Eldorado National Forest
Amador Ranger District

Aquatic Biological Assessment For the Foster Meadow Restoration Project

August 21, 2017

Project Location:
Amador County, California

T19N, R16E sections 1, 29, 30, 31 and 32; MDBM.

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EFFECTS DETERMINATIONS

Species	Status	Determination
Sierra Nevada Yellow-legged Frog *(Rana sierrae)*	Endangered	May affect and is likely to adversely affect
Sierra Nevada Yellow-legged Frog Critical Habitat	Designated	No Effect
Yosemite Toad (*Anaxyrus canorus*)	Threatened	No Effect
Yosemite Toad Critical Habitat	Designated	No effect
Delta smelt *(Hypomesus transpacificus)*	Threatened	No Effect
Steelhead *(Oncorhynchus mykiss)*	Threatened	No Effect

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I. INTRODUCTION

Section 7 of the Endangered Species Act (ESA) of 1973 as amended directs federal departments and agencies to ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any federally threatened, endangered, proposed, or candidate (TEPC) species or result in the destruction or adverse modification of their critical habitats. Directive 2672.4 in the Forest Service Manual (FSM), pursuant to legal requirements set forth for implementing Section 7 of the ESA (16 U.S.C. 1536 (c), requires a biological assessment (BA) be prepared for all proposed projects that may have effects upon TEPC species. The BA is designed to document potential impacts to TEPC species and provide guidance to determine whether formal consultation or conference is required with the United States Department of Interior Fish and Wildlife Service (USFWS).

Species Considered for Analysis

Threatened, Endangered, Proposed, or Candidate Species (TEPC)

Following Section 7(c) of the ESA, the USFWS Information for Planning and Conservation (IPaC) website (https://ecos.fws.gov/ipac/) was accessed on June 6, 2017 to obtain a current list of TEPC species that may be present in the vicinity of the project area and 2) to locate any proposed or designated critical habitat that may be present in the vicinity of the project area. The full IPaC report can be found in Appendix C. The scope of this BA is limited to the aquatic species identified in the IPaC report (Table 1).

Table 1 is included in this analysis document to aid in determining which TEPC species are to be considered for analysis. The potential for direct, indirect, and cumulative effects to individuals and critical habitat were considered. Species with potential for effects are indicated with a “Yes” and are analyzed in detail in the BA. Species with no potential for effects were not analyzed in detail following the generic rationale listed here:

1. No effect to downstream water quality or quantity.
2. Project does not occur within or affect suitable habitat.
3. Project does not occur within known or suspected species range.
4. Project does not affect identified management areas.
5. Project does not affect specific habitat features important to the species.
6. Project LOP or design avoids seasonal effects.

Table 1. Evaluation of potential for project effects to federally listed species

Federally Listed Species					
Species	**Status**	**Preferred Habitat**	**Project Potential for Effects**	**No**	**Yes**
Sierra Nevada yellow-legged frog (SNYLF) **(*Rana sierrae*)**	FE	Above 4,500 ft. High elevation low-gradient streams and small ponds that are either intermittent or perennial	**Project area within elevation range. Potential to impact species and suitable habitat; however, exclusion buffers and design criteria will minimize impacts to the species and suitable habitat. Species has never been detected in project area. Established predatory fish present, indicating low potential of SNYF presence.**		✓
Sierra Nevada yellow-legged frog (SNYLF) **(*Rana sierrae*)**	CH	Above 6,400 ft. High elevation low-gradient streams and small ponds that are either intermittent or perennial	Project area within elevation range. Designated critical habitat not within project area. No impacts to critical habitat is expected.	1,2,3	
Yosemite Toad (YOTO) **(*Anaxyrus canorus*)**	FT	Above 6,400 feet. Breeding habitat occurs in lakes, ponds and wetlands, south from the Blue Lakes region of Alpine County.	Species is listed on the IPAC list; however, species is outside of habitat range and suitable habitat for the project area. No impacts to individuals or suitable habitat is expected.	1,2,3	
Yosemite Toad (YOTO) **(*Anaxyrus canorus*)**	CH	Above 5000 feet. Breeding habitat occurs in lakes, ponds and wetlands, south from the Blue Lakes region of Alpine County. Designated Critical Habitat: Blue Lakes unit	Project area not in suspected species range. Designated critical habitat not within project area. No impacts to critical habitat is expected.	1,2,3	
Delta smelt **(*Hypomesus transpacificus*)**	FT	Sacramento-San Joaquin delta	Endemic to the Sacramento-San Joaquin delta and Suisun Bay; spawns in the sloughs and channels of the upper delta or north of Suisan Bay. No populations on Eldorado National Forest land	1,2,3	
Steelhead **(*Oncorhynchus mykiss*)** **Northern California DPS**	FT	Central Valley delta and up rivers to man-made and natural barriers	Anadromous populations below impassable barriers in California coastal river basins; occurs from Redwood Creek south to, but not including, the Russian River.No populations on Eldorado National Forest land.	1,2,3	
FE = Federal Endangered; FT = Federal Threatened; P = Proposed Federal listing; CH = Critical Habitat					

II. CONSULTATION TO DATE

The Pacific Southwest Region (R5) of the Forest Service and the USFWS completed consultation on activities that R5 Forests implement programmatically. The programmatic "Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged frog, