreground of the reservoir water surface and middle ground views of the reservoir, far-shore, the inlet of Forbes Creek and forested hillsides to the southeast. There is limited vegetative screening from this location and that which does exists tends to enhance the viewing experience by framing views of the reservoir. These conditions support a visual sensitivity of HIGH.

KOP 9— Joshua Hardt Memorial Trail (Southeast Shore)

KOP 9 is located on the JHMT approximately ½ mile northwest of the trail bridge on Forbes Creek. This observation point is located along the paved portion of the JHMT that runs between the bridge at Forbes Creek and the bridge crossing at Shirttail Creek. The JHMT at KOP 9 runs adjacent to the reservoir shoreline with very limited vegetative screening and provides panoramic views of the reservoir to the west, north and south. As seen in the figure, immediate foreground views at this observation point include vegetation along the shoreline and the water surface. Foreground views are exclusively water surface. Middle ground views include the shoreline on the far-shore and forested hillside beyond. This observation point offers clear views of the shoreline along GGCG and MDUA directly across the reservoir.

At maximum pool, water is present in the immediate foreground at KOP 9. On the far-shore, the reservoir extends to the base of forested areas along the southeast shoreline with a narrow band of bare shoreline visible. As shown in *Figure 4.2-12*, during low pool conditions, foreground views are dominated by gravel, mud and rock exposed by the receding reservoir. On the far-shore, the band of exposed soil between the forested shoreline and water surface broadens substantially and is noticeable. This is particularly evident adjacent to the MDUA where waters are shallow even at maximum pool and the area of exposed ground is expansive when the reservoir recedes.

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 9 is RETENTION.

Viewer Concern: HIGH

It is reasonable to assume that typical users of this portion of the JHMT have high expectations concerning quality of views along the trail. Their selection of Sugar Pine Reservoir as a destination with its natural setting and isolated location is evidence of this. The level of concern of viewers at KOP 9 is considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 9 would be experienced by JHMT hikers walking from MDUA or GGCG to Forbes Creek or hikers beginning treks for the parking area at the Sugar Pine boat ramp. Due to exposed views, relatively flat terrain and multiple benches in the vicinity of KOP 9, viewers may spend extended periods of time there to picnic or recreate. Viewer exposure at KOP 9 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 9 affords the viewer panoramic views of Sugar Pine Reservoir in the immediate foreground and foreground of the reservoir water surface and middle ground views of the reservoir, far-shore, the inlet of Shirttail Creek as well as the forested hillsides to the northeast and west. There is limited vegetative screening from this location and that which does exist tends to enhance the viewing experience by framing views of the reservoir. These conditions support a visual sensitivity of HIGH.

KOP 10— Joshua Hardt Memorial Trail (Forbes Creek)

KOP 10 is located on the JHMT approximately 1000 feet west of the Forbes creek bridge crossing, on the north side of the creek (see *Figure 4.2-13*). This observation point is located along the paved portion of the JHMT that runs between the bridge at Forbes Creek and the bridge crossing at Shirttail Creek. The JHMT at KOP 10 runs adjacent to Forbes Creek near its outlet to Sugar Pine Reservoir. Immediate foreground views at this observation point include riparian vegetation adjacent to the creek and a broadening stream channel as the creek meets the reservoir at maximum pool elevation. Foreground views are lush riparian vegetation along the north and south banks of the creek. A narrow and rocky stream channel with multiple pools and ripples upstream of the observation point, giving way to a broader channel with calmer waters as the creek enters the reservoir. Middle ground views are obscured in most directions due to the topography of the Forbes Creek Canyon, but middle ground views to the north offer views of the reservoir and far-shore framed by the contours of the canyon opening to the reservoir.

At maximum pool, water is present in the foreground at KOP 10. The transition from stream to reservoir is clearly apparent. Little exposed ground is visible between the creek and reservoir water surfaces and bands of riparian and forest vegetation surrounding both. During low pool conditions, creek flow may decrease dramatically and the transition from stream to reservoir will occur further to the north of KOP 10. At low-pool conditions, foreground views are dominated by gravel, mud and rock exposed by the receding reservoir. On the far-shore, the band of exposed soil between the forested shoreline and water surface broadens, though this is not particularly noticeable from KOP 10 due to the limited view of the far-shore from this location.

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 10 is RETENTION. Viewer Concern: HIGH

Viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. It is reasonable to assume that typical users of this portion of the JHMT have high expectations concerning quality of views along the trail. The level of concern of viewers at KOP 10 is considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 10 would be experienced by JHMT hikers walking from MDUA or GGCG to Forbes Creek or hikers beginning treks for the parking area at the Sugar Pine boat ramp. Forbes Creek is also popular with easy access from the boat ramp parking area. Viewer exposure KOP 10 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 10 affords the viewer with diverse and dramatic natural views of the transition between stream and reservoir settings. Forbes Creek the immediate foreground and foreground with views of the reservoir beyond afford the viewer with a variety of colorful and compelling views from this vantage point particularly during high reservoir pool conditions. These conditions support a visual sensitivity of HIGH.

KOP 11— Joshua M. Hardt Memorial Trail (Upper Shirttail Creek)

KOP 11 is located on the JHMT at the upper Shirttail Creek bridge crossing. This observation point is located along the paved portion of the JHMT that runs between the MDUA and the Forbes Creek bridge. The JHMT at KOP 11 crosses the creek via a footbridge. The footbridge affords hikers a unique experience along the JHMT of enjoying 360° views of the creek and dense, lush and varied riparian habitat that surrounds it (see *Figure 4.2-14*). Immediate foreground views at this observation point include the bridge, the paved trail, and dense riparian vegetation adjacent to the creek in all directions. Foreground views are exclusively of the stream channel and surrounding vegetation. Middle ground and background views are nearly entirely obscured by vegetation.

Applicable Visual Quality Objective: RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 11 is RETENTION.

Viewer Concern: HIGH

Viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. Given the unique and pleasing views afforded hikers at the Shirttail Creek bridge it is reasonable to assume that users of this portion of the JHMT have high expectations concerning quality of views at this location. The level of concern of viewers at KOP 11 is considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 11 would be experienced by JHMT hikers walking from MDUA or GGCG to Forbes Creek or hikers beginning treks for the parking area at the Sugar Pine boat ramp. It affords an excellent opportunity for rest and reflection. Users of MDUA could also be expected to venture to the bridge to enjoy the views there and take advantage of a shady and quiet location without venturing any further along the trail. Viewer exposure KOP 11 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 11 affords the viewer with diverse and dynamic natural views of the stream setting. Upper Shirttail Creek affords the viewer with colorful and compelling views of the riparian corridor along the creek from a bridge which also adds to the visual diversity and value of the scene. These conditions support a visual sensitivity of HIGH.

KOP 12--Sugar Pine Boat Ramp

KOP 12 is located on the southern shore of Sugar Pine Reservoir, east of Forbes Creek and approximately ¼ mile east of the dam. Looking north from KOP 12, immediate foreground views include paved road and parking areas, the concrete ramp, floating docks, anchor lines and the waterline (see *Figure 4.2-15*). Foreground views include the reservoir water surface and the forested shoreline immediately west of the ramp and extending west toward the dam. To the north, middle ground views include the reservoir and forested shoreline and hills on the far-shore. Views to the east are obscured by trees and topography.

At maximum pool, the reservoir extends to within 10 feet of the top of the boat ramp. The view is pleasing in its natural appearance and balance of line, color, and texture. Areas of shoreline adjacent to the boat ramp show relatively narrow bands of exposed soil and sand between the water line and surrounding vegetation. Under low-pool conditions, the band of exposed soil between the forested shoreline and water surface is much broader. This is most apparent in the immediate foreground and foreground views. It is less distinct in middle ground views of the far shore. Views of the reservoir from KOP 12 at low pool are less natural in appearance due to the bare ground between the forest and water.

Applicable Visual Quality Objective: PARTIAL RETENTION

In keeping with designations defined for the Sugar Pine Management Area in the TNF LRMP, the VQO for KOP 12 is PARTIAL RETENTION. Viewer Concern: HIGH

The level of concern of users at the boat ramp is influenced by the purpose of the viewer for their presence there. The expectations of a recreational boater or fishing enthusiast may be substantially different from that of a hiker, birder or kayaker at this location. It is, however, reasonable to assume that typical users of the boat ramp have high expectations concerning quality of views at the location and on the reservoir. Viewer concern at KOP 12 is HIGH.

Viewer Exposure: MODERATE

Viewers at KOP 12 tend to use this location as a staging area, either to launch boats for use on the reservoir or to use the parking area as a starting point for hiking or fishing along the JHMT. For these reasons, viewer exposure at KOP 12 is considered MODERATE.

Visual Sensitivity: MODERATE

KOP 12 affords unrestricted immediate foreground and foreground views of the reservoir, forest and forested shoreline. Views also include roadways, large parking areas and rest room facilities. Middle ground views of the reservoir, far shore and forested hillside beyond. Viewers that stop at KOP 12 have high expectations for views of the reservoir and surrounding landscape, but this is somewhat mitigated by the developed nature of the site itself. For these reasons, KOP 12 visual sensitivity is considered MODERATE.

KOP 13— Sugar Pine Reservoir (West)

KOP 13 is located on Sugar Pine Reservoir adjacent to the northwest shoreline approximately 1000 feet east of Sugar Pine Dam. Immediate foreground views at this observation point are exclusively of water surface. Foreground views to the south include the reservoir and southeast shoreline. Views to the west are dominated by Sugar Pine Dam and adjacent shorelines. Views to the east include the northwest shoreline and reservoir.

Figure 4.2-16 presents the view from the reservoir at maximum pool and at low pool. At maximum pool, there is very little separation between the waterline and forest on all surrounding shorelines. The waterline elevation at the dam is consistent with the elevation of the spillway, exposing only the structure above the spillway. At low pool, the separation of forest along the shoreline and the reservoir water surface is substantially larger. From KOP 13, this separation is less substantial than at other locations on the reservoir due to the steep topography on the shorelines immediately north and south of the observation point. Because of the steepness of the terrain, the expanse of area exposed as the reservoir recedes is less than shallower areas around the reservoir.

Applicable Visual Quality Objective: RETENTION

As noted above, the VQO for the Sugar Pine Management Area as stated in the TNF LRMP is RETENTION for all areas that are on the reservoir.

Viewer Concern: HIGH

Viewer concern is closely associated with expectations of viewers and speaks to the interest level or concern of viewers regarding the visual resources of a particular area or location. While boaters on the reservoir represent a range of interests including fishing, photography, exercise, sightseeing, birdwatching and others, it is reasonable to assume that typical users of the reservoir have high expectations concerning quality of views on the water. The level of concern of viewers at KOP 13 is considered HIGH.

Viewer Exposure: MODERATE

Views from KOP 13 are from the water and, therefore represent views that are most likely to be experienced by boaters. As such, these users that have invested some degree of effort and planning to facilitate this experience are likely to spend an extended period on the water with relatively unrestricted views of the surrounding landscape. This exposure is still considered “short-term” but viewer exposure at KOP 12 is considered MODERATE.

Visual Sensitivity: HIGH

KOP 13 affords the viewer views of Sugar Pine reservoir in the immediate foreground and foreground of the reservoir water surface and middle ground views of the reservoir, shorelines, forested hillsides and the dam. Due to its location on the water, views of these features are unrestricted. These conditions support a visual sensitivity of HIGH.

Areas Affected by Compensatory Mitigation Measures

Implementation of compensatory mitigation measures described in Chapter 2 and listed in *Table 2-5* of this DEIR/EIS, could potentially affect the quality of views outside of the Sugar Pine Reservoir basin and, therefore, would not be viewable from the 13 KOPs described above. Specifically, activities associated with the implementation of Measure L1 (restoration of forest habitat), M1 (restoration of off-site emergent wetland vegetation), N1 (restoration of montane chaparral habitat), and O1 (restoration of off-site stream habitat) could have short- and/or long-term effects on the quality of views in and near the affected areas and may or may not be consistent with the TNF LRMP visual quality objectives applicable to these areas.

4.2.2 Applicable Regulations, Plans, and Standards

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action and pertaining specifically to potential project effects on visual resources. As noted below, the protection and management of visual resources is addressed in various federal, state, and local plans, and programs including the Tahoe National Forest Land and Resources Management Plan and the Forest Service Landscape Aesthetics Scenery Management

Handbook, and Visual Management System (VMS), and the Placer County General Plan as they pertain to the protection of scenic resources.

4.2.2.1 Federal

Current management direction on desired future conditions for the management of scenic resources in the Tahoe National Forest can be found in the following documents, filed at the District Office:

- Tahoe National Forest Land and Resource Management Plan (LRMP);
- Forest Service Manual and Handbooks;
- National Forest Management Act (NFMA)

The Tahoe National Forest LRMP (USFS 1990) was amended in 2001 by the Record of Decision for the Sierra Nevada Forest Plan Amendment (referred to as the 2001 SNFPA; USFS 2001), which was then replaced in its entirety by the 2004 Record of Decision for the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (referred to as the SNFPA) (USFS 2004). Detailed information including specific standards and guidelines for species management can be found in the 2004 SNFPA.

Regulations in federal law and guidance from the Tahoe NF LRMP gives direction to resource managers and lays out a framework for analysis of impacts on Forest resources. The National Forest Management Act (NFMA) and its implementing regulations, requires the inventory and evaluation of the Forest's visual resources, addressing the landscape's visual attractiveness and the public's visual expectations. Management prescriptions for definitive lands areas of the forest are to include visual quality objectives. The National Environmental Policy Act of 1969 (NEPA) states that it is the "continuing responsibility of the Federal Government to use all practicable means to assure for all Americans, aesthetically and culturally pleasing surroundings." NEPA also requires "a systematic and interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts into planning and decision-making which may have an impact on man's environment." Numerous federal laws require all Federal land management agencies to consider scenery and aesthetic resources in land management planning, resource planning, project design, implementation, and monitoring.

Several USDA handbooks have been developed to establish a framework for management of scenic and visual resources. This report relies upon the principles outlined in Agricultural Handbook Nos. 434, 462, and 559. These handbooks focus on identifying principles and concepts that begin to quantify and describe the visual elements and qualities that determine the appearance of a landscape or viewshed. They describe concepts in identifying the characteristic landscape, landscape variety, deviations, and variable factors, explain how to apply these concepts to the management of activities such as timber management and forest health projects, and define visual quality objectives.

4.2.2.2 State

No state regulations, goals or policies as they pertain to the protection of scenic resources at Sugar Pine Reservoir are applicable to the proposed project/action.

4.2.2.3 Local

County of Placer General Plan

The County of Placer General Plan does not contain a separate element for visual or aesthetic resources; however, the General Plan addresses visual and scenic resources including scenic corridors and scenic viewsheds in the Conservation and Open Space Element.

4.2.3 Environmental Impacts/Consequences

4.2.3.1 Definition and Use of CEQA Significance Criteria and NEPA Indicators

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of visual impacts resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 California Code of Regulations [CCR] 15000 et seq.), which identify four criteria that can lead to a determination of significant visual impact. These criteria are described in the following list.

A development project could have a significant impact on aesthetics if the project would:

- Have a substantial adverse effect on a scenic vista;
- Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- Substantially degrade the existing visual character or quality of the site and its surroundings;
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area; or
- Result in an inconsistency with applicable scenic integrity objective or visual resource management system objective.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified a several indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on aesthetics and visual resources. These include:

- changes to landscape dominance elements (form, line, color, texture) in terms of degree of contrast that results from the proposed action and future reservoir operations;
- projected time during the recreation season that reservoir would be at full pool and at other increments down to minimum recreation pool;
- new recreational structures and the proposed radial gates compliance with TNF Plan visual guidelines for materials, colors and reflectivity;
- description of key viewpoints from Sugar Pine Dam, Giant Gap Campground, Manzanita Day Use Area, Sugar Pine Boat Ramp, Josh Hardt Trail (selected locations), the entrance road to Shirttail

Creek/Giant Gap campgrounds, and from the reservoir itself, facing Shirttail and Forbes Creek drainages;

- analysis of view duration and number of viewers including from what distance zone the reservoir would be viewed using available data and USFS impact assessment methods: and
- assess project compliance with Forest Plan standards and guidelines for visual management within the project area and from established viewpoints and the project's consistency with Forest Plan Visual Quality Objectives.

Tahoe National Forest Visual Management System (VMS)

To evaluate the significance of the potential effects of the proposed project/action on scenic resources, this DEIR/EIS relies on methods of assessing visual quality applied by TNF as expressed in the U.S. Forest Service's VMS as described in detail below. Consistency of the project with the Tahoe National Forest Land and Resources Management Plan, specifically the Visual Quality Objectives for the Sugar Pine Management Area is a key indicator of the significance of project effects on visual resources and whether an effect is or is not considered adverse.

Compensatory Mitigation Measures and Management Requirements

As described in Chapter 2 of this DEIR/EIS Compensatory Mitigation Measures and mandatory USFS Management Requirements are included as part of the proposed project/action for the mitigation of project impacts on existing recreational facilities and sensitive resources. None of these measures or requirements, however, relate directly to reducing potential project impacts on visual resources.

4.2.3.2 Direct and Indirect Effects

Impact VIS-1: Adverse effect on a scenic vista. Impact Determination: *No impact (CEQA) and no effect (NEPA).*

The Management Area 096: Sugar Pine section of the Tahoe National Forest Land and Resources Management Plan does not designate any "scenic vistas" within the management area. However, the reservoir and reservoir shoreline provide the focal point of views from various locations around the reservoir including Sugar Pine Road, Sugar Pine Dam, JHMT, GGCG and SCCG, MDUA, Sugar Pine boat ramp and parking areas, and the reservoir itself has high scenic value to recreationists using the camping, boating and hiking facilities as well as passing motorists on Sugar Pine Road.

No Project Alternative

Under the CEQA No Project Alternative defined in section 3.2 of this draft EIR/EIS, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir would continue and would increase over time to meet growth in water demand from implementation of the Foresthill Community Plan approved by the County of Placer. . Here, he No Project Alternative represents the environmental baseline conditions on which the potential impact of the proposed project and project alternatives, under CEQA, is based. Under that No Project

Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. During these drawdowns, areas of bare ground between the forest surrounding the reservoir and the waterline will alter views from locations around the reservoir. The nature and quality of these views during low pool conditions is generally considered lower than at maximum pool.

No Action Alternative

Under the NEPA No Action Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. In addition, existing Sugar Pine Reservoir management and operational conditions would be continued. In keeping with NEPA requirements to account for future actions likely to occur in the absence of the proposed action, the No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Under that No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. During these drawdowns, areas of bare ground between the forest surrounding the reservoir and the waterline will alter views from locations around the reservoir. The nature and quality of these views during low pool conditions is generally considered lower than at maximum pool.

Given that the effect of the No Action Alternative on views would be similar to views observed historically at the reservoir, and because no designated "scenic vistas" occur within the project area, the impact of the No Action Alternative is considered have no impact under CEQA. Given that conditions anticipated under the No Action Alternative serve as the environmental baseline for determining environmental effect, the No Action Alternative would have no effect under NEPA. The Action Alternatives represent the environmental baseline conditions on which the following determination of potential project effects NEPA is based.

Proposed Project/Action and Alternative 2 (Helicopter Harvest)

With implementation of the proposed project/action and Alternative 2 (Helicopter Timber Harvest), radial gates would be installed within the existing spillway. These gates will increase the storage capacity of Sugar Pine reservoir and expand the reservoir's area of inundation. This expansion will require the removal of much of the JHMT and the elimination of several campsites and picnic facilities at GGCG. In addition, portions of MDUA will be inundated at maximum pool elevations with the project and will require the removal of a number of picnic and viewing facilities including benches, tables and interpretive displays. These facilities will be replaced in-kind as compensatory mitigation for losses due to the proposed action. In addition, new facilities will be added as part of these measures including shade structures at MDUA and hardened pedestrian walkways extending between MDUA and CCGC to the minimum pool elevation waterline if deemed to be appropriate based on responses from post-project recreational users.

In keeping with FPUD's current Special Use Permit (SUP) with the Forest Service and its original agreement with Bureau of Reclamation for the acquisition of the Sugar Pine Project, FPUD is responsible for replacing any and all recreational facilities directly affected by installation of the radial gates. To comply with this requirement, FPUD in collaboration with the USFS, developed the compensatory mitigation plan described in detail in Chapter 2 of this EIR/EIS. With implementation of the mitigation plan, facilities that currently provide the opportunity for visitors to enjoy scenic vistas that would be removed to accommodate the proposed project, would be replaced in kind. While the exact vistas from viewpoints lost due to the proposed action cannot be duplicated via the mitigation plan, the nature and quality of views from the new facilities can be recreated through replacement of the affected facilities in locations that afford viewers comparable vistas of the reservoir, shoreline, surrounding forest, and Shirttail Creek and Forbes Creek riparian areas.

The effect of the proposed project/action and Alternative 2 on the visual character and quality from each of the key observation points identified for this DEIR/EIS is addressed under **Impact VIS-3**, below. The project, however, would have ***no impact*** on a "scenic vista" because, as discussed above, there are no designated scenic vistas within the Sugar Pine Management Area. Similarly, the project would have ***no effect*** on scenic vistas under NEPA for the same reason.

Alternative 1: JHMT Realignment

As described in Chapter 2 of this DEIR/EIS, all project elements associated with Alternative 1 would be identical to the proposed project/action with the following exception: the alignment of the proposed replacement of the JHMT north of Forbes Creek would be altered to avoid an identified population of Layne's butterweed, a plant species federally listed as threatened. As the area in which the alternate alignment of the JHMT is not in view of any designated scenic vista, Alternative 1 would have ***no impact*** on a scenic vista under CEQA. For the same reason, Alternative 2 would have ***no effect*** under NEPA.

Impact VIS-2: Damage to scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway. Impact Determination: *No impact (CEQA) and no effect (NEPA)*.

All Alternatives

There are no designated state scenic highways in or near the Sugar Pine Management Area. In fact, no roads in Placer County are designated under the California Scenic Highway Mapping System.[2] Highway 49 in the southwest part of the county is considered eligible for designation as are portions of US 80, State Route 89 and State Route 28 in the far northeast corner of Placer County. Because the project area is not within view of any designated or eligible scenic highways, the project would have ***no impact/effect*** on views from a state scenic highway.

[2] http://www.dot.ca.gov/hq/LandArch/16_livability/scenic_highways/. Screenshot of website. March 27, 2017.

Impact VIS-3: Degrade the existing visual character or quality of the site and its surroundings. Impact Determination: *Less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA)* (short-term construction-related impacts). *Significant and unavoidable (CEQA) and adverse (NEPA)* (long-term operational impacts).

No Project Alternative

Under the CEQA No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir would continue and would increase over time to meet growth in water demand from implementation of the Foresthill Community Plan approved by the County of Placer. Here, the No Project Alternative represents the environmental baseline conditions on which the potential impact of the proposed project and project alternatives, under CEQA, is based. Under that No Project Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. During these drawdowns, areas of bare ground between the forest surrounding the reservoir and the waterline will alter views from locations around the reservoir. The nature and quality of these views during low pool conditions is generally considered lower than at maximum pool.

No Action Alternative

Under the No Action Alternative, existing facilities would not be modified and no new facilities would be constructed. In addition, existing Sugar Pine Reservoir management and operational conditions would be continued. As noted, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. During these drawdowns, areas of bare ground between the forest surrounding the reservoir and the waterline alter views from locations around the reservoir. This is particularly evident in locations where the elevation change between the shoreline and waterline is gradual as it is the vicinity of MDUA. The character and quality of these views is generally considered lower during low pool conditions than at maximum pool.

Under the No Action Alternative low pool conditions would generally increase in extent, frequency and duration overtime. These views however would not differ in terms of line, color, pattern, and/or size and scale from views observed historically during low pool conditions from all KOPs identified in this DEIR/EIS. As such, the impact of the No Action Alternative is considered ***less than significant*** under CEQA. Given that conditions anticipated under the No Action Alternative serve as the environmental baseline for determining environmental effect, the No Action Alternative would have ***no effect*** under NEPA.

Proposed Project/Action

Short-Term Construction-related Visual Effects Analysis

Construction activities associated with the proposed installation of radial gates at Sugar Pine Dam would include the transport and installation of the gates and related facilities at the dam, timber and brush removal within the expanded inundation area of Sugar Pine Reservoir, the demolition and removal of recreational facilities within the expanded area of inundation, and the construction of replacement facilities and implementation of other compensatory mitigation measures such as Shirttail Creek habitat enhancement, fuel management, and pond construction as outlined in the compensatory mitigation plan. These activities could be visible to motorists on Sugar Pine Road and/or recreationists.

Impacts on the existing visual character of landscapes at and around the reservoir would result from the influx of construction vehicles, equipment, and workers to the area. Gate installation, timber harvest operations, construction staging, and facilities demolition and construction will temporarily alter and degrade the visual character of the area which is currently dominated by views of the forested shoreline and water surface of Sugar Pine Reservoir, Sugar Pine Dam, the boat ramp, JHMT and developed camping and picnic facilities at GGCG, Shirttail Campground, and MDUA.

While the visual impact of project construction activities would be temporary, both the visibility of construction vehicles and equipment and disturbances in the landscape associated with the preparation of construction work area could degrade existing visual character of the project area for recreational users at Sugar Pine Reservoir. With implementation of mitigation measures Mitigation Measure **VIS-1** and Mitigation Measure **VIS-2** the potential for visual impacts during construction would be reduced to ***less-than-significant*** levels under CEQA and to ***no effect*** under NEPA by limiting public access to USFS recreational facilities with views of the project area during project construction and by requiring the restoration of all temporary work areas to near pre- construction conditions (when construction has been completed).

Long-Term Visual Effects Analysis

The potential long-term impacts on visual character and quality of the project area resulting from the proposed project/action are described below. As stated previously, KOPs were identified at various locations around Sugar Pine Reservoir with the intent to provide an array of vantage points that represent key views experienced by the spectrum of project area users including, but not limited to motorists, campers, boaters, fishers, hikers, swimmers and picnickers.

KOP 1: Sugar Pine Dam Parking Area/Viewpoint

As described above, KOP 1 is located at the eastern edge of the visitor parking lot on the southern edge of Sugar Pine Dam. Looking east, north and south from KOP 1 viewers are afforded foreground views of the dam, reservoir water surface and the forested shoreline adjacent to the north and south ends of the dam. KOP 1's location on Sugar Pine Dam also affords an immediate foreground view of the dam's spillway in which radial gates and support facilities would be installed. Middle ground views from KOP 1 include the reservoir, far-shore adjacent to Forbes Creek and forested hillside to the east. From KOP 1, background views are obscured by topography.

At maximum pool, the reservoir extends to the base of forested areas on the north and south shores of the reservoir with a narrow band of bare shoreline visible. During low pool conditions, the band of exposed soil between the forested shoreline and water surface (an area commonly referred to as the "bathtub ring") is broader.

Implementation of the proposed project/action will affect long-term views from KOP 1 in a number of ways. First, current views from KOP 1 include forested hillsides that extend to the maximum pool shoreline on the northwest and southeast shorelines of Sugar Pine Reservoir immediately adjacent to the dam. Trees along both shorelines partially screen middle ground views of the reservoir and far shoreline. These trees also frame the view of the reservoir as seen from KOP 1, providing a pleasing view of the landscape particularly when the reservoir is at maximum pool. The proposed project/action will remove trees that occur within the expanded inundation area. This will expand/widen the views of the reservoir and far shore compared to current conditions. During low pool conditions, areas of bare soil along the shoreline will be more visible from KOP 1 due to the tree removal along the north and south shorelines and the reduction in vegetative screening. Some tree stumps will remain in the cleared areas but will be flush-cut.

As described in Chapter 2, various locations of paved portions of the JHMT to be replaced under the proposed project/action will be left in place and these locations may be within middle ground views from KOP 1. The pavement however would be ripped and covered with soil and would likely not be clearly visible from KOP 1.

Second, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. In years where FPUD does not execute a water transfer, or when future transfers do not exceed the historical maximum of 2,000 acre-feet, views of exposed soil between the waterline and forested hillside during low pool conditions will be less apparent or unchanged from KOP 1 relative to existing conditions. This is because the proposed project/action would increase maximum storage at the reservoir by over 3,600 acre-feet. In doing so, the project would add approximately 44 acres to the reservoir's surface area at maximum pool (from 160 acres currently to 204 acres) and just under 5,000 linear feet to its current shoreline (from approximately 22,230 feet currently at maximum pool to a projected 27, 123 feet with the gates in place). With an expanded reservoir, diversions and releases would result in a narrower (albeit longer) "bathtub ring" around the reservoir when compared to current conditions with the same diversions/releases.

It is important to note, however, that the proposed project/action would allow for periodic water transfers of up to 5,000 AF. This would exceed the 2,000 AF historical transfer maximum by 3,000 AF. The diversion of an additional 3,000 AF would result in a substantially broader ring of exposed soil around the reservoir relative to historical conditions, and this would adversely affect the visual character of the reservoir as seen from KOP 1. This is somewhat offset by improved views of the reservoir the project would afford via a larger reservoir at maximum pool and a reduced low pool impacts during non-transfer years, but, nevertheless would be considered a significant impact on visual character from KOP 1.

The potential frequency of transfers of up to 5,000 AF under the proposed project/action is dependent on a number of variables including, but not limited to, the availability of a willing buyer; local hydrology; spill conditions at Folsom Reservoir, the ability of FPUD to timely obtain regulatory permitting agency approvals, and projected water demand within the FPUD service area. These conditions preclude an accurate prediction of the frequency and amounts of potential future transfers with implementation of the proposed project/action. As described in Chapter 2 of this DEIR/EIS, under consistently ideal conditions (i.e., conditions that support the highest possible frequency of transfers of up to 5,000 acre-feet) a transfer of up to 5,000 AF could occur once every three years. Under this scenario, the proposed project/action would adversely affect views at KOP 1, no more than once every three years when a transfer of 5,000 acre-feet AF is executed. The effect of this impact on travelers and recreationists would depend on the timing of the transfer. An early transfer, i.e., a spring transfer, would have the greatest effect on recreational users at Sugar Pine in that reductions in reservoir levels would occur early in the recreation season, which typically begins on Memorial Day. A late-season transfer on the other hand would divert water toward the end of the recreation season, exposing fewer users to lower reservoir levels.

Lastly, as noted above, KOP 1 affords the closest view of the proposed radial gates and related facilities to be installed in the Sugar Pine Dam spillway. The gates and facilities will substantially alter the immediate foreground view down into the spillway from KOP 1. Foreground, middle ground and background views from KOP 1 would be relatively unaffected by the radial gates.

Form: As described above, "form" is defined as the dimensional shape and/or dimensional mass of an object or group of objects that appear unified in relation to the landscape. Under the proposed project/action, some of the existing screening of middle ground views provided by trees on the north and south shorelines will be eliminated. This will provide a wider view of the far shoreline and forested hillside east of the reservoir. The "framing" effect currently provided by tree along the northwest and southeast shorelines will be lessened somewhat by tree removal but the effect itself will remain intact. Various facilities including the radial gates, hoists, and support structures described in Section 2, will be visible from KOP 1 upon completion of the proposed project.

Views of recreational facilities to be constructed under the compensatory mitigation plan from KOP 1 would generally be obscured by the forest and topography, with one exception. The multiuse trail replacement adjacent to the northwest and southeast shoreline of Sugar Pine Reservoir will be visible from KOP 1. As the new trail would be an in-kind replacement of the existing trail, the contrast in form between the proposed trail and the existing trail would be not be substantial as viewed from KOP 1.

For these reasons, changes to the form of immediate foreground, foreground and middle ground views of the reservoir and shoreline from KOP 1 is considered MODERATE.

Line: As noted, "line" is the path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture or when objects are aligned in a one-dimensional sequence, usually evident as the edge of shapes or masses in the landscape. The line of sight of viewers at KOP 1 includes a panorama moving from foreground views of the dam, spillway and parking area to foreground and middle ground views of the forested shorelines adjacent to the dam and middle ground views of the reservoir and far-shore during maximum pool conditions (see *Figure 4.2-2*). During low pool conditions the line is altered due to the expanse of bare ground between the water surface and forest edge exposed with the receding reservoir.

Under the proposed project, the radial gates and related facilities will be visible from KOP 1 to varying degrees. The gates will be screened from view when in the lowered/closed position. When open, the gates will be in view in the immediate foreground from KOP 1. As such, installation of the gates will alter the line of sight from KOP 1.

Tree removal and expansion of the inundation area under the proposed project/action will minimally affect the line of sight from KOP1. While the water line at maximum pool will be higher under the proposed project/action and the reservoir larger at low pool, the line of these features will not be appreciably different. The line of sight to features on the far-shore will be slightly greater under the project due to the removal of trees along the northwest and southeast shore lines which currently provide limited screening/framing of views to the east from KOP 1. Lastly, construction of a new multi-use trail near KOP 1 would be an in-kind replacement of the existing trail, the contrast in line between the new and existing trail as viewed from KOP 1 would be not be substantial. For these reasons the effect of the project on line is considered WEAK.

Color: Color is the property of reflecting light of a particular intensity and wavelength to which the eye is sensitive. Colors observed from KOP1 vary considerably depending on light conditions but, in general are dominated by the stark gray colors of the dam, spillway and parking area in the immediate foreground, deep grey/green of the reservoir, greens of the forested shoreline and surrounding hillsides, light brown grey of the exposed shoreline between the forest edge and reservoir, and pale tans of the areas of bare ground at MDUA.

Under the proposed project, the spectrum of color observed from KOP 1 will remain unchanged with the following exceptions. Structures associated with the radial gate installation that are visible from KOP 1 will present a departure from the existing color scheme of the dam and spillway structure. Depending on the color of these facilities, this departure could have a substantial effect on views of the spillway and dam from the observation point. Also, under the proposed project, the size of the reservoir during maximum pool and low pool conditions will be greater relative to the surrounding forest as compared to current conditions. Colors associated with the reservoir will be slightly more prominent relative to the forested hillsides. For these reasons, the effect of the project on color is considered to be WEAK to STRONG.

Pattern: Pattern is the sequences and combinations of forms, lines, and/or colors that combine to form pleasing visual experience. The patterns contained in views of the dam, reservoir, shoreline and forest from KOP1 do indeed provide the viewer a pleasing visual experience. With one exception, i.e., the introduction of radial gate facilities in the dam spillway, patterns observed from KOP1 under the proposed project/action will not change appreciably from current conditions. The effect of the project on pattern would be WEAK.

Size and Scale: As noted above, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. In addition, views of exposed soil between the waterline and forested hillside that occur during low pool conditions will change under the proposed project. In years where no water transfer is conducted by FPUD, the breadth of the area of exposed soil and the reservoir waterline (the "bathtub ring") will be somewhat reduced under the proposed project/action relative to the no project and no action alternatives during low pool conditions. In years where a transfer is conducted that is 2,000 AF or less, conditions related to exposed soil around the reservoir will be similar to or less than those under the no project or no action alternatives. In years where FPUD is able to execute a transfer of between 2,000 AF (the historical maximum) and 5,000 AF (the proposed future maximum), the ring of exposed soil/reservoir bottom around the reservoir would appear larger than under the No Project or No Action Alternatives. For these reasons, the effect of the project on the size and scale of features in views from KOP 1 is MODERATE.

KOP 2—Sugar Pine Road at Sugar Pine Dam

KOP 2 is located on Sugar Pine Road at the center of Sugar Pine Dam. To the east of KOP 2 travelers on the roadway are afforded views of the dam structure, spillway and reservoir water line in the immediate foreground. Foreground views include the reservoir water surface and the forested shoreline running east from the north and south ends of the dam. Middle ground views of the reservoir and far shore can be observed through the constriction formed by forested shorelines to the north and south of the reservoir. Background views of the forest and mountains beyond the far shore can also be seen through the constriction (see *Figure 4.2-3*). KOP 2's location on Sugar Pine Dam also affords immediate foreground and foreground views of the dam as well as brief views of the spillway from passing cars.

Form: The forms observed in views, i.e., shapes and masses of objects, observed from passing motorists at KOP 2 will be marginally altered by the proposed project. Trees adjacent to the current shoreline at maximum pool will be removed to accommodate the expanded inundation area. Under the proposed project/action, the reservoir at maximum pool and during low pool conditions will appear larger relative to the surrounding landscape. The radial gates and support structures will be visible, to varying degrees by passing motorists at KOP 2. For these reasons, changes to the form of immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line: The line of sight of viewers at KOP 2 includes a panorama moving from foreground views of the dam, spillway and parking area to foreground and middle ground views of the forested shorelines adjacent to the dam and middle ground views of the reservoir and far-shore during maximum pool conditions. During low pool conditions the line is altered due to the expanse of bare ground between the water surface and forest edge exposed with the receding reservoir. In addition, the radial gates and related facilities will be visible from KOP 2 to varying degrees. Tree removal and expansion of the inundation area under the proposed project/action will minimally affect the line of sight from KOP 2. While the water line at maximum pool will be higher under the proposed project/action and the reservoir larger at low pool relative to existing conditions, the line of these features will not be appreciably different. The line of sight to features on the far-shore will be slightly greater under the project due to the removal of trees along the northwest and southeast shorelines. For these reasons the effect of the project on line is considered WEAK.

Color: Colors observed from KOP 2 vary considerably depending on light conditions but, in general are dominated by the stark gray colors of the dam, spillway, and roadway in the immediate foreground; deep grey/green of the reservoir; greens of the forested shoreline and surrounding hillsides; light brown grey of the exposed shoreline between the forest edge and reservoir; and pale tans of the areas of bare ground at MDUA.

Under the proposed project, the spectrum of color observed from KOP 2 will remain unchanged with the following exceptions. Structures associated with the radial gate installation that are visible from KOP 2 will present a departure from the existing color scheme of the dam and spillway structure. Depending on the color of these facilities, this departure could have a substantial effect on views of the dam and spillway from KOP 2. Also, under the proposed project/action, the size of the reservoir during maximum pool and low pool conditions will be greater relative to the surrounding forest as compared to current conditions. Colors associated with the reservoir will be slightly more prominent relative to the forested hillsides. Lastly, light-colored areas at MDUA visible from KOP1 will be somewhat reduced under the proposed project/action at maximum pool. For these reasons, the effect of the project on color is considered to be WEAK to STRONG.

Pattern: The patterns contained in views of the dam, reservoir, shoreline and forest from KOP 2 provide the viewer a pleasing visual experience. With one exception, i.e., the introduction of radial gate facilities in the dam spillway, patterns observed from KOP 2 under the proposed project/action will not change appreciably from current conditions. The effect of the project on pattern would be WEAK.

Size and Scale: The expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. In addition, views of exposed soil between the waterline and forested hillside that occur during low pool conditions will change under the proposed project. For these reasons, the effect of the project on the size and scale of features in views from KOP 2 is MODERATE.

KOP 3—Entrance to Giant Gap and Shirttail Creek Campgrounds

Immediate foreground and foreground views from KOP 3 facing south include moderately vegetated areas of scrub and forest, paved roadways for access to the two campgrounds and day use area, signage, and public restrooms (see *Figure 4.2-4*). Views of the reservoir and shoreline are patchy due to substantial screening from trees between the entrance and waterline and topography. Middle ground views from KOP 3 include the screened and limited views reservoir surface, far shore, and forested hillsides to the south of the reservoir. Background views from KOP 3 are obscured by topography.

Form: Because the views of the reservoir surface and shoreline from KOP 3 are heavily screened, the contrast in appearance of the reservoir during maximum pool and low pool conditions from this observation point are not substantial. Under the proposed project, some of the existing screening of foreground and middle ground views provided by trees on the northwest shorelines will be eliminated. This will provide a wider view of the reservoir and far shoreline, the MDUA and forested hillside east of the reservoir. Additionally, the reservoir shoreline at maximum pool will be substantially closer to KOP 3. Nevertheless, views of the parking area and roadways will continue to dominate. As such, project alterations to the forms observed from KOP 3, i.e., shapes and masses of objects, will be limited. Proposed tree removal will afford greater visibility of the shoreline and reservoir beyond the parking area. The reservoir and shoreline will have greater visibility from KOP 3 under the proposed project. At low pool conditions, expanses of exposed due to the receding reservoir will be more visible from KOP 3. However, the size of the reservoir during low pool conditions will be generally larger with the proposed project/action relative to pre-project conditions. In years when FPUD can execute a water transfer of 5,000 AF, the size of the reservoir at the completion of that transfer will be comparable conditions during transfers of 2,000 AF under the No Project and No Action alternatives.

For these reasons, changes to the form of KOP 3 immediate foreground, foreground and middle ground views of the reservoir and shoreline is WEAK.

Line of Sight: As shown in *Figure 4.2-4*, the line of sight from KOP 3 offers a relatively limited view of the reservoir and shoreline. Views are screened to the east, west and north by forest and topography. Foreground views are dominated by the parking area, related facilities, and the roadways. Line of sight under the proposed project/action will include greater views of the reservoir and shoreline, the focal point of views from KOP3 will continue to be the roadways, parking areas and facilities which will not substantially change under the project. For these reasons the effect of the project on line is considered WEAK.

Color: Colors of the dominant features viewed from KOP 3, e.g., the roadway, parking area and related facilities will not change under the proposed project. The removal of trees will reduce the level of screening of views of the reservoir and shoreline from this point, and the color of the reservoir will be more apparent. This would be true for post project conditions at maximum pool and at low pool. For these reasons, the effect of the project on color is WEAK.

Pattern: Patterns observed at KOP 3 are comprised of a mixture of roadway features, signage, parking/restroom facilities in the foreground and screened views of the reservoir and shoreline beyond. In large part, the prominent patterns in this view will remain unchanged with the project. Patterns presented by the near shoreline, surrounding forest, the reservoir and the far-shore also will not change substantially with the proposed project/action except that exposure to these views will be improved somewhat by the removal of trees that are currently within the expanded area of inundation. The effect of the project on patterns seen from KOP 3 would be WEAK.

Size and Scale: The size and scale of features prominent in the view from KOP 3 will not change under the proposed project. As noted, the expansion of the reservoir's inundation area will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will also change under the proposed project. Views of the reservoir and shoreline, however, are limited at KOP 3 and will continue to be with the proposed project. For these reasons, the effect of the project on the size and scale of features in views from KOP3 are considered WEAK.

KOP 4— Manzanita Day Use Area

Views of the immediate foreground from KOP 4 include bare ground, trees and shrubs, and a portion of the JHMT. At maximum pool, the reservoir extends to the beach area at the MDUA. Middle ground views of the north and south shorelines shore a narrow band of bare ground between the water surface and forested areas. Some bare areas with distinctive rock features are visible in various locations along the shoreline at maximum pool. In addition, a small island feature is visible just offshore from the day use area. Background views from KOP 4 are obscured by topography.

Under low pool conditions, a wide band of darker colored soil/mud extends beyond the light-colored beach area to waters-edge (see *Figure 4.2-5*). During low pool conditions, the island feature is landlocked and no longer appears as an island. At low pool, the band of exposed soil between the forested shoreline and water surface along the north and south shorelines appears much broader in middle ground views.

Form: Alterations to the forms observed from KOP 4, i.e., shapes and masses of objects, will substantial under the proposed project/action. Proposed tree removal will afford greater visibility of the shoreline and reservoir, but will eliminate the framing effect and points of interest in those views that are currently present. In addition, vegetation on the island feature which now presents high visual interest to viewers will be cleared and the island itself will no longer be visible at maximum pool. During low pool conditions, expanses of exposed soil will dominate foreground and middle ground views as would also be the case with the No Action alternative. The size of the reservoir during low pool conditions, will be greater with the project relative to the no action alternative. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered to be MODERATE.

Line of Sight: As shown in *Figure 4.2-5*, the existing line of sight from KOP 4 is somewhat screened by trees and other vegetation. Line of sight under the proposed project/action will include wider, less obstructed views of the reservoir and shoreline. Views from KOP 4, however, will contain less diversity with the elimination of the island feature and tree/vegetation removal. For these reasons the effect of the project on line is considered MODERATE.

Color: Colors of the dominant features viewed from KOP 4, e.g., the reservoir, shorelines and surrounding areas that make up the MDUA will not change substantially under the proposed project. The removal of trees will expand views of the reservoir and shoreline from this point and the color of reservoir would be more dominant. This would be true for post project conditions at maximum pool and at low pool. For these reasons, the effect of the project on color is considered WEAK.

Patterns: As is evident in *Figure 4.2-5*, the patterns observed at KOP 4 are comprised of a mixture of trees, shrubs, gravel and the paved pathway of the JHMT in the foreground and screened views of the reservoir, island feature, and shoreline beyond. The prominent patterns in this view change substantially under the proposed project. Views of the reservoir and shorelines will be relatively unscreened. The reservoir shoreline at maximum pool will appear in the immediate foreground, and the island feature will be gone. Existing picnic facilities at MDUA will be replaced and relocated, and two new shade structures will be constructed at MDUA. The effect of the project on patterns seen from KOP 4 is considered MODERATE.

Size and Scale: The size and scale of features prominent in the view from KOP 4 will be considerably different under the proposed project/action relative to the no project and no action alternatives. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. Views of the reservoir and shoreline also will be relatively unobscured. The size and scale of areas exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described. For these reasons, the effect of the project on the size and scale of features in views from KOP 4 is considered MODERATE.

KOP 5— Giant Gap Picnic Area

KOP 5 is located at one of the picnic sites approximately 200 feet from the maximum pool shoreline. *Figure 4.2-6* shows the view from KOP 5 to the south. From this vantage point, views of the immediate foreground are scrub and scattered forest vegetation surrounding the picnic tables. Foreground views include the surrounding vegetation, trails, the northwest shoreline and the reservoir surface.

At maximum pool, the reservoir extends to the beach area at the MDUA and to forested areas that surround the GGCG picnic area. During low pool conditions, the waterline recedes substantially from MDUA and the forest exposing substantial areas of bare ground.

Form: Under the proposed project, much if not all screening of reservoir views from KOP 5 will be eliminated. During maximum pool conditions, views of the reservoir surface will appear in the immediate foreground. Foreground and middle ground views of the reservoir to the south and southwest will be panoramic and relatively unscreened by trees or other vegetation. During low pool conditions, the viewer will have unobstructed views of a substantial areas of exposed soil between shoreline vegetation and reservoir. From KOP 5, the reservoir will appear distant and larger relative to conditions anticipated under the no action alternative.

Figure 4.2-7 presents the view from the reservoir shoreline just downslope of KOP 5 at maximum pool, looking southeast toward the Manzanita Day Use Area. Also shown in *Figure 4.2-7* is a visual simulation of the same view at maximum pool with the proposed installation of the radial gates. *Figure 4.2-8* shows the view from the same general location during low pool conditions. That figure also presents the same view with simulated post-project conditions during low pool conditions. These simulations are approximate and were constructed using projected maximum pool elevations under the proposed project/action and lidar representations of the projected boundary of timber removal activities under the proposed project.

In light of the above information, project alterations to the forms observed from KOP 5, i.e., shapes and masses of objects, will be considerable. Proposed tree removal will afford greater visibility of the shoreline and reservoir but will eliminate the framing effect of those views currently present. At low pool conditions, areas of exposed soil will dominate foreground and middle ground views as would also be the case with the no action alternative. The size of the reservoir during low pool conditions will be greater with the project relative to the no action alternative. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line of Sight: As shown in *Figure 4.2-6*, views of the reservoir and shoreline from the KOP 5 picnic areas are highly screened by trees and other vegetation. Line of sight under the proposed project/action will include wider, less obstructed views of the reservoir and shoreline. Views from KOP 5, however, will contain less diversity with tree/vegetation removal. For these reasons the effect of the project on line is considered MODERATE.

Color: Colors of the dominant features viewed from KOP 5 are largely the greens and browns of the surrounding forest vegetation. Partial views of colors of the reservoir and far shoreline provide diversity and visual interest. The removal of trees under the proposed project/action will expand views of the reservoir and shoreline from this point and the color of the reservoir would be more dominant. This would be true for post project conditions at maximum pool and at low pool. For these reasons, the effect of the project on color is considered MODERATE.

Pattern: The patterns observed at KOP 5 are comprised primarily of forest habitat, picnic facilities, and partial views of the reservoir. The prominent patterns in this view would change substantially under the proposed project. Views of the reservoir and shorelines will be relatively unscreened. The reservoir shoreline at maximum pool will appear in the immediate foreground, and the island feature will be gone. The effect of the project on patterns seen from KOP 5 therefore is considered MODERATE.

Size and Scale: The size and scale of features prominent in the view from KOP 5 will be considerably different under the proposed project/action relative to the no project and no action alternatives. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. Views of the reservoir and shoreline also will be relatively unobscured under the proposed project. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described. For these reasons, the effect of the project on the size and scale of features in views from KOP 5 are considered MODERATE.

KOP 6—Giant Gap Campground (Shoreline Campsite #22)

KOP 6 provides a representative example of typical views experienced from developed campsites at GGCG that are situated in close proximity to the shoreline during maximum pool conditions. KOP 6 is located approximately 30 feet from the reservoir at maximum pool. This observation point offers foreground and middle ground views of the reservoir that are partially or moderately obscured by trees and other vegetation.

Under the proposed project, KOP 6 will be within the area of inundation. As such, the area surrounding the observation will be cleared of all vegetation. During maximum pool conditions, views of the reservoir surface will appear in the immediate foreground. Foreground and middleground views of the reservoir, near shore, and far shore will be panoramic and unscreened by trees or other vegetation. During low pool conditions, KOP 6 will be positioned on soil exposed by the receding reservoir. Views of the low pool reservoir will unobscured. The low pool reservoir will be larger under the proposed project/action relative to conditions anticipated under the no action alternative.

Form: Alterations to the forms observed from KOP 6, i.e., shapes and masses of objects, will be considerable under the proposed project/action. Tree removal will afford greater visibility of the shoreline and reservoir, but will eliminate the framing effect of those views currently present. At low pool conditions, expanses of exposed soil will dominate foreground and middle ground views as would also be the case with the No Action and No Project alternatives. The size of the reservoir during low pool conditions, will be greater with the project relative to the no action alternative. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered to be MODERATE.

Line of Sight: As shown in *Figure 4.2-9*, the line of sight from KOP 6, views of the reservoir and shoreline are highly screened by trees and other vegetation. Line of sight under the proposed project/action will be panoramic and unobstructed in all directions. For these reasons the effect of the project on line of sight is considered MODERATE.

Color: Colors of the dominant features viewed from KOP 6 are largely the greens and browns of the surrounding forest vegetation. Partial views of colors of the reservoir and far shoreline provide diversity and visual interest. The removal of trees under the proposed project/action will expand views of the reservoir and shoreline from this point and the color of reservoir would be more dominant. This would be true for post project conditions at maximum pool and at low pool. For these reasons, the effect of the project on color is considered to be MODERATE.

Pattern: The patterns observed at KOP 6 are comprised primarily of forest habitat, campsite facilities, and partially screened views of the reservoir. The prominent patterns in this view would change substantially under the proposed project. Views of the reservoir and shorelines will be unscreened. The reservoir and shoreline at maximum pool will appear in the immediate foreground. At minimum pool, the foreground will consist of bare soil. The effect of the project on patterns seen from KOP 6 therefore is considered MODERATE.

Size and Scale: The size and scale of features prominent in the view from KOP 6 will be considerably different under the proposed project/action relative to the No Action and No Project alternatives. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. Views of the reservoir and shoreline also will be relatively unobscured from KOP 6 under the proposed project. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described. For these reasons, the effect of the project on the size and scale of features in views from KOP 6 is considered MODERATE.

KOP 7—Giant Gap Campground (Inland Campsite #11)

KOP 7 is located a Campsite #11 and is located approximately 200 feet from the reservoir at maximum pool. In general, views from inland campsites at GGCG such as this are heavily screened by the forest surrounding these sites. As seen in *Figure 4.2-10*, immediate foreground and foreground views from KOP 7 include the forest floor, trees, scrub and camp facilities. Middle ground views of the reservoir and background views are largely or fully obscured by forest.

Under the proposed project/action, KOP 7 will be situated in close proximity to the reservoir shoreline at maximum pool. Views of the reservoir and far shoreline will be similar to those that currently exist at KOP

6 described above. Post-project views from KOP 7 would offer foreground and middle ground views of the reservoir that are only partially or moderately obscured by trees and other vegetation.

Form: Project alterations to the forms observed from KOP 7, i.e., shapes and masses of objects, will be considerable. Proposed tree removal will afford greater visibility of the shoreline and reservoir. At low pool conditions, areas of exposed soil will dominate foreground and middle ground views. Currently, these views from KOP 7 are obscured by trees and vegetation. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line of Sight: The line of sight from KOP 7, views of the reservoir and shoreline are highly screened by trees and other vegetation. Line of sight under the proposed project/action will be less obscured by vegetation. As such, the effect of the project on line is considered MODERATE.

Color: Colors of the dominant features viewed from KOP 7 are largely the greens and browns of the surrounding forest vegetation. Views of colors of the reservoir and far shoreline are largely obscured from view. The removal of trees under the proposed project/action will expand views of the reservoir and shoreline from this point and the color of reservoir be more dominant. This would be true for post-project conditions at maximum pool and at low pool. For these reasons, the effect of the project on color is considered MODERATE.

Pattern: The patterns observed at KOP 7 are comprised primarily of forest habitat, campsite facilities. The prominent patterns in this view would change substantially under the proposed project. Partially screened views of the reservoir and shorelines will become available. The reservoir and shoreline at maximum pool will appear in the immediate foreground. At minimum pool, the foreground will consist of bare soil exposed by the receding reservoir. The effect of the project on patterns seen from KOP 7 therefore is considered MODERATE.

Size and Scale: The size and scale of prominent features in the view from KOP 7 will be considerably different under the proposed project/action relative to the no action alternative. As noted, the reservoir's area of inundation will increase the size and scale at maximum pool and low pool under the project in relation to the surrounding shoreline and forested hillsides adjacent to shore. In addition, proposed timber and brush removal will eliminate obstructions to views of the reservoir that currently exist at KOP 7. The size and scale of areas exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described. For these reasons, the effect of the project on the size and scale of features in views from KOP 7 are considered MODERATE.

KOP 8- Multi-use Trail (Northwest Shore)

KOP 8 is located on the multi-use trail approximately ½ mile southwest of GGCG. This observation point is located along an unpaved portion of the trail that runs between the campground and the dam. Views from the trail near this location tend to be partially to heavily screened from view by vegetation, but as seen in *Figure 4.2-11*, screening of views of the reservoir from KOP 8 is minor. Immediate foreground views from KOP 8 include the reservoir, shoreline, and shoreline vegetation. Middle ground views at maximum pool are dominated by the reservoir, far shoreline, the forested hillside beyond, and the dam to the west.

The proposed expansion of the area of inundation for Sugar Pine Reservoir will inundate much of the multi-use trail in its current location. In keeping with the compensatory mitigation plan, the JHMT and the unpaved multi-use trails that circumscribe the reservoir will be reconstructed in locations entirely outside of the expanded inundation area. To address the potential project effects on views from the trails, several KOPs were selected to represent current views from the trails at various locations [i.e., KOP 8 (northwest shore), KOP 9 (southeast shore), KOP 10 (Forbes Creek), and KOP 11 (upper Shirttail Creek)]. Because these sites will be inundated under the proposed project, instead of comparing future views from the exact locations of KOPs 8-11, this evaluation instead compares future views from comparable sites along the trail realignments.

Under the proposed project, views from the replacement alignment due south of KOP 8 will be similar to those currently observed at KOP 8 during maximum pool conditions. The level of screening at this location is expected to be similar. As with KOP 8, views from the new trail will include the trail, forest, shoreline, shoreline vegetation and reservoir, and middleground views at maximum pool are dominated by the reservoir, far shoreline and forested hillside beyond. At low pool, areas of bare soil exposed will be visible between forest and waterline on both the near and far shore.

Form: Project alterations to the forms observed from KOP 8, i.e., shapes and masses of objects, will be relatively minor. From the new trail, views to the south will include low to moderate screening from shoreline vegetation and will be dominated by the reservoir, far shore and forested hillside beyond. At low pool conditions, expanses of exposed soil will dominate foreground and middle ground views as would also be the case with the no action alternative. The size of the reservoir during low pool conditions, will be greater with the project relative to the No Action and No Project alternatives. The gates and other facilities to be installed at Sugar Pine Dam will be slightly visible from the observation point. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered WEAK.

Line of Sight: For reasons presented above, the line of sight from the new trail near KOP 8 will not be unlike that currently experienced by trail users at KOP 8. As such, the effect of the project on line is considered WEAK.

Color: Colors of the dominant features viewed from KOP 8 will be not unlike those observed from nearby locations along the new trail. With the larger reservoir under the proposed project, colors of the reservoir will be somewhat more dominant relative to the forested hillside relative to conditions anticipated under the no action alternative, but this would not be apparent to the casual observer or slightly so. During low pool conditions the reservoir would be larger under the proposed project/action relative to the No Action and No Project alternatives and expanses of exposed soil between the forest and waterline would be similar. For these reasons, the effect of the project on color is considered WEAK.

Pattern: For reasons presented above, the patterns observed from the new trail near KOP 8 will not be unlike those experienced by trail users at KOP 8. As such, the effect of the project on line is considered WEAK.

Size and Scale: The size and scale of features prominent in the view from the new trail near KOP 8 will be different under the proposed project/action relative to the no action alternative. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project, but in most years, this change will not be substantially apparent given that the reservoir at low pool will be larger than that which would occur under the No Action and No Project alternatives. However, in years when FPUD executes a water transfer that is greater than the historic maximum of 2,000 AF, the size of the area of exposed soil between the waterline and forest will be greater under the proposed project/action. For these reasons, the effect of the project on the size and scale of features in views from KOP 8 are considered MODERATE.

KOP 9— Joshua Hardt Memorial Trail (Southeast Shore)

KOP 9 is located on the JHMT approximately ½ mile northwest of the trail bridge on Forbes Creek (see *Figure 4.2-12***)**. This observation point is located along the paved portion of the JHMT that runs between the bridge at Forbes Creek and the bridge crossing at Shirttail Creek. The JHMT at KOP 9 runs adjacent to the reservoir shoreline with very limited vegetative screening and provides panoramic views of the reservoir to the west, north and south. As seen in the figure, immediate foreground views at this observation point include vegetation along the shoreline and the water surface. Foreground views are exclusively water surface. Middle ground views include the shoreline on the far-shore and forested hillside beyond. This observation point offers clear views of the shoreline along GGCG and MDUA directly across the reservoir.

At maximum pool, water is present in the immediate foreground at KOP 9. On the far-shore, the reservoir extends to the base of forested areas along the southeast shoreline with a narrow band of bare shoreline visible. During low pool conditions, foreground views are dominated by gravel, mud and rock exposed by the receding reservoir. On the far-shore, the band of exposed soil between the forested shoreline and water surface broadens substantially and is noticeable. This is particularly evident adjacent to the MDUA where waters are shallow even at maximum pool and the area of exposed ground is considerable when the reservoir recedes.

Under the proposed project/action, views from the replacement JHMT due north of KOP 9 will be similar to those currently observed at KOP 9 during maximum pool conditions. The level of screening at this location is expected to be similar. As with KOP 9, views from the new JHMT will include the trail, sparse scrub vegetation and scattered trees, shoreline vegetation and the reservoir. Middle ground views at maximum pool will be dominated by the reservoir, far shoreline and forested hillside beyond. At low pool, areas of exposed bare soil will be visible between forest and waterline on both the near and far shore.

Form: Project alterations to the forms observed from KOP 9, i.e., shapes and masses of objects, will be moderate. From the new JHMT, views to the south will include low to moderate screening from shoreline vegetation and will be dominated by the reservoir, far shore and forested hillside beyond. At present, views from KOP 9 include the island feature just offshore of MDUA and much of the varied habitat and terrain associated with MDUA. Under the proposed project, the island feature and much of the terrain associated with MDUA will be inundated during maximum pool conditions. At low pool, expanses of exposed soil will dominate foreground and middle ground views as would also be the case with the no action alternative. The size of the reservoir during low pool conditions will vary depending on a number of variables including seasonal precipitation, diversions made to meet service area demand, and whether or not a water transfer is executed and the size of that transfer. In general, if the maximum future transfer of 5,000 acre-feet is executed by the District, the size of the reservoir will be comparable during low pool conditions to the no action and no project alternative. If a transfer is not executed in a given year, the size of the reservoir will be larger during low pool conditions under the proposed project/action relative to the No Action and No Project alternatives.

To illustrate the effects of the visual contrast between current and post-project views from KOP 9, a visual simulation was created for the view from KOP 9 looking north toward GGCG and MDUA. Both photos show views from KOP 9 under low pool conditions.

For the above reasons and as illustrated in *Figure 4.2-12*, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line of Sight: For reasons presented above the line of sight from the new JHMT near KOP 9 will be not unlike that currently experienced by trail users at KOP 9. As such, the effect of the project on line is considered WEAK.

Color: Colors of the dominant features viewed from KOP 9 will be not unlike those observed from nearby locations along the new JHMT. With the larger reservoir under the proposed project, colors of the reservoir will be somewhat more dominant relative to the forested hillside relative to conditions anticipated under the no action alternative, but this would not be apparent to the casual observer or slightly so. The contrast in color presented by light-colored, sparsely vegetated expanses of gravel at MDUA will be reduced with the expanded area of inundation extending to the forest edge at that location. During low pool conditions the reservoir would be larger under the proposed project/action relative to the no action alternative and expanses of exposed soil between the forest and waterline would be similar. For these reasons, the effect of the project on color is considered WEAK to MODERATE.

Pattern: For reasons presented above the patterns observed from the new JHMT near KOP 9 will be somewhat altered by the propose project relative to those experienced by trail users at KOP 9. As such, the effect of the project on line is considered MODERATE.

Size and Scale: The size and scale of features prominent in the view from the new JHMT near KOP 9 will be different under the proposed project/action relative to the no action alternative. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project, but in most years, this change will not be substantially apparent given that the reservoir at low pool will be larger than that which would occur under the No Action and No Project alternatives. However, in years when FPUD executes a water transfer that is greater than the historic maximum of 2,000 AF, the size of the area of exposed soil between the waterline and forest will be greater under the proposed project/action. For these reasons, the effect of the project on the size and scale of features in views from KOP 9 are considered MODERATE.

KOP 10— Joshua Hardt Memorial Trail (Forbes Creek)

KOP 10 is located on the JHMT approximately 1000 feet west of the Forbes Creek bridge crossing, on the north side of the creek. The JHMT at KOP 10 runs adjacent to Forbes Creek near its outlet to Sugar Pine Reservoir. The top photo in *Figure 4.2-13* was taken during maximum pool conditions and show immediate foreground views that include riparian vegetation adjacent to the creek and a broadening stream channel as the creek meets the reservoir at maximum pool elevation. Foreground views are lush riparian vegetation along the north and south banks of the creek. A narrow and rocky stream channel with multiple pools and ripples upstream of the observation point, giving way to a broader channel with calmer waters as the creek enters the reservoir. Middle ground views are obscured in most directions due to the topography of the Forbes Creek Canyon, but middle ground views to the north offer views of the reservoir and far-shore framed by the contours of the canyon opening to the reservoir.

At maximum pool, water is present in the foreground at KOP 10. The transition from stream to reservoir is clearly apparent. Little exposed ground is apparent between the creek and reservoir water surfaces and the bands of riparian and forest vegetation surrounding both. The bottom photo in *Figure 4.2-13* was taken from the same location during low pool conditions. During low pool conditions, creek flow may decrease dramatically and the transition from stream to reservoir will occur further to the north of KOP 10. At low-pool conditions, foreground views are dominated by gravel, mud and rock exposed by the receding reservoir. On the far-shore, the band of exposed soil between the forested shoreline and water surface broadens substantially, though this is not particularly noticeable from KOP 10 due to the limited view of the far-shore from this location.

Under the proposed project/action, views from the replacement JHMT due south of KOP 10 will be similar to those currently observed at KOP 10 during maximum pool conditions. The level of screening at this location is expected to be similar. As with KOP 10, views from the new JHMT will include the trail, sparse scrub vegetation and scattered trees, shoreline vegetation and the reservoir. Middle ground views at maximum pool will be dominated by the reservoir, far shoreline and forested hillside beyond. Views from the new JHMT will lack the riparian nature of existing views from KOP 10 at least in the short term. The project will, at maximum pool, inundate areas along Forbes Creek that support willow, cottonwood and other plants indicative of streamside habitat. Over time, these species will reestablish where suitable conditions allow along Forbes Creek, but the short-term effects of the project will show a marked reduction in the diversity of habitat in views from KOP 10. At low pool, foreground views from the new JHMT will include larger expanses of bare soil between the forest edge and Forbes Creek. Middle ground views will show larger areas of open water at the reservoir and expanses of exposed soil along near and far shorelines.

Form: Project alterations to forms observed from KOP 10, (i.e., shapes and masses of objects), will be moderate. From the new JHMT, views to the west and north of Forbes Creek and Sugar Pine Reservoir will be relatively unobstructed. At present, views from KOP 10 include a visually pleasing mix of stream, streamside and lake views with a variety of habitat types. With the proposed project, views from JHMT will be less varied, dominated by the reservoir and adjacent hillside at high water and exposed soil, unvegetated stream channel, and forested hillside during low pool conditions. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line of Sight: For reasons presented above the line of sight from the new JHMT near KOP 10 will be not unlike that currently experienced by trail users at KOP 10. As such, the effect of the project on line of sight is considered WEAK.

Color: Colors observed from KOP 10 are those of the dominant features viewed from KOP 10 which include riparian habitat along Forbes Creek, the stream and stream bank, forested hillside west of the creek, and Sugar Pine Reservoir and shoreline. Colors viewed from the new JHMT will be less diverse primarily due to project effects on streamside habitat. For these reasons, the effect of the project on color is considered MODERATE.

Pattern: For reasons presented above the patterns observed from the new JHMT near KOP 10 will be altered by the propose project relative to those experienced by trail users at KOP 10. As such, the effect of the project on patterns is considered MODERATE.

Size and Scale: The size and scale of features prominent in the view from the new JHMT near KOP 10 will be different under the proposed project/action relative to the no action alternative. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project, but in most years, this change will not be substantially apparent given that the reservoir at low pool will be larger than that which would occur under the No Action and No Project alternatives. However, in years when FPUD executes a water transfer that is greater than the historic maximum of 2,000 AF, the size of the area of exposed soil between the waterline and forest will be greater under the proposed project/action. For these reasons, the effect of the project on the size and scale of features in views from KOP 10 are considered MODERATE.

Alternative 1: Alternative JHMT Alignment

As described in Chapter 2, Alternative 1 to the proposed project/action would realign the proposed reconstruction of the JHMT to avoid an identified population of Layne's butterweed. The realignment would route the new JHMT up the hill north of the Forbes Creek bridge and then west to intersect with the proposed JHMT southwest of upper Shirttail Creek. Implementation of Alternative 1 and its effect on views would be identical to the proposed project/action at all KOPs addressed in this DEIR/EIR with the singular exception of KOP 10.

Views along the Alternative 1 trail route would be partially screened and would consist of views of the Forbes Creek intersection with Sugar Pine Reservoir where the trail heads north from Forbes Creek. As the trail extends west toward the reservoir, predominant views are of the reservoir and far shore including GGCP and MDUA.

Under Alternative 1 and in areas where views are not screened by vegetation, hikers would be afforded higher vantage points for views of Forbes Creek and Sugar Pine Reservoir in comparison to views from KOP 10. As such, the impact of the proposed project/action on views due to periodic increases in areas of exposed soil along the shorelines would be more apparent along the Alternative 1 trail alignment. Immediate foreground and foreground views of Forbes Creek and the reservoir would be largely unavailable under Alternative 1 given its largely inland route location. Despite these differences, however, there is no evidence to suggest that the effect of Alternative 1 on form, color, patterns, line of site, and size and scale of views relative to the no project and no action alternatives would be substantially different than that expected from the proposed project/action. Specifically, the effect of Alternative 1 on the form, line of sight, color, pattern, and size and scale in views from the alternative trail route are found to be Moderate, Weak, Moderate, Moderate, and Moderate, respectively.

KOP 11— Joshua Hardt Memorial Trail (Upper Shirttail Creek)

KOP 11 is located on the JHMT at the upper Shirttail Creek bridge crossing. This observation point is located along the paved portion of the JHMT that runs between the MDUA and the Forbes Creek bridge. The JHMT at KOP 11 crosses the creek via a footbridge. The footbridge affords hikers a unique experience along the JHMT of enjoying 360° views of the picturesque creek and dense, lush and varied riparian habitat that surrounds it (see *Figure 4.2-14*). Immediate foreground views at this observation point include the bridge, the paved trail, and dense riparian vegetation adjacent to the creek in all directions. Foreground views are exclusively of the stream channel and surrounding vegetation. Middle ground and background views are nearly entirely obscured by vegetation.

Under the proposed project/action, vegetation within the expanded reservoir inundation area will be removed. This removal will include a large portion of riparian vegetation along upper Shirttail Creek west of KOP 11, although some vegetation along the creek will remain in place to provide fish habitat. As noted above, foreground views to the west of KOP 11 include the creek channel and dense riparian vegetation. Middle ground and background views are obscured by this vegetation. With the proposed removal of riparian vegetation west of KOP 11, middle ground views of the expanded reservoir, the far shoreline and forested hillsides will be opened up. Foreground views of the stream and surrounding vegetation will be substantially altered. Views to the north, south, and east of the bridge will be largely unchanged with the proposed project/action.

Form: Project alterations to forms observed from KOP 11, i.e., shapes and masses of objects, will be moderate. As noted, views to the west that are currently obscured by dense vegetation, will be opened up to afford views of the reservoir, reservoir shoreline and forested hillsides. This represents a significant change in the shapes and masses of objects currently viewable from KOP 11. As noted, views to the east, south and north, however, will be unchanged under the proposed project/action. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered MODERATE.

Line of Sight: For reasons presented above the line of sight to the west of KOP 11 will be substantially altered under the proposed project/action. As such, the effect of the project on line is considered MODERATE.

Color: Colors observed from KOP 11 are those of the dominant features viewed from KOP 11 which include almost exclusively riparian habitat along Shirttail Creek, the stream and stream bank, JHMT, and the footbridge. With the proposed project/action, colors viewed from KOP 11 will include those associated with the reservoir and surrounding shoreline and hillsides as views to the west of KOP 11 will be opened up. For these reasons, the effect of the project on color is considered MODERATE.

Pattern: For reasons presented above the patterns observed from the new JHMT near KOP 11 will be altered by the propose project relative to those experienced by trail users at KOP 11. As such, the effect of the project on patterns is considered MODERATE.

Size and Scale: The size and scale of features prominent in the views to the west of KOP 11 will be different under the proposed project/action relative to the No Action and No Project alternatives due to the removal of vegetation that currently obscures middle ground views of reservoir and shoreline. Vegetation removal will afford the views of these features and substantially alter the size and scale of the landscape visible from KOP 11. For these reasons, the effect of the project on the size and scale of features in views from KOP 11 is considered MODERATE.

KOP12--Sugar Pine Boat Ramp

KOP 12 is located on the southern shore of Sugar Pine Reservoir, east of Forbes Creek and approximately ¼ mile east of the dam. Looking north from KOP 12, immediate foreground views include paved road and parking areas, the concrete ramp, floating docks, anchor lines and the waterline (see *Figure 4.2-15*). Foreground views include the reservoir water surface and the forested shoreline immediately west of the ramp and extending west toward the dam. To the north, middle ground views include the reservoir and forested shoreline and hills on the far-shore. Views to the east are obscured by trees and topography.

At maximum pool, the reservoir extends to within 10 feet of the top of the boat ramp with only a narrow band of bare shoreline visible. The view is impressive in its natural appearance and balance of line, color, and texture. At minimum pool, the band of exposed soil between the forested shoreline and water surface is much broader. This is most apparent in the immediate foreground and foreground views. It is less distinct in middle ground views of the far shore. Views of the reservoir from KOP 12 at minimum pool are less natural in appearance and tend to be dominated by the expanse of bare ground between the forest and water.

Form: Under the proposed project/action, the boat ramp would be extended approximately 100 feet to the southeast in order to accommodate the expanded inundation area. The existing ramp would be left in place. As is currently the practice, the floating dock at the ramp will be moved back and forth to accommodate fluctuations in reservoir elevations. Views from the top of the ramp west toward the reservoir will be similar to those currently observed at KOP 12 during maximum pool conditions. The reservoir will extend to the forest edge with a narrow band of exposed soil and rock between. At low pool, expanses of bare soil exposed will be visible between forest and waterline on both the near and far shore. The water line at the dam will be higher during low pool conditions as compared to low pool under the no action alternative. The area of inundation during low pool conditions will also be larger with the proposed project/action relative to the No Action and No Project alternatives.

The presence of dense forest along the shoreline adjacent to the boat ramp dominates views from the top of the existing ramp. The forest frames a narrow view of the boat ramp, reservoir, far-shore, and dam from KOP 12. The removal of trees and vegetation within the expanded inundation area adjacent to the ramp will open up views of the reservoir to the south and north. Views from KOP 12 will be dominated to a greater degree by the reservoir surface, far-shore and dam with only limited screening by trees and other vegetation. Additionally, views from the existing boat ramp parking areas that are currently heavily screened, will change with much greater visibility of the reservoir and far-shore. For these reasons, changes to the forms presented in views of the reservoir and shoreline is considered to be MODERATE.

Line of Sight: For reasons presented above the line of sight from KOP 12 will be altered substantially. As such, the effect of the project on line is considered MODERATE.

Color: Colors observed from KOP 12 are dominated by the greens and brown of the surrounding forest, with the focal point of the boat ramp, reservoir and far-shore framed by the forest. Under the project colors of the reservoir and far-shore will dominate views. For these reasons, the effect of the project on color would be considered MODERATE.

Pattern: For reasons presented above the patterns observed from KOP 12 will be altered considerably by the proposed project/action relative to those experienced by current users of the boat ramp facilities. As such, the effect of the project on patterns is considered MODERATE.

Size and Scale: As described above, the size and scale of features prominent in the view from KOP 12 will be different under the proposed project/action relative to the no action and no projects alternatives. In addition, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described. For these reasons, the effect of the project on the size and scale of features in views from KOP 12 are considered MODERATE.

KOP 13— Sugar Pine Reservoir (West)

KOP 13 is located on Sugar Pine Reservoir adjacent to the northwest shoreline approximately 1000 feet east of Sugar Pine Dam. Immediate foreground views at this observation point are exclusively of water surface. Foreground views to the south (see *Figure 4.2-16*) include the reservoir and southeast shoreline. Views to the west are dominated by Sugar Pine Dam and adjacent shorelines. Views to the east include the northwest shoreline and reservoir.

The top photo in *Figure 4.2-16* shows the view from the reservoir at maximum pool. There is very little separation between the waterline and forest on all surrounding shorelines. The waterline elevation at the dam is consistent with the elevation of the spillway, exposing only the structure above the spillway. As shown in the bottom photo in the figure, at low pool, the separation of forest along the shoreline and the reservoir water surface is substantially larger. From KOP 13, this separation is less apparent than at other locations on the reservoir due to the steep topography on the shorelines immediately north and south of the observation point. Because of the steepness of the terrain, the expanse of area exposed as the reservoir recedes is less than shallower areas around the reservoir.

Under the proposed project/action, views from KOP 13 will be similar to those currently observed at KOP 13 during maximum pool conditions. Immediate foreground and foreground views will be of the reservoir water surface and near shore. Middle ground views will be of the reservoir, dam, far shore and forested hillsides beyond. At low pool, expanses of bare soil exposed will be visible between forest and waterline on both the near and far shore. The size of the reservoir will be greater during low pool conditions relative to the no action alternative.

Form: Project alterations to the forms, i.e., shapes and masses of objects, observed from KOP 13 at maximum pool will include the appearance of the reservoir being larger relative to the surrounding vegetated hillsides. Because the waterline at the dam will be approximately 20 feet higher at maximum pool, less of the dam will be visible from KOP 13. Additionally, features associated with MDUA, riparian areas at the mouths of Shirttail and Forbes creeks will be inundated under the proposed project. At KOP 13, forms present in immediate foreground and foreground views will not change substantially. For these reasons, changes to the forms presented in immediate foreground, foreground and middle ground views of the reservoir and shoreline is considered to be WEAK.

Line of Sight: The line of sight from KOP 13 will be not unlike that currently experienced by boaters on Sugar Pine Reservoir. As such, the effect of the project on line is considered WEAK.

Color: Colors of the dominant features viewed from KOP13 will be not unlike those observed currently by reservoir users. With the larger reservoir under the proposed project, colors of the reservoir will be somewhat more dominant relative to the forested hillside relative to conditions anticipated under the no action alternative, but this would not be apparent to the casual observer or slightly so. During low pool conditions the reservoir would be larger under the proposed project/action relative to the no action alternative and expanses of exposed soil between the forest and waterline would be similar. For these reasons, the effect of the project on color is considered WEAK.

Pattern: For reasons presented above the patterns observed from the KOP 13 will be not unlike those experienced by current users of Sugar Pine Reservoir. As such, the effect of the project on patterns from this observation point is considered WEAK.

Size and Scale: The size and scale of features prominent in the view from the KOP 13 will be different under the proposed project/action relative to the no action alternative. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool and low pool in relation to the surrounding shoreline and forested hillsides adjacent to shore. The size and scale of areas of exposed soil between the waterline and forested hillside during low pool conditions will change under the proposed project/action as previously described, but views from the surface of the reservoir will not be substantially different given that the reservoir at low pool will be larger than that which would occur under the No Action and No Project alternatives. An exception to this is when FPUD executes future water transfers of from 2,000 to 5,000 AF. This is projected to occur no more frequently than once every three years, but would result in views from the water surface that exhibit larger areas of exposed soil between the reservoir water surface and forested shoreline. For these reasons, the effect of the project on the size and scale of features in views from KOP 13 is considered MODERATE.

Alternative 2: Helicopter Harvest

Short-Term Construction-related Visual Effects Analysis

Construction activities associated with the proposed installation of radial gates at Sugar Pine Dam would include the transport and installation of the gates and related facilities at the dam, timber and brush removal within the expanded inundation area of Sugar Pine Reservoir, the demolition and removal of recreational facilities within the expanded area of inundation, and the construction of replacement facilities and implementation of other compensatory mitigation measures such as Shirttail Creek habitat enhancement, fuel management, and pond construction as outlined in the compensatory mitigation plan described in Chapter 2 (Project Description) of this DEIR/EIS. These activities could be visible to motorists on Sugar Pine Road and/or recreationists.

Under Alternative 2, all elements of project construction would be identical to those described for the proposed project/action with the exception of timber harvest activities. As described above, nine (9) acres of forest habitat within the expanded reservoir inundation area would be harvested with the use of a helicopter instead of mechanical methods which would be employed for the proposed project/action.

Similar to that of the proposed project/action, the visual impact of project construction activities would be temporary. The visibility of helicopter activities in the project area, construction vehicles and equipment, and disturbances in the landscape associated with the preparation of construction work area could degrade existing visual character of the project area for recreational users at Sugar Pine Reservoir. With implementation of Mitigation Measures **VIS-1** and **VIS-2** the potential for visual impacts during construction would be reduced to less-than-significant levels under CEQA and to not adverse under NEPA by limiting public access to USFS recreational facilities with views of the project area during project construction and by requiring the restoration of all temporary work areas to near pre- construction conditions (when construction has been completed).

Long-Term Visual Effects Analysis

The long-term visual effects resulting from implementation of Alternative 2 would be identical to those of the proposed project/action described above.

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Short-Term Effects of the Proposed Project/Action and Alternatives 1 and 2

As discussed above, activities associated with installation of radial gates, timber and brush removal from the expanded area of inundation, replacement and relocation of the JHMT and multi-use trails, and the construction of new recreational facilities at GGCG and MDUA will have temporary and significant impacts on the character and quality of visual resources within the project area. Implementation of Mitigation Measures **VIS-1** and **VIS-2** will reduce this temporary impact to a level considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Long-Term Effects of the Proposed Project/Action

Long-term effects of the proposed project/action on the scenic character and quality of the project area and surroundings were examined in relation to views from 13 key observation points situated at various locations around Sugar Pine Reservoir. The long-term effect of the proposed project/action was examined in terms of how the project will change various aspects of visual character, i.e., form, line, color, pattern, and size/scale, compared to conditions expected to occur under the no project and no action alternatives.

Table 4.2-3 summarizes the findings of this section regarding the anticipated contrast in the landscape character elements of form, line, color, patterns, and size and scale between the proposed project/action and no action alternative conditions as viewed from each of the 13 KOPs. The majority or project effects on visual characteristics at these observation points range from weak to moderate. In one instance, however, a potentially "strong" effect could occur as a result of the project. In this case, the installation of the radial gates could have a strong effect on the color aspect of views from KOP 1 if the colors selected for the radial gate facilities are in high contrast to existing conditions at the dam.

Table 4.2-3. Effects of the Proposed Project/Action on Visual Contrast from Selected KOPs

KOP	Location	Form	Line	Color	Pattern	Size and Scale
1	Sugar Pine Dam Viewpoint	Moderate	Weak	Weak to Strong	Weak	Moderate
2	Sugar Pine Road at Sugar Pine Dam	Moderate	Weak	Weak to Strong	Weak	Moderate
3	Entrance to GGCG and MDUA	Weak	Weak	Weak	Weak	Weak
4	MDUA	Moderate	Moderate	Weak	Moderate	Moderate
5	GGCG Picnic Area	Moderate	Moderate	Moderate	Moderate	Moderate
6	GGCG: Shoreline Campsite #22	Moderate	Moderate	Moderate	Moderate	Moderate
7	GGCG: Inland Campsite #11	Moderate	Moderate	Moderate	Moderate	Moderate
8	JHMT: Northwest Shore	Weak	Weak	Weak	Weak	Moderate
9	JHMT: Southeast Shore	Moderate	Weak	Weak to Moderate	Moderate	Moderate
10	JHMT: Forbes Creek	Moderate	Weak	Moderate	Moderate	Moderate
11	JHMT: Upper Shirttail Creek	Moderate	Moderate	Moderate	Moderate	Moderate
12	Sugar Pine Boat Ramp	Moderate	Moderate	Moderate	Moderate	Moderate
13	Sugar Pine Reservoir	Weak	Weak	Weak	Weak	Moderate

As described in detail above, changes in the scenic character of views from the various KOPs can be characterized as: 1) changes in the viewers perception of the size of the reservoir in relation to the surrounding hillside; 2) loss of visual diversity due to tree removal within the expanded inundation area; 3), loss of points of visual interest such as the island feature at MDUA at maximum pool and stream habitat on Forbes Creek at its inlet to Sugar Pine Reservoir; 4) changes in the appearance of areas of exposed soil and rock above the reservoir waterline during low pool conditions; and 5) the elimination or reduction of screening of reservoir views from various viewpoints.

Of the 13 KOPs examined in this section, nine (9) have a Visual Quality Objective of "RETENTION." As noted, the RETENTION objective:

> "Provides for management activities which are not visually evident. Activities may only repeat form, line, color and texture which are frequently found in the characteristic landscape. Changes in their qualities of size, amount, intensity, direction, pattern, etc. should not be evident."

The nine (9) KOPs for which the RETENTION KOP applies include: KOP 1 (Sugar Pine Dam Observation Area); KOP 2 (Sugar Pine Road); KOP 4 (MDUA); KOP 5 (GGCG picnic area); KOPs 8 through 11 (various locations on the JHMT and multi-use trail; and KOP 13 (Sugar Pine Reservoir). As shown in *Table 4.2-3* above, project effects on the form, line, color, pattern, and size and scale of views from KOP 1 (Sugar Pine Dam Observation Area) and KOP 2 (Sugar Pine Road) are considered moderate, weak, weak to strong, weak, and moderate, respectively. As such, the visual contrast of views from KOP 1 and KOP 2 under the proposed project/action could be considered inconsistent with the RETENTION VQO.

The effect of the project on the form, line, color, pattern, and size and scale of views from views from KOPs 4, 5, 8-11, and 13 include multiple instances where the effects are considered MODERATE (see *Table 4.2-3*). MODERATE effects on form, line, color, pattern or size or scale would, by definition, not be consistent with the RETENTION VQO. Mitigation Measure **VIS-3**, below, is designed to assure consistency of the proposed project/action and Alternatives 1 and 2 with the TNF LMRP VQO designations, particularly, those viewpoints which fall under the RETENTION designation.

Of the 13 KOPs examined herein, four (4) have a VQO of PARTIAL RETENTION. As noted, the PARTIAL RETENTION objective:

> "Provides for management activities that remain visually subordinate to the characteristic landscape. Activities may repeat form, line, color and texture common to the characteristic landscape but changes in their qualities of size, amount, intensity, direction, pattern, etc. remain visually subordinate to the characteristic landscape. Activities may also introduce form, line, color or texture which are found infrequently or not at all in the characteristic landscape, but still remain subordinate to the visual strength of the characteristic landscape."

The potential project effects on the form, line, color, pattern, and size and scale from KOP 1 (Sugar Pine Dam Observation Area) and KOP 2 (Sugar Pine Road at Sugar Pine Dam) range from WEAK to MODERATE with two exceptions. The effect of the project on color is considered potentially STRONG contingent on the color selection for the radial gates and related facilities. This is considered a significant impact requiring mitigation under CEQA and an adverse impact under NEPA. Implementation of Mitigation Measure **VIS-4** would reduce the impact to less than significant under CEQA and would avoid adverse effect under NEPA.

Apart from the assessment of project consistency with VQO of the TNF LRMP, CEQA requires an EIR to consider whether a project will degrade the existing visual character or quality of the site and its surroundings. The long-term effects of the proposed project/action on views are described in detail in the preceding text relative to conditions anticipated with the no project and no action alternatives. With implementation of the proposed project/action, forest and scrub habitat within in the expanded inundation area will be removed and the size of the reservoir at maximum pool will increase. The proposed increase in reservoir storage capacity will allow for FPUD to maintain higher reservoir elevations during low pool conditions relative to the no project and no action in all years. Also, under the proposed project/action, recreational facilities directly affected by the project would be replaced in-kind.

Expansion of the reservoir at maximum pool and during low pool conditions, in and of itself, is not considered a substantial degradation of the visual character of the project site and surroundings. The reservoir will appear larger relative to its surroundings but not substantially different in appearance relative to pre-project conditions in terms of form, pattern, line of sight, color and scale.

The appearance of the ring of exposed soil around the reservoir during low pool conditions, however, would be substantially larger under the proposed project/action under certain conditions. Specifically, in years where a maximum allowed water transfer of 5,000 AF is executed, the drawdown associated with such a transfer will result in a ring that is substantially broader than would occur under historical conditions in which no transfers greater than 2,000 AF have occurred. While the appearance of exposed soil between the forest and waterline is common during seasonal low pool conditions, it is, nonetheless considered visually adverse relative to views at maximum pool, and this condition would be exacerbated by the proposed project/action in years when a maximum transfer is carried out, particularly when that transfer is performed in spring as opposed to late summer. This is considered a ***significant and unavoidable impact*** (CEQA) and ***adverse effect*** (NEPA) on visual resources under the proposed project/action and alternatives.

Construction of new recreational facilities at GGCG and MDUA and replacement of portions of the JHMT would either replace facilities that currently exist and would be constructed in accordance with Forest Plan visual guidelines for materials, colors, and reflectivity. For these reasons and reasons presented above, the proposed project/action effect of the project on visual quality and character of the project area and surrounding would be less than significant, with the following exceptions. As described in Section 2.2.5: Project Design Features and Compensatory Mitigation Measures, Measure H1 could, upon review of input from recreational users at Sugar Pine Reservoir, require the installation of a removable mat surface or a permanent hardened surface to facilitate access between MDUA/CCGC and the reservoir waterline during low pool conditions. These walkways would introduce new structural elements to the landscape previously viewable from a number of the 13 KOPs addressed in this section, including those with VQOs designated as RETENTION. This is considered a potentially significant impact. With implementation of Mitigation Measure **VIS-3**, this impact is considered ***less than significant with mitigation incorporated*** (CEQA) ***and no effect*** (NEPA).

In addition to the proposed walkways discussed above, another structural element to be constructed under the proposed project/action that is not entirely consistent with existing facilities is the expansion of the Sugar Pine boat ramp. While the boat ramp does indeed currently exist, the proposed project/action would require an expansion of the existing ramp to maintain the ramp's functionality during high pool conditions. As described in Chapter 2, this would require the removal of areas of forest adjacent to the existing ramp, grading, the removal of some existing pavement, the placement of new pavement to replace affected parking areas and access roadways, and the upland extension of the ramp itself.

The boat ramp is visible from two of the 13 KOPs evaluated in this DEIR/EIS: KOP 8 and KOP 12. KOP 8 represents views of the ramp from the JHMT along the northeast shore of the reservoir. These are middle ground views, and while the ramp is clearly visible from this vantage point, it is not prominent given its location above the water surface and along the shoreline, with substantial back screening due to the forested hillside beyond the ramp (see *Figure 4.2-15*). Views of the ramp from at KOP 12 are foreground views of the ramp, surrounding forest, shoreline and paved parking and access areas. Boat ramp modifications will be consistent with facilities currently present at the site but larger in size and scale. This expansion is not expected to substantially affect views from KOP 8 and other locations along the JHMT. Immediate Foreground and Foreground views of the ramp modifications from KOP 12, however, will be substantial due, primarily, to tree removal, new pavement, and the extension of the concrete ramp. As there is no feasible mitigation to substantially reduce this effect, this is considered a ***significant and unavoidable impact*** (CEQA) and ***adverse effect*** (NEPA) of the proposed project/action.

Long-Term Effects of Alternative 1: JHMT Realignment (Impact VIS-3)

Under this alternative, project effects on the visual character of views from observation points in areas affected by the proposed project/action would be similar to those for the proposed project/action with the following exception. The appearance of reconstructed JHMT from KOPs 9 (JHMT Southeast Shore) and 10 (JHMT Forbes Creek) would be different under this alternative. Under the proposed action, the reconstructed JHMT would be paved and located close to the reservoir shoreline adjacent to Forbes Creek. The alternative alignment would construct a non-paved foot path from the Forbes Creek bridge to the approximate location of KOP 9 on the reservoir's southeast shore. Future uses of the alternative alignment would be presented with elevated views of Forbes Creek and the reservoir from the hillside that are currently unavailable and would not be available under the proposed project/action. The alternative alignment would be barely discernable from other KOPs around the lake and, although it would appear in a different location than the proposed project/action alignment, not substantially different in visual character as compared to the paved trail that would be constructed as part of the proposed project/action.

For these reasons, the determination of impact on the visual character of views resulting from this alternative is the same as that for the proposed project/action. The impact is considered ***significant and unavoidable*** (CEQA) and an ***adverse effect*** (NEPA).

Long-Term Effects of Alternative 2: Helicopter Harvest (Impact VIS-3)

The long-term visual effects resulting from implementation of Alternative 2 would be identical to those of the proposed project/action described above. For these reasons, the determination of impact on the visual character of views resulting from this alternative is the same as that for the proposed project/action. The impact is considered ***significant and unavoidable*** (CEQA) and an ***adverse effect*** (NEPA).

Mitigation Measures

Mitigation Measure VIS-1: Public access to the Sugar Pine Reservoir recreational facilities at Sugar Pine Reservoir including Giant Gap Campground, Shirttail Creek Campground, Manzanita Day Use Area, the Sugar Pine Boat Ramp, Joshua Hardt Memorial Trail, Forbes Creek Group Campground, and Sugar Pine Reservoir will be restricted during project construction.

Mitigation Measure VIS-2: Upon completion of construction activities including timber harvest, radial gate installation, GGCG facilities construction, boat ramp expansion, and JHMT replacement, areas of construction will be cleared of all construction related equipment and debris subject to USFS inspection and approval.

Implementation of Mitigation Measures **VIS-1** and **VIS-2** will reduce the potential for temporary construction-related activities associated with the proposed project/action and Alternatives to adversely affect public views of the project area.

Mitigation Measure VIS-3: To ensure consistency of the proposed project/action with the TNF LRMP, the Forest Service will approve a project-specific TNF LRMP Amendment to the Sugar Pine Management Area contemporaneously with the decision to authorize the SUP. The project-specific plan amendment would amend the Sugar Pine Management Area section of the LRMP to allow project-specific exemptions for inconsistencies with the Sugar Pine Management Area VQO, specifically, those locations within the management area with VQO objectives of "RETENTION."

With implementation of Mitigation Measure **VIS-3**, inconsistencies with the TNF LRMP RETENTION VQO would be allowed and therefore conflicts with the TNF LRMP would be addressed as required by the National Forest Management Act and resolved under NEPA. The proposed amendment would recognize that the proposed action is consistent with language in the LRMP that recognizes that the primary purpose of reservoir operation is for water supply, and that installation of the radial gates at Sugar Pine Dam is expected under the LRMP.

Under CEQA, impacts would be less than significant with mitigation. While Mitigation Measure **VIS-3** would provide an exception for the project and allow authorization of the project, it does not reduce the project effects that caused the conflicts with the plan which are considered significant and unavoidable.

Mitigation Measure VIS-4: Ensure that the colors of all facilities associated with the installation of the radial gates on Sugar Pine Dam are consistent with and of limited contrast to, the existing dam and spillway structure.

Implementation of Mitigation Measure **VIS-4** will ensure that the potential contrast in color between the proposed project/action and pre-project conditions will be considered "weak" in accordance with the VQO.

Mitigation Measure VIS-5: Avoid the construction of new structures within the expanded inundation area of Sugar Pine Reservoir.

Implementation of Mitigation Measure **VIS-5** will avoid the potential visual impact of introducing new structural elements to the Sugar Pine Reservoir area of inundation.

Impact VIS-4: Creation of a substantial new source of light or glare that would adversely affect day or nighttime views in the area. Impact Determination: *Less than significant with mitigation incorporated (CEQA) and no effect (NEPA)*.

No Project Alternative

Under the No Project Alternative, existing conditions at the project site would be unchanged. No new lighting sources or sources of glare would be introduced to the study area. Under CEQA, the No Project Alternative serves to define baseline conditions on which project impact assessment is based.

No Action Alternative

The No Action Alternative would introduce no new facilities into the project area and, therefore, no new sources of lighting or glare. Under CEQA, the No Action Alternative would have no impact. Under NEPA serves to define baseline conditions on which the project effect assessment is based.

Proposed Project/Action and Alternatives 1 and 2

While detailed information on the final design of the radial gates and related facilities has not yet been developed, it is reasonable to assume that gates and related facilities at the Sugar Pine Dam will include lighting facilities for purposes of emergency repair, maintenance, periodic monitoring and, possibly, security. At present, no artificial lighting is present on top of dam or in the spillway area. The nearest exterior lighting source to the gate location is at the downstream base of the dam outside of dam outlet facilities. Low intensity lighting is also present at GGCG, Shirttail Creek CG and MDUA parking area and restroom facilities.

The introduction of a new and persistent lighting source at the location of the proposed radial gate installation would represent a substantial new source of light given the current lack of lighting in that area and the visibility of the site from numerous locations around the reservoir, primarily Sugar Pine Road, the boat ramp and the JHMT. This would substantially affect nighttime views in the area, but effective measures are available to mitigate this impact. The impact, therefore, is considered ***less than significant with mitigation incorporated*** under CEQA. With mitigation, the impact would have ***no effect*** under NEPA.

Mitigation Measures

Mitigation Measure VIS-6: Lighting installed with installation of the radial gates and related structures, if any, would be down-cast low intensity lighting. Lighting would only operate when initiated by use of motion sensors or manually by FPUD/USFS personnel. Normally, lighting associated with the gates would remain off at the dam. All lighting associated with replacement facilities shall be consistent with lighting associated with the replaced facilities.

Mitigation Measure **VIS-6** places restrictions on the nature, intensity and location of future lighting to be installed at part of the proposed action. Implementation of MM VIS-5 would obviate the adverse effect of Impact VIS-4 under NEPA and reduce the impact to less than significant under CEQA.

In keeping with the proposed project/action design, material types, colors, and reflectivity of materials used for construction and operation of the proposed project/action will be consistent with Forest Plan visual guidelines. As such, new facilities construction will not introduce a substantial new source of glare due to use of nonreflective materials.

Impact VIS-5: Result in an inconsistency with applicable visual quality objectives of the Tahoe National Forest Land and Resources Management Plan. Impact Determination: *Less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA)*.

As described under Impact VIS-3 above, the Tahoe NF LRMP directs managers to maintain VQO levels specified in each management area, as a minimum, but maintain higher visual quality wherever practical and compatible with other goals. The LRMP also contains specific management area direction for the visual resource. VQOs are expressed in terms of the amount of visual disturbance (contrast in form, line, color, texture, pattern, and/or size and scale) to a valued characteristic landscape that is considered acceptable under the TNF LRMP. Those levels of disturbance are referred to as Visual Quality Levels (VQLs) and include preservation; retention; partial retention; modification; and maximum modification. As noted above, the VQO for the Sugar Pine Management Area as stated in the TNF LRMP is RETENTION for all areas that are located on the reservoir itself or in developed campgrounds, campground access roads, or other forest service roads that traverse the area. Areas within the management area that do not meet these criteria, the applicable VQO is PARTIAL RETENTION.

The evaluation of the project's effect on the visual character of the study area, in part, uses project consistency with the TNF as a determining factor in considering the significance of project effects on visual resources. The evaluation described under Impact VIS-3 found that the project would be inconsistent with the visual quality objectives presented in the TNF LRMP for the Sugar Pine Management Area (096). This is considered an adverse effect under NEPA and a significant impact requiring mitigation under CEQA. As noted above, implementation of mitigation measure Mitigation Measure **VIS-3** will obviate the adverse effect of the project under NEPA and reduce the impact to ***less than significant with mitigation incorporated*** under CEQA and ***no effect*** under NEPA.

Mitigation Measures

Implement Mitigation Measure **VIS-3** described above.

4.2.4 Cumulative Impacts

4.2.4.1 Approach to Assessing Cumulative Impact on Visual Resources

Section 15130 (a) of the California State CEQA Guidelines states:

> An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

NEPA, as amended, requires an assessment of potential cumulative impacts. Federal regulations (40 [Code of Federal Regulations [CFR] 1500 1508) define cumulative impacts as:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taken place over a period of time (40 CFR 1508.7).

For the purpose of this DEIR/EIS, the cumulative impact is the sum of all past, present, and reasonably foreseeable future actions resulting primarily from forestry practices and recreational facilities development within the viewshed of areas affected by the proposed project/action and facilities development and reservoir operations associated with the Sugar Pine Project. In addition, past, ongoing and future projects in areas likely to affected compensatory mitigation measures associated with the proposed project/action are considered as part of the cumulative impact assessment.

Past and Present Actions

In order to understand the contribution of past actions to the cumulative effects of the proposed action, this analysis relies on current environmental conditions as a proxy for the impacts of past and ongoing actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to the cumulative effect on visual resources at Sugar Pine Reservoir. From a visual resources perspective, the aggregate impact of past and ongoing projects is nearly entirely reflected in the current views of the Sugar Pine Dam and Reservoir, and the recreational facilities (i.e., campgrounds, parking areas, trails, bridges, restrooms, picnic tables, interpretive installations, and the boat ramp) that surround the reservoir. Representative examples of these views are shown in *Figures 4.2-2 through 4.2-16* referenced above. By looking at current conditions, one is able to capture the residual effects of past human actions, regardless of which particular actions or events contributed to those effects. In regard to NEPA compliance, this approach is consistent with a Council on Environmental Quality memorandum issued on June 34, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate aggregate effects of past actions without delving into the historical details of individual past actions." This approach is also compliant with CEQA in that it provides an adequate basis for assessing the incremental contribution of the project to the aggregate of previous actions as reflected in current views of the Sugar Pine Project area.

In keeping with the above discussion, current views of the Sugar Pine Project and associated recreational facilities represent a considerable aggregate impact on pre-project visual resources which were dominated by relatively undeveloped views of native riparian habitat along Shirttail and Forbes Creeks, meadow, and densely forested hillsides. However, it is worth noting that, prior to the construction of the

Sugar Pine Project, viewing of these areas by motorists, campers, and casual recreationists was extremely limited due to lack of access.

Typical operation of Sugar Pine Reservoir by FPUD to provide water to customers within its service area and to periodically conduct water transfers to downstream users result in seasonal and period fluctuations in reservoir surface elevations. As described above, these fluctuations adversely affect visual quality to varying degrees.

Reasonably Foreseeable Future Actions

Under the proposed project/action, FPUD would install radial gates on Sugar Pine Dam, clear areas within the proposed expanded reservoir inundation area, continue to serve its current and future customers within the District's service area, execute downstream water transfers to the extent practicable, replace or modify existing recreational facilities at Sugar Pine Reservoir, and implement all other proposed compensatory mitigation measures as described in Chapter 2 of this EIR/EIS. No other construction or facilities development are proposed or envisioned at this time. Reasonably foreseeable future actions at Sugar Pine that could affect visual resources would, therefore, be limited to the execution of forest management practices carried out by the USFS. These practices are intended to improve overall forest health and reduce fire risk in high use areas and include treatments such as commercial and precommercial thinning, fuels reduction, fuel breaks, prescribed burning, and removal of bug-kill trees. The Sunny South Insect Treatment Project (Sunny South Project), for example, is proposed within the vicinity of the Sugar Pine Management Area and would address bug-kill through thinning, fuels reduction, removal of infested patches of trees, and prescribed burning.

Cumulative Impact on Visual Resources

The proposed project/action would add to the substantial cumulative effect on visual resources associated with previous development of the Sugar Pine Project and associated recreational facilities. The proposed project/action would contribute to past impacts on views of native habitat by eliminating 1.6 acres of emergent wetland vegetation, roughly 44 acres of forest habitat, over 1,600 linear feet of upper Shirttail Creek and 1,100 linear feet of Forbes Creek. However, the proposed project/action's contribution to the cumulative impact on the quality of public views would be, in most circumstances, limited. This is due to a number of factors including:

1. At maximum pool, views of Sugar Pine Reservoir would not be appreciably different under the proposed project/action compared to current maximum pool conditions in terms of form, color, and pattern. The size of the reservoir under the proposed project/action relative to the surrounding terrain would be larger, but it is reasonable to assume that this does not constitute an adverse effect on views.

2. During typical operation of the reservoir, both historically and ongoing, seasonal drawdowns of the reservoir occur to serve FPUD water customers. These drawdowns result in the exposure of bare ground between the forested areas and the reservoir waterline. This "bathtub ring" area is generally considered unsightly relative to full pool conditions. Under the proposed project/action reservoir storage will increase. Seasonal drawdowns (of comparable volumes) from the larger

reservoir will result in a bathtub ring of similar aerial extent as currently occurs, but the width of ring will be reduced under the proposed project/action. As such, views from each of the KOPs addressed herein would be not adversely affected by the proposed project/action, and could, arguably, be improved due to the mitigating effect of an expanded reservoir storage.

3. The effect of the proposed project/action on views of the reservoir's bathtub during typical reservoir operations described in Item 2, above, would also apply to conditions when FPUD would execute water transfers consistent with past practices, i.e., transfers of 2,000 AF or less. Simply put, the transfer of 2,000 AF, as has occurred previously, and could occur in future without the proposed project/action, would result in a bathtub ring that is wider than would occur under the proposed project/action.

However, as discussed in Section 4.2.4.1, above, under Impact VIS-3, conditions expected to occur under the proposed project/action when water transfers exceed current conditions, i.e., when future transfers range from 2,000+ AF to 5,000 AF, the potential exists for the exposure of bare ground to exceed conditions that would occur without the project/action. These conditions could occur as often as once every three years, and are considered a significant and unavoidable impact. For this reason, the proposed project/action's contribution to the impact on existing visual character or quality of the site and its surroundings is considered ***cumulatively considerable.***

4.2.4.2 Mitigation Measures

Feasible mitigation to substantially reduce the project's contribution to past and foreseeable future effects of similar project's on the visual character of the project area is unavailable when future transfers exceed 2,000 AF. When future water transfers under the proposed project/action and Alternatives 1 and 2 exceed the historical maximum of 2,000 AF, the project's and alternatives' contribution to the cumulative impact on visual character of the area is considered ***cumulatively considerable*** (CEQA) and ***adverse*** (NEPA).

4.2.4.3 Residual Unavoidable Effects

As discussed under Impact VIS-3, the proposed project/action would result in a ***significant and unavoidable impact*** (CEQA) on visual character and quality of the project site. In addition, the proposed project/action's contribution to the cumulative impact of past, ongoing and future projects on visual quality and character is impact is considered ***cumulatively considerable. (CEQA) and adverse (NEPA)***

4.2.5 References

USFS. 2004. 2004 Record of Decision for the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement.

_____. 2001. Sierra Nevada Forest Plan Amendment

_____. 1995. Landscape Aesthetics: A Handbook for Scenery Management. USDA Handbook No. 701. December 1995.

_____. 1990. Tahoe National Forest Land and Resource Management Plan.

View to the east from KOP 1.

Observation area parking lot at KOP 1.

View of Sugar Pine Dam spillway from KOP 1.

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Figure 4.2-2 Key Observation Point 1

2015-019 FPUD Sugar Pine Reservoir

View to the east from KOP 2 at maximum pool.

View to the east from KOP 2 at low pool.

View to the west from KOP 3 (Giant Gap Campground and Manzanita Day Use Area entrance).

Figure 4.2-4 Key Observation Point 3

2015-019 FPUD Sugar Pine Reservoir

View from Josh Hardt Memorial Trail to the west at Manzanita Day Use Area during maximum pool conditions.

View to the west from KOP 4 during low pool conditions.

View from Giant Gap Campground picnic area, upslope from KOP 5.

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Figure 4.2-6 Key Observation Point 5

2015-019 FPUD Sugar Pine Reservoir

View to southeast from KOP 5 beach area at maximum pool.

Photo Simulation of post-project view from KOP 5 at maximum pool.

View to southeast from KOP 5 beach area at low pool.

Photo Simulation of post-project view to southeast from KOP 5 at low pool.

Figure 4.2-8 Key Observation Point 5 at Low Pool

View from Giant Gap Campground shoreline at campsite 22.

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Figure 4.2-9 Key Observation Point 6

2015-019 FPUD Sugar Pine Reservoir

View from Giant Gap Campground inland at campsite 11.

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Figure 4.2-10 Key Observation Point 7

2015-019 FPUD Sugar Pine Reservoir

Panoramic view southwest from KOP 8 at maximum pool.

View southeast from KOP 8 at low pool.

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Figure 4.2-11 Key Observation Point 8

2015-019 FPUD Sugar Pine Reservoir

Northeast view from KOP 9 at low pool.

Photo simulation of post-project northeast view from KOP 9 at low pool.

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Figure 4.2-12 Key Observation Point 9 at Low Pool

2015-019 FPUD Sugar Pine Reservoir

View of Forbes Creek from Josh Hardt Memorial Trail at low pool.

View of Forbes Creek from Josh Hardt Memorial Trail at max pool.

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Figure 4.2-13 Key Observation Point 10

2015-019 FPUD Sugar Pine Reservoir

View to the east of Josh Hardt Memorial Trail footbridge at upper North Shirttail Creek.

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Figure 4.2-14 Key Observation Point 11

2015-019 FPUD Sugar Pine Reservoir

View of Sugar Pine Boat Ramp during high pool conditions.

View of Sugar Pine Boat Ramp during low pool conditions.

Figure 4.2-15 Key Observation Point 12

View west from Sugar Pine Reservoir during maximum pool.

View west from Sugar Pine Reservoir during low pool.

View east from Sugar Pine Reservoir during maximum pool.

4.3 Air Quality and Climate Change

This section of the DEIR/EIS assesses the potential direct, indirect and cumulative effects of the proposed project/action on air quality resulting from construction activities related to the installation of radial gates at Sugar Pine Dam, timber harvest operations and recreational facilities development. Project greenhouse gas (GHG) emissions are analyzed as well. Section 4.4.1 describes the location of the proposed project and project-related activities and the surrounding air basin in which they would occur. Regulations, plans, policies and standards pertaining to both air quality and GHG management are described in Section 4.4.2.

The environmental consequences of the proposed project/action and project Alternatives are described in Section 4.4.3. Environmental impacts/consequences addressed herein include the potential short-term effects of construction-related activities associated with gate installation, timber harvest/vegetation management, and recreational facilities development. The long-term effects on air quality due to potential changes in recreational use at the reservoir are also considered. The effects of project GHG production related to construction activities and the permanent conversion of up to 43 acres of forest and other vegetated habitat are also evaluated herein.

4.3.1 Environmental Setting/Affected Environment

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action includes installation of radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. This will in turn increase the "safe yield" for water supply stored at the reservoir. Gate installation will provide additional water supply available for diversion by the Foresthill Public Utility District (FPUD) to serve current customers within the District's service area and ensure that adequate water will be available to serve future approved growth and development within the service area. The indirect effects of the proposed project on air quality and global climate change related to growth and development is addressed in Chapter 7 of this DEIR/EIS.

In addition to gate installation and expansion of the Sugar Pine Reservoir inundation area, the proposed project/action would implement a compensatory mitigation program to replace recreational facilities affected by the project and mitigate for lost or degraded natural and cultural resources within the Tahoe National Forest (TNF).

4.3.1.1 Air Quality Setting

The California Air Resources Board (CARB) divides the state into air basins that share similar meteorological and topographical features. The project area is located in the central portion of unincorporated Placer County, which is encompassed by the Mountain Counties Air Basin (MCAB). The MCAB consists of nine counties or portions of counties stretching from Plumas County on the north to Mariposa County on the south. The MCAB exhibits large variations in terrain and consequently exhibits large variations in climate, both of which affect air quality. The western portions of the basin slope relatively gradually, with deep river canyons running from southwest to northeast toward the crest of the Sierra Nevada range. East of the divide, the slope of the Sierra is steeper, but river canyons are relatively shallow.

Because of the region's topographical features and meteorological conditions, the MCAB is more sensitive to negative impacts on air quality than most other areas of California. The prevailing wind direction over the county is westerly. However, the terrain has a great influence on local winds, so that wide variability in wind direction can be expected. Afternoon winds are generally channeled up-canyon, while nighttime winds generally flow down-canyon. Winds are, in general, stronger in spring and summer and weaker in fall and winter. Periods of calm winds and clear skies in fall and winter often result in strong, ground-based inversions forming in mountain valleys. These layers of very stable air restrict the dispersal of pollutants, trapping these pollutants near the ground, representing the worst conditions for local air pollution occurring in the county.

Cold temperatures and mild winds often result in temperature inversions in which upper layers of warmer air trap colder air near the surface. Local pollutant sources in the MCAB are trapped by frequent inversions, which limit the volume of air into which they can be mixed and in turn result in elevated pollutant concentrations. The most frequent episodes of high pollution occur during local basin inversions, when emissions from local sources such as motor vehicles, chimney smoke, and forest burning are trapped in the basin. This is the most common meteorological condition contributing to air quality degradation in the area.

The second-most common meteorological condition contributing to air quality degradation is transport from the Sacramento Valley and the Bay Area into the region. This meteorological condition is strongest during the warmer summer months and contributes approximately 30 percent of the ozone and airborne particulate matter pollution in the region. The lowest pollution regimes are associated with the fall and winter months and contribute approximately 10 percent of the pollution to the region. Similar to other areas, when winds are strong enough to break up basin inversion layers, pollution is generally blown outside of the region and the air quality is typically good. However, when fall and winter winds are weak, this regime is associated with persistent local inversions and the associated buildup of local pollutants.

Criteria Air Pollutants

Criteria air pollutants are defined as those pollutants for which the federal and state governments have established air quality standards for outdoor or ambient concentrations to protect public health with a determined margin of safety. Ozone (O_3), coarse particulate matter (PM_{10}), and fine particulate matter ($PM_{2.5}$) are generally considered to be regional pollutants because they or their precursors affect air quality on a regional scale. Pollutants such as carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) are considered to be local pollutants because they tend to accumulate in the air locally. PM is also considered a local pollutant. Health effects commonly associated with criteria pollutants are summarized in *Table 4.3-1*.

Table 4.3-1. Criteria Air Pollutants- Summary of Common Sources and Effects

Pollutant	Major Manmade Sources	Human Health & Welfare Effects
CO	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, effecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
NO_2	A reddish-brown gas formed during fuel combustion for motor vehicles, energy utilities and industrial sources.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Causes brown discoloration of the atmosphere.
O_3	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrous oxides (NOx) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, solvents, paints and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield.
PM_{10} & $PM_{2.5}$	Power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles and others.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
SO_2	A colorless, nonflammable gas formed when fuel containing sulfur is burned. Examples are refineries, cement manufacturing, and locomotives.	Respiratory irritant. Aggravates lung and heart problems. Can damage crops and natural vegetation. Impairs visibility.

Source: California Air Pollution Control Officers Association (CAPCOA) 2013

Ambient Air Quality

Ambient air quality at the project site can be inferred from ambient air quality measurements conducted at nearby air quality monitoring stations. CARB maintains over 60 monitoring stations throughout California. The Colfax – City Hall air quality monitoring station, located approximately 8.4 miles west of the project area, monitors ambient concentrations of O_3 and $PM_{2.5}$. The Roseville – N. Sunrise Boulevard air quality monitoring station, located approximately 35 miles southwest of the reservoir, monitors ambient concentrations of PM_{10}. Ambient emission concentrations will vary due to localized variations in emission sources and climate and should be considered "generally" representative of ambient concentrations in the development area.

Table 4.3-2 summarizes the published data concerning O_3, $PM_{2.5}$, PM_{10} since 2015 for each year that the monitoring data is provided. O_3, PM_{10} and $PM_{2.5}$ are the pollutant types most potently affecting the project region.

Table 4.3-2. Summary of Ambient Air Quality Data

Pollutant Standards	2015	2016	2017
O_3 (Colfax – City Hall Air Quality Monitoring Station)			
Max 1-hour concentration (ppm)	0.095	0.095	0.094
Max 8-hour concentration (ppm) (state/federal)	0.085 / 0.085	0.086 / 0.085	0.079 / 0.078
Number of days above 1-hour standard (state/federal)	1 / 0	1 / 0	0 / 0
Number of days above 8-hour standard (state/federal)	13 / 12	17 / 14	16 / 14
PM_{10} (Roseville – N. Sunrise Road Air Quality Monitoring Station)			
Max 24-hour concentration (µg/m3) (state/federal)	59.1 / 35.7	39.1 / 39.2	65.8 / 66.0
Number of days above 24-hour standard (state/federal)	* / *	* / 0	* / 0
$PM_{2.5}$ (Colfax – City Hall Air Quality Monitoring Station)			
Max 24-hour concentration (µg/m3) (state/federal)	104.7 / *	26.2 / *	48.8 / *
Number of days above federal 24-hour standard	*	*	*

Source: CARB 2018
µg/m^3 = micrograms per cubic meter; ppm = parts per million
* = Insufficient data available

The U.S. Environment Protection Agency (USEPA) and CARB designate air basins or portions of air basins and counties as being in "attainment" or "nonattainment" for each of the criteria pollutants. Areas that do not meet the standards are classified as nonattainment areas. The National Ambient Air Quality Standards (NAAQS) (other than O_3, PM_{10}, $PM_{2.5}$, and those based on annual averages or arithmetic mean) are not to be exceeded more than once per year. The NAAQS for O_3, PM_{10}, and $PM_{2.5}$ are based on statistical calculations over one- to three-year periods, depending on the pollutant. The California Ambient Air Quality Standards (CAAQS) are not to be exceeded during a three-year period. The attainment status for the central portion of Placer County is included in *Table 4.3-3*.

The determination of whether an area meets the state and federal standards is based on air quality monitoring data. Some areas are unclassified, which means there is insufficient monitoring data for determining attainment or nonattainment. Unclassified areas are typically treated as being in attainment. Because the attainment/nonattainment designation is pollutant specific, an area may be classified as nonattainment for one pollutant and attainment for another. Similarly, because the state and federal standards differ, an area could be classified as attainment for the federal standards of a pollutant and as nonattainment for the state standards of the same pollutant. The region is designated as a nonattainment area for the federal O_3 standard and is also a nonattainment area for the state standards for O_3 and PM_{10} standards (CARB 2017a).

Table 4.3-3. Attainment Status of Criteria Pollutants in Central Placer County

Pollutant	State Designation	Federal Designation
O_3	Nonattainment	Nonattainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$	Unclassified	Unclassified/Attainment
CO	Unclassified	Unclassified/Attainment
NO_2	Attainment	Unclassified/Attainment
SO_2	Attainment	Unclassified/Attainment

Source: CARB 2017a

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes approximately 200 compounds, including particulate emissions from diesel-fueled engines.

Hazardous Air Pollutants (HAP) is a term used by the Federal Clean Air Act (FCAA), which includes a variety of pollutants generated or emitted by industrial production activities. Identified as TACs under the California Clean Air Act (CCAA), 10 have been singled out through ambient air quality data as being the most substantial health risk in California. Direct exposure to these pollutants has been shown to cause cancer, birth defects, damage to the brain and nervous system, and respiratory disorders. CARB provides emission inventories for only the larger air basins.

TACs do not have ambient air quality standards because no safe levels of TACs can be determined. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. The requirements of the Air Toxic "Hot Spots" Information and Assessment Act (Assembly Bill [AB] 2588) apply to facilities that use, produce, or emit toxic chemicals. Facilities subject to the toxic emission inventory requirements of the act must prepare and submit toxic emission inventory plans and reports, and periodically update those reports.

4.3.1.2 Greenhouse Gas Setting

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. Because the earth has a much lower temperature than the sun, it emits lower-frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on earth. Without the greenhouse effect, the earth would not be able to support life as we know it.

Greenhouse Gas Emissions

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O). Fluorinated gases also make up a small fraction of the GHGs that contribute to climate change. Fluorinated gases include chlorofluorocarbons, hydrofluorocarbons, perfluorocarbons, sulfur hexafluoride, and nitrogen trifluoride; however, it is noted that these gases are not associated with typical land use development. Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed to be responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic factors together (IPCC 2014).

Table 4.3-4 describes the primary GHGs attributed to global climate change, including their physical properties, primary sources, and contributions to the greenhouse effect.

Each GHG differs in its ability to absorb heat in the atmosphere based on the lifetime, or persistence, of the gas molecule in the atmosphere. CH_4 traps over 25 times more heat per molecule than CO_2, and N_2O absorbs 298 times more heat per molecule than CO_2 (IPCC 2014). Often, estimates of GHG emissions are presented in carbon dioxide equivalents (CO_2e), which weight each gas by its global warming potential (GWP). Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted.

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, or other forms. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013).

Table 4.3-4. Greenhouse Gases

Greenhouse Gas	Description
CO_2	Carbon dioxide is a colorless, odorless gas. CO_2 is emitted in a number of ways, both naturally and through human activities. The largest source of CO_2 emissions globally is the combustion of fossil fuels such as coal, oil, and gas in power plants, automobiles, industrial facilities, and other sources. A number of specialized industrial production processes and product uses such as mineral production, metal production, and the use of petroleum-based products can also lead to CO_2 emissions. The atmospheric lifetime of CO_2 is variable because it is so readily exchanged in the atmosphere.[1]
CH_4	Methane is a colorless, odorless gas and is the major component of natural gas, about 87 percent by volume. It is also formed and released to the atmosphere by biological processes occurring in anaerobic environments. Methane is emitted from a variety of both human-related and natural sources. Human-related sources include fossil fuel production, animal husbandry (intestinal fermentation in livestock and manure management), rice cultivation, biomass burning, and waste management. These activities release significant quantities of CH_4 to the atmosphere. Natural sources of CH_4 include wetlands, gas hydrates, permafrost, termites, oceans, freshwater bodies, non-wetland soils, and other sources such as wildfires. The atmospheric lifetime of CH_4 is about12 years.[2]
N_2O	Nitrous oxide is a clear, colorless gas with a slightly sweet odor. Nitrous oxide is produced by both natural and human-related sources. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuels, adipic acid production, and nitric acid production. N_2O is also produced naturally from a wide variety of biological sources in soil and water, particularly microbial action in wet tropical forests. The atmospheric lifetime of N_2O is approximately 120 years.[3]

Sources: [1]USEPA 2016a, [2]USEPA 2016b, [3]USEPA 2016c

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature or to global, local, or microclimates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Sources of Greenhouse Gas Emissions

In June 2017, CARB released the 2017 edition of the California GHG inventory covering calendar year 2015 emissions. In 2015, California emitted 440.4 million gross metric tons of CO_2e including from imported electricity. Combustion of fossil fuel in the transportation sector was the single largest source of California's GHG emissions in 2015, accounting for approximately 37 percent of total GHG emissions in the state. This sector was followed by the industrial sector (21 percent) and the electric power sector (including both in-state and out-of-state sources) (19 percent) (CARB 2017b).

Emissions of CO_2 are by-products of fossil fuel combustion. CH_4, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. Carbon dioxide sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through sequestration and dissolution (CO_2 dissolving into the water), respectively, two of the most common processes for removing carbon dioxide from the atmosphere.

4.3.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on air quality and global climate conditions.

4.3.2.1 Federal

Clean Air Act

The Federal CAA requires CARB, based on air quality monitoring data, to designate portions of the state where the national ambient air quality standards are not met as "nonattainment areas." Because of the differences between the national and state ambient air quality standards, the designation of nonattainment areas is different under the federal and state legislation. Areas that meet the air quality standards are considered to be in attainment of the standards.

The USEPA requires states that have areas that are not in compliance with the national ambient air quality standards to prepare and submit air quality plans showing how the standards would be met. If the states cannot show how the standards would be met, then they must show progress toward meeting the standards. These plans are referred to as the State Implementation Plan. Federal action required to approve or fund a project triggers the Federal Clean Air Act conformity requirements. As part of the State Implementation Plan, California has incorporated the federal General Conformity Rule. The USEPA's Conformity Rule, as promulgated in 40 CFR Part 93 Subpart B, and 40 CFR Part 51, Subpart W, implements the conformity requirements of Section 176(c) of the 1990 Amendments to the Federal Clean Air Act. Conformity to the State Implementation Plan is defined in the CAA as requiring all federal agencies to ensure that any federal agency activity conforms to an approved State Implementation Plan in nonattainment or maintenance areas. Compliance with the State Implementation Plan assists in eliminating or reducing the number of violations of the national ambient air quality standards, which expedites attainment of the standards. The project is subject to General Conformity compliance.

On April 17, 2009, the USEPA Administrator signed Proposed Endangerment and Cause or Contribute Findings for GHG emissions under Section 202(a) of the Clean Air Act. The USEPA found that six GHGs taken in combination endanger both the public health and the public welfare of current and future generations. The USEPA also found that the combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the greenhouse effect and, under Section 202(a) of the Clean Air Act, result in air pollution that endangers public health and welfare. The specific GHG regulations USEPA has adopted to date are as follows:

Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98)

This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of carbon dioxide equivalent (CO_2e) emissions per year. Additionally, the reporting of emissions is required for owners of sulfur hexafluoride- (SF_6) and perfluorinated compound- (PFC) insulated equipment when the total nameplate capacity of these insulating gases is above 17,280 pounds.

Proposed Prevention of Significant Deterioration (PSD) and Title V Greenhouse Gas Tailoring Rule (40 CFR Part 52)

The USEPA recently mandated that Prevention of Significant Deterioration requirements be applied to facilities that have stationary-source CO_2e emissions exceeding 100,000 tons per year if they otherwise would not be subject to PSD requirements, and 75,000 tons per year if they otherwise would be subject to PSD requirements. On June 23, 2014, the United States Supreme Court struck down the requirement as to sources that would not otherwise be subject to PSD requirements. The Court upheld the USEPA Greenhouse Gas Tailoring Rule as to sources otherwise subject to PSD requirements.

4.3.2.2 State

California Clean Air Act

The California Clean Air Act (CCAA) allows the state to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the California Environmental Protection Agency, is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the California ambient air quality standards. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's State Implementation Plan (SIP)), for which it works closely with the federal government and the local air districts.

California State Implementation Plan

The federal Clean Air Act (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the SIP. The SIP is a living document that is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the Clean Air Act. The EPA has the responsibility to review all State Implementation Plans to determine if they conform to the requirements of the CAA.

State law makes CARB the lead agency for all purposes related to the SIP. Local air districts and other agencies prepare SIP elements and submit them to CARB for review and approval. CARB then forwards SIP revisions to the EPA for approval and publication in the Federal Register.

Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emission targets for the state. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

While dated, this executive order remains relevant because a more recent California Appellate Court decision, *Cleveland National Forest Foundation v. San Diego Association of Governments* (November 24, 2014) 231 Cal.App.4th 1056, examined whether it should be viewed as having the equivalent force of a legislative mandate for specific emissions reductions. While the California Supreme Court ruled that the San Diego Association of Governments did not abuse its discretion by declining "to adopt the 2050 goal as a measure of significance in light of the fact that the Executive Order does not specify any plan or implementation measures to achieve its goal, the decision also recognized that the goal of a 40 percent reduction in 1990 GHG levels by 2030 is "widely acknowledged" as a "necessary interim target to ensure that California meets its longer-range goal of reducing greenhouse gas emissions 80 percent below 1990 levels by the year 2050.

Assembly Bill 32 Climate Change Scoping Plan and Updates

In 2006, the California legislature passed AB 32 (Health and Safety Code § 38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 requires CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels by 2020 (representing a 25 percent reduction in emissions). AB 32 anticipates that the GHG reduction goals will be met, in part, through local government actions. CARB has identified a GHG reduction target of 15 percent from current levels for local governments and notes that successful implementation relies on local governments' land use planning and urban growth decisions.

Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008, which was re-approved by CARB on August 24, 2011, that outlines measures to meet the 2020 GHG reduction goals. To meet these goals, California must reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels or about 15 percent from today's levels. The Scoping Plan recommends measures for further study and possible State implementation, such as new fuel regulations. It estimates that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, and forestry sectors and other sources could be achieved should the State implement all of the measures in the Scoping Plan.

The Scoping Plan is required by AB 32 to be updated at least every five years. The first update to the AB 32 Scoping Plan was approved on May 22, 2014 by CARB. The 2017 Scoping Plan Update was adopted on December 14, 2017. The Scoping Plan Update addresses the 2030 target established by Senate Bill 32 (SB 32) as discussed below and establishes a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include: increasing the use of renewable energy in the state, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes.

Executive Order B-30-15

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's executive order aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (AB 32, discussed above). California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2 degrees Celsius, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

Senate Bill 32 and Assembly Bill 197 of 2016

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EOs S-3-05 and B-30-15 of 80 percent below 1990 emissions levels by 2050.

Senate Bill X1-2 of 2011, Senate Bill 350 of 2015, and Senate Bill 100 of 2018

SB X1-2 of 2011 requires all California utilities to generate 33 percent of their electricity from renewables by 2020. SB X1-2 sets a three-stage compliance period requiring all California utilities, including independently-owned utilities, energy service providers, and community choice aggregators, to generate 20 percent of their electricity from renewables by December 31, 2013; 25 percent by December 31, 2016; and 33 percent by December 31, 2020. SB X1-2 also requires the renewable electricity standard to be met increasingly with renewable energy that is supplied to the California grid from sources within, or directly proximate to, California.

In October 2015, SB 350 was signed by Governor Brown, which requires retail sellers and publicly-owned utilities to procure 50 percent of their electricity from renewable resources by 2030. In 2018, SB 100 was signed by Governor Brown, codifying a goal of 60 percent renewable procurement by 2030 and 100 percent by 2045 RPS.

4.3.2.3 Local

Placer County Air Pollution Control District

At the county level, air quality is managed through land use and development planning practices implemented by Placer County and through permitted source controls implemented by the Placer County Air Pollution Control District (PCAPCD). The PCAPCD is also the agency responsible for enforcing many federal and state air quality requirements and for establishing air quality rules and regulations. The

PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The PCAPCD's clean air strategy includes the preparation of plans for the attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. The PCAPCD also inspects stationary sources of air pollution and responds to citizen complaints, monitors ambient air quality and meteorological conditions, and implements programs and regulations required by the federal Clean Air Act, the Clean Air Act Amendments of 1990, and the California Clean Air Act (CCAA).

4.3.3 Environmental Consequences

4.3.3.1 Impact Significance Thresholds

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of impacts on air quality resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which identify criteria that can lead to a determination of significant impact on air quality. A development project could have a significant impact on air quality if the project would:

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- Conflict with or obstruct implementation of any applicable air quality plan;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Result in other emissions (such as those leading to odors adversely affecting a substantial number of people).

A project could have a significant impact on greenhouse gas emissions if the project would:

- Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified several indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on air quality. These include:

- Compliance with local, state and federal regulations regarding air quality;
- Estimated traffic and emissions associated with construction of the proposed project, including timber removal;

- Narrative description of timber removal techniques and their potential effect on air quality in the region;
- Description of the impact of climate change on the operations of FPUD and the proposed project; and
- Description of potential GHG emissions associated with the proposed project and potential contributions to climate change including reservoir methane emissions.

4.3.3.2 Assumptions and Methods Used to Determine Impact/Effect

Air quality and GHG-related impacts were assessed in accordance with methodologies recommended by CARB and the PCAPCD. Where quantification was required, emissions were modeled using the California Emissions Estimator Model (CalEEMod), version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to quantify potential criteria air pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. Project emissions were primarily calculated using CalEEMod model defaults for Placer County as well as the detailed project specifications completed for the project.

By its very nature, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds for both criteria air pollutants and GHG emissions would not be considered cumulatively considerable.

4.3.3.3 Direct and Indirect Impacts/Effects

Impact AIR-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors. Impact Determination: *less than significant* (CEQA) and *no effect* (NEPA) for the proposed project/action and Alternative 1; *significant and unavoidable* (CEQA) and *minorly adverse effect* (NEPA) for Alternative 2.

Construction-Related Effects

No Project and Action Alternatives

The No Project/Action Alternative only includes the approval of the extension of Water Right 15375, and no modifications to facilities or recreational features at the reservoir would be implemented.

Proposed Project/Action and Alternative 1

The Proposed Project/Action would result in the placement of radial gates and the removal and relocation of several recreational facilities. The removal and relocation of facilities include: campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities. Erosion could occur during construction given the slopes and nature of activities.

The Proposed Project/Action also includes a timber harvest plan which affects approximately 40 to 43 acres. The timber harvest would expose those areas between current high-water mark and the new high-water mark to potential wind and water erosion and loss of top soil. See Chapter 2.0 for a discussion of the timber harvest plan.

Hazard tree abatement would be conducted within 150 feet of the relocated JHMT, the Sugar Pine trial and relocated campgrounds and picnic area. The hazard tree treatment area would be approximately 110 acres in size. The hazard trees would be felled and removed via end-lining from a skidder. Furrows created during tree removal would be filled and re-contoured to match the existing slope.

Implementation of the proposed Project/Action would generate short-term emissions of criteria air pollutants. Emissions generated during proposed Project/Action implementation would be short term and of temporary duration, lasting only as long as such activities occur, but have the potential to represent a significant air quality impact under CEQA if the volume of pollutants generated exceeds the PCAPCD's CEQA-related thresholds of significance. As previously described, the PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. As part of this effort, the PCAPCD has developed significance criteria which may be relied upon to make air quality impact determinations for the proposed project/action.

Two basic sources of emissions would be generated through implementation of the proposed Project/Action: operation of the vehicles (i.e., dozers, loaders, dump trucks) and the creation of fugitive dust. Specifically, implementation of the proposed Project/Action would result in the temporary generation of emissions resulting from the placement of the radial gates, the removal and relocation of the recreational facilities, and tree removal/timber harvesting as these activities include excavation, trenching, and grading. Proposed Project/Action implementation would generate motor vehicle exhaust associated with construction equipment, worker commute trips, and the movement of construction equipment over unpaved surfaces. Emissions of airborne particulate matter are largely dependent on the amount of ground disturbance associated with site preparation activities as well as weather conditions.

Emissions associated with implementation of the proposed project/action were calculated using the CARB-approved CalEEMod computer program, which is designed to model emissions for land use development projects. Emission projections account for the construction timeline, including timber harvest, provided in Chapter 2.0 of this DEIR/EIS. In order to provide a conservative analysis, emission estimates include 93 acres of land disturbance to account for land disturbed during timber harvest activities, recreational facility construction, and hazard tree treatment. 1,574 logging truck trips are anticipated, and emission estimates also account for the hauling of demolished asphalt associated with an asphalt trail proposed for removal.

See Section 2.2.8 of this DEIR/EIS for TNF Management Requirements and required BMP's regarding the construction assumptions, including construction equipment and duration, used in this analysis. Predicted maximum daily construction-generated emissions for the proposed Project are summarized in *Table 4.3-5*.

Table 4.3-5. Construction-Related Emissions (Regional Significance Analysis)

Construction Year	Pollutant (pounds per day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction Year 1	6.89	68.64	53.95	0.12	4.15	3.19
Construction Year 2	2.90	28.36	24.65	0.04	1.88	1.42
PCAPCD Potentially Significant Impact Threshold	82 lbs daily	82 lbs daily	None	None	82 lbs daily	None
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Sources: CalEEMod version 2016.3.2. Refer to **Attachment A** for Model Data Outputs.

As shown in *Table 4.3-5*, implementation of the Project/Action would not exceed PCAPCD significance thresholds. Thus, the project/action would be ***less than significant*** under CEQA.

Under NEPA, emissions generated by implementation of the proposed Project/Action are compared to the Federal General Conformity thresholds. General Conformity ensures that the actions taken by federal agencies do not interfere with a state's plans to attain and maintain national standards for air quality. Established under the Clean Air Act (section 176(c)(4)), the General Conformity rule plays an important role in helping states improve air quality in those areas that do not meet the NAAQS. Under the General Conformity rule, federal agencies must work with state and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state or tribal implementation plan. The overall purpose of the General Conformity rule is to ensure that:

- federal activities do not cause or contribute to new violations of NAAQS;
- actions do not worsen existing violations of the NAAQS; and
- attainment of the NAAQS is not delayed.

Predicted annual emissions associated with implementation of the proposed Project/Action are summarized in *Table 4.3-6*. Emissions would be considered a significant air quality impact if the volume of pollutants generated exceeds the Conformity Determination thresholds.

Table 4.3-6. Construction-Related Emissions (Federal Conformity Determination Analysis)

Construction Year	Pollutant (tons per year)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction 2020	0.3	3.4	2.5	0.0	0.2	0.2
Construction 2021	0.3	0.3	0.3	0.0	0.0	0.0
EPA Conformity Determination Thresholds (40 CFR 93.153) (tons annually)	*100*	*100*	*100*	*100*	*100*	*100*
Exceed Threshold?	**No**	**No**	**No**	**No**	**No**	**No**

Sources: CalEEMod version 2016.3.2. Refer to **Attachment A** for Model Data Outputs.
Notes: ROG and NOx thresholds are based on the region's "Moderate" nonattainment status for ozone. All other pollutant thresholds are based on "Maintenance" status.

As shown in *Table 4.3-6*, Project/Action implementation would not surpass Federal Conformity Determination thresholds and therefore would have ***no effect*** under NEPA.

Alternative 2: Helicopter Harvest Alternative

Under Alternative 2, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine acres of the 44 acres to be cleared under the proposed Project/Action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. The use of a helicopter would reduce the number of on-site vehicle trips to transfer the cut material to the landings, as harvest would be expected to take only two days to complete with use of a helicopter.

For the purposes of this analysis the use of UH-1H Super Huey (Type II) helicopter is assumed. Project implementation would average two takeoffs and landings per day over the course of two days. UH-1H Super Huey (Type II) helicopters are estimated to consume 103.3 gallons of aviation fuel per hour (California Department of Forestry and Fire Protection [CAL-FIRE] 2017). Aviation fuel is a specialized type of petroleum-based fuel used to power aircraft. It is generally of a higher quality than fuels used in less critical applications, such as heating or road transport. UH-1H Super Huey (Type II) helicopters possess a range of 250 miles per flight and an endurance of 2 hours per flight event. Assuming four hours of total flight time each day of the two days of use, the Project would be expected to instigate the consumption of 113 gallons of aviation fuel daily [4 hours x 103.3 = 413.2 gallons daily]. Project emissions resulting from helicopter operations are identified in *Table 4.3-7*.

Table 4.3-7. Helicopter-Related Emissions

Construction Year	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Pounds per Day						
Helicopter Operations (includes take off, landing, & cruising)	7.67	43.39	0.00	0.00	8.16	8.16
Tons per Year						
Helicopter Operations (includes take off, landing, & cruising)	0.0	0.0	0.0	0.0	0.0	0.0

Sources: "Pounds per Day" emissions account for 4 hours of helicopter operations in a single day. "Tons per Year" emissions account for 8 hours of helicopter operations total. Refer to **Attachment A** for helicopter emissions calculations.

As described in Chapter 2.0, Alternative 2 would occur during proposed Phase 3 of the project/action, which is anticipated to take place during the first year of construction. Project emissions resulting from the combination of Project/Action Phase 3 implementation using a helicopter are identified in *Table 4.3-8*.

Table 4.3-8. Construction-Related Emissions with use of Helicopter

Construction Year	Pollutant (pounds per day)					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Construction 2020	6.89	68.64	53.95	0.12	4.15	3.19
Helicopter Operations	7.67	43.39	0.00	0.00	8.16	8.16
Total:	**14.56**	**112.03**	**53.95**	**0.12**	**12.31**	**11.35**
PCAPCD Potentially Significant Impact Threshold	82 lbs daily	82 lbs daily	None	None	82 lbs daily	None
Exceed Threshold?	**No**	**Yes**	**No**	**No**	**No**	**No**

Sources: CalEEMod version 2016.3.2. Refer to **Attachment A** for Model Data Outputs.

As shown in *Table 4.3-8*, the use of a helicopter during implementation of Phase 3 would result in the PCAPCD significance threshold for NOx being surpassed. Therefore, under CEQA, Alternative 2 would have a ***significant and unavoidable*** impact. Potential mitigation available to reduce this impact involves limiting the use of the helicopter, but this would be contrary to the primary objective of Alternative 2 which is to allow non-mechanical timber harvest in all areas where slope exceeds 35 degrees. As shown in *Table 4.3-7*, the estimated two days of helicopter use would generate a negligible amount of pollutants on the basis of the ton and, therefore, would not exceed Federal Conformity thresholds. For this reason, the effect of Alternative 2 is ***minorly adverse*** under NEPA.

Post-Project Operation-Related Impact

No Project and No Action Alternatives

Under the No Project and No Action alternatives, FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. It is acknowledged that under the No Project/Action Alternative seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in number due to a projected higher demand for water in the future. The increase in drawdowns may have an indirect impact/affect since drawdowns expose shoreline areas that are normally under water to the drying action of the sun and wind. Once dry, fine particles can be picked up by the wind and contribute to dust in the atmosphere. Airborne particulate matter concentrations resulting from drawdowns are dependent upon the area of sediment exposed and the weather conditions at the time of exposure. Clear, windy, summer days typically provide the weather conditions most conducive to high levels of blowing particulate matter.

While quantification of the amount of particulate matter (PM10) that would be exposed from the increase in drawdowns as a result of the No Project/Action Alternative would be overly speculative due to the variability in seasonal drawdowns under future conditions, this Alternative can be compared with research conducted as part of the Lower Snake River Biological Drawdown Test Draft EIS (USACE and NMFS 1994) which analyzed the effects of the drawdown of the Lower Granite Reservoir in the Washington State in order to provide information to inform a decision of whether or not to drawdown the entire Snake River. At the time of the drawdown test, the Lower Granite Reservoir spanned 43.9 miles in length and possessed a capacity of 49,000 acre-feet of water, substantially greater than the 7,000 acre-feet capacity currently possessed at the Sugar Pine Reservoir, and with substantially more shoreline. The Lower Snake River Biological Drawdown Test Draft EIS (1994) analysis identified PM10 concentrations of 5 micrograms per cubic meter (μg/m3), which is significantly less than the 150 μg/m3 threshold promulgated under the National Ambient Air Quality Standards (NAAQS) and the 50 μg/m3 threshold promulgated under the California Ambient Air Quality Standards (CAAQS). The Draft EIS concluded that the PM10 levels associated with the drawdown of Lower Granite Reservoir would be so low that they would be unlikely to contribute significantly to threshold exceedances (USACE NMFS 1994). Thus, it can be similarly concluded that future drawdowns at the Sugar Pine Reservoir as a result of the No Project/Action Alternative. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action, Alternative 1, and Alternative 2

Neither the proposed project/action nor Alternative 2 will result in new permanent stationary or mobile sources of emissions beyond that already existing. While the Project/Action and alternatives would reconstruct campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities, these facilities already exist at the Sugar Pine Reservoir and are only proposed to be relocated. Therefore, the proposed project/action Alternative 2 would not generate quantifiable criteria air pollutant emissions from project operations. As with the No Project/Action Alternative, the proposed Project/Action and Alternative 2 would intermittently expose shoreline areas that are normally under water. Once dry, fine particles can be picked up by the wind and contribute to dust in the atmosphere. As previously described, while quantification of the amount of

PM10 that would be exposed from the increase in drawdowns as a result of the No Project/Action Alternative would be overly speculative due to the variability in intermittent shoreline exposure under future conditions, research conducted as part of the Lower Snake River Biological Drawdown Test Draft EIS (USACE and NMFS 1994), which analyzed the effects of the drawdown of the Lower Granite Reservoir in the Washington State in order to provide information to inform a decision of whether or not to drawdown the entire Snake River, provide a point in comparison. At the time of the drawdown test, the Lower Granite Reservoir spanned 43.9 miles in length and possessed a capacity of 49,000 acre-feet of water, substantially greater than the proposed 10,872 acre-feet capacity intended for the Sugar Pine Reservoir, and with substantially more shoreline. The Lower Snake River Biological Drawdown Test Draft EIS (USACE and NMFS 1994) analysis identified PM10 concentrations of 5 µg/m3, which is significantly less than the 150 µg/m3 threshold promulgated under the NAAQS and the 50 µg/m3 threshold promulgated under the CAAQS. The Draft EIS concluded that the PM10 levels associated with the drawdown of Lower Granite Reservoir would be so low that they would be unlikely to contribute significantly to threshold exceedances (USACE NMFS 1994). Thus, it can be similarly concluded that future drawdowns at the Sugar Pine Reservoir as a result of the proposed project/action or Alternative 2 would be ***less than significant*** under CEQA and ***no effect*** under NEPA.

Compensatory Mitigation Implementation: Vegetation Management

As described in Chapter 2 of this DEIR/EIS and as listed in *Table 2-5*, various compensatory mitigation measures would be implemented as part of the proposed project/action and Alternatives 1 and 2. Measures L1, N1 and O1 would carry our vegetation/fuels management on 200+ acres in the vicinity of Sugar Pine Reservoir. These measures include potential use of prescribed burns. Smoke released during vegetation management activities release particulate matter (PM10, PM2.5), carbon monoxide (CO), nitrogen oxides (NOx), and volatile organic carbons (VOCs).

No Project and No Action Alternatives

Vegetation/fuels management measures would not be required for the No Project and No Action alternatives.

Proposed Project/Action and Alternatives 1 and 2

As noted above, Measures L1, N1 and O1 would carry our vegetation/fuels management on 200+ acres in the vicinity of Sugar Pine Reservoir. These measures include potential use of prescribed burns. In order to carry out prescribed burns under the compensatory mitigation measures listed above, TNF would acquire a Smoke Management Plan (SMP) and Burn Permit as required by the California Air Resources Board under Title 17, Smoke Management Guidelines for Agricultural and Prescribed Burning for all prescribed fire activities. These activities would also need to comply with additional requirements set forth by the Mountain Counties Air Basin and the Great Basin Air Pollution Control Districts and the Tahoe National Forest Land and Resources Management Plan (USDA, 1990).

Prescribed fire would be controlled by the PCAQMD and it is unlikely smoke impacts to people in smoke-sensitive areas would exceed NAAQS because fire managers are required by law to follow smoke permit stipulations. Most smoke impacts occur during nighttime and early morning hours when smoke pools in drainages and low-lying areas such as valleys where people occupy homes. People living in smoke-sensitive areas downwind might smell smoke at night and during early morning hours, however there are no homes or communities near the project. Smoke from prescribed fire may temporarily reduce visibility in the vicinity of the project from one day to several days at a time. With implementation of the SMP as required under Management Requirement AQ1 (see *Table 2-6*, above), the impact of prescribed burns is considered ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA).

Impact AIR-2: Result in the exposure of sensitive receptors to substantial pollutant concentrations. Impact Determination: *less than significant with mitigation incorporated* (CEQA) *and no effect* (NEPA).

Construction-Related Effects

No Project and No Action Alternatives

Sensitive receptors are defined as facilities or land uses that include members of the population that are particularly sensitive to the effects of air pollutants, such as children, the elderly, and people with illnesses. Examples of these sensitive receptors are residences, schools, hospitals, and daycare centers. CARB has identified the following groups of individuals as the most likely to be affected by air pollution: the elderly over 65, children under 14, athletes, and persons with cardiovascular and chronic respiratory diseases such as asthma, emphysema, and bronchitis.

The No Project and No Action alternatives include no modifications to facilities or recreational features at the reservoir.

Proposed Project/Action and Alternative 1

Activities associated with implementation of the proposed project/action and Alternative 1 would result in temporary, short-term project-generated emissions of diesel particulate matter (DPM) from the exhaust of off-road, heavy-duty diesel equipment for site preparation (e.g., tree felling, grading); timber hauling truck traffic; paving; application of architectural coatings; and other miscellaneous activities. For construction-type activity, DPM is the primary TAC of concern. Particulate exhaust emissions from diesel-fueled engines (i.e., DPM) were identified as a TAC by the CARB in 1998. The potential cancer risk from the inhalation of DPM, as discussed below, outweighs the potential for all other health impacts (i.e., non-cancer chronic risk, short-term acute risk) and health impacts from other TACs.

Based on the emission modeling conducted, the maximum equipment-related emissions of $PM_{2.5}$ exhaust, considered a surrogate for DPM, would be 2.92 pounds per day (see *Appendix H*) during proposed Project/Action implementation activity ($PM_{2.5}$ is considered a surrogate for DPM because more than 90 percent of DPM is less than 1 microgram in diameter and therefore is a subset of particulate matter under 2.5 microns in diameter (i.e., $PM_{2.5}$), according to CARB. Most $PM_{2.5}$ derives from combustion, such as use of gasoline and diesel fuels by motor vehicles.) Furthermore, even during the most intense month of construction, emissions of DPM would be generated from different locations around the Sugar Pine Reservoir, rather than a single location, because different types of construction activities (e.g., demolition, site preparation, timber harvesting) would not occur at the same place at the same time.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., potential exposure to TAC emission levels that exceed applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on a 70-, 30-, or 9-year exposure period; however, such assessments should be limited to the period/duration of activities associated with the TAC-generated activities. Consequently, an important consideration is the fact that construction of the Proposed Project is not anticipated to last nine consecutive years, the minimum duration of exposure from which to calculate health risk (Project construction is anticipated to span approximately one year total), and that on a day-to-day basis construction activity generally spans eight hours as opposed to throughout the entire day.

Therefore, considering the relatively low mass of DPM emissions that would be generated during even the most intense season of construction, the fact that construction would not last as long as the minimum duration of exposure from which to calculate health risk, the lack of sensitive receptors in the vicinity of Sugar Pine Reservoir given the facility will be closed to public access during construction and the relatively short duration that construction activities (one year) would occur , construction-related TAC emissions would not expose sensitive receptors to substantial amounts of air toxics.

Another potential toxic air pollutant issue associated with construction-related activities is the airborne entrainment of asbestos due to the disturbance of naturally-occurring asbestos-containing soils. CARB has identified naturally occurring asbestos (NOA) as a TAC. NOA is contained in serpentine and ultramafic rock rocks as a result of natural geological processes (California Geological Survey [CGS] 2000).. Natural weathering and human activities, such as construction and ground-disturbance, may disturb NOA-bearing rock or soil and release mineral fibers into the air, which pose a greater potential for human exposure by inhalation thus posing a hazard to workers during construction, timber harvest, mitigation activities and the public during normal operations. Breathing in NOA is associated with diseases related to the respiratory system, and diseases of the lung and pleural membrane surrounding the lungs have been extensively studied. Breathing NOA increases the risk of the following health effects:

- *Malignant mesothelioma*—Cancer of the membrane lining the chest cavity and covering the lungs (pleura) or lining the abdominal cavity (peritoneum). This cancer can spread to tissues surrounding the lungs or other organs. The great majority of mesothelioma cases are attributable to asbestos exposure. Many scientists believe that amphibole asbestos fibers have a potency for causing mesothelioma that is as much as 100 times greater than that of chrysotile fibers, mainly because of increased persistence of amphiboles in the lungs.
- *Lung cancer*—Cancer of the lung tissue, also known as bronchogenic carcinoma. The exact mechanism relating asbestos exposure with lung cancer is not completely understood. The combination of tobacco smoking and asbestos exposure greatly increases the risk of developing lung cancer.

- *Noncancer effects*—These include *asbestosis*, a restrictive lung disease caused by asbestos fibers scarring the lung; *pleural plaques*, localized areas of thickening of the pleura; *diffuse pleural thickening*, generalized thickening of the pleura; *pleural calcification*, calcium deposition on pleural areas thickened from chronic inflammation and scarring; and *pleural effusions*, fluid buildup in the pleural space between the lungs and the chest cavity. Loss of lung function or other clinical signs may or may not be associated with these noncancer effects. (ATSDR 2001.)

NOA-bearing rock/soil has been identified in Placer County. Additionally, the California Geological Survey's General Location Guide for Ultramafic Rocks in California - Areas More Likely to Contain Naturally Occurring Asbestos (CGS 2000) shows the Sugar Pine Reservoir as existing in an area designated as likely to contain NOA. Therefore, ground-disturbing activity associated with implementation of the proposed project/action and Alternatives 1 and 2, particularly timber harvesting and also any activity involving the movement of heavy equipment over unpaved surfaces, would result in a potentially significant impact associated with the release of NOA requiring mitigation. Implementation of Mitigation Measure AIR-1 would reduce this impact to a less than significant level. Therefore, the impact/effect is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Mitigation Measures

Mitigation Measure AIR-1: Prepare and Implement an Asbestos Dust Mitigation Plan for all ground-disturbing activities involved with the proposed project/action.

Foresthill PUD will submit an Asbestos Dust Mitigation Plan to the Placer County Air Pollution Control District for approval. Placer County Air Pollution Control District approval is required before the start of any ground-disturbing activity, including the movement of construction equipment over unpaved land. The provisions of the approved Asbestos Dust Mitigation Plan shall be implemented at the beginning and maintained throughout the duration of Project/Action implementation (i.e., gate installation, recreational facility relocation, timber harvesting).

The Asbestos Dust Mitigation Plan shall include, yet not be limited to, the following asbestos airborne toxic control measures as provided by the CARB, at the discretion of the PCAPCD:

- Track-out prevention and control measures which may include the removal of any visible track-out from a paved public road at any location where vehicles exit the work site as accomplished by using wet sweeping or a HEPA filter equipped vacuum device at the end of the work day or at least one time per day; and/or the installation of one or more of track-out prevention measures such as a) a gravel pad designed to clean the tires of exiting vehicles, b) a tire shaker, c) a wheel wash system, d) pavement extending for not less than fifty (50) consecutive feet from the intersection with the paved public road, and/or e) any other measure as effective as the measures listed above.
- Keeping active storage piles adequately wetted or covered with tarps.

- Control for disturbed surface areas and storage piles that will remain inactive for more than seven (7) days by a) keeping the surface adequately wetted, b) establishing and maintaining surface crusting, c) applying chemical dust suppressants or chemical stabilizers according to the manufacturers' recommendations, d) covering with tarp(s) or vegetative cover, e) installing wind barriers of fifty (50) percent porosity around three (3) sides of a storage pile, f) installing wind barriers across open areas, or g) implementing any other measure as effective as the measures listed above.
- Control for traffic on on-site unpaved roads, parking lots, and staging areas by implementing a maximum vehicle speed limit of fifteen (15) miles per hour or less; watering every two hours of active operations or sufficiently often to keep the area adequately wetted.
- Control for earthmoving activities by a) pre-wetting the ground to the depth of anticipated cuts, b) suspending grading operations when wind speeds are high enough to result in dust emissions crossing the property line, despite the application of dust mitigation measures, c) applying water prior to any land clearing, or d) any other measure as effective as the measures listed above.
- Control for off-site transport by ensuring that no trucks are allowed to transport excavated material off-site unless trucks are maintained such that no spillage can occur from holes or other openings in cargo compartments and loads are adequately wetted and either covered with tarps or loaded such that the material does not touch the front, back, or sides of the cargo compartment at any point less than six inches from the top and that no point of the load extends above the top of the cargo compartment.
- Post construction stabilization of disturbed areas shall be instigated upon completion of Project implementation by ensuring disturbed surfaces are stabilized by a) establishing a vegetative cover, b) placement of at least three (3.0) inches of non-asbestos-containing material, c) paving, and/or d) any other measure deemed sufficient to prevent wind speeds of ten (10) miles per hour or greater from causing visible dust emissions.
- Air monitoring for asbestos.

Timing: *Submittal to the Placer County Air Pollution Control District before the start of construction activities and implementation throughout Project construction.*

Responsibility: *Foresthill PUD and contractor.*

Significance after Mitigation: implementing Mitigation Measure **AIR-1** would reduce potential impact associated with NOA during construction and timber harvesting activities to a *less than significant* level under CEQA and *no adverse effect* under NEPA.

Helicopter Harvest Alternative (Alternative 2)

Activities associated with Alternative 2 would be identical to those of the proposed project/action except that a helicopter would be used for approximately two days during timber harvest in lieu of ground equipment. As such, the emission of air toxics would be greater compared with the proposed Project/Action. As previously described, Alternative 2 would burn up to 113 gallons of aviation fuel daily, emitting air pollutants including $PM_{2.5}$, in quantities beyond the proposed project/action. However, the dose to which receptors are exposed is the primary factor used to determine health risk, and the dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. The risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period of time. Thus, an important consideration is the fact that Alternative 2 proposes the use of a helicopter for just two days. For this reason, the impact is considered comparable to that described for the proposed project/action above. This impact, therefore, is considered ***less than significant impact with mitigation incorporated*** with the implementation of mitigation measure **AIR-1** under CEQA and ***no effect*** under NEPA, again, with the implementation of AIR-1.

Post-Construction Operational Impacts

No Project and No Action Alternatives

Under the No Project and No Action Alternatives, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. While the No Project and No Action alternatives would result in an increase in the number of seasonal drawdowns of Sugar Pine Reservoir due to a projected higher demand for water in the future, resulting in an increased amount of airborne particulate matter pollutant concentrations, previous research concerning reservoir drawdowns and particulate matter concentrations has been conducted on a substantially larger scale than the Sugar Pine Reservoir where it was determined particulate matter concentrations would be so low that they would be unlikely to contribute significantly to threshold exceedances (USACE 1994). As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action Alternatives

Once operational, the proposed project/action would function as a reservoir possessing more water capacity than under currently conditions. Therefore, operations would not generate quantifiable air toxic emissions. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

Impact AIR-3: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impact Determination: *less than significant* (CEQA) and *no effect* (NEPA)

Typically, odors are regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

With respect to odors, the human nose is the sole sensing device. The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Construction Impacts

No Project and Action Alternatives

Under the No Project and No Action alternatives, no modifications to facilities or recreational features at the reservoir would be implemented. FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. There is no aspect of the No Project or No Action Alternative that would result in the generation of odors affecting a substantial number of people. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternative 1

During Project/Action implementation, the proposed Project/Action presents the potential for generation of objectionable odors in the form of diesel exhaust in the immediate vicinity of the reservoir. However, these emissions are short-term in nature and will rapidly dissipate and be diluted by the atmosphere downwind of the emission sources. Additionally, odors would be localized and generally confined to the construction area. Once completed, the Sugar Pine Reservoir would possess increased water capacity and relocated recreational facilities. No aspect of Project/Action operations would result in the generation of odors affecting a substantial number of people. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

Helicopter Harvest Alternative (Alternative 2)

While this Alternative would employ the use of a helicopter, there no aspect that would result in the generation of odors affecting a substantial number of people. There would be a ***less than significant*** under CEQA and ***no effect*** under NEPA.

Operational Impacts

No Project and No Action Alternatives

Under the No Project and No Action alternatives, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. While the No Project and No Action alternatives would result in an increase in the number of seasonal drawdowns of Sugar Pine Reservoir due to a projected higher demand for water in the future, resulting in an increased amount of airborne particulate matter pollutant concentrations, previous research concerning reservoir drawdowns and particulate matter concentrations has been conducted on a substantially larger scale than the Sugar Pine Reservoir where it was determined particulate matter concentrations would be so low that they would be unlikely to contribute significantly to threshold exceedances (USACE 1994). Thus, it can be similarly concluded that future drawdowns at the Sugar Pine Reservoir as a result of the No Project and No Action alternatives would result in ***no impact*** under CEQA concerning the exposure to sensitive receptors to substantial odors and ***no effect*** under NEPA. The No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternatives 1 and 2

Once operational, the proposed project/action would function as a reservoir possessing more water capacity than under currently conditions. Therefore, operations would not generate emissions leading to odors. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

Impact AIR-4: Conflict with or obstruct implementation of the applicable air quality plan. Impact Determination: *No impact* (CEQA) and *no effect* (NEPA).

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, state, and local plan components and regulations to identify specific measures to reduce pollution in nonattainment areas, using a combination of performance standards and market-based programs. Similarly, under state law, the California Clean Air Act requires an air quality attainment plan to be prepared for areas designated as nonattainment with regard to the federal and state ambient air quality standards. Air quality attainment plans outline emissions limits and control measures to achieve and maintain these standards by the earliest practical date.

The PCAPCD is the agency responsible for enforcing many federal and state air quality requirements and for establishing air quality rules and regulations. The PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. As part of this effort, the PCAPCD has developed input to the SIP, which is required under the federal Clean Air Act for areas that are out of attainment for air quality standards. The SIP includes the PCAPCD's plans and control measures for attaining the ozone national ambient air quality standards.

The SIP plans and control measures are based on information derived from projected growth in Placer County in order to project future emissions and then determine strategies and regulatory controls for the reduction of emissions. Growth projections are based on the general plans developed by Placer County and the incorporated cities in the county. As such, projects that propose development consistent with the growth anticipated by the respective general plan of the jurisdiction in which the proposed development is located would be consistent with the SIP. In the event that a project would propose a development that is less dense than that associated with the general plan, the project would likewise be consistent with the SIP. If a project, however, proposes a development that is denser than that assumed in the general plan, the project may be in conflict with the SIP and could therefore result in a significant impact on air quality.

No Project Alternative and No Action Alternative

There would be no increase in population as a result of the No Project/Action Alternative. Therefore, this Alternative would not exceed the population or job growth projections used by the PCAPCD to develop its portion of the SIP. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

Proposed Project/Action and Alternatives

There would be no increase in population as a result of the Project/Action. Therefore, the Project would not exceed the population or job growth projections used by the PCAPCD to develop its portion of the SIP. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

Impact AIR-5: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Impact Determination: *less than significant* (CEQA) *and no effect* (NEPA).

Construction-Related Impacts

No Project and No Action Alternatives

Reservoirs are a source of the GHG, CH_4. As previously described, CH_4 is 25 times more potent than CO_2 in terms of absorbing heat energy. Reservoirs are a source of CH_4 as the dams holding back water in reservoirs also traps sediments, and CH_4 is produced by underwater microbes that feast on the organic matter that piles up in these sediments trapped by dams. According to the USEPA (2016d), reservoirs can generate up to 15.4 milligrams (mg) of CH_4 per square meter of a reservoir every hour (0.000000015 metric tons per 0.0002 acre).[1] Additionally, the combustion of fossil fuel necessary to power automobiles and off-road construction equipment is a source of CO_2 emissions.

[1] USEPA research identified three separate methane emission rates associated with reservoirs, 4.8 mg/m^2/hour, 33.0 mg/m^2/hour, and 8.3 mg/m^2/hour. 15.4 is the average of these three emission rate estimates.

Under the No Project and No Action alternatives, no modifications to facilities or recreational features at the reservoir would be implemented. FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area.

The current span of the Sugar Pine Reservoir is 163 acres (659,637 square meters). Based on the latest estimated CH_4 emission rate identified by the EPA, this amount of reservoir could be expected to emit 0.01 metric ton of CH_4 in one hour [659,637 x 15.4 = 10,158,410 mg or 0.01 metric ton per hour]. 0.01 metric ton of CH_4 equates to 0.25 metric ton of CO_2e (as previously described, CH_4 is 25 times more potent than CO_2 in terms of absorbing heat energy). There are 8,760 hours in one year and therefore the Sugar Pine Reservoir could be emitting as much as 2,190 metric tons of CO_2e annually under existing conditions [8,760 hours x 0.25 CO_2e = 2,190 metric tons]. However, there is no aspect of the No Project and No Action alternatives that would result in an increase of CO_2e emissions beyond existing conditions. Thus, the No Project and No Action alternatives would have ***no impact*** under CEQA and ***no effect*** under NEPA.

Proposed Project/Action and Alternative 1

Implementation of the proposed project/action would generate short-term emissions of GHG. Emissions generated during proposed Project/Action implementation would be short term and of temporary duration, lasting only as long as such activities occur, but have the potential to represent a significant air quality impact under CEQA if the volume of GHG emissions generated exceeds the PCAPCD's CEQA-related GHG-related threshold of significance. PCAPCD has developed significance criteria which may be relied upon to make GHG-related impact determinations for the proposed Project/Action.

The primary source of GHG emissions associated with the proposed Project/Action includes the operation of construction-related equipment and vehicles (i.e., chainsaws, dozers, cranes, dump trucks) and logging trucks, which will be required in order to place the radial gates, remove and relocate the recreational facilities, and remove trees. Additionally, proposed Project/Action implementation would generate GHG emissions associated with worker commute trips.

Emissions associated with implementation/construction of the proposed project/action were calculated using the CARB-approved CalEEMod computer program, which is designed to model GHG emissions for development projects. Emission projections account for the construction timeline, including timber harvest, provided in Chapter 2.0 of this DEIR/EIS. In order to provide a conservative analysis, emission estimates include 93 acres of land disturbance to account for land disturbed during timber harvest activities, recreational facility construction, and hazard tree treatment. 1,574 logging truck trips are anticipated, and emission estimates also account for the hauling of demolished asphalt associated with an asphalt trail proposed for removal and the one-time emission of CO_2 from the removal of trees.

See *Appendix H* for more information regarding the construction assumptions, including construction equipment and duration, used in this analysis. Predicted maximum daily construction-generated emissions for the proposed Project are summarized in *Table 4.4-9*.

Table 4.3-9. Construction-Related GHG Emissions

Construction Year	GHG Emissions (metric tons per year)
	CO_2e
Construction 2020	525
Construction 2021	47
Removal of 44 acres of Forest Land	4,884
Total:	**5,456**
PCAPCD Potentially Significant Impact Threshold	*10,000*
Exceed Threshold?	**No**

Sources: CalEEMod version 2016.3.2. Refer to **Appendix H** for Model Data Outputs.

As shown in *Table 4.3-7*, construction would result in the generation of 5,456 metric tons of CO_2e. This total includes the one-time release of CO_2 emissions resulting from the deforestation of 44 acres of forest land. The proposed project/action would not generate GHG emissions at a level that exceeds the PCAPCD construction significance threshold and is therefore a ***less than significant impact*** under CEQA.

Under NEPA, emissions generated by implementation of the proposed Project/Action are compared to the *Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98)* rule, which requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year. As shown in *Table 4.3-9*, the proposed Project/Action would not generate 25,000 metric tons of CO_2e annually, and thus would have ***no effect*** under NEPA.

Helicopter Harvest Alternative (Alternative 2)

Under this alternative to the proposed Project/Action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine acres of the 44 acres to be cleared under the proposed Project/Action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. The use of a helicopter would reduce the number of on-site vehicle trips to transfer the cut material to the landings, as harvest would be expected to take only two days to complete with use of a helicopter.

For the purposes of this analysis the use of UH-1H Super Huey (Type II) helicopter is assumed. Project implementation would average two takeoffs and landings per day over the course of two days. UH-1H Super Huey (Type II) helicopters are estimated to consume 103.3 gallons of aviation fuel per hour (CAL-FIRE 2017). UH-1H Super Huey (Type II) helicopters possess a range of 250 miles per flight and an endurance of 2 hours per flight event. Assuming 4 hours of total flight time each day of the two days of use, the Project would be expected to instigate the consumption of 113 gallons of aviation fuel daily [4 hours x 103.3 = 413.2 gallons daily]. According to the California Climate Action Registry (2016), 0.008 metric tons of CO_2 is generated for every gallon of aviation fuel consumed [0.008 x 413.2 = 3.3 metric tons daily]. Since this Alternative would employ the use of a helicopter for two days, an addition of 6.6 metric tons of GHG emissions could be expected to be generated beyond the proposed Project/Action. Therefore, this Alternative would have a ***less than significant impact*** under CEQA and ***no effect*** under NEPA.

Operational Impact

No Project and No Action Alternatives

Under the No Project and No Action alternatives, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Under both alternatives, no new permanent stationary or mobile sources of emissions would be created beyond that already existing. The No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternatives 1 and 2

The proposed project/action and Alternatives 1 and 2 will not include the provision of new permanent stationary or mobile sources of emissions beyond that already existing. While the proposed project/action and alternatives would result in campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities, these facilities already exist at the Sugar Pine Reservoir and are only proposed to be relocated. However, as previously described, reservoirs themselves are a source of CH_4. This is because the dams holding back water in reservoirs also traps sediments, and CH_4 is produced by underwater microbes that feast on the organic matter that piles up in these sediments trapped by dams. As previously described, EPA research (2016d) has indicated there is a potential that reservoirs can generate up to 15.4 mg of CH_4 per square meter of a reservoir every hour (0.000000015 metric tons per 0.0002 acre). The proposed Project/Action would enlarge the Sugar Pine Reservoir from approximately 163 acres to span 208 acres. Therefore, based on the emission rate of 15.4 mg of CH_4 per square meter of a reservoir every hour, the increased water capacity of the Sugar Pine Reservoir resultant of the proposed project/action and Alternatives 1 and 2 could emit an additional 657 metric tons of CO_2e over existing conditions [208 acres – 163 acres = 45 acres (182,109 square meters). 182,109 m^2 x 15.4 = 2,804,479 mg (0.003 metric tons) of CH_4 per hour. 0.003 metric tons of CH_4 x 8,760 annual hours = 26 metric tons of CH_4, which equates to 657 metric tons of CO_2e annually]. *Table 4.3-10* shows a comparison of the proposed Project/Action operational GHG emission to the PCAPCD CEQA-related GHG-related threshold of significance.

Table 4.3-10. Operational-Related GHG Emissions

Emissions Source	GHG Emissions (metric tons per year)
	CO_2e
Increased Reservoir Methane	657
PCAPCD Potentially Significant Impact Threshold	*1,100*
Exceed Threshold?	**No**

As shown, the increase water capacity at the Sugar Pine Reservoir associated with the proposed project/action and Alternatives 1 and 2 would not result in an increase of GHG emissions beyond the PCAPCD GHG significance threshold. Under NEPA, emissions generated by implementation of the proposed project/action or Alternatives 1 or 2 are compared to the *Mandatory Reporting of Greenhouse Gases Rule (40 CFR Part 98)* rule, which requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2e emissions per year. As shown, the proposed project/action or alternatives would not exceed this threshold either.

Operations under the proposed project/action or Alternative 1 or 2 would have a ***less than significant impact*** under CEQA and ***no effect*** under NEPA.

Impact AIR-6: Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. Impact Determination: *No impact* (CEQA) and *no effect* (NEPA)..

There are no locally adopted GHG emissions reduction plans applicable to the Proposed Project site or area. The State's 2017 Scoping Plan includes strategies for water that may be applicable to the Sugar Pine Reservoir. First instance, a primary goal of the 2017 Scoping Plan is to develop and support more reliable water supplies for people, agriculture, and the environment, provided by a more resilient, diversified, sustainably managed water resources system with a focus on actions that provide direct GHG reductions.

No Project/Action Alternative

The No Project/Action Alternative only includes the approval of the extension of Water Right 15375, and no modifications to facilities or recreational features at the reservoir would be implemented. The extension of Water Right 15375 will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. There is no aspect of the No Project/Action Alternative that would conflict with any GHG-reduction plans. However, it is acknowledged that under the No Project/Action Alternative seasonal drawdowns of Sugar Pine Reservoir will, on average, increase due to a projected higher demand for water in the future. Nonetheless, while the existing water capacity at the Sugar Pine Reservoir may not contribute to more reliable water supplies in the FPUD service area, the No Project/Action would not exacerbate this situation.

Proposed Project/Action and Alternatives

One of the primary objectives of the proposed Project/Action is to expand water storage capacity at Sugar Pine Reservoir to help mitigate potential decline in project yield due to climate change. Specifically, the additional water storage provided by the proposed Project/Action is intended to enhance water supply reliability needed to protect Foresthill from a prolonged drought. The water supply impacts analysis in the Environmental Impact Report (EIR) certified for the Foresthill Community Plan concluded that installation of the radial gates and the associated increase in water storage would avoid significant water supply impacts by ensuring adequate supplies to implement full build-out under the Foresthill Community Plan despite anticipated climate change and droughts. Therefore, the proposed Project/Action would be consistent with the 2017 Scoping Plan goal of to developing and supporting more reliable water supplies for people. The Project/Action would not conflict with existing plans or regulations regarding reduction of GHG emissions. The impact, therefore, is considered ***less than significant*** (CEQA) with and ***no effect*** (NEPA).

4.3.3.4 Cumulative Impact

As previously stated, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project would be cumulatively considerable. Projects that do not exceed significance thresholds for both criteria air pollutants and GHG emissions would be considered ***not cumulatively considerable***.

4.3.3.5 Residual Unavoidable Effects

The proposed project/action and Alternatives 1 and 2 would result in potential impacts during construction and the timber harvest related to the generation of air toxics. These impacts would be reduced to a less than significant level with implementation of mitigation measure AIR-1. The proposed project/action and Alternatives 1 and 2 would result in less than significant impacts concerning odors. Lastly, while the proposed Project/Action and Alternative 1 would result in less than significant impacts regarding the violation of an air quality standard, Alternative 2 could be expected to surpass significance threshold for daily NOx emissions due to the use of a helicopter.

Thus, Alternative 2 would result in a significant and unavoidable and cumulatively considerable impact while the proposed Project/Action and Alternative 1 would be less than significant and less than cumulatively considerable.

4.3.4 References

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4.4 Biological Resources

This section describes potential direct, indirect, and cumulative effects on terrestrial and aquatic biological resources that could result from construction and operation of the proposed Sugar Pine Dam Radial Gate Installation and Water Right Extension Project including the implementation of all proposed compensatory mitigation measures identified in this DEIR/EIS. Section 4.4.1 provides a description of the existing environmental setting/affected environment for biological resources in the Project Area. Section 4.4.2 describes applicable regulations, plans, and standards pertinent to the proposed project/action. Section 4.4.3 addresses the potential direct, indirect and cumulative effects of the proposed project/action and provides mitigation measures to reduce effects that are found to be significant.

4.4.1 Environmental Setting/Affected Environment

As described in detail in Chapter 2.0 of this DEIR/EIS, the proposed project/action would install radial gates within the Sugar Pine Dam spillway. The spillway for Sugar Pine Dam was originally designed by Reclamation to accommodate potential installation of the proposed radial gates to increase water storage capacity of the reservoir. Installation of the radial gates would inundate ±44 additional acres by raising the reservoir's maximum water surface elevation by 20 vertical feet to an elevation of 3,638 feet above sea level, which would increase the reservoir's storage capacity to 10,872 acre-feet (AF), up from the existing capacity of 6,922 AF. This increased inundation area requires the relocation of existing recreational facilities, including the Joshua M. Hardt Memorial Trail (JHMT), located around the perimeter of the reservoir.

The Project Area analyzed in this section includes the planned inundation area and adjacent lands considered for relocation of displaced recreational facilities. The compensatory mitigation sites are in the vicinity of the Project Area and existing conditions are generally consistent with those of the Project Area.

In addition to the Project Area surrounding the existing reservoir, the proposed project/action would implement a compensatory mitigation program to replace recreational facilities affected by the project and mitigate for lost or degraded biological resources. These areas include: fuels treatments on 70 acres of the North Shirttail Creek RCA; streambank stabilization on two locations of North Shirttail Creek, erosion repair on Fisherman's Access Road, wetland creation for California red-legged frogs near the existing population at Michigan Bluff, invasive species treatments in montane chaparral in the vicinity of the Project Area, bull frog suppression on 8,500 linear feet of North Shirttail and Forbes creeks and fuels treatments on up to 196.5 acres of spotted owl potential activity centers (PACs) to reduce the risk of wildfire and improve the long-term habitat conditions for spotted owls.

This section of the DEIR/EIS describes existing biological conditions in areas likely to be affected by project construction and operation and by implementation of the compensatory mitigation program.

The Project Area is comprised of rolling to steep terrain at an elevation range of approximately 3,620 to 3,700 feet above mean sea level (msl). The Project Area is primarily undeveloped but includes parking and boat launch facilities in the southern portion and camping and day use facilities in the northeastern portion. The JHMT, a paved hiking trail, extends from the Sugar Pine boat ramp to Giant Gap Campground. Two other unpaved multi-use trails complete the circle around the entire perimeter of Sugar Pine Reservoir.

4.4.1.1 Sugar Pine Management Area

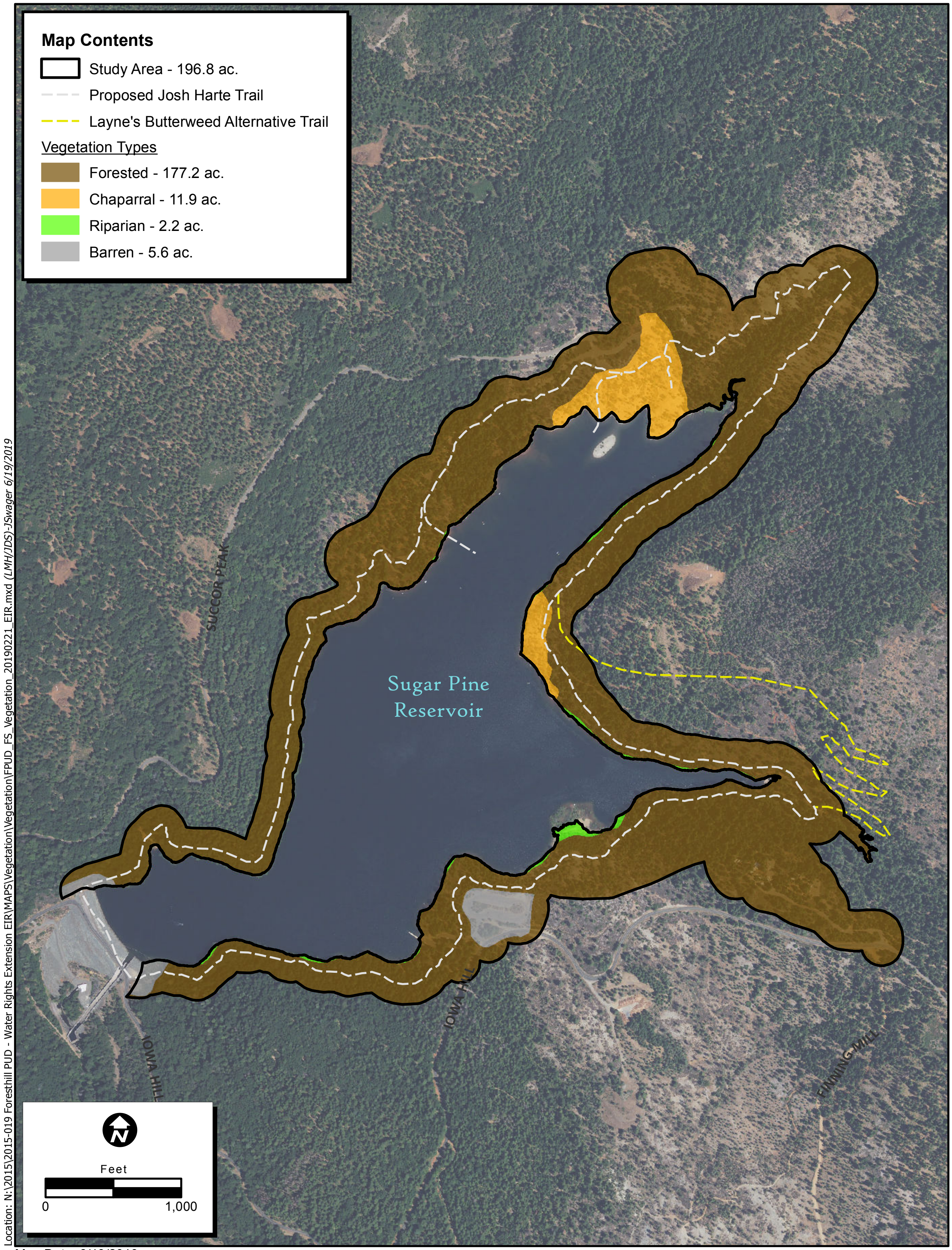
The Project Area is located in the American River District of the TNF in the Sugar Pine Management Area 096 (see **Appendix C**). The resource management emphasis for the 1,611-acre MA 96 is protection of the Sugar Pine Project as a public water supply source and recreation with a desire for a mosaic of continuous canopy cover. Water quality and watershed condition are a concern because the reservoir is a public water source. The Sugar Pine Reservoir is also an important recreational facility in the TNF.

The Sugar Pine Reservoir is an important recreational facility on the TNF. Sugar Pine Reservoir supports numerous fish species of recreational importance, including rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), green sunfish (*Lepomis cyanellus*), and other bluegills and sunfish in the family Centrarchidae (USBR and USFS 2003). The reservoir is stocked with hatchery-reared rainbow trout annually by CDFW to supplement the recreational fishery. No special-status fish species have been documented in Sugar Pine Reservoir.

Fish species occurring in North Shirttail Creek include rainbow trout, Sacramento pikeminnow (*Ptychocheilus grandis*), hardhead (*Mylopharadon conocephalus*), and hitch (*Lavinia exilicauda*) (White 2008). Hitch, a California Species of Special Concern, is the only special-status fish species known to occur in the creek.

4.4.1.2 Vegetation Communities/Wildlife Habitat Type

For the purposes of this analysis and the compensatory mitigation requirements, the Project Area was classified into three primary California wildlife habitat relationships (CWHR) habitat types: Sierra mixed conifer, montane chaparral, and montane riparian with inclusions of lacustrine, perennial grass, Douglas-fir, ponderosa pine, and hardwood-conifer forests, and barren/urban areas (Mayer and Laudenslayer 1988). Northern and eastern aspects within the Project site are primarily comprised of lower montane coniferous forest, while southern and western aspects are dominated by chaparral. Riparian vegetation occurs within the floodplains of North Shirttail Creek and Forbes Creek, and to a limited extent along the margins of Sugar Pine Reservoir. Outcrops of serpentinite occur in several locations throughout the site, the largest occurring in the vicinity of the day use facilities in the northeastern portion of the site. The primary vegetation communities in the Study Area are quantified in **Table 4.4-1** and shown on **Figure 4.4-1 Vegetation Communities in the Study Area**.



Map Date: 6/19/2019
Photo Source: NAIP, 2018

Figure 4.4-1 Vegetation Communities

2015-019 FPUD Sugar Pine Reservoir

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Table 4.4-1. Vegetation Communities/Wildlife Habitat Types in the Project Area	
Type	**Acreage**
Sierra Mixed Conifer	37.0[1]
Montane Chaparral	6.4
Montane Riparian	1.6
Reservoir	162.87

Project Area including the reservoir and projected inundation area.

Sierra Mixed Conifer Forest

Most of the Project Area is comprised of Sierra mixed conifer forest which varies significantly in species composition throughout the site. More xeric areas, located primarily on south and west facing slopes, are characterized by an overstory dominated by ponderosa pine (*Pinus ponderosa*) and incense cedar (*Calocedrus decurrens*), with a dense understory of whiteleaf manzanita (*Arctostaphylos viscida*). More mesic areas, located primarily on north and east facing slopes, are characterized by an overstory of mixed conifers, including ponderosa pine, Douglas fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), and incense cedar, with an understory dominated variously by canyon live oak (*Quercus chrysolepis*), black oak (*Quercus kelloggii*), Pacific madrone (*Arbutus menziesii*), and big leaf maple (*Acer macrophyllum*).

Montane Chaparral

The Project Area includes ±12 acres of the montane chaparral habitat type. Montane chaparral occurs within the site on south and west facing slopes, primarily where the soil is rocky and shallow. The largest contiguous area of chaparral onsite occurs on the south-facing slope north of where Forbes Creek flows into Sugar Pine Reservoir. Montane chaparral within the site is dominated by buck brush (*Ceanothus cuneatus*) and whiteleaf manzanita.

Montane Riparian

Riparian vegetation occurs in some locations along the margin of Sugar Pine Reservoir. The most notable area of riparian vegetation located along the margin of the reservoir occurs near Forbes Creek and encompasses ±1.6 acres on the southern shoreline. This area is dominated by emergent willow (*Salix* sp.) trees.

4.4.1.3 Sensitive Natural Communities

No sensitive natural communities as defined by CDFW (2018a) occur in the Project Area. In addition to CDFW defined communities, wetlands and riparian communities are also considered sensitive. There is ±1.6 acres of riparian community on the southern shoreline of the reservoir. Wetlands are also present and are described below. For more information, refer to **Appendix I**, Permanently Impacted Vegetation and Habitat Maps.

Wildlife Movement/Corridors and Nursery Sites

According to CDFW's BIOS database, CDFW Mule Deer Range, the Project Area is not a mule deer migration corridor or critical fawning area (CDFW 2019b-BIOS). The riparian-vegetated stream corridors along North Shirttail and Forbes Creek likely serve as regional and localized wildlife movement corridors.

No nursery sites are mapped in the Project Area (CDFW 2019a-CNDDB) but large trees and recreational structures (i.e., outhouses, bathhouses) may serve as bat maternal roosting sites.

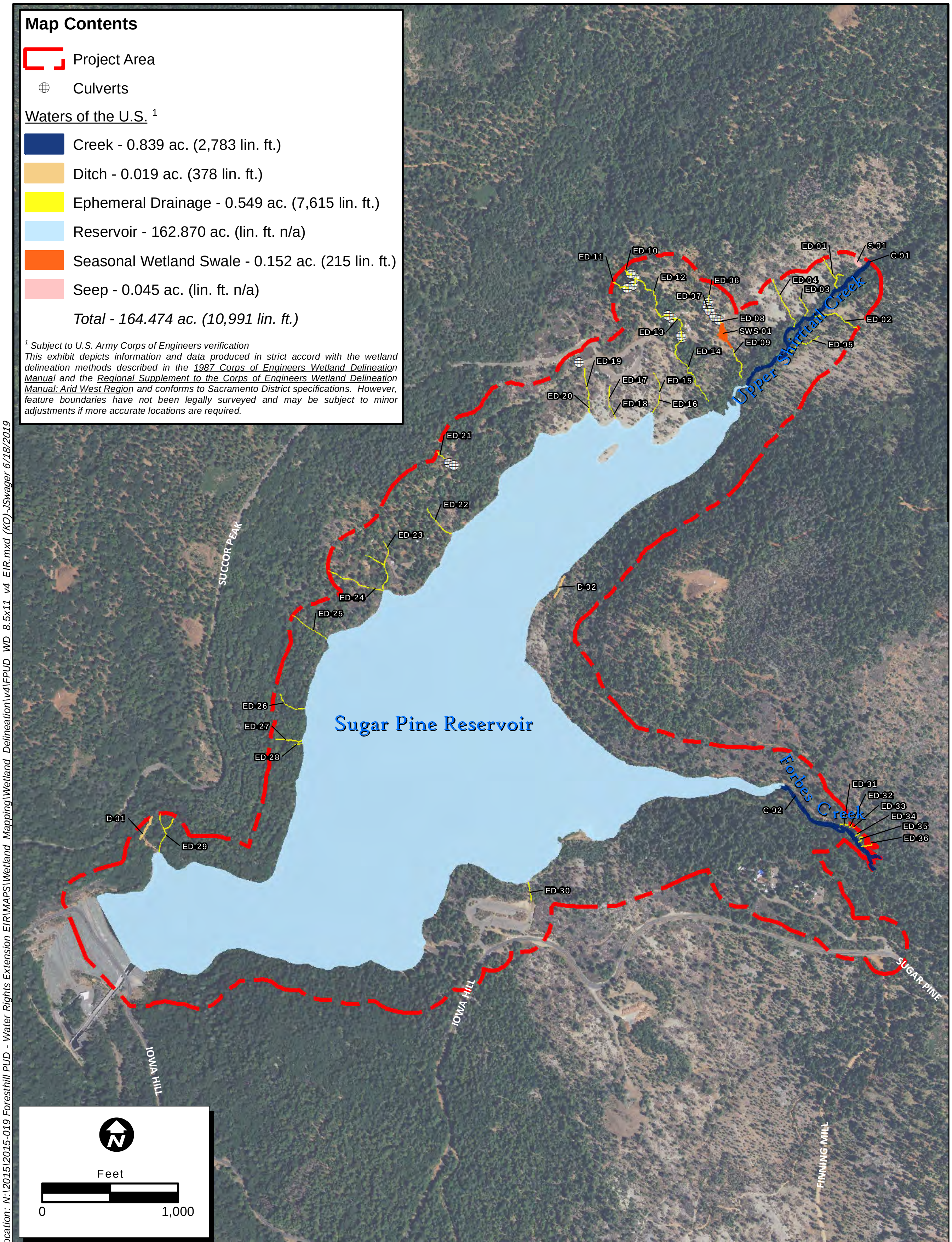
Waters of the U.S.

A wetland delineation (in accordance with the 1987 *Corps of Engineers Wetland Delineation Manual* and the *2008 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* USACE 2008) was conducted in the Project Area in 2016. A total of 164.48 acres of potential Waters of the U.S. were mapped in the Project Area (**Table 4.4-2**). The prominent Waters of the U.S. in the Project Area include the reservoir and North Shirttail and Forbes Creeks (**Figure 4.4-2 Wetland Delineation**). One seep and one seasonal wetland swale was also mapped in the Project Area.

Table 4.4-2. Potential Waters of the U.S.

Type	Acreage[1]
Wetlands	
Seasonal Wetland Swale	0.15
Seep	0.05
Other Waters	
Creek	0.84
Ditch	0.02
Ephemeral Drainage	0.55
Reservoir	162.87
Total	164.48

[1]Acreages represent a calculated estimation and are subject to modification following the USACE verification process.



Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Wetland_Mapping\Wetland_Delineation\v4\FPUD_WD_8.5x11_v4_EIR.mxd (KO)-JSwager 6/18/2019

Map Date: 6/18/2019
Photo Source: NAIP, 2018

Figure 4.4-2 Wetland Delineation

2015-019 FPUD Sugar Pine Reservoir

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4.4.1.4 Special-Status Plant and Animal Species

Special-Status Plant Species

All 120 special-status plant species considered for this analysis, their status, and habitat associations are identified in **Appendix J**. Of the 120 species considered, **Appendix J** describes 41 species that are considered absent from the entire Project Area and are not further considered in the analysis and were not part of the protocol-level floristic surveys completed for the proposed project/action. All U.S. Forest Service (USFS) Sensitive, Watch List or CNDDB species with some potential to occur were identified as target species for the purposes of protocol-level floristic surveys. **Appendix J** identifies these species as either present, meaning they were detected during the surveys, or "Absent" based on the results of the floristic surveys (**Figure 4.4-3 Locations of Special-Status Plants**). These species are described below.

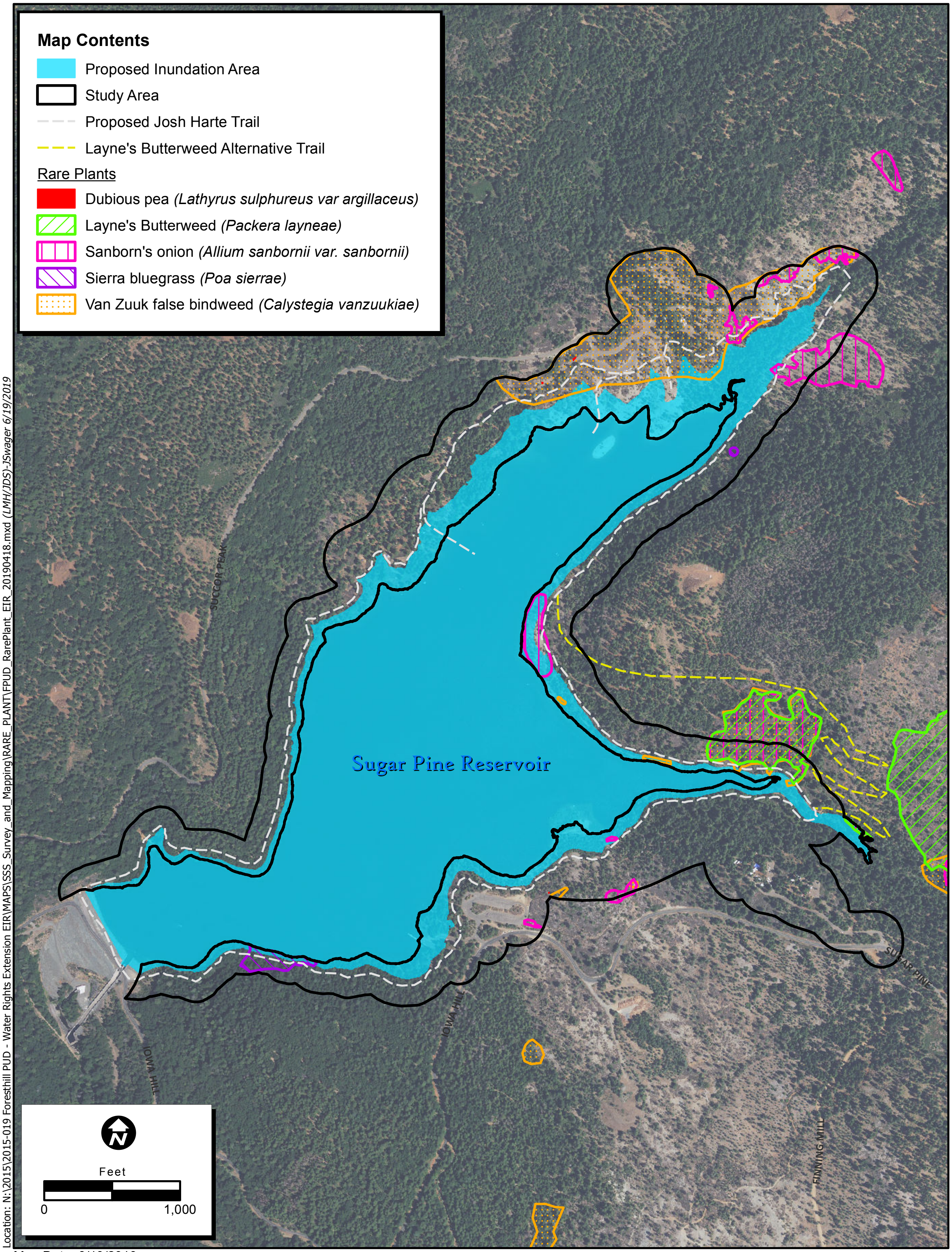
Layne's Butterweed (Packera layneae)

Layne's butterweed has been listed as federally threatened since 1996. It is considered rare and moderately threatened in California (CRPR 1B.2) and is globally threatened (G2) (CNPS 2019). There are two previously documented occurrences in the TNF, both in Placer County on the American River Ranger District. One is located just west of Sage Hill (south of Foresthill) and the other is located along Forbes Creek within the Project analysis area.

Layne's butterweed appears to be an early successional species that occupies temporary openings on gabbro (i.e. rich in iron and magnesium with low concentrations of heavy metals) or serpentine soils (i.e. derived from ultra-mafic parent material) (U.S. Fish and Wildlife Service [USFWS] 2002a). Layne's butterweed densities are significantly higher in areas with more exposed bare ground (Merriam et al. 2009). On TNF, its habitat appears to be restricted to a narrow suite of soil types.

One occurrence of Layne's butterweed was documented during field surveys of the Project Area in 2016 (**Figure 4.4-3**). This occurrence includes portions of the previously documented TNF occurrence on Forbes Creek. This occurrence consists of two sub-populations: the western sub-population occurs in a canopy opening on a steep, rocky, eroded slope on bright red soils with serpentinite parent material. The eastern subpopulation occurs in mostly similar habitat, but several individuals occur in alluvium on a relatively flat bench adjacent to Forbes Creek. Approximately 140 individuals of Layne's butterweed were observed within 2.57 acres in the Project Area. Both sub-populations within this occurrence extend beyond the Project Area comprising an additional 22.2 acres, and many more individuals are likely present within the portions of the occurrence that were not surveyed for this Project. All ultra-mafic soil types in the Project Area are considered potential habitat for Layne's butterweed.

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\SSS_Survey_and_Mapping\RARE_PLANT\FPUD_RarePlant_EIR_20190418.mxd (LMH/JDS)-JSwager 6/19/2019



Map Date: 6/19/2019
Photo Source: NAIP, 2018

Figure 4.4-3 Locations of Special-Status Plants

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2015-019 FPUD Sugar Pine Reservoir

Van Zuuk's Morning Glory (Calystegia vanzuukiae)

Van Zuuk's morning-glory is a USFS Watch List species. This species is not listed pursuant to either the federal or California ESAs; however, it has a designation of CRPR 1B.3 plant. This species is a perennial rhizomatous herb that occurs in serpentinite and gabbro soils within chaparral and cismontane woodland (CNPS 2019). Van Zuuk's morning-glory blooms from May through August and is known to occur at

elevations ranging from 1,640 to 3,870 feet above MSL. Van Zuuk's morning-glory is endemic to California, and the current range of this species includes El Dorado and Placer counties (CNPS 2019).

Two occurrences of Van Zuuk's morning-glory have been reported within five miles of the Project area (CDFW 2019a). The montane chaparral throughout the Project area represents suitable habitat for this species. During the surveys conducted in 2016, four occurrences, including 10 sub-populations of Van Zuuk's morning-glory were observed in the eastern portion of the Project area, largely occupying the same habitat as Sanborn's onion (**Figure 4.4-3**). A total of approximately 1,236 individuals of Van Zuuk's morning-glory were observed within the Project area, with occurrences ranging in size from 1 to approximately 1,000 individuals.

Sierra Blue Grass (Poa sierrae)

Sierra blue grass is considered rare, threatened, or endangered in California and elsewhere (CNPS list 1B.3). Though, it is not very threatened in California (less than 20 percent of occurrences threatened/low degree and immediacy of threat or no current threats known). The species was detected on the TNF on the American River Ranger District in 2013.

The Sierra mixed conifer forest, especially on north-facing slopes, throughout the Project Area is suitable habitat for this species. During the surveys in 2016, two occurrences of Sierra blue grass were documented **Figure 4.4-3**). The first occurrence is in the southwestern portion of the Project Area and includes approximately 1,000 individuals. This occurrence occurs on a steep, north-facing slope under a canopy of mostly Douglas-fir, on soil and rock outcrops with dense cover of mosses. This occurrence consists of three sub-populations. The northernmost sub-population occurs adjacent to the existing JHMT. The two southern sub-populations occur within a previously disturbed area on top of buried utility lines.

A second occurrence of Sierra blue grass occurs in the northeastern portion of the Project Area. This occurrence includes approximately 50 individuals in one contiguous population. This occurrence is in a dense Douglas fir forest.

Dubious Pea (Lathyrus sulphureus var. argillaceus)

Dubious pea is not listed pursuant to either the federal or California ESAs; however, it has a designation of CRPR 3 plant. This species is a perennial herb that occurs in cismontane woodland and upper and lower montane conifer forests (CNPS 2019). Dubious pea blooms from April through May and it is known to occur at elevations ranging from 500 to 3,000 feet above MSL. This species is endemic to California, and the current range of this species includes Calaveras, El Dorado, Nevada, Placer, Shasta, and Tehama counties (CNPS 2019).

During the surveys conducted in 2016, two occurrences of dubious pea, including three sub-populations, were identified within the Project area. The first population occurs to the northeast of the day use parking lot south of Sugar Pine Reservoir, and the second population occurs adjacent to the road running between Giant Gap Campground and Shirttail Campground. A total of 20 individuals of dubious pea were observed within the Project area, with occurrences ranging in size from two to 18 individuals.

Sanborn's Onion (Allium sanbornii var. sanbornii)

Sanborn's onion is not listed pursuant to either the federal or California Endangered Species Act (ESA); however, it has a California Rare Plant Rank (CRPR) designation of 4.2. This species is a perennial bulbiferous herb that occurs in gravelly soils derived from serpentinite within chaparral, cismontane woodland, and lower montane coniferous forest (CNPS 2019). Sanborn's onion blooms from May through September, and it is known to occur at elevations ranging from 850 to 4,950 feet above MSL.

Sanborn's onion is endemic to California, and the current range of this species includes Butte, Calaveras, El Dorado, Nevada, Placer, Plumas, Shasta, and Tehama Counties.

There are nine occurrences of Sanborn's onion occupying 211.5 acres in the analysis area (1.5-mile radius of the Project boundary) (USFS 2017). The montane chaparral and Sierra mixed coniferous forest throughout the Project Area represent suitable habitat for this species.

During the floristic surveys conducted in 2016, four occurrences, including 17 sub-occurrences of Sanborn's onion were observed in the eastern portion of the Project Area (**Figure 4.4-3**). All sub-populations occur within openings in Sierra mixed conifer forest on rocky or gravelly soils apparently derived from serpentinite. A total of approximately 6,250 individuals of Sanborn's onion were observed within the Project Area, with occurrences ranging in size from 130 to approximately 5,500 individuals.

Special-Status Wildlife Species

All 33 special-status wildlife species considered for this analysis, their status, and habitat associations are identified in **Appendix K**. All species with some potential to occur in the Project Area are discussed in detail in the Sugar Pine Radial Gates Installation: Wildlife Biological Evaluation (ECORP 2019) in **Attachment L4** of **Appendix L**. Of the 33 species considered, 20 are considered absent from the entire Project Area and are not further considered in the analysis. Five species have low potential to occur due to lack of suitable habitat and/or lack of records of nearby occurrences including bald eagle,: black juga, marten, California red-legged frog (CRLF), and western bumblebee. Because the CRLF is a federally threatened species, the effects of the Project on this species are evaluated below. The other four species are addressed in detail in the Wildlife Biological Evaluation and identified in Appendix K but are not described below. The remaining wildlife species with potential to occur or known records in the Project Area are discussed below.

California Spotted Owl (Strix occidentalis)

The California spotted owl is a management indicator species on all National Forests in the Sierra Nevada Bioregion and is listed as a Sensitive Species on the TNF. The California spotted owl generally occurs in the southern Cascades south of the Pit River, throughout the Sierra Nevada, the mountainous regions of southern California, and the Central Coast Ranges at least as far north as Monterey County (Gutiérrez and Barrowclough 2005). The elevation of known nest sites ranges from approximately 1,000 to 7,700 feet, with 86 percent of nest sites occurring between 3,000 and 7,000 feet. As discussed in *The California Spotted Owl: Current State of Knowledge* (Gutiérrez et al. 2017), California spotted owls utilize various compositions of mixed conifer, ponderosa pine, red fir and montane hardwood forest types with high structural diversity, and dominated by medium (12-24" diameter at breast height [dbh) and large (>24" dbh) trees and with moderate to high levels of canopy cover (generally >40) (Bias and Gutiérrez 1992, Blakesley et al. 2005, Chatfield 2005, Moen and Gutiérrez 1997, North et al. 2000, Roberts et al. 2011, Seamans 2005). Nesting habitat has been primarily characterized by dense canopy closure (generally >70% total canopy cover above 7 feet) dominated by medium to large trees and multi-storied structure stands (Blakesley et al. 2005, Chatfield 2005, Moen and Gutiérrez 1997, North et al. 2000, Roberts et al. 2011).

A draft Conservation Strategy for California Spotted owls focused on National Forest System lands in the Sierra Nevada Ecoregion, was released in 2018 (USFS 2018). The Strategy provides updated conservation measures including conservation of key habitats and habitat elements, restoration through forest management to increase forest resilience and to reflect a natural range of variability, minimization of other threats such as barred owls and disease and contaminants and fostering climate adaptation of spotted owls.

On the TNF, the USFS delineates spotted owl protected activity centers (PACs) and home range core areas (HRCAs) according to direction in the 2001 SNFPA (USFS 2001). Surveys using regional protocols were initiated in 2016 for the Sunny South project (USFS 2016). Spotted owl territories continue to be monitored by the Peery lab, University of Wisconsin. These surveys delineated five owl PACs encompassing 1,118 acres and six Home Range Core Areas (HRCAs) encompassing 2,462 acres are wholly or partially within a 1.5-mile radius of the Project Area (**Figure 4.4-4 Spotted Owl Protected Activity Centers and Home Range Core Areas**). Spotted owls are known to occur in suitable nesting, roosting, and foraging habitats in the Project Area and adjacent lands. One spotted owl PAC (PLA0024) overlaps the Project Area and two additional HRCAs overlap the Project Area (PLA0022 and PLA0116).

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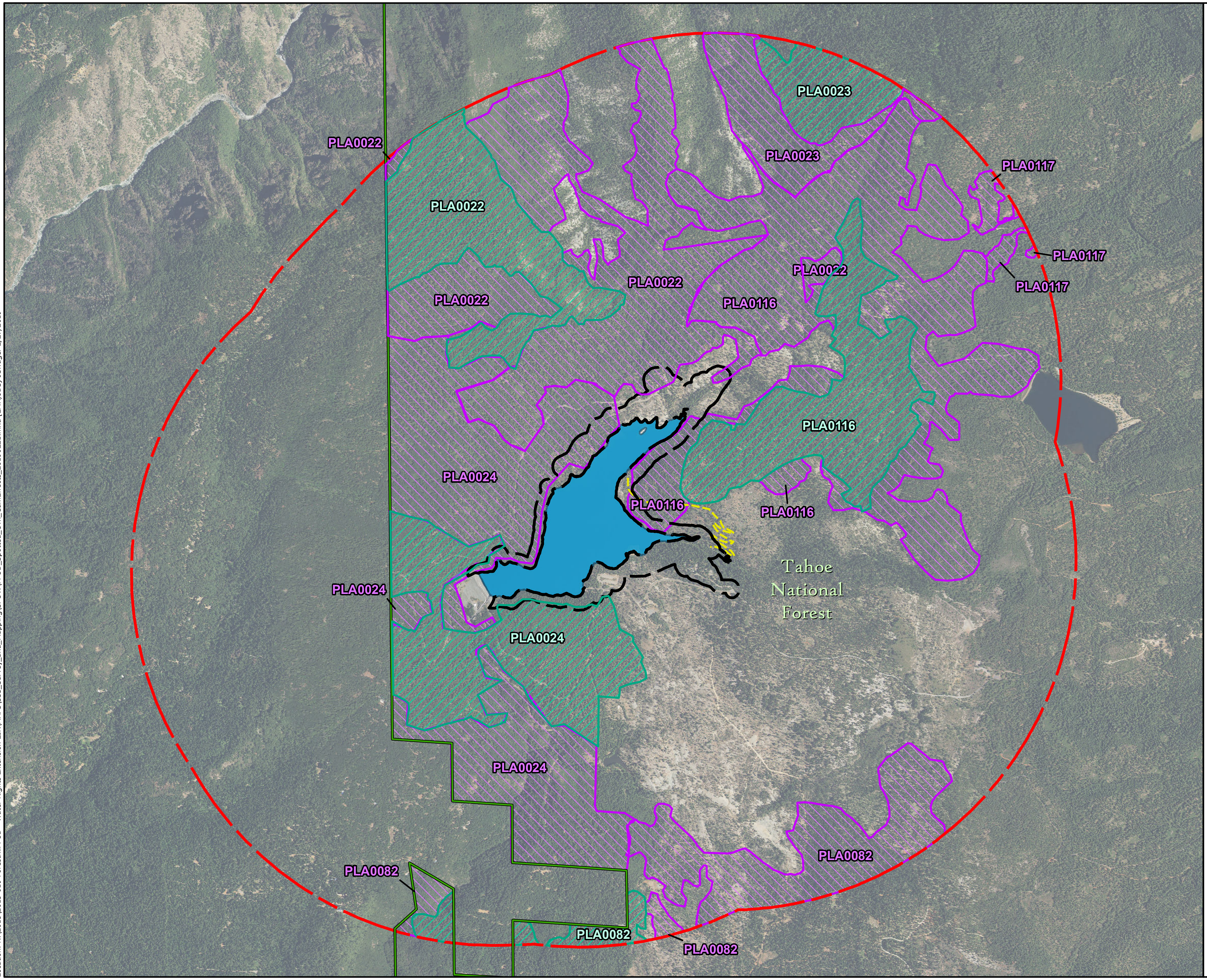
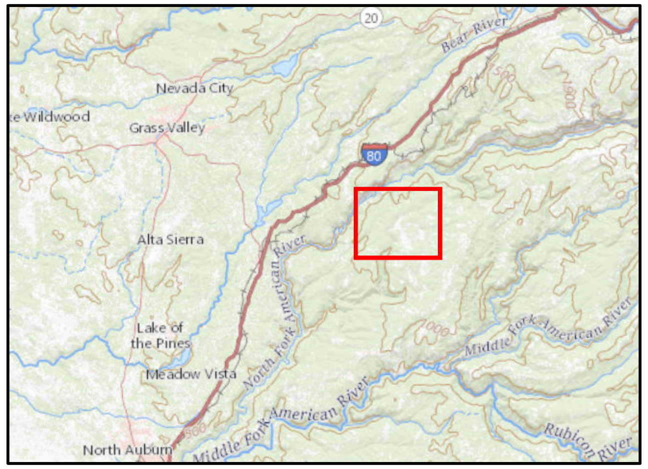
Figure 4.4-4
Spotted Owl Protected Activity Centers and Home Range Core Areas



Map Features

- Cumulative Effects Analysis Area
- Study Area
- Layne's Butterweed Alternative Trail
- Current Spillway Water Surface
- Spotted Owl PAC
  1,117.7 ac. within Cumulative Effects Area
- Spotted Owl HRCA
  2,462.4 ac. within Cumulative Effects Area
  Note a 12.6 ac. portion of PLA0022 is contained completly within PLA0116, both acreages reported in total



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Sources: ESRI, USFS, NAIP 2016
HRCAinAA.shp
PACsinAA.shp

Map Date: 2/27/2019

Scale in Feet
0 2,000

2015-019 FPUD Sugar Pine Reservoir

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\SSS_Survey_and_Mapping\SPOW\FPUD_Spotted_Owl_CumEffects_20190221.mxd (LMH/JDS) JSwager 2/27/2019

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Northern Goshawk (Accipiter gentilis)

The northern goshawk is on the Sensitive Species List for the TNF. In the Sierra Nevada goshawks breed from the mixed conifer forests at low elevations up to and including high elevation lodgepole pine forests and eastside ponderosa pine habitats. Goshawks winter from the lodgepole pine forest down slope to blue oak savannah (Verner and Boss 1980). In the TNF, goshawks are year-round residents. Nests are found in all of the vegetation types listed above, as well as in aspen stands (USFS 1999). Andersen et al. (2005), in review of existing research on goshawks including their nesting habitat and typical high canopy closure preferences, noted that high canopy closure in relation to the range of available canopy closure may be more important for goshawk nesting than absolute canopy closure, at least above some minimum threshold.

Surveys using regional protocols were conducted in 2016 and 2017 for the Sunny South project (USFS 2016). These surveys did not detect goshawks in the Sunny South analysis area, which largely overlaps and surrounds the proposed project/action analysis area. Any new goshawk detections or confirmed nesting would result in additional Limited Operating Periods (LOPs), as needed, to comply with management requirements. There is one northern goshawk territory, the Sugar Loaf PAC, 1.5 miles from the Project Area; breeding in this PAC was last documented in 1995. No other goshawk territories are documented within the Project Area.

Bats

Three bat species listed as Sensitive on the Region 5 Forester's Sensitive Species List (USFS 2013) have potential to occur in the Project Area: pallid bat, Townsend's big-eared bat and fringed myotis.

Pallid bats are known to occur on the Tahoe National Forest (USFS 2016). Surveys have not been conducted within the analysis area. The project and analysis area contain suitable habitat for the pallid bat. The pallid bat is strongly associated with arid regions (Hermanson and O'Shea 1983). It is also found in high elevation conifer forests (Rambaldini 2005). Pallid bats are opportunistic generalists that glean a variety of arthropod prey from surfaces, but also capture insects on the wing (Rambaldini 2005). They forage primarily in uncluttered, open habitats (Rambaldini 2005; Ferguson and Azerrad 2004). Day roosts may vary but are commonly found in rock crevices, tree hollows, mines, caves and a variety of manmade structures (Ellison et al. 2003). Night roosts are usually more open sites and may include open buildings, porches, mines, caves, and under bridges. Winter roosts are cool (25-50˚F50˚ Fahrenheit) with a stable temperature range, and are located in protected structures, including caves, mines, and buildings (Rambaldini 2005).

Townsend's big-eared bats are known to occur on the Tahoe National Forest (USFS 2016). Surveys have not been conducted within the analysis area. A large breeding colony was discovered in an abandoned mine adit in 2019 approximately 7.5 miles south of Sugar Pine Reservoir. This species has also been detected foraging and roosting in a meadow about 2.5 miles east of the reservoir. The project and analysis area contains marginally suitable foraging habitat for Townsend's big-eared bats, primarily associated with the edge and open water of the reservoir. Townsend's big-eared bats range and forage in a wide range of habitat types, particularly edges (Fellers and Pierson 2002). Its distribution is strongly correlated to geomorphic features such as natural and manmade caves, buildings, and bridges. Caves and mine tunnels typically are used as hibernacula (Piaggio 2005). These, along with old buildings, bridges, and large trees may be used as roost sites (Piaggio 2005).

Fringed myotis are known to occur on the Tahoe National Forest (USFS 2016). The nearest detections to the analysis area were southwest of Downieville approximately 30 miles north of the Project Area. Surveys have not been conducted within the analysis area. To generalize, this species is found in open habitats that have nearby dry forests and an open water source (Keinath 2004). Though, this species often forages along secondary streams, in fairly cluttered habitat. It also has been captured over meadows (Pierson et al. 2001). Likelihood of occurrence increases as snags greater than 11.8 inches in diameter increases and percent canopy cover decreases (Keinath 2004). The fringed myotis roosts in crevices found in rocks, cliffs, buildings, underground mines, bridges, and in large, decadent trees (Weller 2005). Fringed myotis roosts in tree hollows, particularly in large conifer snags. The majority of maternal roost sites documented in California have been found in buildings (Angerer and Pierson draft). Mines are also used as roost sites.

Foothill Yellow-Legged Frog (Rana boylii)

The foothill yellow-legged frog is listed as Sensitive on the Region 5 Forester's Sensitive Species List (USFS 2013). California Department of Fish and Wildlife recognizes six distinct genetic clades, of which the Northeast/Northern Sierra Clade occurs in the analysis area. This population is considered Threatened under the California Endangered Species Act (CDFW 2019c).

Fall/winter habitat for foothill yellow-legged frogs includes small tributary streams with perennial water and associated upland riparian areas. Springs, seeps, undercut banks, woody debris and other habitat structure may serve as refugia during high stream flow in winter (CDFW 2018b). Breeding habitat is typically characterized by wider, sunlit streams usually in low-gradient edge water at point bars or depositional areas near tail-ends of pools and runs (CDFW 2018b).

Larval foothill yellow-legged frogs consume primarily algae and will preferentially graze on epiphytic diatoms (Jennings and Hayes 1994). Post-metamorphs likely consume both aquatic and terrestrial insects but there is little research on the subject (Jennings and Hayes 1994). Adult diet is thought to include flies, moths, hornets, ants, beetles, grasshoppers, water striders and snails (Fellers 2005).

Foothill yellow-legged frogs initiate breeding in spring when air and water temperatures increase and streamflow declines (Hayes et al. 2016)). In the Sierra Nevada and Klamath-Siskiyou (snowmelt-fed) systems, breeding occurs between late April to early July (van Hattem and Mantor 2018), and generally from May to early June (Hayes et al. 2016).

ECORP performed visual encounter surveys (Crump and Scott 1994) for foothill yellow-legged frogs in the Project Area. Foothill yellow-legged frogs were documented by ECORP approximately 1,000 meters upstream of the reservoir in North Shirttail Creek and downstream from the reservoir in lower Shirttail Creek near its confluence with the North Fork American River.

Northwestern Pond Turtle (Actinemys marmorata)

The northwestern pond turtle is listed as Sensitive on the Region 5 Forester's Sensitive Species List (USFS 2013). Aquatic habitats used include lakes, natural ponds, rivers, oxbows, permanent streams, ephemeral streams, marshes, freshwater and brackish estuaries and vernal pools. Additionally, these turtles will use manmade waterways including drainage ditches, canals, reservoirs, mill ponds, ornamental ponds, stock ponds, abandoned gravel pits, and sewage treatment plants (Buskirk 2002). They generally require slack- or slow-water aquatic microhabitats in streams and other lotic features (Jennings and Hayes 1994). Western pond turtles require basking areas for thermoregulation (Bury et al. 2012), and favor areas with offshore basking sites including floating logs, snags, protruding rocks, emergent vegetation and overhanging tree boughs, but will also use steep and/or vegetated shores. Hatchlings additionally require shallow, eutrophic, warm areas often found at the margins of natural waterways (Buskirk 2002). Terrestrial habitats are less well understood. Pond turtles may overwinter under litter or buried in soil in areas with dense understories consisting of blackberry, poison oak or stinging nettle which likely reduces the likelihood of predation (Davis 1998). Individuals in the northern portions of the range can be terrestrial for up to eight months (Lovich and Meyer 2002).

While western pond turtles have been observed on the TNF, no western pond turtles were documented during surveys in any creek reach in the Project Area or during a dedicated survey of Sugar Pine Reservoir by ECORP.

California Red-Legged Frog (Rana draytonii),

The California red-legged frog was federally listed as threatened on June 24, 1996 (USFWS 1996). On March 17, 2010, the USFWS finalized designation of critical habitat within three locations in or adjacent to the Tahoe National Forest (USFWS 2010; 75 FR 12816), including PLA-1 (Michigan Bluff), NEV-1 (Sailor Flat), and YUB-1 (Oregon Creek). The Recovery Plan objective is to reduce threats and improve the population status of the California red-legged frog sufficiently to warrant de-listing. The strategy for recovery includes protecting existing populations by reducing threats, restoring and creating habitat that will be protected and managed in perpetuity, surveying and monitoring populations, conducting research on the biology of the species and threats to the species, and re-establishing populations of the species within the historic range.

The California red-legged frog is a highly aquatic species typically found in cold water ponds and stream pools with depths exceeding 0.7 meters and with overhanging vegetation such as willows, as well as emergent and submergent vegetation (Hayes & Jennings 1988). It is generally found at elevations below 4,000 feet but has been found higher (Martin 1992), and it is generally found in or near water but has been known to disperse away from water after rain storms (Martin 1992). This species breeds along aquatic vegetation in deep, slow water (<2% gradient) environments during the months of November through March in most of their current range (USFWS 1996). Breeding in the Sierra Nevada foothills would occur later due to freezing temperatures between November and February. Breeding would likely occur between March and May at higher elevations (Freel 1997 personal communication). Permanent or nearly permanent pools are required for tadpole development, and emergent and overhanging vegetation is used as refugia by adult frogs. Ponds with cattails or other emergent vegetation provide good cover

(Martin 1992). Ideal breeding habitat of California red-legged frogs is characterized by dense, shrubby riparian vegetation associated with deep (> 2 feet), still or slow-moving water (Jennings 1988, Hayes and Jennings 1988). Shrubby riparian vegetation, that seems to be most suitable for California red-legged frogs structurally, is provided by willow, cattails, and bulrushes (Jennings 1988).

In 2006, a red-legged frog site was discovered near Michigan Bluff on private land, near the town of Foresthill. Approximately 50 adults were observed in July 2006 inhabiting historic mine tailing ponds (elevation 3,335 feet) just east of a historic occurrence reported prior to 1951. The Recovery Plan for the California Red-legged Frog (USFWS 2002b) was written prior to the discovery of this species near Michigan Bluff so approximately 1,245 acres were designated as critical habitat (PLA-1) in 2010 (USFWS 2010, 75 FR 12816). The designated critical habitat (PLA-1) is located approximately 6.7 miles south east t of the Project Area in a separate watershed.

Assessments for suitable California red-legged frog habitat in the Project Area, based on habitat requirements as described by USFWS (2005), were conducted by walking along and around the perimeters of aquatic features and through adjacent upland areas. Potential aquatic habitats and adjacent uplands were evaluated as to their potential to support breeding, foraging activities, refugia, and as dispersal corridors for CRLF. The reservoir lacks the physical biological features needed for breeding by California red-legged frogs (shoreline emergent vegetation, undercut banks, and exposed root wads). Combined with a lack of occurrence records from this heavily-visited site and an abundance of aquatic predators (including regularly-stocked game fish), it is unlikely to provide breeding, foraging, or dispersal habitat for California red-legged frogs. All of the surveyed creek segments in the Project Area could potentially serve as dispersal habitat for California red-legged frogs. Suitable California red-legged frogs breeding habitats may occur in these creek segments; however, the presence of bullfrogs, which are known to prey on larval amphibians (Corse and Metter 1980; Stebbins 2003), and in Shirttail and Forbes Creek, the lack of deep, ponded water more than 70 cm in depth and other physical biological features needed for breeding, likely limit or preclude successful establishment of a California red-legged frog population in these segments. Further, California red-legged frogs have not been detected and are not known to occur in the intermittent and perennial streams and wetlands in the Project Area.

4.4.1.5 Special Habitat Management Areas

Riparian Conservation Areas

The TNF establishes Riparian Conservation Areas (RCAs) for all aquatic features, as specified in **Table 4.4.3** below. Within these areas, Riparian Conservation Objectives (RCOs) as described in the LRMP are met by adhering to the Project Riparian Conservation Area (RCA) Guidelines described in the LRMP. These guidelines specify the types of activities that can be conducted within RCAs and mitigation measures to minimize impacts to aquatic feature and riparian ecosystems. For the proposed project/action, TNF has identified a 300-foot RCA on North Shirttail Creek and Forbes Creek for the Project Area.

Table 4.4-3. Riparian Conservation Area Widths

Stream Type	Width of the Riparian Conservation Area
Perennial Streams	300 feet each side, measured from bank-full edge
Seasonal Flowing Streams	150 feet each side, measured from bank-full edge
Streams In Inner Gorge	Top of inner gorge
Meadows, lakes, and springs	300 feet from edge of feature or riparian vegetation, whichever is greater

Research Natural Areas

The intent of the Research Natural Area (RNA) System is to preserve a representative array of all significant natural ecosystems and their inherent processes as baseline areas (USFS 2004). For lands in the RNA System, the resource management emphasis (Management Areas 016, 100, is to protect and preserve the natural ecological features (USFS 1990). There are three RNAs on Tahoe National Forest (**Table 4.4-4**) (USFS 2004). The nearest RNA is the Sugar Pine Point RNA but it does not occur in the Project Area.

Table 4.4-4. RNAs on Tahoe National Forest

RNA	District	LRMP Management Area	Acres	Target Element
Babbitt Peak	Sierraville	016	1,747	Washoe pine & mountain mahogany
Lyon Peak / Needle Lake	American River	100	700	mountain hemlock
Sugar Pine Point	American River	085	640	mixed conifer forest

Source: USFS 2004

Special Interest Areas

Special interest areas (SIAs) can be designated to recognize a broader range of values than research natural areas, including botanical resources. There are eight SIA designated on TNF, including one botanical SIA—Placer County Big Trees Grove (356 ac, American River Ranger District). There are no SIAs in the Project Area.

Forest Service Special Management Area

There are no USFS Special Management Areas in the Project Area.

Tahoe National Forest Management Indicator Species (MIS)

The TNF LRMP, as amended, directs USFS resource managers to: (1) at the project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS. MIS are representative species whose habitat conditions and/or population changes are used to assess the impacts of management activities on species in similar habitats in a particular area.

The habitats and ecosystem components and associated MIS analyzed for the Project are identified in **Table 4.4-5**. The effects of the Project on MIS species habitat in Category 2 and 3 (**Table 4.4-5**) are analyzed separately (**Attachment L10** of **Appendix L**).

Table 4.4-5. Selection of MIS for Project Level Habitat Analysis for the Sugar Pine Project.

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests Management Indicator Species *Scientific Name*	Category for Project Analysis[2]
Riverine & Lacustrine	lacustrine (LAC), riverine (RIV)	aquatic macroinvertebrates	3
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow *Passerella iliaca*	3
Sagebrush	Sagebrush (SGB)	greater sage-grouse *Centrocercus urophasianus*	1
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), MHC	mule deer *Odocoileus hemionus*	2
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler *Dendroica petechia*	3
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Sierran Treefrog *Pseudacris sierra*	1
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR) red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail *Oreortyx pictus*	2
Mid Seral Coniferous Forest	PPN, SMC, WFR, RFR, EPN, tree size 4, all canopy closures	Mountain quail *Oreortyx pictus*	2
Late Seral Open Canopy Coniferous Forest	PPN, SMC, WFR, RFR, EPN, tree size 5, canopy closures S and P	Sooty (blue) grouse *Dendragapus obscurus*	2
Late Seral Closed Canopy Coniferous Forest	PPN, SMC, WFR, RFR, tree size 5 (canopy closures M and D) and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	3
		Pacific marten *Martes caurina*[3]	
		Humboldt's flying squirrel *Glaucomys oregonensis*	
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	3
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	1

[1] All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

[2] **Category 1:** MIS whose habitat is not in or adjacent to the Project Area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to Project Area, but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

[3] Identified as American Marten (*Martes americana*) in original MIS designation. Later classified as a separate species by Dawson and Cook (2012).

4.4.2 Regulatory Setting: Applicable Regulations, Plans and Standards

4.4.2.1 Federal

The National Forest Management Act

The National Forest Management Act provides the statutory direction for the development of Land and Resource Management Plans. It also requires that "Resource plans and permits, contracts, and other instruments for the use and occupancy of National Forest System lands shall be consistent with the land management plans" (16 U.S.C. 1604(i)).

U.S. Forest Service Land Management Plan

The TNF Forest LRMP (USFS 1990) was amended in 2001 by the Record of Decision (ROD) for the Sierra Nevada Forest Plan Amendment (referred to as the 2001 SNFPA; USFS 2001), which was then replaced in its entirety by the 2004 ROD for the Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement (referred to as the 2004 SNFPA; USFS 2004). Detailed information including specific standards and guidelines for species management can be found in the 2004 SNFPA.

Clean Water Act

Increasing public awareness and concern for controlling water pollution led to enactment of the Federal Water Pollution Control Act Amendments of 1972. As amended in 1977, this law became commonly known as the Clean Water Act (CWA) (33 U.S.C. 1251 et seq.). The objective of the CWA is to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The CWA established basic guidelines for regulating discharges of pollutants into the waters of the United States. The CWA requires that states adopt water quality standards to protect public health, enhance the quality of water resources, and ensure implementation of the CWA. Please see Section D.9, Hydrology and Water Quality, of this EIR/EIS for a detailed description regarding CWA Sections 208, 303, 304, 401, 402, and 404.

Endangered Species Act

The federal Endangered Species Act (FESA) authorizes the determination and listing of species as endangered and threatened; prohibits unauthorized taking, possession, sale, and transport of endangered species; provides authority to acquire land for the conservation of listed species, using Land and Water Conservation Funds; authorizes establishment of cooperative agreements and grants-in-aid to states that establish and maintain programs for endangered and threatened wildlife and plants; authorizes the assessment of civil and criminal penalties for violating FESA or regulations; and, authorizes the payment of rewards to anyone furnishing information leading to arrest and conviction for any violation of FESA or any regulation issued there under.

Section 7 of FESA requires federal agencies to ensure that any action authorized, funded or carried out by them is not likely to jeopardize the continued existence of listed species or modify their critical habitat. Section 7(a)(1) identifies the affirmative conservation duties of agencies and requires all federal agencies to carry out programs aimed at recovery of listed species.

Under Section 7 of FESA, a federal agency that authorizes, funds, or carries out a project that "may affect" a listed species or its critical habitat must consult with USFWS. In a Section 7 consultation, the lead agency (e.g., ACOE) prepares a Biological Assessment that analyzes whether the project is likely to adversely affect listed wildlife or plant species or their critical habitat and proposes suitable avoidance, minimization, or compensatory mitigation measures. If the action would adversely affect the species, USFWS has up to 135 days to complete the consultation process and develop a Biological Opinion determining whether the project is likely to jeopardize the continued existence of the species or result in adverse modification of critical habitat. If a "no jeopardy" opinion is provided, "the action agency may proceed with the action as proposed, provided no incidental take is anticipated. If incidental take is anticipated, the agency or the applicant must comply with the reasonable and prudent measures and implementing terms and conditions in the Services' [USFWS's] incidental take statement to avoid potential liability for any incidental take" (USFWS and NMFS 1998). If a jeopardy or adverse modification opinion is provided, USFWS may suggest "reasonable and prudent alternatives for eliminating the jeopardy or adverse modification of critical habitat in the opinion" or "choose to take other action if it believes, after a review of the biological opinion and the best available scientific information, such action satisfies section 7(a)(2)" (USFWS and NMFS 1998).

Executive Order 11990 – Protection of Wetlands

Executive Order 11990 directs federal agencies to avoid to the extent possible the impacts associated with the destruction or modification of floodplains and wetlands. Agencies are directed to avoid construction and development in flood plains and wetlands whenever there are any feasible alternatives. Specifically, measures should be taken to "avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (16 U.S.C. 661–666) authorizes the secretaries of Agriculture and Commerce to assist and cooperate with other federal and state agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The Act also authorizes the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by federal agencies of funds or lands for related purposes provided that land donations receive the consent of the state in which they are located.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA) controls the taking, killing, possessing, transportation, and importation of migratory birds. The MBTA implements international treaties between the United States and other nations that protect migratory birds (including their eggs and nests) from killing, hunting, pursuing, capturing, selling, and shipping unless expressly authorized or permitted.

Bald Eagle Protection Act

The bald eagle and golden eagle are federally protected under the Bald Eagle Protection Act, passed in 1940 to protect the bald eagle and amended in 1962 to include the golden eagle (16U.S.C. 668a–d). This act provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds. Specifically, this act prohibits the take, possession, sale, purchase, barter, offering to sell or purchase, export or import, or transport of bald eagles and golden eagles and their parts, eggs, or nests without a permit issued by the USFWS. The definition of "take" includes to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb. The act prohibits any form of possession or taking of both eagle species and the statute imposes criminal and civil sanctions as well as an enhanced penalty provision for subsequent offenses. Further, the act provides for the forfeiture of anything used to acquire eagles in violation of the statute. The statute exempts from its prohibitions on possession the use of eagles or eagle parts for exhibition, scientific, and Indian religious uses.

However, there is allowance within the act that, after investigation, the Secretary of the Interior may determine that direct and purposeful taking is compatible with the preservation of the bald eagle or the golden eagle. If so, then the Secretary may permit the taking, possession, and transportation of specimens for the scientific or exhibition purposes of public museums, scientific societies, and zoological parks, or for the religious purposes of Indian tribes. The Secretary may also determine that it is necessary to permit the taking of eagles for the protection of wildlife or of agricultural or other interests in any particular locality. This permitting may be for the seasonal protection of domesticated flocks and herds, and may also permit the taking, possession, and transportation of golden eagles for the purposes of falconry if the eagles may cause depredations on livestock or wildlife. Finally, the Secretary of the Interior may permit the taking of golden eagle nests that interfere with resource development or recovery operations, or in an emergency.

In November 2009, the USFWS published the Final Eagle Permit Rule (74 FR 46836–46879) providing a mechanism to permit and allow for incidental (i.e., non-purposeful) take of bald and golden eagles pursuant to the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.). Disturb means "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior." These regulations may apply to projects such as wind turbines and transmission lines and were followed by issuance of guidance documents for inventory and monitoring protocols and for avian protection plans (Pagel et al. 2010). In February 2011, the USFWS released Draft Eagle Conservation Plan Guidance, aimed at clarifying expectations for acquiring take permits acquisition by wind power projects consistent with the 2009 rule.

4.4.2.2 State Laws and Regulations

California Endangered Species Act

The California Endangered Species Act (CESA) (California Fish and Game Code, Section 2050 et seq.) provides protection and prohibits the take of plant, fish, and wildlife species listed as rare, threatened, or endangered by the State of California. Unlike FESA, state-listed plants have the same degree of protection as wildlife. Take authorization may be obtained by the project applicant from CDFW under CESA Section 2081. Section 2081 allows take of a listed species for educational, scientific, or population-management purposes. In this case, private developers consult with CDFW to develop a set of measures and standards for managing the listed species, including full mitigation for impacts, and funding of implementation and monitoring of mitigation measures.

A CESA permit may not authorize the take of fully protected species that are protected in other provisions of the California Fish and Game Code, discussed further below.

California Environmental Quality Act

In addition to state-listed or federally listed species, special-status plants and animals receive consideration under CEQA. Special-status species include wildlife Species of Special Concern listed by CDFW and plant species with a CRPR of 1A, 1B, or 2.

California Fish and Game Code

Birds and Mammals

According to Sections 3511 and 4700 of the California Fish and Game Code, which regulate birds and mammals, respectively, a "fully protected" species may not be taken or possessed and "incidental takes" of these species are not authorized. However, the CDFW may authorize the taking of those species for necessary scientific research, including efforts to recover fully protected, threatened, or endangered species, and may authorize the live capture and relocation of those species pursuant to a permit for the protection of livestock.

Resident and Migratory Birds

The California Fish and Game Code provides protection for wildlife species. It states that no mammals, birds, reptiles, amphibians, or fish species listed as fully protected can be "taken or possessed at any time." In addition, CDFW affords protection over the destruction of nests or eggs of native bird species (Section 3503), and it states that no birds in the orders of Falconiformes or Strigiformes (birds of prey and owls) can be taken, possessed, or destroyed (Section 3503.5). CDFW cannot issue permits or licenses that authorize the take of any fully protected species, except under certain circumstances such as scientific research and live capture and relocation of such species pursuant to a permit for the protection of livestock (Section 3511). Separate from federal and state designations of species, CDFW designates certain vertebrate species as Species of Special Concern based on declining population levels, limited ranges, and/or continuing threats that have made them vulnerable to extinction.

California Native Plant Protection Act

The California Native Plant Protection Act of 1977 (California Fish and Game Code, Sections 1900–1913) directed the CDFW to carry out the legislature's intent to "preserve, protect and enhance rare and endangered plants in this State." The act gave the California Fish and Game Commission the power to designate native plants as "endangered" or "rare" and protect endangered and rare plants from take. When CESA was passed in 1984, it expanded on the original California Native Plant Protection Act, enhanced legal protection for plants, and created the categories of "threatened" and "endangered" species to parallel FESA. CESA converted all rare animals into the act as threatened species but did not do so for rare plants, which resulted in three listing categories for plants in California: rare, threatened, and endangered. The California Native Plant Protection Act remains part of the California Fish and Game Code.

Porter-Cologne Water Quality Control Act

The intent of the Porter-Cologne Water Quality Control Act (California Water Code, Section 13000 et seq.) is to protect water quality and the beneficial uses of water, and it applies to both surface water and groundwater. Under this law, the State Water Resources Control Board develops statewide water quality plans, and the Regional Water Quality Control Board (RWQCB) develops basin plans that identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans. Waters regulated under the Porter-Cologne Water Quality Control Act include isolated waters that are no longer regulated by the ACOE. Developments with impact to jurisdictional waters must demonstrate compliance with the goals of the act by developing stormwater pollution prevention plans, standard urban stormwater mitigation plans, and other measures in order to obtain a CWA Section 401 certification.

Streambed Alteration Agreement

CDFW must be notified prior to beginning any activity that would obstruct or substantially divert the natural flow of, use material from, or deposit or dispose of material into a river, stream, or lake, whether permanent, intermittent, or ephemeral water bodies under Section 1602 of the California Fish and Game Code. CDFW has 30 days to review the proposed actions and propose measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by CDFW and the applicant is the Streambed Alteration Agreement (SAA). The conditions of an SAA and a CWA Section 404 permit often overlap.

4.4.3 Environmental Consequences and Mitigation Measures

4.4.3.1 Definition and Use of CEQA Significance Criteria and USFS Indicators

The CEQA criteria and guidelines described below are also used as indicators of adverse effect under NEPA. In accordance with Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), biological resources impacts would be considered significant under CEQA if the proposed project/action would result in any of the following conditions:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by CDFW, NMFS, or USFWS, and meets the definition of Section 15380 (b), (c), or (d) of the CEQA Guidelines.

- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by CDFW or USFWS.
- Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.), either individually or cumulatively, through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors or impede the use of wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources.
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan, recovery plan, or federal Biological Opinion.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified several indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on biological resources.   These include:

- Identification of federally listed, Management Indicator, Forest Service Sensitive wildlife species, and migratory birds potentially present in the habitats of the project site and conduct field studies (as needed) to determine the presence or absence of these species. Use current info regarding proximity of known locations as well as habitat potential.
- Identification and disclosure of impacts on any federally listed threatened and endangered fish and amphibians and Forest Service Region 5 sensitive fish, amphibian, and other aquatic species known or potentially occurring in upper Shirttail Creek and Forbes Creek (i.e., California red-legged frog, Foothill yellow-legged frog, and western pond turtle).
- Quantification and characterization of existing wildlife habitat and proposed alteration, fragmentation, or removal of wildlife habitat, by species.
- Determination of effects of implementation (logging, etc.) and long-term management on terrestrial TES, MIS, and migratory birds.
- Quantification and qualification of compensatory mitigation for impacts on relevant species habitat, if necessary, related to increased distances from cover to reservoir waterline and increased reservoir size and its effect on wildlife movement around the reservoir.
- Evaluation of consistency of alternatives with TNF Management direction.
- Identification of impacts on avian species as a result of tree removal.
- Effect of radial gate installation on releases to Shirttail Creek downstream of the Dam which, in turn could adversely affect fish and amphibian species.

- Anticipated temporary and permanent changes in water yield (acre feet), peak flows (cfs) and temperature effects in Lower Shirttail Creek. Narrative description of downstream water releases associated with transfers.
- Description of existing conditions in Shirttail Creek below Sugar Pine Reservoir.
- Identification and disclosure of impacts on any federally listed threatened and endangered fish and amphibians and Forest Service Region 5 sensitive fish, mollusks, amphibians, and other aquatic species known or potentially occurring in Lower Shirttail Creek (i.e., California red-legged frog, Foothill yellow-legged frog, western pond turtle, and listed species of aquatic mollusks.)
- Identification of flow/transfer criteria and BMPs (including timing and volume of transfers) to avoid impacts to sensitive life stages of fish and amphibians in Lower Shirttail Creek.
- Project effects on stream and riparian health.
- Evaluation of compliance with Watershed Conservation Practices Handbook, Water Quality Management Handbook and Forest Plan requirements.
- Qualitative and quantitative description of existing surface drainage conditions within the context of Forest Plan Standards.
- Quantification (acres) of ground disturbing activities located on highly erodible soils as it pertains to stream conditions.
- Identification of BMPs and mitigation techniques to minimize adverse effects to watershed health.
- Identified wetlands and other waters of the U.S. throughout the project area could be temporarily and/or permanently affected by timber harvest operations, recreational facilities replacement or stream restoration activities.
- Area of wetlands and other waters of the U.S. existent within areas directly or indirectly affected by construction and operation of the proposed project.
- Disclosure of wetland functions and values within the project area.
- Narrative description of wetland communities, classifications and disclosure of anticipated temporary and/or permanent impacts (acres/linear feet).
- Description of compliance with EO 11990, Protection of Wetlands.

4.4.3.2 Analytic Methods

In preparing this DEIR/EIS, and in support of the Special Use Permit Amendment application, various analyses were carried out by ECORP Consulting, Inc. to assess the possible presence of sensitive biological resources and potential impacts on those resources. The results of these analyses and their employed methods were documented and included in this DEIR/EIS as **Appendix L**.

ECORP 2019. Biological Assessment to Support Federal Endangered Species Act – Section 7 Consultation for California Red-Legged Frog and Layne's Butterweed. Sugar Pine Reservoir. Prepared for American River Ranger District on behalf of Foresthill Public Utilities District. (**Attachment L1**).

ECORP 2016. California Red-Legged Frog (*Rana draytonii*) Habitat Assessment and Foothill Yellow-Legged Frog (*Rana boylii*) and Western Pond Turtle (*Actinemys marmorata*) Survey Results for the Sugar Pine Dam and Radial Gates Installation Project. Placer County, California. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L2**).

ECORP. 2018. Foothill Yellow-legged Frog and Northwestern Pond Turtle Monitoring Results for the FPUD 2018 Water Transfer. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp. (**Attachment L3**).

ECORP 2019. Biological Evaluation: Birds, Mammals, Amphibians, Reptiles, Fish, Invertebrates for the Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp. (**Attachment L4**).

ECORP 2019. Biological Evaluation: Forest Service Sensitive Plants and Fungi for the Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. 141pp. (**Attachment L5**).

ECORP 2019. Delineation of Waters of the United States (U.S.) for the Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L6**).

ECORP 2019. Other Botanical Resources Report: Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L7**).

ECORP 2019. Invasive Species Risk Assessment: Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L8**).

ECORP 2019. Management Indicator Species Report: Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L9**).

ECORP 2019. Migratory Landbird Report: Sugar Pine Dam and Radial Gates Installation Project. Prepared for Foresthill Public Utility District, Foresthill, California. (**Attachment L10**).

In support of the studies listed above, numerous surveys of the Project Area were conducted, including the following:

- Visual encounter surveys (Crump and Scott 1994) for northwestern pond turtles and foothill yellow-legged frogs were conducted in North Shirttail Creek, Forbes Creek, Shirttail Creek below the dam, and 0.7 miles of Shirttail Creek upstream from its confluence with North Fork American River on 8 and 16 July 2015, and 14, 15, 18, and 19 July 2016.
- Wetland delineation field surveys were conducted in the Project Area on 1 September 2015 and 25 and 26 August 2016.

- A visual encounter survey for western pond turtles was conducted within Sugar Pine Reservoir on 14 July 2016.
- Protocol surveys for California spotted owls and northern goshawks were conducted for the Sunny South Project, which largely overlaps the Project Area, in 2016 and 2017. Ongoing spotted owl territory monitoring by the Peery lab, University of Wisconsin.
- Field surveys were conducted for USFS sensitive plants and federally listed plants 28 April and 16 July 2015.
- Early season, protocol-level floristic surveys (USFWS 2000), CDFW (CDFG 2009), and CNPS (CNPS 2015) were conducted in the Project Area on May 24 and 27, 2016.
- Late season, protocol-level floristic surveys (USFWS 2000), CDFW (CDFG 2009), and CNPS (CNPS 2015) were conducted in the Project Area on July 27 and 28, 2016.
- Field surveys were conducted to collect ecological data on the Project Area on August 3, 25, and 26, 2016.
- Field-based habitat assessments for the California red-legged frog were conducted in July 2015.
- Visual encounter surveys (Crump and Scott 1994) for foothill yellow-legged frog and western pond turtle were conducted in July 2015 and 2016.
- Surveys were conducted August 13, September 9, 11, 13, 15, 22, 24, and 27, 2018 to assess the effects of water transfer on foothill yellow-legged frog and western pond turtle populations in Lower Shirttail Creek.

4.4.3.3 Direct and Indirect Impacts/Effects

Impact BIO-1: The proposed project/action could adversely affect, either directly or through habitat modifications, species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the U.S. Forest Service, California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Impact Determination: *Less than significant with mitigation incorporated* (CEQA) and a *minorly adverse effect* (NEPA).

Special-Status Plants

Protocol floristic surveys were conducted in the Project Area for all plant species with potential to occur. Four species were detected, and **Table 4.4-6** lists the BIO-1 impacts and classification of impacts under CEQA/NEPA for special-status plants in the Project Area.

Table 4.4-6 Special-Status Plants Impact Determinations

Species	Status	Description of Impact	Significance Determination
Layne's Butterweed	FT	Permanent loss of 0.13 acre of occurrences and 38 acres of suitable habitat.	Less than significant under CEQA and not adverse under NEPA with mitigation incorporated.
Van Zuuk's Morning Glory	FS Watch, CR 1B.3	Permanent loss of 4 acres of occurrences and 6.4 acres of suitable habitat.	Less than significant under CEQA and not adverse under NEPA with mitigation incorporated.
Sierra Bluegrass	CR 1B.3	Permanent loss of 0.28 acres of occurrences and 37 acres of suitable habitat.	Less than significant under CEQA and no adverse under NEPA
Dubious Pea	CR 3	No direct effect. Permanent loss of 37 acres of suitable habitat.	Less than significant under CEQA and no adverse under NEPA
Sanborn's Onion	CR 4.2	Permanent loss of 3.73 acres of occurrences and disturbance of 37 acres of suitable habitat.	Less than significant under CEQA and no adverse effect under NEPA

No Project Alternative

Under the No Project Alternative (CEQA), no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The Project Area would be subject to ongoing hazard tree removal associated with recreational facilities and disturbance from human recreational use. The No Project Alternative serves as the CEQA environmental baseline on which the following impact analysis is based.

No Action Alternative

Under the NEPA No Action Alternative, the Water Right Permit 15375 will be extended, but no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative serves as the NEPA environmental baseline on which the following effects analysis is based.

Proposed Project/Action

Layne's Butterweed

The proposed project/action would result in the permanent loss of approximately 0.13 acre of the eastern sub-population of the occurrence due to inundation and trail realignment.

Suitable habitat for this species includes all ultramafic soil types (see soil types DUE, DUF, ISE, ISF, and RDE on **Figure 4.4-5 Natural Resources Conservation Service Soil Types)**. Of the 162 acres of suitable habitat in the Project Area, 38 acres would be permanently lost to inundation.

Observations suggest that disturbance, such as fire or vegetation removal, is needed for Layne's butterweed recruitment (Baad and Hanna 1987). While the effects of vegetation management practices—

i.e., tree removal or fuels treatments—to Layne's butterweed habitat are not fully known, there is strong enough evidence of a disturbance regime that USFWS included fire, vegetation removal, and scraping as possible recovery actions in its species recovery plan (USFWS 2002a).

The compensatory mitigation sites have been subject to floristic surveys and no species were observed. Further, these actions would not occur on soil types that support Layne's Butterweed on the TNF. With implementation of BOT 1, no effects on Layne's Butterweed are expected from these actions.

Compensatory invasive plant treatments on up to 18 acres of chaparral habitat (see Compensatory Mitigation Measure N1 in Table 2.5) may benefit suitable habitat for Layne's butterweed. Though, at most, the benefit would be minor considering the treatments may not occur adjacent to known occurrences and the scale of suitable habitat is far greater than the extent of known occurrences. In addition, implementation of management requirements IS 1 through IS 5 and BOT 1 and 2 (see Table 2-6) would reduce direct and indirect effects of the proposed project/action on Layne's butterweed by addressing the risk of invasive species spread and protecting occurrences during project implementation These measures, however, are not considered adequate to fully reduce the potential effect of the proposed project/action on Layne's butterweed to a level considered less than significant with mitigation incorporated under CEQA and minorly adverse under NEPA.

In addition to the measures described above, Compensatory Mitigation Measure Q1 (see Table 2-5, above) would be implemented as part of the proposed project/action. Measure Q1 requires the establishment permanent protection of 0.5-acre of an existing Layne's population and 8.5 acres of surrounding habitat through conservation easement, fee title, or other mechanism to assure permanent protection of the population and adjacent habitat. In addition, FPUD will provide a $150,000 endowment to the Pine Hill State Ecological Preserve for the enhancement and management of Layne's butterweed populations at the preserve. This measure, in combination with implementation of all IS management requirements and BOT 1, is considered adequate to reduce the potential impact to less than significant (CEQA) and minorly adverse (NEPA). The development of Measure Q1 is described in detail in the draft report *Sugar Pine Reservoir Radial Gate Installation Project*

Layne's Butterweed (Packera layneae) Compensatory Mitigation Measures (C. Rowe, USFS, 2016) included as Attachment L10 to Appendix L of this DEIR/EIS.

Van Zuuk's Morning Glory

The proposed project/action would result in the unavoidable loss of approximately 1.2 acres of Van Zuuk's morning-glory occurrences within the inundation area. An additional 2.8 acres of Van Zuuk's morning-glory occurrences may also be permanently lost due to JHMT realignment. The expected project impacts to Van Zuuk's morning-glory occurrences represent 6 percent of the total 71.1 acres of known Van Zuuk's morning-glory occurrences within a 1.5-mile radius of the project. Indirect effects to Van Zuuk's morning-glory suitable habitat would occur through the loss of 6.4 acres of chaparral habitat in the expanded inundation area. Floristic surveys did not detect the species in this location.

The project/action would implement Compensatory Mitigation Measure N1 (see Table 2-5, above). Measure N1 would carry out invasive plant treatments on up to 18 acres of chaparral habitat to protect native plant communities. These treatments would benefit Van Zuuk's morning-glory in the project vicinity by controlling the further spread of invasive plants, which are a significant threat to this species Floristic surveys have been completed at the compensatory mitigation sites and this species was not found. Further, Van Zuuk's morning-glory appears to have an affinity for canopy openings and/or disturbance (Brummitt and Namoff 2013, CDFW 2017) and may benefit from trail relocation activities in the Project Area. While van Zuuk's morning-glory is locally abundant in the vicinity of Sugar Pine Reservoir; the USFS has determined that its limited range, patchy distribution, and low overall abundance makes this species vulnerable to a loss of viability within the vicinity of the proposed project/action.

In addition to Measure N1 described above, the proposed project/action would implement TNF management requirements BOT4 a) through g) (see Table 2-6) that require various measures to mitigate potential adverse effects on Van Zuuk's morning glory due to project construction and future recreational use. BOT4 requires the establishment of protective measures on up to 6 acres of these existing occurrences of Van Zuuk's morning glory. Measures will include exclusionary fencing or other forms of barricade (e.g., rock placement). Compensatory Mitigation Measure N1 and in combination with TNF management requirement BOT4, are adequate to reduce the potential impact to ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Sierra Blue Grass

Tree removal and inundation would result in the permanent loss (0.28 acre) of a portion of the southwest occurrence of Sierra blue grass in the Project Area. Approximately 1.06 acres of the southwest occurrence is in proximity to the proposed realigned JHMT. With the implementation of management requirements (BOT3: flagging and avoiding occurrences) it appears direct impacts to the northeast occurrence could be avoided. Indirect effects to Sierra blue grass would also occur through the loss of 37 acres of suitable forested habitat in the expanded inundation area.

Implementation of compensatory mitigation involving fuels treatment in spotted owl PACs and the North Shirttail Creek RCA would reduce habitat suitability in the short-term through canopy removal but would increase long-term plant diversity, growth rates, and wildfire resilience. These treatments are expected to sustain suitable habitat for this species in the long-term. Floristic surveys of the compensatory mitigation sites have been completed and this species was not found. Wetland creation and streambank and road stabilization would not occur in suitable habitat for this species and is expected to have no effect.

. With implementation of management requirements (IS1 through IS6 and BOT3), and compensatory mitigation measures, this impact would be reduced to ***less than significant*** (CEQA) and ***minorly adverse effect*** (NEPA).

Dubious Pea

Both occurrences of dubious pea in the Project Area would be avoided by inundation and the trail realignment. Inundation would indirectly affect 37 acres of suitable habitat for this species. With implementation of management requirements (IS1 through IS6 and BOT1 through BOT4), this impact would be ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA).

Sanborn's Onion

The proposed project/action would result in the unavoidable and permanent loss of 3.73 acres of Sanborn's onion occurrences within the inundation area. An additional 0.6 acre of Sanborn's onion occurrences may also be permanently lost due to JHMT realignment. Additional direct and indirect disturbance may occur to the 14.2 acres of Sanborn's onion occurrences in the Project Area in association with trail and recreational facility relocation. The expected direct and indirect impacts to Sanborn's onion represent 9 percent of the total 200.85 acres of Sanborn's onion occurrences within a 1.5-mile radius of the Project. The proposed project/action would implement invasive plant treatments on up to 18 acres of chaparral habitat to protect native plant communities. These treatments would benefit Sanborn's onion and Van Zuuk's morning-glory in the project vicinity by controlling the further spread of invasive plants, which are a significant threat to these species. Additionally, fuels treatments on 70 acres of North Shirttail Creek riparian conservation area (RCA) and up to 196.5 acres of spotted owl protected activity centers (PACs) would benefit Sanborn's onion by protecting and maintaining large trees and retaining sufficient canopy cover, snags, and downed logs to maintain suitable habitat for associated FSS wildlife and plants, while reducing the risk of stand-replacing wildfire. Floristic surveys have been completed at the compensatory mitigation sites and this species was not found. With implementation of management requirements (IS1 through IS6 and BOT3), and compensatory mitigation measures, impacts on Sanborn's onion would be reduced to ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA).

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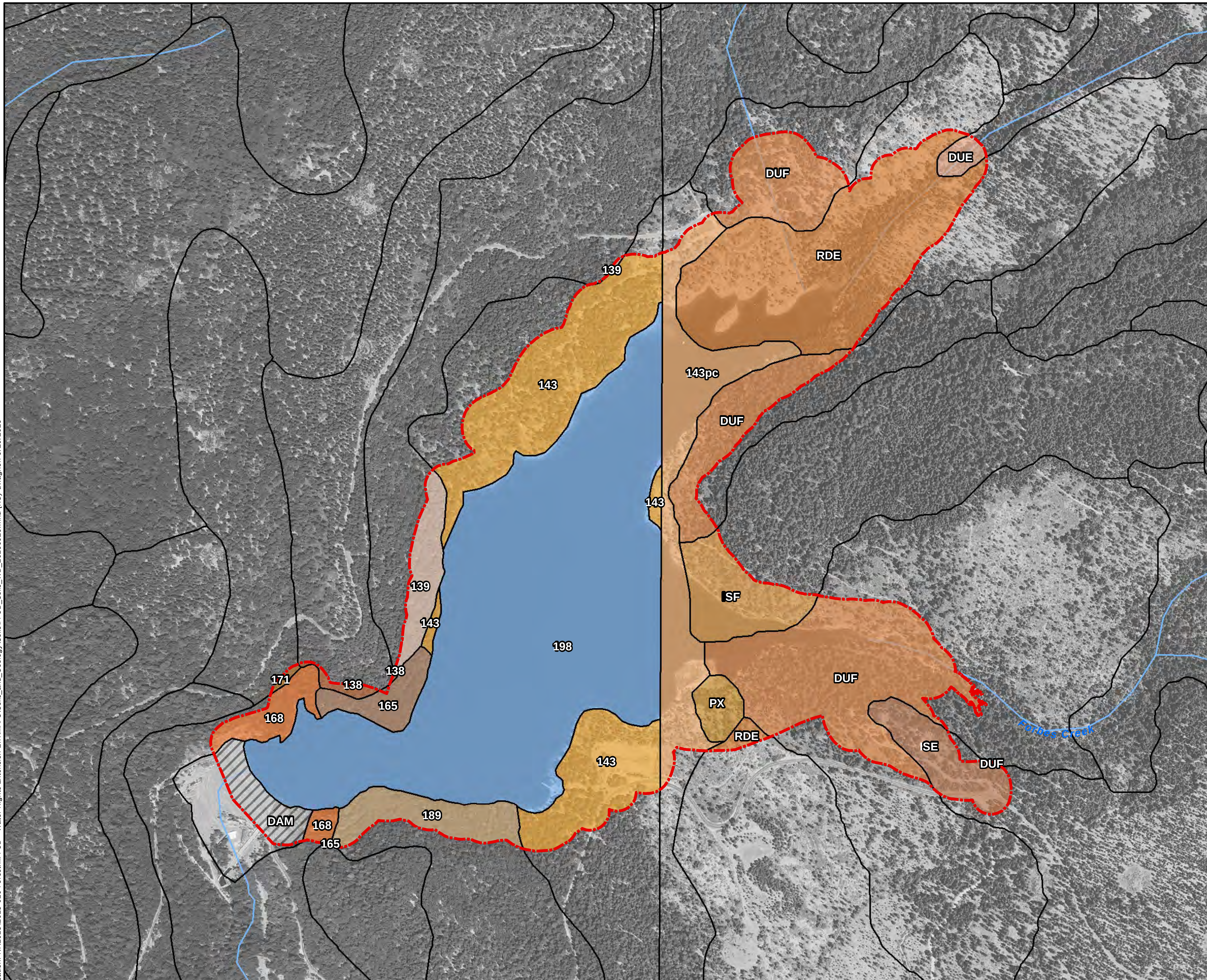
Figure 4.4-5
Natural Resources Conservation Service Soil Types



Map Features

Delineation Area

Series Code - Series Name

- 138- Cohasset cobbly loam, 15 to 30 percent slopes
- 139- Cohasset cobbly loam, 30 to 50 percent slopes
- 143- Dubakella very stony loam, 9 to 50 percent slopes
- 143pc- Dubakella very stony loam, 9 to 50 percent slopes
- 165- Mariposa-Josephine complex, 30 to 50 percent slopes
- 168- Mariposa-Rock outcrop complex, 50 to 70 percent slopes
- 171- McCarthy cobbly sandy loam, 5 to 30 percent slopes
- 189- Sites loam, 30 to 50 percent slopes
- 198- Water
- DAM- Dams
- DUE- Dubakella-Dubakella variant-Rock outcrop complex, 2 to 30 percent slopes
- DUF- Dubakella-Dubakella variant-Rock outcrop complex, 30 to 50 percent slopes
- ISE- Forbes-Dubakella complex, 2 to 30 percent slopes
- ISF- Forbes-Dubakella complex, 30 to 50 percent slopes
- PX- Pits, borrow
- RDE- Rock outcrop-Dubakella-Dubakella variant complex, 2 to 40 percen t slopes

Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) Database for Placer County, CA & Tahoe National Forest

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Soils_and_Geology\Soils\FPUD_Soils_WD_20160929.mxd (KO)-dwagnon 9/29/2016

Photo Source: NAIP 2014

Map Date: 9/29/2016

Scale in Feet
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Alternative 1: Alternate JHMT Alignment

As described in Chapter 2 of this DEIR/EIS, all project elements associated with Alternative 1 would be identical to the proposed project/action with the following exception: the realignment of the JHMT trail north of Forbes Creek would be altered to avoid an identified population of Layne's butterweed, a plant species federally listed as *threatened*.

The effects of Alternative 1 on special-status plants occurring in the Project Area would be the same as those described for the proposed project/action, except for Layne's butterweed.

Compared to the proposed project/action, Alternative 1 would avoid all direct effects to Layne's butterweed attributed to trail relocation and hazard tree removal. . Direct and indirect effects of the Alternative due to inundation (i.e., the loss of 0.11 acre of the existing population and 38 acres of suitable habitat), however, would be identical to that of the proposed project/action. Compared to the proposed project/action, Alternative 1 would disturb a similar acreage of suitable habitat for Layne's butterweed due to trail construction, but this effect would be minor given the abundance of suitable habitat in the vicinity. With implementation of management requirements (all IS and BOT1 and BOT2) to control the spread of weeds and protect occurrences during project implementation, the impact of Alternative 1 is considered ***less than significant*** under CEQA and ***minorly adverse*** under NEPA.

Mitigation Measures

Under Alternative 1, management requirements IS1 through IS6 and BOT1 and BOT2 would be implemented. Implementation of Compensatory Mitigation Measure Q1, described above, would not be required to avoid significant impact and adverse effect on Layne's butterweed under Alternative 1.

Alternative 2: Helicopter Timber Harvest

The Alternative 2 effects on special-status plants occurring in the Project Area would be the same as those described for the proposed project/action.

In summary, absent mitigation, temporary and permanent impacts to special-status plant species are considered potentially significant under CEQA and adverse under NEPA. However, with implementation of the MRs specified above, compensatory mitigation measures, and MM-BIO-1, temporary and permanent impacts at or near project components would be ***less than significant*** under CEQA and ***minorly adverse*** under NEPA.

Mitigation Measures

Mitigation measures required for Alternative 2 would be identical to those required for the proposed project/action.

Special Status Animals

Table 4.4-7 lists the special-status animals species addressed in this section and the determination of impact significance.

Table 4.4-7. Special-Status Animals Impact Determinations		
Species	**Description of Impact**	**Significance Determination**
Spotted Owl	Loss of 37 acres of suitable habitat	Less than significant under CEQA and minorly adverse under NEPA
Northern goshawk	Loss of 37 acres of marginally suitable habitat.	Less than significant under CEQA and minorly adverse under NEPA
Northwestern Pond Turtle	Indirect effects to suitable habitat through altered streamflows.	Less than significant under CEQA and minorly adverse under NEPA
Foothill Yellow-legged Frog	Indirect effects to suitable habitat through permanent inundation of Forbes and North Shirttail Creeks and altered streamflows in Shirttail Creek.	Less than significant under CEQA and minorly adverse under NEPA with mitigation incorporated.
California Red-legged Frog	Indirect effects from increased sedimentation and reductions in canopy cover.	Less than significant under CEQA and minorly adverse under NEPA with mitigation incorporated.
Bats (Pallid, Townsend's big-eared, and fringe-toed)	Loss of potential roost sites by removal of trees in the inundation zone, hazard trees, or by relocation of facilities.	Less than significant under CEQA and minorly adverse under NEPA with mitigation incorporated.

No Project Alternative and No Action Alternative

As described above, the No Project and No Action Alternatives serve as the environmental baselines on which the following respective CEQA and NEPA impact and effects assessments are based.

Proposed Project/Action and Alternatives 1 and 2

As stated above, black juga, bald eagle, marten, and western bumblebee have low potential to occur in the Project area. There would be no direct effects on these species and minimal potential to affect to marginally suitable habitat for these species. The impact would be ***less than significant*** (CEQA) and ***not adverse*** (NEPA), and they are not further considered in this analysis.

California Spotted Owl

The proposed project/action and Alternatives 1 and 2 have the potential to cause direct disturbance to individual California spotted owls from tree removal in the inundation area, installation of the radial gates, relocation of recreational facilities, and fuels treatments near roost or nesting sites. Disturbance at nests and roosts can result in nest predation and/or abandonment. Three spotted owl PACs surrounding the reservoir are at risk: PLA 0024, PLA 0116, and PLA 0022 (**Figure 4.4-4**). Surveys conducted by USFS suggest the nest in PLA 0024 is the only nest site within ¼-mile of the proposed Project activities while there are two activity centers (nest/roost locations) within ¼-mile of proposed fuels treatment areas. Noise associated with the proposed activities along the southwest inundation area (i.e., installation of the radial gates, tree removal, trail pavement demolition, trail construction, and extension of the existing boat ramp) and fuels treatments has the potential to adversely affect this nest site, if it is occupied during construction of the proposed project/action. PLA 0022 and PLA 0116 are greater than ½-mile from the proposed project/action activities and are not expected to be affected by mechanical disturbance.

To avoid potential effects to nesting spotted owls, the management requirement TW 5 identifies a limited operating period (LOP) of March 1st to August 15th for the proposed project/action activities within a ¼ mile of the spotted owl activity center at PLA 0024 to prevent disturbance to breeding birds. If activity centers change prior to implementation, the area protected by the LOP would be moved or expanded. No direct effects to foraging spotted owls associated with PLA 0024, PLA 0022, and PLA 0116 are expected because implementation activities occur during the day and the owls forage at night. The LOP would also be implemented for fuels treatments and these activities would be prohibited within a 500-foot radius of activity centers. Most fuels treatments would occur during the day when foraging birds are not expected to suffer disturbance. Burning may occur at night and would temporarily displace foraging activities. No activities would occur within ¼-mile of active nest stands during the breeding season.

An exception to the LOP may be applied for prescribed fire in the spring, which may cause some disturbance associated with chainsaw work and smoke; however, these activities would be relatively brief, limited to 1-2 days. Burning would be coordinated to prevent excessive smoke drift into activity centers. Disturbance to spotted owls may occur outside of the breeding season, but aside from potential temporary displacement, this disturbance is not expected to result in substantial adverse effects. While unlikely, if spotted owls are detected in or adjacent to the burn units during the breeding period, LOPs would be applied, as needed, therefore project-related disturbance to this species is expected to be minimal.

Indirect effects on spotted owls would occur from removal of 37 acres of marginally suitable habitat in the inundation area. The Project Area is marginally suitable habitat for spotted owls due to its occurrence along the reservoir and the extent of seasonal human presence from recreation uses. However, the habitat in the surrounding area on NFS lands beyond the human disturbance associated with the reservoir is high-quality suitable habitat for spotted owls.. Some hazard tree removal and tree removal from the inundation area may overlap the HRCA associated with PLA 0116, PLA 0022, and PLA 0024. The total area of HRCA affected for any one PAC is limited but tree removal would decrease cover and increase the edge effect thereby potentially reducing the habitat quality in that portion of the HRCA.

The proposed project/action would replace existing recreational facilities including trails, campgrounds, and boat ramp displaced by the increased area of inundation. In addition to the direct loss of habitat, the overall recreational footprint of the reservoir (waterbody and amenities) would increase such that disturbance may reduce the quality of adjacent habitat. The effect is expected to be minor and low intensity because the relocated facilities would maintain the existing recreational capacity and spotted owls using adjacent areas are likely adapted to the existing levels of disturbance.

The proposed project/action would implement compensatory mitigation to improve spotted owl habitat to offset the effects of the project. Approximately 196.5 acres of spotted owl PACs would be subject to hand thinning and underburning to enhance existing high-quality spotted owl habitat. Mechanical treatments are limited to small understory trees with a 6" dbh or smaller. Fuels treatments would thin understory vegetation and ground cover and may recruit a limited number of snags from tree scorching during prescribed fire in the PACs. Visibility and accessibility for spotted owls hunting in the understory would be improved slightly but a more open understory may reduce habitat quality for some spotted owl prey species (woodrats) and improve it for others (flying squirrel). Fuels treatments would have negligible effects on canopy layering, average dominant and co-dominant tree diameter, and tree canopy closure. Some large down logs would likely be lost during prescribed burning but in areas where they are currently available, PACs will be retained. Prescribed burning is not expected to reduce habitat suitability because overstory canopy cover would not change and large trees would be retained. Effects on habitat quality will be mixed as discussed above but are expected to result in long-term benefits, particularly increased stand resilience to stressors such as drought, insects, and fire.

Compensatory mitigation measures implemented on North Shirttail Creek including road maintenance, streambank stabilization, and fuels reduction on 70 acres of the RCA are within ¼ mile of reported nesting in PAC 0116. These activities may also disturb territories or individual birds. An LOP (March 1st to August 15th) would be required for implementation of activities within a ¼ mile of the spotted owl activity center at PLA 0116 to prevent disturbance to breeding birds. Underburning may occur in conjunction with fuels treatments. Consistent with management requirements, prescribed underburning would generally occur during suitable periods in the fall when early season rainfall has occurred or spring when the material has dried sufficiently to support ignition. There is a moderate to low risk of escaped fires associated with broadcast underburning because it may encounter dense fuels or reach into the tree canopy. Protective fire-lines would be placed around underburn areas to control the extent and the total area proposed for burning is limited in size. If a fire escapes or the intensity is greater than planned, active suppression would be used to stop the spread of the fire and to minimize the impact to the surrounding area. The risk of injuring or killing owls during these activities is relatively low, as the initial human disturbance and ongoing, slow ignition will flush animals from the area.

With implementation of management requirements (TW1 through TW16, RCA1 through RCA4, and PFA1 through PFA3) and compensatory mitigation measures, this impact would be reduced to ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA).

Northern Goshawk

Minor direct effects to individual goshawks are possible with project implementation but because nesting birds were not found in the area, effects are likely to be limited to flushing perched, resting, or foraging birds. Goshawks may also temporarily avoid the Project Area during vegetation removal within the inundation area, during installation of the radial gates, during construction of the relocated recreation facilities, and during activities associated with the compensatory mitigation involving fuel treatments in spotted owl PACs surrounding the reservoir, along Upper Shirttail Creek, and during bank stabilization on Upper Shirttail Creek. Installation of the radial gates, operation of heavy equipment and felling of trees may generate noise disturbance within the analysis area. Disturbance-type effects, if they occur, are expected to be minor (short-term duration). The Sugar Loaf PAC is far enough from the project (1.5 miles) that disturbance of the territory is not anticipated. If goshawks are discovered nesting nearer the Project Area prior to project implementation, management requirements will limit project activities during the breeding season to a distance determined by the district wildlife biologist necessary to minimize disturbance.

Indirect effects on goshawks are expected from direct loss of 37 acres of suitable habitat. Given the limited acreage affected, the lack of known detections in the area, and the availability of high-quality habitat in the spotted owl PACs in the surrounding area this indirect effect is expected to be minor.

Compensatory mitigation involving thinning and underburning on up to 196.5 acres in two owl PACs would result in removal of understory trees and shrubs that may reduce some prey species (squirrels and birds) in the short-term. Thinning and underburning would increase the likelihood of stand resilience to stressors such as drought and fire, and well as increase the growth rate and support the diversity of remaining trees.

With implementation of management requirements (TW1 through TW16) and compensatory mitigation measures, this impact would be reduced to ***less than significant*** (CEQA) and a ***minorly adverse effect*** (NEPA).

Bats

Minor direct effects on bats may occur and could include disturbance of roosting bats causing temporary abandonment of a roost and/or changes in patterns of habitat use. Disturbance may occur because of vegetation removal in the inundation area, hazard tree removal, relocation of recreational facilities, and compensatory mitigation in the form of fuel treatments, erosion control and road improvements. Flushing of bats from roosting sites may occur where bats are day roosting within or adjacent to the project boundary. There is also potential for mortality if breeding or roosting trees are removed. Although adult bats would likely abandon roost sites prior to tree felling, young bats may not be able to fly.

A limited number of permanent, man-made structures in the Project Area currently serve as potential bat roosting sites, though species using the structures are unknown. Regardless of bat species present, any structures to be removed and relocated by the project would be subject to management requirement TW14 to avoid direct effects on roosting bats in man-made structures.

The project is expected to reduce availability of potential roost sites for bats, either by removing suitable roosting trees in the inundation area, removing hazard trees, or by relocation of facilities. A limited number of permanent, man-made structures potentially serving as roosting sites (e.g. restroom buildings) would be removed and relocated or replaced by the project, though the configuration of man-made structures removed and replaced by the project are not expected to support reproductive or roosting habitats for this species. Therefore, the effect of temporary removal and replacement would be minor. The proposed limited effects on large trees and snags from hazard tree removal (approximately 110 acres) may minimally reduce roosting habitat for all bat species. Removal of large snags would be incidental and would not substantially reduce large snag availability across the analysis area.

The effects of habitat loss on pallid bat are expected to be minor, as there would be limited change in the quantity of available habitat (approximately 44 acres). Fuels treatments on up to 266 acres may improve habitat for pallid bat by opening the understory or canopy. The project would slightly increase edge habitat created by the increased inundation area and maintain edge habitats created by the reservoir and recreational facilities, which may benefit Townsend's big-eared bat. Loss of suitable habitat for fringed myotis would occur in association with the removal and inundation of Upper Shirttail and Forbes Creeks and their adjacent habitats. On the other hand, fuels treatment on 266 acres may improve habitat quality by retaining large trees and reducing understory vegetation.

With implementation of management requirement TW14 and compensatory mitigation measures, potential impacts to bats would be reduced to ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Foothill Yellow-legged Frog

Direct Loss of Frogs. Direct effects on foothill yellow-legged frog (FYLF) individuals could occur if frogs come into direct contact with mechanical equipment or trees falling upon individual frogs or implementation of fuels treatments as compensatory mitigation. There is also a risk of direct effects associated with water drafting and water transfers.

Tree removal from the inundation area associated with North Shirttail Creek and Forbes Creek and fuels treatment and bank stabilization proposed for compensatory mitigation on North Shirttail Creek would occur adjacent to the stream channel. Management requirements for an LOP during the wet season would avoid direct effects to FYLF. Implementation of management requirements WAR, RCA, WSU, and PFA would also avoid the risk of direct effects to FYLF from implementation of fuels treatments as compensatory mitigation.

The primary risk with water drafting comes from egg masses and/or tadpoles coming into contact with equipment used to suction water from the stream/watering hole. Although screens are placed on the ends of water intake hoses to aid in preventing suction of aquatic species, egg masses and tadpoles may be smaller than the mesh size present on the screens. Implementation of WSU management requirements would require visual presence-absence surveys for amphibian egg masses and tadpoles prior to operations. Drafting will primarily occur within the reservoir, which would not affect FYLF. If drafting from streams is proposed, management requirement WSU11 would reduce the risk of direct effects to FYLF by directing drafting to non-suitable habitat and by completing pre-activity surveys for the presence of egg masses or tadpoles at proposed water drafting sites.

For the above reasons, there would be negligible risk of direct effect on FYLF individuals or their habitat from the proposed project/action or alternatives.

Sedimentation from Vegetation Removal and Compensatory Mitigation Measures. Sedimentation from exposed soils adjacent to the Sugar Pine Reservoir is expected to occur during the first season it is filled and potentially for one additional filling season thereafter as the inundation area stabilizes through the deposition of organic materials. Because exposed soils would be graded as necessary and stabilized after tree removal, the extent of sedimentation is expected to be short duration and low in severity. Because the reservoir is not suitable habitat for foothill yellow-legged frog and the newly inundated stream channels would displace any existing occurrences of FYLF, no additional direct or indirect effects from sedimentation would occur. Compensatory mitigation in the form of fuels treatments in spotted owl PACs would be accomplished through hand thinning and underburning, limiting the potential to expose soils and generate increased sedimentation to nearby streams. Fuels treatment on 70 acres of the Upper Shirttail Creek RCA and bank stabilization of up to 200 feet of eroding stream channel and road repairs also has potential to increase sedimentation to the stream channel. Fine sediments released into breeding streams can reduce interstitial spaces between cobble and other substrates, reducing the quality of substrates as egg-deposition sites for foothill yellow-legged frogs (Ligon et al. 1995). Sedimentation can potentially smother egg masses, while increased water turbidity could restrict respiration for tadpoles (Gillespie 2002). Sedimentation could alter the periphyton community and affect foraging quality for tadpoles. Sediment deposition can affect adult frogs by filling interstitial spaces between substrates, closing up refugia and hiding spaces. Excavation of CRLF breeding ponds for compensatory mitigation would occur in uplands with no downstream hydrologic connection. Therefore, no sedimentation effects are anticipated. Proposed fuels treatments would involve hand treatments and mastication (grinding trees in pace with motorized equipment) which would reduce the risk of sedimentation to low. Bank stabilization and road repairs would result in temporary increases in sedimentation which may displace frogs from adjacent aquatic habitats but in the long-term would improve suitability of habitat by eliminating chronic sources of sedimentation. Implementation of WAR, WSU, RCA, and PFA management requirements would reduce the likelihood of adverse effects during implementation and, in the long-term, road repairs and bank stabilization would eliminate chronic sources of sediment delivery associated with sedimentation from compensatory mitigation measures.

Effects of Water Transfers. *Early season spill-year transfers* would typically occur in spring and end by June 1. An early season transfer augments the existing downstream flow by using one or more of the Dam's existing outlets to release stored water as natural inflows to the reservoir and resulting spill over the Dam's spillway attenuate. The augmentation of downstream flow is controlled at the dam so that the rate of discharge is within the range of historic flow events. In spill years, FPUD would begin the release of water to be transferred while the spill is occurring. This will allow the transition from the spill event to the transfer water release rates. This is done in order to avoid significant fluctuations in flow rates and resulting water surface elevations in Shirttail Creek caused by transfer releases. Such fluctuations, i.e., the repeated raising and lowering of the creek's water surface could have an adverse effect on aquatic resources such as foothill yellow-legged frog, particularly during critical life stages such as egg-laying, larval development, and metamorphosis.

To minimize the potential effects of future spring transfers on aquatic resources within Shirttail Creek, operating criteria for conducting such transfers would be implemented under the proposed project/action. These criteria are described below. It is important to note that proposed water release rates during future spring transfers would remain well within the range of spill rates that have historically occurred and are typical from the reservoir during spring. The purpose of the proposed approach to future transfers is to provide a smooth transition from uncontrolled spill to a controlled release and thus provide a smooth transition from uncontrolled spill to a controlled release. The early season transfer would be concluded to coincide with initiation of the foothill yellow-legged frog breeding season (**Figure**

4.4-6 Relationship of Transfer Operations, Flow Volumes, and Foothill Yellow-legged Frog Critical Periods).

Breeding is triggered by three primary factors, increasing air temperature, increasing water temperatures and decreasing flow velocity (Hayes et al. 2016 and references therein). An early season transfer occurs primarily in May and is timed such that volumes are tapering off by the end of May. Thus, flow velocity is decreasing as air temperature and water temperatures are increasing in late May. The gradual increase of flow added to spring run-off, sustained release, and subsequent gradual decrease mimics the range of natural flow events in a system such as Shirttail Creek and thus would allow foothill yellow-legged frogs occurring in the downstream reach of Shirttail Creek to respond to the seasonal cues.

In years when downstream Folsom Reservoir is also spilling, the transfer release may need to be delayed until the Bureau of Reclamation regains control of Folsom releases, so that Sugar Pine Reservoir transfer water is not spilled at Folsom. In some cases, only water released at Folsom (not spilled) can be transferred to a purchasing party. Once most of the transfer water is released from the Sugar Pine Reservoir, the remainder of the transfer water will be released over a multi-day period to ramp down to the minimum fishery flow release specified by the MOA. How future transfers would be carried out under the proposed project/action is described in greater detail in Section 2.2.5.3, above,

Early season, non-spill year transfers may also occur in a year when Sugar Pine Reservoir does not spill, FPUD would use the transfer water to gradually ramp up releases to Shirttail Creek from the minimum flow requirement to the calculated transfer flow rate, then carefully ramp down to the minimum flow requirement to provide a smooth transition from minimum flow to transfer rates and back down again. Ramping rates up to the transfer rate will be the maximum of 10 cfs per day or double the previous day release rate, whichever is lesser. Ramping rates down to the minimum flow requirement will be no more than half the release rate from the previous day or 10 cfs, whichever is lesser. An example of how an early-season, non-spill-year transfer would occur is illustrated in **Figure 2-9**. Again, this gradual increase and gradual decrease would mimic the range of natural flow events in a system such as Shirttail Creek and thus would allow foothill yellow-legged frogs occurring in the downstream reach of Shirttail Creek to respond to the seasonal cues.

Under the proposed project/action, the volume of water that could be transferred could be as much as 5,000 acre-feet (AF), which is 3,000 AF more than the 2,000-AF transfer amount previously carried out (and which is part of the environmental baseline). Therefore, the period of sustained discharge could supplement flows with as much as an additional 80 to 90 cfs. Nevertheless, as long as the transfers are completed by June 1 and releases do not commence after natural flows have abated, adverse effects on foothill yellow-legged frogs from the increased volume of discharge are not expected for the following reasons:

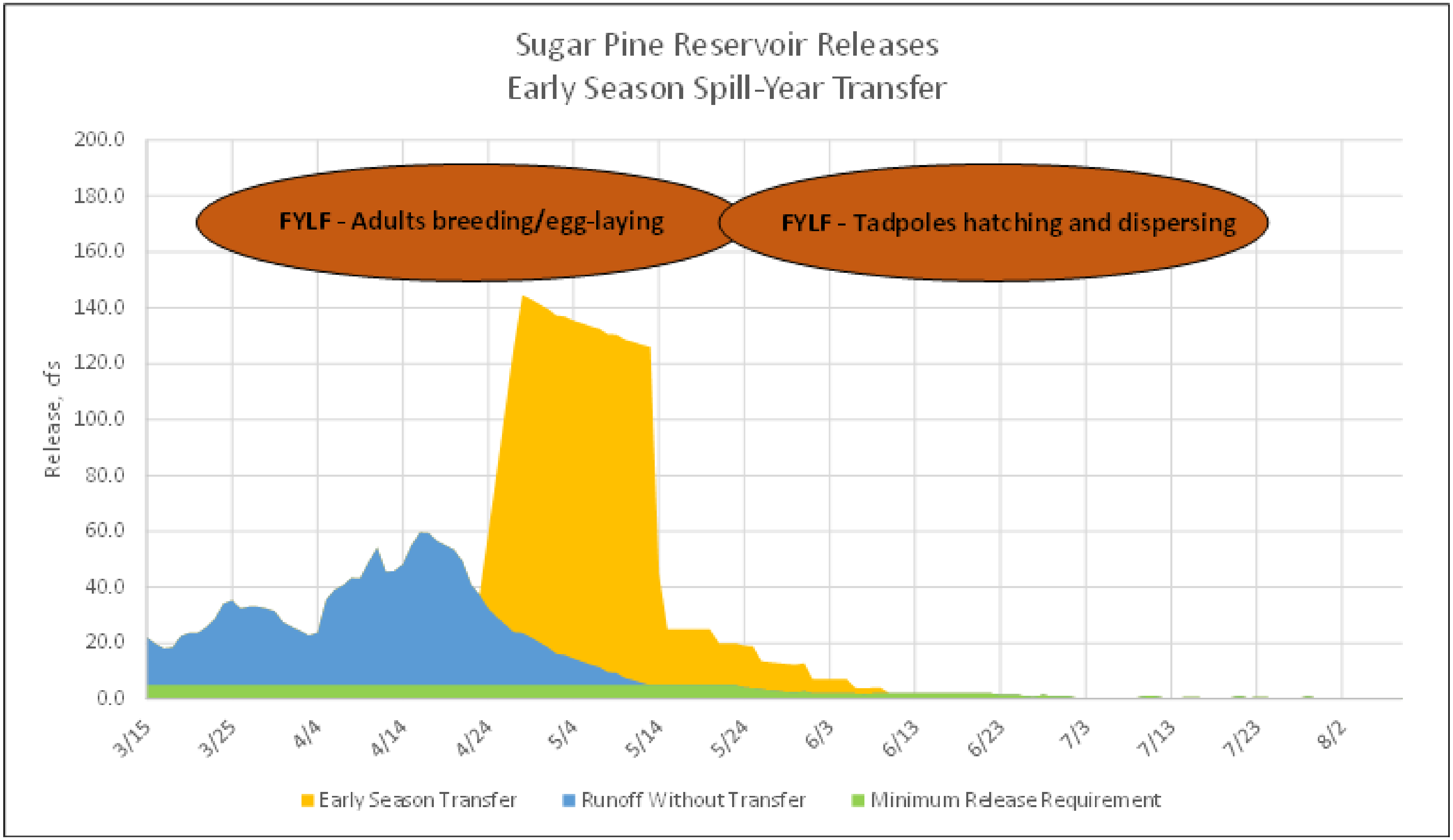

Figure 4.4-6 Relationship of Transfer Operations, Flow Volumes, and Foothill Yellow-legged Frog Critical Periods

- The volume is controlled at the dam at a rate of discharge within the range of historic flow events.
- Foothill yellow-legged frog breeding is triggered by increasing air temperature, water temperature, and decreasing flows. For most transfers, flows would be tapered into natural over-the-dam spills as the natural spills taper off, augmenting and prolonging the volume of water released to Shirttail Creek, but not comprising a pulsed flow after water releases have already diminished. (A pulsed flow could prematurely trigger breeding activity in foothill yellow-legged frog.)
- For transfers temporarily stored in or passing through Folsom Reservoir a NEPA environmental assessment would be prepared to assess the effects of the proposed transfer on the natural and human environment. This process provides an opportunity to modify the timing, rate, and duration of flows to address potential effects on foothill yellow-legged frogs.

Early Season Transfers FYLF Monitoring Program Protocol

To ensure the efficacy of the proposed project/action reservoir operations plan to protect FYLF in the course of early season transfers, FPUD will implement a temporary monitoring program. The program would be implemented as part of the Proposed Project Design Features and Compensatory Mitigation Measures listed in Table 2-5 above (see Measure P1). The proposed protocols for carrying out early season spill-year and non-spill-year transfers are as follows:

Spill Year Early Season Transfer FYLF Monitoring Protocol

When transfers are planned during a normal spill year, a two-survey monitoring approach for foothill yellow-legged frogs will be undertaken. A baseline, pre-transfer survey will be performed at the outfall and at the Shirttail Creek confluence with North Fork American River prior to the planned release. It is anticipated that water volume will still be high and unregulated and temperatures will be relatively cold, so surveys are expected to indicate that breeding has not commenced. Adult and subadult frogs that may be encountered during surveys will likely not be at risk of harm due to transfer flows. Thermochron ibuttons will be deployed prior to the transfer to record ambient and water temperatures in representative locations over the duration of the transfer.

A post-transfer amphibian survey will be conducted at both sites after cessation of the transfer. By this point water levels will be reduced from peaks during the prior survey, water temperatures will be rising, and average ambient temperature will be gaining. Reproduction of foothill yellow-legged frogs would be expected to start imminently. Evidence of reproduction will confirm that the approach and timing taken during the spill year transfer were conservative and appropriate. Stream hydrology monitoring will not be performed during spill year transfers. Given the same operating parameters (timing, volume, and duration of transfer) for future spill-year transfers, monitoring may not be repeated during subsequent transfers undertaken within the same parameters. A brief summary report will compile foothill yellow-legged frog survey data at the completion of the transfer.

Non-spill Year Early Season Transfer FYLF Monitoring Protocol

Four surveys will be performed during a non-spill year transfer event. In preparation for a non-spill year transfer, a pre-transfer survey will be conducted at both sites (outfall and confluence) immediately prior to water release. This survey is intended to document the current status of breeding within the resident foothill yellow-legged frog population. If egg masses are detected, each location will be marked with colored or flagged rocks, rebar, GPS or small pins. If the survey shows that no early-stage (egg or tadpole) foothill yellow-legged frogs are present, the transfer will commence within 24 hours. The transfer will be ramped as described in Section 2.2.5.3 of this Draft EIR/EIS and another survey will be conducted at the midpoint of the ascending asymptote (based on the ultimate maximum release volume) to confirm that breeding has not initiated. Thermochron ibuttons will be deployed to record ambient and water temperatures in representative locations over the duration of the transfer.

A third survey will be conducted as the release volume is being reduced, at the halfway point on the descending asymptote, to document that no eggs have been laid during the high volume water release that would be stranded by decreasing water volume. If egg masses were detected prior to water transfer flows, return visits will check known egg mass locations to determine potential impacts from project operations. Lastly, a fourth survey will be conducted after the transfer has completed. . After the successful transfer of a high volume of water, the descending water volume and ascending water and ambient temperatures should trigger breeding. Stream hydrology monitoring will be performed at both sites concurrent with all amphibian surveys. A brief summary report will compile foothill yellow-legged frog survey data at the completion of the transfer. Environmental conditions encountered during every non-spill year water transfer will be unique, so this monitoring approach will be undertaken for any non-spill year transfer.

Late-season transfers may occur under the proposed project/action and Alternatives 1 and 2. Late season transfer releases to Shirttail Creek would begin no earlier than August 15 and not extend beyond September 25 (as occurred in 2018). In this scenario, the timing, volume, and duration of transfers is limited by requirements at Folsom Dam, maintaining recreation opportunities at the Sugar Pine Reservoir, and meeting local consumptive demand. Therefore, the peak rate of discharge for a 5,000-AF transfer could reach 90 cfs for as long as 20 days with a 5-day ramping up/down period.

The actual start date for future late season transfers will be contingent on conditions within Shirttail Creek relative to sensitive aquatic biological resources. While frogs are adapted to seasonal high flows, the turbulence associated with high flows out of season (i.e., September) at rates as high as 90 cfs and the colder water temperatures of the transferred water could cause stress or flush the various life stages downstream. In 2018, 932-acre-feet of water was transferred between September 8 and September 26 at a peak rate of discharge of 40 cfs. Monitoring of that transfer within Shirttail Creek at its confluence with the North Fork of the American River documented that no vulnerable early life stages of foothill yellow legged frogs were present within the survey reaches at the time of the transfer; young-of-year had metamorphosed before the release began. Also, substantial but varying numbers of young-of-year and adult frogs were observed in the survey reach at the confluence throughout the water transfer. It appeared that habitat use changed as the volume of transfer water gradually increased. Transfers in

August before young-of-year metamorphose could flush this life stage downstream, which could cause mortality; monitoring and mitigation to offset observed effects would be necessary under these circumstances. If a late season transfer requires a release in excess of 40 cfs, the effects on frogs are not known and could be significant. In this case, monitoring and mitigation to offset observed effects would be required. This monitoring and mitigation would be consistent with that conducted for the previous late-season transfer conducted in 2018. Each calendar year in which FPUD performs monitoring as described in this protocol, FPUD will provide a draft Monitoring Report to the Forest Service, for a 30-day written comment period.

For the above reasons, the impact of late-season transfers on FYLF is considered significant under CEQA and adverse under NEPA requiring mitigation (BIO 3) beyond identified management requirements and compensatory mitigation measures. The impact is considered ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA)**.**

Loss of Habitat in Upper Shirttail Creek and Forbes Creek.

The increased inundation area of reservoir would not provide suitable habitat for FYLF. Further, tree removal and subsequent inundation extending a total of 2,783 linear feet upstream in North Shirttail Creek and Forbes Creek would result in a complete loss of occupied habitat and suitable habitat, respectively. Though these areas would draw down or drain annually as the reservoir fills and is drawn down, the loss of adjacent riparian forest, flushing flows, and habitat complexity would render the creek habitats unusable for foothill yellow-legged frogs. This represents 11 percent of the available habitat in North Shirttail Creek and 5 percent in Forbes Creek. Further, the conversion of 2,783 feet of lotic habitats to lentic, palustrine habitats could increase the amount of suitable habitat available to American bullfrogs, a major predator of yellow-legged frogs.

The potential for effect is greater for North Shirttail Creek, which provides higher quality habitat than Forbes Creek due to what appears to be a shorter hydroperiod (as observed during the 2015 survey during which the reach was only 10 percent wetted). Approximately 11 percent of suitable habitat in North Shirttail Creek would be permanently lost and remaining upstream habitat may be subject to occupation by bullfrogs ultimately contributing to a further reduction in the quality of habitat. Similarly, 5 percent of Forbes Creek suitable habitat would be permanently lost and remaining upstream habitat may be subject to occupation by bullfrogs ultimately contributing to a reduction in habitat quality. This effect would be less for Forbes Creek, which already supports bullfrogs. Compensatory mitigation for the loss of habitat includes bull frog suppression in up to 8,500 linear feet of North Shirttail and Forbes Creeks.

With implementation of management requirements (all RCAs, WSU, PFA, and WARs) and compensatory mitigation measures, this impact would be reduced to ***less than significant*** (CEQA) and a ***minorly adverse effect*** (NEPA).

Western Pond Turtle

Direct Effects on Turtles. There would be a negligible risk of direct effects on western pond turtles, or their habitat, resulting from implementation of the proposed action, including the compensatory mitigation actions. Pond turtles could be directly affected by project implementation if turtles come into direct contact with mechanical equipment or trees falling upon individual turtles. As stated, the risk is negligible as intensive surveys have not identified turtles in the Project Area. Further, management requirement TW-12 requires a preconstruction survey for nesting turtles prior to initiation of timber removal in the inundation area. If a northwestern pond turtle is found it will be relocated out of the construction area. If a nest is found, exclusionary fencing would be installed around the nest providing a migratory corridor outside the construction area. The combination of the lack of western pond turtle occurrence in the Project Area and implementation of management requirements WAR, RCA, WSU, and PFA would yield a negligible risk of direct effects to turtles from implementation of fuels treatments as compensatory mitigation.

Effects of Sedimentation. Sedimentation from exposed soils adjacent to the Sugar Pine Reservoir is expected to occur during the first season it is filled and potentially for one additional filling season thereafter as the inundation area stabilizes through the deposition of organic materials. Because exposed soils would be graded as necessary and stabilized after tree removal, the extent of sedimentation is expected to be short duration and low in severity. If northwestern pond turtles were to occur at Sugar Pine Reservoir, habitat quality might be reduced for a limited period until sediment settles. The effect may be partially offset by a possible increase in available forage in the newly created inundation area. In the first year of inundation, drowned insects, larvae, and carcasses may increase foraging opportunities for northwestern pond turtle in the project area.

Compensatory mitigation in the form of fuels treatments in spotted owl PACs would be accomplished through hand thinning and underburning, limiting the potential to expose soils and generate increased sedimentation to nearby streams. Fuels treatment on 70 acres of the Upper Shirttail Creek RCA and bank stabilization of up to 200 feet of eroding stream channel and road repairs also has potential to increase sedimentation to the stream channel. Fuels treatments would involve hand treatments and mastication (grinding trees in pace with motorized equipment) which would reduce the risk of sedimentation to low. Bank stabilization and road repairs would result in temporary increases in sedimentation which may displace turtles from adjacent aquatic habitats but in the long-term would improve suitability of habitat by eliminating chronic sources of sedimentation. Implementation of WAR, WSU, RCA, and PFA management requirements would reduce the likelihood of adverse effects during implementation and in the long-term, road repairs and bank stabilization would eliminate chronic sources of sediment delivery. Excavation of CRLF breeding ponds for compensatory mitigation would occur in uplands with no downstream hydrologic connection. Therefore, no sedimentation effects are anticipated.

Effects on Habitat. Sugar Pine Reservoir provides marginally suitable habitat for western pond turtle due to the abundance of human recreational use, presence of predatory game fish and bullfrogs, lack of vegetative, woody, and shoreline structure for basking sites; and limited availability of shallow, eutrophic, warm areas for hatchlings (1.6 acres adjacent to the reservoir constitutes riparian habitat that meets this description). Ponds, creeks and tributaries in the analysis area with a diversity of habitat conditions, decreased human recreational use, and lacking predatory fish and bullfrogs likely provide the best habitat for western pond turtles. The increased area of reservoir may provide more marginally suitable habitat for turtles. In the first year of inundation, drowned insects, larvae, and carcasses may increase foraging opportunities for turtles. Tree removal and inundation of portions of North Shirttail Creek and Forbes Creek would result in a loss of suitable habitat. This represents 11 percent of the available habitat in North Shirttail Creek and five (5) percent in Forbes Creek. Further, the conversion of 2,783 feet of lotic habitats to lentic, palustrine habitats could increase the amount of suitable habitat available to American bullfrogs, a known predator of turtles. Fuels treatments as compensatory mitigation would maintain suitable habitat for turtles.

Effects of Water Transfers. Turtles are adapted to seasonal high flows and will move to shallow pools or high ground to avoid high flow events. Like with foothill yellow-legged frogs, the gradual increase of flow added to spring run-off, sustained release, and subsequent gradual decrease mimics the range of natural flow events in a system such as Shirttail Creek, allowing turtles to respond to the seasonal cues. Therefore, early season transfers are not expected to affect habitat suitability for western pond turtles. Under the proposed action, the volume of water that could be transferred could be as much as 5,000 acre-feet. Therefore, the sustained discharge could supplement flows with as much as an additional 90 cfs. Nevertheless, if transfers are completed by June 1 and releases do not commence after natural flows have abated, negative effects to western pond turtle suitable habitat would be avoided.

Unseasonal high flows at rates as high as 90 cfs associated with late season transfers could adversely affect western pond turtles by flushing turtles downstream. Amongst the life stages, young turtles may be the most vulnerable to flushing, as calm edge habitats with floating or emergent vegetation become inundated with higher velocity water. On the other hand, turtles are typically moving to overwinter habitat at this time of the year and may avoid the high flow events altogether. During the 2018 late season transfer, no western pond turtles were observed in the survey reaches. However, based on the observations of foothill yellow-legged frog, we similarly conclude that late season transfers limited to a peak rate of discharge of 40 cfs or less, would not result in adverse effects on turtles. If a late season transfer requires a release in excess of 40 cfs, and turtles are present in the downstream reach, the effects would not be known and could be significant. In this case, monitoring and mitigation could be required to offset observed effects to frogs and would benefit turtles. Again, the NEPA environmental assessment prepared for the proposed transfer would allow for additional monitoring or mitigation to document and offset potential effects.

Given the low likelihood of western pond turtle occurrence combined with implementation of management requirements (all RCAs, WSU, PFA, and WARs) and compensatory mitigation measures, only late season transfers with a discharge greater than 40 cfs is considered significant under CEQA and adverse under NEPA requiring mitigation beyond identified management requirements and compensatory mitigation measures. The impact is considered ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

California Red-legged Frog

Direct Loss of Frogs. The mechanism of direct effects to California red-legged frogs, or CRLF, include: 1) frogs coming into direct contact with mechanical equipment, tree felling upon individual frogs, or implementation of fuels treatments as compensatory mitigation. and 2) mortality associated with water drafting.

Tree removal from the inundation area would not affect CRLF because the reservoir does not provide suitable breeding, foraging, or dispersal habitat. North Shirttail Creek and Forbes Creek provide dispersal habitat for CRLF. Implementation of management requirements WAR, RCA, WSU, and PFA combined with the lack of occurrence of CRLF in the Project Area would also avoid the risk of direct effects from implementation of fuels treatments as compensatory mitigation. Implementation of management requirements (WAR-1) requiring an LOP for tree removal from the inundation area associated with North Shirttail Creek and Forbes Creek and fuels treatment and bank stabilization proposed for compensatory mitigation on North Shirttail Creek would avoid direct effects to CRLF. Proposed compensatory mitigation would construct breeding ponds for CRLF. LOPs would similarly minimize the potential for direct effects to migrating CRLF adults, which can move long distances (200 to 2,800 meters) between aquatic sites, during construction of breeding ponds.

The primary risk with water drafting comes from egg masses and/or tadpoles coming into contact with equipment used to suction water from the stream/watering hole. Although screens are placed on the ends of water intake hoses to aid in preventing suction of aquatic species, egg masses and tadpoles may be smaller than the mesh size present on the screens. Implementation of WSU management requirements would require visual presence-absence surveys for amphibian egg masses and tadpoles prior to operations. No water drafting will occur if egg masses or tadpoles are observed in a given water drafting site.

Habitat Effects. The two risks associated with proposed project/action activities which may indirectly affect CRLF or their potentially suitable habitat include: 1) increased sedimentation of potentially suitable habitat from ground disturbance and 2) reductions in canopy cover within potentially suitable habitat from fuels treatments, particularly if these actions occur within RCAs, which could lead to increased water temperatures. It has been determined that activities proposed under the proposed project/action would have a negligible to low risk of sedimentation of stream channel and off-channel habitat, and a negligible risk to changes in canopy cover.

The analysis of effects is focused on treatments within RCAs that are hydrologically linked to potentially suitable habitats. Descriptions of RCA-specific management requirements can be found in the management requirements section of this document. In general, the RCA-specific requirements are designed to minimize ground-disturbing actions within RCAs while meeting project objectives.

Ground-disturbing activities, including fuels treatments that include hand thinning, mastication and underburning and stabilization of eroding streambanks and roads within RCAs, are the actions most likely to produce sediment which could enter perennial waters and thus affect CRLF or their potentially suitable habitat. Project activities taking place in upland (non-RCA) habitat may also contribute sediment to perennial waters.

There is no occupied CRLF habitat within the proposed project/action. Project activities are proposed in suitable CRLF dispersal habitat and specifically within 300 feet of suitable habitat, including RCAs. These treatments include hand thinning and underburning to remove fuels and streambank and road stabilization. Implementation would be consistent with Riparian Conservation Objectives (RCOs) and Aquatic Management Strategy (AMS) goals (USFS 2004) and the Land and Resource Management Plan for the Tahoe National Forest, as amended (USFS 2004). The intent of management direction for RCAs is to 1) minimize impacts, enhance, and restore habitat for riparian- and aquatic-dependent species; 2) ensure that water quality is maintained or restored; 3) enhance habitat conservation for species associated with the transition zone between upslope and riparian areas; and 4) provide greater connectivity within the watershed. Additionally, no mechanical operations will occur within 300 feet of suitable habitat for CRLF (e.g. intermittent or perennial streams, ponds, springs, and seeps) during the wet season (defined as starting with the first frontal rain system that deposits a minimum of 0.25 inches of rain after October 15 and ending April 15). These measures will also reduce the risk of sedimentation from runoff entering streams during implementation. Hand treatments and mastication produce negligible ground disturbance; therefore, these actions would not contribute sediment to adjacent stream channels.

Vegetation treatments (i.e. fuels treatments including hand thinning, mastication, and burning and hazard tree removal) would reduce tree and shrub cover on up to 70 acres of the North Shirttail Creek RCA. Fuels treatments are proposed on an additional 196.5 acres of spotted owl PACs which may include RCAs. Vegetation removal would make these areas slightly warmer, drier, and less suitable for CRLF dispersal, although this species is known to disperse across seemingly inhospitable habitats. New growth will replace the lost cover over the 20 years following implementation.

Pile burning and underburning associated with fuels treatments would follow the management requirements in Section 5.0. Pile burning would result in patchy increases in soil hydrophobicity and potential nutrient transport within RCAs in the short term but, because of spatial buffers between piles and aquatic habitats, is not expected to affect water quality. Prescribed burning is not expected to affect suitable habitat given the low severity of prescribed burning typical to riparian areas at the Project elevation and the limited acres treated (up to 226 acres). Implementation of standard management requirements (WSU, PFA, WRA, and RCAs) would reduce the likelihood of adverse effects from Project and compensatory mitigation implementation.

Reservoir operations would affect downstream habitat in Shirttail Creek. This system is potential dispersal habitat for CRLF. For spring, spill-year transfers, the gradual increase of flow added to spring run-off, sustained release, and subsequent gradual decrease mimics the range of natural flow events in a system such as Shirttail Creek and thus should allow native amphibians to respond to the seasonal cues. Spring transfers are not expected to affect habitat suitability for CRLF. Unseasonal high flows associated with spring transfers in a non-spill year and summer/fall transfers may reduce the suitability of Shirttail Creek as dispersal habitat. The severity of the effect is expected to be low because there are no records of CRLF in the Project Area.

With implementation of management requirements (all RCAs, WSU, PFA, and WARs) and compensatory mitigation, impacts of the proposed project/action of CRLF would be reduced to ***less than significant*** (CEQA) with a ***minorly adverse effect*** (NEPA)**.**

Effects to CRLF Critical Habitat. To offset the adverse effects to CRLF from loss of habitat in N. Shirttail and Forbes Creek, the Project would excavate 3.2 acres of small, breeding ponds in CRLF critical habitat (PLA-1). Implementation of breeding ponds has the potential to affect the four primary biological and physical factors of CRLF critical habitat: aquatic breeding, aquatic non-breeding habitat, upland habitat, and dispersal habitat. Construction of the breeding ponds would increase aquatic breeding habitat by 3.2 acres and would not affect aquatic non-breeding habitat. Construction of the breeding ponds would minimally improve the quality of adjacent upland and dispersal habitat by reducing the distance between foraging activities, refugia, and as dispersal opportunities. With implementation of management requirements (all RCAs, WSU, PFA, and WARs) impacts of the proposed project/action on CRLF critical habitat would be ***less than significant*** (CEQA) with a ***minorly adverse effect*** (NEPA)**.**

4.4.3.4 Impact Determination

For reasons presented above, the proposed project/action impact on special status animals is considered ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA) with implementation of appropriate Management Requirements and Compensatory Mitigation with one exception. The impact of the proposed project/action on FYLF related to future late season water transfers of up to 5,000 AF is considered potentially significant (CEQA) and adverse (NEPA). With implementation of mitigation measure MM-BIO-2, however, the impact is considered ***less than significant with mitigation incorporated*** (CEQA) *and* ***minorly adverse*** (NEPA).

Mitigation Measures

Mitigation Measure BIO-1: Late season water transfers resulting in releases to Shirttail Creek of 40 cfs or less shall not start until it is determined that FYLF in Shirttail Creek have achieved metamorphosis. The determination of metamorphosis will be made by a qualified biologist and confirmed by USFS. If a late season transfer requiring releases to Shirttail Creek of between 40 cfs and 90 cfs is proposed, the first such transfer shall be initiated after a determination of FYLF metamorphosis in Shirttail Creek and shall include implementation of a comprehensive monitoring program during and immediately after the transfer. The program shall be carried out by qualified biologist, shall be consistent with the approach and scope of the 2018 study by FPUD (ECORP 2018), and shall be subject to approval by CDFW and USFS. The program will contain adaptive management procedures to monitor effects during the transfer and to take protective action in the event that any significant adverse effect on FYLF is detected. Post-transfer surveys will be conducted to determine if any residual adverse effect on FYLF has occurred. In the event that it confirmed that no significant adverse effect on FYLF occurred as a result of the transfer, future transfers of between 40 cfs and 90 cfs will not require implementation of a comprehensive monitoring program so long as future transfers are conducted within the parameters established by the initial transfer unless otherwise required agencies with transfer approval authority.

Execution of a late season water transfer in September of 2018 by FPUD was accompanied by a comprehensive monitoring and reporting program. A description and results of that program are included in **Attachment L3 in Appendix L** of this DEIR/EIS (*Foothill Yellow-legged Frog and Northwestern Pond Turtle Monitoring Results for the FPUD 2018 Water Transfer* (ECORP 2018). In carrying out future transfers consistent with the parameters of the 2018 water transfer, as outlined in the above study, potential adverse effects on FLYF would be avoided. Key parameters include the application of specified ramping rates, the initiation of transfers only after it is determined that metamorphosis has occurred, and release volumes that do not exceed 40 cfs. If, however, a future transfer is proposed that is not consistent with those parameters, the transfer must incorporate a monitoring and reporting program that assures adequate mitigation of potential harm to FYLF. Such a plan will be consistent with the approach and scope of the 2018 study referenced above, and subject to approval by CDFW and USFS. If the initial transfer is carried out without impact on FYLF, future transfers would be carried out with limited survey requirements to confirm FYLF metamorphosis has occurred before the transfer starts.

With implementation of **Mitigation Measure BIO-1** above, the potential impact on FYLF, specifically, and special status animals, generally, is considered ***less than significant with mitigation incorporated*** (CEQA) *with a* ***minorly adverse effect*** (NEPA).

Alternative 1: Alternate JHMT Alignment

The Alternative 2 effects on special-status wildlife occurring in the affected area would be the same as those described for the proposed project/action.

Alternative 2: Helicopter Timber Harvest

The Alternative 2 effects on special-status wildlife occurring in the Project Area would be the same as those described for the proposed project/action.

Impact BIO-2: The proposed project/action could adversely affect native habitats through the introduction of invasive, non-native, or noxious plant species. Impact Determination: *less than significant* (CEQA) and *minorly adverse* (NEPA).

No Project Alternative

Under the No Project Alternative (CEQA), no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir will be similar to historical precedents and reservoir operations will remain within historical parameters. The No Project Alternative serves as the CEQA environmental baseline on which the following impact analysis is based.

No Action Alternative

Under the NEPA No Action Alternative, the Water Right 15375 will be extended, but no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative serves as the NEPA environmental baseline on which the following impact analysis is based.

Proposed Project/Action and Alternatives 1 and 2

Table 4.4-8 identifies known invasive plant infestations that occur within or intersect the Project Area. **Figure 4.4-7 Invasive Plant Locations** shows infestations identified by ECORP in the Project Area and TNF known infestations in a 1.5-mile surrounding area. In addition to the species identified in Table 4.4-8, two other invasive plants were observed within the Project Area: cheatgrass (*Bromus tectorum*) and Himalayan blackberry (*Rubus armeniacus*). These species are widespread on TNF but lack effective treatment options. Therefore, they are not tracked in the TNF Natural Resources Information System and management on TNF is generally limited to prevention during project and management activities. These species are not further discussed.

Table 4.4-8. Invasive Plant Infestations that Intersect the Project

Scientific	Common Name	Site ID	Last surveyed	Number of plants	Acres
Aegilops triuncialis	Barbed goatgrass	051754AETR000001	2016	180	2.21
Centaurea solstitialis	Yellow star-thistle	051754CESO300031	2016	20	2.13
Centaurea solstitialis	Yellow star-thistle	051754CESO300032	2016	1	0.0005
Chondrilla juncea	Rush skeletonweed	051754CHJU000016	2016	15	2.13
Elymus caput-medusae	Medusahead grass	051754ELCA130001	2016	350	2.24
Elymus caput-medusae	Medusahead grass	051754ELCA130005	2016	50	0.0045

There are a moderate number of infestations within the Project Area (**Table 4.4-8**); though several of the species present have limited treatment options. All infestations within the Project Area occur in the immediate vicinity of parking facilities and paved roads. The extent of invasive plants at the compensatory mitigation sites is expected to be less than the Project Area because the mitigation sites do not support intense recreational use. The Project Area is largely Sierra mixed conifer forests with variable canopy cover. Barren, grassland, and forested areas with relatively open canopy are generally more susceptible to colonization by invasive plants than closed-canopy forested areas (Brooks 2007; Hobbs and Huenneke 1992).

Activities in the Project Area, including road and trail construction and recreational activities such as camping and hiking have resulted in some disturbed areas within the Project Area. Disturbed habitats often have a higher susceptibility to invasions than those with long periods in late successional phases (Radosevich 2002). Invasive plant establishment in disturbed areas may be the direct result of destruction of vegetation, or it may indirectly result from changes in resource levels, such as light or moisture, or other conditions (Kowarik and Von der Lippe 2007; Parendes and Jones 2000).

The compensatory mitigation sites are not within disturbed areas or high recreational use areas and therefore are not as vulnerable to invasive plant colonization as the Project area.

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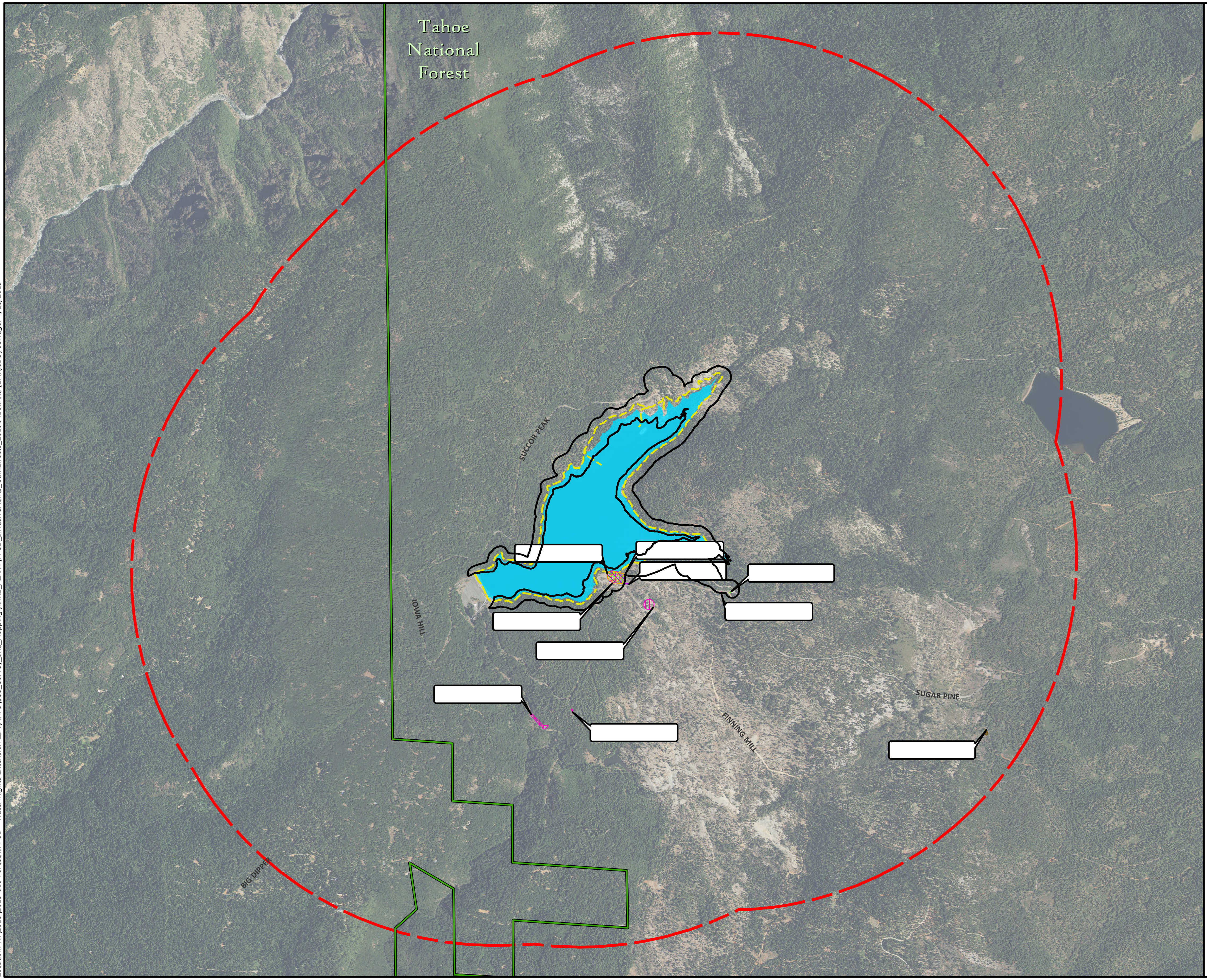
Figure 4.4-7
Invasive Plant Locations



Map Features

Proposed Inundation Area

Cumulative Effects Analysis Area

Study Area

Proposed Josh Harte Trail

Invasive Plant Species

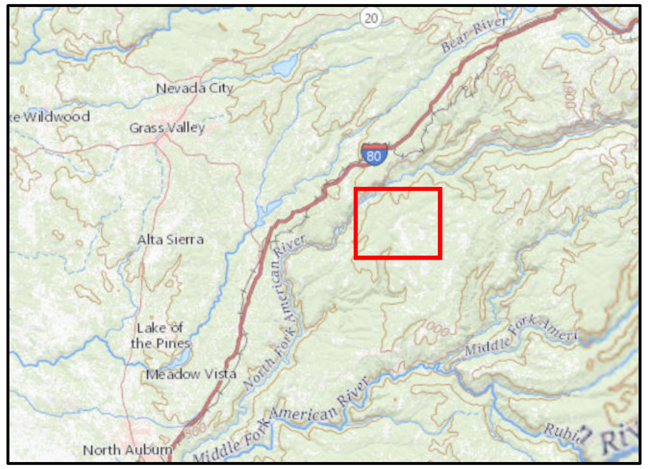
Scotch broom *(Cytisus scoparius)*

barbed goatgrass *(Aegilops triuncialis)*

medusahead *(Elymus caput-medusae)*

rush skeletonweed *(Chondrilla juncea)*

yellow star-thistle *(Centaurea solstitialis)*



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\SSS_Survey_and_Mapping\RARE_PLANT\FPUD_InvasivePlants_CumEffects_20190418.mxd (LMH/JDS)-JSwager 4/18/2019

Sources: ESRI, USFS, NAIP 2016
TESPlant_All (20170222)

Map Date: 4/18/2019

Scale in Feet
0 2,000

2015-019 FPUD Sugar Pine Reservoir

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Vectors such as roads, trails, utility lines, recreational activities (e.g., camping, hiking), and ongoing land management activities can spread invasive plants through the transport of weed seed. In particular, roads, trails, and utility corridors can contribute to long-distance dispersal of invasive species via three mechanisms: providing habitat by altering conditions, making invasion more likely by stressing or removing native species, and allowing easier movement of seeds or propagules by wild or human vectors (i.e., direct transport on clothes or vehicles) (Trombulak and Frissell 2000). There is a high risk of introduction and further spread associated with existing roads, trails, and recreation activities in the Project area. There is a low risk of introduction or spread of existing invasive weeds at the compensatory mitigation sites.

Use of mechanical equipment during harvesting and thinning can result in soil disturbances that favor nonnative plant establishment (Brooks 2007; Hobbs and Huenneke 1992; Lonsdale 1999; Zouhar et al. 2008). Ground disturbance will occur during timber harvesting associated with the removal of trees within the inundation zone of the enhanced Sugar Pine Reservoir. This area encompasses approximately 44 acres comprised of 37 acres of Sierra mixed conifer habitat type, 1.6 acres of montane riparian habitat, and 6.4 acres of montane chaparral habitat. The inundation area will be underwater once the reservoir’s additional capacity is filled, hence, this area does not pose a substantial risk for invasive species establishment. Additional ground disturbance will result from relocation of recreational facilities. This area is largely comprised of Sierra mixed conifer habitat type, with inclusions of barren, perennial grassland habitat, and montane chaparral habitat. This area is at moderate risk of invasive species establishment due to the proximity of recreational amenities and presence of vulnerable habitats including chaparral and barren habitats.

Habitat alteration will also occur in association with implementation of compensatory mitigation including wetland creation, road and streambank stabilization, and fuels treatments on up to 266.5 acres. The wetland creation, streambank stabilization, and fuels treatment areas are at low risk of invasive species establishment because they are remote, undisturbed, and low-risk habitats. The road stabilization area is at moderate risk because it occurs on barren soils.

The proposed installation of the radial gates, timber harvesting, relocation of recreational facilities, and implementation of compensatory mitigation (wetland creation, road and streambank stabilization, and fuels treatments) will necessitate the use of heavy equipment. Soil containing invasive plant propagules can adhere to machinery, be dispersed to uninfested areas, and result in new infestations (Hodkinson and Thompson 1997). The use of infested machinery is considered a substantial vector for incidental introduction (Kowarik and Von der Lippe 2007; USFS 2001; van der Meulen and Sindel 2008). On TNF, machinery is often imported from lower elevations (e.g., Sacramento Valley); in California, invasive plant species richness is generally greater at lower elevations (Dark 2004; Randall et al. 1998). So, use of imported equipment presents a high risk of introduction. The proposed project/action would not increase the quantity of access routes, recreation facilities, utility corridors, livestock graving, or movement of water from potentially invaded sources. The proposed project/action also does not increase the capacity of access routes and recreation facilities.

The compensatory mitigation sites would use existing access routes and does not increase recreation facilities, utility corridors, livestock graving, or movement of water from potentially invaded sources.

In summary, the implementation of the proposed project/action or Alternatives 1 and 2 would be at moderate risk of weed introductions. Implementation of the management requirements (all IS) and compensatory mitigation will reduce the risk of the spread of weeds within the Project Area to ***less than significant (CEQA)*** and ***minorly adverse (NEPA)***.

Impact BIO-3: The proposed project/action could adversely affect riparian habitat and other sensitive natural communities identified in local or regional plans, policies or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Impact Determination: *less than significant* (CEQA) and *minorly adverse* (NEPA).

No Project Alternative

Under the No Project Alternative (CEQA), no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir will be similar to historical precedents and reservoir operations will remain within historical parameters. The No Project Alternative serves as the CEQA environmental baseline on which the following impact analysis is based.

No Action Alternative

Under the NEPA No Action Alternative, the Water Right 15375 will be extended, but no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative serves as the NEPA environmental baseline on which the following impact analysis is based.

Proposed Project/Action

Under the proposed project/action, approximately 1.6 acres of existing riparian habitat would be inundated along the reservoir shoreline and approximately 2,032 linear feet of North Shirttail and Forbes Creeks stream habitat and adjacent riparian areas would be permanently inundated. The proposed project/action would implement management requirements (WAR, RCA, PFA, WUS) to avoid or reduce encroachment into riparian habitat. The proposed project/action would also implement compensatory mitigation measures (1) Fuels reduction on 70 acres of Shirttail Creek RCA and (2) bullfrog suppression program and (3) wetland creation. With these management requirements and compensatory mitigation measures, this impact would be reduced to ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Alternative 1: Alternate JHMT Alignment

Under Alternative 1, the effects on riparian habitat or other sensitive natural communities would be the same as those described for the proposed project/action. As stated for the proposed project/action, with implementation of management requirements (WAR, RCA, PFA, WUS) and compensatory mitigation measures (1) Fuels reduction on 70 acres of Shirttail Creek RCA and (2) bullfrog suppression program and (3) wetland creation, this impact would be reduced to ***less than significant*** (CEQA) *with a* ***minorly adverse effect*** (NEPA).

Alternative 2: Helicopter Harvest

Under Alternative 2, the effects on riparian habitat or other sensitive natural communities would be the same as those described for the proposed project/action. As stated for the proposed project/action, with implementation of management requirements (WAR, RCA, PFA, WUS) and compensatory mitigation measures (1) Fuels reduction on 70 acres of Shirttail Ck RCA and (2) bullfrog suppression program and (3) wetland creation, this impact would be reduced to ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Mitigation Measures

No mitigation measures are required.

Impact BIO-4 The proposed project/action could adversely affect federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, and inundation. Impact Determination: *less than significant (CEQA)* and *minorly adverse (NEPA).*

No Project Alternative

Under the No Project Alternative (CEQA), no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir will be similar to historical precedents and reservoir operations will remain within historical parameters. The No Project Alternative serves as the CEQA environmental baseline for which the following impact analysis for federally protected wetlands is based.

No Action Alternative

Under the NEPA No Action Alternative, the Water Right 15375 will be extended, but no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative serves as the NEPA environmental baseline for which the following impact analysis for federally protected wetlands is based.

Proposed Project/Action

This analysis considers the effects on all potential waters of the U.S./wetlands delineated in the Project Area. The proposed project/action would have no construction-related or permanent impacts to seeps or seasonal wetlands because these features are a sufficient distance from proposed activities to be avoided.

Ground-disturbing activities associated with tree removal in the inundation area have the potential for producing fine sediment, which could wash into the reservoir and newly inundated stream channels. The risk is greater where work is required on steep slopes. Increases in fine sediment have the potential for detrimental effects on benthic macroinvertebrate diversity and abundance.

Compensatory mitigation in the form of fuels treatments in spotted owl PACs (up to 195.6 acres) and along North Shirttail Creek (70 acres) also has the potential to expose soils, potentially resulting in temporary increases in sedimentation if actions are proposed near stream channels. Implementation of bank stabilization at two locations on North Shirttail Creek along with road stabilization on Fishermen's Access Road would also temporarily increase sedimentation to North Shirttail Creek until the sites are stabilized. The long-term goal of this measure is to eliminate this chronic source of sedimentation to North Shirttail Creek and Sugar Pine Reservoir. As described above, management recommendations (LIST) would reduce the amount and likelihood of sediment reaching nearby waters. The temporary impacts from streambank and road stabilization on North Shirttail Creek ultimately result in stabilization of a chronic source of sedimentation, generating a beneficial effect for this system.

Overall, the construction-related effects of sedimentation would be temporary and reduced by implementation of management recommendations (WAR1 through WAR3, RCA1 through RCA4, WSU1 though WSU13, PFA1 though PFA3, and IAW1) that limit the amount and likelihood that sediment would reach adjacent waters where it could potentially affect macroinvertebrates and other aquatic species. Compensatory mitigation measures (1) road maintenance on Fishermen's Access Road and (2) streambank stabilization on North Shirttail would reduce chronic sources of sedimentation to the reservoir. Implementation of management requirements and compensatory mitigation measures would reduce sedimentation impacts to ***less than significant*** (CEQA) and ***minorly adverse*** (NEPA).

Increased inundation of the Sugar Pine Reservoir would convert 44 acres of upland habitat and 0.217 acres of ephemeral drainages to lacustrine habitat. Additionally, approximately 2,032 feet of stream habitat within North Shirttail Creek and Forbes Creek would be converted to lacustrine habitat within the reservoir. The net effect would be conversion of riverine habitat (streams and drainages) to lacustrine habitat. The conversion of habitat is likely to result in changes in the composition of benthic macroinvertebrates from species that thrive in cool (shaded) flowing waters to species that thrive in warm, still waters.

Overall, potential project-related impacts on Water of the U.S./State and wetland would be reduced by implementation of management requirements (WAR1 through WAR3, RCA1 through RCA4, WSU1 though WSU13, PFA1 though PFA3, and IAW1). The permanent effects of replacing riverine wetlands with lacustrine wetlands would be reduced by compensatory mitigation measures (1) wetland creation and (2) habitat enhancement through bull frog suppression on North Shirttail and Forbes Creeks. Therefore, the permanent impact on Water of the U.S./State and wetland is ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Alternative 1: Alternate JHMT Alignment

Under Alternative 1, the realignment of JHMT uphill from the reservoir could generate a slightly greater risk of erosion and sedimentation to nearby waters of the U.S./wetlands when compared to the proposed project/action. The impacts would be temporary during construction and reduced by implementation of management requirements as described for the Proposed project/action. Implementation of Management Requirements WAR1 through WAR3, RCA1 through RCA4, WSU1 though WSU13, PFA1 though PFA3, and IAW1 are considered adequate to avoid potentially significant impacts on federally protected wetlands; the impact is ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Alternative 2: Helicopter Harvest

Under Alternative 2, the use of helicopter to remove vegetation within the expanded inundation area where slopes exceed 35% would slightly decrease risk of erosion and sedimentation to nearby waters of the U.S./wetlands when compared to the Proposed project/action. Implementation of Alternative 2 would avoid potentially significant impacts on federally protected wetlands; the impact is ***less than significant*** (CEQA) with a ***minorly adverse effect*** (NEPA).

Mitigation Measures

No mitigation measures are required.

Impact BIO-5: The movement of native resident or migratory fish or wildlife species, established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites could be affected by the proposed project/action. Impact Determination: *Less than significant* (CEQA) and *minorly adverse* (NEPA).

No Project Alternative

The No Project Alternative would not alter existing fish or wildlife species habitat, migratory corridors or native wildlife nursery sites. The No Project Alternative serves as the CEQA environmental baseline for these resources.

No Action Alternative

The No Action Alternative would not alter existing fish or wildlife species habitat, migratory corridors or native wildlife nursery sites. The No Action Alternative serves as the NEPA environmental baseline for these resources.

Proposed Project/Action

Project implementation including vegetation removal in the inundation area and relocation of the recreational facilities may temporarily interrupt localized movements of native wildlife in the habitats surrounding the reservoir attributed to the operation of equipment, increased presence of humans, and increased noise. The impacts would be temporary. The Project Area is not mapped as mule deer migration corridor. Therefore, there would be no effect to this resource. The proposed project/action would maintain the Project Area designation of "less permeable" as mapped by the Essential Habitat Connectivity Project. For the reasons presented above, the impact is ***less than significant*** (CEQA) and ***no effect*** (NEPA).

Spring water transfers occurs primarily in May and are timed such that volumes are tapering near the end of May into early June. The volume of water that could be transferred under the proposed project/action could supplement flows with as much as an additional 80 to 90 cfs. Nevertheless, this essentially extends the period of spring run-off and the potential rate of discharge is within the range of historic flow events. Therefore, we do not anticipate adverse effects to native fish movement or migration in Shirttail Creek.

The effects of transfers on native amphibians and reptiles are addressed in the discussion under Impact BIO-1, above. Unseasonal high flows at rates as high as 90 cfs could occur associated with late season transfers. While native species are adapted to such high flows, their atypical seasonal occurrence could temporarily interrupt native fish movements. The effects would be short-term during the period at which the transfer discharge peaks (likely no more than 10 to 15 days). For the reasons presented above, the impact is ***less than significant*** (CEQA) and ***minorly adverse***(NEPA).

Alternative 1: Alternate JHMT Alignment

Alternative 1 would have the same effects as the proposed project/action. Therefore, the impact is ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Alternative 2: Helicopter Harvest

In general, Alternative 2 would have the same effects as the proposed project/action. Helicopter harvest on slopes greater than 35% would reduce the amount of time required to clear vegetation compared to ground-based harvest, though some wildlife species may find it more disruptive due to the intensity of noise and air movement associated with flights. To avoid adverse effects to special-status wildlife, the proposed project/action would adhere to management requirements for limited operating periods when operating helicopters within 1/4 mile of known active nesting sites (TW1 and TW6 through TW9). With implementation of the Management Requirements, the impact is ***less than significant*** (CEQA) *and* ***minorly adverse*** (NEPA).

Mitigation Measures

No mitigation measures are required.

Impact BIO-6: Implementation and operation of the proposed project/action could conflict with the goals and policies of the Tahoe National Forest Long Range Management Plan and Sugar Pine Management Area Plan pertaining to biological resources. Impact Determination: *less than significant (CEQA)* with *no effect (NEPA)*.

No Project Alternative

Under the No Project Alternative (CEQA), no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir will be similar to historical precedents and reservoir operations will remain within historical parameters. The No Project Alternative would have ***no impact*** on the TNF LRMP or Sugar Pine Management Area Plan pertaining to biological resources.

No Action Alternative

Under the NEPA No Action Alternative, the Water Right 15375 will be extended, but no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No

Action Alternative would have ***no effect*** on the TNF LRMP or Sugar Pine Management Area Plan Sugar Pine MA 96) pertaining to biological resources.

Proposed Project/Action

The proposed project/action will comply with the standards and guidelines for biological resources contained in the LRMP.

The proposed project/action is in the Sugar Pine Management Area 96 (MA 96). The selected emphasis species for the Sugar Pine MA 96 are small mouth bass, rainbow trout, bald eagle, osprey, mule deer, and the riparian group. The management emphasis for MA 96 is recreation and the desired future vegetative state is a mosaic of continuous cover. The management area standards and guidelines for biological resources are the same as the forest-wide standards and guidelines. As stated, the proposed project/action will comply with the forest-wide standards and guidelines and is therefore consistent with the MA 96. The proposed project/action would not conflict with the stated emphasis species. Management requirements TW6 and TW7 would avoid potential effects to bald eagle or osprey. Impacts to the riparian group are addressed above under Impacts BIO-2. For these reasons, the impact of the proposed project/action is ***less than significant*** (CEQA) with ***no effect*** (NEPA).

Alternative 1: Alternate JHMT Alignment

Alternative 1 would have the same effects as the proposed project/action. Therefore, the impact is ***less than significant*** (CEQA) with ***no effect*** (NEPA).

Alternative 2: Helicopter Harvest

Alternative 1 would have the same effects as the proposed project/action. Therefore, the impact is ***less than significant*** (CEQA) with ***no effect*** (NEPA).

Mitigation Measures

No mitigation measures are required.

Impact BIO-7: The proposed project/action could adversely affect fish resources in Sugar Pine Reservoir and lower North Shirttail Creek. Impact Determination: *Less than significant with mitigation incorporated* (CEQA) and *minorly adverse* (NEPA).

No Project Alternative

Under the CEQA No Project Alternative defined in section 3.2 of this draft EIR/EIS, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. District diversions from the reservoir would continue and would increase over time to meet growth in water demand from implementation of the Foresthill Community Plan approved by the County of Placer. The No Project Alternative represents the environmental baseline conditions on which the potential impact of the proposed project and project alternatives, under CEQA, is based. Under that No Project Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. During these drawdowns, areas of bare ground between the forest surrounding the reservoir and the waterline will alter views from locations around the reservoir. The nature and quality of these views during low pool conditions is generally considered lower than at maximum pool. For purposes of this DEIR/EIS, this is considered the CEQA baseline by which potential project impacts on fish resources are determined.

No Action Alternative

Under the NEPA No Action Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. In addition, existing Sugar Pine Reservoir management and operational conditions would be continued. In keeping with NEPA requirements to account for future actions likely to occur in the absence of the proposed action, the No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Under that No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. For purposes of this DEIR/EIS, this is considered the NEPA baseline by which potential project impacts on fish resources are determined.

Proposed Project/Action and Alternatives 1 and 2

Sugar Pine Reservoir Fishes

Under the proposed project/action and Alternatives 1 and 2, the installation of the radial gates would increase the storage capacity of Sugar Pine Reservoir. This increase would expand the overall footprint and maximum surface area of the reservoir by approximately 44 acres (see **Figure 2-4 Existing and Proposed Maximum Area of Inundation**) and would raise the maximum water level by approximately 20 vertical feet. This would substantially increase both the overall availability of aquatic habitat for the reservoir's fisheries resources and the available near-shore shallow water habitats used by many of the resident fish species for spawning, early life stage rearing, and foraging. In addition, the amount of available habitat comprising the littoral (i.e., light-receiving) zone would be increased, thereby increasing productivity (e.g., increases in production of aquatic macrophyte, plankton, and macroinvertebrates, a major food source for reservoir fish). Overall, this would result in a net beneficial impact on the fisheries resources of Sugar Pine Reservoir. The impact on reservoir fish resources is considered ***less than significant*** (CEQA) and ***no effect*** (NEPA).

North Shirttail Creek Fishes

Under the proposed project/action and Alternatives 1 and 2, current minimum flow requirements for releases to North Shirttail Creek downstream of the dam that are referenced in FPUD's existing water right would remain unchanged and thus would be equally protective of the creek's fisheries resources relative to existing conditions. During water transfers, releases to the creek would be increased relative to existing conditions. These releases would likely occur in the late spring and be completed by June 1. However, in some years the District may carry out “late season” transfers that would begin no earlier than August 15 and extend no later than September 25. These transfers would be conducted by releasing additional flows during periods in which the dam is spilling (i.e., early season spill transfers; see **Figure 2-8 Early Season Spill-Year Transfer**) or by gradually ramping up release rates to a maximum rate and subsequently ramping flows back down to the minimum release rate to achieve the total transfer volume for early season transfers during non-spill periods (see **Figure 2-9 Early Season Non-Spill Year Transfer**) and late season (**see Figure 2-10 Late Season Maximum Transfer**).

The primary impacts associated with the water transfers include changes in temperature and the potential for stranding of fish in isolated pools during ramp down of releases from the reservoir. With regard to temperature, the releases would primarily be beneficial to the coldwater fisheries resources of the creek because the increase in coldwater releases from the reservoir cool the downstream temperatures, particularly during the critical warm summer months, where creek temperatures may approach critical maximum thresholds for trout. Temperature monitoring conducted during the 2018 late season transfer showed that water temperatures in North Shirttail Creek are affected by both ambient air temperature and temperature of the water being released from Sugar Pine Reservoir. Due to the close proximity of the monitoring sites near the dam outfall, water temperature within the upper reach of the creek immediately downstream of the dam were essentially the same as water temperatures at the reservoir release point. During the transfer, temperatures within the upper reach were observably reduced, with a subsequent gradual increase. All temperatures recorded in the upper monitoring sites during the water transfer were no greater than 13.5°C. Water temperatures near the NFAR confluence (i.e., 11 miles downstream of the dam) were less affected by the water transfer, but appeared to be reduced by an average of approximately 2°C. This would provide a beneficial impact on the creek’s fisheries resources. Under the proposed project, the greater depth of the reservoir would provide an even larger cold water pool than was present during the 2018 late season transfer. As such, the beneficial effect on downstream water temperatures during these transfers would likely be the same or greater.

During the 2018 late season transfer, flows were ramped up from a base discharge of 0.5 cfs to a peak average daily release rate of 41-42 cfs, followed by a gradual ramp down over an 8-day period to 0.5 cfs. During this transfer, ECORP biologists observed for evidence of any stranding of rainbow trout or other fish at a reach immediately downstream of the dam’s outfall and a short distance upstream of the NFAR confluence. Rainbow trout were documented during all surveys at the confluence survey area. At no time were they abundant, but trout to 10 inches in length were noted in deeper pools and the thalweg. Fry were noted at edges in still water. As the release was abated, special attention was given to finding any fish that might have been stranded in remnant side pools. None were observed and stranding was determined to not be an issue. As such, the potential for stranding of fish during water transfers and the potential for interruptions in movements of native fish are determined to be ***less than significant*** (CEQA) with ***no effect*** (NEPA).

For the above reasons, the potential impact of the project/action or Alternatives 1 and 2 on lower North Shirttail Creek fish resources is found to be ***less than significant*** (CEQA) and ***no effect*** (NEPA).

4.4.4 Cumulative Impact Analysis

Cumulative effects from past, present, and reasonably foreseeable future actions to biological resources were considered within an 8,142-acre analysis area extending 1.5 miles beyond the Project Area boundary (**Figure 4.4-8 Cumulative Effects Analysis Area**). This area was considered large enough to encompass all biological resources that (a) occur within the Project Area, (b) have suitable habitat within the Project Area, or (c) are near enough to potentially be affected indirectly by Project activities. Of the area considered, approximately 6,158.05 acres (76 percent) are on the TNF; the remaining 1,983.6 acres (24 percent) are privately owned.

4.4.4.1 Past Actions

Past actions on Forest land that have occurred in the analysis area include an extensive history of natural disturbances, recreational and infrastructure developments, and vegetation management.

The landscape in and around the analysis area was affected by historic fires. In 1936, portions of the analysis area burned near Sugar Pine Reservoir; this area has largely recovered and stands exhibit more natural assemblages of species, size, and age classes. The Volcano Fire (1960) also overlapped the analysis area and led to extensive reforestation efforts that created dense stands pines of a uniform age (referred to as the Volcano plantations) in the analysis area. The plantations were densely planted in ponderosa pine, limiting the diversity and density of other species such as oak and white fir found in more natural stands. More recently, the analysis area has not been exposed to fire but rather has been subject to fire suppression; the fire return interval has increased from a historic range of 15 to 30 years to present day range of 32 to 95+ years (USFS 2016). This has led to dense canopy cover by more shade-tolerant species.

Construction of the existing Sugar Pine Project was completed by the U.S. Bureau of Reclamation (Reclamation) in 1983. In 1985, Reclamation entered into an agreement with the TNF for administration of NFS and Reclamation resources, including recreation facilities, at the Sugar Pine Project site (1985 Agreement). The establishment of the reservoir resulted in the loss of approximately 10 miles of stream habitat. A campground, day use areas, and boat ramp were subsequently established at the reservoir. More recently, the paved multi-use trail (Joshua M. Hardt Accessible Trail) was added along the southern shore of the reservoir. Recreational use of the reservoir has led to the introduction of predatory species that prey on native aquatic species such as foothill yellow-legged frog (Moyle 2002). The expansion of bullfrogs into foothill yellow-legged frog habitat is an ongoing threat to existing native populations (Crayon 1998). Other recreational facilities in the cumulative effects analysis area include various campgrounds and OHV staging areas and trail systems. Roads for recreational use and management access are also present in the analysis area. These actions likely reduced habitat quality and displaced some wildlife from the vicinity of the projects at least seasonally due to disturbance from human presence. Recreational facilities also create openings that benefit edge-species and can introduce a food source benefitting species adapted to the presence of humans.

Figure 4.4-8
Cumulative Effects Analysis Area

Map Features

Survey Area
Cumulative Effects Analysis Area - 8141.65 acres
Current Spillway Water Surface
Tahoe National Forest
Private Lands

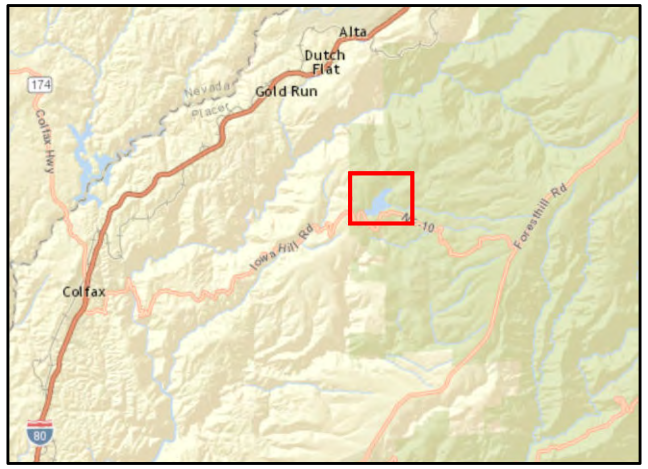
Recreational Facilities

Campground
Day Use Area
Boat Ramp
OHV Staging Area

Activity Type

Overstory Removal - 4019.14 ac.
Understory Removal - 7698.20 ac.

Service Layer Credits: Copyright:© 2015 DeLorme
Sources: Esri, HERE, DeLorme, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), MapmyIndia, NGCC, © OpenStreetMap contributors, and the



ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Photo Source: NAIP 2016
Base Data: USFS

Map Date: 5/25/2017

Scale in Feet
0 3,000

2015-019 FPUD Sugar Pine Reservoir

Location: N:\2015\2015-019 Foresthill PUD - Water Rights Extension EIR\MAPS\Meeting_Maps_and_Analysis\2016-09-16 Cumulative Effects\FPUD_CumEffects_v4_20170525.mxd (LMH/JDS) jswager 5/25/2017

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Vegetation management actions that have occurred within the analysis area over the last 20 years (1996-2016) or that are expected to happen over the next 20 years (2017-2037), and a general description of the actions' effects on wildlife habitats are summarized in **Table 4.4-9**.

As shown in Figure 4.4-8, above, past management actions on NFS lands overlapped extensively. Stands may have undergone multiple treatments such as pre-commercial thinning, followed by commercial thinning and underburning, all within the same footprint. Past vegetation management activities on the TNF were generally aimed at reducing small-to-medium diameter materials (e.g. shrubs and trees less than 24 inches dbh) for fuel reduction; however, some larger diameter (up to 30 inches dbh) trees were also removed, particularly during salvage, commercial thinning, clear cutting, group selection, seed tree, and overstory removal prescriptions. Over the past 20 years, overstory removal occurred on approximately 4,020 acres; understory treatments occurred on 14,473 acres; and tree plantings and restoration projects occurred on 4,400 acres in the analysis area.

Table 4.4-9. General Terrestrial Cumulative Effects: Summarized Vegetation Management Effects of Past (1996-2018), Present, and Reasonably Foreseeable Future Actions (2019-2039).

Activity	Effects of Past, Present, and Reasonably Foreseeable Future Actions	Acres
Past Activities		
Commercial Thinning	Commercial thinning reduces competition among trees and increases tree vigor and resilience to wildfire and insect and disease outbreak. Reduction in canopy cover potentially reduces habitat for late-successional wildlife species, including marten, goshawk, and spotted owl.	1,734
Private Land Timber Harvest	A variety of possible timber harvest techniques/objectives, but typically more overstory removal than on TNF, reducing overstory canopy cover and increasing early seral habitat for species including deer and mountain quail. Reduction in canopy cover potentially reduces habitat for late-successional wildlife species, including marten, goshawk, and spotted owl.	983
Pre-Commercial Thinning	Removal of trees <6-10-inch dbh to create a more open understory tree layer. Causes localized impacts to prey species including some small mammals and songbirds by reducing or eliminating cover. Reduces competition among trees, increases vigor and resilience to wildfire and insect and disease outbreak.	5,616
Group Selection-removal of all trees <30"dbh on up to 1 acre	Increase in habitat for early seral species, increase in forest seral stage diversity across units, not likely to alter overall suitability of habitat for mature to late-seral forest species.	444
Tree Planting and Habitat Restoration	Reduction in the timeframe that shrub-dominated habitats will return to mid- and late-seral forests. Targeted prescriptions for habitat restoration.	4,400
Site Preparation for Planting	Clearing of shrub vegetation that would compete with tree seedlings. Some loss of understory/shrub habitat resulting in short-term reduction in foraging habitat quality for late-seral species such as goshawk, spotted owl, and marten.	3,173
Seed Tree Cut	Long-term removal/loss of late-successional habitat for marten, goshawk, spotted owl; increased early-seral habitat for deer and mountain quail.	148
Thinning for Hazardous Fuels Reduction and Disease Control	Short-term reduction in foraging habitat quality for late-seral species, such as goshawk, spotted owl, and marten. Long-term benefits from increased forest resistance to wildfire, insect and disease outbreaks.	1,325
Tree Release and Weed	More open understory potentially affecting short-term availability of cover and foraging habitat for small mammals and bird species. No effects on overstory canopy cover.	3,600

Table 4.4-9. General Terrestrial Cumulative Effects: Summarized Vegetation Management Effects of Past (1996-2018), Present, and Reasonably Foreseeable Future Actions (2019-2039).

Activity	Effects of Past, Present, and Reasonably Foreseeable Future Actions	Acres
Underburning	More open understory resulting in short-term changes in habitat quality and quantity for some small mammal and bird species. Some species will benefit, others will be negatively affected in the short and long term. No affects to overstory canopy cover.	1,195
Clearcut	Long-term removal/loss of late-successional habitat for marten, goshawk, spotted owl; increased early-seral habitat for deer and mountain quail.	1,081
Present and Reasonably Foreseeable Future Actions		
Roadside Hazard Tree Removal	Removal/loss of a minimal number of trees and snags. Should not affect canopy cover or change overall habitat structure. Removal of snags and dying trees reduces habitat quality and habitat components needed for denning, resting, and foraging for marten, goshawk, and spotted owl.	145
Commercial thinning	Reduction in canopy cover reduces habitat quality for late-successional wildlife species including marten, goshawk, and spotted owl.	133
Underburning	More open understory reduces habitat for the short-term for small mammal and bird species. No effects on overstory canopy cover.	133
OHV Reroutes	Minor loss of vegetation and habitat fragmentation from relocated routes; somewhat offset by closing and restoring existing routes. (Acres are attributed to recently completed 1.4 miles on Pagge Creek project and approx. 102 miles on proposed Big Sugar project).	37.5
Insect Treatment	Reduction in canopy cover can reduce habitat quality or quantity for late-successional wildlife species including marten, goshawk, and spotted owl. The reduction in canopy cover and basal area in these areas would nonetheless result in higher resilience to future outbreaks and wildfires and growth rates. Acres are attributed to recently completed Sunny South Project.	1,350
	Total Cumulatively Affected Acres	21,777

Past actions on private lands include private developments, timber harvest, wildfires, and fire salvage. Exact acreage affected is not available.

4.4.4.2 Recent Projects

Several projects were recently completed in the analysis area. The Sunny South Insect Treatment Project (Sunny South Project) addressed bug-kill through thinning, fuels reduction within the Volcano plantations, removal of infested patches of trees, and prescribed burning. Approximately 1,350 acres were treated resulting in a reduction in snags in areas and improved forest health including increased resilience to fire and drought.

An aquatic organism project on North Shirttail Creek replaced an undersized culvert to enhance connectivity and address sedimentation issues upstream of the reservoir. The Pagge Creek OHV project was recently completed and partially overlaps the Action Area. This project is a recent example of response to recreational use on the TNF and rerouted several miles of OHV trails where soil damage and erosion were prevalent. A larger project, known as Big Sugar, has not commenced and addresses the district motorized trail system as a whole and includes trails in the Sugar Pine Reservoir area. Several trails north of the reservoir would be closed or rerouted. These types of projects benefit wildlife by reducing sedimentation to surface waters and limiting unauthorized trails that create additional wildlife and vegetation disturbance.

Hazardous tree removal at the Sugar Pine Campground was implemented in 2017. This project resulted in a reduction of snags and dying trees and may reduce habitat quality and habitat components for denning, resting, and foraging by marten, goshawk, and spotted owl. All recent actions were implemented following systematic surveys for rare plant species and application of appropriate management requirements to limit potential effects to these plants.

4.4.4.3 Present and Future Actions

Present and future projects on the TNF strive to improve overall forest health and reduce fire risk in high use areas and to respond to demands by the recreating public. Projects that improve forest health and reduce fire risk use treatments including commercial and precommercial thinning, fuels reduction, fuel breaks, prescribed burning, and removal of bug-kill trees. Most of the recent vegetation management activities in natural stands on the TNF (such as the Sunny South Project) are focused on forest health and fuels reduction treatments that aim to protect and maintain large trees and retain canopy cover, snags, and downed logs for wildlife, while reducing the risk of stand-replacing wildfires. Activities in plantations tend to include more aggressive thinning to ensure the continued survival of planted trees. Together, these projects have resulted in various degrees of short-term habitat change at the patch-scale, but overall maintain suitable habitat at the stand or landscape scale for late-seral species such as the goshawk, marten, and spotted owl.

TNF is currently in the planning stages for the Big Sugar OHV project. This project will reduce impacts of stream crossings, realign or close problem trails, and remove trails in the Shirttail Creek spotted owl PAC. It is likely that other recreational management projects like the Pagge Creek and Big Sugar OHV projects will occur within the analysis area within the next 20 years. All present and future actions are implemented following systematic surveys for rare plant species and application of appropriate management requirements to limit potential effects to these plants.

Climate change and ongoing drought conditions contribute to increases in outbreaks of western pine beetle and other species that benefit from drought-stressed trees, including long-horn beetles (Cerambycids) and flat-headed borers (Buprestids). Insect outbreaks contribute to existing conditions including increased insect populations; reduced canopy cover; increased understory openings; increased snags; increased downed wood and coarse woody debris. Reduced canopy cover under dead and dying trees provides more light, water, and nutrients to other understory plants, including oaks, which do not appear to be dying in substantial numbers in the area. These plants also serve various insect specialists, particularly pollinators such as bees, beetles, and butterflies, which provide various ecosystem services and serve as prey for birds and other species. In general, the loss of canopy is expected to reduce habitat values for late-seral stage forest species, while benefitting early-seral species. The abundance of insects feed insectivorous insects and insectivorous birds and mammals, including woodpeckers and bats.

The increased recruitment of logs and large woody debris from dying trees can help reduce soil erosion and provide cover and movement corridors for small animals. Along with snags, downed wood provides nesting, roosting, and escape cover for cavity-associated birds and animals. The abundance of dead and dying trees also increases the susceptibility of stands to wildfire and reduces the abundance of large trees.

In addition to contributing to the conditions that favor bug-kill, the effects of climate change may be realized more gradually through effects on tree seedling survival, changes in plant species composition; and changes in microclimates. Climate modeling suggests reduced long-term conifer densities, which would reduce habitat values for mature conifer-dependent species such as spotted owl, northern goshawk, and marten (USFS 2016). Meadow, shrub, and oak woodland species may benefit from the anticipated changes in forest structure. Direct metabolic impacts of warming climate on wildlife, their prey, diseases, and vegetation may have profound effects on the analysis area and the species assemblage it supports. Because interactions between various factors that make up a species' niche are complicated and synergistic, it is not possible to make precise predictions of climate change impacts, nor is it possible to exhaustively list all the effects. These factors may result in large disruptive changes in the ecosystem, or slow changes over time.

4.4.4.4 Net Cumulative Effect

The proposed project/action would contribute a cumulative loss of habitat through inundation of 44 acres of Sierra mixed conifer forest, montane riparian habitat, and montane chaparral habitat, and 2,023 linear feet of stream channel. The proposed project/action would contribute a cumulative loss in habitat quality where recreational facilities are relocated and trees are removed (approximately 110 acres) and reduction in the in-stream habitat quality of Shirttail Creek below the reservoir which would be subject to seasonal water transfers. The proposed project/action would also contribute to the cumulative loss of rare plant occurrences and suitable habitat in the analysis area for Sierra blue grass, dubious pea, Van Zuuk's morning-glory, and Layne's butterweed. These species would benefit from ongoing OHV restoration projects in the analysis area which cumulatively protects habitats and limits off-route recreational damage.

The net cumulative effect on owls would be low because the proposed project/action would minimally contribute to the cumulative loss of marginally suitable spotted owl habitat, while compensatory mitigation would benefit spotted owl habitat by improving flight paths, improving the growth potential and health in high quality, occupied habitat, and reducing the risk of high severity wildfires that would result in long-term loss of suitable habitat.

Current and future timber management prescriptions in RCA habitat are limited to maintain stream shade and water temperatures. Therefore, reasonably foreseeable future actions are not expected to affect or are expected to result in low level temporary effects on foothill yellow-legged frog suitable habitat and California red-legged frog dispersal habitat.

The proposed action would contribute to the cumulative loss of foothill yellow-legged frog suitable habitat and California red-legged frog dispersal habitat from inundation of Forbes Creek and Upper Shirttail Creek. Approximately 5 percent and 11 percent of the available habitat in these systems, respectively, would be permanently lost. Bullfrog suppression in North Shirttail and Forbes Creeks would improve the suitability of remaining habitat for foothill yellow-legged frogs and California red-legged frogs.

Summer water transfers are expected to contribute to a reduction in habitat quality for foothill yellow-legged frogs and western pond turtle in Shirttail Creek below the dam attributed to unseasonal high flows.

For the reasons presented above, with implementation of identified Mitigation Measures, Compensatory Mitigation and Management Requirements specific to biological resources identified in this section, the contribution of the proposed project/action and Alternatives 1 and 2 to impacts on biological resources from similar past, ongoing and foreseeable future projects is ***not cumulatively considerable***.

4.4.5 Residual Unavoidable Effects

The preceding evaluation of potential impact of the proposed project/action on biological resources identified no potential project impacts that would be considered significant and unavoidable under CEQA and, therefore findings of significant and unavoidable impact under Section 15091 of the State CEQA Guidelines would not be required for biological resources for the proposed project/action or alternatives.

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4.5 Cultural Resources

This section describes potential impacts to cultural resources resulting from construction and operation of the proposed Dam Radial Gate Installation and Water Right Extension project along with operation and maintenance activities under the special use permit. Section 4.5.2 provides a description of the existing environmental setting/affected environment for Cultural resources in the project area. Applicable regulation, plans, and standards are listed in Section 4.6.2. The following information has been summarized from the *Cultural Resources Inventory and Evaluation, Sugar Pine Project Water Right Permit 15375 Extension and Radial Gate Installation*, Tahoe National Forest, Placer County, California (ECORP 2017). Due to the sensitive and confidential nature of information discussed, the report is not included as an appendix to this document.

4.5.1 Environmental Setting

4.5.1.1 Pre-Contact

4.5.1.2 Regional

It is generally believed that human occupation of California began at least 10,000 years before present (BP). The archaeological record indicates that between approximately 10,000 and 8,000 BP, a predominantly hunting economy existed, characterized by archaeological sites containing numerous projectile points and butchered large animal bones. Animals that were hunted probably consisted mostly of large species still alive today. Bones of extinct species have been found but cannot definitely be associated with human artifacts. Although small animal bones and plant grinding tools are rarely found within archaeological sites of this period, small game and floral foods were probably exploited on a limited basis. A lack of deep cultural deposits from this period suggests that groups included only small numbers of individuals who did not often stay in one place for extended periods (Wallace 1978).

Around 8,000 BP, there was a shift in focus from hunting towards a greater reliance on plant resources. Archaeological evidence of this trend consists of a much greater number of milling tools (e.g., metates and manos) for processing seeds and other vegetable matter. This period, which extended until around 5,000 years BP, is sometimes referred to as the Millingstone Horizon (Wallace 1978). Projectile points are found in archaeological sites from this period, but they are far fewer in number than from sites dating to before 8,000 BP. An increase in the size of groups and the stability of settlements is indicated by deep, extensive middens at some sites from this period (Wallace 1978).

In sites dating to after about 5,000 BP, archaeological evidence indicates that reliance on both plant gathering and hunting continued as in the previous period, with more specialized adaptation to particular environments. Mortars and pestles were added to metates and manos for grinding seeds and other vegetable material. Flaked-stone tools became more refined and specialized, and bone tools were more common. During this period, new peoples from the Great Basin began entering southern California. These immigrants, who spoke a language of the Uto-Aztecan linguistic stock, seem to have displaced or absorbed the earlier population of Hokan-speaking peoples. During this period, known as the Late

Horizon, population densities were higher than before and settlement became concentrated in villages and communities along the coast and interior valleys (Erlandson 1994; McCawley 1996). Regional subcultures also started to develop, each with its own geographical territory and language or dialect (Kroeber 1925; McCawley 1996; Moratto 1984). These were most likely the basis for the groups encountered by the first Europeans during the eighteenth century (Wallace 1978). Despite the regional differences, many material culture traits were shared among groups, indicating a great deal of interaction (Erlandson 1994). The introduction of the bow and arrow into the region sometime around 2,000 BP is indicated by the presence of small projectile points (Wallace 1978; Moratto 1984).

4.5.1.3 Local

Central Sierras

The Tahoe Reach Complex is the earliest component on the eastern side of the Sierras. It is characterized by Parman points and dates to 8,000 to 6,000 B.C. (Elston et al. 1977; Hull 2007:Figure 12.4).

The Spooner Complex represents the initial colonization of the higher elevations of the Sierra Nevada by hunters using Humboldt Concave-based and Pinto projectile points (Elston 1971). They may have come from the western Great Basin during the hot and dry conditions induced by the Altithermal. The Spooner Complex is dated between 6,000 - 3,000 B.C. (Baker 2000; Hull 2007:Figure 12.4).

The Martis Complex was originally defined by Heizer and Elsasser (1953) based on survey work they conducted east of the crest of the Sierra Nevada around Lake Tahoe and along the drainages of the Truckee and Carson Rivers. The Martis complex was characterized by large heavy roughly flaked projectile points made of basalt and it was thought that hunting using a spear-thrower was the most important economic activity. Martis sites also have atlatl weights, bowl mortars, manos and metates, perforators, basalt flake scrapers, and core tools (Baker 2000). Subsequent investigations expanded the geographic area where Martis sites were found to mid-elevation areas on both sides of the central Sierras (Elsasser 1960).

The Martis Complex has been divided into two phases, Early and Late Martis. The Early Martis phase (3,000 - 1,000 B.C.) has Martis Contracting Stem, Martis Split Stem, and Steamboat (leaf-shaped) projectile points. Martis Corner Notched, Elko Corner Notched, and Elko Eared points are found in Late Martis (1,000 B.C. - A.D. 700) sites (Elston et al. 1994).

The Martis Complex may represent exploitation of the Sierra Nevada by both California and Great Basin groups using similar tool kits to exploit similar environments (Elston et al. 1977). The Martis Complex and similar complexes, such as the Crane Flat Complex in the Yosemite area, appear to be spread along the western midslopes of the length of the Sierra Nevada (Zeier and Elston 1986).

The Kings Beach Complex is the late Prehistoric cultural complex in the central Sierras and may represent the initial phase of the Washoe ethnographic pattern (Zeier and Elston 1986). It was originally defined by Heizer and Elsasser (1953:20). The King Beach Complex has large numbers of smaller arrow projectile points made from obsidian flake blanks rather than the larger basalt projectile points found in the Martis Complex. There are numerous bedrock mortars and manos and metates. Fishing was also important. Data from Kings Beach Complex sites indicate an intensification of plant food (acorns and seeds) use and other lower ranked resources. A reduction in the size of regularly used territory was accompanied by an increase in regional population size (Zeier and Elston 1986; Elston et al. 1994).

The Kings Beach Complex is commonly divided into two periods: Early Kings Beach (A.D. 700 – 1250), characterized by Rosegate Series projectile points; and Late Kings Beach (A.D 1250 – 1800), characterized by Desert Series Points (Elston 1971; Zeier and Elston 1986).

Bedrock mortars were introduced after cal A.D. 500 in the southern Sierras based on temperature-corrected obsidian hydration dates. In higher elevations, mortars were used after cal A.D. 1,000 and were especially prevalent after cal A.D. 1,500 (Hull 2007:187).

Central Valley

The cultural chronology of the Sacramento Delta area can be divided into several periods: Lower Archaic or Milling stone, Windmiller, Cosumnes, and Hotchkiss. Time periods for these periods are provided in the *Table 4.5-1* and the chronology for the Sierras is also provided for comparison.

Table 4.5-1. Chronological Sequences for the Central Sierras and the Central Valley

Sierras	Age	Delta and Central Valley	Age
Tahoe Reach	8,000-6,000 BC		
Spooner	6,000-3,000 BC	Lower Archaic Milling Stone	6,000-3,000 BC
Early Martis	3,000-1,000 BC	Late Archaic Windmiller	3,000-1,000 BC
Late Martis	1,000 BC-AD 700	Cosumnes	1,000 BC-AD 1,000
Early Kings Beach	AD 700-1,250	Hotchkiss	AD 1,000-1,800
Late Kings Beach	AD 1,250-1,800		

The earliest evidence of the prehistoric inhabitants of the Sacramento Valley region comes from the Arcade Creek site where grinding tools and large stemmed projectile points were found (Wallace 1978). This site dates to the Lower Archaic period. The points and grinding implements suggest an occupation date of sometime between 6,000-3,000 B.C. (Wallace 1978). This period is also known as the Milling Stone Horizon. Large projectile points and milling stones have been found in sites on the margins of the Sacramento Valley and may indicate hunting of Roosevelt elk using spear-throwers and gathering hard seeds (Kowta 1988; Baker 2000).

In the Late Archaic Period people began to move into the San Joaquin and Sacramento Valleys in significant numbers. This earliest permanent settlement of the Delta region of the Sacramento River is called the Windmiller Tradition and is known primarily from burial sites containing relatively elaborate grave goods (Ragir 1972; Wallace 1978). Artifacts characteristic of the Windmiller Tradition include projectile points, shell beads and pendants, and highly polished charmstones. Stone mortars and pestles, milling stones, bone tools such as fishhooks, awls, and pins, are also present. It is probable that people during this time subsisted on deer and other game, salmon, and hard seeds. They also were apparently the first Californians to discover the process for leaching the tannins out of acorns, thus making them edible by humans. Based on linguistic evidence, it has been suggested that the Windmiller culture was ancestral to several historic tribes in the Central Valley, including the Penutian-speaking Nisenan (Elsasser 1978). The Windmiller Tradition lasted until about 1,000 B.C.

Around 1,000 B.C., subsistence strategies in the Delta region became noticeably more "focal," with a clear increase in the reliance on acorns and salmon (Elsasser 1978). Culturally, this has been dubbed the Cosumnes Tradition (1,000 B.C.-A.D. 1,000), and appears to be an outgrowth of the Windmiller Tradition (Ragir 1972). People in this time continued to occupy knolls or similar high spots above the floodplain of the Sacramento River and the terraces of tributaries such as the Cosumnes and American rivers, flowing out of the foothills of the Sierra Nevada located to the east. Populations increased and villages became more numerous than before, with more milling tools and specialized equipment for hunting and fishing. Trade appears to have increased, with burials containing larger amounts of marine shell beads and obsidian. Burial styles, too, became more varied, with the addition of flexed interments along with the extended burials characteristic of the Windmiller period. Projectile points found embedded in the bones of excavated skeletons suggest that warfare was on the rise, possibly as a result of increased competition over available resources and trade (Beardsley 1954; Lillard et al. 1939; Ragir 1972).

The next, and final, discrete prehistoric culture is the Hotchkiss Tradition (A.D. 1,000-1769) that persisted until the arrival of European settlers in central California (Beardsley 1954; Ragir 1972). During this period, use of acorns and salmon reached its peak, along with hunting of deer. Diet was supplemented with the addition of waterfowl, hard seeds, and other resources. Large sedentary villages along the lower Sacramento and San Joaquin rivers and their tributaries and delta were common. The size and density of these settlements suggest a further increase in population from Cosumnes times. Trade goods were plentiful and burials exhibit a marked stratification of society with wide differences in the amount and variety of funerary objects. Cremation of the dead appears, along with the flexed inhumations of the previous period (Ragir 1972). While ornamental or ritual artifacts, such as large, fragile projectile points and trimmed bird bone increased during this period, milling tools are rare or absent. Shell beads are found in large numbers, and there are numerous utilitarian artifacts made of bone, such as awls, needles, and barbed harpoon points. Polished charmstones are rare during this time, but ground stone pipes become more abundant. In addition, fired and unfired clay objects begin to appear.

4.5.1.4 Ethnographic

Ethnographically, the project area is in the central portion of the territory occupied by the Penutian-speaking Nisenan. The territory extended from the area surrounding the current City of Oroville on the north to a few miles south of the American River in the south. The Sacramento River generally bounded the territory on the west, and in the east, it extended to a general area located within a few miles of Lake Tahoe. In all, it has been said that the Nisenan territory was contained within 5,340 square miles (Beals and Hester 1974). In 1928, Henry Thompson explained that village's territories were marked by piles of stones; however, most of these boundary markers were removed or destroyed by Euroamerican farmers and miners who changed the landscape (Littlejohn n.d.).

As a language, Nisenan (meaning "from among us" or "of our side") is a combined term for all of the dialects and sub-dialects of the Nisenan language and reflects a common perception, worldview, and culture. There are three main dialects, differentiated by region—Northern Hill, Southern Hill, and Valley Nisenan, with three or four subdialects (Kroeber 1925; Placer County 1992; Shipley 1978; Wilson and Towne 1978). According to Tatsch (2006), within each dialect region, there were several different communities. Exact territories of the Nisenan remain vague due to the loss of the majority of people near the time of settler contact.

The Valley Nisenan lived along the Sacramento River, primarily in large villages with populations of several hundred each. Between there and the foothills, the grassy plains were largely unsettled, used mainly as a foraging ground by both valley and hill groups (Placer County 1992). Individual and extended families "owned" hunting and gathering grounds, and trespassing was discouraged (Kroeber 1925; Wilson and Towne 1978). Residence was generally patrilocal, but couples actually had a choice in the matter (Wilson and Towne 1978). The land within the project may have been inhabited by the Hill Nisenan. The Hill Nisenan lived in villages much smaller than the Valley Nisenan and were located along the flats and ridges near major streams. Family groups often lived outside of the main villages in conical-shaped structures that were covered in local material of bark and branches and sometimes animal skins. Also common throughout the villages were bedrock mortars used for grinding plant and animal material (Wilson Towne 1978).

Politically, the Nisenan were divided into "tribelets," made up of a primary village and a series of outlying hamlets, presided over by a more-or-less hereditary chief (Kroeber 1925; Wilson and Towne 1978). Beals referred to these tribelets as "communities," and identified them as part of a larger group generally separated by the type of landscape and topography which also represented variations in dialect among the Nisenan (Beals 1933).

Villages typically included family dwellings, acorn granaries, a sweathouse, and a dance house, owned by the chief. The chief had little authority to act on his or her own, but with the support of the shaman and the elders, the word of the chief became virtually the law (Wilson and Towne 1978). Most of the major villages were located along large bodies of water such as the American, Feather, and Sacramento rivers. According to Wilson and Towne (1978), there were three major centers for the Nisenan near the village of *Pusune* just north of the confluence of the Sacramento and American rivers, an area along Feather River near the mouth of the Bear River, and an area near the Yuba River near the current city of Marysville. Journals from nonnative travelers and fur trappers in the early 1800s documented upwards of 1,000 to 1,200 Nisenan living in the villages in the valley; however, due to sickness brought about by malaria, these villages had decreased to 200 to 300 (Littlejohn n.d.).

Two common types of shamans or doctors were used by the Nisenan. The shamans were used for either curing patients or religious ceremonies. Both types of shamans used dance houses in their performances and the shaman would perform their dances in the spring. Before a shaman could cure a patient, they would dance around an outside fire to decide who the strongest shaman was or who had loudest voice

(Wilson and Towne 1978). The shamans that cured patients had limited contact with the spirits and could be either male or female.

Shamans had special charms and medicines in their possession for curing patients. Shamans were also known as the sucking doctors. In order for a shaman to cure a patient, they would suck the infected area or area of pain to remove any offending objects. The offending object, which could be a dead fly, a clot of blood, or a stone, would be taken from the mouth, displayed quickly then buried immediately (Wilson and Towne 1978). Religious shamans or *oshpe* had a deep connection with the spirits and gained control over them through dreams and esoteric experiences. Shamans helped represent the supernatural and could conjure up spirits of the deceased (Wilson and Towne 1978).

The dead and their possessions (especially beads) were cremated in a community burning ground and then buried in a village cemetery. Some Nisenan groups practiced burial without cremation. A mourning ceremony was held several weeks or months after a death (Baker 2000:26).

Subsistence activities centered on the gathering of acorns (tan bark oak and black oak were preferred), seeds, and other plant resources. The hunting of animals such as deer and rabbits, and fishing were also important parts of normal subsistence activities. Large predators such as mountain lions, were hunted for their meat and skins, and bears were hunted ceremonially. Although acorns were the staple of the Nisenan diet, they also harvested roots like wild onion and "Indian potato" that were eaten raw, steamed, baked, or dried and processed into flour cakes to be stored for winter use (Wilson and Towne 1978). Wild garlic was used as soap/shampoo, and wild carrots were used medicinally (Littlejohn 1928). Seeds from grasses were parched, steam dried, or ground and made into a mush. Berries were collected, as were other native fruits and nuts. Game was prepared by roasting, baking, or drying. In addition, salt was obtained from a spring near modern-day Rocklin (Wilson and Towne 1978).

Hunting of deer often took the form of communal drives, involving several villages, with killing done by the best marksmen from each village. Snares, deadfalls, and decoys were used as well. Fish were caught by a variety of methods including use of hooks, harpoons, nets, weirs, traps, poisoning, and by hand (Wilson and Towne 1978).

Trade was important with goods traveling from the coast and valleys up into the Sierra Nevada and beyond to the east, and vice versa. Coastal items like shell beads, salmon, salt, and Foothill pine nuts were traded for resources from the mountains and farther inland, such as bows and arrows, deer skins, and sugar pine nuts. In addition, obsidian was imported from the north. It was also common for the Hill Nisenan to travel down to the valley to trade with the Valley Nisenan. The Hill Nisenan would trade pine nuts, skins, Black oak acorns, and Manzanita berries for goods found near the valley such as roots, shells, salt, beads, feathers, and fish. The Hill Nisenan would also trade goods with the Washo to the east near Pyramid Lake (Wilson and Towne 1978).

The Spanish arrived on the central California coast in 1769 and by 1776 the Miwok territory bordering the Nisenan on the south had been explored by José Canizares. Gabriel Moraga crossed Nisenan territory in 1808 and a major battle was fought between the Miwok and the Spaniards in 1813 near the mouth of the Cosumnes River. Though the Nisenan appear to have escaped being removed to missions by the Spanish, they were not spared the ravages of European diseases. In 1833, an epidemic—probably malaria—raged through the Sacramento Valley, killing an estimated 75 percent of the native population. When John Sutter erected his fort at the future site of Sacramento in 1839, he had no problem getting the few Nisenan survivors to settle nearby. The discovery of gold in 1848 at Sutter's Mill, near the Nisenan village of *Colluma* (now Coloma) on the South Fork of the American River, drew thousands of miners into the area, and led to widespread killing and the virtual destruction of traditional Nisenan culture. By the Great Depression, no Nisenan remained who could remember the days before the arrival of the Euro-Americans (Wilson and Towne 1978).

In addition to Sutter's arrival and permanent residence into Nisenan territory, several other early explorers documented the locations of Nisenan communities or tribelets such as Gabriel Moraga, Jedediah Smith, John Werks, and Dana, who worked with John Sutter. Several of the exact locations of villages along the American, Yuba and Feather rivers were of the first documented by Dana in the late 1830s (Hale 1846). Some 30 years later in the 1870s, Stephen Powers produced several ethnographic texts of the Nisenan, studying the language differences between the individual groups and referencing the landscape regions of the Nisenan such as the foothills, timberland, western hills, and the plains (Powers 1877).

Although Powers studied the Nisenan throughout the region in places such as Coloma, Placerville, Latrobe and along the Cosumnes River, his focus was of the several residential communities along the Bear River. Powers identified 17 communities along the Bear River stretching from its mouth at the Sacramento River to the Sierra Nevada foothills, and noted this accounted for approximately 1/3 of the communities prior to Euro-American contact (Powers 1877).

Preceding Powers' work, Roland Dixon studied the Nisenan between 1899 and 1903 as part of the Huntington Expedition. Dixon's study encompassed a larger area including the Mechoopda, Konkow, and Maidu, but identified the Nisenan as the "southern division" of the Maidu (Dixon 1905). Dixon had mentioned that the communities within the Nisenan used distinct boundary markers such as scratching or pecking designs into large outcrops or boulders. According to Dixon, the lines between the boulder markers, establishing the community boundaries, were patrolled by members of the tribe to assure that poaching did not occur on the tribal lands (Dixon 1905).

In 1928, C. Hart Merriam worked closely with Mrs. Barron of French Corral, located 23 miles northwest of the project. Mrs. Barron noted that her language, known as *Ne-sem Kow'-wahk*, *To-sow'-wan-no*, and *Ton-kah*, was used throughout the areas including Nevada City, North Bloomfield, and Grass Valley. Mrs. Baron described a definite change in language and culture between the tribes in the Nevada City area and those near the Gold Run and Colfax region (Merriam n.d.). An extensive compilation of the Nisenan language has been documented in Sheri Jean Tatsch's 2006 doctoral dissertation titled *The Nisenan: Dialects & Districts of a Speech Community* (Tatsch 2006).

4.5.1.5 Historic

Regional

The first European to visit California was Spanish maritime explorer Juan Rodriguez Cabrillo in 1542. Cabrillo was sent north by the Viceroy of New Spain (Mexico) to look for the Northwest Passage. Cabrillo visited San Diego Bay, Catalina Island, San Pedro Bay, and the northern Channel Islands. The English adventurer Francis Drake visited the Miwok Native American group at Drake's Bay or Bodega Bay in 1579. Sebastian Vizcaíno explored the coast as far north as Monterey in 1602. He reported that Monterey was an excellent location for a port (Castillo 1978).

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. The nearest missions were in the vicinity of San Francisco Bay and included Mission San Francisco de Asis (Dolores) established in 1776 on the San Francisco peninsula, Mission Santa Clara de Asis at the south end of San Francisco Bay in 1777, Mission San Jose in 1797, Mission San Rafael, established as an *asistencia* in 1817 and a full mission in 1823, and Mission San Francisco Solano in Sonoma in 1823 (Castillo 1978). Presidios were established at San Francisco and Monterey. The Spanish took little interest in the area and did not establish any missions or settlements in the Central Valley.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers (Thompson and West 1880).

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos" (Robinson 1948). During the Mexican period there were small towns at San Francisco (then known as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort (Bidwell 1971). Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in January 1848 (Marshall 1971).

The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra Nevada foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office. Land outside the land grants became federal public land which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862) (Robinson 1948).

Local

The nearest town to the project is Foresthill, which is listed as a California State Landmark (Landmark No. 399). Foresthill was given its name because of its dense pine forest (Gudde 1969). Foresthill is located on the summit of the Forest Hill Divide between the Middle Fork of the American River and Shirttail Canyon and is about eight miles south of the project area. Gold was first discovered in Foresthill in 1850 and many miners came to the Forest Hill Divide in hope of becoming rich. The new discovery of gold at the Forest Hill Diggings encouraged people from the town of Auburn and others from the town of Coloma to come to Foresthill. These two groups met about three miles northeast of Todd's Store, which would become the town of Foresthill. This trading post would be replaced by a substantial house and hotel in 1858, known as the Forest House. The Forest House became the center of trade and travel for mining camps nearby. This original Forest House was destroyed by fire in December 1918 and was later replaced (Kyle 2002).

After the heavy winter storms of 1853, chunks of gold were exposed in Jenny Lind Canyon. As a result, the Jenny Lind Mine was established in 1853 and yielded over $1 million in gold by 1880. This impressive discovery of gold led, in the 1850s, to the development of Foresthill as a prosperous mining town with a newspaper, hotels and stores, a bank, saloons, and residences with gardens and orchards. According to the census of 1880, Foresthill was one of the largest towns in Placer County, with a population of 688 (Kyle 2002; Thompson and West 1882).

In addition to Foresthill, several other communities near the project area, such as Iowa Hill, Hughes Mill, Damascus, Sugar Pine Hill, and Monona Flats, were established as a result of placer mining along tributaries of the American River.

The Sugar Pine Reservoir has inundated Shirttail Canyon, originally named in 1849. The name, Shirttail Canyon, may derive from a prospector who was found working wearing only a shirt (Gudde 1969). Another mining town in close proximity to the project area was Iowa Hill (SRL 401). Iowa Hill is located approximately four miles southwest of the reservoir. Gold was first discovered at Iowa Hill in 1853 (Gudde 1969) and mines in the area eventually yielded $20 million in gold (Kyle 2002). According to the census of 1880, Iowa Hill had a population of 450 (Thompson and West 1882).

The Sugar Pine Reservoir Dam and Conveyance System was completed in 1982 by the United States Bureau of Reclamation (Reclamation). The conveyance system consists of an eight-mile pipeline that carries water from the Sugar Pine Reservoir to Foresthill. The Sugar Pine Reservoir Dam flooded Shirttail Creek in North Shirttail Canyon and Forbes Creek.

4.5.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

4.5.2.1 Federal

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to take into account the effects of their undertakings on historic properties and affords the Advisory Council on Historic Preservation a reasonable opportunity to comment on such undertakings. The Council's implementation regulations, "Protection of Historic Properties," are found in 36 Code of Federal Regulations (CFR) Part 800. The goal of the Section 106 review process is to offer a measure of protection to sites that are determined eligible for listing on the National Register of Historic Places. The criteria for determining National Register eligibility are found in 36 CFR Part 60. Amendments to the Act (1986 and 1992) and subsequent revisions to the implementing regulations have, among other things, strengthened the provision for Native American consultation and participation in the Section 106 review process. Federal regulations apply in the private and local agency sectors if a project requires a federal permit or if it uses federal funding. Under NHPA, the quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of State and local importance that possess integrity of location, design, setting, material, handiwork, feeling, and association.

For this project, the Foresthill PUD serves as the lead agency under CEQA. In addition, because the project would require a modification of the existing Special Use Permit, the USFS (TNF) serves as the federal lead agency under NEPA. By extension, because this project qualifies as a federal undertaking, regulations (36 CFR Part 800) implementing Section 106 of the NHPA require that cultural resources be identified and then evaluated using NRHP eligibility criteria. Mitigation units planned for areas outside of the area covered by the ECORPS cultural resource inventory were surveyed in October 2019 by Tahoe National Forest archeologists. This additional cultural resource inventory (R2019051700026 Sugar Pine Radial Gates Mitigations, Brokenshire 2020) was conducted in accordance with Stipulation 7.8 of Amendment 1 of the Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), California, State Historic Preservation Officer, Nevada State Historic Preservation Officer, and the Advisory Council on Historic Preservation regarding the Process for Compliance With Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region (Regional PA 2018).

4.5.2.2 State

CEQA (14 CCR 15064.5) applies to cultural resources of the historic and prehistoric (pre-contact) periods. Pursuant to CEQA, any project with an effect that may cause a substantial adverse change in the significance of a cultural resource, either directly or indirectly, is a project that may have a significant effect on the environment. As a result, such a project would require avoidance or mitigation of impacts to those affected resources. Significant cultural resources must meet at least one of four criteria that define eligibility for listing on the CRHR (PRC 5024.1; 14 CCR 4852). Resources listed on or eligible for inclusion in the CRHR are considered Historical Resources under CEQA.

Section 15064.5(a) of the CEQA Guidelines states that for purposes of this section, the term "historical resources" shall include the following:

(1) A resource listed in or determined to be eligible for listing in, the California Register of Historical Resources (PRC SS5024.1, Title 14 CCR, Section 4850 et seq.)

(2) A resource included in a local register of historical resources, as defined in section 5020.1(k) of the PRC, or identified as significant in an historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, shall be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of the evidence demonstrates that it is not historically or culturally significant.

(3) Any object, building, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be an historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource shall be considered by the lead agency to be "historically significant" if the resource meets the criteria for listing on the California Register of Historical Resources (PRC SS5024.1, Title 14 CCR, Section 4852) including the following:

    (A) Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    (B) Is associated with the lives of persons important in our past;
    (C) Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
    (D) Has yielded, or may be likely to yield, information important in prehistory or history.

(4) The fact that a resource is not listed in, or determined to be eligible for listing in, the California Register of Historical Resources, not included in a local Register of Historical Resources (pursuant to Section 5021.1(k) of the PRC), or identified in an historical resources survey (meeting the criteria in section 5024.1(g) of the PRC does not preclude a lead agency from determining that the resource may be an historical resource as defined in Public Resources Code sections 5020.1(j) or 5024.1."

Section 15064.5(c) applies to effects on archaeological sites as follows:

(1) When a project will impact an archaeological site, a lead agency shall first determine whether the site is an historical resource, as defined in subsection (a).

(2) If a lead agency determines that the archaeological site is an historical resource, it shall refer to the provisions of this section and Section 15126.4 of the Guidelines.

In addition, the CEQA Guidelines (Section 15064.5(c) (3), and (4)) provide tests for significance for archaeological resources, as summarized below:

(1) If the site does not meet the criteria [for a historical resource] (a), but does meet the definition of a unique archaeological resource in Section 21083.2 of the PRC, the site shall be treated in accordance with the provisions of section 21083.2.

(2) If an archaeological resource is neither a unique archaeological nor an historical resource, the effects of the project on those resources shall not be considered a significant effect on the environment.

However, in practice, archaeological resources that are unique are also eligible for the CRHR, and are, thus, historical resources.

Section 5097.5 (a & b) of the California Public Resources Code

"No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological, or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor. As used in this section, "public lands" means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof." Subsequent subsections establish the penalties for violation of this section.

Public Resources Code 5097.9

Except where permitted through CEQA, this establishes that no public agency or private party using or occupying public property or operating on public property, under a public license, permit, grant, lease, or contract made on or after July 1, 1977 shall interfere with the free expression or exercise of Native American religion. This code also prohibits damage to a Native American sanctified cemetery, place of worship, religious or ceremonial site, or sacred shrine located on public property, except on a clear and convincing showing that the public interest and necessity so require.

Public Resources Code 5097.98

This specifies procedures to be followed in the event of the discovery of Native American human remains. This code specifies that the county coroner shall immediately notify the persons believed to be most likely descended from the deceased Native American. It provides that the most likely descendant has the right to inspect the site, with permission of the land owner, and provide recommendations for treatment of the remains and grave goods within 48 hours of being granted access to the site. The code also provides procedures in the event that the most likely descendant is unable to be identified or the identified descendants fail to make a recommendation.

Public Resources Code 5097.99

This states that no person shall obtain or possess any Native American artifacts or human remains except as otherwise provided by law. The code further states that unlawful possession of these items is a felony, punishable by imprisonment.

California Health and Safety Code Section 7050.5, 7051, and 7054

These sections of the California Health and Safety Code collectively address the illegality of interference with human burial remains, as well as the disposition of Native American burials found in archaeological sites. They protect said remains from vandalism, disturbance, or inadvertent destruction, and establish procedures to be implemented if Native American skeletal remains are discovered during construction of a project, including the treatment of remains prior to, during, and after evaluation, as well as reburial procedures.

California Environmental Quality Act Guidelines 14 CCR Section 15064.5(e)

The CEQA guidelines address "the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery" (14 CCR 15064.5(e)). This section specifically addresses the disposition of Native American burials in archaeological sites and protects such remains from disturbance, vandalism, and inadvertent destruction. Further, it establishes procedures to be implemented if Native American skeletal remains are discovered during construction of a project and establishes the NAHC as the entity for resolving disputes over such remains.

4.5.2.3 Local

The proposed project site is located within the boundaries of Placer County planning documents. As such, development and operation of the proposed project is subject to applicable goals and policies contained therein.

4.5.3 Environmental Impacts and Mitigation Measures

4.5.3.1 Methodology and Assumptions

The ECORP site survey was carried out under the terms and conditions of an approved research design and Permit for Archaeological Investigations from U.S. Forest Service (USFS) under the Archaeological Resources Protection Act, issued on October 21, 2015. As mentioned above, the Forest Service cultural resource inventory of the mitigation units was conducted separately, under the provisions of the Regional PA 2018.

Records Search

Records searches were completed at the North Central Information Center (NCIC) of the California Historical Resources Information System (CHRIS) at California State University-Sacramento on August 21, 2015 (NCIC search #PLA-15-85) and May 13, 2016 (NCIC search #PLA-15-85b). The purpose of the records searches was to determine the extent of previous surveys within a 0.5-mile (800-meter) radius of the project APE, and whether previously documented prehistoric or historic archaeological sites, architectural resources, or traditional cultural properties exist within this area.

Records searches were also carried out by ECORP and the TNF District Archaeologist at the TNF’s Foresthill Ranger District station on August 20, 2015 and March 16, 2016, respectively. The records searches consisted of obtaining all site records and cultural resources technical reports within 0.5 mile of the APE that are on file with TNF, but are not available through the NCIC. For each records search, ECORP was assisted by the TNF District Archaeologist Nolan Smith.

In addition to the official records and maps for archaeological sites and surveys in Placer County, the historic references were also reviewed. The nearest local historical register is the Sacramento Register of Historical Resources, which is limited to the City of Sacramento and does not include any properties located near the APE.

ECORP contacted the California Native American Heritage Commission (NAHC) on September 30, 2015 to request a search of the Sacred Lands File for the project area.

Additionally, a letter was also sent to the Placer County Historical Society on September 30, 2015 in order to solicit comments or obtain historical information that the repository might have regarding events, people, or resources of historical significance in the area.

Archival Research Methods

In addition to the official records and maps for archaeological sites and surveys reviewed during the records search at the NCIC, ECORP conducted focused property- and site-specific archival research. Archival research was conducted at the Placer County Archives and Research Center (PCARC) located in the Dewitt Center in Auburn. At the PCARC, ECORP reviewed all available historical property records, which included historical county and Assessor’s maps, assessment tax records, and information pertaining to mining activities in the area. Research was also conducted online, where primary sources such as historical newspaper articles, maps, and County Recorder’s records were reviewed. These records were found at online repositories that include websites such as archive.org; the California Digital Newspaper Collection; the BLM GLO survey plats at glorecords.blm.gov; and historical topographic maps at geonames.usgs.gov. The focused archival research was used to provide an historical context for the evaluations of the resources within the APE.

Field Methods

On October 27, 28, and 29 and November 5, 2015, the entire project APE (excepting the mitigation units) was subjected to an intensive pedestrian survey under the guidance of the *Secretary of the Interior's Standards for the Identification of Historic Properties* (NPS 1983) using 15-meter transects. When the APE was expanded, additional survey was conducted on July 25, 26, 27, 29 and August 1 and 2, 2016. Areas shown as not surveyed had steep slopes or were covered by dense vegetation. The mitigation units were surveyed by Tahoe National Forest archeologists in October of 2019.

4.5.3.2 Results

As a result of the records searches and field investigations, the following cultural resources were identified within the APE:

- FS#05-17-54-25 (CA-PLA-132/P-31-258), prehistoric bedrock milling station
- FS#05-17-54-114 (CA-PLA-1566/P-31-2110), prehistoric lithic artifacts
- FS#05-17-54-141 (CA-PLA-1560/P-31-2101), historic refuse dump area
- FS#05-17-54-157 (also identified as CA-PLA-1558/P-31-2091 and CA-PLA-1563H/P-31-2106), historic rock cairn, possible cabin debris, and possible historic grave
- FS#05-17-54-164 (also identified as CA-PLA-129/P-31-2045 and CA-PLA-1880/P-31-2676), prehistoric bedrock milling station
- FS#05-17-54-165 (CA-PLA-130/P-31-256), prehistoric lithic artifacts
- FS#05-17-54-172 (P-31-2107), possible historic prospect pit
- FS#05-15-17-54-374 (CA-PLA-1554/P-34-2087), prehistoric lithic artifacts
- FS#05-17-54-143 (P-31-2102) lumber scatter
- FS#05-17-54-144 (P-31-2103), lumber scatter
- FS#05-17-54-168, prehistoric bedrock mortar
- FS#05-17-54-378 (CA-PLA-1545/P-31-2087), Iowa Hill Chrome Mine
- FS#05-17-54-397, FS#05-17-54-154 (P-31-2119), McGeachin Ditch
- FS#05-17-54-532, historic road grade,
- FS#05-17-54-533, Elliott Ranch Road
- SP-003-I, isolated artifact - basalt biface
- FS#05-17-54-534, prehistoric bedrock mortars
- FS#05-17-54-535, pit and pipe

As a result of the evaluations of resources, all but one of the resources in the project APE are not individually eligible for the NRHP and CRHR and do not contribute to any known or potential historic district. FS Site 05-17-54-194, the Iowa Hill Canal was identified during the mitigation unit survey. This site has not been evaluated and should be protected during project implementation.

4.5.3.3 Section 106 Tribal Consultation Summary

Tribal Consultation under Section 106 of the NHPA for this project was initiated by the USDA Forest Service, Tahoe National Forest (TNF) in July 2015. TNF's cultural resources consultant ECORP Consulting, Inc. (ECORP) provided technical support to the agencies in their consultation efforts but was not delegated legal authority to consult directly with any Native American tribe.

In July 2015, USDA Forest Service TNF notified several Native American Tribes of their proposal for the current project. The tribes included the United Auburn Indian Community (UAIC), Nevada City Rancheria, Washoe Tribe of Nevada and California, and the Colfax-Todds Valley Consolidated Tribe. This letter initiated Tribal consultation concerning the project. Colfax-Todds Valley Consolidated Tribe and UAIC expressed concerns and TNF conducted consultation with these two tribes inviting meetings and site visits to address these concerns.

A subsequent tribal consultation meeting was held in August 2015 between Foresthill PUD, USFS, Colfax-Todds Valley Consolidated Tribe, and the UAIC at ECORP's Rocklin Office to discuss the project. At this meeting there was a request for paid tribal surveyors and mention of gathering sites within the project area. The USDA Forest Service could not direct an agency to pay tribal surveyors as there is no federal requirements for doing so, and no further information was provided the TNF regarding specific gathering areas or potential project impacts to gathering areas. In January 2016, ECORP led a field meeting involving ECORP archaeologists and project manager, representatives from USDA Forest Service, a representative from Foresthill PUD, and representatives from both UAIC and the Colfax-Todds Valley Consolidated Tribe, at which ECORP took participants to each site in the project area. No areas of cultural importance were identified by the Tribal participants or representatives. TNF sent out follow-up letters in June 2016 to Colfax-Todds Valley Consolidated Tribe and UAIC summarizing consultation efforts up to that point, informing them of additional 97 acres of added project area, and requesting that if there are any gathering areas or sites of religious significance in the project area to bring them to TNF's attention so these areas can be considered and they can address potential adverse effects during the planning process.

In November 2016 ECORP sent representatives from UAIC and Colfax-Todds Valley Consolidated Tribe copies of all the archaeological site records of resources in the project area for review. In April of 2017 subsequent meeting was held between the TNF and UAIC, at which an overview of cultural resources investigations and their results were provided to UAIC. The tribe requested the draft site records be resubmitted and an electronic copy of the report be provided for their review, and offered current tribal perspectives on topics including but not limited to NRHP evaluations. The TNF went over remaining steps for Section 106 including possibly developing a Historic Properties Treatment Plan and Memorandum of Agreement if it is determined the project will results in adverse effects to eligible historic properties. A subsequent meeting was requested to go over the draft effects analysis when completed. TNF continued consultation with UAIC.

4.5.3.4 Thresholds of Significance

Federal Evaluation Criteria

The technical report provided evaluations of cultural resources within the APE using NRHP eligibility criteria set forth in 36 CFR 60.4 and CRHR eligibility criteria, and ensures the evaluations are consistent with the "Secretary of the Interior's Standards and Guidelines for Evaluation" [48 Federal Register 44723-26] (NPS 1983).

There are a number of different sets of standards and guidelines that currently apply to cultural resources management. These standards and guidelines include the following:

- Section 106 of the NHPA and its implementing regulations at 36 CFR 800
- Sacramento District Regulatory Division Guidelines for Compliance with Section 106 of the NHPA
- Archaeological Resource Management Reports: Recommended Contents and Format (February 1990), published by the California OHP
- Applicable sections of CEQA (PRC § 21000 et seq.) and its implementing regulations (CCR Title 14, Article 5, § 15064.5)
- Instructions for Recording Historical Resources (March 1995), published by the OHP
- Ethical and professional standards of the Society for California Archaeology, the Society of American Archaeology, and Register of Professional Archaeologists

Under federal regulations implementing Section 106 of the NHPA (36 CFR 800), cultural resources identified in the project APE must be evaluated using NRHP and eligibility criteria. The eligibility criteria for the NRHP are as follows (36 CFR 60.4):

"The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects of state and local importance that possess aspects of integrity of location, design, setting, materials, workmanship, feeling, association, and

A. is associated with events that have made a significant contribution to the broad patterns of our history;

B. is associated with the lives of a person or persons significance in our past;

C. embodies the distinctive characteristics of a type, period or method of construction, or represents the work of a master, or possesses high artistic value, or represents a significant and distinguishable entity whose components may lack individual distinction; or

D. has yielded or may be likely to yield information important in prehistory or history."

In addition, the resource must be at least 50 years old, except in exceptional circumstances (36 CFR 60.4).

Historical buildings, structures, and objects are usually eligible under Criteria A, B, and C based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion D, the potential to yield information important in prehistory or history. An archaeological test program and tribal consultation may be necessary to determine whether the site has the potential to yield important data. The lead federal agency, in this case, the U.S. Army Corps of Engineers (USACE), makes the determination of eligibility based on the results of the test program and seeks concurrence from the State Historic Preservation Officer (SHPO).

Effects to NRHP-eligible resources (Historic Properties) are adverse if the project may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association.

State Evaluation Criteria

Under State law (CEQA) cultural resources are evaluated using CRHR eligibility criteria in order to determine whether any of the sites are Historical Resources, as defined by CEQA. CEQA requires that impacts to Historical Resources be identified and, if the impacts would be significant, that mitigation measures to reduce the impacts be applied. An Historical Resource is a resource that:

1. is listed in or has been determined eligible for listing in the CRHR by the State Historical Resources Commission;
2. is included in a local register of historical resources, as defined in Public Resources Code 5020.1(k);
3. has been identified as significant in an historical resources survey, as defined in Public Resources Code 5024.1(g); or
4. is determined to be historically significant by the CEQA lead agency [CCR Title 14, Section 15064.5(a)].

In making this determination, the CEQA lead agency usually applies the CRHR eligibility criteria.

For this project, only the fourth definition of a Historical Resource is applicable because there are no resources previously determined eligible or listed on the CRHR, there are no resources included in a local register of historical resources, and no resources identified as significant in a qualified historical resources survey.

The eligibility criteria for the CRHR are as follows [CCR Title 14, Section 4852(b)]:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the U.S.
2. It is associated with the lives of persons important to local, California, or national history
3. It embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master or possesses high artistic values; or
4. It has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation.

In addition, the resource must retain integrity. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association [CCR Title 14, Section 4852(c)].

Historical buildings, structures, and objects are usually eligible under Criteria 1, 2, and 3 based on historical research and architectural or engineering characteristics. Archaeological sites are usually eligible under Criterion 4, the potential to yield information important in prehistory or history. An archaeological test program and tribal consultation may be necessary to determine whether the site has the potential to yield important data. The CEQA lead agency makes the determination of eligibility based on the results of the test program. Cultural resources determined eligible for the NRHP by a federal agency are automatically eligible for the CRHR.

Impacts to a Historical Resource (as defined by CEQA) are significant if the resource is demolished or destroyed or if the characteristics that made the resource eligible are materially impaired [CCR Title 14, Section 15064.5(a)].

4.5.3.5 Direct and Indirect Impacts/Effects

Impact CUL-1 **Result in a substantial adverse change in the significance of a historical or archaeological resource pursuant Section 15064.5, or result in an effect to a historic property, as defined in Section 106 of NHPA and 36 CFR 800. Impact Determination: *Less than significant with mitigation incorporated* (CEQA) and *no effect (NEPA)*.**

Construction Impacts

No Project and No Action Alternatives

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow the Foresthill Public Utility District (FPUD) to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact regarding cultural resources. However, under the No Project Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in scale because of a higher demand for water over time. Conditions resulting from the No Project Alternative serve as the environmental baseline for determining potential project impact under CEQA as they relate to project compliance with applicable historical or archaeological resource protections.

Under NEPA, the No Action Alternative no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. In addition, existing Sugar Pine Reservoir management and operational conditions would be continued. In keeping with NEPA requirements to account for future actions likely to occur in the absence of the proposed action, the No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Under the No Action

Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size because of an anticipated higher demand for water in the future. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. Conditions resulting from the No Action Alternative serve as the environmental baseline for determining potential project impact under NEPA as they relate to project compliance with applicable federal protections concerning historical or archaeological resources.

Proposed Project/Action and Alternatives 1 and 2

Indirect impacts/effects related to cultural resources would be those caused by the construction of the new facilities and trails and an increase in potential drawdown area in the lake.

Upon completion of the proposed project/action, recreational facilities and reservoir use would continue to be used as it was prior to implementation of the project. The relocated campsites, picnic areas, and parking spurs would be located nearby to existing campsites, picnic areas, and parking spurs.

The project will increase the reservoir footprint which will inundate a currently dry area. Once inundated it would be expected that this area would be subject to sedimentation deposits as organic debris suspended in the water settle. This area including the additional sedimentation, would be occasionally exposed with planned water transfers and ongoing water supply operations. Although this area will be subject to inundation and exposure as the lake level changes, known resources within the project area were found to be less than significant.

Vegetation treatments in the mitigation units located above the inundation zone involve heavy equipment and may cause ground disturbance. FS Site 05-17-54-194, Iowa Hill Canal was the only cultural resource identified in the mitigation units. The site will be protected using the standard protection measures outlined in Appendix E of the Regional PA 2018. The Iowa Hill Canal will be flagged for avoidance prior to implementation. Only breaches designated by the District Archeologist may be used. In addition, vegetation treatments to be carried out by TNF will implement Compensatory Mitigation Measures CR1 through CR9 listed in *Table 2-8* of this DEIR/EIS.

During construction of the project or alternatives, there is a potential for ground-disturbing activities to expose previously unrecorded cultural resources. Both CEQA and Section 106 of the NHPA require the Lead Agency to address any unanticipated cultural resources discoveries during project construction. Therefore, construction-related impact would be potentially significant and adverse and would require mitigation. As such, mitigation measure **CUL-1** is required to reduce this impact to a less than significant level. The impact, therefore, is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

4.5.4 Mitigation Measures

Mitigation Measure CUL-1: There is a potential for ground-disturbing activities to expose previously unrecorded cultural resources. Both CEQA and Section 106 of the NHPA require the Lead Agency to address any unanticipated cultural resources discoveries during project construction. Therefore, ECORP recommends the following mitigation measures be adopted and implemented by the Lead Agency to reduce potential adverse impacts to Less than Significant.

If subsurface deposits believed to be cultural or human in origin are discovered during construction, then all work must halt within a 100-foot radius of the discovery. A qualified professional archaeologist, meeting the Secretary of the Interior's Professional Qualification Standards for prehistoric and historic archaeologist, shall be retained to evaluate the significance of the find, and shall have the authority to modify the no-work radius as appropriate, using professional judgment. The following notifications shall apply, depending on the nature of the find:

- If the professional archaeologist determines that the find does not represent a cultural resource, then work may resume immediately and no agency notifications are required.
- If the professional archaeologist determines that the find does represent a cultural resource from any time period or cultural affiliation, then he or she shall immediately notify USFS and the FPUD. The agencies shall consult on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.
- If the find represents a Native American or potentially Native American resource that does not include human remains, then he or she shall further notify the UAIC and Colfax-Todds Valley Consolidated Tribe. The agencies shall consult with the tribes on a finding of eligibility and implement appropriate treatment measures, if the find is determined to be eligible for inclusion in the NRHP or CRHR. Work may not resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the site either: 1) is not eligible for the NRHP or CRHR; or 2) that the treatment measures have been completed to their satisfaction.

Under CEQA, implementing mitigation measure **CUL-1** would reduce the significant impact associated with unanticipated discovery of cultural resources during construction and timber harvesting activities to a ***less than significant impact***. Once soil disturbing activities associated with construction are complete, the proposed project operation would have no impact to cultural resources.

Under NEPA, the proposed project/action would have the same placement of radial gates and the removal and relocation of several recreational facilities, the tree harvesting and tree hazard abatement as it would under CEQA. This implementation of the mitigation measure **CUL-1** would reduce the potential construction impacts unanticipated discovery of cultural resources during construction to a less than significant level under CEQA. Because CEQA requires mitigation for the proposed project/action, NEPA considers this to be a part of the proposed project/action. As such, the proposed project/action would have ***no effect*** related to construction under NEPA.

Operational Impact

No Project and No Action Alternatives

Under the No Project and No Action Alternatives, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact under CEQA and NEPA, respectively as they relate to the compliance of future project operations with applicable federal protections concerning historical or archaeological resources.

Proposed Project/Action and Alternatives 1 and 2

With the completion construction activities including installation of radial gates at the dam, Sugar Pine Reservoir would continue to serve its current function to provide water supply to FPUD and recreational use under the proposed project/action or Alternatives 1 or 2. Long-term operation of the project/alternatives for these purposes pose no greater risk of impact on significant historical or archaeological resources relative to existing conditions. Therefore, the project/alternatives would have ***no impact*** under CEQA and ***no effect*** under NEPA.

Impact CUL-2 Disturb any human remains, including those interred outside formal cemeteries. Throughout history, human burials have occurred outside of formal cemeteries, usually associated with archaeological resource sites and prehistoric people; therefore, areas with known archaeological resources sites may have higher risk for containing human remains. Impact Determination: *less than significant with mitigation (CEQA) and no effect (NEPA)*.

Construction Impacts

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow the Foresthill Public Utility District (FPUD) to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact regarding cultural resources. However, under the No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in number because of a higher demand for water over time. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact under CEQA and NEPA, respectively as they relate to the compliance of future project operations with applicable federal protections concerning the discovery of buried remains.

Proposed Project/Action and Alternatives

Indirect impacts/effects related to unknown buried remains would be those caused by the construction of new facilities and trails. Although there are no known buried human remains within the project site, during construction of the project or action alternatives, there is a potential for ground-disturbing activities to expose previously unknown buried remains. Therefore, the potential impact is considered significant and adverse. Implementation of mitigation measure **CUL-2** would be required to reduce impacts to less than significant. Therefore, the impact is considered ***less than significant with mitigation incorporated (CEQA) and no effect (NEPA).***

Mitigation Measure CUL-2: If the find includes human remains, or remains that are potentially human, he or she shall ensure reasonable protection measures are taken to protect the discovery from disturbance (Assembly Bill [AB] 2641). The archaeologist shall notify the Placer County Coroner (as per § 7050.5 of the Health and Safety Code). The provisions of Section 7050.5 of the California Health and Safety Code, § 5097.98 of the California PRC, and AB 2641 will be implemented. If the Coroner determines the remains are Native American and not the result of a crime scene, the Coroner will notify the NAHC, which then will designate a Native American Most Likely Descendant (MLD) for the project (§ 5097.98 of the PRC). The designated MLD will have 48 hours from the time access to the property is granted to make recommendations concerning treatment of the remains. If the landowner does not agree with the recommendations of the MLD, then the NAHC can mediate (§ 5097.94 of the PRC). If no agreement is reached, the landowner must rebury the remains where they will not be further disturbed (§ 5097.98 of the PRC). This will also include either recording the site with the NAHC or the appropriate Information Center; using an open space or conservation zoning designation or easement; or recording a reinternment document with the county in which the property is located (AB 2641). Work cannot resume within the no-work radius until the lead agencies, through consultation as appropriate, determine that the treatment measures have been completed to their satisfaction.

Significance after Mitigation: Under CEQA, implementing mitigation measure **CUL-2** would reduce the significant impact associated with unanticipated discovery of human remains during construction and timber harvesting activities to ***less than significant.***

Under NEPA, the proposed project/action would have the same placement of radial gates and the removal and relocation of several recreational facilities, the tree harvesting and tree hazard abatement as it would under CEQA. The implementation of mitigation measure **CUL-2** would reduce the potential construction impacts unanticipated discovery of human remains during construction to ***a less than significant level*** under CEQA. Because CEQA requires mitigation for the proposed project/action, NEPA considers this to be a part of the proposed project/action. As such, the proposed project/action would have ***no effect*** related to construction under NEPA.

Operational Impacts

No Project and No Action Alternatives

Under the No Project and No Action alternatives, FPUD would continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. While the No Project and No Action alternatives would result in an increase in the number of seasonal drawdowns of Sugar Pine Reservoir due to a projected higher demand for water in the future, the proposed project is not located within a known burial site. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact under CEQA and NEPA, respectively as they relate to the compliance of future project operations with applicable federal protections concerning the discovery of buried remains.

Proposed Project/Action Alternatives

With the completion construction activities including installation of radial gates at the dam, Sugar Pine Reservoir would continue to serve its current function to provide water supply to FPUD and recreational use under the proposed project/action or Alternatives 1 or 2. Long-term operation of the project/ alternatives for these purposes pose no greater risk of impact on undiscovered human remains relative to existing conditions. Therefore, the project/alternatives would have ***no impact*** under CEQA and ***no effect*** under NEPA.

4.5.4.1 Cumulative Impact

Approach to Assessing Cumulative Impact on Cultural Resources

Section 15130 (a) of the California State CEQA Guidelines states:

> An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

NEPA, as amended, requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1500 1508) define cumulative impacts as:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taken place over a period of time (40 CFR 1508.7).

For the purpose of this Draft EIR/EIS, assessment the cumulative impact of the proposed project/action on cultural resources are site-specific (determined by a particular site's sensitivity and known locations of resources), rather than cumulative in nature. In California, individual development projects would be subject to CEQA analysis. Impacts regarding surficial deposits can be cumulative in nature in an area that is known to contain resources. However, with cultural resources being finite the cumulative impacts are limited only the area that contain the resource. Therefore, resources that are already below the lake would remain undisturbed and further buried by additional water intrusion when reservoir levels are raised. As such, cumulate impacts to cultural resources for the proposed project would ***not be cumulatively considerable***.

4.5.5 References

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4.6 Geology, Soils and Paleontological Resources

This section describes the geology, soils, and seismicity in the area potentially affected by the proposed project/action and the relationship between the project and relevant adopted federal, state, and regional and local laws, regulations, and planning goals, and policies. Section 4.6.1 assesses the environmental effects of the project on soils and geological conditions in areas directly affected by project construction activities. Seismic conditions in the project area are examined considering proposed modifications to Sugar Pine Dam and Reservoir to ascertain the project's consistency with state and federal dam safety requirements. Ground disturbance, including tree clearing and grading, associated with construction and operation of proposed project has potential to increase erosion/soil compaction and lead to a loss of soil organic matter. In addition, naturally occurring asbestos in the area may pose a hazard to workers during construction, timber harvest, mitigation activities and the public during normal operations.

Naturally Occurring Asbestos (NOA) occurs in the proposed project/action area. While NOA is a geological related hazard, the hazard is the airborne fibers of asbestos that have the potential to cause human health effects and as such, is discussed in Section 4.5 *Air Quality and Greenhouse Gas*.

Regulations, plans, policies and standards pertaining to geology and soils are provided in Section 4.6.2. The environmental consequences resulting from implementation of the proposed project/action and project alternatives are described in Section 4.6.3. Section 4.6.4 provides mitigation monitoring, compliance, and reporting information; Section 4.6.5 addresses residual effects of the project; and Section 4.6.6 lists the references cited in this section.

4.6.1 Environmental Setting/Affected Environment

4.6.1.1 Introduction

As described in detail in Chapter 2.0 of this DEIR/EIS, in addition to gate installation and expansion of the Sugar Pine Reservoir inundation area, the proposed project/action would implement a compensatory mitigation program to replace recreational facilities affected by the project and mitigate for lost or degraded TNF natural and cultural resources. This section of the DEIR/EIS describes existing soils conditions in areas likely to be affected by project construction and operation and by implementation of the compensatory mitigation program.

4.6.1.2 Regional Geology

The project area is located in the California geomorphic province known as the Sierra Nevada province. The Sierra Nevada province is a tilted fault block nearly 400 miles long. Its east face is a high, rugged multiple scarp, contrasting with the gentle western slope (about 2°) that disappears under sediments of the Great Valley. Deep river canyons are cut into the western slope. Their upper courses, especially in massive granites of the higher Sierra, are modified by glacial sculpturing, forming such scenic features as Yosemite Valley. The high crest culminates in Mt. Whitney with an elevation of 14,495 feet above sea level near the eastern scarp. The metamorphic bedrock contains gold bearing veins in the northwest trending Mother Lode. The northern Sierra boundary is marked where bedrock disappears under the Cenozoic volcanic cover of the Cascade Range. The Sierra Nevada is bounded on the west by the Great Valley province, on the north by the Cascade Range, and on the east by the Basin and Range Province, and on the south by the intersection of the Transverse Ranges and Mojave Desert Provinces (CGS 2002).

4.6.1.3 Local Geology

According to the California Geological Survey (CGS), The eastern 4/5 of the project area occupies a surface underlain by plutonic rocks defined as ultramafic rocks, mostly serpentine. minor peridotite, gabbro, and diabase. The western 1/5 of the project site is underlain by metavolcanic rocks defined as undivided pre-Cenozoic metavolcanic rocks. These include; latite; dacite; tuff; and greenstone, commonly schistose (CGS 2010a).

Ultramafic rocks are igneous rocks that contain 90 percent or more of the dark colored iron-magnesium-silicate minerals olivine, augite, hypersthene, or less commonly hornblende. Ultramafic rocks form in high temperature environments well below the surface of the earth. By the time they are exposed at the surface by uplift and erosion, ultramafic rocks may be partially to completely altered to serpentinite, a type of metamorphic rock. Sometimes the metamorphic conditions are right for the formation of chrysotile asbestos or tremolite-actinolite asbestos in bodies of ultramafic rock or along their boundaries.

4.6.1.4 Topography

The project is located in the Sierra Nevada mountain range and as such has areas of relatively flat ground, areas of general slopes as well as areas of steep slopes. Elevations range from approximately 3,650 to 3,800 feet above mean sea level.

4.6.1.5 Soils

The U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) provides soil information for areas throughout the United States. The NRCS' online soils mapping tool, called the Web Soil Survey, is an interactive tool that can provide a variety of soil-related information for a user-defined specific site. This tool was used to determine the specific soil for the project site, and the survey is located in *Appendix M* as well as defined in *Table 4.6-1*.

Table 4.6-1. Project Area Soil Characteristics

Soil	Percentage of Site	Drainage	Flooding Frequency Class	Erosion Hazard[1]	Runoff Potential[2]	Linear Extensibility (Rating)[3]	Frost Action[4]	Limitations for Haul Roads and Log Landings
Placer County, California, Western Part (CA620)								
Cohasset cobbly loam, 15 to 50 percent slopes	2.2	Well drained	None	Severe	C (medium)	2.4%	Moderate	Moderate
Dubakella very stony loam, 9 to 50 percent slopes	52.9	Well drained	None	Severe	D (high)	4.5%	None	Moderate
Mariposa-Josephine complex, 30 to 50 percent slopes	10.1	Well drained	None	Severe	C (medium)	1.5%	None	Severe
Mariposa-Rock outcrop complex, 50 to 70 percent slopes	11.2	Well drained	None	Severe	C (medium)	1.5%	None	Severe
McCarthy cobbly sandy loam, 5 to 30 percent slopes	0.3	Well drained	None	Moderate	B (low)	1.5%	None	Moderate
Sites loam, 30 to 50 percent slopes, C low montane	23.3	Well drained	None	Severe	C (medium)	2.0%	None	Severe
TNF Area, California (CA719)								
Dubakella very stony loam, 9 to 50 percent slopes	7.8	Well drained	None	Severe	D (high)	4.5%	None	Moderate
Dubakella-Dubakella variant-Rock outcrop complex, 30 to 50 percent slopes	20.0	Well drained	None	Severe	D (high)	4.5%	Low	Severe
Forbes-Dubakella complex, 2 to 30 percent slopes	3.3	Well drained	None	Severe	C (medium)	2.2%	Low	Moderate
Forbes-Dubakella complex, 30 to 50 percent	4.3	Well drained	None	Severe	C (medium)	2.2%	Low	Severe
Pits, borrow	1.0	Not rated	None	Not rated	Not rated	Not rated	Not rated	Not rated

Table 4.6-1. Project Area Soil Characteristics

Soil	Percentage of Site	Drainage	Flooding Frequency Class	Erosion Hazard[1]	Runoff Potential[2]	Linear Extensibility (Rating)[3]	Frost Action[4]	Limitations for Haul Roads and Log Landings
Rock outcrop-Dubakella-Dubakella variant complex, 2 to 40 percent slopes	16.0	Well drained	None	Not rated	Not rated	Not rated	Low	Not rated

Source: NRCS 2019

Notes: The area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

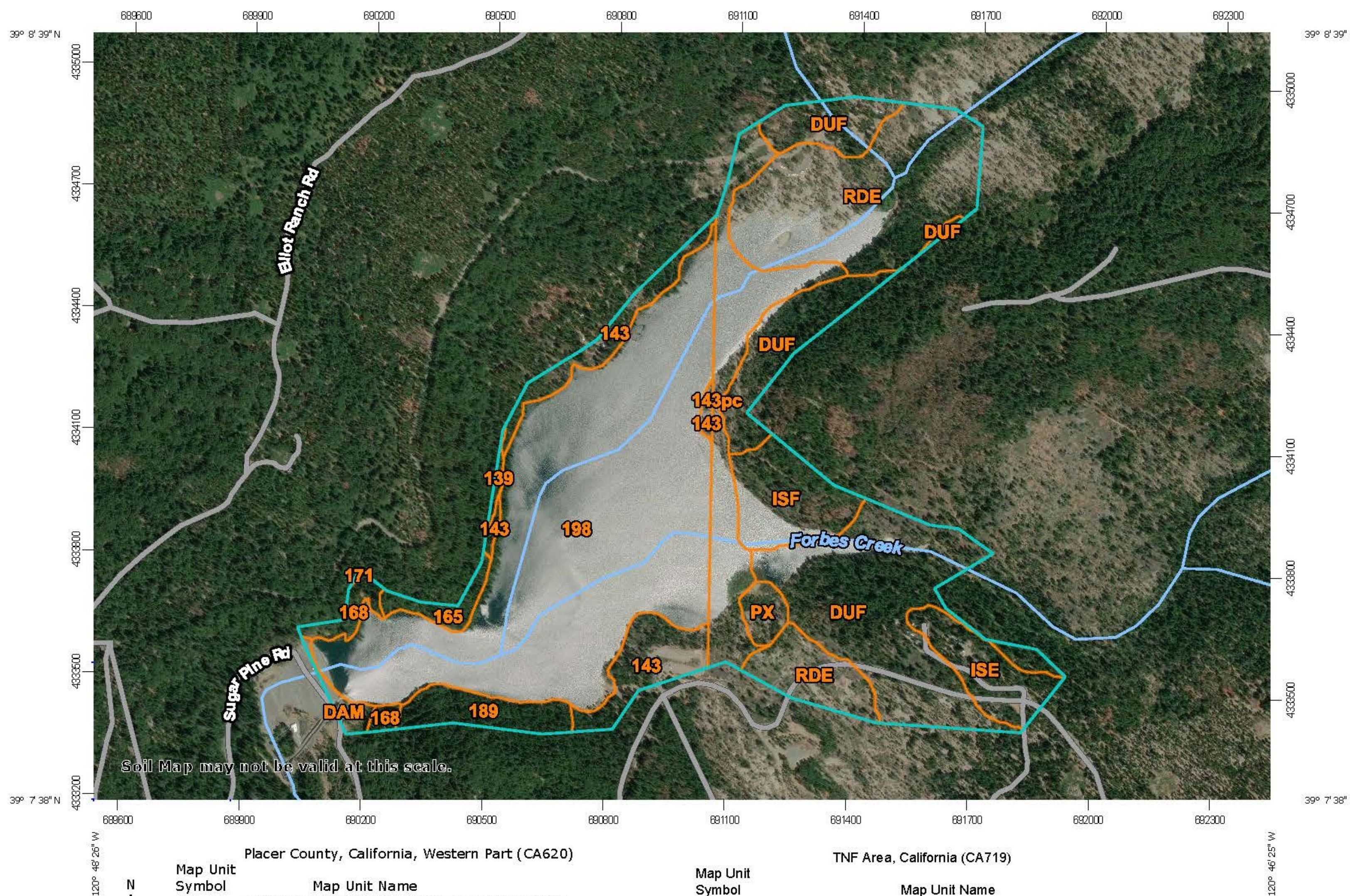
1. The ratings are both verbal and numerical. The hazard is described as "slight," "moderate," "severe," or "very severe." A rating of "slight" indicates that erosion is unlikely under ordinary climatic conditions; "moderate" indicates that some erosion is likely and that erosion-control measures may be needed; "severe" indicates that erosion is very likely and that erosion-control measures, including revegetation of bare areas, are advised; and "very severe" indicates that significant erosion is expected, loss of soil productivity and off-site damage are likely, and erosion-control measures are costly and generally impractical.
2. Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation. Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. Group B. Soils having a moderate infiltration rate when thoroughly wet. Group C. Soils having a slow infiltration rate when thoroughly wet. Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.
3. Linear extensibility is used to determine the shrink-swell potential of soils. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent, moderate if 3 to 6 percent, high if 6 to 9 percent, and very high if more than 9 percent. If the linear extensibility is more than 3, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed.
4. Potential for frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Frost heave and low soil strength during thawing cause damage to pavements and other rigid structures.

According to the NRCS, the project site is located within two different soil survey coverage areas: Placer County, California, Western Part (CA620) and TNF Area, California (CA719).

Five soil units or types were identified within the Placer County, California, Western Part (CA620) soil survey area of the APE. These are: Cohasset cobbly loam (139), 30 to 50 percent slopes; Dubakella very stony loam (143), 9 to 50 percent slopes; Mariposa-Josephine complex (165), 30 to 50 percent slopes; Mariposa-Rock outcrop complex (168), 50 to 70 percent slopes; Sites loam (189), 30 to 50 percent slopes; and Water (198) These soil units are derived from residuum weathering from either metasedimentary rock or serpentinite (NRCS 2019). See *Figure 4.6-1. Soil Map***.**

Six soil units or types were identified within the TNF area, California (CA719) soil survey area of the project Area. These are: Dubakella very stony loam (143pc), 9 to 50 percent slopes; Dubakella-Dubakella variant-Rock outcrop complex (DUE), 2 to 30 percent slopes; Dubakella-Dubakella variant-Rock outcrop complex (DUF), 30 to 50 percent slopes; Forbes-Dubakella complex (ISF), 30 to 50 percent slopes; Pits, borrow (PX); and Rock outcrop-Dubakella-Dubakella variant complex (RDE), 2 to 40 percent slopes.

Custom Soil Resource Report
Soil Map



Placer County, California, Western Part (CA620)

Map Unit Symbol	Map Unit Name
139	Cohasset cobbly loam, 15 to 50 percent slopes
143	Dubakella very stony loam, 9 to 50 percent slopes
165	Mariposa-Josephine complex, 30 to 50 percent slopes
168	Mariposa-Rock outcrop complex, 50 to 70 percent slopes
171	McCarthy cobbly sandy loam, 5 to 30 percent slopes
189	Sites loam, 30 to 50 percent slopes, C low montane

TNF Area, California (CA719)

Map Unit Symbol	Map Unit Name
143pc	Dubakella very stony loam, 9 to 50 percent slopes
DUF	Dubakella-Dubakella variant-Rock outcrop complex, 30 to 50 percent slopes
ISE	Forbes-Dubakella complex, 2 to 30 percent slopes
ISF	Forbes-Dubakella complex, 30 to 50 percent
PX	Pits, borrow
RDE	Rock outcrop-Dubakella-Dubakella variant complex, 2 to 40 percent slopes

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Figure 4.6-1 Soil Map

2015-019 FPUD Sugar Pine Reservoir

These soil units are derived from residuum weathering from either serpentinite or ultramafic rock (NRCS 2019). See *Figure 4.6-1*.

Table 4.6-1 summarizes the characteristics of the soil types present in the project area. The project soils are all considered to be well drained, have a low to high runoff potential, and a moderate to severe erosion potential. Additionally, these soils are not subject to flooding and linear extensibility (shrink/swell) ranges from low to moderate (NRCS 2019).

4.6.1.6 Seismicity

Fault Zones

Seismically induced ground rupture is defined as the physical displacement of surface deposits in response to an earthquake's seismic waves. The magnitude, sense, and nature of fault rupture can vary for different faults or even along different strands of the same fault.

In California, special definitions for active faults were devised to implement the Alquist-Priolo Earthquake Fault Zoning Act of 1972, which regulates development and construction in order to avoid the hazard of surface fault rupture. The State Mining and Geology Board established policies and criteria in accordance with the act. The board defined an active fault as one which has had surface displacement within Holocene time (about the last 11,000 years). A potentially active fault was considered to be any fault that showed evidence of surface displacement during Quaternary time (last 1.6 million years). Because of the large number of potentially active faults in California, the State Geologist adopted additional definitions and criteria in an effort to limit zoning to only those faults with a relatively high potential for surface rupture. Thus, the term sufficiently active was defined as a fault for which there was evidence of Holocene surface displacement. This term was used in conjunction with the term well-defined, which relates to the ability to locate a Holocene fault as a surface or near-surface feature (CGS 2010b).

The project site is not located within the Alquist-Priolo Fault Rupture Hazard Zone, as designated through the Alquist-Priolo Earthquake Fault Zoning Act (CGS 2015). However, the project site is located within an area identified as having a number of faults, such has the Melones Fault Zone of Clark, the Giant Gap fault, the Foresthill fault and the Gillis Hill fault. The only fault that is considered potentially active is the Giant Gap Fault. The Giant Gap Fault is a Quaternary/Late Quaternary fault meaning that movement has occurred within the last 1.6 million years. According to CGS, The Giant Gap fault crosses the eastern half of the Sugar Pine Reservoir (CGS 2018a). See *Figure 4.6-2*.

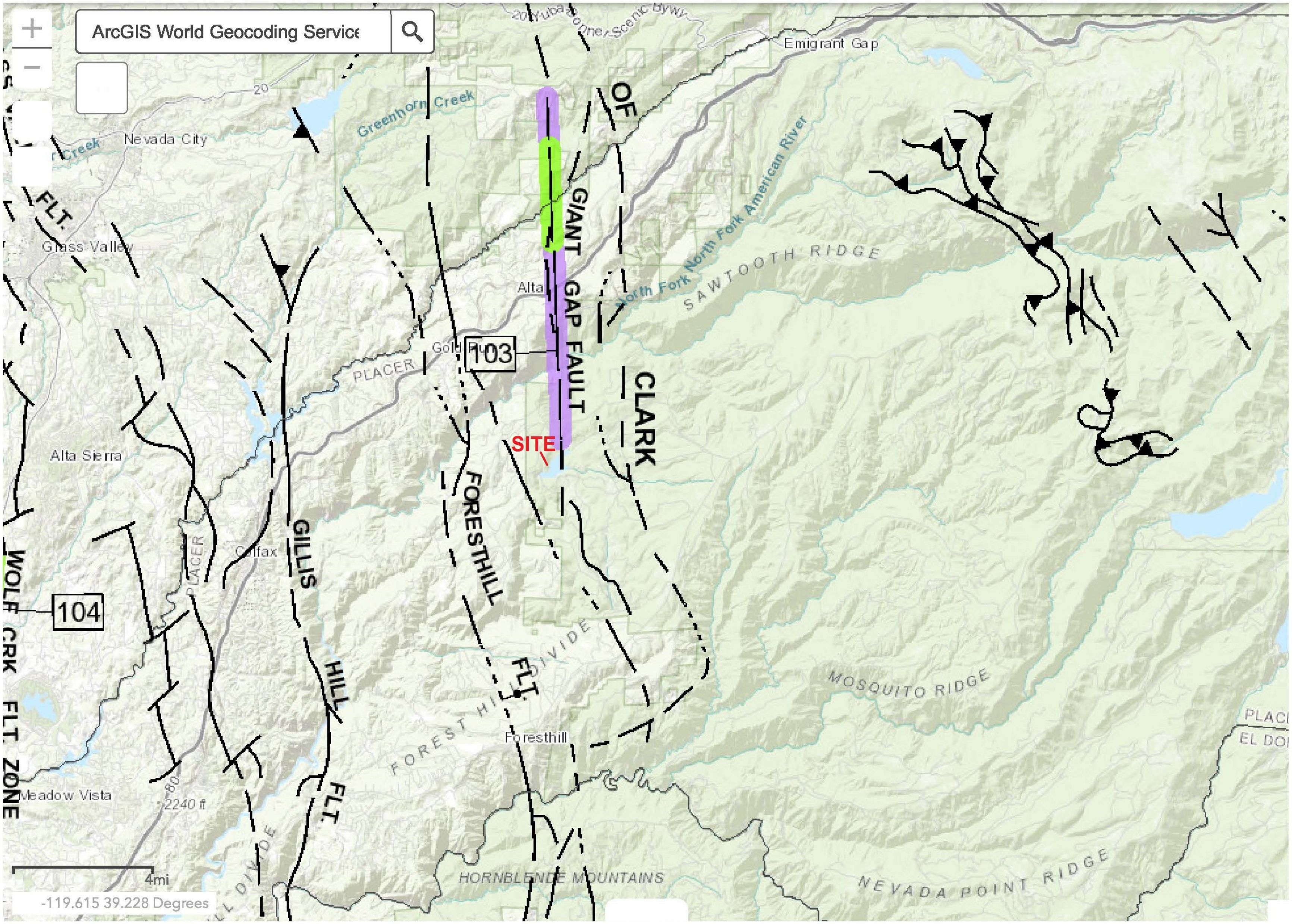

Figure 4.6-2 Earthquake Map

2015-019 FPUD Sugar Pine Reservoir

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Ground Shaking

Richter magnitude (M) is a measure of the size of an earthquake as recorded by a seismograph, a standard instrument that records ground shaking at the location of the instrument. The reported Richter magnitude for an earthquake represents the highest amplitude measured by the seismograph at a distance of 100 kilometers (60 miles) from the epicenter. Richter magnitudes vary logarithmically, with each whole number step representing a tenfold increase in the amplitude of the recorded seismic waves. Earthquake magnitudes are also measured by their Moment Magnitude (Mw), which is related to the physical characteristics of a fault including the rigidity of the rock, the size of fault rupture, and movement or displacement across a fault.

Ground movement during an earthquake can vary depending on the overall magnitude, distance to the fault, focus of earthquake energy, and type of geologic material. The composition of underlying soils, even those relatively distant from faults, can intensify ground shaking. For this reason, earthquake intensities are also measured in terms of their observed effects at a given locality. The intensities of an earthquake will vary over the region of a fault and generally decrease with distance from the epicenter of the earthquake.

CGS provides mapping indicating the "Earthquake Shaking Potential for California" (CGS 2016). This map shows the relative intensity of ground shaking in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a two percent chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2500-year average repeat time. Relatively long-period (1.0-second) earthquake shaking are shown on this map. Long-period shaking affects tall, relatively flexible buildings, but also correlates well with overall earthquake damage. Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage (CGS 2016). According to this information, the project site has a low potential (20 to 30 percent) of damage from shaking by active faults.

Secondary Seismic Hazards

Secondary seismic hazards include several types of ground failure that can occur as a result of the severe ground shaking. These hazards can include liquefaction and landslides.

4.6.1.7 Landslides and Slope Failure

Landslides or slope failures are dependent on various factors including the slope characteristics and geology as well as the amount of rainfall, man-made alterations through excavation, or seismic activities. A slope failure is a mass of rock, soil, and debris displaced downslope by sliding, flowing, or falling. Steep slopes and downslope creep of surface materials characterize landslide-susceptible areas. Debris flows consist of a loose mass of rocks and other granular material that, if present on a steep slope and saturated, can move downslope. The rate of rock and soil movements can vary from a slow creep over many years to sudden mass movements. Landslides occur throughout California, but the density of incidents increases in zones of active faulting. Seismic inducement can accelerate otherwise slower processes, triggering landslides and slope failure over wide areas. With or without seismic inducement, slope failure is most commonly found in slopes that exceed a 1.5:1 (horizontal: vertical) incline.

Landslide Susceptibility

Rock Strength and slope are combined to create classes of landslide susceptibility. These classes express the generalization that on very low slopes, landslide susceptibility is low even in weak materials, and that landslide susceptibility increases with slope and in weaker rocks. Very high landslide susceptibility, classes VIII, IX, and X, includes very steep slopes in hard rocks and moderate to very steep slopes in weak rocks (CGS 2011). CGS Deep-Seated Landslide Susceptibility Map identifies that the project site has slopes ranging from Class III to X (CGS 2019a). See *Figure 4.6-3*.

Liquefaction

Liquefaction occurs during moderate to great earthquakes, when ground shaking causes water-saturated soils to become fluid and loose strength, much like quicksand. The loss of soil strength occurs as a consequence of cyclic pore water pressure increase below the groundwater surface. Potential hazards due to liquefaction include loss of bearing strength beneath structures, possibly causing foundation failure and/or significant settlements and differential settlements. Seismic settlement occurs when soil is compacted in response to ground shaking. Localities susceptible to liquefaction-induced damage are underlain by loose, water-saturated, granular sediment within 50 feet of the ground surface. Liquefaction is often responsible for damage to bridges, buildings, buried pipes, and underground storage tanks.

Lateral spreading is a potential hazard commonly associated with liquefaction. Lateral spreading is a result of extensional ground cracking and settlement occur as a response to lateral migration of subsurface liquefiable material. This phenomenon typically occurs adjacent to slopes or incised channels. Since soils prone to liquefaction become unstable, such soils are undesirable places to locate structures or would require substantial engineering for safe structures.

The CGS Seismic Hazards Program

Liquefaction zones provides information on potential liquefaction zones in California as well as mapping these areas. This mapping identifies that the project site is not within an area potentially susceptible to liquefaction (CGS 2018b).

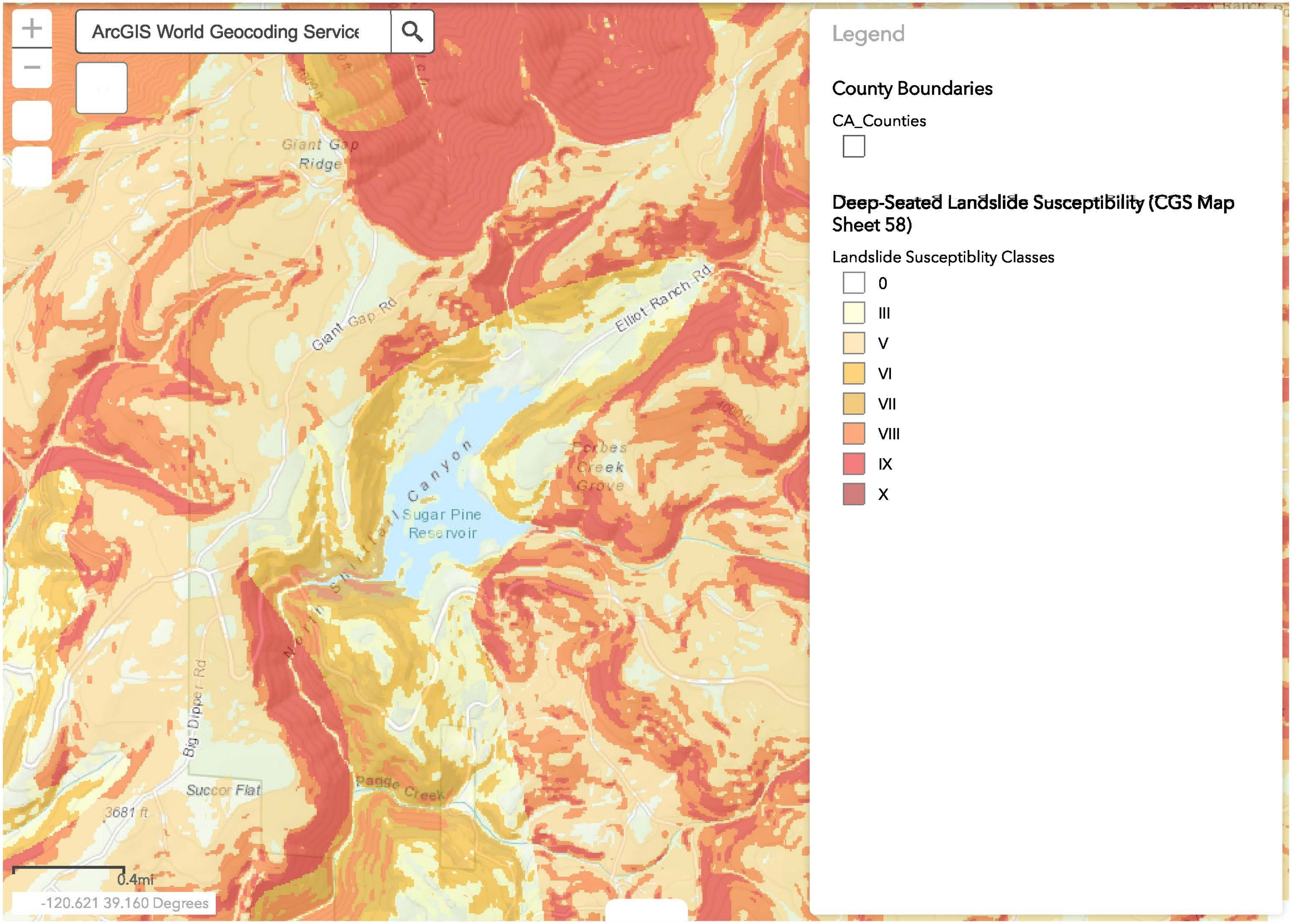

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Figure 4.6-3 Landslide Susceptibility Map

2015-019 FPUD Sugar Pine Reservoir

4.6.1.8 Other Geologic Hazards

Expansive Soils

Expansive soils possess a shrink-swell characteristic that can result in structural damage over a long period of time.[1] Expansive soils largely comprise silicate clays, which expand in volume when water is absorbed and shrink when dried. Highly expansive soils can cause damage to foundations and roads over time. As shown in *Table 4.6-1*, the soil units identified on the project site generally have a low to moderate shrink-swell potential (NRCS 2019).

Settlement and Subsidence

Settlement can occur from immediate settlement, consolidation, shrinkage of expansive soil, and liquefaction. Immediate settlement occurs when a load from a structure or placement of new fill material is applied, causing distortion in the underlying materials. This settlement occurs quickly and is typically complete after placement of the final load. Soils tend to settle at different rates and by varying amounts depending on the load weight or changes in properties over an area, which is referred to as differential settlement. Subsidence is a form of settlement that can be caused by natural (tectonic movement) or through human extraction activities such as the removal of groundwater, oil, or gas. Subsidence can also occur due to placement of new structures or improvements on inadequately prepared surface soils. The U.S. Geological Survey (USGS) provides mapping indicating areas of land subsidence in California. According to this information, the project site and surrounding area are not identified as an area of substantial subsidence (USGS 2017).

4.6.1.9 Paleontological Resources

Paleontological resources are the remains and/or traces of prehistoric life (excluding human remains) and including the localities where fossils were collected and the sedimentary rock formations from which they were obtained. They can include bones, teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. The defining character of fossils is their geologic age. Fossils or fossil deposits are generally regarded as older than 100,000 years. Generally, when conducting analysis, we look at the end of the last Late Pleistocene glacial event and the beginning of the current period of climatic improvement of the Holocene. A paleontological record search was carried out by ECORP and included: a query of the University of California Museum of Paleontology (UCMP) catalog records; a review of regional geologic maps from the California Geological Survey; a review of local soils data; and a review of existing literature on paleontological resources of Placer County. The purpose of records search was to determine the sensitivity of the project area, whether or not known occurrences of paleontological resources are present within or immediately adjacent to the project area, and whether or not implementation of the project could result in significant impacts to paleontological resources.

[1] "Shrink-swell" is the cyclical expansion and contraction that occurs in fine-grained clay sediments from wetting and drying. Structures located on soils with this characteristic may be damaged over a long period of time, usually as the result of inadequate foundation engineering.

The results of the search of the UCMP indicated that of the 779 paleontological specimens recorded from 9 localities in Placer County, no paleontological resources have been previously recorded within or near the project area. The closest recorded paleontological resources to the project area are situated several miles to the southeast within a mountain range north of Michigan Bluff. Review of geologic maps shows the site is underlain with ultramafic rocks, mostly serpentine. Minor peridotite, gabbro, and diabase, chiefly Mesozoic as well as undivided pre-Cenozoic metavolcanics rocks including latite, dacite, tuff, and greenstone. Of the 779 recorded paleontological specimens, 763 consisted of fossilized plants, 10 are invertebrates, and six are vertebrates. (UCMP 2019).

4.6.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on soils and geology.

4.6.2.1 Federal Plans, Policies, Regulations, and Laws

Earthquake Hazards Reduction Act

In October 1977, the U.S. Congress passed the Earthquake Hazards Reduction Act to reduce the risks to life and property from future earthquakes in the United States through the establishment and maintenance of an effective earthquake hazards reduction program. To accomplish this goal, the act established the National Earthquake Hazards Reduction Program (NEHRP). This program was substantially amended in November 1990 by the National Earthquake Hazards Reduction Program Act (NEHRPA), which refined the description of agency responsibilities, program goals, and objectives.

The mission of NEHRP includes improved understanding, characterization, and prediction of hazards and vulnerabilities; improved building codes and land use practices; risk reduction through post-earthquake investigations and education; development and improvement of design and construction techniques; improved mitigation capacity; and accelerated application of research results. The NEHRPA designates the Federal Emergency Management Agency as the lead agency of the program and assigns several planning, coordinating, and reporting responsibilities. Other NEHRPA agencies include the National Institute of Standards and Technology, National Science Foundation, and the USGS.

Water Quality Management for National Forest Lands in California – Best Management Practices (2000)

This document was prepared by the USFS to present practices and procedures which serve as the basis for water quality management on National Forest lands within the state of California. It describes Best Management Practices (BMPs) used for water quality management National Forest lands including TNF.

Tahoe National Forest

Current management direction on desired future conditions for the management of water resources in the Tahoe National Forest can be found in the following documents, filed at the District Office:

- Tahoe National Forest Land and Resource Management Plan (LRMP);

- Forest Service Manual and Handbooks; and
- National Forest Management Act (NFMA)

4.6.2.2 State Plans, Policies, Regulations, and Laws

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act (AP Act) was created in 1972 in response to the San Fernando Earthquake. The AP Act was created to mitigate the hazards of surface faulting to manmade structures. The California Geological Survey's Special Publication 42 includes the provisions of the Act and an index to maps of Earthquake Fault-Rupture Zones, as well as current revisions to these documents (CGS 2007a).

Earthquake Fault-Rupture Zones have been delineated to prevent the construction of urban development across the trace of known active faults. The boundary of these regulatory fault zones are approximately 500 feet from major active faults and 200 to 300 feet from well-defined minor faults, referred to as Alquist-Priolo Earthquake Hazard Zones. The State Geologist establishes regulatory zones around the surface traces of active faults in order to issue appropriate maps (CGS 2007b).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act of 1990 (Public Resources Code [PRC] §§2690–2699.6) directs the State of California Department of Conservation, California Geological Survey to identify and map areas subject to earthquake hazards (such as liquefaction, earthquake-induced landslides, and amplified ground shaking). The Seismic Hazards Mapping Act was passed shortly after the 1989 Loma Prieta Earthquake, and is intended to minimize the loss of life and property through identification, evaluation, and mitigation of seismic hazards (CGS 2007c).

Seismic Zone Hazard Maps identify Zones of Required Investigation, which are areas with potential for seismic hazards. These maps help cities and counties in their land use planning and building permit processes (CGS 2007c).

California Building Code

The California Building Code (CBC) has been codified in the California Code of Regulations (CCR) as Title 24, Part 2. Title 24 is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The purpose of the CBC is to establish minimum standards to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, and general stability by regulating and controlling the design, construction, quality of materials, use and occupancy, location, and maintenance of all building and structures within its jurisdiction. The CBC is based on the International Building Code. The 2013 CBC is based on the 2009 International Building Code (IBC) published by the International Code Conference. In addition, the CBC contains necessary California amendments which are based on reference standards obtained from various technical committees and organizations such as the American Society of Civil Engineers (ASCE), the American Institute of Steel Construction (AISC), and the American Concrete Institute (ACI). ASCE Minimum Design Standards 7-05 provides requirements for general structural design and includes the means for determining earthquake loads as well as other loads (i.e., flood, snow, wind) for inclusion into building codes. The provisions of the CBC apply to the construction, alteration, movement, replacement, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The earthquake design requirements take into account the occupancy category of the structure, site class, soil classifications, and various seismic coefficients that are used to determine a Seismic Design Category (SDC) for a project. The SDC is a classification system that combines the occupancy categories with the level of expected ground motions at the site and ranges from SDC A (very small seismic vulnerability) to SDC E (very high seismic vulnerability and near a major fault). Design specifications are then determined according to the Seismic Design Category.

California Water Code—Dam Safety Program

The California Water Code designates the regulatory Dam Safety Program to the California Department of Water Resources, Division of Safety of Dams (DSOD). The principal goal of this program is to avoid dam failure and thus prevent loss of life and destruction of property. The DSOD reviews plans and specifications for the construction of new dams and for the enlargement, alteration, repair, or removal of existing dams, and must grant written approval before the owner can proceed with construction. Professional engineers and geologists from the DSOD evaluate each project, investigate proposed sites, and review foundation conditions and proposed construction materials. Sugar Pine Dam is under the jurisdiction of the DSOD. DSOD provides condition as well as other information about each of the 1,200 dams under its jurisdiction. DSOD uses the US Army Corps of Engineers' National Inventory of Dams condition rating definitions, with additional criteria, as a guideline in assigning condition assessments (DSOD 2018). Sugar Pine Dam has received a "satisfactory" condition rating from DSOD. Satisfactory means, "no existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines" (DSOD 2019).

4.6.2.3 Regional and Local Plans, Policies, Regulations, and Ordinances

Government Code Section 53091 states that building and zoning ordinances do not apply to "construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." Public utility projects that serve the facilities described above would not be subject to local plans, policies, regulations, or ordinances. The following local regulations related to geology, soils, and seismicity are provided for informational purposes and are provided as a basis to assist with CEQA review in evaluating the level of significance associated with impacts.

Placer County General Plan

The Placer County General Plan includes goals and policies within the Health and Safety Element that assist in the protection of people and structures within Placer County. Because the project site is located within a national forest, development and design requirements identified in the General Plan do not pertain to the project. However, certain polices can assist in the protection of people and structures when considering potential seismic and soils hazards within the national forest system. Those that would apply to the proposed project/action area as follows:

Goal 8.A: *To minimize the loss of life, injury, and property damage due to seismic and geological hazards.*

Policy 8.A.1. The County shall require the preparation of a soils engineering and geologic-seismic analysis prior to permitting development in areas prone to geological or seismic hazards (i.e., ground shaking, landslides, liquefaction, critically expansive soils, avalanche).

Policy 8.A.3. The County shall prohibit the placement of habitable structures or individual sewage disposal systems on or in critically expansive soils unless suitable mitigation measures are incorporated to prevent the potential risks of these conditions.

Policy 8.A.4. The County shall ensure that areas of slope instability are adequately investigated and that any development in these areas incorporates appropriate design provisions to prevent landsliding.

Policy 8.A.5. In landslide hazard areas, the County shall prohibit avoidable alteration of land in a manner that could increase the hazard, including concentration of water through drainage, irrigation, or septic systems; removal of vegetative cover; and steepening of slopes and undercutting the bases of slopes.

Policy 8.A.9. The County shall require that the location and/or design of any new buildings, facilities, or other development in areas subject to earthquake activity minimize exposure to danger from fault rupture or creep.

Policy 8.A.10. The County shall require that new structures permitted in areas of high liquefaction potential be sited, designed, and constructed to minimize the dangers from damage due to earthquake-induced liquefaction.

Policy 8.A.11. The County shall limit development in areas of steep or unstable slopes to minimize hazards caused by landslides or liquefaction.

Goal 8.B: *To minimize the risk of loss of life, injury, damage to property, and economic and social dislocations resulting from flood hazards.*

Policy 8.B.4. The County shall require that the design and location of dams and levees be in accordance with all applicable design standards and specifications and accepted state-of-the-art design and construction practices.

Foresthill Divide Community Plan

The Foresthill Divide Community Plan (FDCP), in combination with the Placer County General Plan, is the official statement of Placer County setting forth goals, policies, assumptions, guidelines, standards and implementation measures that will guide the physical, social and economic development of the Foresthill Divide Community Plan area to approximately the year 2030. The Plan will provide overall direction for future growth in the Foresthill Divide. Because the project site is located within a national forest, development and design requirements identified in the Community Plan do not pertain to the project. However, certain polices can assist in the protection of people and structures when considering potential seismic and soils hazards within the NFS. Those that would apply to the proposed project/action area as follows:

Goal 4.A.8. *Promote the conservation of soils as a valuable natural resource.*

Policy 4.A.8-4 Require the use of feasible and practical BMPs to minimize the effects of construction, logging, mining, recreation or other activities that could result in soil loss from dust generation and water runoff.

Goal 4.A.9. *Minimize the loss of life, injury, and property damage due to seismic and geological hazards.*

Goal 4.A.9-4 *The County shall ensure that areas of slope instability are adequately investigated and that any development in these areas incorporates appropriate design provisions to prevent landsliding.*

Goal 4.A.9-5 *In landslide hazard areas, the County shall prohibit avoidable alteration of land in a manner that could increase the hazard, including concentration of water through drainage, irrigation, or septic systems; removal of vegetative cover; and steepening of slopes and undercutting the bases of slopes.*

Goal 4.A.9-11 *The County shall limit development in areas of steep (in excess of 30%) or unstable slopes, or slope breaks to minimize hazards caused by landslides, liquefaction, construction undercutting or vegetation loss.*

4.6.3 *Environmental Consequences*

4.6.3.1 Definition and Use of CEQA Significance Criteria

The Initial Study completed for the proposed project identified that the following issue areas would result in a less than significant or no impact. Therefore, these issue areas are not discussed further in this DEIR/EIS. For further discussion of these issue areas, refer to the Initial Study located in *Appendix N*.

- Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault; strong seismic ground shaking; seismic-related ground failure, including liquefaction; or landslides.
- Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property.
- Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of impacts on geology and soils resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which identify criteria that can lead to a determination of significant impact on geology and soils. A development project could have a significant impact on geology and soils if the project would:

- Result in substantial soil erosion or the loss of topsoil.
- Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified several indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on geology and soils. These include:

- Inventory and discussion of soil organic matter pre- and post-implementation of any project components involving grading or grading/clearing.
- Identify and estimated quantification (acres) of temporary and permanent ground disturbance according to high/moderate/low erodibility soils classes and slope stability concerns, in particular to the cut and fill process needed for trail construction.
- Discuss of soil disturbance on Naturally Occurring Asbestos soils.
- Analyze increased erosion hazard due to temporary and permanent ground disturbance and future modification in reservoir management.

- Inventory of erodible soils by soil map unit.
- Identify BMPs to reduce soil erosion.

4.6.3.2 Assumptions and Methods Used to Determine Impact/Effect

As a part of this environmental analysis, it is assumed that geological, seismic, and soil information provided by the various governmental agencies used in the environmental setting is the best information available at this time and as up-to-date as possible. The method used to determine the impact/effect is a comparison of the existing conditions to the post-project/action conditions as well as an analysis of how the proposed project/action would affect the environment during construction activities. If it determined that the proposed project/action will impact/effect the environment based on the CEQA guidelines issue area defined above, mitigation measures are included in this analysis to reduce the impact to a less than significant level or result in no adverse effect.

4.6.3.3 Direct And Indirect Impacts/Effects

Impact GEO-1 **The construction and operation of the proposed project/action may result in the potential for substantial soil erosion and/or loss of topsoil. Impact Determination: *Less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA).***

Construction Impacts

No Project/Action Alternative

Under the No Project/Action Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternatives 1 and 2

The proposed project/action and Alternatives 1 and 2 would result in the placement of radial gates and the removal and relocation of several recreational facilities. The removal and relocation of facilities include campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities. Erosion could occur during construction given the slopes and nature of activities.

The proposed project/action and alternatives also include a timber harvest plan which affects approximately 40 to 43 acres. The timber harvest would expose those areas between current high-water mark and the new high-water mark to potential wind and water erosion and loss of top soil. See Chapter 2.0 for a description of the timber harvest plan.

Hazard tree abatement would be conducted within 150 feet of the relocated JHMT, the Sugar Pine trial and relocated campgrounds and picnic area. The hazard tree treatment area would be approximately 110 acres in size. The hazard trees would be felled and removed via end-lining from a skidder. Furrows created during tree removal would be filled and recontoured to match the existing slope.

Direct impacts/effects substantially increasing the potential for erosion and loss of topsoil would be those related to the construction of the proposed project/action as these processes inherently remove the vegetation and natural drainage features that protect topsoil and decrease erosion.

Placement of the radial gates would not result in construction-related erosion impacts. The gates will be place in a structure already designed to accommodate the gates. The gates will be lowered into place by crane and attached by existing concrete anchors. No earth moving activities or other activities would occur that would increase the potential for erosion at the spillway. Placement of the radial gates would have ***no impact*** (CEQA) and ***no effect*** (NEPA) regarding erosion or loss of topsoil during construction.

Recreational facility construction activities such as the removal of existing structures, construction of the realigned trails, excavation, and grading would occur in soils that are rated by NRCS (as shown in *Table 4.6-1*) with a severe erosion hazard. Conducting these activities would result in the temporary disturbance of soil and would expose disturbed areas to storm events. Rain of sufficient intensity could dislodge soil particles from the soil surface. If the storm is large enough to generate runoff, localized erosion could occur. Because steep slopes are present in certain areas of the project site, severe erosion could occur as a result of some of the proposed activities. In addition, soil disturbance as a result of construction activities could result in soil loss because of wind erosion. The USFS requires measures to protect water quality using BMPs as discussed in *Water Quality Management for National Forest Lands in California – Best Management Practices.* Therefore, the recreational facilities construction-related impact would be potentially significant and adverse and would require mitigation. With implementation of mitigation measure **GEO-1**, the potential impact of the proposed project/action and alternatives on soils erosion from recreational facilities construction is considered ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Hazard tree abatement would affect approximately 110 acres. The hazard trees would be felled and removed via end-lining from a skidder. Furrows created during tree removal would be filled and re-contoured to match the existing slope. These processes would increase the potential for erosion and loss of topsoil and would be a potentially significant impact and adverse effect and require mitigation. With implementation of mitigation measure **GEO-2**, the impact is ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

The timber harvesting proposed as a part of the project/action would include the removal of trees and mature brush on 40 to 44 acres. This area will become part of the inundation area. Tree harvesting will include tree cutting, transport of felled trees to one of the landing areas, processing of the trees, and transporting the processed trees off-site. Logging equipment will use the reservoir's existing roads and accesses to implement logging procedures. However, it is estimated that approximately two miles of temporary road would be constructed to facilitate logging operations. The implementation of the timber harvesting operations would expose 40 to 43 acres, including two miles of temporary road, to increased erosion and a loss of topsoil. Under Alternative 2, the extent of disturbance to areas where slope exceeds 35% would be reduced through the use of helicopter harvest as opposed to mechanical harvest that would be employed under the proposed project/action. Nevertheless, the impact of timber harvest and vegetation management under the proposed project on soils erosion and each alternative would be potentially significant under CEQA, would be considered an adverse effect under NEPA and require mitigation. With implementation of mitigation measure **GEO-2,** the impact is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Mitigation Measures

Mitigation Measure GEO-1: FPUD shall prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs) for recreational facilities construction.

FPUD will implement a project-specific Stormwater Pollution Prevention Plan (SWPPP) at the time the Notice of Intent to Discharge is filed.

The SWPPP shall identify and specify the following:

i. The use of an effective combination of robust erosion and sediment control BMPs and construction techniques for use on the project site at the time of construction that shall reduce the potential for runoff and the release, mobilization, and exposure of pollutants; these may include but would not be limited to temporary erosion control and soil stabilization measures, sedimentation ponds, inlet protection, perforated riser pipes, check dams, and silt fences;
ii. The implementation of approved local plans, non-stormwater management controls, permanent postconstruction BMPs, and inspection and maintenance responsibilities;
iii. The pollutants that are likely to be used during construction that could be present in stormwater drainage and non-stormwater discharges, including fuels, lubricants, and other types of materials used for equipment operation;
iv. The means of waste disposal in a manner that would prevent discharges to surface waterways or groundwater;
v. Spill prevention and contingency measures, including measures to prevent or clean up spills of hazardous waste and of hazardous materials used for equipment operation, and emergency procedures for responding to spills;
vi. Personnel training requirements and procedures that shall be used to ensure that workers are aware of permit requirements and proper installation methods for BMPs specified in the SWPPP; and
vii. The appropriate personnel responsible for supervisory duties related to implementation of the SWPPP.

Where applicable, BMPs identified in the SWPPP shall be in place and functional during all site work and construction/demolition activities and shall be used in all subsequent site development activities. BMPs may include, but are not limited to, the following measures:

i. Implementing temporary erosion and sediment control measures in disturbed areas to minimize discharge of sediment into nearby drainage conveyances, in compliance with state and local standards in effect at the time of construction; these measures may include silt fences, staked straw bales or wattles, sediment/silt basins and traps, geofabric, sandbag dikes, and temporary vegetation;

ii. Establishing permanent vegetative cover to reduce erosion in areas disturbed by construction by slowing runoff velocities, trapping sediment, and enhancing filtration and transpiration; and

iii. Using drainage swales, ditches, and earth dikes to control erosion and runoff by conveying surface runoff down sloping land, intercepting and diverting runoff to a watercourse or channel, preventing sheet flow over sloped surfaces, preventing runoff accumulation at the base of a grade, and avoiding flood damage along roadways and facility infrastructure.

Mitigation Measure GEO-2: Prepare and Implement a Storm Water Pollution Prevention Plan (SWPPP) and Best Management Practices (BMPs) for the timber harvesting plan to include the following measures:

- Use existing roads if possible.
- Use existing paved areas for log landings, if possible. Existing areas should be used if they were designed to control erosion. They should be free of standing water in all seasons and sloped to disperse water to vegetated areas and ditches.
- New haul roads and landings shall be located on firm, well-drained soil, as far from water as possible.
- New landings shall be slightly sloping to shed water and keep equipment on firm ground.
- Stabilize areas where heavy equipment is parked shall be stabilized using gravel, logs, or other materials to prevent heavy equipment from settling down in forest soils.
- Log decks and landings shall be kept at a minimum size. Enough space should be available for moving equipment, processing and stacking logs, and loading log trucks without rutting up the adjacent forest. Landings should not be any larger than necessary.
- Truck/wheel washing facilities shall be provided to prevent mud from being tracked onto public roads from landings and haul roads.
- The new haul road and log landings shall be encompassed with erosion control measures such as straw bales, waddles, sediment traps, fabric fencing barriers to control runoff and prevent contaminates from flowing off-site.

- The above erosion control measures shall be included in the final Timber Harvesting Plan.

Operation Impacts

No Project and No Action Alternatives

The No Project and No Action Alternatives include approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact regarding erosion and loss of top soil. However, under the No Project and No Action Alternatives, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size as more water will be needed to serve future FPUD water users. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. This may have an indirect impact/affect as over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. The area that would be exposed because of a short-term drawdown would not be affected by the loss of top soil as this area, under normal conditions, is under water and would remain somewhat wet during the exposure period. The increase of long-term drawdowns may intensify the potential for erosion as bare soil is exposed for a longer basis allowing for drying of the soil. Because this soil is not protected by vegetation, a drying of the soil will allow the soil to be affected by wind and water erosion to a great extent. However, the drawdowns would be gradual over time and only affect relatively short expanses of bare soils for each drawdown. Erosion from this area would be minimal and any sedimentation caused by this erosion would settle to the lake bottom thereby, eliminating any downstream water quality issues. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternative 2

Indirect impacts/effects related to loss of top soil and the potential for increased erosion would be those caused by be use of the new facilities and trails and an increase in potential drawdown area in the lake.

Upon completion of the proposed project/action or Alternative 2, recreational facilities and reservoir use would continue as it was prior to implementation of the project. The relocated campsites, picnic areas, and parking spurs would be located nearby to existing campsites, picnic areas, and parking spurs as shown in *Figures 4.11-1 through 4.11-5*. The location of these facilities would be required, because of the nature of use, to be on fairly level ground. This, in turn, would limit the runoff and erosion potential at these new sites during operation of the proposed project/action or Alternative 2.

The proposed project/action and Alternatives 1 and 2 include the construction of 2.8 miles of paved trail and 1.5 miles of natural soil trail. These trails would be constructed to the requirements of the Forest Service's Standard Trail Plans and Specifications. The Standard Trail Plans and Specifications were developed to assist with trail design, construction, maintenance, inventory, condition assessment, and the assembly of trail construction plan packages (USFS 2014). The 2.8-mile JHMT would be a fully accessible paved trail. During operation of the project/action, the paved trail would have little to no erosion due to the paved surface.

However, unsurfaced trails are susceptible to a variety of trail impacts. Common impacts include vegetation loss and compositional changes, soil compaction, erosion, muddiness, exposure of tree roots, trail widening, and the proliferation of visitor-created side trails. Soil erosion exposes rocks and plant roots, creating a rutted, and uneven tread surface. Erosion can also be self-perpetuating when treads erode below the surrounding soil level, preventing the diversion of water from the tread. This in turn, result in increased water turbidity and sedimentation (USGS 2006).

In 2006, the USGS completed an assessment of the causes of trail degradation and factors of erosion from this degradation in the Big South Fork National River and Recreational Area (USGS 2006). This assessment determined that though trail degradation is caused by many factors, such as topography, soil types, and uses, trail degradation can be minimized through proper trail design (alignment), construction and maintenance. An important aspect of trail design is the grade or slope of trails. Steeper trail grades are associated with greater susceptibility to soil erosion, particularly when the substrates have little rock content and are readily eroded. Another factor affecting trail degradation is trail slope alignment angle. Trails that directly ascend slopes are difficult or impossible to drain water from so they are highly susceptible to erosion. The least erodible trails are those that are aligned with the contour.

Approximately 1.5 miles of the Sugar Pine Multi-Use Trail will be relocated. This trail would be constructed using those techniques for erosion control established in the Forest Service's Standard Trail Plans and Specifications. These features would minimize the potential for erosion during operation. Therefore, implementation of the proposed project/action or Alternative 2 would not result in a substantial increase in erosion or the loss of topsoil during operation and would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) related to recreational facilities and trail use.

Installation of the radial gates would increase water levels by 20 feet. At full drawdown of the reservoir, this would increase the drawdown area over existing conditions resulting in the exposure of a greater amount of bare soil. The increased drawdown area would affect up to 44 acres over existing conditions. However, the drawdown would occur over a relatively long period and for a portion of this time the soil will be saturated limiting the potential for windblown erosion would during that period. However, once this area becomes dry, water and windblown erosion could occur. While this does occur under current conditions, the proposed project/action would increase the total area of exposed soil during transfers in excess of 2,000 acre feet resulting in an increase in the potential amount of erosion. However, the drawdowns would be gradual over time and only affect relatively short expanses of bare soils for each drawdown. Erosion from this area would be minimal and any sedimentation caused by this erosion would settle to the lake bottom thereby, eliminating any downstream water quality issues. As such, the proposed project/action would have a ***less than significant impact*** under CEQA regarding erosion during operation of the reservoir.

NEPA requires that both context and intensity are considered to determine the level of significance (CFR § 1508.27). Context refers to several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Intensity refers to the severity of the impact.

Because NEPA requires that both context and intensity are considered when analyzing the level of environmental effect, the resultant determination may be different than that of CEQA. When considering the potential level of impact for erosion and loss of topsoil for NEPA, a consideration of context and the weighing of this context and the potential intensity of impact must be considered. In the case of the Sugar Pine Reservoir and the proposed project/action, the Tahoe National Forest LRMP and original reason the Sugar Pine Reservoir was constructed must be taken into account. The reservoir was constructed to provide a reliable resource for water. The LRMP identifies the following goals that pertain to this construction and the proposed project/action.

Recreation

Goal 1) *Provide a broad spectrum of dispersed and developed recreation opportunities in accordance with identified needs and demands.*

Goal 3) *Work with cooperating water agencies and irrigation districts to maintain desirable water levels on reservoirs through the entire length of the recreation season.*

Soil, Water, And Riparian Areas

Goal 1) *Produce water of sufficient quality and quantity to meet or exceed identified use requirements and improve water quality by the year 2030.*

While implementation of the proposed project/action or Alternative 2 would increase the area of potential of erosion, in consideration of the primary purpose of the reservoir (water supply) the goals of the LRMP stated above, and the understanding that the amount of erosion would decrease over time (intensity), under NEPA, the proposed project/action would result in ***no effect***.

Alternative 1: Layne's Butterweed Trail Realignment

As discussed in Chapter 3.0, the Layne's Butterweed Trail Realignment Alternative reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acres of Layne's butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne's butterweed occurrences and associated hazard tree mitigation 150 feet. on both sides of the trail alignment, this alternative is identical to the proposed project/action.

Alternative 1 would move the trail upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. It would not be paved and would have a native soil surface. This portion of the trail would have switchbacks to navigate the slope and it would be slightly longer than the alignment described as part of the proposed project/action.

Construction Related Impacts

While this alternative would avoid impacts to Layne's Butterweed, because of the similarities of the Layne's Butterweed Trail Realignment Alternative and the proposed project/action, this alternative would have the same construction related impacts related to erosion and loss of topsoil as the proposed project/action. The realignment of the trail to avoid impacts to Layne's Butterweed would have little effect on the potential impacts related to erosion and loss of topsoil. Alternative 1 would result in a potentially significant impact. With implementation of mitigation measure **GEO-1**, however, the impact is considered ***less than significant with mitigation incorporated***.

As with the proposed project/action, because CEQA requires the implementation of the mitigation measures to reduce impacts potential construction impacts for the loss of topsoil and increase in erosion, NEPA considers this to be a part of the alternative. As such, the Layne's Butterweed Trail Realignment Alternative would have ***no effect*** related to construction under NEPA.

Operation Impact

The only event different between this alternative and the proposed project/action would be the realignment of the JHMT to avoid impacts to Layne's Butterweed. This portion of the trail would be unpaved and would have a native soil surface. Since the realigned portion of the trail to would have to navigate the slope, it would involve a number of switchbacks. While, this trail would be constructed using the erosion control requirements established in the Forest Service's Standard Trail Plans and Specifications, it would be longer and have a greater incline than the proposed project/action. Therefore, operational erosion and loss of topsoil impacts would be potentially greater than the proposed project. However, through proper design and maintenance of the trail the potential for erosion could be limited.

Implementation of Alternative 1 would not result in a substantial increase in erosion or the loss of topsoil during operation and would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) related to recreational facility and trail use.

Alternative 1 would have the same drawdown effect as the proposed project/action and result in a ***less than significant impact*** under CEQA and ***no effect*** under NEPA.

Impact GEO-2. Potential Geologic Hazards Related to Construction in Unstable Soils. Impact Determination: *Less than significant (CEQA) and no effect (NEPA) (Proposed Project/Action and Alternative 2); Less than significant with mitigation incorporated (CEQA) and no effect (NEPA) (Alternative 1).*

Construction Impacts

No Project and No Action Alternatives

Under the No Project Alternative and No Action Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The both alternatives include approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. As discussed in Section 4.6.1.3, the Sugar Pine Reservoir area is not susceptible to liquefaction, lateral spreading, subsidence or collapse. The continuation of FPUD service would have no impact regarding these geologic hazards. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternative 2

CGS has identified the portions of the area surrounding Sugar Pine Reservoir as being within a very high landslide susceptibility area (CGS 2019a). Although the proposed project/alternative and Alternative 2 would result in the potential for drawdowns of Sugar Pine Reservoir to increase, the areas directly adjacent to the reservoir that would be affected by these drawdowns are either Class III to Class VII rating on the Deep-Seated Landslide Susceptibility Map. This indicates that these areas are not within the very high susceptibility area for landslide. Additionally, there have been no indications of past landslides adjacent to the reservoir (CGS 2019b).

As discussed in Section 4.6.1.3, the Sugar Pine Reservoir area is not susceptible to liquefaction, lateral spreading, subsidence or collapse. Construction and operation of the proposed project/action or Alternative 2 would have no impact and no adverse effect regarding these geological hazards.

The construction of the proposed project/action may result in direct impacts/effects potentially resulting in on- or off-site landslide as areas within the construction footprint are identified as having a high landslide potential. As shown in *Figure 4.6-3*, while much of the area directly surrounding the reservoir is not considered to have a high landslide potential (less than Class VIII), those areas adjacent to Forbes Creek and the area between the Forbes Creek group campground and the boat ramp parking area are identified as being within the Class VIII to X range. Classes VIII, IX, and X have a very high landslide susceptibility. Relocation of the recreational facilities at the Giant Gap campground, the Shirttail Creek campground, the Manzanita Day Use area and the boat ramp are not located in a high landslide susceptibility area. Nor would the construction of these facilities, which would generally require shallow if any grading, result in substantial ground movement. Therefore, the construction in these areas would not increase the potential for on- or off-site landslides.

However, portions of the relocated JHMT are located in a high landslide susceptibility area. Construction of this trail and the related hazard tree abatement may increase the potential for landslides tin these areas. Additionally, the tree harvesting portion of the proposed project/action may also increase the potential for landslides in the Class VII though X areas. Design of the trail and revegetation of adjacent areas as soon as possible can reduce the potential for landslides due to trail construction. Additionally, there is no history of substantial landslides in the proposed project/action area. Construction/relocation of the recreation facilities and trails would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) for landslides.

The timber harvesting proposed as a part of the proposed project/action would include the removal of trees and mature brush on 40 to 43 acres. Tree harvesting will include tree cutting, transport of felled trees to one of the log landing areas[2], processing of the trees, and transporting the processed trees off-

[2] Log landing - An area within a timber harvest where felled trees and/or logs are processed, piled, and/or loaded onto trucks for hauling to a mill.

site. Logging equipment will use the reservoir's existing roads and accesses to implement logging procedures. However, it is estimated that approximately two miles of temporary road would be constructed to facilitate logging operations. NRCS rates soils for use of haul roads and log landings. Ratings are based on slope, rock fragments on the surface, plasticity index, content of sand, the Unified classification of the soil, depth to a water table, ponding, flooding, and the hazard of soil slippage (NRCS 2019). *Table 4.6-1* illustrates this potential for soils in the proposed project/action area. While approximately half of the soils in the proposed project/action area are considered to have severe limitations for haul roads and as log landings, mainly due to steep slopes, only a small band in these areas around the lake will actually be logged because the steeper the slope, the smaller the inundation/logging area. The smaller logged area results in less potential for landslides in that area because of less ground disturbance and weakening of underlying soils. Additionally, as a part of the Tree Harvesting Plan, a portion of the tree stumps are to be left in place.[3] This will assist in preserving of the soil structure and lessen the potential of landslides. Finally, there is no history of substantial landslides in the proposed project/action area (CGS 2019b). As such, timber harvesting would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) for landslides.

As discussed above the proposed project/action would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) regarding the potential for a geologic unit to become unstable due to the project.

Alternative 1

As discussed in Chapter 3.0, Alternative 1 reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acre of Layne's butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne's butterweed occurrences and associated hazard tree mitigation 150 feet on both sides of the trail alignment, this alternative is identical to the proposed project/action.

Alternative 1 would move the trail upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. It would not be paved and would have a native soil surface. This portion of the trail would have switchbacks to navigate the slope and it would be approximately 0.6 miles longer than the alignment described as part of the proposed project/action.

While this alternative would avoid impacts to Layne's Butterweed, because of the similarities of the Layne's Butterweed Trail Realignment Alternative and the proposed project/action, this alternative would have the similar construction related impacts related to unstable soils as the proposed project/action with the exception that this alignment of the trial would have a greater potential for landslides. This is because a portion of the Alternative 1 alignment would be within a very high landslide susceptibility area (CGS 2019b). However, as with the proposed project/action, proper design and construction of the trail and the use of best management practices to limit erosion and provide soil stabilization as identified under

[3] Tree stump clearing is planned for only those areas within 300 feet of the campgrounds, day use area and boat ramp.

mitigation measure **GEO-1** in this area would limit the landslide potential. As such, Alternative 1 would result in a ***less than significant impact with mitigation incorporated*** related to unstable soils.

As with the proposed project/action, the Layne's Butterweed Trail Realignment Alternative would have ***no effect*** related to construction under NEPA.

Operation Impact

Proposed Project/Action and Alternative 2

Upon completion of the proposed project/action and Alternative 2, recreational facilities and reservoir use would continue to be used as it was prior to implementation of the project. The relocated campsites, picnic areas, and parking spurs would be located nearby to existing campsites, picnic areas, and parking spur. These areas are located on relatively flat ground and as such would not result in the potential for a geologic unit to become unstable due to the project resulting in a landslide.

The proposed project/action and Alternative 2 also include the relocation of the existing Joshua M. Hardt Accessible Trail, the Sugar Pine Multi-Use Trail and two trail bridges, interpretive signs and seating benches. Those areas of the JHMT and the Sugar Pine Multi-Use Trail that are to be relocated, would be constructed to follow the existing contours with drainage features added as necessary will be paved and as such little to no erosion would occur during operation of the trail. These features would limit the potential for landslides during operation.

Installation of the radial gates would increase water levels by 20 feet. At full drawdown of the reservoir, this would increase the bathtub ring area over existing conditions resulting in the exposure of a greater amount of bare soil and the potential for landslides due to the weakening of the soil structure. However, as identified by CGS the areas directly adjacent to the reservoir that would be affected by these seasonal drawdowns are either Class III to Class VII rating on the Deep-Seated Landslide Susceptibility Map. This indicates that these areas are not within the very high susceptibility area for landslide (CGS 2019a). Additionally, as a part of the Tree Harvesting Plan, a portion of the tree stumps are to be left in place. This will assist in preserving the soil structure and lessen the potential of landslides. Finally, there have been no indications of past landslides adjacent to the reservoir (CGS 2019b). Therefore, this alternative would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) regarding this issue area.

Alternative 1

The only difference between Alternative 1 and the proposed project/action would be the realignment of the JHMT to avoid impacts to Layne's Butterweed. This portion of the trail would be unpaved and would have a native soil surface. Since the realigned portion of the trail to would have to navigate the slope, it would have a number of switchbacks however, the trail would be constructed to follow the existing contours as much as possible with drainage features added as necessary. These features would limit the potential for erosion. Operational impacts related to unstable soils would be similar to the proposed project. Therefore, implementation of Alternative 1 would not result in impact due to unstable soils during operation and would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA).

Impact GEO-3 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Impact Determination*: Less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA)*.

The proposed project is not located in an area that has known paleontological resources. However, under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact regarding cultural resources. However, under the No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in number because of a higher demand for water. Although unlikely, continued drawdowns of the lakes could uncover unknown resources beneath the lake bed. If resources, that were previously underwater were uncovered, exposing them to further erosion by the elements as well as looting would have a potentially significant impact regarding this issue area. construction activities will require the ground disturbing activities that could uncover unknown resources. Additionally, construction would require ground disturbing activities that could uncover unknown resources. Therefore, construction-related impact would be potentially significant and adverse and would require mitigation. With implementation of mitigation measure **GEO-3**, below, the impact of the proposed project/action and Alternatives 1 and 2 is considered ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Mitigation Measures

Mitigation Measure GEO-3: If subsurface deposits believed to be paleontological in origin are discovered during construction, then all work must halt within a 50-foot radius of the discovery. A qualified professional paleontologist shall be retained to evaluate the significance of the find and collect specimens, if required. Work may not continue at the location of the find until the paleontologist, in coordination with the lead agency, determines that there will be no further impact to paleontological resources.

4.6.3.4 Cumulative Impacts

Approach to Assessing Cumulative Impact on Geology and Soils

Section 15130 (a) of the California State CEQA Guidelines states:

> An EIR shall discuss cumulative impacts of a project when the project’s incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not “cumulatively considerable,” a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

NEPA, as amended, requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1500 1508) define cumulative impacts as:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taken place over a period of time (40 CFR 1508.7).

Cumulative Setting

For the purpose of this EIR/EIS, and for the purpose of assessing the cumulative impact of the proposed project/action on geology and soils, impacts associated with geology and soils are generally site-specific (determined by a particular site's soil characteristics, topography, location of site, and proposed land uses), rather than cumulative in nature. In California, individual development projects would be subject to, at a minimum, uniform site development and construction standards relative to seismic and other geologic conditions that are prevalent in the region. Impacts regarding surficial deposits, namely erosion and sediment deposition, can be cumulative in nature in a watershed. The reader is referred to Section 4.10, *Hydrology and Water Quality*, regarding cumulative water quality impacts from soil erosion.

Effects of Past, Present, and Reasonably Foreseeable Future Actions

Impact GEO-4. Cumulative Geologic Hazards Related to Substantial Soil Erosion and/or Loss of Topsoil. Impact Determination: *Not cumulatively considerable.*

As discussed above, cumulative impacts related to geology and soils are generally site-specific. As such, cumulative projects would necessarily have to be adjacent to or in close proximity to a proposed project/action in order to have related cumulative impacts. This is because geologic materials, minerals, and soils occur at specific locales and are unaffected by activities not acting on them directly and any impacts of the proposed project/action would be site-specific. The only project within proximity of the Sugar Pine Recreation Area is the subject proposed project/action. No other past, present, and reasonably foreseeable future projects/actions are in the subject project/action area.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. As discussed in under Impact GEO-1, the No Project/Action Alterative would result in a potentially significant impact under CEQA and adverse effect under NEPA because of the potential for erosion from increased drawdowns. No other cumulative projects are identified as being in the immediate area which would add to the erosion potential. The No Project/Action alternative , the No Project/Action Alternative would be the continuation of existing conditions. As such, this alternative would have a ***less than cumulatively considerable impact*** related to erosion and loss of top soil.

Proposed Project/Action

The proposed project/action would result in a less than significant impact under CEQA and no adverse effect under NEPA regarding the potential for erosion. No other cumulative projects are identified as being in the immediate area which would add to the erosion potential. As such, the impact of proposed project/action would be ***less than cumulatively considerable*** related to erosion and loss of top soil.

Layne's Butterweed Trail Realignment Alternative (Alternative 1)

With the exception of a realignment of a portion of the trial to reduce biological impacts, Alternative 1 is the same as the proposed project/action. This alternative would have the same potential for erosion from increased drawdowns as the proposed project/action and result in a less than significant impact and no adverse effect. As such, the impact of Alternative 1 would be ***less than cumulatively considerable*** related to erosion and loss of top soil.

Helicopter Harvest Alternative (Alternative 2)

The use of helicopters would reduce the number of onsite vehicle trips to transfer the cut material to the landings. Other than the reduced number of onsite vehicle trips, this alternative would be the same as the proposed project/action in every other aspect. This alternative would have the same potential for erosion from increased drawdowns as the proposed project/action and result in a less than significant impact and no adverse effect. No other cumulative projects are identified as being in the immediate area which would add to the erosion potential. As such, the impact of Alternative 2 would be ***less than cumulatively considerable*** related to erosion and loss of top soil.

Impact GEO-5. Cumulative Geologic Hazards Related to Unstable Soils. Impact Determination: *Not cumulatively considerable.*

As discussed above, cumulative impacts related to geology and soils are generally site-specific. As such, cumulative projects would necessarily have to be adjacent to or in close proximity to a proposed project/action in order to have related cumulative impacts. This is because geologic materials, minerals, and soils occur at specific locales and are unaffected by activities not acting on them directly and any impacts of the proposed project/action would be site-specific. The only project within proximity of the Sugar Pine Recreation Area is the subject proposed project/action. No other past, present, and reasonably foreseeable future projects/actions are in the subject project/action area.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. As discussed in under Impact GEO-2, the Sugar Pine Reservoir area is not susceptible to liquefaction, lateral spreading, subsidence, collapse or landslides. As no other cumulative projects are identified as being in the immediate area, the continuation of the no project/action would be ***less than cumulatively considerable*** regarding these geologic hazards.

Proposed Project/Action

Because implementation of the proposed project/action would not result in impacts or effects related to unstable soils and no other projects are in the immediate vicinity which may increase cumulative impacts as a result of unstable soils. The impact of the proposed project/action would be ***less than cumulatively considerable*** regarding these geologic hazards.

Alternative 1

With the exception of a realignment of a portion of the trial to reduce biological impacts, Alternative 1 is the same as the proposed project/action. However, this alignment of the trail would have a greater potential for landslides. Proper design and construction of the trail and the use of best management practices to limit erosion and provide soil stabilization as identified under mitigation measure **GEO-1** in this area would limit the landslide potential.

Because implementation of Alternative 1 would not result in impacts or effects related to unstable soils and no other projects are in the immediate vicinity which may increase cumulative impacts as a result of unstable soils. The Alternative 1 would have a ***less than cumulatively considerable impact with mitigation incorporated*** regarding these geologic hazards.

Alternative 2

The use of helicopters would reduce the number of onsite vehicle trips to transfer the cut material to the landings. Other than the reduced number of onsite vehicle trips, this alternative would be the same as the proposed project/action in every other aspect.

Because implementation of Alternative 2 would not result in impacts or effects related to unstable soils and no other projects are in the immediate vicinity which may increase cumulative impacts as a result of unstable soils. The impact of Alternative 2 would be ***less than cumulatively considerable*** regarding these geologic hazards.

4.6.4 Residual Unavoidable Effects

The proposed project/action and Alternatives 1 and 2 would result in potential erosion impacts during construction and the timber harvest. These impacts would be reduced to a less than significant level with implementation of mitigation measures **GEO-1** and **GEO-2**. Additionally, the discovery of unknown paleontological resources during construction activities have the potential to occur. This impact would be reduced to a less than significant level with implementation of mitigation measure **GEO-3**.

Additionally, the proposed project/action alternatives 1 and 2, as well as, the no project/action alternative would all result in a ***less than cumulatively considerable*** impact related to erosion and loss of top soil.

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4.7 Hazards and Hazardous Materials

This section evaluates the potential environmental effect of the proposed project related to hazards and hazardous materials. This section describes existing site conditions and the regulatory setting pertaining to hazards/hazardous materials. Potential environmental effects of project construction and operation related to the use, transport, and storage of hazardous materials are assessed, as are other hazards to public safety that may occur because of the project. This includes potential project effects related to fire hazard.

The CEQA significance criteria for potential impact on schools is based on a project location within 0.25 mile of any existing or proposed school. As no existing or proposed school is located within that distance, the project would have no impact and, therefore, this issue is not discussed further in this section.

4.7.1 Environmental Setting

4.7.1.1 Hazardous Materials and Waste

Hazardous materials and wastes are those substances that, because of their physical, chemical, or other characteristics, pose a risk of endangering human health or safety or of endangering the environment (California Health and Safety Code Section 25260). Types of hazardous materials include petroleum hydrocarbons, persistent bioaccumulative toxins such as lead and mercury, industrial carcinogens, pesticides, and volatile organic carbons.

The California Department of Toxic Substances Control (DTSC) maintains a database (EnviroStor) of organizations handling or disposing of hazardous waste and maintains a list of sites within the state that represent hazardous waste facilities subject to corrective action, lands designated as hazardous waste properties or border zone properties, and public drinking water wells that contain detectable levels of organic contaminants and that are subject to water analysis. A query of the EnviroStor database determined that the database does not contain any hazardous sites within 4 miles of the proposed project site. The closest site is located approximately nine miles southeast of the proposed project along Iowa Hill Road in Colfax.

As described in Chapter 3, “Project Description,” of this DEIR/EIS, the proposed project site is located approximately 7.5 miles north of the town of Foresthill on and around the Sugar Pine Reservoir. The area surrounding the site consists mostly of forest lands. At full pool, the reservoir covers approximately 165 acres and contains approximately 6,921 acre feet of water. The Reservoir supplies water to the Foresthill Public Utility District. Expansion of the Sugar Pine Reservoir storage capacity is necessary to meet current and projected future water demands for municipal, industrial, agricultural, and fire control uses.

4.7.1.2 Fire Protection

Fire protection in the area is provided by the Placer County Fire Department (Placer Fire). Placer Fire operates eight full Time stations with paid staff, and seven volunteer stations. Placer Fire operates through a Cooperative Fire Protection Agreement with CAL FIRE. Placer Fire integrates state and local firefighting resources, career and volunteer, to provide all risk fire and emergency medical services to a 475-square-mile service area. Placer Fire currently has eight full time career and five volunteer fire stations that serve a population of 58,000 residents and businesses in unincorporated Placer County and protect $6.7 billion in private property and infrastructure. Placer Fire responds to over 9,000 calls for service annually. The project site is provided fire service from Placer County Fire (CSA 28, Zone 137) and the closest fire station is the Iowa Hill Volunteer Fire Station #31, approximately 3.5 miles west of the reservoir.

The project site is located in unincorporated Placer County within an area classified by CAL FIRE as a Very High fire hazard within a State or Federal Responsibility Area. Potential sources of wildland fire on the project site include those associated with natural occurrences such as lighting strikes and with human activities such as use of internal combustion vehicles and other spark-ignited or heat-generating equipment, illegal campfires and improper disposal of ignited cigarettes. The current use of the project site is expected to create a limited potential for human-caused fire ignition on the property.

4.7.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action’s effects on hazards and hazardous materials.

4.7.2.1 Federal Plans, Policies, Regulations, and Laws

Federal laws require planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and if such materials are accidentally released, to prevent or mitigate injury to health or the environment. The primary federal agencies with responsibility for hazardous materials management include the USEPA, OSHA, and the U.S. Department of Transportation. Applicable federal regulations pertaining to hazardous materials are primarily contained in the CFR Titles 29, 40, and 49. Hazardous materials, as defined in the Code, are listed in 49 CFR 172.101. Management of hazardous materials is governed by the following laws, among others:

- The Toxic Substances Control Act of 1976 (15 USC §§ 2601–2697) regulates the manufacturing, inventory, and disposition of industrial chemicals, including hazardous materials. Section 403 of the Toxic Substances Control Act establishes standards for lead-based paint hazards in paint, dust, and soil. This is the federal law that mandates use of the Universal Hazardous Waste Manifest to track hazardous substances from “cradle to grave.”
- The Resource Conservation and Recovery Act of 1976 (42 USC §§ 6901–6992k) is the law under which USEPA regulates hazardous waste from the time the waste is generated until its final disposal (“cradle to grave”).
- The CERCLA (42 USC §§ 9601–9675) gives USEPA authority to seek out parties responsible for releases of hazardous substances and ensure their cooperation in site remediation.
- The Superfund Amendments and Reauthorization Act (SARA) of 1986 (Public Law 99-499), also known as SARA Title III or the Emergency Planning and Community Right-to-Know Act of 1986

(EPCRA), imposes hazardous materials planning requirements to help protect local communities in the event of accidental release.

The federal Hazardous Materials Transportation Act (49 USC §§ 5101–5127) is the basic statute regulating transport of hazardous materials in the United States. Hazardous materials regulations are enforced by the Federal Highway Administration, the U.S. Coast Guard, the Federal Railroad Administration, and the Federal Aviation Administration.

OSHA is the agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 29 USC Sections 651–678). OSHA has adopted numerous regulations pertaining to worker safety, contained in CFR Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials and those required for excavation and trenching.

4.7.2.2 State Plans, Policies, Regulations, and Laws

In California, both federal and state community right-to-know laws are coordinated through the California Governor's Office of Emergency Services (OES). The federal law, SARA Title III or EPCRA, described above, encourages and supports emergency planning efforts at the state and local levels and to provide local governments and the public with information about potential chemical hazards in their communities. The provisions of EPCRA apply to four major categories: emergency planning, emergency release notification, reporting of hazardous chemical storage, and inventory of toxic chemical releases. Information gathered in these four categories helps federal, state, and local agencies and communities understand the chemical hazards in a particular location or area and what chemicals individual facilities are using, storing, or producing on site.

The DTSC, a division of the California Environmental Protection Agency (Cal EPA), has primary regulatory responsibility over hazardous materials in California, working in conjunction with USEPA to enforce and implement hazardous materials laws and regulations, including use of the Universal Hazardous Waste Manifest system.

Transport of Hazardous Materials and Hazardous Materials Emergency Response Plan

The State of California has adopted U.S. Department of Transportation regulations for the movement of hazardous materials originating within the state and passing through the state; state regulations are contained in 26 CCR. State agencies with primary responsibility for enforcing state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and Caltrans, these agencies determine container types, placarding, and signage used, and license hazardous waste haulers to transport hazardous waste on public roads.

California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governments and private agencies. Response to hazardous materials incidents is one part of the plan. The plan is managed by Cal OES, which coordinates the responses of other agencies in the project area.

Porter-Cologne Water Quality Act

Through the Porter-Cologne Water Quality Act and the National Pollutant Discharge Elimination System (NPDES) program, the Central Valley Regional Water Quality Control Board (CVRWQCB) has authority to require proper management of hazardous materials during project construction. For a detailed description of the Porter-Cologne Water Quality Act, the NPDES program, and the role of the Central Valley RWQCB, see Section 4.8 of this DEIR/EIS, "Hydrology and Water Quality."

California Occupational Safety and Health Administration

The California Occupational Safety and Health Administration (Cal/OSHA) assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are typically more stringent than federal OSHA regulations and are presented in Title 8 of the CCR. Cal/OSHA conducts on-site evaluations and issues notices of violation to enforce necessary improvements to health and safety practices.

4.7.2.3 Regional And Local Plans, Policies, Regulations, and Ordinances

Government Code Section 53091 states that building and zoning ordinances do not apply to "construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." Public utility projects that serve the facilities described above would not be subject to local plans, policies, regulations, or ordinances. The following local regulations related to hazards are provided for informational purposes and are provided as a basis to assist with CEQA and NEPA review in evaluating the level of significance associated with impacts.

Placer County General Plan

The Placer County General Plan has several goals and policies that deal with hazards. Below are the goals and policies that are applicable to the propose project.

Goal 8.C: *To minimize the risk of loss of life, injury, and damage to property and watershed resources resulting from unwanted fires.*

Policy 8.C.7. The County shall work with local fire protection agencies, the California Department of Forestry and Fire Protection, and the U.S. Forest Service to promote the maintenance of existing fuel breaks and emergency access routes for effective fire suppression.

Policy 8.C.10. The County shall continue to implement state fire safety standards through enforcement of the applicable standards contained in the Placer County Land Development Manual.

Goal 8.C: *To minimize the risk of loss of life, injury serious illness, damage to property, and economic and social dislocations resulting from the use, transport, treatment, and disposal of hazardous materials and hazardous materials wastes.*

Policy 8.C.13. The County shall work with local fire protection and other agencies to ensure an adequate Countywide response capability to hazardous materials emergencies.

4.7.3 Environmental Consequences

4.7.3.1 Analysis Methodology

This impact analysis examines the potential for the construction and/or operation of the proposed project to result in release of hazardous materials into the environment. Construction and operation of the project will comply with all applicable laws, permits, and legal requirements pertaining to hazards and hazardous materials, as discussed above. As described in Chapter 2 of this DEIR/EIS, the implementation of all Management Requirements (see Section 2.2.8 above) and Compensatory Mitigation (see Section 2.2.7, above) will be completed as part of the proposed project/action. Management Requirements that apply to the hazards and hazardous materials include WSU-2,3, 4 and 5 related to water source use, Compensatory Mitigation R1 (Public Safety) applies to project construction activities, specifically restrictions on public access to Sugar Pine Reservoir and adjacent recreational sites during project construction.

4.7.3.2 Definition and Use of CEQA Significance Criteria

The following thresholds of significance are based on Appendix G of the 2017 CEQA Guidelines. For the purposes of this DEIR/EIS, implementation of the proposed project may result in a potentially significant impact associated with hazards and hazardous materials if it would do any of the following:

- Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- Creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildfires.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified an indicator to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on hazards or hazardous materials. It is:

- Qualitatively assess potential hazards that could be introduced with construction activities and long-term operation of the project.

4.7.3.3 Direct and Indirect Impacts/Effects

Impact HAZ-1 Project construction will require the transport, storage and use of hazardous materials common for such activities and could result in their inadvertent release to the environment.

Impact Determination: *less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA)*.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact regarding transport, storage, and use of hazardous materials. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact/effects under CEQA and NEPA, respectively, as they relate to hazards and hazardous materials.

Project/Action and Alternatives

Construction of the proposed project/action would involve the transport, storage, and use of hazardous materials such as gasoline, diesel fuel, and various other construction materials. Protections in place to prevent the accidental release of chemicals, fuels, lubricants, and other potentially hazardous materials during project construction include implementation of an Erosion Control Plan, Stormwater Pollution Prevention Plan (SWPPP) and the installation of appropriate TNF Management Requirements (MRs). As noted above, MRs specific to hazards and hazardous materials include WSU 2, 3, 4, and 5. Implementation of the project will also require a Section 1602 Streambed Alteration Agreement (SAA), Section 401 Water Quality Certification, and Section 404 permit.

With implementation of the Erosion Control Plan, Spill Prevention Plan, SWPPP (as required with implementation of mitigation measures **GEO-1** and **GEO-2** in Section 4.6 (Geology, Soils and Paleontological Resources) of this DEIR/EIS), and TNF Management Requirements and compliance with all appropriate project permit conditions, measures to be implemented during project construction will be adequate to prevent, contain, or mitigate spills and releases of substances that could occur during construction. This impact, therefore, is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Impact HAZ-2 Project construction will require heavy machinery and personal in an area that is currently forestlands. Introduction of the construction equipment could temporarily increase the risk of fire.
Impact Determination: *less than significant (CEQA) and no effect (NEPA)*.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow the Foresthill Public Utility District (FPUD) to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would have no direct impact construction requirements of heavy machinery and personal. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact/effects under CEQA and NEPA, respectively, as they relate to fire risk.

Proposed Project/Action and Alternatives 1 and 2

The County has many policies and plans in place to help offset this risk to land and residences by preventative efforts and rapid response to wildland threats. Generally, the fire season extends from early spring to late fall. Fire conditions arise from a combination of hot weather, an accumulation of vegetation, and low moisture content in the air. These conditions, when combined with high winds and years of drought, increase the potential for wildfire to occur. The County is protected by multiple fire protection agencies, including nine local districts, nine Fire Departments, CAL FIRE, and the US Forest Service (USFS).

CAL FIRE provides wildland fire protection services on private, non-federal lands for the purpose of life, property and resource protection. USFS provide wildland fire protection services on federal lands in Federal Responsibility Areas for watershed and resource protection. Some areas are also identified as Local Responsibility Areas and are typically under the jurisdiction of City Fire Districts. Various agreements between the fire protection agencies enable cooperative fire protection services.

Although the proposed project/action is located in an SRA classified as High and Very High, the proposed project does not exacerbate an existing condition by the addition of structures, machinery, people, or recreational opportunities that would encourage the use of flammable materials or create situations that could lead to increase fire risk. The proposed project/action is intended to increase available water supplies within the existing reservoir that will be available for fire protection use. The project would also inundate an area of forest with water thereby eliminating the risk for the area to burn. Therefore, the propose project would not exacerbate wildfire risks and impacts would be ***less than significant*** (CEQA) and ***no effect*** (NEPA).

4.7.3.4 Cumulative Impact

Section 15130 (a) of the California State CEQA Guidelines states:

> "An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable."

NEPA, as amended, requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1500 1508) define cumulative impacts as:

> "… the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor but collectively significant actions taken place over a period of time (40 CFR 1508.7)."

For the purpose of this DEIR/EIS, and for the purpose of assessing the cumulative hazards impact of the proposed project/action are related to construction activities only, rather than cumulative operational impacts. The proposed project/action will not introduce new hazards to the project area and will decrease existing fire risks by inundating exposed timberlands with water. As such cumulate impacts for the proposed project site are considered ***not cumulatively considerable***.

4.8 Hydrology and Water Quality

This section of the DEIR/EIS assesses the potential direct, indirect and cumulative effects of the proposed project/action on hydrology and water quality. The proposed installation of radial gates at Sugar Pine Dam, subsequent expansion of the storage capacity of Sugar Pine Reservoir and future modifications in reservoir operations and releases to Shirttail Creek will affect hydrology within the future reservoir inundation area and stream flow downstream of the dam. Construction activities related to gate installation, vegetation removal within the area of reservoir expansion, and implementation of compensatory mitigation measures may adversely affect reservoir, stream and diversion water quality. Installation of radial gates within the Sugar Pine Dam spillway and the proposed increase in storage capacity behind the dam could also affect downstream flood risk in the event of dam failure.

Section 4.8.1 provides a description of the existing hydrological setting. Regulations, plans, policies and standards pertaining to reservoir operations, stream flow, and water quality protection are provided in Section 4.8.2. The environmental consequences resulting from implementation of the proposed project/action and project alternatives are described in Section 4.8.3. Section 4.8.4 addresses residual effects of the project.

4.8.1 Environmental Setting/Affected Environment

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action would install radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. This will in turn increase the "safe yield" for water supply stored at the reservoir. Gate installation will provide additional water supply available for diversion by FPUD to serve current customers within the District's service area and ensure that adequate water will be available to serve future approved growth and development under the Foresthill Divide Community Plan adopted by the County of Placer. Additional storage capacity will also allow the District to increase the maximum size of temporary surplus water transfers to downstream users until such time as future demand within the service area increases to the point where surplus water is no longer available. Historically, transfers of up to 2,000 AF have been carried out by the District. With installation of the radial gates, periodic transfers of up to 5,000 AF could be executed.

In addition to gate installation and expansion of the Sugar Pine Reservoir inundation area, the proposed project/action would implement a compensatory mitigation program to replace recreational facilities affected by the project and mitigate for lost or degraded TNF natural and cultural resources. This section of the DEIR/EIS describes existing hydrological features (reservoirs, streams, drainages, etc.) that could directly or indirectly be affected by gate construction, site preparation, or compensatory mitigation development.

In addition to potential effects on hydrology within the project study area, installation of the radial gates, vegetation removal, recreational facility demolition, compensatory mitigation development could result in degradation of existing water quality within the study area. This section uses the best available information to characterize existing water quality within the project study area.

4.8.1.1 Regional Hydrology

Sugar Pine Reservoir was created with the construction of Sugar Pine Dam on North Shirttail Creek. The creek above the reservoir is referred to as North Shirttail Creek or upper Shirttail and the creek below the dam is generally referred to as lower Shirttail Creek. Forbes Creek enters Sugar Pine Reservoir along its southern shore to the southwest of North Shirttail Creek. The watershed from which runoff supplies Sugar Pine Reservoir encompasses approximately 9.4 square miles. Below the dam Shirttail Creek drains numerous perennial and ephemeral drainages from the Shirttail Canyon Watershed which encompasses approximately 54.4 square miles. During the wetter months, spills from Sugar Pine make up about 20% of the total flow at the confluence of Shirttail Creek and North Fork American River. In heavy rain events, flows are estimated to approach 5,000 cfs at the mouth, where Shirttail Creek discharges into the North Fork American River (i.e., at the confluence). During the drier months, controlled releases from Sugar Pine Reservoir can provide 50% of the total flow at the confluence. This change occurs because Sugar Pine Reservoir is the only storage facility that makes environmental water releases in the drier months during the period when natural runoff slows considerably.

Sugar Pine Dam is at elevation 3,609 feet. The Sugar Pine watershed includes two major tributaries whose headwaters reach a maximum elevation of approximately 4,800 feet. Although snowfall is a frequent occurrence in the watershed above the dam, snow rarely accumulates. In this part of the Sierra Nevada the snowpack generally begins to accumulate between 5,500 and 6,000 feet. Because this is a relatively low elevation watershed, any snowfall usually melts within a few days and contributes only a small portion of inflow to the reservoir. Given the small size of the watershed, inflow to the reservoir generally increases rapidly during storm events and decreases relatively quickly after precipitation stops. Runoff from the Sugar Pine and Shirttail Canyon watersheds drains to Shirttail Creek which, in turn, drains to the North Fork American River. The North Fork American River enters Folsom Reservoir south of the City of Auburn.

Over time, changes in climate may affect the timing and amount of inflow to Sugar Pine Reservoir. Most climate change scenarios project rising snow elevations with varying degrees of change to runoff volumes. A recent study by UCLA Center for Climate Science[1] indicates the elevation band projected to lose the most snow in the Sierra Nevada is between 5,000 – 8,000 feet. Because the watershed above Sugar Pine in 3,600 – 4,800 feet, runoff patterns are generally expected to remain dominated by rainfall events. Most volumetric estimates range seasonally by + 10%. In this watershed, the effects of climate change would likely result in earlier runoff patterns by just a few days following any snowfall events. Otherwise, runoff patterns would remain relatively unchanged by any changes in snowfall resulting from climate change. However, climate change also is expected to affect rainfall patterns, including the frequency of drought events, their duration, and their severity.

As described in detail in Section 2.2.5 (Reservoir Operations), Sugar Pine Reservoir is operated for the purpose of water supply and water levels fluctuate throughout the year. As a result, bare areas between bank-side vegetation and the water surface occur seasonally. Maximum storage capacity of Sugar Pine

[1] Reich, KD, N Berg, DB Walton, M Schwartz, F Sun, X Huang, and A Hall, 2018: "Climate Change in the Sierra Nevada: California's Water Future." UCLA Center for Climate Science.

Reservoir as gauged from the dam's spillway sill is currently 6,922 AF. Average annual inflow to the reservoir is approximately 14,000 AF. Typically, the reservoir fills (achieving maximum storage capacity to the dam's spillway sill) and spills (passes water over the spillway and into lower Shirttail Creek) annually. This occurs even in years with extended drought conditions such as was experienced recently from 2012 through 2016.

As described in Section 2.2.5, the operation of Sugar Pine Reservoir is currently subject to the direction and guidance contained in the following several key documents. The 2016 Sugar Pine Reservoir Operations Plan, *Appendix A* to this DEIR/EIS, includes: FPUD's State Water Right Permit 15375 (Attachment A), the 1967 Memorandum of Agreement between Reclamation and the California Department of Fish and Game (CDFG) (Attachment B), the 1985 Memorandum of Agreement between Reclamation and the TNF (Attachment C), the 2000 agreement between FPUD and the USFS (Attachment D), and the Key Sugar Pine Reservoir Storage and Elevation Levels for Long-Term Operations (Attachment E). *Appendix B* includes the 2003 Special Use Permit issued by the TNF authorizing use and occupancy of NFS lands. *Appendix C* includes the USFS TNF Land and Resource Management Plan section for Management Area 096 Sugar Pine. *Appendix D* includes Title V of Public Law 106-566. *Appendix E* includes the California Water Action Plan.[2]

4.8.1.2 Minimum Shirttail Creek Release Requirements and Minimum Reservoir Storage Requirements

Currently, the water right permit requires compliance with the January 26, 1967, Memorandum of Agreement with the CDFG (now CDFW) for the Protection and Preservation of Fish and Wildlife and Recreational Resources of North Shirttail Canyon Creek, which includes minimum release requirements and minimum pool requirements as follows:

- 5 cfs or natural inflow from February 1 to May 31, whichever is less, must be released to Shirttail Creek at Sugar Pine Dam;
- 2 cfs or natural inflow from June 1 through January 31, whichever is less must be released to Shirttail Creek;
- a minimum of 0.5 cfs must be released to Shirttail Creek at all times, regardless of the natural inflow;
- 3,560 AF storage at Sugar Pine Reservoir should be maintained during the recreation season from May 1 through September 30, subject to District water use; and
- at no time should FPUD maintain a minimum pool less than 1,100 AF of water.

The 1985 Memorandum of Agreement (1985 Agreement)between Reclamation and the TNF contains some additional instruction on reservoir operations. Paragraph 5 includes a statement that Reclamation reserves the right to vary, as it deems necessary, the water surface elevation of the reservoir. The Sugar

[2] http://resources.ca.gov/california_water_action_plan/

Pine Reservoir and Dam Conveyance Act (Public Law 106-566) provides that FPUD succeeds to Reclamation's rights and obligations under the 1985 Agreement.

4.8.1.3 Water Deliveries to the FPUD Service Area and Tahoe National Forest

FPUD's water right permit authorizes direct diversion of up to 18 cfs to serve customers within its service area. In addition, FPUD may divert to storage up to 15,400 AF annually. Total authorized diversion and use of water from Sugar Pine Reservoir is 24,076 AF annually under FPUD's water right permit. Between July 1 and November 1, FPUD relies on rediversion of Sugar Pine Reservoir storage to meet consumptive demands. In recent years, consumptive demands within FPUD's service area have averaged about 1,200 AF per year. The TNF may take up to 50 AF per year from the reservoir for water-based public recreation uses, including dust abatement on roads, and for fire control, and may use the existing power and water system located at the Dam.

4.8.1.4 Water Transfers

In accordance with the California Water Code and guidance from the 2014 California Water Action Plan and subsequent updates, FPUD began participating in water transfers using surplus stored water in 2015. The first transfer was carried out in spring of 2015 and released 2,000 AF of water to Shirttail Creek which enters the North Fork American River which in turn flows to Folsom Reservoir. From Folsom Reservoir, the transferred water entered the lower American River and then the Sacramento River for ultimate delivery to the Santa Clara Valley Water District. A second transfer was carried out in late summer/early fall of 2018. 932 AF was released from Sugar Pine Reservoir between September 8 and 26 for ultimate delivery to Kern County Water Agency and Dudley Ridge Water District.

Transfers can be conducted only when Sugar Pine Reservoir holds "surplus" water. Water stored in Sugar Pine Reservoir is considered to be surplus when that water can be withdrawn from storage while not impinging on minimum required releases to Shirttail Creek, water demand within the FPUD service area, minimum pool requirements for Sugar Pine Reservoir that protect recreation uses, and any applicable Folsom reservoir refill agreements associated with any previous transfer. To accommodate past transfers, surplus water was released from Sugar Pine Reservoir to Lower Shirttail Creek for storage in, or delivery through, Folsom Reservoir. That water was diverted from Folsom and released to the American River for ultimate delivery to, and use by the public water agency customers listed above.

4.8.1.5 North Shirttail and Forbes Creeks

The floodplain of North Shirttail Creek is dominated by white alder, Goodding's black willow, western azalea, and cut-leaved blackberry. The streambed is narrow (6.5-10 feet in most places). The lower stretch of North Shirttail Creek for at least 1,000 feet above Sugar Pine Reservoir is ephemeral and is generally dry during summer and early fall. Stream gradient is low and bank gradient low to moderate with some areas of steeply incised banks. Where North Shirttail Creek discharges into the reservoir, the banks become broad, unvegetated, and dominated by soil (ECORP 2018).

The channel of Forbes Creek is generally broader than North Shirttail Creek (13-16 feet) and sparsely occupied by Indian rhubarb and fowl mannagrass. The narrow floodplain of Forbes Creek is dominated by white alder, incense cedar, Pacific yew, miner's dogwood, western azalea, and cut-leaved blackberry. Rock, cobble, and bedrock dominate the instream substrates, with sand, gravel, and soil appearing in much lower proportion. Undercut banks are common, and like North Shirttail Creek, the site is in deep shade, though with a slightly more open canopy. Water depth throughout the reach averages approximately eight inches, with a few deeper pools to approximately 20 inches. Stream gradient throughout is generally low, and streambank gradient is low to high, with bank gradient increasing as the upstream extent of the survey was reached (ECORP 2018).

Lower Shirttail Creek begins at the outfall from Sugar Pine Reservoir. Just below the Dam, the channel of Lower Shirttail is broad (50 feet) and deep (greater than 1 meter) in places. Water pools at the outfall, and sun exposure is 100 percent. Boulder, rock, cobble, and concrete comprise the substrate. The streambed narrows quickly, however, and soon averages 3 - 10 feet wide. Canopy cover from streamside willows, California alder, and big-leaf maple becomes dense, with little direct sunlight reaching the creek. Indian rhubarb dominates in-stream vegetation, and at some places clumps of this plant become almost impenetrable. Instream vegetative cover (including rhubarb rhizomes) approaches 80 to 90 percent in places. Stream gradient is low to medium throughout the survey reach, but bank gradient is high. Undercut banks are uncommon. The entire reach is wetted, with water depths vary throughout the reach. This reach features colder water than the upper creeks and receives fluctuating flow volumes depending on the time of year and time-specific management of reservoir lake levels. Most of the creek farther down occurs on private property, and evidence of in-stream suction-dredge mining was found during the 2016 survey (ECORP 2018).

Lower Shirttail Creek at the confluence of the North Fork of the American River has characteristics similar to the river. It is a broad (to 98 feet at bank full) stream, lined with cobble, boulders, and bedrock, with evidence of regular scouring flows. Stream gradient for most of the stream is gentle, increasing in slope as one goes farther east (downstream) from the confluence. Instream habitats are diverse, with low gradient riffles and runs, a few mid-stream and side pools, and, as the upstream extent of the survey is reached, some cascade pools are found. Most of the reach occurs in full sun, with overhanging oaks and alders shading up to 30 percent of the bank at water's edge. Little emergent or submerged vegetation is present. High visitor-ship effects are evident, with many in-stream substrates showing abundant signs of in-stream mining.

4.8.1.6 Water Quality Setting and Affected Environment

The Sugar Pine Reservoir recreation area has been used for recreational purposes since 1983 and was visited by 47,831 persons in 2016 (see *Table 4.13-1*). Much of this use such as boating, fishing, and swimming can directly affect water quality in the reservoir. Other uses such as camping, picnicking and hiking can indirectly affect water quality in the reservoir as well as the creeks and drainages that feed the reservoir.

As discussed previously, the SWRCB identifies streams, rivers and lakes in the state that are considered to be impaired due to high pollution levels. Sugar Pine Reservoir, Shirttail Creek and Forbes Creek are not identified in the 303d list as impaired water bodies (SWRCB 2016).

Various parameters are considered in assessing existing water quality at Sugar Pine Reservoir relative to existing operations and the beneficial uses they serve. These parameters are discussed below and include: water temperature; dissolved oxygen levels; turbidity; chemical content; and nutrient content.

Water Temperature

Given the size and location of Sugar Pine Reservoir, temperature stratification is expected to occur annually during warm spring and summer months (Reclamation 1976). The thermocline[3] would generally occur at a depth of about 30-50 feet below the surface, below which colder reservoir water occurs. As discussed in Section 4.4 (Biological Resources), the reservoir supports both warm and cold-water resident fisheries but is generally managed for cold-water fishes to protect downstream cold-water fisheries. Surface water temperature during summer and fall can exceed 65˚F which could be detrimental to cold-water fishes downstream. Temperatures of deeper water, however, below the thermocline are more suitable to cold-water species. Sugar Pine Reservoir has multiple level intakes which allow for temperature management of releases to Lower Shirttail Creek.

Dissolved Oxygen

A water quality problem typical to many California reservoirs stems from anerobic conditions that can occur in the bottom layers of a reservoir during fall months prior to natural overturn or destratification that typically occurs in late fall or winter. Due to thermal stratification, little mixing or reaeration, and biochemical oxygen demand, the bottom reservoir layers can become devoid of oxygen. (Reclamation 1976)

Turbidity

Due to the relatively small size of Sugar Pine Reservoir, high turbidity can be expected at lower depths during storm periods and high flows in spring. As discussed in Section 4.6 (Geology) of this DEIR/EIS, erosion of soil from sparsely vegetated areas within the watershed and barren areas between the forested perimeter and reservoir waterline can be substantial. Such increases in turbidity, however, are short-lived and generally subside within a month of high runoff periods (Reclamation 1976). During storm periods, turbidity is highest near the reservoir bottom. The least turbid waters are available near the upper outlets of the reservoir.

Chemical Content

Chemical analysis of North Shirttail Creek and Forbes Creek show the water to be of excellent quality for all uses. Serpentine deposits occur along these drainages and, although small quantities of asbestos have

[3] "Thermocline" refers to a steep temperature gradient in a body of water such as a lake, marked by a layer above and below which the water is at different temperatures.

been observed, the presence of asbestos fibers in the creeks and reservoir do not pose a hazard for human use or biological resources (Reclamation1976).

4.8.1.7 Dam Safety

The proposed project/action would install two radial gates within the existing spillway of Sugar Pine Dam. The radial gates will add 20-feet of elevation and 3,700 AF of storage to the reservoir. The proposed gate installation is consistent with the original design of the Sugar Pine Project as constructed by the U.S. Bureau of Reclamation in 1983. The dam spillway was designed and constructed to accept 20-foot radial gates, and the dam itself was designed and constructed to accommodate an ultimate maximum storage capacity of approximately 10,872 AF.

Sugar Pine Dam, is under the jurisdiction of the California Department of Water Resources: Division of Safety of Dams (DSOD). Sugar Pine Dam (DSOD Dam No. 2045) has been certified by DSOD and has a condition assessment of "Satisfactory" (DSOD 2018a). The downstream hazard condition identified by DSOD for Sugar Pine Dam is "High." Prior to the initiation of project construction, FPUD must file an enlargement application with DSOD. The application must include final plans for radial gate installation, specifications, and the appropriate filing fee. All dam safety related issues must be resolved prior to approval of the application by DSOD, and the work must be performed under the direction of a Civil Engineer registered in California.

The operation, maintenance and repair of Sugar Pine Dam is also subject to the conditions included in the Special Use Permit (SUP) issued to FPUD by USFS in 2003 (see *Appendix B* of this DEIR/EIS). SUP conditions specific to dam safety are included in Section E (Dam Safety) of the 2003 SUP and include provisions for construction, inspection, certification (by USFS), and project files management. The SUP also specifies when and under what conditions dam operation and maintenance plans should be reviewed and amended as needed. Under the criteria described in Forest Service Manual (FSM) 7512, the "hazard potential" for Sugar Pine Dam is classified as "Low."

The District recently completed a dam spillway condition assessment. The assessment was conducted by Wagner & Bonsignore Consulting Civil Engineers, Inc., and included a review of historical records for the dam on file at FPUD, DSOD, and a visual inspection of the spillway facilities and environs by a California registered civil engineer and a California certified geologist.[4] The assessment "did not reveal any geologic hazards or structural/performance issues that could jeopardize the ability of the spillway to safely pass a flood event," and it includes recommendations for ongoing monitoring and maintenance.

4.8.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Standards

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on hydrology and water quality.

[4] Wagner & Bonsignore Consulting Civil Engineers, Inc. 2019. *Sugar Pine Dam (DSOD No. 2045) Spillway Condition Assessment Report.* Prepared for Foresthill Public Utility District. May 28, 2019.

4.8.2.1 Federal Plans, Policies, Regulations, and Laws

Clean Water Act

The EPA is the federal agency responsible for water quality management. The Federal Water Pollution Control Act of 1948 was the first major U.S. law to address water pollution. As amended in 1972, the law became commonly known as the Clean Water Act (CWA). The CWA establishes the basic structure for regulating discharges of pollutants in the Waters of the U.S. and regulating quality standards for surface waters.

Section 401

Section 401 of the federal CWA requires that any applicant for a federal permit or license that may result in a discharge to Waters of the U.S. must obtain certification from the State. The certification declares that the discharge will comply with applicable provisions of the Act, including water quality standards requirements. Most projects receiving a U.S. Army Corps of Engineers (USACE) nationwide permit also need individual Section 401 certification. The State Water Resource Control Board (SWRCB), through the Regional Water Quality Control Board (RWQCB) administers these permits.

Section 402.

The National Pollutant Discharge Elimination System (NPDES) permit program controls water pollution by regulating point sources that discharge pollutants into Waters of the U.S. The State of California is authorized to administer various aspects of the NPDES permit program under Section 402 of the CWA. The General Construction Permit treats any construction activity over one acre as an industrial activity, requiring a permit under the State's General NPDES Permit. The SWRCB, through the RWQCB administers these permits.

Section 404

In 1972, Section 404 of the federal CWA established a program to regulate the discharge of dredged or fill material into Waters of the U.S. The CWA defines Waters of the U.S. to include tributaries to navigable waters, interstate wetlands, wetlands which could affect interstate or foreign commerce, and wetlands adjacent to other Waters of the U.S.

The program is jointly administered by the USACE and the EPA. The USACE is responsible for the day-to-day administration and permit review and the EPA provides program oversight. The fundamental rationale of the program is that no discharge of dredged or fill material should be permitted if there is a practicable alternative that would be less damaging to aquatic resources or if significant degradation would occur to the nation's waters. Permit review and issuance follows a sequence process that encourages avoidance of impacts, followed by minimizing impacts and, finally, requiring mitigation for unavoidable impacts to the aquatic environment. The sequence is described in the guidelines at Section 404(b)(1) of the CWA.

Proposed activities are regulated through a permit review process. An individual permit is required for potentially significant impacts. Individual permits are reviewed by the USACE, which evaluates applications under a public interest review, as well as the environmental criteria set forth in the Section 404(b)(1) guidelines. However, for most discharges that will have only minimal adverse effects, a general permit may be suitable. General permits are issued on a nationwide, regional, or State basis for particular categories of activities. The general permit process eliminates individual review and allows certain activities to proceed with little or no delay, provided that the general or specific conditions for the general permit are met.

Water Quality Management for National Forest Lands in California – Best Management Practices (2000)

This Water Quality Management document was prepared by the USFS to present practices and procedures which serve as the basis for water quality management on National Forest lands within the state of California. It describes Best Management Practices (BMPs) used for water quality management National Forest lands including TNF.

Tahoe National Forest

Current management direction on desired future conditions for the management of water resources in the Tahoe National Forest can be found in the following documents, filed at the District Office:

- Tahoe National Forest Land and Resource Management Plan (LRMP);
- Forest Service Manual and Handbooks; and
- National Forest Management Act (NFMA)

4.8.2.2 State Plans, Policies, Regulations, and Laws

Porter-Cologne Water Quality Act

In 1969, the California Legislature enacted the Porter-Cologne Water Quality Control Act to preserve, enhance, and restore the quality of the state's water resources. The act established the State Water Resources Control Board and nine Regional Water Quality Control Boards as the principal state agencies with the responsibility for controlling water quality in California. Under the act, water quality policy is established, water quality standards are enforced for both surface water and groundwater, and the discharges of pollutants from point and non-point sources are regulated. The act authorizes the State Water Resources Control Board to establish water quality principles and guidelines for long-range resource planning including groundwater and surface water management programs and control and use of recycled water (SWQCB 2014).

California Fish and Game Code Section 1602

The California Department of Fish and Wildlife (CDFW) requires notification before beginning an activity that will substantially modify a river, stream, or lake. If CDFW determines that the activity could substantially adversely affect an existing fish and wildlife resource, a Lake or Streambed Alteration

Agreement is required. Because this is primarily an issue related to habitat this requirement is discussed in Section 4.5, Biological Resources, of this DEIR/EIS.

California Water Code—Dam Safety Program

The California Water Code designates the regulatory Dam Safety Program to DSOD. The principal goal of this program is to avoid dam failure and thus prevent loss of life and destruction of property. The DSOD reviews plans and specifications for the construction of new dams and for the enlargement, alteration, repair, or removal of existing dams, and must grant written approval before the owner can proceed with construction. Professional engineers and geologists from the DSOD evaluate each project, investigate proposed sites, and review foundation conditions and proposed construction materials.

4.8.2.3 Regional and Local Plans, Policies, Regulations, and Ordinances

County of Placer General Plan

The Placer County General Plan includes goals and policies within the Natural Resources Element that assist in the protection of people and structures within Placer County. Because the project site is located within a national forest, development and design requirements identified in the General Plan do not pertain to the project. However, certain polices can assist in the protection of water quality within the project/action site and Lower Shirttail Creek. Those that would apply to the proposed project/action area are as follows:

Policy 6.A.3. The County shall require development projects proposing to encroach into a stream zone or stream setback to do one or more of the following, in descending order of desirability:

- a. Avoid the disturbance of riparian vegetation;
- b. Replace all functions of the existing riparian vegetation (on-site, in-kind);
- c. Restore another section of stream (in-kind); and/or
- d. Pay a mitigation fee for in-kind restoration elsewhere (e.g., mitigation banks).

Policy 6.A.4. Where stream protection is required or proposed, the County should require public and private development to:

- a. Preserve stream zones and stream setback areas through easements or dedications. Parcel lines (in the case of a subdivision) or easements (in the case of a subdivision or other development) shall be located to optimize resource protection. If a stream is proposed to be included within an open space parcel or easement, allowed uses and maintenance responsibilities within that parcel or easement should be clearly defined and conditioned prior to map or project approval;
- b. Designate such easement or dedication areas (as described in a. above) as open space;
- c. Protect stream zones and their habitat value by actions such as:
  1. providing an adequate stream setback,

2. maintaining creek corridors in an essentially natural state,
3. employing stream restoration techniques where restoration is needed to achieve a natural stream zone,
4. utilizing riparian vegetation within stream zones, and where possible, within stream setback areas,
5. prohibiting the planting of invasive, non-native plants (such as Vinca major and eucalyptus) within stream zones or stream setbacks, and
6. avoiding tree removal within stream zones;

d. Provide recreation and public access near streams consistent with other General Plan policies;

e. Use design, construction, and maintenance techniques that ensure development near a creek will not cause or worsen natural hazards (such as erosion, sedimentation, flooding, or water pollution) and will include erosion and sediment control practices such as: 1) turbidity screens and other management practices, which shall be used as necessary to minimize siltation, sedimentation, and erosion, and shall be left in place until disturbed areas; and/or are stabilized with permanent vegetation that will prevent the transport of sediment off site; and 2) temporary vegetation sufficient to stabilize disturbed areas.

f. Provide for long-term stream zone maintenance by providing a guaranteed financial commitment to the County which accounts for all anticipated maintenance activities.

Policy 6.A.5. The County shall continue to require the use of feasible and practical best management practices (BMPs) to protect streams from the adverse effects of construction activities and urban runoff and to encourage the use of BMPs for agricultural activities.

Policy 6.A.7. All new development and redevelopment projects shall be designed so as to minimize the introduction of pollutants into stormwater runoff, to the maximum extent practicable, as well as minimize the amount of runoff through the incorporation of appropriate Best Management Practices.

Policy 6.A.10. The County shall discourage grading activities during the rainy season, unless adequately mitigated, to avoid sedimentation of creeks and damage to riparian habitat.

Policy 6.A.14. The County shall help ensure that open space located in a reservoir is preserved and protected to assure adequate performance of those reservoirs. The watershed is defined as those lands draining into a reservoir and having an immediate effect upon the quality of water within that reservoir. Those lands located within the watershed and within 5,000 feet of the reservoir shall be considered as having an immediate effect. Following are key watersheds labeled "immediate," because of their current domestic usage and proximity to urban areas and "future," because of current nondomestic usage and/or distance from urban areas.

Immediate	Future
Folsom Lake Watershed	Sugar Pine Reservoir
Combie Lake Watershed	Lake Spaulding
Rock Creek Reservoir	French Meadows Reservoir
Rollins Lake	Hell Hole Reservoir
Camp Far West Reservoir	

4.8.3 Environmental Impact/Effect

4.8.3.1 Definition and Use of CEQA Significance Criteria and NEPA Indicators

The Initial Study completed for the proposed project identified that the following issue areas would result in a less than significant impact. Therefore, these issue areas are not discussed further in this DEIR/EIS. For further discussion of this issue area, refer to the Initial Study located in *Appendix N*.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?
- Inundation by seiche, tsunami, or mudflow?

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of impacts on hydrology and water quality resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which identify nine criteria that can lead to a determination of significant impact on hydrology or water quality. Based on the preliminary analysis provided in the Initial Study, the project could have a significant impact on Hydrology/Water Quality if the project would:

- Violate any water quality standards or waste discharge requirements;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or offsite;
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam;

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified for this proposed project/action several factors to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on hydrology and water quality. These include:

- Will reservoir management be affected by climate change in the Sierra Nevada in the form of increasing winter stream flow and decreasing late spring and summer flow?
- Will the action have a significant effect on projected future reservoir management, spills and releases based on modeling results taking into account the period of record operations, the physical characteristics of Sugar Pine reservoir, storage and diversion rights, downstream water rights, future demand, fish water release requirements and recreation requirements based on the Sugar Pine Fish Agreement dated January 26, 1967, and evaporation and rainfall information?
- Will the action result in changes in operational policy, frequency of inundation of the upper 20 feet and potential impacts associated with changes in downstream releases.
- Will the action substantially affect FPUD's water rights and provisions for water deliveries to the Forest Service?
- Will the action adversely affect water quality downstream in Shirttail Creek, including potential changes in stream temperature, turbidity and suspended sediment?
- Will the action result in potential chemical contamination of reservoir waters from facilities, construction areas and timber harvest operations?

4.8.3.2 Assumptions and Methods Used to Determine Impact/Effect

Approach to Defining Affected Hydrological Resources

The approach to defining the affected hydrological resources is based on an examination of existing conditions in and surrounding the Sugar Pine Dam and Reservoir facilities and how the increase of water storage will affect these areas. Existing conditions include a maximum storage capacity of 6,922 AF of water and reflect that the water level in the reservoir may decrease to a minimum storage level of 3,560 AF during the recreation season. The proposed project/action will increase the maximum storage level to 10,872 AF but would not change the minimum storage level during the recreation season.

Approach to Defining Water Quality within the Project Study Area

The Clean Water Act Section 303(d) requires states to identify Waters in the State that may be polluted to the extent of impairing designated beneficial uses. The "303(d) list" is short for a state's list of impaired and threatened waters (e.g., stream/river segments, lakes). States are required to submit their list for EPA approval every two years. For each water on the list, the state identifies the pollutant causing the impairment, when known. In addition, the state assigns a priority for development of Total Maximum Daily

Loads (TMDL) based on the severity of the pollution and the sensitivity of the beneficial uses to be made of the waters, among other factors.

The California State Water resources Control Board (SWRCB) provides 303d list information on impaired water bodies[5] within the state. This section will use this information, in part, to determine water quality impacts of the proposed project/action. Additionally, the section will use information provided in the biological assessments completed for the proposed project to determine how the project/action will affect water quality. Finally, this section uses hydrologic modeling and other available information to determine the effect of the proposed project/action on water quality.

4.8.3.3 Direct and Indirect Impacts/Effects

Impact HYD-1: Construction and/or operation of the proposed project/action could violate any water quality standards. Impact Determination: *Less than significant impact with mitigation incorporated* (CEQA) and *minorly adverse* (NEPA).

TNF Standard Management Requirements for water quality protection (Code No. FY2a) require the implementation of BMPs (USFS 1985). The Forest Service document "Water Quality Management for National Forest System Lands in California – Best Management Practices" provides guidelines for BMPs, but not to the specificity of an individual project (USFS 2000). These guidelines are used by the Forest Service to assist in the protection of water quality and have been determined to be effective in controlling and preventing nonpoint source water pollution. The Forest Service has BMP guidelines for timber harvesting, road and building construction, mining, recreation, vegetation management, fire suppression and fuel management, watershed management, and range management. The TNF LRMP provides further guidance on BMPs stating that "Appropriate BMPs are identified during the project environmental analysis process and are documented in the Environmental Assessment" (USFS 2000).

Construction Impacts

No Project and No Action Alternatives

Under No Project and No Action Alternatives, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented.

Proposed Project/Action and Alternatives 1 and 2

As detailed in Chapter 2 of this DEIR/EIS, the proposed project/action and Alternatives 1 and 2 would result in the placement of radial gates, the removal and relocation of several recreational facilities, hazard tree abatement, a timber harvest of approximately 44 acres, and an increase in lake levels by

[5] A body of water is considered "impaired" if it fails to meet one or more water quality standards. California's water quality standards protect lakes, rivers, and streams by defining how much of a pollutant such as bacteria or nutrients can be in water before it is no longer drinkable, swimmable, fishable, or useable in other, designated ways (called "beneficial uses").

approximately 20 vertical feet. Implementation of these undertakings could have an impact on water quality without adequate mitigation.

Direct impacts/effects substantially increasing the potential for water quality impacts would be those related to the construction of the proposed project/action and alternatives as these processes may result in an increase in sedimentation and oil based pollutants in to the reservoir, creeks and drainages in the proposed project/action area.

Placement of the radial gates would not result in construction-related water quality impacts. Pre-installation activities within the spillway will be limited to debris removal and cleanup of the sill beams and side rubbing plates. The dam parking lot will serve as the temporary staging area for gate installation. The gates will be place in a structure already designed to accommodate the gates. The gates will be lowered into place by crane and attached by existing concrete anchors. No earth moving activities or other activities would occur that would increase the potential for sedimentation, oils/fuels spills at the spillway. Following installation of radial gates and hoist assemblies, all construction equipment and materials will be collected and removed from the project site. Placement of the radial gates would have no impact and no adverse effect regarding water quality during construction.

Recreational facility construction activities such as the removal of existing structures, construction and paving of the realigned trails, excavation, and grading would occur in soils that are rated by NRCS (as shown in *Table 4.7-1*) with a severe erosion hazard. Conducting these construction activities would result in the temporary disturbance of soil and would temporarily expose disturbed areas to potential erosion during storm events. Rain of sufficient intensity could dislodge soil particles from the soil surface. If the storm is large enough to generate runoff, localized erosion could occur. Because steep slopes are present in certain areas of the Project site, severe erosion could occur as a result of some of the proposed construction activities. In addition, soil disturbance as a result of construction activities could result in soil loss because of wind erosion. All of this erosion would increase the potential for an increase in sedimentation in the lake, creeks and drainages in the proposed project/action area.

Construction of the proposed project/action and alternatives may temporarily introduce contaminants typically associated with construction into stormwater runoff, potentially resulting in the degradation of downstream surface water. Stormwater flowing over the project/action site during construction could carry various pollutants downstream such as nutrients, bacteria and viruses, oil and grease, heavy metals, organics, pesticides, gross pollutants, and miscellaneous waste. These pollutants could originate from soil disturbances, construction equipment, building materials, and workers. The proposed project/action has the potential to result in the generation of runoff containing these pollutants.

While the TNF Management Requirements require the implementation of BMPs, these BMPs are not specifically defined in the TNF Standard Management Requirements Water Quality Management for National Forest System Lands in California – Best Management Practices. Therefore, even with the implementation of required BMPs, proposed action compensatory mitigation, and management requirements, recreational facilities construction could have a significant impact and adverse effect on water quality.

Hazard tree abatement would affect approximately 110 acres. The hazard trees would be felled and removed via end-lining from a skidder. Furrows created during tree removal would be filled and re-contoured to match the existing slope. These processes would increase the potential to affect water quality would be a potentially significant impact and an adverse effect and require mitigation.

The timber harvesting proposed as a part of the proposed project/action would include the removal of trees and mature brush on 40 to 44 acres. This area will become part of the inundation area. Tree harvesting will include tree cutting, transport of felled trees to one of the landing areas, processing of the trees, and transporting the processed trees offsite. Logging equipment will use the reservoir's existing roads and accesses to implement logging procedures. However, it is estimated that approximately two miles of temporary road would be constructed to facilitate logging operations. The implementation of the timber harvesting operations would expose 40-44 acres and increase the potential for water quality impacts during timber harvest operations. Therefore, the timber harvesting construction-related impact would be potentially significant and have an adverse effect and require mitigation.

As discussed above, project construction activities associated with recreational facility development, the implementation of other compensatory mitigation measures, and timber harvest and vegetation removal activities would have a potentially significant impact and adverse effect on water quality. Mitigation measures **GEO-1** and **GEO-2**, described in detail in Section 4.9 above, were developed to ensure adequate protection of stream courses and the reservoir from erosion due to storm runoff from areas affected by project construction and habitat management activities. Implementation of mitigation measures **GEO-1** and **GEO-2** would reduce potentially significant and adverse water quality impacts that could occur during facilities construction, habitat management, or timber harvesting activities to less than significant and minorly adverse. The impact of the proposed project/action and Alternatives 1 and 2 on water quality, therefore, is considered ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Mitigation Measures

Mitigation Measure HYD-1: Implement Mitigation Measures GEO-1 and GEO-2.

As discussed above, implementation of mitigation measures **GEO-1** and **GEO-2** would reduce the potential project-related impact on erosion due to project construction. As described in Section 4.6, mitigation measures **GEO-1** and **GEO-2** would reduce the potentially significant water quality impacts during construction, habitat management, and timber harvesting activities to a less-than-significant level. mitigation measure **HYD-1** requires implementation of mitigation measures **GEO-1** and **GEO-2** to ensure project consistency with applicable water quality standards.

Operational Impacts

Proposed Project/Action and Alternatives 1 and 2

As described above, the operation of Sugar Pine Reservoir is currently subject to the direction and guidance contained in several key documents. *Appendix A*, the 2016 Sugar Pine Reservoir Operations Plan, includes: FPUD's State Water Right Permit 15375 (Attachment A), the 1967 Memorandum of

Agreement between Reclamation and the California Department of Fish and Game (CDFG) (Attachment B), the 1985 Memorandum of Agreement between Reclamation and the TNF (Attachment C), the 2000 agreement between FPUD and the USFS (Attachment D), and the Key Sugar Pine Reservoir Storage and Elevation Levels for Long-Term Operations (Attachment E). *Appendix B* includes the 2003 Special Use Permit issued by the TNF authorizing use and occupancy of NFS lands. *Appendix C* includes the USFS TNF Land and Resource Management Plan section for Management Area 096 Sugar Pine. *Appendix D* includes Title V of Public Law 106-566. *Appendix E* includes the California Water Action Plan. Conditions of operation of the Sugar Pine Project will not change because of proposed project/action implementation or implementation of Alternatives 1 or 2. FPUD would continue to operate the reservoir for the primary purpose of domestic water supply and will continue to execute transfers of surplus water to downstream users for domestic, agricultural, and/or environmental uses. With the proposed installation of radial gates, however, FPUD would be able to increase the volume of future transfers to as high as 5,000 AF in a given season.

Model results indicate that once FPUD's water rights are extended and the radial gates installed under the proposed project/action, the initial fill during the first wet season will likely result in reduced spills to lower Shirttail Creek relative to historical conditions. Once the additional storage space created by the installation of the radial gates fills, absent any water transfers, the reservoir operations will remain unchanged in the short term. During the first few years of operation, sediment from brush and tree removal activities along the shore will likely increase turbidity and suspended sediment in the lake. In time, water clarity should return to current levels.

In the short term, before consumptive demands reach buildout levels, the controlled releases from Sugar Pine Reservoir will effectively be unchanged from current operations unless there are water transfers that exceed the historical maximum of 2,000 AF. In years following a transfer, spills will likely be reduced to refill the storage space created by the previous year transfer as has occurred after past transfers. Transfers will not happen in every year nor will the release rates associated with anticipated transfers exceed naturally occurring flow rates below the dam.

The storage frequency graph (*Figure 4.8-1*) below, illustrates that proposed operations will result in higher storage at Sugar Pine Reservoir than current operations most of the time. These results indicate that Sugar Pine Reservoir will likely have a larger cold water pool than current operations. Because the reservoir has three intakes at three different elevations, the potential for managing the temperature of water releases from the dam is improved under the project/action relative to the No Project and No Action alternatives.

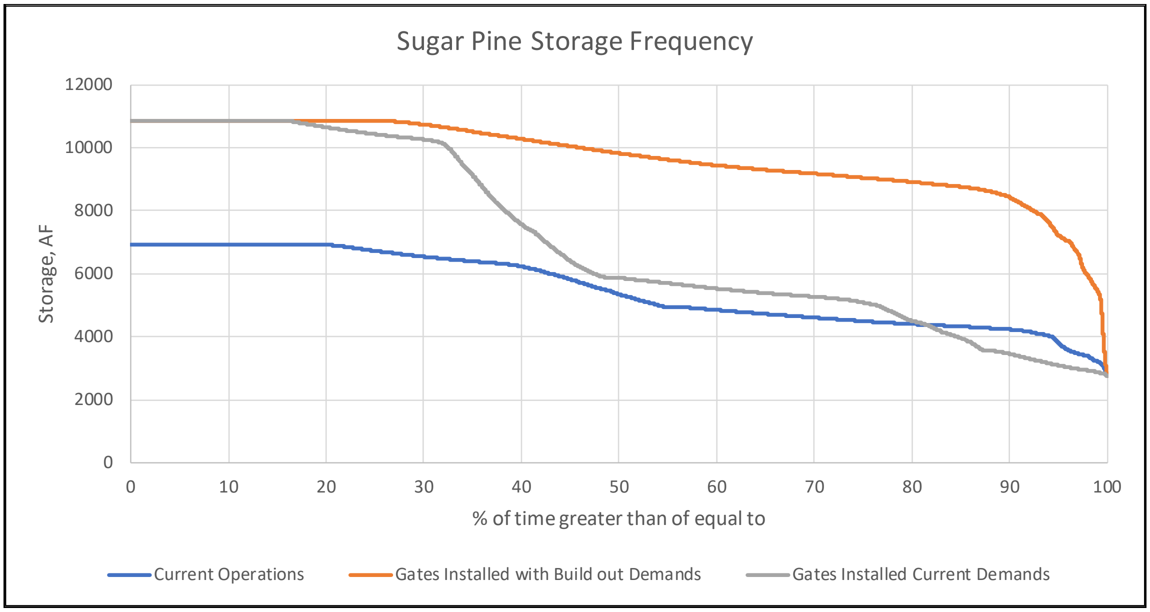

Figure 4.8-1. Storage Frequency Graph

Reservoir storage with the gates in place would consistently remain higher than current operations. However, anticipated short-term alteration of the frequency and volumes of spills from Sugar Pine Dam could affect aquatic resources in Shirttail Creek below the dam. These effects are addressed in Section 4.4 (Biological Resources) above.

In addition to the effects of reservoir operational changes discussed above, indirect impacts/effects related to water quality could be caused by be use of the new facilities and trails and an increase in potential drawdown area in the lake.

Upon completion of the proposed project/action, recreational facilities and reservoir use would continue as it was prior to implementation of the project. The relocated campsites, picnic areas, and parking spurs would be located nearby to existing campsites, picnic areas, and parking spurs as shown in *Figures 4.11-1 through 4.11-5*. The location of these facilities would be required, because of the nature of use, to be on fairly level ground. This, in turn, would limit the runoff potential at these new sites during operation of the proposed project/action. The proposed project/action or alternatives would not increase the number of campsites and as such the amount of human activities that would potentially affect water quality would be similar to the existing use. As such, no increase in the potential to affect water quality from human activities during operation of the proposed project/action campground/picnic facilities would occur.

The proposed project/action includes the construction of 2.8 miles of paved trail and 1.5 miles of natural soil trail. These trails would be constructed to the requirements of the Forest Service's Standard Trail Plans and Specifications. The Standard Trail Plans and Specifications were developed to assist with trail design, construction, maintenance, inventory, condition assessment, and the assembly of trail construction plan packages (USFS 2014).

The 2.8-mile JHMT would be a fully accessible paved trail. While the paved JHMT would be slightly longer than the existing trail due to the relocation, the introduction of substantial amounts of new pollutants that would affect water quality during operation of the trail would not occur. This paved trail will continue to be used as it is presently. There has been no indication that past operation of the trail has affected water quality in the lake.

However, unsurfaced trails are susceptible to a variety of trail impacts. Common impacts include vegetation loss and compositional changes, soil compaction, erosion, muddiness, exposure of tree roots, trail widening, and the proliferation of visitor-created side trails. Soil erosion exposes rocks and plant roots, creating a rutted, and uneven tread surface. Erosion can also be self-perpetuating when treads erode below the surrounding soil level, preventing the diversion of water from the tread. This in turn, result in increased water turbidity and sedimentation (USGS 2006).

Approximately 1.5 miles of the Sugar Pine Multi-Use Trail will be relocated. This trail would be constructed using those techniques for erosion control established in the Forest Service's Standard Trail Plans and Specifications. These features would minimize the potential for erosion and resulting sedimentation during operation. Additionally, the trail is a replacement of a trail that would be affected by the increased lake levels caused by the proposed project/action. This is not a new use in the area and no increase in use of the trail over existing conditions is expected because of this relocation nor an increase in the potential for water quality impacts because of this relocation. Therefore, implementation of the proposed project/action would not result in a significant adverse effect on water quality due to recreational facilities and trail use.

As a part of the proposed project/action, the abatement of hazard trees within 150 feet of the new trail system is required by TNF as a compensatory action for expansion of reservoir capacity. The removal of these hazard trees would be completed per USFS standards and BMPs would be required as a part of this removal process. Those BMPs identified in mitigation measure **GEO-1** would be required for the hazard tree abatement program. With implementation of mitigation measure GEO-1, the project/action would avoid significant impact or adverse effect on water quality due to hazard tree abatement.

As discussed in Chapter 3.0, Alternative 1 reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acre of Layne's butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne's butterweed occurrences and associated hazard tree mitigation 150 feet on both sides of the trail alignment, this alternative is identical to the proposed project/action.

The only difference between this alternative and the proposed project/action would be the realignment of the JHMT to avoid impacts to Layne's Butterweed. This portion of the trail would be unpaved and would have a native soil surface. Since the realigned portion of the trail would have to navigate the slope, it would involve a number of switchbacks designed for maintaining accessibility to all trail users. While, this trail would be constructed using the erosion control requirements established in the Forest Service's Standard Trail Plans and Specifications, it would be longer and have a greater incline than the proposed project/action. Therefore, under operating conditions, the increased potential for erosion and loss of topsoil would also increase the potential for sedimentation and affect the water quality of the reservoir. However, through proper design and maintenance of the trail the potential for erosion/sedimentation would be limited.

Implementation of Alternative 1 would not result in a substantial increase in water quality impacts during operation relative to the proposed project/action.

Because all other aspects of Alternative 2 would be the same as the proposed project/action, hydrology and water quality impacts and mitigations for those impacts would be the same.

For the reasons presented above, the impact of operation of the proposed project/action, Alternative 1 or Alternative 2 on compliance with water quality standards is considered less than significant with implementation of mitigation measure **HYD-1**, above. Therefore, the impact determination is ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Impact HYD-2: Will the proposed project/action substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. Impact Determination: *less than significant with mitigation incorporated* (CEQA) and *minorly adverse* (NEPA).

No Project and No Action Alternatives

Under No Project and No Action Alternatives, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Project/Action Alternatives includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and temporarily execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area under the Foresthill Community Plan adopted by the County of Placer. Seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in size as more water will be needed to serve future FPUD water users. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. However, this increase in potential drawdowns would not change the course of lower Shirttail Creek as water will flow down the creek in similar amounts as it does presently and a substantial increase in flow amount resulting in a course change would not occur.

Proposed Project/Action

As discussed in Chapter 2 of this DEIR/EIS, the proposed project/action would increase water storage capacity at Sugar Pine Reservoir and expand the reservoir's area of inundation. These actions could result in substantial erosion or siltation in and around the future reservoir and downstream of the dam. As shown in *Figure 2-4*, implementation of the proposed project/action will inundate approximately 44 acres of land including the lower reaches of North Shirttail Creek and Forbes Creek as well as the perimeter of Sugar Pine Reservoir. The use of BMPs during construction, as required in mitigation measures **GEO-1** and **GEO-2**, would reduce the potential for erosion and sedimentation during construction. During the filling of the reservoir, those mitigation measures would assist in reducing the amount of runoff carrying sedimentation to the reservoir and creeks as well.

As the reservoir fills, sediment will be suspended in the water column until such time that the sedimentation becomes saturated and sinks. This is typical in reservoirs that are operated for the purpose of water supply, and will occur as drawdowns and refilling of those reservoirs occurs until such time that the sedimentation is settles out of the reservoir water column or is washed downstream. This is consistent with existing conditions and operations at Sugar Pine Reservoir. Under the proposed project/action, this process could be exacerbated due to the inundation of newly exposed unconsolidated soils within the expanded inundation zone without the implementation of effective BMPs during timber harvest and facilities construction in and near the expanded area of inundation. This could result in substantial increases in erosion and turbidity within Sugar Pine Reservoir.

This effect could increase the amount of sedimentation in the lake and potentially lower Shirttail Creek. This would occur anytime that there is a drawdown and would occur over multiple years and be greatest in the first few years of drawdown due to a greater amount of unconsolidated soils in the drawdown area during that time. Therefore, implementation of the proposed project/action would potentially result in a substantial increase in sedimentation during project operation. This impact is considered significant under CEQA and adverse under NEPA. With implementation of mitigation measure **HYD-1** described above, however, this impact is considered ***less than significant with mitigation incorporated*** and ***minorly adverse***.

Mitigation Measures

Implement mitigation measure **HYD-1,** described above under Impact HYD-1.

Alternative 1: Layne's Butterweed Trail Realignment

As discussed in Chapter 3.0, Alternative 3 reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acres of Layne's butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne's butterweed occurrences and associated hazard tree mitigation 150 feet on both sides of the trail alignment, this alternative is identical to the proposed project/action.

While this alternative would avoid impacts to Layne's Butterweed, because of the similarities of the Layne's Butterweed Trail Realignment Alternative and the proposed project/action, this alternative would have the same impacts related to erosion and sedimentation caused by a substantial alteration in the reservoir and creeks drainage as the proposed project/action. As with the proposed project/action, the impact of Alternative 1 is considered ***less than significant with mitigation incorporated*** and ***minorly adverse.*** As with the proposed project/action, implementation of mitigation measure **HYD-1** would be required for this determination.

Alternative 2: Helicopter Harvest

Under this alternative to the proposed action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35% cover approximately nine of the 44 acres to be cleared under the proposed action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. All other aspects of this alternative would be the same as the proposed project/action.

As with the proposed project/action, the impact of Alternative 2 is considered ***less than significant with mitigation incorporated*** and ***minorly adverse.*** As with the proposed project/action, implementation of mitigation measure **HYD-1** would be required for this determination.

Impact HYD-3: The compensatory mitigation program will construct new recreational facilities and implement habitat and fuels management/improvement practices that could result in substantial erosion or siltation in and around to future reservoir and downstream of the dam. Impact Determination: *Less than significant with mitigation incorporated* (CEQA) and *minorly adverse* (NEPA).

As a part of the proposed project/action, replacement of existing recreational facilities including campsites, parking areas, trails, and vault toilets in order to satisfy TNF requirements. In addition, the removal of hazardous trees within 150 feet of the new trails is required for due compensation in the increase of reservoir levels as described in Section 2.2.5 (Reservoir Operations) of this EIR/EIS.

No Project/Action Alternative

Under no project/action alternative, no modifications to existing recreational facilities would occur. No hazard tree abatement program would occur. The increase in potential erosion or siltation due to replacement of recreational facilities and a hazard tree abatement program would not occur. As such, the no project/action alternative would have ***no impact*** under CEQA and ***no effect*** under NEPA. regarding this issue area

Proposed Project/Action

As discussed in Chapter 2 of this DEIR/EIS, the proposed project/action would replace existing recreational facilities including campsites, parking areas, trails, and vault toilets in order to satisfy TNF requirements. In addition, the removal of hazardous trees within 150 feet of the new trails is required. As discussed under Impact **HYD-1**, incorporation of BMPs and other measures as required in mitigation measure **HYD-1** would reduce potential erosion and sedimentation impacts from the replacement of recreation facilities to less than significant level under CEQA and minorly adverse under NEPA. The impact determination, therefore, is ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Alternative 1

As discussed in Chapter 3.0, Alternative 3 reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acres of Layne’s butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne’s butterweed occurrences and associated hazard tree mitigation 150 feet on both sides of the trail alignment, this alternative is identical to the proposed project/action.

While this alternative would avoid impacts to Layne’s Butterweed, because of the similarities of the Layne’s Butterweed Trail Realignment Alternative and the proposed project/action, this alternative would have the same impacts related to erosion and sedimentation caused by the replacement of recreational facilities and the hazard tree abatement program as the proposed project/action. As with the proposed project/action, implementation of mitigation measure **HYD-1** would be required. The impact determination for Alternative 1 is ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Alternative 2

While this alternative would reduce the number of onsite vehicle trips for transporting the cut timber, this alternative would have the same impacts related to erosion and sedimentation caused by the replacement of recreational facilities and the hazard tree abatement program as the proposed project/action. As with the proposed project/action, the impact determination for Alternative 1 is ***less than significant with mitigation incorporated*** (CEQA) and ***minorly adverse*** (NEPA).

Impact HYD-4: No features of the proposed project/action would be constructed within 100-year flood hazard area. Impact Determination: *No impact* and *no effect*.

The proposed project/action site and surrounding area are located on FEMA Firm Map No. 06061C0225H. Only the areas immediately adjacent to the reservoir and immediately adjacent to Shirttail Creek within North Shirttail Canyon are identified as being in a flood zone (Zone A) (FEMA 2018).

No Project/Action Alternative

Under No Project/Action Alternative, no modifications to existing recreational facilities would occur. As such there would not be a change in flooding potential over existing conditions with this alternative. The No Project/Action Alternative would have ***no impact*** under CEQA and ***no adverse effect*** under NEPA. regarding this issue area

Proposed Project/Action

As discussed in Section 2.0, the proposed project/action would increase the potential storage capacity at the reservoir by 3,950 AF resulting in the inundation of ±43 acres and an increase in potential flood area. However, because the proposed project/action also replaces existing recreational facilities including campsites, parking areas, trails, and vault toilets above any new water line, these facilities would not be affected by the increase storage capacity. As such, implementation of the proposed project/action would have ***no impact*** under CEQA and would have ***no effect*** under NEPA.

Alternative 1

As discussed in Chapter 3.0, Alternative 3 reroutes the proposed JHMT reconstruction to avoid permanent loss of approximately 0.01 acres of Layne's butterweed that would be impacted by reconstruction of the trail under the proposed action. Other than realignment of the trail to avoid a small portion of impacts to Layne's butterweed occurrences and associated hazard tree mitigation 150 feet on both sides of the trail alignment, this alternative is identical to the proposed project/action.

This alternative would have the same impacts related to flooding potential as the proposed project/action. As with the proposed project/action, this alternative would have ***no impact*** related to flooding under CEQA and would have ***no effect*** under NEPA.

Alternative 2

While this alternative would reduce the number of onsite vehicle trips for transporting the cut timber, this alternative would have the same impacts related to flooding potential as the proposed project/action. As with the proposed project/action, this alternative would have ***no impact*** related to flooding under CEQA and would have ***no effect*** under NEPA.

Impact HYD-5; Installation of radial gates at Sugar Pine Dam will increase storage capacity at Sugar Pine Reservoir but will not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a dam. Impact Determination: *Less than significant (CEQA) and no effect (NEPA).*

In California, all dams greater than 25 feet in height and with a capacity of 50 acre-feet or more come under the jurisdiction of the DSOD, a division of the California DWR. This includes Sugar Pine Dam. According to DSOD, Sugar Pine Dam has received a condition rating of "satisfactory" (DSOD 2018a). Satisfactory is the highest condition rating possible and means "no existing or potential dam safety deficiencies are recognized. Acceptable performance is expected under all loading conditions (static, hydrologic, seismic) in accordance with the applicable regulatory criteria or tolerable risk guidelines" (DSOD 2018b). All dams are regulated by DSOD equally regardless of the type of owner. The process is as follows:

- All dams are generally inspected once on a fiscal year basis, with some dams being inspected up to twice a year, such as Oroville Dam.
- When repairs are required as a result of an inspection, DSOD sends the dam owner a letter requesting the work be completed. If it's not completed in a reasonable timeframe, directives and orders to dam owners are issued.
- Existing dams are periodically reviewed and re-evaluated for changed loading conditions such as seismic and hydrologic.
- DSOD has performed special re-evaluation programs such as the radial gate inspection and evaluation program, the re-evaluation of dams.
- situated near high slip-rate faults, and the recently initiated spillway re-evaluation program (DOSD 2018b).

No Project/Action Alternative

Under No Project/Action Alternative, no modifications to existing dam and recreational facilities would occur. In 2003, the Forest Service issued FPUD a Special Use Permit[6] for the use and operation of the Sugar Pine Dam. As a part of this permit, a number of conditions were included regarding Dam Safety. These conditions required FPUD to:

- provide a dam operations and maintenance plan,
- have the dam inspected by a qualified engineer on a yearly basis and following any major storm, seismic event or an overflow of a spillway other than the service spillway,
- allow the inspection of the dam by the USFS,
- provide dam safety evaluations,
- have a formal inspection to verify safety and integrity of the dam every five years, and
- rectify emergency situations so aa to prevent failure of the dam.

Since the opening of the dam in 1983, Sugar Pine Dam has been under the inspection jurisdiction of DSOD. No dam failure has occurred during that time. The dam is required to continue to complete all inspection requirements established in the permit conditions and those required by the DSOD. As such, it is assumed that the dam will continue to operate in a safe condition and any future issues would be rectified satisfactorily as past history has shown. Therefore, the no project/action alternative would have no impact under CEQA and no effect under NEPA regarding this issue area.

Proposed Project/Action and Alternatives 1 and 2

As discussed in Chapter 2, the proposed project/action and Alternatives 1 and 2 would increase the potential storage capacity at the reservoir by 3,950 AF raising the radial gates by 20 feet. The spillway for Sugar Pine Dam was originally designed by Reclamation to accommodate the potential installation of the proposed radial gates to increase water storage capacity of the reservoir and no modification to the existing dam is required for these gates. While the Proposed Project/Action will allow for a greater amount of water storage in the reservoir, the dam is not compromised with the implementation of the proposed project/action, because Reclamation designed the dam to accommodate the gates and additional storage. The proposed project/action does not remove the requirement for dam safety inspections. The proposed project/action would have the same inspection process and requirements of the existing dam. Ongoing, regular inspection, as required by the permit conditions, the Forest Service, and the DSOD, provide the greatest level of assurance possible that the dam will continue to operate in a safe condition. Proposed dam and reservoir modification under Alternatives 1 and 2 would be identical to those described for the proposed project/action.

[6] Authorization ID #FHD116901

Prior to project initiation. FPUD must file an enlargement application, together with plans, specifications, and the appropriate filing fee with the Division of Safety of Dams for this work. All dam safety related issues must be resolved prior to approval of the application, and the work must be performed under the direction of a Civil Engineer registered in California. As such, implementation of the proposed project/action and Alternatives 1 and 2 would have ***a less than significant impact*** under CEQA and would have ***no effect*** under NEPA regarding the potential for inundation due to dam failure.

4.8.3.4 Cumulative Impact

Approach to Assessing Cumulative Impact on Hydrology and Water Quality

Section 15130 (a) of the California State CEQA Guidelines states:

> An EIR shall discuss cumulative impacts of a project when the project's incremental effect is cumulatively considerable, as defined in section 15065 (a)(3). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

NEPA, as amended, requires an assessment of potential cumulative impacts. Federal regulations (40 CFR 1500 1508) define cumulative impacts as:

> … the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individual minor, but collectively significant actions taken place over a period of time (40 CFR 1508.7).

For the purpose of this EIR/EIS, and for the purpose of assessing the cumulative impact of the proposed project/action on hydrology, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions within the Shirttail Creek watershed, including the Sugar Pine Project, Big Reservoir Project, FPUD's water transfer program, and TNF recreational resources development and forest management practices.

In order to understand the contribution of past actions to the cumulative effects of the proposed project/action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Cumulative Setting

The proposed project/action is located in the Shirttail Creek watershed. The Shirttail Creek subwatershed is a part of the greater North American River Watershed. In general, water quality in the American River is considered to be very good from headwaters to the confluence with the Sacramento River. Streams in the upper watershed are typically clear, cold streams that are naturally highly oxygenated, low in dissolved ions and nutrients, and exhibit low instream plant or algal growth. However, erosion from land use activities (past and present), roads, and recreational use throughout the watershed contribute to instream sediment problems (Sacramento River Watershed Program [SRWP] 2010).

Effects of Past, Present, and Reasonably Foreseeable Future Actions

The proposed project/action, in combination with existing, approved, proposed, and reasonably foreseeable development in the Shirttail Creek subwatershed, would alter drainage conditions, increase erosion and affect water quality, which could result in potential water quality impacts within the overall watershed.

No Project and No Action Alternatives

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact/effects under CEQA and NEPA, respectively, as they relate to project compliance with relevant water quality standards and other project-generated effects on hydrology and water quality.

Proposed Project/Action

With mitigation, construction activities to implement the proposed project/action's timber harvest and vegetation removal operations and to replace recreational facilities would result in a ***less than significant impact*** and as such have a ***less than cumulatively considerable impact*** to water quality. As discussed under *Impact HYD-2*, reservoir operations following proposed project/action construction could result in substantial increases in erosion and turbidity in the reservoir. Therefore, the proposed project/action would require implementation of mitigation measures to reduce this impact to a less than significant level. This alternative, in combination with projected growth in the FDCP, could substantially adversely affect water quality if unmitigated. With implementation of mitigation measures **GEO-1** and **GEO-2,** the contribution of the proposed project/action to cumulative water quality conditions would be ***less than considerable with mitigation incorporated.***

Alternative 1: JHMT Realignment Alternative

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. As such, similar to the proposed project/action, with mitigation, construction activities to implement the timber harvest and vegetation removal operations and replace recreational facilities would result in a less than significant impact and as such have a less than cumulatively considerable impact to water quality. However, future water supply needs would result in reoccurring drawdowns resulting in erosion and sedimentation in the reservoir and possibly downstream. Because of the large area of impact and the re-occurring multiple year drawdowns over a long period of time, mitigation would not be possible to fully reduce this impact to a less than significant level. Therefore, this alternative, in combination with projected growth in the FDCP, would affect water quality. With implementation of mitigation measures **GEO-1** and **GEO-2,** and **HYD-1**, the contribution of the proposed project/action to cumulative water quality conditions would be ***less than considerable with mitigation incorporated***.

Alternative 2: Helicopter Harvest

While this alternative would reduce the number of onsite vehicle trips for transporting the cut timber, this alternative would be the same as the proposed project/action. As such, similar to the proposed project/action, with mitigation, construction activities to implement the timber harvest and vegetation removal operations and replace recreational facilities would result in a less than significant impact and as such have a less than cumulatively considerable impact to water quality. However, future water supply needs would result in reoccurring drawdowns resulting in erosion and sedimentation in the reservoir and possibly downstream. Because of the large area of impact and the re-occurring multiple year drawdowns over a long period of time, mitigation would not be possible to fully reduce this impact to a less than significant level. Therefore, this alternative, in combination with projected growth in the FDCP, would affect water quality. With implementation of mitigation measures **GEO-1**, **GEO-2**, and **HYD-1**, the contribution of the proposed project/action to cumulative water quality conditions would be ***less than considerable with mitigation incorporated.***

4.8.4 Residual Unavoidable Effects

The proposed project/action and Alternatives 1 and 2 would result in potential water quality impacts during construction and the timber harvest. These impacts would be reduced to a less than significant level with implementation of mitigation measures **GEO-1** and **GEO-2**. The proposed project/action and Alternatives 1 and 2, would all result in ***less than considerable cumulative effect with mitigation incorporated*** related to water quality.

4.8.5 References

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4.9 Land Use and Planning

This section addresses potential impacts on existing, planned, and proposed land uses resulting from the construction and operation of the proposed project/action and alternatives. Section 4.9.1 describes existing land use within the areas directly and indirectly affected by the proposed project/action. Section 4.9.2 presents applicable land use plans, policies, and ordinances that are intended to manage and protect project-related environmental resources. Section 4.9.3 assesses the potential conflicts between the proposed project/action and existing plans/policies/ordinances. That section also addresses potential conflicts between the project and adjacent land uses.

Aside from impacts on the existing and planned land uses analyzed in this section, a number of additional land use-related resource-specific topics are addressed in other sections of this Draft EIR/EIS including: Section 4.2 (Aesthetic and Visual Resources); Section 4.5 (Biological Resources); Section 4.11 (Noise); and Section 4.13 (Recreation). Where appropriate, this section of the Draft EIR/EIR refers the reader to those sections that contain more detailed and specialized discussions of resource-related land use effects.

4.9.1 Environmental Setting/Affected Environment

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action would install radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. Gate installation will provide additional water supply available for diversion by the FPUD to serve current customers within the District's service area and ensure that adequate water will be available to serve future approved growth and development within the service area: particularly development within the Foresthill Divide Community Plan Area[1] . In addition, the proposed project/action will replace existing USFS recreational facilities directly affected by the proposed project/action. In addition to the replacement of affected recreational facilities, several "compensatory mitigation measures" would be implemented as part of the proposed project including but not limited to forest, emergent riparian, montane riparian, and montane chaparral habitat restoration in compensation for habitat reduction within the expanded inundation area of Sugar Pine Reservoir.

4.9.1.1 Existing Land Uses within the Affected Environment

Existing land uses within the areas potentially affected by the proposed project/action include facilities associated with the Sugar Pine Project including Sugar Pine Dam and Reservoir. Sugar Pine reservoir is surrounded by a dense mixed conifer forest and a 3.5-mile shoreline. The reservoir is primarily used for fishing, boating, hiking, and camping. Public facilities surrounding the reservoir include Shirttail Creek Campground, Giant Gap Campground, Forbes Creek Group Campground, Manzanita Day Use Swim Area Picnic Site, a boat ramp, and 4.3 miles of foot trails including 2.8 miles of handicap accessible paved trail.

[1] Quad Knopf (2008). Foresthill Divide Community Plan. December 2008. Prepared for Placer County Community Development Resource Agency and Planning Department.

There are no residences or other occupied structures within the Sugar Pine Project Management Area (Area 096).

The Shirttail Creek Campground is located on the northwest shore of the Sugar Pine Reservoir and includes 30 campsites and a trailer dump station. Picnic tables, campfire rings and grills are provided, as well as vault toilets and drinking water. Giant Gap Campground is located on the northwest shore of Sugar Pine Reservoir and includes 35 campsites, picnic tables, campfire rings, grills, vault toilets and drinking water. Drinking water to both sites is provided via a potable water line running between the sites and a FPUD storage tank located southeast of Sugar Pine Dam.

Forbes Creek Group Campground is located near the southeast shore of Sugar Pine Reservoir. The campground offers two group campsites. Each site can accommodate up to 50 people and 18 vehicles. Both sites are equipped with a central cooking and picnic area, with a large campfire circle and multiple tables.

The Manzanita Day Use Area is located along the northeast shore of the reservoir adjacent to Shirttail Campground. The day use area includes a parking lot, 25 picnic units, a beach and a swimming area, and shares restroom facilities with Shirttail Campground. The Sugar Pine Boat Ramp and associated floating dock, parking lot, and restroom are located on the south shore in between the dam and Forbes Creek.

Approximately 4.2 miles of foot trails circumscribe the reservoir. Approximately 1.2 miles of this system are paved and make up the Josh Hardt Memorial Accessible Trail (JHMT). The trail system includes two bridge crossings: one at Forbes Creek and one at upper Shirttail Creek.

As described in Chapter 2 of this Draft EIR/EIS, the proposed extension of Water Right 15375 and the installation of radial gates are needed to provide a reliable water supply to existing customers and future planned development within the Foresthill Divide Community Plan Area (see *Figure 2-7*). The Community Plan Area encompasses approximately 109 square in central Placer County and includes the communities of Foresthill, Todd's Valley, Baker Ranch, Michigan Bluff, and Yankee Jim's. The FPUD service area and sphere of influence are contained within the Community Plan Area.

4.9.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on land use in areas potentially affected by the construction and operation of the proposed project/action.

4.9.2.1 Federal

Tahoe National Forest Land and Resource Management Plan (1990)

The Tahoe National Forest Land and Resource Management Plan (TNF LRMP) is the relevant long-range planning document for the TNF. The purpose of the LRMP is to direct the management of the Tahoe National Forest (USDA 1990). Its goals are to ensure the wise use and protection of TNF resources, fulfill legislative requirements, and address local, regional, and national issues. The LRMP accomplishes these goals in the following ways:

- It guides the management of the forest by elucidating short- and long-term management intent, goals, and objectives for the TNF.
- It allocates land to the combination of management activities for which it is most suited.
- It provides for multiple use and sustained yield of goods and services to maximize long-term net public benefits in a cost-efficient and environmentally sound manner.
- It responds to major issues, management concerns, and resource opportunities.
- It establishes monitoring and evaluation programs to ensure that the Forest Plan direction is carried out and to determine how well outputs and effects were predicted.
- It updates and provides information and direction for the development of program and budget proposals.
- It meets the requirements of the National Forest Management Act and the Pacific Southwest Regional Guide.

The LRMP is implemented at the project level. The District Ranger and staff plan and carry out projects, using the Forest Plan to guide their decisions. Because the Plan is programmatic in nature, site-specific analysis is required for specific projects such as the proposed project/action. Data, evaluations, and other information from the LRMP, however, can serve as a basis for the evaluation of specific projects.

Sugar Pine Management Area (096)

The Forest Plan identifies numerous "management areas" within the TNF. A management area is a geographically distinct area managed under one management prescription. Sugar Pine Dam and Reservoir and surrounding forest, riparian, and recreational areas are contained within the Sugar Pine Management Area (096) which encompasses approximately 1,311 acres of NFS land. The management prescription for Sugar Pine is included as *Appendix C* of this DEIR/EIS. The management prescription recognizes that Sugar Pine Dam was designed to accommodate the future addition of a 20-foot radial gate and that the operation of the reservoir provides a source of domestic water supply for FPUD. As shown in *Appendix C*, a host of available management practices are listed for the Sugar Pine Management Area addressing various issue areas including recreational use, biological resources, range management, timber harvest, water resource improvement, soils resource improvement, minerals management, land adjustments, road access, trail construction, and transportation management.

Sierra Nevada Forest Plan (as Amended 2004)

The amended Sierra Nevada Forest Plan (SNFP) presents amendments to the land and resource management plans for the Modoc, Lassen, Plumas, Tahoe, Eldorado, Stanislaus, Sequoia, Sierra, Inyo, and Humboldt-Toiyabe national forests and the Lake Tahoe Basin Management Unit. The 2004 amendment to the SNFP focused on six specific areas including: the pursuit of more aggressive fuels treatments while still protecting old-forest conditions and species at risk; improved compatibility with the National Fire Plan to ensure that goals of community protection and forest health: implementation of the Herger-Feinstein

Quincy Library Group Pilot Project; reduced unintended and adverse impacts on grazing permit holders; reduced unintended and adverse impacts on recreation users and permit holders; and reduced unintended and adverse impacts on local communities.

Federal Land Policy and Management Act

The Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S.C. 1701 et seq.) directs public land managers to use and observe the principles of multiple use and sustained yield when developing and revising land use plans. Per Section 103(c), multiple use "means the management of public land and their various resource values so that they are utilized in the combination that will best meet the present and future needs of the American public." Sustained yield refers to the achievement and maintenance in perpetuity of a regular periodic output of the renewable resources of public lands consistent with multiple use.

Wild and Scenic Rivers Act of 1968

The Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.) preserves select rivers or sections or rivers in their free-flowing condition in order to protect water quality of such rivers and achieve "vital" national conservation measures. In part due to the construction of the Sugar Pine Project in 1983, Forbes Creek and Shirttail Creek are not eligible for designation as "wild and scenic" and therefore would not be subject to Wild and Scenic River Standards S59, which states:

> Manage eligible wild and scenic river segments to perpetuate their free-flowing condition and proposed classifications, and protect and enhance their outstandingly remarkable values and water quality through the suitability study period and until designated or released from consideration. When management activities are proposed that may compromise the outstandingly remarkable value(s), potential classification, or free-flowing character of an eligible wild and scenic river segment, a suitability study will be completed for that eligible river segment prior to initiating activities.

Shirttail and Forbes creeks, however, do contribute to flows of the North Fork American River, which is considered eligible for a National Wild and Scenic River designation.

4.9.2.2 State

The California Water Action Plan

The California Water Action Plan was issued at the direction of Governor Brown in January 2014 and updated in 2016 – set forth 10 priority actions that guide the state's effort to create more resilient, reliable water systems and to restore critical ecosystems.

4.9.2.3 Regional

Placer County General Plan

While the FPUD and USFS have independent jurisdiction and approval authority for the proposed project/action, state agencies such as FPUD are required to consider local land use policies and regulations when making decisions. The project site occurs within unincorporated Placer County and, therefore, falls within a planning area addressed in the Placer County General Plan (as updated on May 21, 2013) and the Placer County Zoning Ordinance. Under the Placer County General Plan, the project site is designated as "Agriculture/Timberland" with a minimum of 80 acres. Under the Placer County Zoning Ordinance, the project site is zoned FOR 180 (Forestry Minimum 180 acres).

Foresthill Divide Community Plan (FDCP)

The FDCP was approved by the Placer County Board of Supervisors in 2008. As noted above, the FDCP Area comprises approximately 109 square miles located in the foothills of the western slope of the Sierra Nevada in central Placer County. Several small, rural communities are located on the Divide, including Foresthill, Todd's Valley, Baker Ranch, Michigan Bluff, and Yankee Jim's. The FDCP, in combination with the Placer County General Plan, is the official statement of Placer County setting forth goals, policies, assumptions, guidelines, standards and implementation measures that will guide the physical, social and economic development of the Foresthill Divide Community Plan area to approximately the year 2030. The FPUD service area is contained within the FDCP Area and the proposed project is intended to provide water supply to future growth and development under the FDCP. (See *Figure 2-7*). The Community Plan and FDCP Final EIR (Quad Knopf, Inc. Placer County 2008) identify FPUD as the current and future provider of water service to the Plan Area.

The FPCP consists of the following elements:

- the Community Development Element, including Population and Housing, Land Use, Community Design, Public Facilities, and Parks and Recreation;
- the Resource Management Element, including Natural Resources/Conservation/Open Space, Cultural Resources, and Air Quality: and
- the Transportation and Circulation Element.

The FDCP includes a land use and circulation plan for the Plan Area. The FDCP also includes rezoning of properties within the Plan Area as necessary and required to achieve consistency with the plan's land use designations.

Air Pollution Control District

At the county level, air quality is managed through land use and development planning practices implemented by Placer County and through permitted source controls implemented by the Placer County Air Pollution Control District (PCAPCD). The PCAPCD is also the agency responsible for enforcing many federal and state air quality requirements and for establishing air quality rules and regulations. The

PCAPCD attains and maintains air quality conditions in Placer County through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues.

4.9.3 Environmental Consequences

4.9.3.1 Impact Significance Thresholds

Assumptions and Methods Used to Determine Impact/Effect

The state CEQA criteria and guidelines described below are also used as indicators of adverse effects under NEPA as they pertain to land use issues. The following significance criteria were derived from Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.).

Under CEQA, land use impacts would be significant if the project would:

- Temporarily disturb land uses at or near project components;
- Physically divide an established community; or
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

As discussed in Section 4.1 above, under NEPA, impacts should be addressed in proportion to their significance (40 CFR 1502.2(b)), meaning that severe impacts should be described in more detail than less consequential impacts. The evaluation of effects considers the magnitude, duration, and significance of the changes. For the analysis of each resource topic considered in this EIR/EIS analytical indicators are identified to assist in the characterization and evaluation of environmental effects under NEPA. In determining the significance of potential effects of the proposed action on land use, the indicators of potential effect under NEPA are consistent with the CEQA thresholds identified above. Specifically, the proposed project/action would be considered to have an effect on the human environment if it results in temporary disturbances to adjacent land uses, would physically divide a community, or conflict with any land use plans, policies or regulations.

4.9.3.2 Direct and Indirect Impacts/Effects

Impact LU-1: Disturb existing land uses at or near Sugar Pine Dam and Reservoir during construction. Impact Determination: *Less than significant with mitigation incorporated* (CEQA) and *no effect (NEPA).*

No Project and No Action Alternatives

The No Project and No Action Alternatives result in no construction at Sugar Pine Dam and Reservoir beyond ongoing maintenance and facilities improvements and thus would have ***no impact/effect*** on project-area land uses due to construction.

Proposed Project/Action, Alternative 1 and Alternative 2

As described in Chapter 2 of this DEIR/EIS, the proposed project/action and Alternatives 1 and 2, would install radial gates at Sugar Pine Dam resulting in a significant increase in reservoir storage and an expansion of the reservoir's inundation zone. To accommodate the inundation zone expansion, approximately 44 acres of forest and riparian habitat will be cleared and existing recreational facilities relocated and/or modified to accommodate the expansion. Construction activities will be in direct conflict with recreational use of the three campgrounds: Manzanita Day Use Area, the Sugar Pine Boat Ramp, and the JHMT and related hiking trails around the reservoir. Any potential users of recreational facilities on and adjacent to the reservoir could be put at considerable risk during proposed timber harvest and vegetation removal activities and the implementation of compensatory mitigation measures including, but not limited to, the replacement/reconstruction of campground, day use, boat ramp and trail amenities. Further, construction of the proposed project/action and alternatives may also result in delayed access to residential, recreational, and/or TNF lands due to increased traffic volumes on construction access routes and local roads and noise and air quality disturbances generated by the movement of materials, personnel and equipment to and from the project site. Absent mitigation, temporary impacts on sensitive land uses at and around the Sugar Pine Dam and Reservoir would be significant and adverse. However, with implementation of mitigation measures **LU-1** and **LU-2**, temporary use conflicts and other disturbances of land uses at or near the project area and access routes could be mitigated. For these reasons, the impact is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect (NEPA).***

Mitigation Measures

Mitigation Measure LU-1: Prohibit public access to all recreational use areas at Sugar Pine Reservoir prior to initiation of construction-related activities and maintain closures until construction is complete. Public access closure notices shall be posted at: the entrance to the access road serving Giant Gap Campground, Shirttail Campground, and Manzanita Day Use Area; Forbes Creek Group Campground entrance; the entrance to the Sugar Pine Boat Ramp; and at trailheads located at the north and south ends of Sugar Pine Dam.

Mitigation Measure LU-2: Prepare and implement a Construction Notification Plan. Sixty (60) days prior to the start of construction activities, FPUD shall prepare and submit a Construction Notification Plan to the USFS and the County of Placer for review and approval. The plan shall identify the procedures that will be used to inform the public and appropriate agencies of the location and duration of construction and roadway and facilities closures associated with construction. Elements of the plan shall include, but not be limited to public notice mailer; newspaper and/or website notices; posted notices at public venues including but not limited to USFS offices, Sugar Pine Dam, and all Sugar Pine Project recreational facilities and access roads; and identification of a public liaison person and toll-free hotline to provide information to interested parties.

Impact LU-2: Divide an established community or result in disproportionately high adverse effects on minority or low-income populations. Impact Determination: *Less than significant (CEQA)* and *no effect (NEPA)*.

No Project Alternative, No Action Alternative, Proposed Project/Action, Alternative 1 and Alternative 2

Neither the proposed project/action nor any of the project alternatives addressed in this DEIR/EIS would result in displacing people or housing or divide an established community. Activities associated with project construction and operation would occur within TNF and would not divide an existing community. The project would provide a reliable water source to serve approved growth and development within the FDCP area. For these reasons, the proposed project/action would not directly or indirectly result in any change to approved population growth and development or result in significant impacts on planned improvements to local employment, property values, and tax revenues benefiting public agencies. The proposed project/action would not create disproportionately high or adverse effects on minority or low-income populations as the construction footprint is limited to unpopulated areas within TNF. This impact, therefore, is considered ***less than significant*** (CEQA) and ***no effect (NEPA).***

Impact LU-3: Conflict with applicable land use plans, policies, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Impact Determination: *Less than significant with mitigation incorporated (CEQA)* and *no effect (NEPA)*.

No Project Alternative, No Action Alternative, Proposed Project/Action, Alternative 1 and Alternative 2

As described in Section 4.9.2 above, various planning documents and the goals, policies and regulations contained therein, guide land use decisions to be made within the areas affected by the proposed project/action and Alternatives 1 and 2. Of particular importance to this DEIR/EIS are those policies related to the protection of environmental resources. Given the proposed project's location within the Tahoe National Forest, the key planning documents pertaining to the proposed project/action include the *Tahoe National Forest Land and Resource Management Plan (LRMP)*, the Sugar Pine Management Area (096) element of the LRMP, the *Sierra Nevada Forest Plan,* and the *Federal Land Policy and Management Act*.

As stated above, the Project area is located entirely within the TNF and thus under the independent jurisdiction of FPUD and USFS. Nevertheless, FPUD is required to consider local land use policies and regulations when considering project approval. The project site occurs within unincorporated Placer County and, therefore, falls within a planning area addressed in the County's General Plan and Zoning Ordinance. As noted, the project site is designated as "Agriculture/Timberland" in the General Plan and is zoned as FOR 180 (forestry minimum 180 acres). The proposed project/action does not change the existing land use on the project site, nor do either Alternative 1 or 2. Therefore, consistency with the County's land use designation and zoning ordinance would not be affected by the proposed project/action.

The proposed project/action and alternatives would provide a reliable water source to serve existing customers and future development within the Foresthill Divide Community Plan Area which is outside of the TNF. The FDCP and the FDCP EIR identify FPUD as the current and future provider of water service to the Plan Area. Implementation of the proposed project/action or alternatives would in no way alter approved land uses within the Community Plan Area. For these reasons, the proposed project/action is considered fully consistent with the Community Plan as would be Alternative 1 or 2.

The effects of the proposed project/action and alternatives on specific environmental resources are addressed in detail in this section (Chapter 4) of the DEIR/EIS. These resources include: 4.2 Aesthetics and Visual Resources; 4.3 Air Quality and Climate Change; 4.4 Biological Resources; 4.5 Cultural Resources; 4.6 Geology, Soils and Paleontological Resources; 4.7 Hazards and Hazardous Materials; 4.8 Hydrology and Water Quality; 4.10 Noise; 4.11 Recreation; and 4.12 Traffic and Transportation. In each of these sections, the impact of the construction and operation of the project and project alternatives on that specific resource is assessed as is the consistency of the project with relevant policies in the LRMP pertaining to their protection and, where appropriate, policies contained in County General and Community plans. With the implementation of Compensatory Mitigation Measures, Management Requirements, and resource-specific mitigation measures proposed in this DEIR/EIS, the proposed project/action is found to be fully consistent with applicable federal and regional land use policies and regulations, with one exception.

As discussed in Section 4.2 (Aesthetics/Visual Resources), construction and operation would be inconsistent with the Visual Quality Objectives (VQO) for the Sugar Pine Project area, included in the LRMP. This is considered a potentially significant impact and adverse effect relative to consistency with the proposed project/action and Alternatives to the TNF LRMP. Implementation of mitigation measure **VIS-3**, however, would amend the relevant objective in order to ensure project consistency with the VQO. This impact, therefore, is considered ***less than significant with mitigation incorporated*** (CEQA) and ***no effect*** (NEPA).

Mitigation Measures

Mitigation Measure LU-3: Implement Mitigation Measure VIS-3.

4.9.3.3 Cumulative Impact

As discussed under Impact LU-3 above, the proposed project/action and Alternatives 1 and 2 would conflict with the VQO identified for the Sugar Pine Management Area (096) of the TNF LRMP when FPUD carries out future water transfers beyond historical levels and up to 5,000 AF. This conflict can be mitigated only through an amendment or exemption to the LRMP VQO. In considering such an amendment/exemption TNF must consider that the LRMP and specifically its treatment of Sugar Pine Management Area (096) recognize the future installation of radial gates at Sugar Pine Dam, expansion of Sugar Pine Reservoir, and continued operation of Sugar Pine Reservoir for the primary purpose of municipal water supply. For the reasons discussed above, the contribution of the proposed project/action and Alternatives 1 and 2 to the cumulative effect of past, ongoing and future projects to inconsistencies related to land use plans, policies and ordinances would be ***less than considerable***.

4.9.3.4 Residual Unavoidable Effects

With implementation of mitigation measure **VIS-3**, no significant and unavoidable impacts/effects related to project consistency with land use plans, policies and ordinances would occur as a result of implementing either the proposed project/action or Alternatives 1 and 2.

4.9.4 References

Quad Knopf, Inc. (2008.). Foresthill Divide Community Plan. December 2008. Prepared for Placer County Community Development Resource Agency and Planning Department.

USDA. 1990. Environmental Impact Statement for the Tahoe National Forest Land and Resource Management Plan.

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4.10 Noise

This section of the DEIR/EIS documents the results of a noise impact assessment completed for the proposed project/Action and Alternatives. The Purpose of this analysis is to estimate project/action-generated noise and to determine the level of impact the project would have on the environment. Section 4.10.1 provides a discussion on the fundamentals of noise as well as groundborne vibration. A description of the existing ambient noise environment is contained in Section 4.10.2. Regulations, plans, policies and standards pertaining to the management of noise are described in Section 4.10.3.

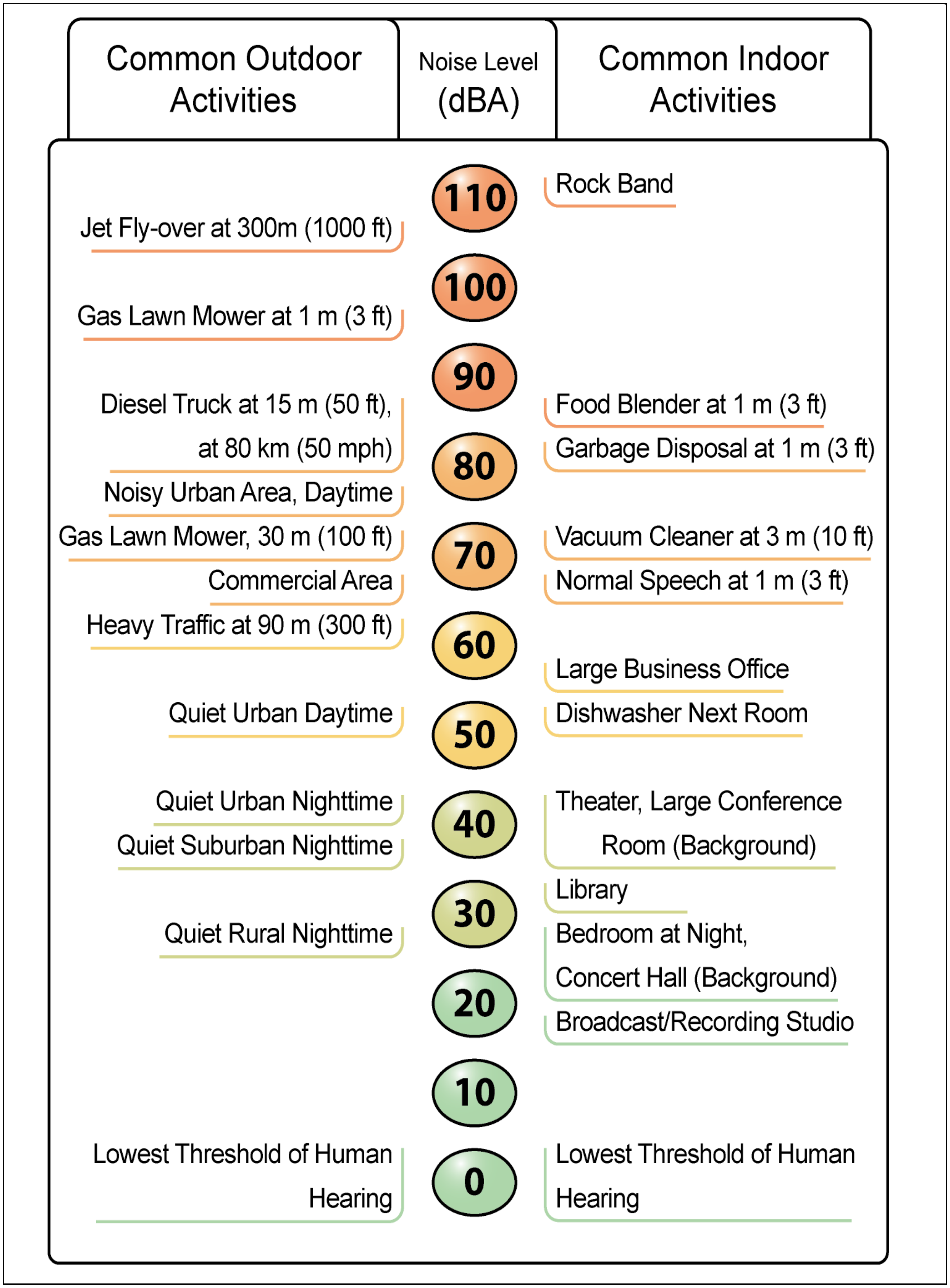
The environmental consequences of the proposed project/action and alternatives are described in Section 4.10.4. Environmental impacts/consequences addressed herein include the potential short-term noise impacts generated during construction-related activities associated with gate installation, timber harvest/vegetation management, and recreational facilities development. The long-term effects on the ambient noise environment due to potential changes in recreational use at the reservoir are also considered.

4.10.1 Fundamentals of Sound, Environmental Noise, and Groundborne Vibration

4.10.1.1 Addition of Decibels

The decibel (dB) scale is logarithmic, not linear, and therefore sound levels cannot be added or subtracted through ordinary arithmetic. Two sound levels 10 dB apart differ in acoustic energy by a factor of 10. When the standard logarithmic decibel is A-weighted (dBA), an increase of 10 dBA is generally perceived as a doubling in loudness. For example, a 70-dBA sound is half as loud as an 80-dBA sound and twice as loud as a 60-dBA sound. When two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dB higher than one source under the same conditions (FTA 2018). For example, a 65-dB source of sound, such as a truck, when joined by another 65-dB source results in a sound amplitude of 68 dB, not 130 dB (i.e., doubling the source strength increases the sound pressure by 3 dB). Under the decibel scale, three sources of equal loudness together would produce an increase of 5 dB.

Typical noise levels associated with common noise sources are depicted in *Figure 4.10-1*.



Source: Caltrans 2012

Figure 4.10-1. Common Noise Levels

4.10.1.2 Sound Propagation and Attenuation

Noise can be generated by a number of sources, including mobile sources, such as automobiles, trucks and airplanes, and stationary sources, such as construction sites, machinery, and industrial operations. Sound spreads (propagates) uniformly outward in a spherical pattern, and the sound level decreases (attenuates) at a rate of approximately 6 dB for each doubling of distance from a stationary or point source. Sound from a line source, such as a highway, propagates outward in a cylindrical pattern, often referred to as cylindrical spreading. Sound levels attenuate at a rate of approximately 3 dB for each doubling of distance from a line source, such as a roadway, depending on ground surface characteristics (FHWA 2011). No excess attenuation is assumed for hard surfaces like a parking lot or a body of water. Soft surfaces, such as soft dirt or grass, can absorb sound, so an excess ground-attenuation value of 1.5 dB per doubling of distance is normally assumed.

4.10.1.3 Noise Descriptors

The decibel scale alone does not adequately characterize how humans perceive noise. The dominant frequencies of a sound have a substantial effect on the human response to that sound. Several rating scales have been developed to analyze the adverse effect of community noise on people. Because environmental noise fluctuates over time, these scales consider that the effect of noise on people is largely dependent on the total acoustical energy content of the noise, as well as the time of day when the noise occurs. The L_{eq} is a measure of ambient noise, while the L_{dn} and CNEL (Community Noise Equivalent Level) are measures of community noise. Each is applicable to this analysis and defined in *Table 4.9-1*.

The dBA sound level scale gives greater weight to the frequencies of sound to which the human ear is most sensitive. Because sound levels can vary markedly over a short period of time, a method for describing either the average character of the sound or the statistical behavior of the variations must be utilized. Most commonly, environmental sounds are described in terms of an average level that has the same acoustical energy as the summation of all the time-varying events.

The scientific instrument used to measure noise is the sound level meter. Sound level meters can accurately measure environmental noise levels to within about plus or minus 1 dBA. Various computer models are used to predict environmental noise levels from sources, such as roadways and airports. The accuracy of the predicted models depends on the distance between the receptor and the noise source. Close to the noise source, the models are accurate to within about plus or minus 1 to 2 dBA.

Table 4.9-1. Common Acoustical Descriptors

Descriptor	Definition
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.
Sound Pressure Level	Sound pressure is the sound force per unit area, usually expressed in micropascals (or 20 micronewtons per square meter), where 1 pascal is the pressure resulting from a force of 1 newton exerted over an area of 1 square meter. The sound pressure level is expressed in decibels as 20 times the logarithm to the base 10 of the ratio between the pressures exerted by the sound to a reference sound pressure (e.g., 20 micropascals). Sound pressure level is the quantity that is directly measured by a sound level meter.
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure. Normal human hearing is between 20 Hz and 20,000 Hz. Infrasonic sound are below 20 Hz and ultrasonic sounds are above 20,000 Hz.
A-Weighted Sound Level, dBA	The sound pressure level in decibels as measured on a sound level meter using the A weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Equivalent Noise Level, L_{eq}	The average acoustic energy content of noise for a stated period of time. Thus, the Leq of a time-varying noise and that of a steady noise are the same if they deliver the same acoustic energy to the ear during exposure. For evaluating community impacts, this rating scale does not vary, regardless of whether the noise occurs during the day or the night.
L_{ma}x, L_{min}	The maximum and minimum A-weighted noise level during the measurement period.
L_{01}, L_{10}, L_{50}, L_{90}	The A-weighted noise levels that are exceeded 1%, 10%, 50%, and 90% of the time during the measurement period.
Day/Night Noise Level, L_{dn} or DNL	A 24-hour average Leq with a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the nighttime. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.4 dBA Ldn.
Community Noise Equivalent Level, CNEL	A 24-hour average Leq with a 5 dBA “weighting” during the hours of 7:00 p.m. to 10:00 p.m. and a 10 dBA “weighting” added to noise during the hours of 10:00 p.m. to 7:00 a.m. to account for noise sensitivity in the evening and nighttime, respectively. The logarithmic effect of these additions is that a 60 dBA 24-hour Leq would result in a measurement of 66.7 dBA CNEL.
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Intrusive	That noise which intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends on its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure. The reference pressure for air is 20.

4.10.1.4 Human Response to Noise

The human response to environmental noise is subjective and varies considerably from individual to individual. Noise in the community has often been cited as a health problem, not in terms of actual physiological damage, such as hearing impairment, but in terms of inhibiting general well-being and contributing to undue stress and annoyance. The health effects of noise in the community arise from interference with human activities, including sleep, speech, recreation, and tasks that demand concentration or coordination. Hearing loss can occur at the highest noise intensity levels.

Noise environments and consequences of human activities are usually well represented by median noise levels during the day or night or over a 24-hour period. Environmental noise levels are generally considered low when the CNEL is below 60 dBA, moderate in the 60 to 70 dBA range, and high above 70 dBA. Examples of low daytime levels are isolated, natural settings with noise levels as low as 20 dBA and quiet, suburban, residential streets with noise levels around 40 dBA. Noise levels above 45 dBA at night can disrupt sleep. Examples of moderate-level noise environments are urban residential or semi-commercial areas (typically 55 to 60 dBA) and commercial locations (typically 60 dBA). People may consider louder environments adverse, but most will accept the higher levels associated with noisier urban residential or residential-commercial areas (60 to 75 dBA) or dense urban or industrial areas (65 to 80 dBA). Regarding increases in A-weighted noise levels (dBA), the following relationships should be noted in understanding this analysis:

- Except in carefully controlled laboratory experiments, a change of 1 dBA cannot be perceived by humans.
- Outside of the laboratory, a 3 dBA change is considered a just-perceivable difference.
- A change in level of at least 5 dBA is required before any noticeable change in community response would be expected. An increase of 5 dBA is typically considered substantial.
- A 10 dBA change is subjectively heard as an approximate doubling in loudness and would almost certainly cause an adverse change in community response.

4.10.1.5 Effects of Noise on People

Hearing Loss

While physical damage to the ear from an intense noise impulse is rare, a degradation of auditory acuity can occur even within a community noise environment. Hearing loss occurs mainly due to chronic exposure to excessive noise, but may be due to a single event such as an explosion. Natural hearing loss associated with aging may also be accelerated from chronic exposure to loud noise.

The Occupational Safety and Health Administration (OSHA) has a noise exposure standard that is set at the noise threshold where hearing loss may occur from long-term exposures. The maximum allowable level is 90 dBA averaged over eight hours. If the noise is above 90 dBA, the allowable exposure time is correspondingly shorter.

Annoyance

Attitude surveys are used for measuring the annoyance felt in a community for noises intruding into homes or affecting outdoor activity areas. In these surveys, it was determined that causes for annoyance include interference with speech, radio and television, house vibrations, and interference with sleep and rest. The L_{dn} as a measure of noise has been found to provide a valid correlation of noise level and the percentage of people annoyed. People have been asked to judge the annoyance caused by aircraft noise and ground transportation noise. There continues to be disagreement about the relative annoyance of these different sources. For ground vehicles, a noise level of about 55 dBA L_{dn} is the threshold at which a substantial percentage of people begin to report annoyance.

4.10.1.6 Environmental Groundborne Vibration

Vibration Sources and Characteristics

Sources of earthborne vibrations include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) or manmade causes (e.g., explosions, machinery, traffic, trains, construction equipment). Vibration sources may be continuous (e.g., factory machinery) or transient (e.g., explosions).

Ground vibration consists of rapidly fluctuating motions or waves with an average motion of zero. Several different methods are typically used to quantify vibration amplitude. One is the peak particle velocity (PPV); another is the root mean square (RMS) velocity. The PPV is defined as the maximum instantaneous positive or negative peak of the vibration wave. The RMS velocity is defined as the average of the squared amplitude of the signal. The PPV and RMS vibration velocity amplitudes are used to evaluate human response to vibration.

Table 4.9-2 displays the reactions of people and the effects on buildings produced by continuous vibration levels. The annoyance levels shown in the table should be interpreted with care since vibration may be found to be annoying at much lower levels than those listed, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to exaggerated vibration complaints, even though there is very little risk of actual structural damage. In high noise environments, which are more prevalent where groundborne vibration approaches perceptible levels, this rattling phenomenon may also be produced by loud airborne environmental noise causing induced vibration in exterior doors and windows.

Ground vibration can be a concern in instances where buildings shake and substantial rumblings occur. However, it is unusual for vibration from typical urban sources such as buses and heavy trucks to be perceptible. Common sources for groundborne vibration are planes, trains, and construction activities such as earth-moving which requires the use of heavy-duty earth moving equipment.

Neither the County of Placer nor the USFS regulate vibrations associated with construction. However, a discussion of construction vibration is included for full disclosure purposes. A PPV descriptor with units of inches per section (in/sec) is used to evaluate construction-generated vibration for building damage and human complaints, for the purposes of this analysis.

Table 4.9-2. Human Reaction and Damage to Buildings for Continuous or Frequent Intermittent Vibration Levels

Peak Particle Velocity (inches/second)	Approximate Vibration Velocity Level (VdB)	Human Reaction	Effect on Buildings
0.006–0.019	64–74	Range of threshold of perception	Vibrations unlikely to cause damage of any type
0.08	87	Vibrations readily perceptible	Recommended upper level to which ruins and ancient monuments should be subjected
0.1	92	Level at which continuous vibrations may begin to annoy people, particularly those involved in vibration sensitive activities	Virtually no risk of architectural damage to normal buildings
0.2	94	Vibrations may begin to annoy people in buildings	Threshold at which there is a risk of architectural damage to normal dwellings
0.4–0.6	98–104	Vibrations considered unpleasant by people subjected to continuous vibrations and unacceptable to some people walking on bridges	Architectural damage and possibly minor structural damage

Source: Caltrans 2004

4.10.2 Environmental Setting/Affected Environment

4.10.2.1 Introduction

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action would install radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. This will in turn increase the "safe yield" for water supply stored at the reservoir. Gate installation will provide additional water supply available for diversion by the FPUD to serve current customers within the District's service area and ensure that adequate water will be available to serve future approved growth and development within the service area.

In addition to gate installation and expansion of the Sugar Pine Reservoir inundation area, the proposed project/action would implement a compensatory mitigation program to replace recreational facilities affected by the project and mitigate for lost or degraded natural and cultural resources in the TNF.

4.10.2.2 Noise Sensitive Land Uses

Noise-sensitive land uses are generally considered to include those uses where noise exposure could result in health-related risks to individuals, as well as places where quiet is an essential element of their intended purpose. Residential dwellings are of primary concern because of the potential for increased and prolonged exposure of individuals to both interior and exterior noise levels. Additional land uses such as parks, historic sites, cemeteries, and recreation areas are considered sensitive to increases in exterior noise levels. Schools, churches, hotels, libraries, and other places where low interior noise levels are essential are also considered noise-sensitive land uses. There are no permanent residences or other permanent sensitive receptors in proximity to the Sugar Pine Reservoir Dam or project/action timber harvest area. The nearest sensitive noise receptors would include temporary users of Sugar Pine Reservoir during open season.

Existing Ambient Noise Environment

Primary noise sources at Sugar Pine Reservoir include traffic noise on the surrounding roadway network and recreational activities associated with boating, off-road vehicles, hunting, camping, and day use of the beaches around the reservoir.

4.10.3 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on the ambient noise environment.

4.10.3.1 Federal

Occupational Safety and Health Act of 1970

The OSHA regulates onsite noise levels and protects workers from occupational noise exposure. To protect hearing, worker noise exposure is limited to 90 decibels with dBA over an eight-hour work shift (29 Code of Regulations [CFR] 1910.95). Employers are required to develop a hearing conservation program when employees are exposed to noise levels exceeding 85 dBA. These programs include provision of hearing protection devices and testing employees for hearing loss on a periodic basis.

4.10.3.2 State

State of California General Plan Guidelines

The State of California regulates vehicular and freeway noise affecting classrooms, sets standards for sound transmission and occupational noise control, and identifies noise insulation standards and airport noise/land-use compatibility criteria. The State of California General Plan Guidelines, (State of California 2003),published by the Governor's Office of Planning and Research (OPR 2003), also provides guidance for the acceptability of projects within specific CNEL/L_{dn} contours. The guidelines also present adjustment factors that may be used in order to arrive at noise acceptability standards that reflect the noise control goals of the community, the particular community's sensitivity to noise, and the community's assessment of the relative importance of noise pollution.

State Office of Planning and Research Noise Element Guidelines

The State OPR Noise Element Guidelines include recommended exterior and interior noise level standards for local jurisdictions to identify and prevent the creation of incompatible land uses due to noise. The Noise Element Guidelines contain a land use compatibility table that describes the compatibility of various land uses with a range of environmental noise levels in terms of the CNEL.

4.10.3.3 Local

Placer County General Plan

The Placer County General Plan Noise Element provides policy direction for minimizing noise impacts on the community and for coordinating with surrounding jurisdictions and other entities regarding noise control. By identifying noise-sensitive land uses and establishing compatibility guidelines for land use and noises, noise considerations will influence the general distribution, location, and intensity of future land uses. The result is that effective land use planning and mitigation can alleviate the majority of noise problems.

Placer County Municipal Code

The County's regulations with respect to noise are included in Article 9.36 of the County Code. The County outlines sensitive land use noise standards as displayed in *Table 4.9-3*.

Table 4.9-3. Maximum Sound Level for Sensitive Source Land Uses

Land Use	Maximum Allowable (dBA)	
	10:00 p.m. to 7:00 a.m.	7:00 a.m. to 10:00 p.m.
Sensitive/Residential	45	55

Source: Placer County Code 2019

Article 9.36 of the County Code exempts noise generated from impermanent construction activities (e.g., construction, alteration or repair activities) between the hours of 6:00 a.m. and 8:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday from numeric noise standards.

4.10.4 Environmental Consequences

4.10.4.1 Definition and Use of CEQA Significance Criteria/Indicators under NEPA

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of noise-related impacts resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.). A development project could have a significant impact related to noise if the project/action would:

- generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies,
- generate excessive groundborne vibration or groundborne noise levels, or

- for a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels.

As identified in the 2015 Initial Study prepared for the project/action, the only element of the project/action that could provide a new long-term noise source is the operation of the proposed radial gates, yet this operation would be powered by small-scale, electric winches and would be periodic and short in duration. Further, the radial gates would operate with no sensitive receptors in proximity and thus would be less than significant. Further, the 2015 Initial Study identified that the Sugar Pine Reservoir is not located in proximity to any airstrip or public airport, and thus would not be affected by such noise sources. Therefore, these issues will not be further discussed in this EIR/EIS.

Under NEPA, the evaluation of effects considers the magnitude, duration, and significance of changes brought about by the proposed action. For the analysis of resource topics considered in this EIR/EIS, analytical indicators are identified to assist in the characterization and evaluation of environmental effects under NEPA. For the evaluation of potential noise effects of the proposed project/action herein, the analytical indicators include:

- A narrative description of existing noise levels in the study area; and
- A narrative description of potential noise-related impacts associated with timber harvest operations, radial gates installation, and recreational facilities replacement and the potential occurrences of sensitive receptors during those project activities.

4.10.4.2 Assumptions and Methods Used to Determine Impact/Effect

This analysis of the existing and future noise environments is based on noise prediction modeling and empirical observations. In order to estimate the worst-case construction noise levels that may occur at the nearest noise-sensitive receptors in the project vicinity, predicted construction noise levels were calculated utilizing the Federal Highway Administration's Roadway Construction Model (2006).

Groundborne vibration levels associated with construction-related activities for the project were evaluated utilizing typical groundborne vibration levels associated with construction equipment, obtained from the Caltrans guidelines set forth above. Potential groundborne vibration impacts related to structural damage and human annoyance were evaluated, taking into account the distance from construction activities to nearby land uses.

4.10.4.3 Direct and Indirect Impacts/Effects

Impact NOISE-1: Generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Impact Determination: *less than significant* (CEQA) and *no effect* (NEPA).

Construction-Related Impacts

No Project and No Action Alternatives

The No Project and No Action Alternatives only include the approval of the extension of Water Right 15375, and no modifications to facilities or recreational features at the reservoir would be implemented. The extension of Water Right 15375 will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. There would be no temporary increase in ambient noise levels as a result of the No Project or No Action Alternative. , and there is ***no impact*** under CEQA and ***no effect*** under NEPA. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action and Alternative 1

The Proposed project/action would result in the placement of radial gates and the removal and relocation of several recreational facilities. The removal and relocation of facilities include campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities. Erosion could occur during construction given the slopes and nature of activities. The Proposed project/action also includes a timber harvest plan which affects approximately 40 to 43 acres.

Hazard tree abatement would be conducted within 150 feet of the relocated JHMT, the Sugar Pine trial and relocated campgrounds and picnic area. The hazard tree treatment area would be approximately 110 acres in size. The hazard trees would be felled and removed via end-lining from a skidder. Furrows created during tree removal would be filled and recontoured to match the existing slope.

Construction noise associated with the proposed project/action would be temporary and would vary depending on the nature of the activities being performed. Noise generated would primarily be associated with the operation of off-road equipment as well as timber truck traffic on area roadways. Construction noise typically occurs intermittently and varies depending on the nature or phase of construction (e.g., building construction, paving). Noise generated by construction equipment, including earth movers, material handlers, and portable generators, can reach high levels. Typical operating cycles for these types of construction equipment may involve 1 or 2 minutes of full power operation followed by 3 to 4 minutes at lower power settings. Other primary sources of acoustical disturbance would be random incidents, which would last less than one minute (such as dropping large pieces of equipment or the hydraulic movement of machinery lifts). During project/action implementation, exterior noise levels could negatively affect sensitive receptors in the vicinity of the construction site.

Table 4.9-4 indicates the anticipated noise levels of construction equipment. The average noise levels presented in *Table 4.9-4* are based on the quantity, type, and acoustical use factor for each type of equipment that is anticipated to be used.

Table 4.9-4. Maximum Noise Levels Generated by Construction Equipment

Type of Equipment	Maximum Noise (L_{max}) at 50 Feet (dBA)	Maximum 8-Hour Noise (L_{eq}) at 50 Feet (dBA)
Auger	84.4	77.4
Chainsaw	83.7	76.7
Clam Shovel	87.3	80.3
Crane	80.6	72.6
Drill Rig Truck	79.1	72.2
Dozer	81.7	77.7
Excavator	80.7	76.7
Flat Bed Truck	74.3	70.3
Front End Loader	79.1	75.1
Generator	80.6	77.6
Gradall	83.4	79.4
Grader	85.0	81.0
Grapple	87.0	83.0
Mounted Impact Hammer	90.3	83.3
Paver	77.2	74.2
Roller	80.0	73.0
Tractor	84.0	80.0
Dump Truck	76.5	72.5
Concrete Pump Truck	81.4	74.4
Welder	74.0	70.0

Source: Federal Highway Administration, Roadway Construction Noise Model (FHWA-HEP-05-054), dated January 2006.

There are no permanent residences or other permanent sensitive receptors in proximity to the Sugar Pine Reservoir Dam or project/action timber harvest area. The nearest noise receptors would include temporary users of Sugar Pine Reservoir, however, all recreation areas associated with the reservoir (including boat ramp, campground, trails, and access roads) will be closed to the public and therefore no sensitive receptors will be present during construction.

As depicted in *Table 4.9-4*, noise levels generated by individual pieces of construction equipment typically range from approximately 70.0 dBA L_{eq} to 83.3 dBA L_{eq} at 50 feet. As previously described, Article 9.36 of the County Code exempts noise generated from impermanent construction activities (e.g., construction, alteration or repair activities) between the hours of 6:00 a.m. and 8:00 p.m. Monday through Friday, and between the hours of 8:00 a.m. and 8:00 p.m. Saturday and Sunday from numeric noise standards. However, given that the reservoir and surrounding area will be closed to recreational use during construction activity, Therefore, temporary increase of ambient noise levels at the Sugar Pine Reservoir will be ***less than significant*** level under CEQA and ***no effect*** under NEPA.

Alternative 2: Helicopter Harvest

Under this alternative to the proposed project/action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine of the 44 acres to be cleared under the proposed project/action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. The use of helicopters would reduce the number of onsite vehicle trips to transfer the cut material to the landings.

There are several components to helicopter noise. For instance, 'thickness noise' is dependent only on the shape and motion of the blade and can be thought of as being caused by the displacement of the air by the rotor blades. It is primarily directed in the plane of the rotor. 'Loading noise' is an aerodynamic adverse effect due to the acceleration of the force distribution on the air around the rotor blade due to the blade passing through it and is directed primarily below the rotor. In general, loading noise can include numerous types of blade loading: some special sources of loading noise are identified separately. This source of helicopter noise tends to dominate at low blade speed. 'Blade vortex interaction (BVI)' occurs when a rotor blade passes within a close proximity of the shed tip vortices from a previous blade. This causes a rapid, impulsive change in the loading on the blade resulting in the generation of highly directional impulsive loading noise. BVI noise can occur on either the advancing or retreating side of the rotor disk and its directivity is characterized by the precise orientation of the interaction. In general, advancing side BVI noise is directed down and forward while retreating-side BVIs cause noise that is directed down and rearward. It has been shown that the main parameters governing the strength of a BVI are the distance between the blade and the vortex, the vortex strength at the time of the interaction. Another form of loading noise, 'broadband noise', consists of various noise sources. Turbulence ingestion through the rotor, the rotor wake itself, and blade self-noise are each sources of broadband noise. While most noise from a helicopter is generated by the main rotor, the tail rotor is a significant source of noise for observers relatively close to the helicopter, where the higher-frequency noise of the tail rotor has not yet been attenuated by the atmosphere. 'Tail rotor noise' is particularly perceivable to the human listener due to its higher frequency (as compared to the main rotor) which places it directly in the band in which the human ear is most sensitive.

Helicopter noise is not emitted at a uniform level continuously yet varies depending on its position to the noise receiver coupled with its function at the specific time its noise is being perceived. For this reason, helicopter noise is best described in L_{max}, the maximum A-weighted noise level during the measurement period. Helicopter noise is generally loudest (most perceivable to humans on the ground) with flying close to the ground and taking off or landing. Based on previous measurements conducted by ECORP Consulting, Inc., helicopter noise reaches noise levels of 87.0 through 87.7 dBA L_{max} to groundborne observers during takeoff, low flying, and landing events.

As previously described, there are no permanent residences or other permanent sensitive receptors in proximity to the Sugar Pine Reservoir Dam or Project/action timber harvest area. The nearest noise receptors would include temporary users of Sugar Pine Reservoir, however, all recreation areas associated with the reservoir (including boat ramp, campground, trails, and access roads) will be closed to the public and therefore no sensitive receptors will be present during construction.

Under this Alternative, helicopters would be employed only during the construction/implementation phase and would not operate as a permanent component of the proposed project. Therefore, temporary increase of ambient noise levels at the Sugar Pine Reservoir will be ***less than significant*** level under CEQA and ***no effect*** under NEPA.

Operation Impact

Proposed Project/Action and Alternatives

As previously described, the only element of the project/action that could provide a new long-term noise source is the operation of the proposed radial gates, yet this operation would be powered by small-scale, electric winches and would be periodic and short in duration. Further, the radial gates would operate with no sensitive receptors in proximity and thus would be ***less than significant*** under CEQA and have ***no effect*** under NEPA.

Impact NOISE-2: Result in the excessive groundborne vibration or groundborne noise levels. Impact Determination: *No impact* (CEQA) and *no effect* (NEPA).

Excessive groundborne vibration impacts result from continuously occurring vibration levels. Increases in groundborne vibration levels are primarily associated with short-term construction-related activities. Construction has the potential to result in varying degrees of temporary groundborne vibration, depending on the specific construction equipment used and the operations involved. Ground vibration generated by construction equipment spreads through the ground and diminishes in magnitude with increases in distance.

The County does not regulate vibration. However, a discussion of construction vibration is included for full disclosure purposes. For comparison purposes, Caltrans' (2004) recommended standard of 0.2 inch per second peak particle velocity with respect to the prevention of structural damage for older residential buildings is used as a threshold. This is also the level at which vibrations may begin to annoy people in buildings.

No Project/Action Alternative

The No Project/Action Alternative only includes the approval of the extension of Water Right 15375, and no modifications to facilities or recreational features at the reservoir would be implemented. The extension of Water Right 15375 will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. There would be no groundborne vibration as a result of the No Project/Action Alternative, and there is ***no impact*** under CEQA and ***no effect*** under NEPA.

Proposed Project/Action

Construction-related ground vibration is normally associated with impact equipment such as pile drivers, jackhammers, and the operation of some heavy-duty construction equipment, such as dozers and trucks. It is noted that pile drivers would not be necessary during project/action implementation. Vibration decreases rapidly with distance and it is acknowledged that construction activities would occur throughout the Sugar Pine Reservoir area and would not be concentrated at any single location. Groundborne vibration levels associated with construction equipment are summarized in *Table 4.9-5*.

Table 4.9-5. Vibration Source Amplitudes for Construction Equipment

Equipment Type	Peak Particle Velocity at 25 Feet (inches per second)	Peak Particle Velocity at 100 Feet (inches per second)
Pile Driver (impact) upper range	1.518	0.189
Pile Driver (typical)	0.644	0.081
Sonic Pile Driver upper range	0.734	0.092
Sonic Pile Driver (typical)	0.170	0.021
Rock Breaker	0.059	0.007
Large Bulldozer	0.089	0.011
Loaded Trucks	0.076	0.010
Jackhammer	0.035	0.004
Small Bulldozer/Tractor	0.003	0.000
Caisson Drilling	0.089	0.011

Source: FTA 2018; Caltrans 2004

As previously described, there are no permanent residences or other permanent sensitive receptors in proximity to the Sugar Pine Reservoir Dam, recreation facilities or timber harvest area and all recreational areas will be closed to the public during construction activities. There is ***no impact*** under CEQA and ***no effect*** under NEPA.

4.10.4.4 Cumulative Impact

Construction activities associated with all Alternatives and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed project/action and all Alternatives was determined to be less than significant following compliance with the County Code. Cumulative development in the vicinity of the Sugar Pine Reservoir could result in elevated construction noise levels for the temporary users in the Sugar Pine Reservoir area. However, each project would be required to comply with the applicable County Code limitations on construction. Therefore, neither the project/action nor Alternatives would be considered cumulatively considerable.

4.10.5 References

Caltrans. 2012. *IS/EA Annotated Outline.* http://www.dot.ca.gov/ser/vol1/sec4/ch31ea/chap31ea.htm.

_____. 2004. *Transportation- and Construction-Induced Vibration Guidance Manual.*

FHWA. 2011. *Effective Noise Control During Nighttime Construction.* http://ops.fhwa.dot.gov/wz/workshops/accessible/schexnayder_paper.htm.

_____. 2006. *Roadway Construction Noise Model.*

FTA. 2018. *Transit Noise and Vibration Impact Assessment.*

OPR. 2003. State of California General Plan Guidelines.

4.11 Recreation

This section of the DEIR/EIS assesses the potential direct, indirect and cumulative effects of the proposed project/action on existing public recreational facilities, future implementation of approved plans related to recreational use at Sugar Pine Reservoir, and future demand for and use of recreational facilities related to historic and anticipated levels without the proposed project/action. The proposed installation of radial gates at Sugar Pine Dam, subsequent expansion of storage capacity of Sugar Pine Reservoir, and future modifications in reservoir operations are likely to affect recreational use at the reservoir either directly via the elimination and replacement of existing camping, day use and boat ramp facilities, or indirectly by changing the quality of the recreational experience for recreational users. Section 4.11.1 provides a description of the existing recreational setting at Sugar Pine Reservoir including existing facilities and current data on past recreational use. Regulations, plans, policies and standards pertaining to recreation and reservoir operations are provided in Section 4.11.2. The environmental consequences resulting from implementation of the proposed project/action and project alternatives are described in Section 4.11.3. Section 4.11.4 provides mitigation monitoring, compliance, and reporting information; Section 4.11.5 addresses residual effects of the project; and Section 4.11.6 lists the references cited in this section.

4.11.1 Environmental Setting/Affected Environment

4.11.1.1 Introduction

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action would extend FPUD's water right and install radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. This will in turn require the relocation and replacement of existing boating facilities, camping sites, picnic tables, trails, trail bridges, trail benches, interpretive signs, and vault toilets.

4.11.1.2 Approach to Defining Affected Recreational Resources and Use

The Recreation Opportunity Spectrum (ROS) is a classification tool used by Forest Service managers since the 1970s to provide visitors with varying challenges and outdoor experiences. Recreation opportunities can be expressed in terms of three main components: activities, setting, and experience. Combinations of these three components have been organized in the ROS as a classification framework for understanding these relationships and interactions. The ROS organizes forest service lands into six management class categories defined by setting and the probable recreation experiences and activities it affords including: primitive; semi-primitive/non-motorized; semi-primitive/motorized; roaded/natural; rural; and urban. A location is evaluated based on seven different attributes: access; remoteness; naturalness; facilities and site management; social encounters; visitor impacts; and visitor management. Each one the of the attributes are then divided into subcategories and the location/area is rated on these attributes which then provides the ROS classification (USDA 1979).

The TNF LRMP is the primary resource planning and management document for the proposed project study area. This document describes existing the recreational facilities and opportunities surrounding Sugar Pine Reservoir. The TNF LRMP identifies the Sugar Pine ROS as roaded/natural.

4.11.1.3 Recreational Setting and Affected Environment

Recreational Facilities with the Sugar Pine Reservoir Management Area

The TNF LRMP divides the Forest into a series of geographical units called Management Areas. The Sugar Pine Management Area recreation facilities have been open to the public since 1985. Sugar Pine reservoir is surrounded by a dense mixed conifer forest and a 3.5-mile shoreline. The reservoir is primarily used for fishing, boating, swimming, hiking, and camping. The reservoir has a 10 mph boat speed limit.

Public facilities surrounding the reservoir include Shirttail Creek Campground (SCCG), Giant Gap Campground (GGCG), Forbes Creek Group Campground (FCGC), Manzanita Day Use Area (MDUA), a boat ramp, and 4.3 miles of foot trails including 2.8 miles of handicap accessible paved trail.

The SCCG is located on the north west shore of the Sugar Pine Reservoir and includes 30 campsites and a trailer dump station. The campground offers single and double family campsites and one triple site; a few of the campsites are handicap accessible. Picnic tables, campfire rings and grills are provided, as well as vault toilets and drinking water.

The GGCG is located on the north west shore of Sugar Pine Reservoir. 30 single site(s), 5 double site(s) The campground offers several single- and double-family campsites, a few of which are handicap accessible. Picnic tables, campfire rings and grills are provided, as are vault toilets and drinking water.

FCGC is located on the southeast shore of Sugar Pine Reservoir. The campground offers two group campsites, Madrone and Rocky Ridge. Each site can accommodate up to 50 people and 18 vehicles. Both sites are equipped with a central cooking and picnic area, with a large campfire circle and multiple tables. RVs, trailers and tents are allowed within the campground. An unloading area and accessible parking are available within the campground.

The MDUA includes 25 picnic units, a beach and a swimming area.

Recreational Use

Based on observations by TNF staff, the recreational area associated with Sugar Pine Reservoir is one of the highest used areas in the entire Tahoe National Forest. This is not surprising given Sugar Pine Reservoir is one of the closest National Forest sites to the Sacramento metropolitan area. On summer weekends the Manzanita Day Use is full to capacity by early to mid-morning. The facilities are regularly full to capacity all summer long (M. Sullivan, TNF, personal communication, 2019). Available data concerning recreational use at Sugar Pine Reservoir and associated recreational facilities, however, is limited. Available information related to recreational use at Sugar Pine Reservoir is based on statistical information provided by TNF and covers the years 2012 through 2016 (see Table 4.11-1 below). Data concerning total revenue are shown for the years 2012 through 2014 in the table. The number of user days and revenue at each Sugar Pine facility are shown for the years 2015 and 2016. As shown in Table 4.11-1, the number of visitors to the Sugar Pine Reservoir increased by 8,553 persons in 2016 compared to 2015. The majority of this increase was from persons using the boat ramp and the MDUA.

Table 4.11-1. Sugar Pine Recreation Visitor Use Days and Revenues

Site	2012	2013	2014	2015		2016	
	Revenue			Visitors	Revenue	Visitors	Revenue
Giant Gap Campground	Detail data by site unavailable prior to 2015 because of reporting methods used by TNF.			12,434	$62,353	13,307	$71,662
Shirttail Creek Campground				8,115	$41,272	8,872	$44,650
Forbes Creek Campground				5,198	$16,701	4,992	$19,743
Boat Ramp				7,662	$9,577	11,071	$13,838
Manzanita Day Use Area				5,869	$7,336	9,589	$11,986
Totals	$145,098	$158,941	$147,469	39,278	$137,241	47,831	$161,880

Source: TNF 2017

Quality of the Recreational Experience

As noted above, available data concerning recreational use at Sugar Pine Reservoir and associated recreational facilities are limited. No quantifiable information concerning the quality of the recreational experience at Sugar Pine such as recreational user surveys or interviews has been attempted by TNF. Anecdotal information provided by TNF suggests that when reservoir levels are maintained at or near maximum pool, the quality of the recreational experience is enhanced. This is a reasonable assumption given that campers, day users, and hikers along the JHMT have easier access to the reservoir's waterline for swimming and boating. As reservoir storage declines, the distance to the waterline increases making it harder for recreationists at Sugar Pine facilities to access the water. This is compounded by the fact that areas of bare soil exposed as the reservoir recedes can be very muddy making walking to the shoreline and transporting kayaks and canoes more difficult and less enjoyable.

4.11.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on recreation.

4.11.2.1 Federal

Current management direction on desired future conditions for the management of recreational resources in the Tahoe National Forest can be found in the following documents.

National Forest Management Act (NFMA)

The National Forest Management Act (NFMA) of 1976 is the primary statute governing the administration of national forests and was an amendment to the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands.

Forest Service Manual 2300 – Recreation, Wilderness, and Related Resource Management

Chapter 2330, "Publicly Managed Recreation Opportunities," of Forest Service Manual 2300, contains objectives and policies regarding the establishment and management of National Forest System recreation facilities. Chapter 2330 contains objectives and policies regarding publicly managed recreation opportunities within the U.S. national forests. (USDA 2018).

Forest Service Strategic Plan

The Strategic Plan provides direction that guides the Forest Service in delivering its mission to "sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations" (USDA 2015). Key items of the FY 2015–2020 strategic plan determined to be applicable to the proposed project/action and associated with recreation are listed below:

- Objective E. Strengthen Communities.
    - Strategies
        - Develop sustainable recreation settings and opportunities along with programs that complement national, State, and community tourism strategies.
- Objective F. Connect people to the outdoors
    - Strategies
        - Maintain recreational settings, hiking trails, and other sustainable recreational opportunities on the national forests and grasslands for public use.
        - Improve recreation facility accessibility.

Tahoe National Forest Land and Resource Management Plan (LRMP)

The LRMP identifies that recreation use is high in the TNF because many areas of high scenic beauty and recreational appeal are located within a short travel distance of the metropolitan areas of Reno, Sacramento, and San Francisco. Some features of special interest that attract visitors to the TNF include: Placer County Grove of Sierra Redwoods, North Fork American Wild River, Granite Chief Wilderness, Donner Camp, the historic emigrant route from Verdi to the Sacramento Valley, and numerous ski areas and reservoirs. The popularity of these and other features of TNF creates conflicts in the TNF for camping, picnicking, swimming, off-highway vehicle use, hiking, winter sports, hunting, and fishing (TNF 1990).

Recreation goals provided in the LRMP that pertain to the proposed project/action are as follows:

1. Provide a broad spectrum of dispersed and developed recreation opportunities in accordance with identified needs and demands.

2. Work with cooperating water agencies and irrigation districts to maintain desirable water levels on reservoirs through the entire length of the recreation season.

Sugar Pine Management Area (096) of the LRMP

As noted, the LRMP, the TNF divides the Forest into a series of geographical units called Management Areas. Sugar Pine Reservoir and recreational facilities surrounding the reservoir are contained within Management Area 096 (see **Appendix C** of this DEIR/EIS). Resource management emphasis for Management Area 096 is listed as recreation development including the reservoir basin and the foreground of the Sugar Pine and Iowa Hill Roads. Various available Management Practices are identified as they pertain to recreational use within the Management Area. Proposed means of addressing identified issues and concerns within Management Area 096 as they pertain to recreational use include the restriction of off-highway vehicle use in the area and the restriction of camping to developed sites and developed camping areas only. In addition, recreational use in the area should adhere to design capacities.

4.11.2.2 State

There are no applicable State laws, regulations, or standards pertaining to recreation.

4.11.2.3 Local

Government Code Section 53091 states that building and zoning ordinances do not apply to "construction of facilities for the production, generation, storage, treatment, or transmission of water, wastewater, or electrical energy by a local agency." Public utility projects that serve the facilities described above would not be subject to local plans, policies, regulations, or ordinances. The following local regulations related to recreation are provided for informational purposes and are provided as a basis to assist with CEQA review in evaluating the level of significance associated with impacts.

Placer County General Plan

The Placer County General Plan includes goals and policies within the Recreation and Cultural Resources Element that guide the development and design of recreational facilities within Placer County. Because the project site is located within a national forest, development and design requirements identified in the General Plan do not pertain to the project. However, certain polices can assist in the development of recreational facilities within the national forest system. Those that would apply to the proposed project/action area as follows:

Goal 5.A: *To develop and maintain a system of conveniently located, properly-designed parks and recreational facilities to serve the needs of present and future residents, employees, and visitors.*

Policy 5.A.11 Regional and local recreation facilities should reflect the character of the area and the existing and anticipated demand for such facilities.

Policy 5.A.12 The County shall encourage recreational development that complements the natural features of the area, including the topography, waterways, vegetation, and soil characteristics.

Policy 5.A.13 The County shall ensure that recreational activity is distributed and managed according to an area's carrying capacity, with special emphasis on controlling adverse environmental impacts, conflict between uses, and trespass. At the same time, the regional importance of each area's recreation resources shall be recognized.

Policy 5.A.14 The County shall encourage federal, state, and local agencies currently providing recreation facilities to maintain, at a minimum, and improve, if possible, their current levels of service.

Foresthill Divide Community Plan

The Foresthill Divide Community Plan (FDCP), in combination with the Placer County General Plan, is the official statement of Placer County setting forth goals, policies, assumptions, guidelines, standards and implementation measures that will guide the physical, social and economic development of the Foresthill Divide Community Plan area to approximately the year 2030. The Plan provides overall direction for future growth in the Foresthill Divide. Because the project site is located within a national forest, development and design requirements identified in the Community Plan do not pertain to the project. However, certain polices can assist in the development of recreational facilities within the national forest system. Those that would apply to the proposed project/action area as follows:

Goal 3.E.4. Develop a system of interconnected hiking, riding and bike trails suitable for active recreation, transportation and circulation from the confluence of the American River to Sugar Pine Reservoir. Trails are a high priority within the Foresthill Community Plan area.

Policy 3.E.4-2: Provide links to a major countywide trail system.

Policy 3.E.4-5: Trails shall be separated from the traveled roadway whenever possible by curbs, barriers, landscaping and spatial distance. Safety is a high priority, also with emphasis on aesthetics.

Policy 3.E.4-8: No trail shall be constructed unless there is a provision for short and long term maintenance. The funding mechanism must be in place and provide for funding to include the cost of administration, overhead, trail plan development and reviews, field inspections, construction and maintenance.

4.11.3 Environmental Consequences

4.11.3.1 Definition and Use of CEQA Significance Criteria

The Initial Study completed for the proposed project identified that the following issue area would result in a less than significant impact. Therefore, this issue area is not discussed further in this EIR/EIR. For further discussion of this issue area, refer to the Initial Study located in **Appendix N**.

- Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The criteria used to assess the significance of impacts on recreation resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which identify criteria that can lead to a determination of significant impact on recreational resources. Based on the preliminary analysis provided in the Initial Study, the project could have a significant impact on traffic if the project would:

- Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

Neither NEPA nor the USFS identify specific guidelines to determine impacts to recreational facilities. As such, the CEQA Appendix G guideline identified above has been used in this EIR/EIS to determine the potential for recreational impacts under NEPA.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified several indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on recreation. These include:

- Identify recreational facilities (camp sites, roadways, hiking trails, picnic facilities, boat ramps, parking lots, restrooms, water supply lines) likely to be directly affected by proposed timber removal activities and future enlargement of the Sugar Pine Reservoir inundation zone.
- Discuss user/guest demand that currently exists at Sugar Pine Reservoir for summer recreation activities.
- Quantify historical public use of recreational facilities and dispersed recreation use to the extent practicable using best available information and assess the potential impact on past use levels that could result from project construction activities (timber harvest/removal and gate installation), mitigation implementation (recreational facilities replacement/modification and habitat restoration) and future long-term changes in reservoir operations due to implementation of the proposed project.
- Quantify projected changes in the distances between Sugar Pine Reservoir high-use areas and the reservoir waterline that are anticipated as a result of the proposed project and quantify projected changes to reservoir surface area due to the proposed project.
- Qualitatively assess potential effects of the project on the recreational user quality of experience based on scoping results, existing data, and user interviews.

4.11.3.2 Assumptions and Methods Used to Determine Impact/Effect

Recreation areas and opportunities were identified through site visits, a review of site photographs, review of the Forest Service Sugar Pine website and a review of previously prepared documents including the

TNF LRMP and associated EIS. (TNF 1990). The analyses for the potential to impact recreational facilities was assisted through illustrative interpretations indicating the construction areas for facility relocations as shown in **Figures 4.11-1 through 4.11-5** and illustrations showing the "bath tub ring" affect when the reservoir is at its lowest point included in Section 4.2.

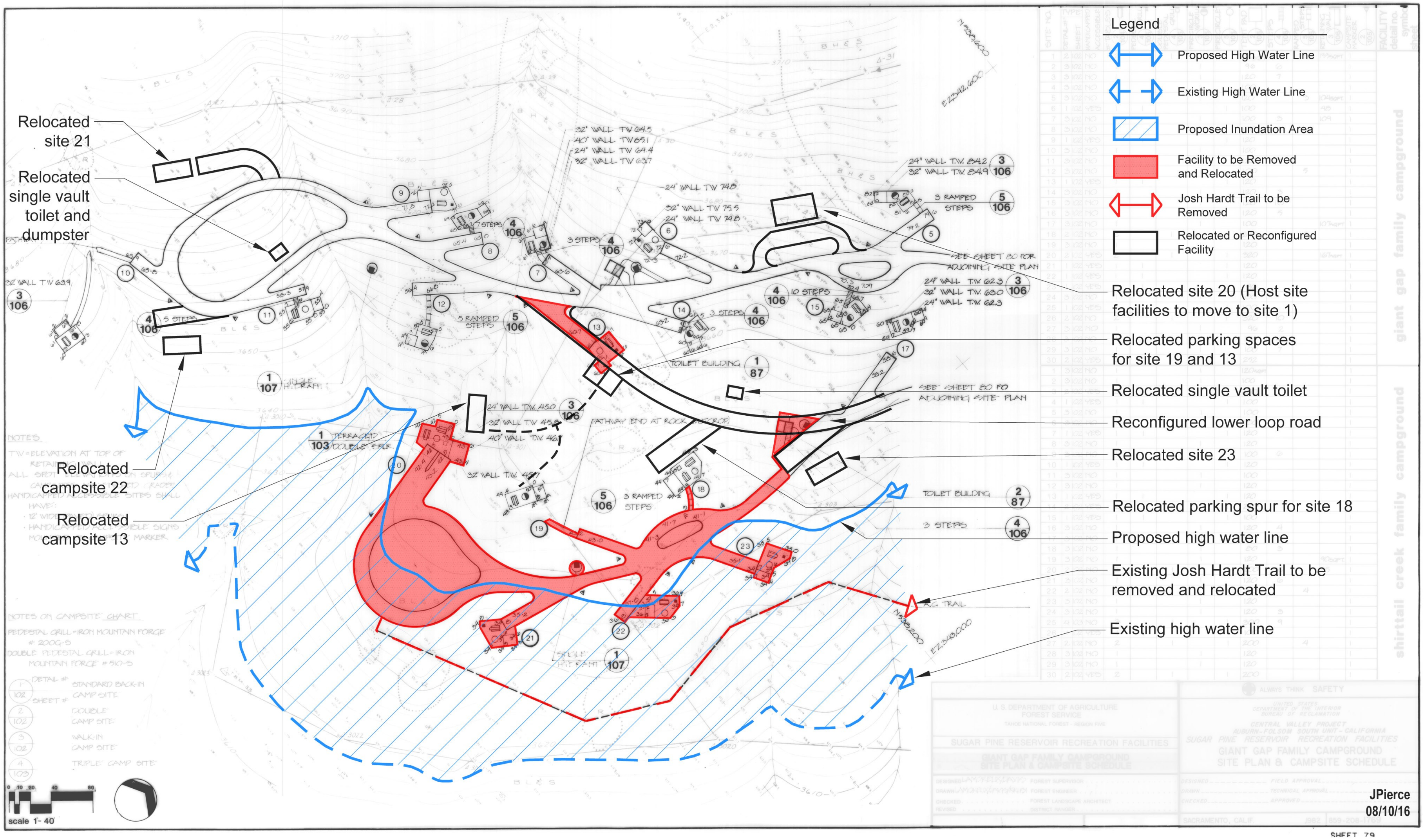
4.11.3.3 Direct and Indirect Impacts/Effects

Impact REC-1: The proposed project/action would require the replacement of camping, day use, trail and boat ramp facilities. Impact Determination: *Less than significant* (CEQA) and *minorly adverse (NEPA)* for the Proposed Project/Action and Alternative 2); *significant and unavoidable* (CEQA) and *adverse* (NEPA) for Alternative 1.

The existing Sugar Pine Reservoir recreational facilities and visitor use is identified in Section 4.11.1.3, above. Modification and relocation of the recreational facilities located at the Sugar Pine Reservoir would temporarily prohibit access and visitation to Sugar Pine's recreation areas during construction. The following describes the potential for impacts to these facilities based on the particular project/action. Existing recreational facilities that would require modification or replacement under the proposed project/action and alternatives are shown in Figures 4.11-1 through 4.11-5, below.

No Project and No Action Alternatives

Under No Project and No Action Alternatives, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. Under the No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in volume because of a higher demand for water. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase. The potential increase of drawdowns may result in the need for walkways to the lake from to the public areas. However, if these new recreational facilities are required, they would be constructed in a manner to allow for placement on a temporary basis over land that was previously under water and thereby limit the potential for physical impacts to the environment. Conditions resulting from the No Project and No Action Alternatives serve as the environmental baseline for determining potential project impact/effects under CEQA and NEPA, respectively, as they pertain to recreational facilities at Sugar Pine Reservoir.

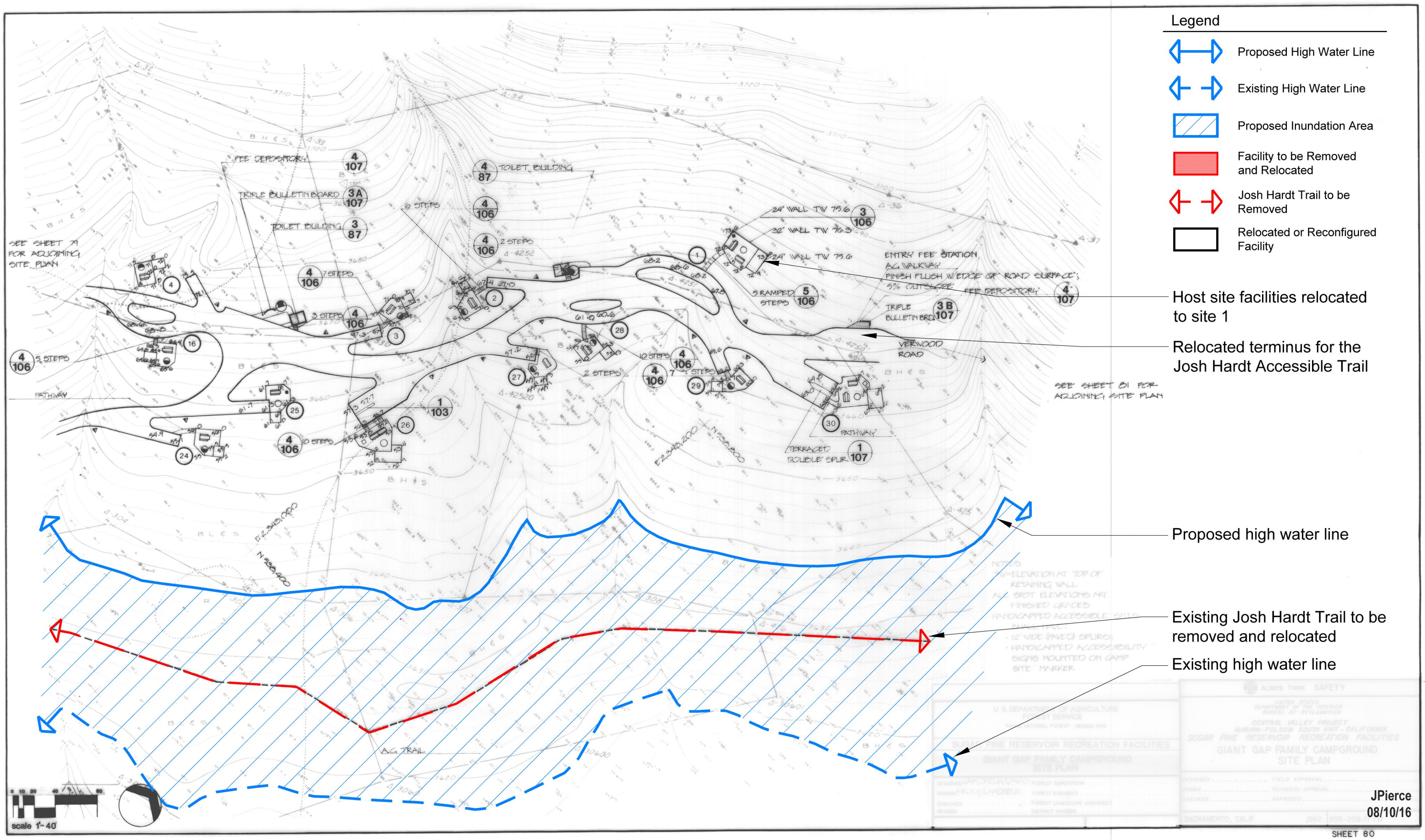


SHEET 1A: GIANT GAP CAMPGROUND

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4.11-1. Giant Gap Campground Affected Area

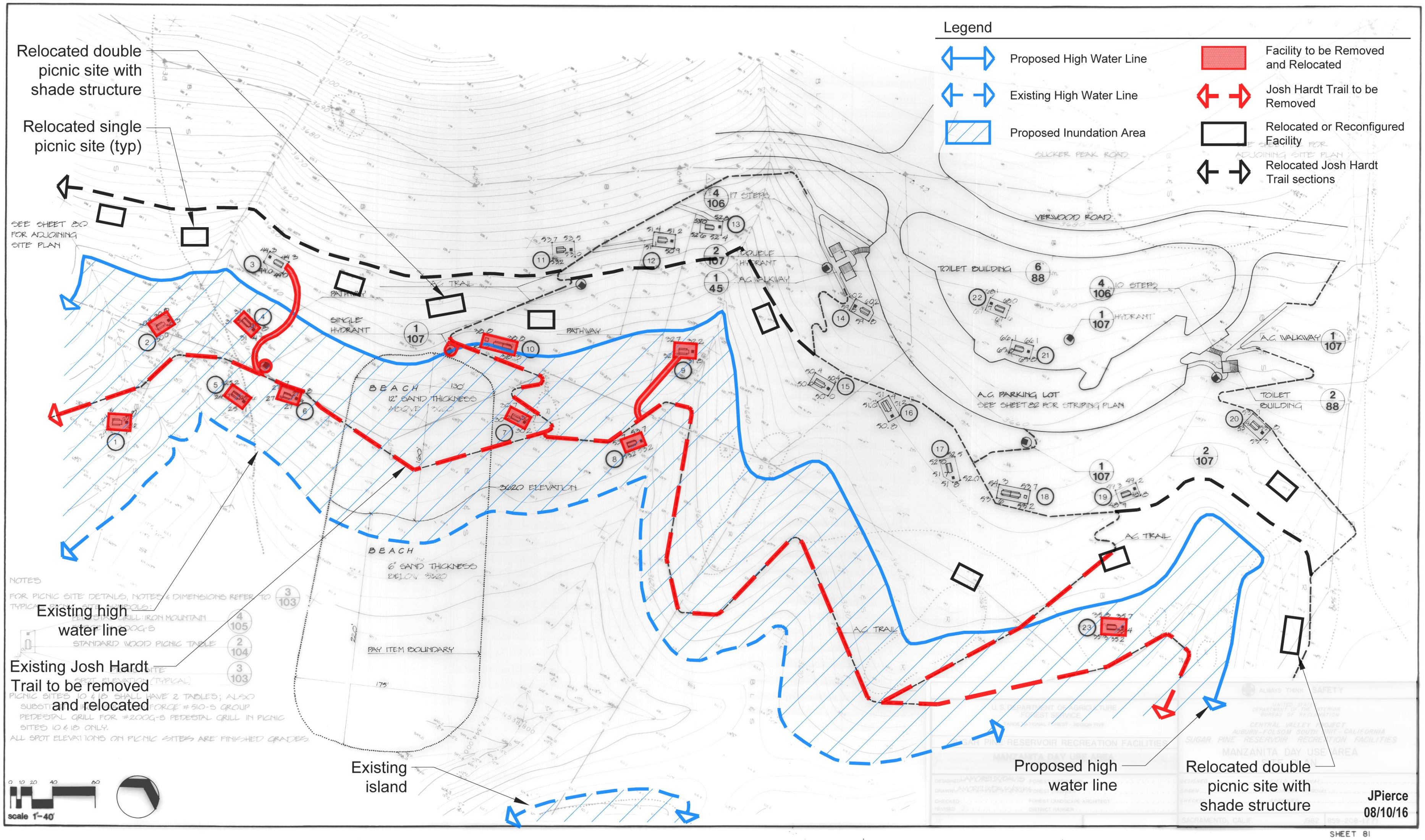
2015-019 FPUD Sugar Pine Reservoir



SHEET 1B: GIANT GAP CAMPGROUND

ECORP Consulting, Inc.
ENVIRONMENTAL CONSULTANTS

Figure 4.11-2. Giant Gap Campground Affected Area



SHEET 2: MANZANITA DAY USE AREA

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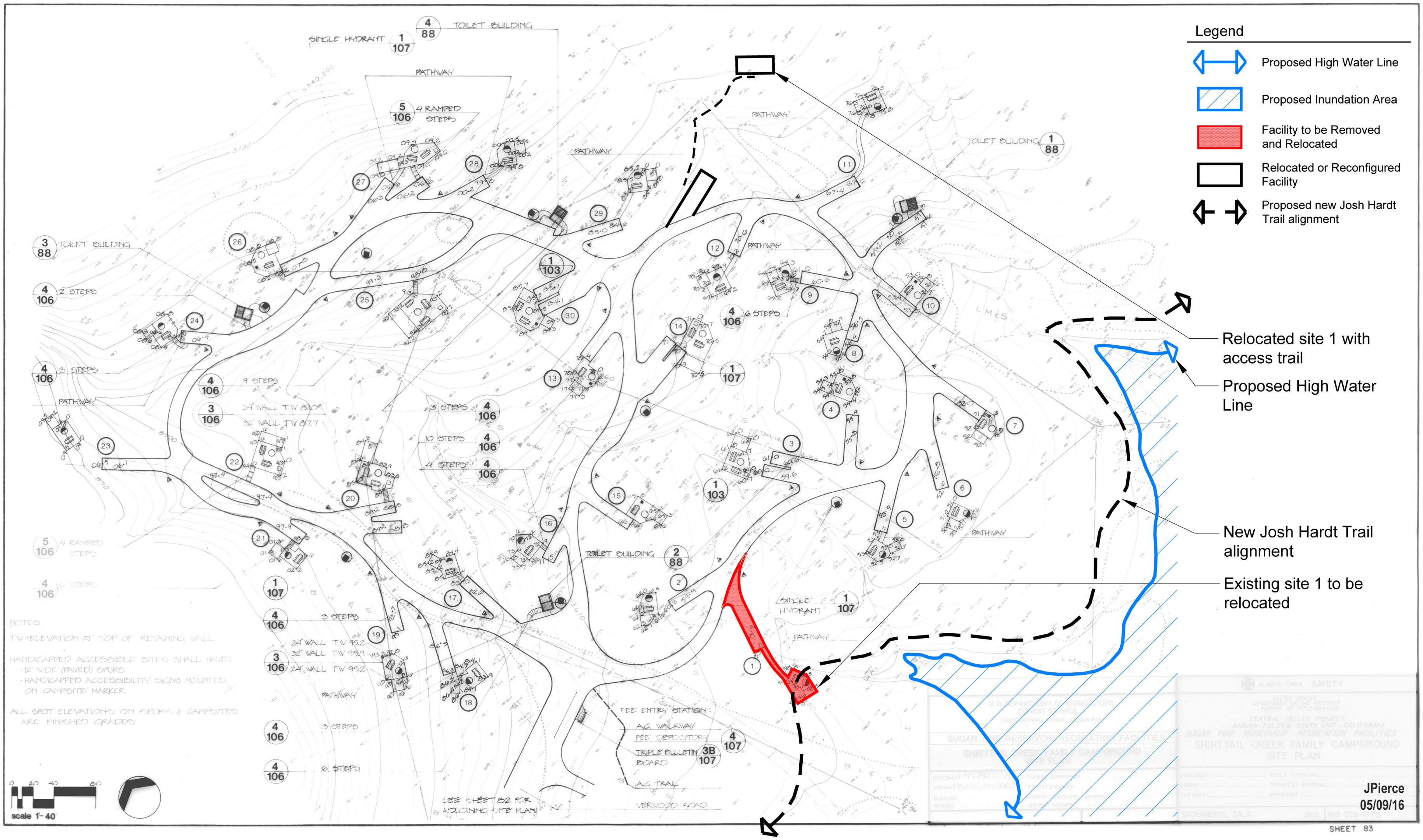
ENVIRONMENTAL CONSULTANTS

Figure 4.11-3. Manzanita Day Use Affected Area

2015-019 FPUD Sugar Pine Reservoir



SHEET 3: SHIRTTAIL CREEK CAMPGROUND

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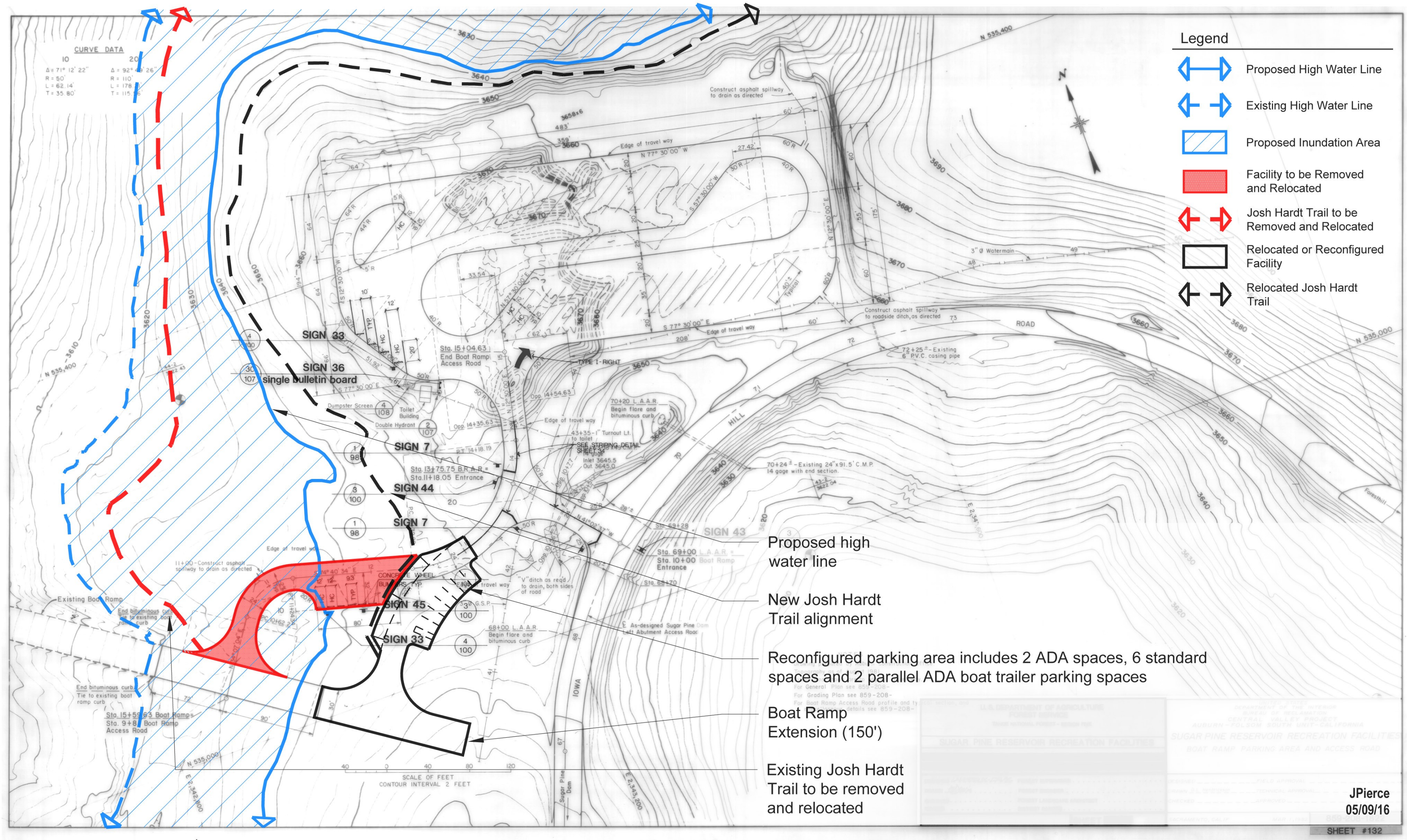
Figure 4.11-4 Shirttail Creek Campground Affected Area.

2015-019 FPUD Sugar Pine Reservoir



SHEET 4: SUGAR PINE BOAT RAMP

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ENVIRONMENTAL CONSULTANTS

Figure 4.11-5. Sugar Pine Boat Ramp Affected Area

2015-019 FPUD Sugar Pine Reservoir

Proposed Project/Action

The proposed project/action would result in the removal and relocation of several recreational facilities from areas that would be inundated by the new footprint of the expanded reservoir. The removal and relocation of facilities would include: campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, picnic tables, the boat ramp and parking facilities. These facilities are discussed in Section 2.2.5 and illustrated in **Figures 4.11-1 through 4.11-5**.

The proposed project/action would result in extensive recreation facility removal and construction. These activities potentially affect various environmental resources, each of which is addressed specifically in other sections of this DEIR/EIS. Regarding the direct impact of the project on existing recreational facilities at Sugar Pine Reservoir, the proposed action replaces facilities that would be affected by the increased size of the reservoir footprint, consistent with FPUD's SUP with the USFS for the dam and the reservoir. (see **Appendix B** of this DEIR/EIS). The replacement of recreational facilities, as described above, was incorporated into the design of the proposed action to mitigate impacts to recreation facilities

As discussed in Section 2.2.4.9, it is anticipated that this reconstruction of affected recreational facilities would result in the closing of the Sugar Pine Recreation Area for one recreation season. Replacement/construction activities would temporarily impact the ability to use the site for recreation purposes. Once construction is complete, Sugar Pine Recreation Area will continue to provide recreational opportunities to the public comparable to current conditions. Temporary Impacts to recreation are discussed under Impact REC-3 below.

Implementation of the proposed project/action requires the reconstruction/relocation of the JHMT. Because of site constraints associated with the location of existing Giant Gap Campground campsites and the campground's access road, a short section of the busy JHMT was not able to be reconstructed and trail users will be diverted through the campground. Trail users will share the campground access road with motor vehicle traffic for approximately 0.2 mile. This is a change from the existing condition of a dedicated non-motorized route around the entire reservoir from one side of the dam to the other. The impact resulting from the loss of a portion of non-motorized trail around the reservoir is considered ***less than significant*** and ***minorly adverse.***

Alternative 1: Layne's Butterweed Trail Realignment

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. Implementation of Alternative 1 would result in extending the length of the JHMT by approximately 4,900 feet (0.9 mile) and would incorporate a series of "switchbacks" that do not currently exist on the JHMT and would not be implemented under the proposed project/action. This is considered a significant departure from the existing and proposed trail configurations which emphasize trail accessibility to the general public including those with disabilities. For this reason, the impact is considered ***significant and unavoidable*** (CEQA) and ***adverse*** (NEPA).

Alternative 2: Helicopter Harvest

Under this alternative to the proposed action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35% would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. While implementation of this alternative would result in less on-site vehicle trips, this would not affect recreational uses once the timber harvest is complete. This alternative would have the same recreation and economic impacts to recreational facilities as the proposed project/action. Therefore, the impact of the project would have ***less than significant*** under CEQA and ***no effect*** under NEPA in this area.

Impact REC-2: The proposed project/action could affect user/guest recreational experience at Sugar Pine Reservoir for recreation activities. Impact Determination*: Less than significant* (CEQA) and *Minorly adverse* (NEPA) for the proposed project/action and Alternative 2. *Significant and unavoidable* (CEQA) and *adverse* (NEPA) under Alternative 1.

No Project and No Action Alternatives

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. Under the No Action Alternative, seasonal drawdowns of Sugar Pine Reservoir will, on average, increase in volume because of a higher demand for water. Over time, the frequency of drawdowns to the designated reservoir minimum pool elevation will increase resulting in longer periods of bathtub ring affect and moving the waterline away from the camping and picnicking facilities. The increased bathtub ring period may result in a less visitation to the reservoir as it will be a less desirable area.

NEPA requires the consideration of the social and economic effect of an action. Under the No Action Alternative, reduced visitation to the reservoir due to gradual increases in water demand in the FPUD service area and continued execution of water transfers may occur over time, which, in turn, could result in lost revenue for the Forest Service. Nevertheless, at this time this loss of revenue is purely speculative as it is not known if and how decreasing reservoir levels over time will result in a loss of revenue and if it will, how much revenue will be lost.

Proposed Project/Action

The proposed project/action would result in the removal and relocation of several recreational facilities. The removal and relocation of facilities include: campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities. However, because the affected facilities will be replaced within one recreational season, user/guest demand will not be impacted permanently. Once construction of these new facilities is complete, it is anticipated that user demand in the next recreational season will resume and be equal to those of the previous seasons and lack of facilities will not affect user demand. Temporary impacts as a result of closures during construction activities are described under Impact REC-3 below.

While user demand would not be adversely affected by the replacement of facilities, implementation of the proposed project/action would alter reservoir levels experienced by recreational users at Sugar Pine relative to the No Project and No Action Alternatives. This, in turn, could affect the quality of the recreational experience.

Under the proposed project/action, future recreational users would have access to a substantially larger reservoir at maximum pool than is currently available when Sugar Pine Reservoir is at or near maximum pool. With installation of the radial gates, the surface area of the Reservoir would expand from 162.9 acres to 207.9 acres, a 28% increase. At maximum pool, the reservoir extends to the base of forested areas on the north and south shores of the reservoir with only a narrow band of bare shoreline. At maximum pool, the reservoir waterline is currently in close proximity to facilities at GGCG, MDUA, and the boat ramp, and would remain so under the proposed project/action at maximum pool.

During low pool conditions, the band of exposed soil between the forested shoreline and water surface (i.e., the "bathtub ring") is broader relative to conditions at maximum pool. As discussed in Section 4.2 (Aesthetics/Visual Resources) the bathtub ring is generally considered less desirable from a visual standpoint and requires greater effort on the part of the recreational user to move from camping, picnic, and parking area facilities to the water surface. This condition can be considered beneficial to some recreation activities, in particular fishing, given the reduced interference during casting due to vegetation close to the water's edge with maximum pool conditions.

Implementation of the proposed project/action will affect reservoir surface levels in a number of ways. As noted, the expansion of the reservoir's area of inundation will increase the size and scale of the reservoir at maximum pool. In years where FPUD does not execute a water transfer, or when future transfers do not exceed the historical maximum of 2,000 acre-feet, the size of the "bathtub ring" and, therefore the distance between the waterline and shoreline recreational facilities will be less than or unchanged from relative to existing conditions. This is because the proposed project/action would increase maximum storage at the reservoir by over 3,600 acre-feet. In doing so, the project would increase the reservoir's surface area by approximately 44 acres and its shoreline by just under 5,000 linear feet. With an expanded reservoir, would result in a narrower (albeit longer) "bathtub ring" around the reservoir relative to diversions/releases of comparable amounts under pre-project conditions. This will result in overall reduction in the distance between shoreline recreational facilities and reservoir waterline under the proposed project/action relative to the No Project and No Action Alternatives.

It is important to note however that the project, as proposed, would allow for periodic water transfers of up to 5,000 acre-feet. This would exceed the historical transfer maximum of 2,000 acre-feet by up to 3,000 acre-feet. The diversion of an additional 3,000 acre-feet would result in a substantially broader ring of exposed soil around the reservoir relative to historical conditions and an increased distance between shoreline facilities and the reservoir. The impact/effect on recreational use of the reservoir of large future transfers would depend in part on the timing of the transfer, with transfers occurring late in the recreation season clearly having less potential to affect recreational use than would an early season transfer.

As previously described, the potential frequency of transfers of up to 5,000 acre-feet under the proposed project/action is dependent on a number of variables including, but not limited to, the availability of a willing buyer; local hydrology; spill conditions at Folsom Reservoir, the ability of FPUD to successfully conduct necessary environmental reviews and obtain agency approvals, and projected water demand within the FPUD service area. These conditions preclude an accurate prediction of the frequency and amounts of potential future transfers with implementation of the proposed project/action. As described in Chapter 2 of this DEIR/EIS, under consistently ideal conditions (i.e., conditions that support the highest possible frequency of transfers of up to 5,000 acre-feet) a transfer of up to 5,000 AF could occur once every three-years. Under this scenario, the proposed project/action could adversely affect recreational use, no more than once every three years when a transfer of 5,000 AF is executed and only when that transfer is executed in spring.

For the reasons presented above, the proposed project/action could result in changes to the distances between Sugar Pine Reservoir high-use areas and the reservoir waterline that in turn could affect the quality of experience and level of use by recreational users. However, under CEQA the quality of experience and level of use by recreational users is not defined as a physical impact to the environment and therefore, the proposed project/action would have ***no impact*** for this issue.

Under NEPA, the social effects of an action must be taken into account. When considering the periodic increase in the bathtub ring area anticipated under the proposed project/action, the quality of experience for the visitor to the Sugar Pine Reservoir may be affected. The potential periodic adverse effects must also be balanced against the anticipated benefits to recreational use associated with a larger reservoir and reduced distances to the waterline that would occur in most years.

The importance of providing a reliable water supply to serve existing residents and approved future uses is clear, and the priority given for Sugar Pine Reservoir to serve this purpose has been established in numerous documents including the LRMP and the District’s SUP with USFS. The dam on the Shirttail Creek was built as a source of water supply for FPUD. While this dam has secondary benefits such as recreational facilities and the experiences that go with these facilities, the primary social benefit for the reservoir is as a water supply source. As such, while the proposed project/action may periodically adversely affect recreational use at the reservoir, the social benefits of additional water supply outweigh the potential for diminished recreational experiences. Therefore, the proposed project/action would result in no effect under NEPA for this issue.

Implementation of the proposed project/action also requires the reconstruction/relocation of the JHMT. Because of site constraints associated with the location of existing Giant Gap Campground campsites and the campground’s access road, a short section of the busy JHMT was not able to be reconstructed and trail users will be diverted through the campground. Trail users will share the campground access road with motor vehicle traffic for approximately 0.2 mile. This is a change from the existing condition of a dedicated non-motorized route around the entire reservoir from one side of the dam to the other. The quality of the trail passing through the congested campground will be a different quality of recreation facility and user experience compared with a dedicated and detached, non-motorized trail route. This will likely have an adverse effect on the quality of recreation experience for trail users, though it is only for a short distance. Safety concerns, associated with shared foot, bicycle and motorized traffic, will be partially mitigated with signage to notify trail users and motor vehicles of the shared route. For these reasons the effect on recreation is considered ***minorly adverse*** under NEPA.

Alternative 1: Layne's Butterweed Trail Realignment

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. The alternative route is substantially steeper than any portions of the JHMT and, due to the slope and circuitous route proposed, would not be paved, nor would it accommodate disabled access as does the existing JHMT and JHMT replacement under the proposed project/action. For these reasons, Alternative 1 is considered to have a ***significant unavoidable impact*** (CEQA) and an ***adverse effect*** (NEPA) on recreational use.

Alternative 2: Helicopter Harvest Alternative

Under this alternative to the proposed action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. The short-term and long-term effects of Alternative 2 on the recreational experience would be indistinguishable from that of the proposed project/action. Therefore, this alternative would have ***no impact*** under CEQA and a temporary ***adverse effect*** under NEPA.

Impact REC-3: During project construction temporary impacts would occur. Sugar Pine recreational facilities would be closed to the public during construction in order to avoid potential safety hazards to recreational users that could result from timber harvest, radial gate installation, and recreational facilities construction. Temporary Impact Determination: *no impact* (CEQA) and *adverse* (NEPA) for the proposed project/action and Alternatives 1 and 2.

No Project and No Action Alternatives

Under the No Project Alternative and No Action Alternatives, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. Under these alternatives, Sugar Pine recreational facilities would remain open and there would be no impact on recreational use at Sugar Pine.

Proposed Project/Action and Alternatives 1 and 2

As described in Section 2.2.6.5: Project Construction Schedule, project construction activities (timber harvest, radial gate installation, recreation facilities replacement, and water pipeline replacement) would require an estimated 14 months to complete. Given that construction would commence in that fall and after campground and day use facilities have closed for the season, construction activities would span one recreation season. During construction, public access to the Sugar Pine recreation area would be prohibited. Based on historical recreation use data as shown in Table 4.11 above this temporary closure would result in the loss of tens of thousands of public recreation visits to the popular SP [Sugar Pine] reservoir facilities during a single season. Because the potential loss of recreation visits to Sugar Pine would result in no physical change to the environment, the loss of visits is considered to have ***no impact*** under CEQA. NEPA, however, requires consideration of the socio-economic effects of an action and, therefore, the adverse effect of the proposed project/action on recreational visits warrant consideration.

The actual effect on recreational use due to the closure of Sugar Pine Recreation Area for one season is somewhat dependent on the availability of alternative destinations that would afford the user similar amenities at Sugar Pine. Various alternatives available to recreationists from Placer County, Sacramento, and surrounding areas that seek the types of activities available at Sugar Pine Reservoir such as camping, group camping, boating, swimming, fishing and hiking. Tahoe and El Dorado National Forests, in particular, offer many amenities for recreational use similar to those available at Sugar Pine such as camping and hiking. Additionally, numerous reservoirs and lakes are located in the general vicinity of Sugar Pine which offer water-related recreation. A small sample of these include: Lake Tahoe, Lake Spaulding, Bowman's Lake, Carr Lake, Freely Lake, Wright's Lake, Rollins Reservoir, and Folsom Reservoir. The recreational experience offered at Sugar Pine, however, is exceptional and clearly unique as described above. For this reason, it is reasonable to expect that some potential users of Sugar Pine will forego recreating at alternative sites during its temporary closure. For this reason, the impact of project construction on recreational use is considered ***adverse*** under NEPA.

Under NEPA, the social and economic impacts of an action must be taken into account. When considering the removal and replacement of recreation facilities, the loss of revenue to the Forest Service during construction may be a factor in determining the economic impact. As shown in **Table 4.11-1**, Sugar Pine Recreation Area had 47,831 visitors and a revenue of $161,880 in the 2016 season. Because the Recreation Area is anticipated to be closed for one recreation season, a loss of revenue will occur. The revenue collected at Sugar Pine reservoir is used to fund operation and maintenance of the campgrounds and day use facilities, including salary for seasonal recreation technicians, materials and supplies. The anticipated closure and associated loss of use fee revenue during construction activities at Sugar Pine reservoir would result in the temporary loss of approximately five seasonal jobs (from May to October) in the community (based on $20,000 to $25,000 per seasonal hire).

NEPA requires that both context and intensity are considered to determine the level of significance (CFR § 1508.27). Context refers to several contexts such as society as a whole (human, national), the affected region, the affected interests, and the locality. Intensity refers to the severity of the impact.

In the case of the Sugar Pine Reservoir and the proposed project/action, the Tahoe National Forest LRMP and original reason the Sugar Pine Reservoir was constructed must be taken into account. The reservoir was constructed to provide a reliable source of water. The LRMP identifies the following goals that pertain to this construction and the proposed project/action.

Goal 1: *Provide a broad spectrum of dispersed and developed recreation opportunities in accordance with identified needs and demands.*

Goal 3: *Work with cooperating water agencies and irrigation districts to maintain desirable water levels on reservoirs through the entire length of the recreation season.*

While implementation of the proposed project/action would reduce the Sugar Pine Recreation Area revenue for the TNF for one season, in the context of the original purpose of the reservoir and the goals of the LRMP stated above, and the understanding that the amount of revenue loss is a small fraction of the potential revenue over time, there would be no long term adverse effect on operation of the Sugar

Pine Recreation Area under NEPA. For reasons presented above, however, the proposed project/action would result in a temporary ***adverse effect*** due to the loss of revenue and staff reductions anticipated to occur during the single recreation season affected by project construction activities.

4.11.3.4 Cumulative Impact

For the purpose of this EIR/EIS, and for the purpose of assessing the cumulative impact of the proposed project/action on recreation, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions related to recreation within the vicinity of the Sugar Pine Recreation Area. There are four TNF management areas near the proposed project/action site identified in the Land and Resource Management Plan (LRMP) which are considered to have a potential to add to cumulative recreation impacts under ongoing and future conditions. In additional to Sugar Pine (Management Area 96), these include: Elliot (Management Area 94), Macy (Management Area 95), and Big (Management Area 97).

In addition to the TNF resources listed above, future growth identified in the Foresthill Divide Community Plan will have a cumulative impact on recreational resources in the area.

In order to understand the contribution of past actions to the cumulative effects of the proposed project/action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Cumulative Setting

Foresthill Divide Community Plan Buildout

The Foresthill Divide Community Plan (FDCP) anticipates a 2030 population of 9,620, an increase of 3,918 persons between 2000 and 2030 (Placer County 2008). The Foresthill Divide Community Plan EIR identifies two buildout scenarios. One Without Forest Ranch Concept Plan and one With Forest Ranch Concept Plan. Forest Ranch Concept Plan includes 1,858 residential units, retail and office uses and equestrian park, RV park and a golf course.

Tahoe National Forest Land Resource Management Plan

For the purpose of this DEIR/EIS, and for the purpose of assessing the cumulative impact of the proposed project/action on recreation, the area of potential cumulative impact associated with recreation is generally defined by location. As stated above, the TNF Elliot, Macy, Sugar Pine, and Big management areas provide recreational opportunities in the vicinity of the proposed project/action.

The Elliot Management Area is 175 acres in size and 10 miles north of Foresthill at the headwaters of Shirttail Canyon. This is a research area. The resource management emphasis for this area is to emphasize research for the next 50 years (as of 1990) (TNF 1990).

The Macy Management Area is 667-acres in size and is primarily a wildlife management area. The Bureau of Reclamation acquired a 378-acre parcel to mitigate the loss of wildlife habitat. This management area is encompassed by the Tahoe National Forest boundary on the west, Giant Gap Ridge and Giant Gap

Gulch on the north. and the area north of Sugar Pine Reservoir on the south. The area is closed to motorized vehicles (TNF 1990).

The Sugar Pine Management Area is 1,311-aces in size and includes Sugar Pine Reservoir, three campgrounds, trails, picnic areas, swimming beach, boating and fishing. Off highway vehicle (OHV) trails are nearby (TNF 1990).

The Big Management Area is located nine miles northeast of Foresthill approximately two miles east of the Sugar Pine Reservoir. This 376-acre area includes the Big Reservoir and surrounding area. Big has a 100-space campground and picnicking areas and fishing. Non-motorized boating is allowed (TNF 1990).

None of these management areas have plans for expansion of recreational facilities at this time.

Effects of Past, Present, and Reasonably Foreseeable Future Actions

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. While future growth is anticipated in the FDCP, no new construction or operations would occur with the No Project/Action Alternative that would result in cumulative impacts. Therefore, this alternative would have ***a less than cumulatively considerable impact*** under CEQA and ***no effect*** under NEPA regarding cumulative roadway compacity.

Proposed Project/Action and Alternatives 1 and 2

The proposed project/action and Alternatives 1 and 2 would result in an increase of water storage capacity at Sugar Pine Reservoir. This increase in capacity is in response to anticipated growth in the FDCP. However, without an adequate water supply, growth in the area may not occur at the levels anticipated in the FDCP. As such, these two scenarios are linked and cumulatively may result in a need for additional recreational facilities to serve the expanding population.

Placer County collects a parks and recreation impact fee (Article 15.34 of the Placer County Code) from new development to provide funding for expansion of park land and recreation facilities required to serve new development in unincorporated Placer County. This fee assists in offsetting cumulative impacts to county recreational facilities from new growth. The FDCP EIR (2007) determined that development of the community plan would not result in significant impacts "because the proposed FDCP provides for the creation of funding sources to develop and maintain new parks and recreational facilities associated with new development, and because the Plan also includes policies and implementation measures to address existing deficiencies" (Placer County 2007:3-114).

While the County collects a parks and recreation impact fee, the fee does not account for cumulative recreational impacts to state and federal facilities. Increased growth in the area because of the FDCP and the proposed project/action may cumulatively impact state and federal recreational facilities in the area. However, state and federal taxes, as well as, park/forest fees are used to offset cumulative impacts to state and federal park and forest facilities. As such, the contribution of the proposed project/action or Alternatives 1 and 2 to future development of recreational facilities would be minimal and, therefore, the project's contribution to the cumulative impact of constructing these facilities is considered ***less than considerable***.

As discussed above under Impact REC-3, the proposed project/action would result in the temporary loss of recreation visits during project construction when public access to recreational facilities at Sugar Pine Reservoir would be restricted. Because these losses would be temporary, i.e., limited to one recreation season, the contribution of this loss to lost recreational use caused past, ongoing and foreseeable future projects is considered ***less than considerable*** for the proposed project/action and Alternatives 1 and 2.

4.11.4 Residual Unavoidable Effects

The elimination of a segment of the JHMT as disabled accessible under Alternative 1 is considered as ***significant unavoidable impact*** and ***an adverse effect*** on recreational facilities.

4.11.5 References

Placer County. 2008. Foresthill Divide Community Plan. December 2008. https://www.placer.ca.gov/2971/General-Plan-Community-Plans.

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TNF. 2017. Personal communication – email from Tim Cardoza, Forest Land Use Program Manager. January 25, 2017.

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USDA. 2018. Forest Service Manual, FSM 2300 - Recreation, Wilderness, And Related Resource Management. https://www.fs.fed.us/cgi-bin/directives/get_dirs/fsm?2300.

_____. 2015. USDA Forest Service Strategic Plan: FY 2015–2020. June 2015. https://www.fs.fed.us/sites/default/files/strategic-plan%5B2%5D-6_17_15_revised.pdf.

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4.12 Traffic and Transportation

This section of the DEIR/EIS assesses the potential direct, indirect and cumulative effects of the proposed project/action on roadways likely to be affected by installation of radial gates at Sugar Pine Dam, timber harvest operation and recreational facilities development. Section 4.12.1 provides a description of the existing roadways likely to support project-related traffic during construction at Sugar Pine Reservoir including existing facilities and current data on past recreational use. Regulations, plans, policies and standards pertaining to traffic and transportation are provided in Section 4.12.2. The environmental consequences resulting from implementation of the proposed project/action and project alternatives are described in Section 4.12.3. Section 4.12.4 provides mitigation monitoring, compliance, and reporting information; Section 4.12.5 addresses residual effects of the project; and Section 4.12.6 lists the references cited in this section.

4.12.1 Environmental Setting/Affected Environment

4.12.1.1 Introduction

As described in detail in Chapter 2 of this DEIR/EIS, the proposed project/action would install radial gates within the Sugar Pine Dam spillway. Gate installation will expand the area of inundation and storage capacity at Sugar Pine Reservoir. This will in turn increase the "safe yield" for water supply stored at the reservoir. Gate installation will provide additional water supply available for diversion by FPUD to serve current customers within the District's service area and ensure that adequate water will be available to serve future approved growth and development within the service area. Additional storage capacity will allow the District to increase the maximum size of surplus water transfers to downstream users until such time as future demand within the service area increases to the point where surplus water is no longer available.

In addition to potential effect on traffic and transportation within the project study area, installation of the radial gates, vegetation removal, recreational facility demolition, compensatory mitigation development could result in a change in roadway use within the study area. This section uses the best available information to characterize existing transportation facilities and use within the project study area.

4.12.1.2 Approach to Defining Affected Transportation Corridors Evaluated in the DEIR/EIS

Site Access

These roadways were selected as they were deemed as those most likely to be used for access to the project site and the most affected by the project. The primary access to Sugar Pine Reservoir is via Interstate 80 (I-80) to the Foresthill Road exit. Continue on Foresthill Road through the town of Foresthill for 25 miles to Sugar Pine Road. Turn left onto Sugar Pine Road for nine miles to reach the reservoir.

4.12.1.3 Affected Environment

Foresthill Road: Foresthill Road is a two-lane, east-west roadway that provides the primary connection between Auburn and the Foresthill community. From the Foresthill Bridge to Owl Hill Court, Foresthill Road is classified as a two-lane "Class I" highway. East of Owl Hill Court, the character of the road changes, and Foresthill Road is classified as a local access road. To the east of the Foresthill community, Foresthill Road continues to Soda Springs and carries very low traffic volumes (Placer County 2008).

Sugar Pine Road: Sugar Pine Road is a two-lane rural roadway. This roadway is fully paved 20-foot roadway with no developed shoulder.

Existing Roadway Level of Service

The Placer County Foresthill Divide Community Plan (FDCP) provides level of service (LOS) information for Foresthill Road. While gathering of this information was completed in 2008, it provides a snapshot of the LOS for Foresthill Road during that time. As relatively little development has occurred in the last 10 years in the area, this information is still considered to provide an accurate representation of Foresthill Road traffic conditions. *Table 4.12-1* summarizes the roadway operating conditions for Foresthill Road. LOS information for Sugar Pine Road is not available.

Table 4.12-1. Conditions Roadway Level of Service Summary - 2008

Area Number	Foresthill Road Segment	Direction	AM Peak Hour		PM Peak Hour	
			Trips	LOS	Trips	LOS
1	From Foresthill Bridge to Spring Garden Road	Eastbound	119	B	525	C
		Westbound	523	C	147	C
2	From Spring Garden Rd. to Todd Valley Rd. (West)	Eastbound	156	A	274	B
		Westbound	319	D	187	B
3	From Todd Valley Road (West) to Owl Hill Court	Eastbound	208	B	229	A
		Westbound	269	D	197	C
4	From Owl Hill Court to Yankee Jim's Road	Eastbound	142	B	142	B
		Westbound	148	B	85	B
5	From Yankee Jim's Road to Michigan Bluff Road	Eastbound	10	A	32	A
		Westbound	30	A	16	A
6	From East of Michigan Bluff Rd.	Eastbound	9	A	12	A
		Westbound	12	A	4	A

Source: Placer County 2008
Notes: "Level of Service" is a qualitative measure of traffic operating conditions whereby a letter grade "A" through "F", corresponding to progressively worsening traffic conditions, is assigned to an intersection or roadway segment.

FDCP Policy 5.A.1-1 establishes that a LOS of "D" on Foresthill Road is the acceptable LOS for that roadway. As shown, Foresthill Road operates at a LOS D or better.

Placer County's Public Works Department provides more recent traffic counts on Foresthill Road. While the locations for these counts are not exactly the same as those provided in the FDCP, they are similar, cover the same area, and provide information on how traffic has changed along Foresthill Road since the 2008 survey. Based on *Policy 5.A.1-1*, the only segment of Foresthill Road that was nearing the unacceptable LOS in 2008 was the westbound-trips segment between Spring Garden Road to Yankee Jim's Road (Areas 2 and 3) during the AM peak hour. As shown in *Table 4.12-2*, trips in this segment during the 2018 survey are similar to those in the 2008 survey, slightly greater in Area 3 (269 compared to 278), but less in Area 2 (319 compared to 278). Based on this information, it is assumed that this segment of Foresthill Road continues to be at a LOS D.

Table 4.12-2. Conditions Roadway Level of Service Summary - 2018

Foresthill Road Segment	2008 Area	Direction	AM Peak Hour Trips		PM Peak Hour Trips		Date of Count
			2008	2018	2008	2018	
W of Foresthill bridge	None	Eastbound	Not counted	247	Not counted	479	3/27/2018
		Westbound	Not counted	271	Not counted	199	
Post Mile 1 25 approximately 100 feet east of the eastern end of the Foresthill Bridge	1 & 2	Eastbound	119-156	102	528-274	478	7/22/2014
		Westbound	523-319	432	147-187	164	
Between Old Auburn Folsom Rd and Idlewild Rd	2 & 3	Eastbound	156-208	279	274-229	244	12/4/2018
		Westbound	319-269	278	187-197	299	
Between Idlewild Rd and Mosquito Ridge Rd	4	Eastbound	142	240	142	257	12/4/2018
		Westbound	148	217	85	267	
Between Mosquito Ridge Road and Post Mile 18.75 (east of Bath Road)	5	Eastbound	10	78	32	111	12/4/18
		Westbound	30	149	16	123	
Mosquito Ridge to east of Bath Road	6	Eastbound	9	25	12	59	12/4/2018
		Westbound	12	52	4	53	

Source: Placer County 2019 GIS Traffic Counts.
http://placercounty.maps.arcgis.com/apps/View/index.html?appid=2b58897816ad4c84b2b2b4d39ed8ddfc

4.12.2 Regulatory Setting: Applicable Laws, Ordinances, Regulations and Plans

This section discusses federal, state, and regional regulations, laws, ordinances, plans, policies and standards applicable to the proposed project/action's effects on traffic.

4.12.2.1 Federal

Current management direction on desired future conditions for the management of activities within the TNF are found in the following documents, filed at the District Office:

- Tahoe National Forest Land and Resource Management Plan (LRMP);
- Forest Service Manual and Handbooks; and
- National Forest Management Act (NFMA)

4.12.2.2 Local

The following local regulations related to transportation are provided for informational purposes and are provided as a basis to assist with CEQA review in evaluating the level of significance associated with impacts.

Placer County 2036 Regional Transportation Plan

The 2036 Regional Transportation Plan (RTP) was developed by the Placer County Transportation Planning Agency (PCTPA) to document the policy direction, actions, and funding recommendations that are intended to meet the short and long range needs of Placer County's transportation systems over the next 20 years. The 2036 RTP was designed to be a blueprint for the systematic development of a balanced, comprehensive, multi-modal transportation system, including but not limited to, regional roadways, public transit, passenger rail, aviation, goods movement, active transportation facilities, transportation systems management, transportation safety and security, and intelligent transportation systems. Foresthill Road is identified as a regionally significant road in the RTP, although no improvements to this roadway are identified in the RTP.

Placer County General Plan

The Placer County General Plan includes goals and policies within the Recreation and Cultural Resources Element that guide the development and design of recreational facilities within Placer County. Because the project site is located within a national forest, development and design requirements identified in the General Plan do not pertain to the project. However, roadways to the project site are maintained by Placer County and as such, certain polices can assist in the maintenance of these roadway facilities within the national forest system. Those that would apply to the proposed project/action area as follows:

Goal 3.A: *To provide for the long-range planning and development of the County's roadway system to ensure the safe and efficient movement of people and goods.*

Policy 3.A.1. The County shall plan, design, and regulate roadways in accordance with the functional classification system described in Part I of this Policy Document and reflected in the Circulation Plan Diagram.

Foresthill Divide Community Plan

The FDCP, in combination with the Placer County General Plan, provides overall direction for future growth in the Foresthill Divide. Because the project site is located within a national forest, development and design requirements identified in the Community Plan do not pertain to the project. However, as stated previously, roadways to the project site are maintained by Placer County and as such, certain polices can assist in the development of recreational facilities within the national forest system. Those that would apply to the proposed project/action area as follows:

Goal 5.A.1.: *Provide for the safe and efficient movement of people and goods on the primary roadway serving the Foresthill Divide, i.e., Foresthill Road.*

Policy 5.A.1-1: Establish and maintain an acceptable level of service of "D" on Foresthill Road.

Policy 5.A.1-6: The County shall require the applicant/requesting agency to post notice of any non-emergency closures of Foresthill Bridge, or any section of Foresthill Road, at least 7 days before closure or as practical. Such notices shall be placed on road signs at the Foresthill Bridge, Foresthill Road at its intersection with Lincoln Way, Lower Clementine Road and Spring Garden Road. In addition, the County shall require the applicant/requesting agency to send notices of closure to local newspapers. The County shall examine requiring community compensation for closures for non-public purposes (e.g., filming).

Goal 5A.2.: Provide for safe emergency access and alternative routes onto and within the Foresthill Divide and to provide river and canyon access for recreational purposes.

4.12.3 Environmental Consequences

4.12.3.1 Definition and Use of CEQA Significance Criteria

The Initial Study completed for the proposed project identified that the following issue areas would result in a less than significant or no impact. Therefore, these issue areas are not discussed further in this DEIR/EIR. For further discussion of these issue areas, refer to the Initial Study located in *Appendix N*.

- Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.
- Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.
- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
- Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The CEQA criteria and guidelines described as follows are also used as indicators of adverse effect under NEPA. The criteria used to assess the significance of impacts on traffic and transportation resulting from the proposed project/action are based on Appendix G of the CEQA Guidelines (14 CCR 15000 et seq.), which identify criteria that can lead to a determination of significant impact on traffic and transportation.

Based on the preliminary analysis provided in the Initial Study, the project could have a significant impact on traffic if the project would:

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.
- Result in inadequate emergency access.

In keeping with NEPA requirements and in response to public input during project scoping, the TNF has identified two indicators to be considered in determining the potential direct, indirect and cumulative effects of the proposed action on traffic and transportation. These include the following:

- Estimated road closures and traffic control measures required for the transport of radial gates, related facilities and equipment from I-80 to the Sugar Pine Dam site.
- Estimated vehicle trips per day generated by timber removal and facilities construction activities.

4.12.3.2 Assumptions and Methods Used to Determine Impact/Effect

As a part of this environmental analysis, traffic counts for Foresthill Road, as identified in *Tables 4.12-1 and 4.12-2*, were taken from the FDCP and traffic counts from Placer County It is assumed that this information is accurate and provides the most up to date information available. The method used to determine the impact/effect is a comparison of the existing conditions to the post-project/action conditions as well as an analysis of how the proposed project/action would affect the local transportation network during construction activities. If it is determined that the proposed project/action will impact/effect the environment based on the CEQA guidelines issue area defined above, mitigation measures are included in this analysis to reduce the impact to a less than significant level or result in no adverse effect.

4.12.3.3 Direct and Indirect Impacts/Effects

Impact TRA-1: Potential to result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Impact Determination: *No impact* (CEQA) and *no effect* (NEPA).

Construction-Related Impacts

The closest airports to the project site are the Blue Canyon-Nyack Airport located approximately 10.3 miles to the northeast and the Nevada County Airport located approximately 13 miles to the northwest of the site. The closest airport offering commercial passenger service is the Sacramento International Airport approximately 53 miles to the west of the site.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would result in no changes to the existing air traffic patterns. Therefore, this alternative would have ***no impact*** under CEQA and ***no effect*** under NEPA regarding this issue area. As previously noted, the No Project and the No Action Alternatives represent the environmental baseline conditions on which the following CEQA and NEPA impact evaluations, respectively, are based.

Proposed Project/Action

The proposed project/action would result in the placement of radial gates and the removal and relocation of several recreational facilities. Construction of these facilities would not impact air traffic patterns as they are all ground-related and do not require a large influx of workers resulting in an increase of air traffic.

The nearest airport to the project site is the Blue Canyon-Nyack Airport, located approximately 10.3 miles northeast of the site. According to the Placer County Airport Land Use Compatibility Plan, the Proposed Project is located well outside of all compatibility and influence zones (Placer County 2014). Therefore, the project would have ***no impact*** and ***no effect*** in this area.

Alternative 1: Layne's Butterweed Trail Realignment

Alternative 1 reroutes the proposed Joshua Hardt Memorial Trail (JHMT) reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. While implementation of this alternative would result in a slightly longer trail in a different location, these attributes would not affect airport traffic patterns. This alternative would have the same construction and operational impacts to airport traffic patterns as the proposed project/action. Therefore, Alternative 1 would have ***no impact*** and ***no effect*** in this area.

Alternative 2: Helicopter Harvest

Under this alternative to the proposed action, those areas within the expanded Sugar Pine Reservoir inundation area where slopes exceed 35 percent would be cleared using a helicopter to collect and transport bundled logs to landings beside the reservoir. Areas within the inundation area that exceed 35 percent cover approximately nine of the 44 acres to be cleared under the proposed action. The nine acres are roughly split between areas immediately adjacent to the north and south ends of Sugar Pine Dam. All other aspects of this alternative would be the same as the proposed project/action.

While the actual specifics of helicopter harvest are not known at this time, it is assumed that this alternative would involve the use of helicopters which would not only fly in the timber harvest area but also from its home port at the beginning of each day and possibly for refueling. These flights are required to comply with all safety and flight regulations including any that would possibly affect air traffic. As such, the use of helicopters for the tree harvest would not result in a change to air traffic patterns to the Blue Canyon-Nyack Airport. The operating level for these types of helicopter uses is well below those of any commercial jets using Sacramento International Airport[1] and would not affect air traffic patterns from this airport. Therefore, the project would have a ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

Operation Impacts

Proposed project/action and all Alternatives

Neither the development of the proposed project/action nor any alternatives considered herein would increase population to the area beyond that currently planned and approved. The proposed project/action and alternatives, therefore, would be no impact and no adverse effect air traffic patterns or safety related issues.

Impact TRA-2 Potential to result in inadequate emergency access. Impact Determination: *less than significant impact* (CEQA) and *no effect* (NEPA)..

No Project and No Action Alternatives

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The No Action Alternative includes approval of the extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers within the District service area and execute transfers of surplus water, as well as serve new customers due to future planned growth and development within the service area. The continuation of FPUD service would result in no changes to the existing operation of the reservoir or recreational facilities. No new construction or operations would occur that would affect the existing access routes. Therefore, this alternative would have ***no impact*** under CEQA and ***no effect*** under NEPA. regarding this issue area.

Proposed Project/Action

Construction-Related Impacts

Short-term roadway encroachments may be required during project construction. This could potentially interfere with emergency access to the site. However, all construction activities that would require the encroachment of existing roadway would require the approval of Placer County and/or the USFS. The project applicant would be required to coordinate with Placer County and the Forest Service prior to the start of construction activities and during construction to ensure all safety measures are in place in the event an emergency occurs. This coordination would allow for the proper steps to be taken to ensure that adequate emergency access is always available. Therefore, the project would have ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

[1] The typical “cruising altitude” is around 35,000 feet. However, the number generally varies from about 33,000 feet to 42,000 feet. Private jets typically take the higher end, cruising at around 41,000 feet so they can travel the most direct route, above all the commercial air traffic. Light aircraft typically stick close to 10,000 feet (USA Today 2018).

Post-Project Operation-Related Impact

Once the proposed project/action improvements are completed, the Sugar Pine Reservoir recreational facilities will continue to operate as they did prior to construction, including those related to emergency access. Construction of the new facilities would not result in a change to the existing roadways and access to the site would continue as it was pre-project. Therefore, there would be ***no impact*** (CEQA) and ***no effect*** (NEPA) in this area.

Alternative 1: Layne's Butterweed Trail Realignment

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. While implementation of this alternative would result in a slightly longer trail in a different location, these attributes would not affect emergency access to the site. This alternative would have the same construction and operational impacts to emergency access as the proposed project/action. Therefore, the Project would have ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

Alternative 2: Helicopter Harvest

While this alternative would reduce the number of onsite vehicle trips for transporting the cut timber, this alternative would have the same impacts on emergency access as the proposed project/action. The project applicant would be required to coordinate with Placer County and the USFS prior to the start of construction activities and during construction to ensure all safety measures are in place in the event an emergency occurs. This coordination would allow for the proper steps to be taken to ensure that adequate emergency access is always available. Therefore, the project would have ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

Impact TRA-3: Potential to result in short-term traffic impacts. Impact Determination: *less than significant impact* (CEQA) and *no effect* (NEPA).

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. The continuation of FPUD service would result in no changes to the existing operation of the reservoir or recreational facilities. No new construction or operations would occur that would increase short-term traffic. Therefore, this alternative would have ***no impact*** under CEQA and ***no effect*** under NEPA. regarding this issue area

Proposed Project/Action

Construction activities to implement the proposed project/action will temporarily affect traffic to and from the project site due to the transport of equipment, materials, and personnel required to install radial gates at Sugar Pine Dam, conduct timber harvest and vegetation removal operations, and replace recreational facilities.

The proposed project/action would result in the removal and reconstruction of several recreational facilities including campsites, trails, benches, interpretive signage, trail bridges, water supply infrastructure, restrooms, the boat ramp and parking facilities. These activities will require construction related worker and equipment vehicle trips to the project site. The anticipated number of workers is estimated at 10 to 15 per day. This would result in 20 to 30 average daily trips (ADT) to the site (10 to 15 AM trips and 10 to 15 PM trips).

Additionally, the proposed project/action includes a timber harvest to remove vegetation from areas that will be inundated with the placement of the radial gates. As discussed in Section 2.2.4, the timber harvest is anticipated to be completed in three phases and last approximately four to six months. The timber harvest activities would result in 8 to 12 workers at the site during the four- to six-month period with an average daily trip count of 16 to 24 trips (8 to 12 AM and 8 to 12 PM trips). However, the transportation of timber and chipped material offsite is anticipated to occur over an approximately 12-week period. Based on the anticipated biomass as defined in *Table 2-3*, above, the timber harvest is estimated to result in a total of 40 to 52 ADT for timber removal over the 12-week period as shown in *Table 4.12-3*.

Table 4.12-3. Estimated Timber Harvest Logging Trips

Logging Truck Trips			
	Low Biomass Estimate (tons)	**Average Biomass Estimate (tons)**	**High Biomass Estimate (tons)**
Total Biomass (Logs)	12,609	14,564	16,519
Truck Trips[1]	1,009	1,165	1,322
Trucks Per Day[2]	17	19	22
Chip Van Trips			
	Low Biomass Estimate (tons)	**Average Biomass Estimate (tons)**	**High Biomass Estimate (tons)**
Total Biomass (Chipped)	2,428	2,792	3,156
Truck Trips[1]	194	223	252
Trucks Per Day[2]	3	4	4
Total			
Total Trips	1,203	1,388	1,574
Trips Per Day (including return trip)	20 (40)	23 (46)	26 (52)

Notes:
1) Based on a single tandem axel truck, 25,000 lbs weight limit
2) Based on a 12 week, 5 days per week hauling period. Numbers are rounded.

Combining the construction worker trips, the timber harvest worker trips and the timber harvest logging/chip vans trips, results in 76 to 106 ADT[2] during the weekday period. No trips are anticipated during the weekends.

[2] 76 ADT = 20 construction worker trips + 16 timber harvest worker trips + 40 low biomass logging truck/chip van trips;

Implementation of the project/action is expected to result in the closure of the Sugar Pine recreational facilities for one full season which would eliminate the visitor vehicle trips to the Sugar Pine Recreation Area for that season. According to TNF revenue information, there were 39,278 visitors in 2015 and 47,831 visitors in 2016 to the Sugar Pine Recreation Area (see *Table 4.11-1*). The season is from mid-May through November. Based on this information and an estimated three persons per vehicle, it is estimated that the recreation area averaged 926 vehicle trips per week in 2015 and 1,127 vehicle trips per week in 2016. Visitors by day information is not available. However, as with most recreation areas, visitation to the Sugar Pine Recreation Area is generally much less during the week than the weekend. As such, a 25 weekday/75 weekend ratio was used to determine the week day ADT in order to compare the proposed project/action trips to those of the park. Based on this ratio, the Sugar Pine Recreation Area averaged 46 daily weekday trips in 2015 and 56 daily weekday trips in 2016.

In comparing the highest amount of proposed project/action weekday trips, 106 ADT, to the highest amount of visitation weekday trips, 56 ADT in 2016, the proposed project would produce 50 more weekday trips per day that the 2016 visitor trips. However, those trips related to the logging trucks and chip vans (52) would not occur during the AM and PM peak hour periods, as would those trips for construction/timber harvest workers, but would be spread throughout the eight-hour work day. Additionally, this increase would occur during a 12-week period. Once the reconstruction of the recreation facilities and timber harvest is complete, these trips will cease. Because of the short time period, the current operating conditions of Foresthill Road which is shown in *Tables 4.12-1 and 4.12-2* to operate with an acceptable LOS during the peak hour, and the minimal amount of increased traffic on Foresthill Road (25 AM peak hour trips and 25 PM peak hour trips), the proposed project/action would have ***a less than significant impact*** under CEQA and ***no effect*** under NEPA. regarding this issue area.

Alternative 1

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. While implementation of this alternative would result in a slightly longer trail in a different location, these attributes would not increase construction or timber harvest traffic to the site. This alternative would have the same short-term construction traffic as the proposed project/action. Therefore, the Project would have ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

Alternative 2

While this alternative would reduce the number of on-site vehicle trips for transporting the cut timber, this alternative would have the same off-site vehicle trips as the proposed project/action. As such, this alternative would have the same short-term construction traffic as the proposed project/action. Therefore, the Project would have ***less than significant impact*** (CEQA) and ***no effect*** (NEPA) in this area.

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106 ADT = 30 construction worker trips + 24 timber harvest worker trips + 52 high biomass logging truck/chip van trips

4.12.3.4 Cumulative Impacts

Approach to Assessing Cumulative Impact on Traffic and Transportation

For the purpose of this EIR/EIS, and for the purpose of assessing the cumulative impact of the proposed project/action on traffic and transportation, the cumulative impacts are the sum of all past, present, and reasonably foreseeable future actions within the Foresthill Road corridor, including the FDCP and TNF recreational resources development and forest management practices. In addition, past, ongoing and future projects in areas likely to be affected by implementation of compensatory mitigation measures associated with the proposed project/action are considered as part of the cumulative impact assessment.

In order to understand the contribution of past actions to the cumulative effects of the proposed project/action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Cumulative Setting

The major factor in producing traffic and transportation cumulative impacts is increased growth in the FDPC area and/or additional development of TNF forest resources.

Foresthill Divide Community Plan Buildout

The FDCP anticipates a 2030 population of 9,620, an increase of 3,918 persons between 2000 and 2030 (Placer County 2008). The Foresthill Divide Community Plan EIR identifies two buildout scenarios: One Without Forest Ranch Concept Plan and one With Forest Ranch Concept Plan. Forest Ranch Concept Plan includes 1,858 residential units, retail and office uses and equestrian park, RV park and a golf course. Based on the traffic information provided in the Foresthill Community Plan EIR, both scenarios will impact traffic operations on portions of Foresthill Road under buildout conditions (Placer County 2007). Mitigation measures were included to reduce these impacts to a less than significant level, however, funding of these improvements was questionable resulting in a significant and unavoidable impact.

Tahoe National Forest Land Resource Management Plan

Cumulative transportation impacts related to forest resources are a result of new or expanded recreational facilities such as campgrounds or trails or private timber harvests. The construction of recreational facilities and operation of timber harvests are considered to be short-term and do not add to transportation impacts on a cumulative basis as once the construction/harvest is completed those vehicles related to that activity cease. However, operation of a new or expanded campground, trail, or other recreational area such as an OHV area would potentially result in cumulative traffic impacts.

There are four management areas near the proposed project/action site identified in the LRMP, which are considered to have a potential to add to cumulative transportation impacts under ongoing and future conditions. These include: Elliot (Management Area 94), Macy (Management Area 95), Sugar Pine (Management Area 96), and Big (Management Area 97). However, none of these management areas have plans for expansion at this time.

Effects of Past, Present, and Reasonably Foreseeable Future Actions

Impact TRA-4: In Combination with Other Present and Reasonably Foreseeable Future Projects/Actions Cumulatively Exceed Capacity of Roadway Network and LOS Standards Established by the General Plan. Impact Determination: *less than cumulatively considerable.*

As discussed above, major increases in traffic in the area would be due to future growth established in the FDCP. The TNF's four management areas are not expected to result in an increase of long-term traffic as no expansion of these areas are anticipated.

No Project/Action Alternative

Under No Project Alternative, no modifications to facilities at Sugar Pine Dam or recreational features at the reservoir would be implemented. While future traffic in the area would increase, this is due to the FDCP. The continuation of FPUD service would result in no changes to the existing operation of the reservoir or recreational facilities. No new construction or operations would occur with the No Project/Action Alternative that would increase long-term traffic or affect LOS in the Foresthill Road corridor. Therefore, this alternative would have a ***less than cumulatively considerable impact*** under CEQA regarding cumulative roadway capacity.

Proposed Project/Action

Construction activities to implement the proposed project/action will temporarily affect traffic to and from the project site due to the transport of equipment, materials, and personnel required to install radial gates at Sugar Pine Dam, conduct timber harvest and vegetation removal operations, and replace recreational facilities. However, this is a short-term affect and would not increase traffic in the Foresthill Road corridor such that LOS standards are exceeded. Because the proposed project/action does not increase the number of campsites or picnic areas, an increase in long-term traffic over existing levels would not occur. While traffic in the area may increase, it would not be because of the proposed project/action. Therefore, the proposed project/action would have ***a less than cumulatively considerable impact*** under CEQA regarding cumulative roadway capacity.

Alternative 1

Alternative 1 reroutes the proposed JHMT reconstruction upslope of the shoreline and away from the reservoir to avoid Layne's butterweed occurrences. Other than realignment of the trail to avoid Layne's butterweed, this alternative is identical to the proposed project/action. While implementation of this alternative would result in a slightly longer trail in a different location, these attributes would not increase the number of campsites or picnic areas. As such, an increase in long-term traffic over existing levels would not occur. While traffic in the area may increase, it would not be because of Alternative 1. Therefore, Alternative 1 would have a ***less than cumulatively considerable impact*** under CEQA regarding cumulative roadway capacity.

Alternative 2

While this alternative would reduce the number of onsite vehicle trips for transporting the cut timber, this alternative would have the same offsite vehicle trips as the proposed project/action. However, Alternative 2 would not increase the number of campsites or picnic areas. As such, an increase in long-term traffic over existing levels would not occur. While traffic in the area may increase, it would not be associated with Alternative 2. Therefore, Alternative 2 would have a ***less than cumulatively considerable impact*** under CEQA regarding cumulative roadway capacity.

4.12.4 Residual Unavoidable Effects

No mitigation measures were required to reduce traffic and transportation impacts/effects. As such, no residual unavoidable effects would occur as a result of mitigation implementation.

4.12.5 References

Placer County. 2019. GIS Traffic Counts. http://placercounty.maps.arcgis.com/apps/View/index.html?appid=2b58897816ad4c84b2b2b4d39ed8ddfc.

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CHAPTER 5 COMPARISON OF ALTERNATIVES

5.1 Regulatory Requirements for Alternatives Comparison

This section presents a summary of the impact findings previously presented in the environmental analysis in Section 4 of this Draft Environmental Impact Report/Environmental Impact Statement (DEIR/EIS). The information is organized by alternative rather than by environmental resource category in order to facilitate an evaluation of the comparative merits of the proposed project/action with the alternatives to the proposed project/action considered in this DEIR/EIS. This comparison is based on the assessment of environmental impacts identified in Section 4.

This section is organized as follows:

- Section 5.1 describes the regulatory requirements for the alternatives comparison.
- Section 5.2 presents a comparison of the proposed project/action with the No Project Alternative, No Action Alternative, Alternative 1 and Alternative 2 under CEQA. Section 5.2 also presents the overall environmentally superior alternative in keeping with CEQA requirements.
- Section 5.3 presents a comparative analysis of the alternatives as required by the NEPA regulations, defines the preferred alternative for the federal agencies as required under NEPA and defines the environmentally preferable alternative as required under NEPA regulation as expressed in NEPA's Section 101.

5.1.1 California Environmental Quality Act

Under CEQA, the alternatives analysis is required to include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed. If the environmentally superior alternative is the No Project Alternative, CEQA requires identification of an environmentally superior alternative among the other alternatives (14 CCR 15126.6(e)(2)).

The comparison of alternatives is designed to satisfy the requirements of CEQA Guidelines, Section 15126.6(d), Evaluation of Alternatives (14 CCR 15000 et seq.). The comparison presented below focuses on the significant adverse impacts of the proposed project/action as compared to the alternatives rather than on the beneficial impacts of any alternative above and beyond its ability to reduce or avoid significant effects of the proposed project/action. This is consistent with the constitutional requirement that there be "rough proportionality" between the impacts of the project and the measures identified to reduce or avoid those impacts (Dolan v. City of Tigard, 512 U.S. 374 (1994)), and the constitutional requirement that there be an essential nexus (i.e., connection) between a legitimate governmental interest and the measures identified to further that interest (Nollan v. California Coastal Commission, 483 U.S. 825 (1987). These requirements are also set forth in CEQA Guidelines, Section 15126.4(a)(4). Therefore, the environmental superiority of alternatives under CEQA is based on a comparison of significant impacts that would result from the proposed project and the alternatives identified in this EIR/EIS. Issue areas that are generally given more weight in comparing alternatives are those with long-term impacts (e.g., visual impacts and permanent loss of habitat or land use conflicts). Impacts associated with construction (i.e., temporary or short-term) that are mitigable to less-than-significant levels are considered less important. [CPUC USDA 2015]

5.1.2 National Environmental Policy Act

Under Council on Environmental Quality regulations implementing NEPA, an EIS must present the environmental impacts of the proposal and the alternatives in comparative form, sharply defining the issues and providing a clear basis of choice among options (40 C.F.R. 1502.14). The regulations direct that an EIS "identify the agency's preferred alternative or alternatives, if one exists, in the draft statement and identify such alternative in the final statement unless another law prohibits the expression of such a preference" (40 CFR 1502.14(e)). The "agency's preferred alternative" is the alternative which the agency believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. The concept of the "agency's preferred alternative" is different from the "environmentally preferable alternative," although in some cases one alternative may be both. It is identified so that agencies and the public can understand the lead agency's orientation (see CEQ 40 Most Asked Questions, Question 4a). The identification of a preferred alternative may take into consideration whether the proposed project or an alternative would improve existing environmental conditions and does not constitute a commitment or decision principle, and there is no requirement to select the preferred alternative in the Record of Decision. The identification of the preferred alternative may change between a draft EIS and final EIS. Various parts of separate alternatives that are analyzed in the draft can also be combined to develop a complete alternative in the final EIS as long as the reasons for doing so are explained.

Under the NEPA regulations, the Record of Decision must identify the environmentally preferred alternative. The environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA's Section 101. Ordinarily, this means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources. Although not required, agencies are encouraged to identify the environmentally preferred alternative in the EIS (see CEQ 40 Most Asked Questions 6b). [CPUC USDA 2015]

5.2 Comparison of Alternatives

5.2.1 Proposed Project/Action and Alternatives

5.2.1.1 No Project Alternative

As described in Section 3.2 of this Under CEQA, the No-Project Alternative must also be analyzed (see CEQA Guidelines § 15126.6(e)). This requirement encourages a Lead Agency to compare the environmental effects of approving a proposed project with the effects of not approving it. Unlike the no action alternative, the No Project Alternative generally assumes that the land area or current environment would remain in its existing state. This is typically prefaced by the continuation of current plans and ongoing operation of existing available infrastructure, and community services. Under the No Project Alternative addressed in this DEIR/EIS the following would occur:

- FPUD's Water Right 15375 would be extended to allow time for the District to put to beneficial use the water supply developed by the existing Sugar Pine Dam and Reservoir;
- Radial gates would not be installed on Sugar Pine Dam; and
- Maximum storage capacity and maximum area of inundation of Sugar Pine Reservoir would remain unchanged from current conditions.

As the No Project Alternative does not include the expansion of storage or area of inundation of Sugar Pine Reservoir, the development of replacement recreational facilities or compensatory mitigation measures would not be needed. Under the No Project Alternative, it is reasonable to assume that the State Water Resources Control Board would approve an extension of time to put to beneficial use the existing water supply developed by Sugar Pine Dam and Reservoir. Failure to approve the extension would allow FPUD to continue serving existing customers in its service area but would eliminate the water supply identified to serve the economic development (workplaces, housing, and other public amenities) approved by the County of Placer when it adopted the Foresthill Community Plan in reliance on water supplies available from completing FPUD's Sugar Pine Project. With the requested extension, FPUD would serve water to existing and planned future homes, workplaces, schools and other public amenities anticipated by the Community Plan. As analyzed in Placer County's Foresthill Divide Community Plan EIR, the existing Sugar Pine Project's firm water supply yield is 2,150 AF, which is the same yield used for purposes of this DEIR/EIS. Under the No Project Alternative, FPUD would continue to execute the transfer of surplus water, as available, to downstream users for water supply or environmental purposes in keeping with current practice.

In evaluating the potential impact of the proposed project/action under CEQA in Chapter 4 of this DEIR/EIS, the No Project Alternative served as the environmental baseline for determining the significance that impact and the impact of proposed project alternatives. As such, the No Project Alternative was found to have no impact or less than significant impacts in all subject areas addressed in Chapter 4.

It is important to note that, under the No Project Alternative basic objectives of the proposed project/action would not be met including, but not limited to:

- Ensure that water supply needs for current and future municipal, industrial and agricultural users within the FPUD service area are met in an environmentally sound and economically sustainable manner; and
- Expand water storage capacity at Sugar Pine Reservoir to help mitigate potential decline in project yield due to climate change and potential regulatory changes requiring bypass flows in accordance with the SWRCB's Bay-Delta Water Quality Control Plan, and to supplement the

overall water supply reliability and ecosystem health for the state of California in keeping with the Statewide Water Action Plan

5.2.1.2 No Action Alternative

As described in Section 3.3 of this DEIR/EIS, the No Action Alternative as defined by NEPA reflects future conditions that are likely to occur without the Proposed Action [40 CFR § 1502.14(d)]. The No Action Alternative should reflect existing management and operational conditions that would cause current activities to continue without significant change: activities that directly or indirectly affect resources that, in turn, could be affected by the Proposed Action. The No Action Alternative also should include future actions that are likely to proceed regardless of implementing the proposed action.

For this EIR/EIS, the proposed action is USFS approval of an amendment to FPUD's existing Special Use Permit for the operation of the Sugar Pine Project. The proposed amendment would allow an increase in the Sugar Pine Reservoir maximum area of inundation, tree and brush removal from within the expanded inundation area, replacement of USFS recreational facilities affected by the action, and implementation of compensatory mitigation measures, as a result of the installation of radial gates on Sugar Pine Dam. None of these activities would occur under the No Action Alternative.

The No Action Alternative for this EIR/EIS encompasses the continuation of existing Sugar Pine Reservoir management and operational conditions. The No Action Alternative also incorporates foreseeable future actions likely to occur in the absence of the project that could affect these conditions. Key among these future actions is the proposed extension of Water Right 15375. That extension will allow FPUD to continue to serve existing water customers as well as new customers that will be created as a result of future planned growth and development under Placer County's Foresthill Community Plan, which identifies FPUD as the public water supplier to serve the Community Plan area.

To fully define the No Action Alternative and thus help establish the parameters for the NEPA environmental baseline, current reservoir operations, past and ongoing water transfer activities by FPUD, and expected future increases in water demand within the FPUD service area must be described. For purposes of this DEIR/EIS, the No Action Alternative serves as a basis of comparison for determining potential effects on the human environment of the proposed action and other project alternatives. Using the no action alternative allows the analysis to contrast the impacts of the proposed action with the current condition and expected future condition if the proposed action were not implemented. In other words, conditions anticipated to occur under the no action alternative serve as the environmental baseline for determining the environmental impact of the proposed project/action under NEPA.

5.2.1.3 Proposed Project/Action and Alternatives 1 and 2

A detailed description of the proposed project/action is presented in Chapter 2: Proposed Project/Action of this DEIR/EIS. Chapter 3 presents a description of the alternatives to the proposed project/action as well as a discussion of the process used to develop, consider and select those alternatives for further evaluation in this DEIR/EIS. Alternatives to the proposed project/action that were further evaluated in this DEIR/EIS include:

- The No Project Alternative (CEQA)
- The No Action Alternative (NEPA)
- Alternative 1: Layne's Butterweed Trail Realignment
- Alternative 2: Helicopter Harvest

5.2.2 Comparison of the Proposed Project/Action and Alternatives: CEQA

A detailed analysis of environmental impacts and mitigation for all project alternatives is provided in Sections 4.2 through 4.12 of this DEIR/EIS. The results of this analysis, i.e., the determination of the potential impact of the proposed project/action and alternatives under CEQA is listed in *Table ES-1* (Summary of Environmental Effects and Mitigation). As shown in *Table ES-1*, both the No Project Alternative and the No Action Alternative would result in no significant impact as defined under CEQA and/or NEPA.

Table ES-1 lists impacts found to be "***less than significant with mitigation incorporated***" for the proposed project/action in eight issue areas including:

- Aesthetics
- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning

Table ES-1 identifies a "***significant and unavoidable"*** impact for the proposed project/action in one issue area: Aesthetics.

In comparing the proposed project/action with Alternative 1: Layne's Butterweed Trail Realignment, the impact determinations presented in Sections 4.2 through 4.12 are identical to that of the proposed project/action with the following exception:

- Alternative 1 would result in a ***significant and unavoidable*** impact on recreations facilities and recreationist user experience (Impact REC-1 and REC-2, respectively) due to the Alternative's inability to duplicate the purpose and function of the existing JHMT and an anticipated degradation in the recreational user experience. This is due to the increased length and slope of the JHMT under Alternative 1.

In comparing the proposed project/action to Alternative 1, the reader should note also that under the proposed project/action, reconstruction of the JHMT would be in keeping with the current use and purpose of the JHMT due to the proposed relocation of the trail adjacent to and in close proximity of the reservoir on relatively level topography. The proposed project/action, however, would bisect areas of known occurrences of Layne's butterweed, a federally listed threatened species. Through implementation of management requirements specific to the species (see Management Requirements BOT1 (Surveys) and BOT2 (Layne's Butterweed) in *Table 2-6* of this DEIR/EIS, and with implementation of mitigation measure **BIO-2**, the impact on Layne's butterweed would be reduced to less than significant under CEQA and no effect under NEPA. While the resulting impact determination after mitigation is identical for the proposed project/action and Alternative 1, the approach to mitigation for the proposed project/action is largely compensatory in nature, i.e., providing adequate compensation for impacts on the species due to construction. The approach to mitigation under Alternative 1, however, relies mainly on avoidance of the species.

In comparing the proposed project/action with Alternative 2: Helicopter Harvest, the impact determinations presented in Sections 4.2 through 4.12 are identical to that of the proposed project/action with the following exception:

- Under Alternative 2, helicopter operations during timber harvest would result in a short-term ***significant and unavoidable*** impact due to a projected temporary exceedance of Placer County Air Pollution Control District's significance threshold for NOx emissions.

As discussed in Section 4.3: Air Quality of this DEIR/EIS, the use of a helicopter during proposed timber harvest operations would result in the PCAPCD significance threshold for NOx being surpassed. Under CEQA, Alternative 2 would have a significant and unavoidable impact. Potential mitigation available to reduce this impact involves limiting the use of the helicopter, but this would be contrary to the primary objective of Alternative 2 which is to allow non-mechanical timber harvest in all areas where slope exceeds 35 degrees. The estimated two days of helicopter use would generate a negligible amount of pollutants and, therefore, would not exceed Federal Conformity thresholds. For this reason, Alternative 2 would have no effect under NEPA.

In comparing the proposed project/action to Alternative 2, the reader should note also that under the proposed project/action, helicopter harvest would be employed in order to limit soil disturbance during timber harvest operations in areas where the slope exceeds 35%. This occurs on roughly nine (9) acres within the expanded inundation area. Helicopter harvest would eliminate the need to construct bench-cut skid trails in these areas for felled tree removal. Erosion control and slope restoration in these areas would be problematic under the proposed project/action requiring additional mitigation that would be unnecessary under Alternative 2. Under each alternative, however, all impacts are found to be less than significant or less than significant with mitigation incorporated with the exception of the impact of Alternative 2 on NOx emissions described above.

5.2.2.1 Environmentally Superior Alternative: CEQA

CEQA requires that the environmentally superior alternative be selected from a range of reasonable alternatives that could feasibly attain the basic objectives of the project. As previously discussed in Section 4.1, the assessment of the environmental superiority of alternatives in this DEIR/EIS does not consider whether the proposed project/action would improve existing environmental conditions and does not consider the beneficial impacts of any alternative above and beyond its ability to reduce or avoid significant effects of the proposed project/action. Therefore, based on the analysis presented in Sections 4.2 through 4.12, and the comparison of alternatives presented above, the environmentally superior alternative was determined under CEQA to be the No Project Alternative. Under the No Project Alternative, the proposed project would not be constructed. All environmental impacts associated with the construction and operation of the proposed project would be eliminated and existing environmental conditions would be unaffected and the associated benefits of the proposed project/action discussed in Section 1.5 (Proposed Project Objectives) would not be realized.

CEQA Guidelines, Section 15126, subd. (d)(2) further stipulates that "if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative among the other alternatives." In keeping with the discussion in Section 5.3.1.4 above, the proposed project/action is found to be environmentally superior to both Alternative 1 and 2. Both Alternative 1 and 2 are found to result in significant and unavoidable impacts that would be avoided under the proposed project/action.

5.2.3 Comparison of the Proposed Project/Action and Alternatives: NEPA

As noted above, a detailed description of the proposed project/action is presented in Chapter 2 of this DEIR/EIS. The federal action associated with implementation of the proposed project/action is the approval of the request by FPUD to TNF to amend the Special Use Permit (SUP) it previously approved for the Sugar Pine Dam and Reservoir Project. The SUP amendment would authorize completion of the proposed project by: (1) increasing water storage capacity of Sugar Pine Reservoir by installing radial gates in the existing spillway of the dam to achieve the Sugar Pine Project's full potential water storage capacity; and (2) implementing project design features and mitigation measures to avoid or reduce associated impacts to National Forest System (NFS) resources as administered by USFS.

A detailed analysis of environmental effects and mitigation for all project alternatives is provided in Sections 4.2 through 4.12 of this DEIR/EIS. The results of this analysis, i.e., the determination of the potential effects under NEPA of the proposed project/action and alternatives is listed in *Table ES-1* (Summary of Environmental Effects and Mitigation). As shown in *Table ES-1*, both the No Project Alternative and the No Action Alternative would result in no effect as defined under NEPA.

Table ES-1 lists impacts found to have "no effect" or a "minorly adverse effect" taking into account the implementation of compensatory mitigation measures and management requirements considered part of the proposed project/action. Additional mitigation measures are proposed for a number of potential effects associated with various resource areas. As noted above, these resource areas include: Aesthetics;

Air Quality; Biological Resources; Cultural Resources; Geology and Soils: Hazards and Hazardous Materials; Hydrology and Water Quality; and Land Use and Planning.

The incorporation of proposed mitigation measures as part of the proposed project/action enables the determination of “no effect” or “minorly adverse effect” in all instances with the following exceptions:

- The proposed project/action, Alternative 1 and Alternative 2 would result in an adverse effect on the visual character or quality of the project site and its surroundings;
- Alternative 1 would result in an adverse effect on the mandatory replacement of recreational facilities at Sugar Pine Reservoir and the quality of the recreational experience afforded at Sugar Pine; and
- The proposed project/action, Alternative 1 and Alternative 2 would have a temporary adverse effect on recreational use at Sugar Pine Reservoir campgrounds, boat ramp and day use areas due to their closure during project construction.

Table 5-1. Comparative Analysis of Project Alternatives compares the findings of proposed project/action effects with each of the other project/action alternatives evaluated in this DEIR/EIS.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
Visual Resources			
Impact VIS-1: Adverse effect on a scenic vista. Impact Determination: No impact (CEQA) and no effect (NEPA). Impact VIS-2: Damage to scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway. Impact Determination: No impact (CEQA) and no effect (NEPA). Impact VIS-3: Degrade the existing visual character or quality of the site and its surroundings. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA) (short-term construction-related impacts). Significant and unavoidable (CEQA) and adverse (NEPA) (long-term operational impacts). Impact VIS-4: Creation of a substantial new source of light or glare that would adversely affect day or nighttime views in the area. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact VIS-5: Result in an inconsistency with applicable visual quality objectives of the Tahoe National Forest Land and Resources Management Plan. Impact Determination: Less than significant with mitigation incorporated (CEQA) and not adverse (NEPA).	As with the Proposed Project/Action, Alternative 1 would allow the installation of radial gates within the Sugar Pine Dam spillway and expansion of the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 which requires compensation for impact on Layne's butterweed specific to reconstruction of the Josh Hardt Memorial Trail (JHMT). Under Alternative 1, the proposed JHMT alignment would be modified to avoid impact on Layne's butterweed associated with trail construction. Impacts VIS-1 through VIS-5 under Alternative 1 as they relate to radial gate installation and implementation of project design features and Compensatory Mitigation Measures would be identical to those of the proposed project/action. While construction of the JHMT along an alignment that is different than that of the proposed project/action would alter views of the trail from various locations relative to the proposed project/action, the effect determinations for Alternative 1 would be identical to those of the proposed	As with the proposed project/action, Alternative 1 would allow the installation of radial gates within the Sugar Pine Dam spillway and expansion of the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented. Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35% Impacts VIS-1 through VIS-5 under Alternative 1 as they relate to radial gate installation and implementation of project design features and Compensatory Mitigation Measures would be identical to those of the proposed project/action. Short-term operation of a helicopter	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Adverse effects on the visual character and quality of the project site and surroundings due to long-term operation of the proposed project/action and Alternatives 1 and 2 would be avoided under the No Action Alternative. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary for the No Action Alternative. Visual effects on the quality and character of views of Sugar Pine Reservoir related to reservoir drawdowns will continue to occur as FPUD continues to execute water transfers and increase as water use within FPUD service area

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives		
	Alternative 1: Layne's Butterweed Trail Realignment	**Alternative 2: Helicopter Harvest**	**No Action Alternative**
	project/action for Impacts VIS-1 through VIS-5.	totaling two to four days during timber harvest would not result in any additional significant adverse visual effects relative to the proposed project/action.	increases over time under the No Action Alternative.
	Air Quality and Climate Change		
Impact AIR-1: Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors. Impact Determination: less than significant (CEQA) and no effect (NEPA) for the proposed project/action and Alternative 1; significant and unavoidable (CEQA) and no effect (NEPA) for Alternative 2. Impact AIR-2: Result in the exposure of sensitive receptors to substantial pollutant concentrations. Impact Determination: less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact AIR-3: Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people. Impact Determination: less than significant (CEQA) and no effect (NEPA) Impact AIR-4: Conflict with or obstruct implementation of the applicable air quality plan. Impact Determination: No impact (CEQA) and no effect (NEPA). Impact AIR-5: Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment. Impact Determination: less than significant (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Compensatory Mitigation Measures required for the proposed project/action would also be required for Alternative 1 with the exception of Measure Q1 which requires compensation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Construction activities associated with the trail extension would not result in a substantive difference in the impact determinations for the proposed project/action under Impacts AIR-1 through AIR-6. Determinations under NEPA for Impacts AIR-1 through AIR-6 for Alternative 1 would identical to those for the proposed project/action.	Alternative 2 differs from the proposed project/action in that proposed timber harvest around Sugar Pine Reservoir would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Helicopter use would not exceed Federal Conformity thresholds and, therefore is found to have ***no effect*** on conformance with federal standards under Impact AIR-1. Helicopter use would, however, exceed the local (PCACPD) significance standard for NOx. Determinations under NEPA for Impacts AIR-2 through AIR-6 for Alternative 1 would identical to those for the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary for the No Action Alternative. Under the No Action Alternative, FPUD would continue to periodically execute water transfers of up to 2,000 acre-feet and it is expected that diversions from Sugar Pine Reservoir will increase relative to historic levels as water demand within the FPUD service area continues to expand to serve approved

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives: Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
Impact AIR-6: Conflict with any applicable plan, policy, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases. Impact Determination: No impact (CEQA) and no effect (NEPA).			planned development within the FPUD Sphere of Influence.
Biological Resources			
Impact BIO-1: The proposed project/action could adversely affect, either directly or through habitat modifications, species identified as a candidate, sensitive, or special-status species in local or regional plans, policies or regulations, or by the U.S. Forest Service, California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Impact Determination: Less than significant with mitigation incorporated (CEQA) and a minorly adverse (NEPA). Impact BIO-2: The proposed project/action could adversely affect native habitats through the introduction of invasive, non-native, or noxious plant species. Impact Determination: less than significant (CEQA) and minorly adverse (NEPA). Impact BIO-3: The proposed project/action could adversely affect riparian habitat and other sensitive natural communities identified in local or regional plans, policies or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. Impact Determination: less than significant (CEQA) and minorly adverse (NEPA). Impact BIO-4 The proposed project/action could adversely affect federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling, and inundation. Impact Determination: less than significant (CEQA) and minorly adverse (NEPA). Impact BIO-5: The movement of native resident or migratory fish or wildlife species, established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites could be affected	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Determinations for Impacts BIO-1 through BIO-7 pertaining to those actions would be identical to the proposed project/action. Alternative 1 would implement all Compensatory Mitigation Measures required for the proposed project/action with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile) to avoid direct effects on Layne's butterweed due to trail construction. Determinations for Impacts BIO-1 through BIO-7 for Alternative 1 are identical to those of the proposed project/action although direct impact on populations of Layne's butterweed specific to the reconstruction of	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts BIO-1 through BIO-7 for Alternative 2 are identical to those of the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary for the No Action Alternative. Under the No Action Alternative, FPUD would continue to periodically execute water transfers of up to 2,000 acre-feet and it is expected that diversions from Sugar Pine Reservoir will increase relative to historic levels as water demand within the FPUD service area continues to expand over time.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives: Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
by the proposed project/action. Impact Determination: Less than significant (CEQA) and minorly adverse (NEPA). Impact BIO-6: Implementation and operation of the proposed project/action could conflict with the goals and policies of the Tahoe National Forest Long Range Management Plan and Sugar Pine Management Area Plan pertaining to biological resources. Impact Determination: less than significant (CEQA) with no effect (NEPA). Impact BIO-7: The proposed project/action could adversely affect fish resources in Sugar Pine Reservoir and lower North Shirttail Creek. Impact Determination: Less than significant with mitigation incorporated (CEQA) and minorly adverse (NEPA).	the JHMT would be avoided under Alternative 2.		
Cultural Resources			
Impact CUL-1 Result in a substantial adverse change in the significance of a historical or archaeological resource pursuant Section 15064.5, or result in an effect to a historic property, as defined in Section 106 of NHPA and 36 CFR 800. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact CUL-2 Disturb any human remains, including those interred outside formal cemeteries. Throughout history, human burials have occurred outside of formal cemeteries, usually associated with archaeological resource sites and prehistoric people; therefore, areas with known archaeological resources sites may have higher risk for containing human remains. Impact Determination: less than significant with mitigation (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Determinations for Impacts CUL-1 and CUL-2 pertaining to those actions would be identical to the proposed project/action. All Compensatory Mitigation Measures under the proposed project/action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile).	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for CUL-1 and CUL-2 under Alternative 2 are identical to those of the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary with the No Action Alternative.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
	Determinations for Impacts CUL-1 and CUL-2 for Alternative 1 are identical to those of the proposed project/action.		
Geology, Soils and Paleontological Resources			
Impact GEO-1 The construction and operation of the proposed project/action may result in the potential for substantial soil erosion and/or loss of topsoil. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact GEO-2. Potential Geologic Hazards Related to Construction in Unstable Soils. Impact Determination: Less than significant (CEQA) and no effect (NEPA) (Proposed Project/Action and Alternative 2); Less than significant with mitigation incorporated (CEQA) and no effect (NEPA) (Alternative 1). Impact GEO-3 Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact GEO-4. Cumulative Geologic Hazards Related to Substantial Soil Erosion and/or Loss of Topsoil. Impact Determination: Not cumulatively considerable. Impact GEO-5. Cumulative Geologic Hazards Related to Unstable Soils. Impact Determination: Not cumulatively considerable.	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Determinations for Impacts GEO-1 through GEO-5 pertaining to those actions would be identical to the proposed project/action. All Compensatory Mitigation Measures under the proposed project/action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). The extension and realignment of the JHMT would result in increased excavation activity relative to the proposed project/action and, thus, an increased potential for soil erosion (Impact GEO-1) and paleontological resource disturbance (GEO-3) relative to the proposed project/action. Implementation of TNF Management Requirements would	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. The effects of Alternative 2 on geological, soils and paleontological resources are not discernably different than those of the proposed project/action. The determinations of Impacts GEO-1 through GEO-5 for Alternative 2 are identical to those for the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary Under the No Action Alternative, FPUD would continue to periodically execute water transfers of up to 2,000 acre-feet and it is expected that diversions from Sugar Pine Reservoir will increase relative to historic levels as water demand within the FPUD service area continues to expand over time.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
	prevent adverse effect for both the proposed project/action and Alternative 1. Determinations for Impacts GEO-1 through GEO-5 for Alternative 1 are identical to those of the proposed project/action.		
Impact HAZ-1 Project construction will require the transport, storage and use of hazardous materials common for such activities and could result in their inadvertent release to the environment. Impact Determination: less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact HAZ-2 Project construction will require heavy machinery and personal in an area that is currently forestlands. Introduction of the construction equipment could temporarily increase the risk of fire. Impact Determination: less than significant (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Determinations for Impacts HAZ-1 and HAZ-2 for Alternative 1 are identical to those of the proposed project/action.	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts HAZ-1 and HAZ-2 for Alternative 2 are identical to those of the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary.
Hydrology and Water Quality			
Impact HYD-1: Construction and/or operation of the proposed project/action could violate any water quality standards. Impact Determination: Less than significant impact with mitigation incorporated (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
Impact HYD-2: Will the proposed project/action substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site. Impact Determination: less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact HYD-3: The compensatory mitigation program will construct new recreational facilities and implement habitat and fuels management/improvement practices that could result in substantial erosion or siltation in and around to future reservoir and downstream of the dam. Impact Determination: Less than significant and no effect (NEPA). Impact HYD-4: No features of the proposed project/action would be constructed within 100-year flood hazard area. Impact Determination: No impact (CEQA) and no effect (NEPA). Impact HYD-5; Installation of radial gates at Sugar Pine Dam will increase storage capacity at Sugar Pine Reservoir but will not expose people or structures to a significant risk of loss, injury or death involving flooding as a result of the failure of a dam. Impact Determination: Less than significant (CEQA) and no effect (NEPA).	Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Determinations for Impacts HYD-1 through HYD-5 for Alternative 1 are identical to those of the proposed project/action.	accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts HYD-1 through HYD-5 for Alternative 2 are identical to those of the proposed project/action.	the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary. Under the No Action Alternative, FPUD would continue to periodically execute water transfers of up to 2,000 acre-feet and it is expected that diversions from Sugar Pine Reservoir will increase relative to historic levels as water demand within the FPUD service area continues to expand over time.
Land Use and Planning			
Impact LU-1: Disturb existing land uses at or near Sugar Pine Dam and Reservoir during construction. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA). Impact LU-2: Divide an established community or result in disproportionately high adverse effects on minority or low-income populations. Impact Determination: Less than significant (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives: Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
Impact LU-3: Conflict with applicable land use plans, policies, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect. Impact Determination: Less than significant with mitigation incorporated (CEQA) and no effect (NEPA).	mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Determinations for Impacts HYD-1 through HYD-5 for Alternative 1 are identical to those of the proposed project/action.	timber from areas where the slope exceeds 35%. Determinations for Impacts HYD-1 through HYD-5 for Alternative 2 are identical to those of the proposed project/action.	implemented under the proposed project/action would be unnecessary. Under the No Action Alternative, FPUD would continue to periodically execute water transfers of up to 2,000 acre-feet and it is expected that diversions from Sugar Pine Reservoir will increase relative to historic levels as water demand within the FPUD service area continues to expand over time in accordance with approved County land use plans.
Noise			
Impact NOISE-1: Generation of a substantial temporary increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. Impact Determination: less than significant (CEQA) and no effect (NEPA). Impact NOISE-2: Result in the excessive groundborne vibration or groundborne noise levels. Impact Determination: No impact (CEQA) and no effect (NEPA).	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT.	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts NOISE-1 and NOISE-2 for	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives — Alternative 1: Layne's Butterweed Trail Realignment	Alternative 2: Helicopter Harvest	No Action Alternative
	Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Determinations for Impacts NOISE-1 and NOISE-2 for Alternative 1 are identical to those of the proposed project/action.	Alternative 2 are identical to those of the proposed project/action.	
Recreation			
Impact REC-1: The proposed project/action would require the replacement of camping, day use, trail and boat ramp facilities. Impact Determination: Less than significant (CEQA) and no effect (NEPA) for the proposed project/action. Impact REC-2: The proposed project/action could affect user/guest recreational experience at Sugar Pine Reservoir for recreation activities. Impact Determination: Less than significant (CEQA) and no effect (NEPA) for the proposed project/action. Impact REC-3: During project construction, temporary impacts would occur. Sugar Pine recreational facilities would be closed to the public during construction in order to avoid potential safety hazards to recreational users that could result from timber harvest, redial gate installation, and recreational facilities construction.	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Implementation of Alternative 2 would result in a substantial divergence from the current nature and use of the JHMT which currently service as full-access lake-side trail. Alternative 2 would create a longer steeper trail by constructing a series of switchbacks north of Forbes Creeks. This substantial increase in trail difficulty resulted in	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts REC-1 and REC-2 for Alternative 2 are identical to those of the proposed project/action. The temporary effects of Alternative 2 on recreational use during construction would be identical to the project.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary. The No Action Alternative would have no construction-related effects on recreational use at Sugar Pine Reservoir.

Table 5.1 Comparative Analysis of Project Alternatives

Proposed Project/Action Impact	Federal Proposed Action Alternatives		
	Alternative 1: Layne's Butterweed Trail Realignment	**Alternative 2: Helicopter Harvest**	**No Action Alternative**
	determinations of adverse effect for both Impacts REC-1 and REC-2. The temporary effects of Alternative 1 on recreational use during construction would be identical to the project.		
Traffic and Transportation			
Impact TRA-1: Potential to result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks. Impact Determination: No impact (CEQA) and no effect (NEPA). Impact TRA-2 Potential to result in inadequate emergency access. Impact Determination: less than significant impact (CEQA) and no effect (NEPA). Impact TRA-3: Potential to result in short-term traffic impacts. Impact Determination: less than significant impact (CEQA) and no effect (NEPA). Impact TRA-4: In Combination with Other Present and Reasonably Foreseeable Future Projects/Actions Cumulatively Exceed Capacity of Roadway Network and LOS Standards Established by the General Plan. Impact Determination: less than cumulatively considerable.	As with the proposed project/action, Alternative 1 would install radial gates within the Sugar Pine Dam spillway and expand the storage capacity and inundation area for Sugar Pine Reservoir. Additionally, all Compensatory Mitigation Measures under the Proposed Project/Action would be implemented with Alternative 1 with the exception of Measure Q1 related to mitigation for impact on Layne's butterweed specific to reconstruction of the JHMT. Under Alternative 1, JHMT would be realigned and extended by approximately 4,900 feet (0.9 mile). Determinations for Impacts TRA-1 and TRA-2 for Alternative 1 are identical to those of the proposed project/action.	Alternative 2 differs from the proposed project/action in that Under Alternative 2, timber harvest around Sugar Pine Reservoir necessary to accommodate expansion of the reservoir's inundation area, would employ the use of a helicopter to remove felled timber from areas where the slope exceeds 35%. Determinations for Impacts TRA-1 and TRA-2 for Alternative 1 are identical to those of the proposed project/action.	Under the No Action Alternative, construction activities and long-term modifications to reservoir operations associated with the proposed project/action would not be implemented. Compensatory Mitigation Measures that would be implemented under the proposed project/action would be unnecessary.

5.2.3.1 Federal Environmentally Preferred Alternative

As noted above, the ROD for this EIR/EIS must identify an environmentally preferable alternative which the federal lead agency believes would fulfill their statutory mission and responsibilities, giving consideration to economic, environmental, technical and other factors. There is no requirement for the federal agencies to select the preferred alternative for implementation in the Record of Decision, and the identification of the federal preferred alternative may change between a draft EIS and final EIS.

For purposes of this DEIR/EIS and in accordance with NEPA regulation as expressed in NEPA's Section 101, USFS has chosen to forego designating an "environmentally preferred alternative" until it has received public comments on this DEIR/EIR and completed preparation of the Final EIR/EIS. As required under Section 101, the ROD for the Final EIR/EIS will include USFS's determination of the environmentally preferable alternative.

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CHAPTER 6 CUMULATIVE IMPACTS

6.1 Introduction and Methodology

The California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA) both require an analysis of cumulative impacts as part of the evaluation and analysis of potential impacts. Under CEQA, an environmental impact report (EIR) must discuss cumulative impacts of a project if the project's incremental effects are significant when viewed in connection with the effects of past projects, current projects, and probable future projects (14 CCR 15130(a) and 15065(a)(3)). When this occurs, the project's impacts should be identified as "cumulatively considerable." NEPA defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7).

The effects of past, present, and foreseeable future projects that are critical to determining the cumulative impact of a proposed project or action are referred to as the "cumulative context." The cumulative context defines the environmental conditions that serve as the basis for determining whether the contribution of a project or action can be considered cumulatively considerable. The cumulative context, necessarily, is not the same for all issue areas addressed in this DEIR/EIS. For example, the past, present and future projects which affect the determination of the cumulative impact on air quality, are not necessarily the same projects that influence the cumulative impact on biological resources. As such, each subsection of Chapter 4 of this DEIR/EIS, i.e., Sections 4.2 through 4.12 describes the cumulative context for its specific resource area and assesses the project's incremental contribution to that context. We refer the reader to Sections 4.2 through 4.12 for detailed discussions of the contribution to cumulative impact of the proposed project/action and alternatives.

6.2 Summary of Cumulative Impact

The following is a summary of the conclusions of Sections 4.2 through 4.12 pertaining the project/action and alternatives contribution to cumulative impact.

6.2.1 Aesthetics

The proposed project/action, Alternative 1 and Alternative 2 would add to the substantial cumulative effect on visual resources associated with previous development of the Sugar Pine Project and associated recreational facilities. The proposed project/action would contribute to past impacts on views of native habitat by eliminating 1.6 acres of emergent wetland vegetation, roughly 44 acres of forest habitat, over 1,600 linear feet of upper Shirttail Creek and 1,100 linear feet of Forbes Creek. However, the proposed project/action's and alternatives' contribution to the cumulative impact on the quality of public views would be, in most circumstances, limited. This is due to a number of factors including:

1. At maximum pool, views of Sugar Pine Reservoir would not be appreciably different under the proposed project/action compared to current maximum pool conditions in terms of form, color, and pattern. The size of the reservoir under the proposed project/action relative to the

surrounding terrain would be larger, but it is reasonable to assume that this does not constitute an adverse effect on views.

2. During typical operation of the reservoir, both historically and ongoing, seasonal drawdowns of the reservoir occur to serve FPUD water customers. These drawdowns result in the exposure of bare ground between the forested areas and the reservoir waterline. This "bathtub ring" area is generally considered unsightly relative to full pool conditions. Under the proposed project/action reservoir storage will increase. Seasonal drawdowns (of comparable volumes) from the larger reservoir will result in a bathtub ring of similar aerial extent as currently occurs, but the width of ring will be reduced under the proposed project/action. As such, views from each of the KOPs addressed herein would be not adversely affected by the proposed project/action, and could, arguably, be improved due to the mitigating effect of an expanded reservoir storage.

3. The effect of the proposed project/action on views of the reservoir's bathtub during typical reservoir operations described in Item 2, above, would also apply to conditions when FPUD would execute water transfers consistent with past practices, i.e., transfers of 2,000 AF or less. Simply put, the transfer of 2,000 AF, has occurred previously, and could occur in the future without the proposed project/action, would result in a bathtub ring that is wider than would occur under the proposed project/action.

   However, as discussed in Section 4.2.4.1, above, under Impact VIS-3, conditions expected to occur under the proposed project/action when water transfers exceed current conditions, i.e., when future transfers range from 2,000+ AF to 5,000 AF, the potential exists for the exposure of bare ground to exceed conditions that would occur without the project/action and Alternatives 1 and 2. These conditions could occur as often as once every three years, and are considered a significant and unavoidable impact. For this reason, the proposed project/action's contribution to the impact on existing visual character or quality of the site and its surroundings is considered ***cumulatively considerable.***

6.2.2 Air Quality

As discussed in Section 4.3 above, air pollution is largely a cumulative impact. No single project is sufficient in size, by itself, to result in nonattainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulatively significant adverse air quality impacts. If a project's individual emissions exceed its identified significance thresholds, the project contribution would be cumulatively considerable. Implementation of the Project would not exceed significance thresholds for criteria air pollutants and GHG emissions. Projects that do not exceed significance thresholds for both criteria air pollutants and GHG emissions would be considered ***not cumulatively considerable.***

6.2.3 Biological Resources

As discussed in Section 4.4, the proposed project/action and Alternatives 1 and 2 would contribute a cumulative loss of habitat through inundation of 44 acres of Sierra mixed conifer forest, montane riparian habitat, and montane chaparral habitat, and 2,032 linear feet of stream channel. The proposed project/action would contribute to a cumulative loss in habitat quality where recreational facilities are relocated and trees are removed (approximately 110 acres. The proposed project/action would also contribute to the cumulative loss of rare plant occurrences and suitable habitat in the analysis area for Sierra blue grass, dubious pea, Van Zuuk's morning-glory, and Layne's butterweed. These species would benefit from ongoing OHV restoration projects in the analysis area which cumulatively protects habitats and limits off-route recreational damage.

The net cumulative effect on owls would be low because the proposed project/action would minimally contribute to the cumulative loss of marginally suitable spotted owl habitat, while compensatory mitigation would benefit spotted owl habitat by improving flight paths, improving the growth potential and health in high quality, occupied habitat, and reducing the risk of high severity wildfires that would result in long-term loss of suitable habitat.

Current and future timber management prescriptions in RCA habitat are limited to maintain stream shade and water temperatures. Therefore, reasonably foreseeable future actions are not expected to affect or result in low level temporary effects on foothill yellow-legged frog suitable habitat and California red-legged frog dispersal habitat.

The proposed action would contribute to the cumulative loss of foothill yellow-legged frog suitable habitat and California red-legged frog dispersal habitat from inundation of Forbes Creek and Upper Shirttail Creek. Approximately 5 percent and 11 percent of the available habitat in these systems, respectively, would be permanently lost. Bullfrog suppression in North Shirttail and Forbes Creeks would improve the suitability of remaining habitat for foothill yellow-legged frogs and California red-legged frogs.

Summer water transfers may contribute to a reduction in habitat quality for foothill yellow-legged frogs and western pond turtle in Shirttail Creek below the dam attributed to unseasonal high flows but monitoring has been proposed to avoid impacts to habitat quality during summer transfers.

For the reasons presented above, with implementation of identified Mitigation Measures, Compensatory Mitigation and Management Requirements specific to biological resources identified in this section, the contribution of the proposed project/action and Alternatives 1 and 2 to impacts on biological resources from similar past, ongoing and foreseeable future projects is ***not cumulatively considerable***.

6.2.4 Cultural Resources

As described in Section 4.5, the assessment of the cumulative impact of the proposed project/action and Alternatives 1 and 2 on cultural resources is site-specific (determined by a particular site's sensitivity and known locations of resources), rather than cumulative in nature. In California, individual development projects would be subject to CEQA and/or NEPA analysis. Impacts regarding surficial deposits can be cumulative in nature in an area that is known to contain resources. However, with cultural resources being finite the cumulative impacts are limited only the areas that contain the resource. Therefore, resources that are already below the lake would remain undisturbed and further protected by additional water when reservoir levels are raised. As such cumulate impacts to cultural resources for the proposed project/action and Alternatives 1 and 2 would ***not be cumulatively considerable***.

6.2.5 Geology, Soils and Paleontological Resources

As discussed in Section 4.6 above, cumulative impacts related to geology and soils are generally site-specific. As such, cumulative projects would necessarily have to be adjacent to or in close proximity to a proposed project/action in order to have related cumulative impacts. This is because geologic materials, minerals, and soils occur at specific locales and are unaffected by activities not acting on them directly and any impacts of the proposed project/action would be site-specific. The only project within proximity of the Sugar Pine Recreation Area is the subject proposed project/action. No other past, present, and reasonably foreseeable future projects/actions are in the subject project/action area.

The proposed project/action and Alternatives 1 and 2 would result in a less than significant impact under CEQA and no adverse effect under NEPA regarding the potential for erosion. No other cumulative projects are identified as being in the immediate area which would add to the erosion potential. As such, the impact of proposed project/action would be ***less than cumulatively considerable*** related to erosion and loss of top soil.

As discussed in Section 4.6, because implementation of the proposed project/action and Alternative 2 would not result in impacts or effects related to unstable soils and no other projects are in the immediate vicinity which may increase cumulative impacts as a result of unstable soils. The impact of the proposed project/action would be ***less than cumulatively considerable*** regarding these geologic hazards.

Relative to Alternative 1, however, the proposed trail alignment would have a greater potential for landslides. Proper design and construction of the trail and the use of best management practices to limit erosion and provide soil stabilization as identified under mitigation measure **GEO-1** in this area would limit the landslide potential. Because implementation of Alternative 1 would not result in impacts or effects related to unstable soils and no other projects are in the immediate vicinity which may increase cumulative impacts as a result of unstable soils. The Alternative 1 would have a ***less than cumulatively considerable impact with mitigation incorporated*** regarding these geologic hazards.

6.2.6 Hazards and Hazardous Materials

For the purpose of this DEIR/EIS, and for the purpose of assessing the cumulative hazards impact of the proposed project/action and Alternatives 1 and 2, hazards and hazardous materials issues are related to construction activities only, rather than cumulative operational impacts. The proposed project/action will not introduce new hazards to the project area and will decrease existing fire risks by inundating exposed timberlands with water and implementing fuel modification activities on adjacent parcels. As such cumulate hazards impacts for the proposed project are considered ***not cumulatively considerable***.

6.2.7 Hydrology and Water Quality

As discussed in Section 4.8, in order to understand the contribution of past actions to the cumulative effects of the proposed project/action, the DEIR/EIS relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects. The proposed project/action and Alternatives 1 and 2, in combination with existing, approved, proposed, and reasonably foreseeable development in the Shirttail Creek subwatershed, would alter drainage conditions, increase erosion and affect water quality, which could result in potential water quality impacts within the overall watershed. With mitigation, construction activities to implement the proposed project/action's timber harvest and vegetation removal operations and to replace recreational facilities would result in a ***less than significant impact*** and as such have a ***less than cumulatively considerable impact*** on water quality. As discussed under **Impact HYD-2** above, reservoir operations following proposed project/action construction could result in substantial increases in erosion and turbidity in the reservoir. Therefore, the proposed project/action would require implementation of mitigation measures to reduce this impact to a less than significant level. Project implementation, in combination with projected growth in the FDCP, could substantially adversely affect water quality if unmitigated. With implementation of mitigation measures **GEO-1** and **GEO-2,** the contribution of the proposed project/action to cumulative water quality conditions would be ***less than considerable.***

6.2.8 Land Use and Planning

As discussed in Section 4.9, the proposed project/action and Alternatives 1 and 2 would conflict with the VQO identified for the Sugar Pine Management Area (096) of the TNF LRMP when FPUD carries out future water transfers beyond historical levels and up to 5,000 AF. This conflict can be mitigated only through an amendment or exemption to the LRMP VQO. In considering such an amendment/exemption TNF must consider that the LRMP and specifically its treatment of Sugar Pine Management Area (096) recognize the future installation of radial gates at Sugar Pine Dam, expansion of Sugar Pine Reservoir, and continued operation of Sugar Pine Reservoir for the primary purpose of municipal water supply. The contribution of the proposed project/action and Alternatives 1 and 2 to the cumulative effect of inconsistencies related to land use plans, policies and ordinances of past, ongoing and future projects would be ***less than considerable***.

6.2.9 Noise

As discussed in Section 4.10, construction activities associated with all Alternatives and other construction projects in the area may overlap, resulting in construction noise in the area. However, construction noise impacts primarily affect the areas immediately adjacent to the construction site. Construction noise for the proposed project/action and all Alternatives was determined to be less than significant following compliance with the County Code. Cumulative development in the vicinity of the Sugar Pine Reservoir could result in elevated construction noise levels for the temporary users in the Sugar Pine Reservoir area. However, each project would be required to comply with the applicable County Code limitations on construction. Therefore, the contributions of proposed project/action or Alternatives 1 or 2 would be considered ***less than cumulatively considerable***.

6.2.10 Recreation

As discussed in Section 4.11, the proposed project/action and Alternatives 1 and 2 would result in an increase of water storage capacity at Sugar Pine Reservoir. This increase in capacity is in response to anticipated growth in the FDCP. However, without an adequate water supply, growth in the area may not occur at the levels anticipated in the FDCP. As such, these two scenarios are linked and cumulatively may result in a need for additional recreational facilities to serve the expanding population.

Placer County collects a parks and recreation impact fee (Article 15.34 of the Placer County Code) from new development to provide funding for expansion of park land and recreation facilities required to serve new development in unincorporated Placer County. This fee assists in offsetting cumulative impacts to county recreational facilities from new growth. The FDCP EIR (2007) determined that development of the community plan would not result in significant impacts "because the proposed FDCP provides for the creation of funding sources to develop and maintain new parks and recreational facilities associated with new development, and because the Plan also includes policies and implementation measures to address existing deficiencies" (Placer County 2007:3-114).

While the County collects a parks and recreation impact fee, the fee does not account for cumulative recreational impacts to state and federal facilities. Increased growth in the area because of the FDCP and the proposed project/action may cumulatively impact state and federal recreational facilities in the area. However, state and federal taxes, as well as, park/forest fees are used to offset cumulative impacts to state and federal park and forest facilities. As such, the proposed project/action and Alternatives 1 and 2 would have a ***less than cumulatively considerable impact*** on recreational facilities.

6.2.11 Traffic

As discussed in Section 4.12, major increases in traffic in the area would be due to future growth established in the FDCP. The TNF's four management areas are not expected to result in an increase of long-term traffic as no expansion of these areas is anticipated. Construction activities to implement the proposed project/action or Alternatives 1 and 2 will temporarily affect traffic to and from the project site due to the transport of equipment, materials, and personnel required to install radial gates at Sugar Pine Dam, conduct timber harvest and vegetation removal operations, and replace recreational facilities. However, this is a short-term effect and would not increase traffic in the Foresthill Road corridor such that LOS standards are exceeded. Because the proposed project/action and Alternatives 1 and 2 would not increase the number of campsites or picnic areas, an increase in long-term traffic over existing levels would not occur. While traffic in the area may increase, it would not be because of the proposed project/action or alternatives. Therefore, the proposed project/action and Alternatives 1 and 2 would have ***a less than cumulatively considerable impact.***

CHAPTER 7 CEQA AND NEPA REQUIRED TOPICS

The section addresses topics required by the CEQA and/or NEPA not addressed in previous sections. Topics include: growth inducement (Section 7.1); the irreversible and irretrievable commitment of resources and environmental changes (Section 7.2), adverse unavoidable impacts identified in Chapter 4 of this DEIR/EIS (Section 7.3), the relationship between short-term uses of the environment and the maintenance and enhancement of long-term productivity (Section 7.4), effects found not to be significant (7.5); and project compliance with applicable federal environmental regulations and policies (Section 7.6).

7.1 Growth Inducement

7.1.1 Growth within the FPUD Service Area and Sphere of Influence

CEQA and NEPA require a discussion of the ways in which a proposed project could be an inducement to growth. CEQA Guidelines Section 15126.2(d) identifies a project to be growth-inducing if it fosters economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding environment. For purposes of CEQA, a project that accommodates growth (i.e., by removing an obstacle to growth) is considered growth-inducing. The Council on Environmental Quality NEPA Regulations also require that an EIS discuss the growth-inducing impacts of a project (40 CFR 1508.8(b)):

> "Indirect effects may include growth- inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems."

Typically, the growth-inducing potential of a project would be considered adverse if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, or in projections made by regional planning authorities. Adverse growth impacts could also occur if a project provides infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

As discussed in Chapter 1 of this ADEIR/EIS, in 2003 FPUD prepared a Water System Master Plan (Master Plan) and the County of Placer adopted the Foresthill Divide Community Plan (FDCP) to guide future growth and development in the region encompassing the District's service area and sphere of influence. The Master Plan analyzed actual historic hydrology from 1957 through 2003, identified 1975-1978 as the critical dry period (Critical Period), and projected that in the last year of the Critical Period the existing reservoir would yield 2,150 AFY as is and 3,450 AFY with the radial gates (i.e., the project's safe yield with and without the gates). The safe yield reflects a minimum pool requirement ranging from 1,100-3,560 AF, a downstream fishery flow release schedule ranging from natural reservoir inflow to 5 cubic feet per second, and a requirement to release flows for any downstream prior rights. The Master Plan was adopted in 2008 but was subsequently rescinded.

The EIR certified for the FDCP analyzed all growth-related impacts arising from the development authorized by the Community Plan. The County EIR identified FPUD's Sugar Pine Project as the principal source of water supply available to serve the FDCP area. The EIR projected that existing development and new development of planned future land uses in the District's existing service area would demand up to approximately 3,069-3,269 AFY of water to serve a population of approximately 13,750. The EIR concluded that additional demand from development of a then-pending 2,200-unit senior housing and mixed-use project proposal would cause cumulative demand for District water to exceed the Sugar Pine Project's safe yield, unless the radial gates or other storage augmentation were installed as mitigation. The Community Plan was approved by the County in 2008 and remains in effect.

Subsequent to publication of the 2008 Community Plan EIR, growth within the plan area slowed in response to the regional and global economic recession, and the growth rate within the plan area has not yet recovered to rates projected in the EIR. Another factor that likely could have an adverse effect on growth in the Community Plan Area is increased statewide concern regarding development within high fire hazard areas due to climate change.

In relation to future growth within the District's service area/sphere of influence (SOI), it is important to note that FPUD, as special district water provider, does not possess land use authority that would enable them to directly regulate growth within its sphere of influence. Growth pressures in Placer County are generated irrespective of the water purveyors. State law gives FPUD the legal obligation to obtain the supplies necessary to serve planned growth. Institutionally, the entity responsible for planning for growth within Placer County is the county itself, with its key document being the current County General Plan. Within the FPUD service area/SOI, the key document, as stated above, is the Foresthill Divide Community Plan.

While the lack of new or expanded water supplies can have the practical consequences of slowing the rate of population growth, State law does allow FPUD to simply refuse to seek the full supplies necessary to serve growth. Rather, current statutes such as Senate Bill 610 (Water Code § 10910 et seq.) and Senate Bill 221 (Gov. Code § 66473.7) relate to the timing and procedures for obtaining water needed for planned growth, and do not permit water suppliers to either simply give up on finding needed water or to refuse to obtain water in order to thwart full implementation of growth decisions made by elected county and/or city officials.

As the primary water service provider to existing users and approved development within the District's service area and SOI, FPUD is obligated to maintain and develop adequate water supply to meet anticipated demand. Given the slow rate of growth within the District's service area and the lack of active proposals for new development above and beyond that contained within approved plans, it is highly speculative to assume that new water supplies made available under the proposed project/action would or could eliminate an existing obstacle to future development as yet unapproved by County land use authorities.

For the reasons presented above, the proposed project/action's effect on growth within the District service area or SOI is less than significant. The proposed project/action would not directly or indirectly cause economic growth or development that is inconsistent with the approved Community Plan or County General Plan and, therefore, would not result in environmental impact associated with growth beyond that which is accounted for in those plans.

7.1.2 Growth in Areas Served by Water Transfers

As described in Chapters 1 and 2 of this DEIR/EIS, in advance of full buildout of the Foresthill Community Plan, FPUD could continue to carry out short-term water transfers of surplus stored water to help mitigate water shortages in downstream communities, to provide ecological benefits, or to provide for other beneficial uses consistent with the California Water Code, the State Water Plan, and State Water Resources Control Board's water transfer program. Historically, transfers made by FPUD have not exceeded 2,000 AF, but under the proposed project/action, periodic transfers of as much as 5,000 AF could be done. As stated, these transfers could be used to help mitigate water shortages in downstream communities. As described below, however, it is unlikely that the availability of transferred water from FPUD would help facilitate future growth in these areas due to the temporary, periodic and unpredictable nature of these transfers.

In the absence of a long-term transfer agreement with a particular downstream recipient of transfer water, there will be competing interests for each transfer including municipal, agricultural, and environmental interests. Thus, water transferred from FPUD under the proposed project/action could not serve as a reliable source of water on which future land use decisions in downstream communities could be based. The reliability of transferred water to serve future growth and development is further compromised by the fact that, as water demand increases in the Foresthill Community Plan Area, the availability of surplus water for transfer will decrease and, ultimately, will become unavailable.

An exception would occur if FPUD were to enter into a long-term transfer agreement with a downstream entity. This could provide a somewhat higher level of supply reliability which could conceivably remove some constraint to future development within that entity's service area, at least until water demand within the FPUD service area to the point where surplus water is no longer available for transfer. However, as no such entity has been identified to date, and given that the feasibility or duration of such an agreement has not been evaluated, any examination of potential impacts of growth under such an agreement would be highly speculative and inappropriate for this EIR/EIS.

In the event that a long-term transfer agreement with a downstream user or users is pursued by the District, such an agreement would be subject to its own environmental review in compliance with CEQA and/or NEPA requirements.

7.2 Irreversible and Irretrievable Commitment of Resources and Environmental Changes

CEQA Guidelines (§ 15126.2(c)) require that an EIR identify significant irreversible environmental changes that would be caused by a proposed project. Changes may include use of nonrenewable resources or provision of access to previously inaccessible areas, as well as project accidents that could change the environment in the long term. NEPA regulations also require that an EIS analysis include a discussion of the potential irreversible and irretrievable commitments

7.2.1 Construction-Related Resources

Construction of the proposed project/action, Alternative 1 or Alternative 2 would require a permanent commitment of natural resources resulting from the removal of timber resources from the expanded reservoir inundation area, consumption of fossil fuels, the use of construction materials for the radial gates, related equipment, pavement and concrete for replaced recreational facilities that largely cannot be recycled at the end of the project's useful lifetime, and energy required for the production of materials. The proposed project/action proposes no uniquely hazardous uses, and its operation would not be expected to cause environmental accidents that would affect other areas.

7.2.1.1 Visual Resources

As described in Section 4.2 of this DEIR/EIS, implementation of the proposed project/action or alternatives would alter the long-term visual character of Sugar Pine Reservoir and surrounding areas due to the removal of timber and vegetation surrounding the reservoir, and the execution of future water transfers of up to 5,000 AF. With the execution of transfers of up to 5,000 AF, temporary views of areas of exposed soil between the reservoir pool and forested areas surrounding the reservoir as well as views of the expanded boat ramp facilities will be substantially larger than has been experienced historically, thus adversely affecting the quality of views experienced by recreationists at Sugar Pine or travelers along Sugar Pine Road.

7.2.1.2 Biological Resources

As addressed in Section 4.4 of this DEIR/EIS, implementation of the proposed project/action will result in the permanent reductions in various sensitive habitat types within the areas located within the expanded reservoir inundation area of the proposed project/action and alternatives. These resources include: approximately 37.1 acres of Forest Vegetation and habitat for the California Spotted Owl (Forest Service Sensitive); approximately 1.6 acres of Emergent Riparian Vegetation; approximately 6.4 acres of Montane Chaparral habitat, including serpentine soils; and approximately 2,000 linear feet of stream habitat in North Shirttail and Forbes creeks, including habitat for foothill yellow-legged frog (Forest Service Sensitive and CDFW Threatened species) and rainbow trout spawning and suitable habitat for California red-legged frog is located in this area (Federally Threatened Species). Although compensatory measures would be implemented as part of the project to adequately mitigate the loss of habitats listed, the project would result in the irretrievable removal of habitat from its current location.

7.3 Adverse Environmental Effects That Cannot be Avoided

As detailed in Chapter 4 of this DEIR/EIS and listed in *Table ES-1* (Summary of Environmental Effects and Mitigation), one environmental effect of the proposed project/action and Alternatives 1 and 2 was found to be significant and unavoidable (CEQA) and adverse (NEPA) with the implementation of feasible mitigation: **Impact VIS-3: Degrade the existing visual character or quality of the site and its surroundings**. As described in the discussion of Impact VIS 3, the execution of future water transfers of up to 5.000 AF will result in the significant increases in the area of exposed soil between the reservoir pool and forested areas surrounding the reservoir. This is found to have a significant adverse effect on existing views from various key observation points relative to the environmental baseline: an effect for which no feasible effective mitigation exists.

Section 4. 3 of this DEIR/EIS identifies a significant unavoidable impact for Alternative 2 related to the use of a helicopter for timber harvest. Proposed use of the helicopter under Alternative 2 would result in the PCAPCD significance threshold for NOx being surpassed. Therefore, under CEQA, Alternative 2 would have a significant and unavoidable impact under CEQA. Potential mitigation available to reduce this impact involves limiting the use of the helicopter, but this would be contrary to the primary objective of Alternative 2 which is to allow non-mechanical timber harvest in all areas where slope exceeds 35°. The estimated two days of helicopter use, however, would generate a negligible amount of pollutants on the basis of the ton and, therefore, would not exceed federal conformity thresholds. For this reason, Alternative 2 would have no effect by NEPA standards.

As described in Section 4.11 (Recreation), implementation of Alternative 1; Layne's Butterweed Trail Realignment would result in a significant and unavoidable impact (CEQA) and adverse effect (NEPA) on recreational facilities replacement and the quality of the recreational experience at Sugar Pine Reservoir. This is due to the modification to JHMT that would entail the placement of the trail on a relatively steep slope above Forbes Creek with the installation of a series of switchbacks. As discussed in Section 4.11 this is considered a significant departure from the purpose and use of the JHMT, and is found to be a significant and unavoidable impact (CEQA) and adverse effect (NEPA).

7.4 Short-Term Use Versus Long-Term Productivity of the Environment

NEPA requires consideration of the relationship between short-term uses of the environment and long-term productivity associated with the proposed project (42 U.S.C. § 4332(C)(iv)). This involves the consideration of whether the proposed project/action or alternatives would sacrifice a resource value that might benefit the environment in the long term for some short-term value to the applicant or the public. The potential loss of environmental resources is assessed in Chapter 4 of this DEIR/EIS and evaluated in various technical assessments included in Appendix L to the DEIR/EIS. As stated previously, the purpose for implementing the proposed project/action is to provide adequate water supply to the District's service area: a purpose for which the Sugar Pine Project was originally intended and designed. Neither the proposed project/action nor alternatives involve short-term uses outside of temporary impacts that would occur within the approximately one- to two-year construction period.

7.5 Effects Not Found To Be Significant

CEQA Guidelines Section 15128 requires a brief discussion of the various possible significant effects of a project that were determined not to be significant and were therefore not discussed in the EIR. As discussed in Section A, Introduction, and Section I, Public Participation, of this EIR/EIS, a Notice of Preparation (NOP) and Notice of Intent (NOI) were prepared for the proposed project/action and sent out for public comment as part of the scoping process to determine issues to be addressed in the EIR/EIS. The NOP was accompanied by an Initial Study Checklist which identified issues and resources on which the project could have a significant impact and those for which the potential for impact was considered less than significant. Those areas which did not generate concerns and were found through the scoping process not to have possible significant effects are treated in this section. In addition, these effects were also determined to not be significant issues, per the Forest Service Handbook FSH-1909.15-2012-3 Section 12.41 (40 CFR 1500.4).

7.5.1 Agricultural Resources

The proposed project/action would not adversely affect agricultural resources in that all proposed land use alterations related to project implementation would occur on lands currently designated for forestry or recreational use.

7.5.2 Hazardous Materials

The CEQA significance criteria for potential impact of the handling of hazardous materials on schools is based on project location with 0.25 mile of any existing or proposed school. As no existing or proposed school is located within 0.25 mile of the project area, the project would have no impact on schools due to hazardous materials handling.

7.5.3 Mineral Resources

As noted, the proposed project would install radial gates within the existing spillway at Sugar Pine Dam, expand storage capacity and the area of inundation of Sugar Pine Reservoir, and replace or modify recreational facilities at Giant Gap Campground, Manzanita Day Use Area, and the Sugar Pine Reservoir boat ramp affected by reservoir expansion. These activities would not adversely affect available mineral resources or access to mineral resources.

7.5.4 Public Services

Because the project would not introduce new residents or expand on existing recreational use of Sugar Pine Reservoir and related facilities, the long-term impact of the project on police and fire services is less than significant. Activities associated with project construction such as transport of the radial gate structure to the project site, and radial gate installation may require short-term lane closures or detours. This could affect emergency response by fire protection and police services. Because these closures would be short-term and carried out in coordination would local police and fire service personnel, the impact is considered less than significant. Because the project would not introduce new residents or businesses to the area, the project would have no impact on schools, parks, or other public services.

7.5.5 Utilities and Service Systems

The proposed project would not introduce any new residences or other permanent uses to the project area that would increase demand on utilities or service systems including wastewater treatment, storm water drainage, or water supply. Relative to increased demand for these services, the project would have no impact. The proposed project would not generate long-term sources of solid waste. The project would, however, generate solid waste during project construction, primarily in the form of "slash" created during timber harvest operations and concrete and asphalt debris associated with any removal of recreational facilities located within the expanded inundation area of Sugar Pine Reservoir deemed necessary to accommodate the project. All debris to be disposed of offsite would be disposed of at Placer

County landfill facilities or at other suitable facilities in keeping with applicable federal, state and local requirements. This impact is considered less than significant.

7.5.6 Environmental Justice

Implementation of the proposed project/action would not result in displacing people or housing. Activities associated with project construction and operation would occur within TNF and would not divide an existing community. The project would provide a reliable water source to serve approved growth and development within the Foresthill Community Plan area. For these reasons, the proposed project/action would not directly or indirectly result in any change to approved population growth and development or significant impact on planned improvements to local employment, property values, and tax revenues benefiting public agencies. The proposed project/action would not create disproportionately high or adverse effects on minority or low-income populations as the construction footprint is limited to unpopulated areas within TNF.

7.6 Compliance with Applicable Federal Environmental Regulations and Policies

Table 7.6-1 lists applicable federal environmental regulations and policies, brief descriptions of how these are addressed, and where in the document a full discussion can be found.

Table 7.6-1. Compliance with Applicable Federal Environmental Regulation and Policies

Federal Environmental Regulation or Policy	Compliance Summary	EIR/EIS Section with Detailed Discussion
Endangered Species Act (16 U.S.C. 1531–1534)	FPUD's proposed project is subject to a U.S. Forest Service SUP Amendment, therefore, a Section 7 federal nexus with the U.S. Fish and Wildlife Service (USFWS) exists for the proposed action.	4.4 Biological Resources
Bald Eagle Protection Act (16 U.S.C. 668a–668d)	Construction of the proposed project/action would remove vegetation potentially supporting nesting birds protected by the Bald Eagle Protection Act. Direct and indirect impacts to nesting birds would be potentially adverse, but mitigated.	4.4 Biological Resources
Fish and Wildlife Coordination Act	Active coordination with the U.S. Fish and Wildlife Service agency would occur throughout implementation of the proposed project/action.	4.4 Biological Resources
Clean Air Act, as amended (42 U.S.C. 7401 et seq.)	Emissions generated by timber harvest and other construction-related activities were evaluated and found to conform with Clean Air Act requirements.	4.3 Air Quality
Clean Water Act, as amended (33 U.S.C. 1251 et seq.)	Proposed project/action would be in compliance with the Clean Water Act. The project will obtain all applicable Clean	4.4 Biological Resources, 4.7 Hazards and Hazardous

Table 7.6-1. Compliance with Applicable Federal Environmental Regulation and Policies

Federal Environmental Regulation or Policy	Compliance Summary	EIR/EIS Section with Detailed Discussion
	Water Act permits and/or certifications prior to construction initiation.	Materials and 4.8 Hydrology and Water Quality
Executive Order 11990 – Protection of Wetlands	Impacts to wetlands are avoided to the greatest extent possible. Unavoidable impacts would be mitigated.	4.4 Biological Resources
National Historic Preservation Act	Proposed project/action will avoid to the extent possible and mitigate any unavoidable impacts to cultural resources.	4.5 Cultural Resources
Resource Conservation and Recovery Act, or Solid Waste Disposal Act (42 U.S.C. 6901 et seq.	Proposed project/action would comply with hazardous materials and non-hazardous solid waste management as outlined in the Resource Conservation and Recovery Act and the Solid Waste Disposal Act.	4.7 Hazards and Hazardous Materials
Comprehensive Environmental Response, Compensation, and Liability Act, as amended (42 U.S.C. 9601 et seq.)	Proposed project/action would be in compliance with the guidelines and requirements as set forth in the Comprehensive Environmental Response, Compensation, and Liability Act.	4.7 Hazards and Hazardous Materials
Toxic Substances Control Act, as amended (15 U.S.C. 2601 et seq.)	Proposed project/action would be in compliance with the guidelines and requirements as set forth in Toxic Substances Control Act.	4.7 Hazards and Hazardous Materials
Federal Wildland Fire Management Policy	Proposed project/action includes APMs which would reduce impacts related to wildland fires.	4.7 Hazards and Hazardous Materials
National Fire Plan	Proposed project/action would be in compliance with the National Fire Plan requirements with the development and implementation of a Construction Fire Prevention/ Protection Plan and an Operations and Maintenance Fire Prevention/Protection Plan.	4.7 Hazards and Hazardous Materials
National Forest Management Act and USDA Forest Service Management Plans	USFS authorization of the proposed SUP Amendment will require a determination of consistency of the proposed action with the National Forest Management Act and the Tahoe National Forest Land and Resources Management Plan.	4.2 Aesthetics and Visual Resources, 4.4 Biological Resources, 4.5 Cultural Resources, and 4.9 Land Use.
Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as amended (7 U.S.C. 136 et seq.)	Proposed project/action would be in compliance with the guidelines and requirements as set forth by FIFRA.	4.7 Hazards and Hazardous Materials and 4.8 Hydrology and Water Quality

Table 7.6-1. Compliance with Applicable Federal Environmental Regulation and Policies

Federal Environmental Regulation or Policy	Compliance Summary	EIR/EIS Section with Detailed Discussion
Safe Drinking Water Act (SDWA), as amended (42 U.S.C 300f et seq.)	Proposed project/action would be in compliance with the guidelines and requirements as set forth by SDWA.	4.8 Hydrology and Water Quality
Executive Order 13112 – Invasive Species	Construction and operation and maintenance of the proposed project could result in the introduction of invasive, non-native or noxious plant species. Direct and indirect impacts resulting from proposed project construction and management activities would be potentially adverse, but mitigated.	4.4 Biological Resources

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Kathleen Ports....Senior Biologist/Associate Technical Team Leader
Michael Preszler....Water Resources Program Manager
Mateo Rodriquez....Environmental Planner
Eric Stitt....Herpetologist
Jeffrey Swager....GIS Manager
Dave Thomas....Fisheries Biologist
Jeff Tupen....Biologist
Megan Webb....Archaeologist

8.2.2 Western Hydrologics

Jeffrey K. Meyer, P.E....Hydrological Engineer/Principal
Jared Emery....Hydrologic Modeling Specialist

CHAPTER 9 PUBLIC PARTICIPATION

This section describes the public participation program and scoping process employed for this DEIR/EIS. In keeping with CEQA and NEPA requirements, this process is intended to solicit agency and public input to help inform the environmental review process for the proposed project/action. FPUD and the EIR/EIS preparer administered the public notice and participation elements required under CEQA. The USFS administered a public notice and participation program in keeping with NEPA requirements. Although the public scoping requirements for CEQA and NEPA differ slightly, the requirements are intended to initiate the public scoping process for the EIR/EIS preparation; provide information about the proposed project/action; and solicit information (comments from affected public agencies, governmental representatives, tribal representatives, and the public) that will be helpful in the environmental review process.

9.1 Public Scoping Process

The Draft EIR/EIS scoping process consisted of five elements each of which is described in more detail subsequently in this section:

1. Publication of a NOP and NOI of a joint EIR/EIS.
2. Public scoping meeting conducted in Foresthill, California by FPUD on July 16, 2015.
3. Public scoping meeting conducted in Foresthill by USFS on September 19, 2016.
4. Public scoping meeting conducted in Rocklin, California on September 20, 2016.
5. Agency consultation (ongoing during DEIR/EIS preparation).
6. Tribal Consultation (ongoing during DEIR/EIS preparation).

For CEQA purposes, a NOP was circulated for public review on June 26, 2015 along with an Initial Study Checklist. During the 30-day public review period for the NOP, a public scoping meeting was held on July 16, 2015 in Foresthill, California, during which FPUD solicited public comments on the proposed project and, specifically, the scope and content of the upcoming environmental review. The NOP and Initial Study are included with this DEIR/EIS in Appendix N along with all written comments received during the CEQA public review period.

In keeping with NEPA requirements, two additional public scoping meetings were conducted by the USFS. Notice for these meetings was published in the Federal Register on September 2, 2016. The first meeting was held on September 19, 2016 at Foresthill Veterans Memorial Hall in Foresthill, California. The second was held on September 20, 2016 in Rocklin, California. After those meetings, 27 public scoping comments were submitted by agencies, groups, and individuals. Those comments and the Federal Register notice are included in Appendix O of this DEIR/EIS.

The scoping process provided an opportunity for general public and governmental agencies to provide comments on the scope and content of the DEIR/EIS. Written comments received during the scoping process were reviewed and considered by the CEQA and NEPA lead agencies and DEIR/EIS preparers. The following is a list of agencies, organizations, and individuals that submitted comments during the public scoping process for this DEIR/EIS:

9.1.1 Federal Agencies:

U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

9.1.2 Tribal Agencies

United Auburn Indian Community

9.1.3 State Agencies:

Central Valley Regional Water Quality Control Board
California Department of Water Resources: Division of Safety of Dams
California Department of Fish and Wildlife (comments submitted jointly with USFWS)

9.1.4 Organizations:

Friends of the River
Protect American River Canyons
Sierra Pacific Industries

9.1.5 Individuals:

Adrian Rodarte
R. Husmann
Jim Valentino
Daniel Messing
Kris Ingalls
Jeremy Van Wert
Ron Salter
Robert Young
Linda Littleton
Patty Wade
Robert Crawford
Susan Ward
Sharon Page
Richard and Angela Miller
Cathy Mader
Amanda Godon
K. Greene
Sharon Finning
Kathleen Knudsvig
Jeanne Crawford
Samantha Melk
Sharon Hernandez

9.2 Public Review of the Draft EIR/EIS

9.2.1 Distribution of the Draft EIR/EIS

The USFS and FPUD prepared the following list of agencies, organizations, and persons to whom this document or the notice of availability was sent directly. The notification included a summary of the proposed project/action and the EIR/EIS process. The distribution list includes:

- Federal Agencies with jurisdiction by law or special expertise, Tribal Governments, and any appropriate federal, state or local agency authorized to develop and enforce environmental standards. The USFS maintains a list of federal agencies and provides either a notice of where the document may be found on the web, a copy of the document on disk, or a printed copy depending on the agency's preference.
- The project applicant (FPUD in this case).
- Any person, organization, or agency requesting the entire DEIR/EIS.

The complete distribution list is included in Appendix P of this DEIR/EIS.

The DEIR/EIS and Appendices are available online for review and download at:

https://www.foresthillpud.com/reports.html and

https://www.fs.usda.gov/projects/tahoe/landmanagement/projects

Copies of the DEIR/EIS can be reviewed at the following libraries:

Foresthill Library
24580 Main Street
Foresthill, California

Placer County Library
350 Nevada St.
Auburn, California

9.2.2 *Opportunity to Comment*

The lead agencies are providing a 60-day comment period for the DEIR/EIS. Comments may be submitted in a variety of ways: (1) by U.S. mail, (2) by electronic mail (email), or (3) by attending and handing in written comments at the DEIR/EIS public informational meeting. This DEIR/EIS will be circulated for public review and comment for a minimum period of 60 days (specific circulation dates will be provided in the Notice of Availability (NOA) to be issued with this DEIR/EIS). During the public comment period, written comments from the general public as well as organizations and agencies on the DEIR/EIS's accuracy and completeness may be submitted to the lead agency at the contact information below.
A virtual public meeting will be held during the DEIR/EIS public review period to provide information on the proposed project/action and the DEIR/EIS review process and to address questions from the public. The meeting will be held on **July 12, 2012 from 6:00 to 8:00 pm**. Any interested parties can gain online or phone access to the meeting via the Zoom platform at the following link:

https://us02web.zoom.us/j/81044511928?pwd=WXd3VjlpREtGcCtwR0NEd2lCaVdRUT09

Meeting ID: 810 4451 1928
Passcode: 124808
Dial into the meeting via phone by your location:
+1 669 900 9128 US (San Jose)
+1 253 215 8782 US (Tacoma)
+1 346 248 7799 US (Houston)
+1 646 558 8656 US (New York)
+1 301 715 8592 US (Washington DC)
+1 312 626 6799 US (Chicago)
Meeting ID: 810 4451 1928
Passcode: 124808
Find your local number: https://us02web.zoom.us/u/kbJ8yd82Ia

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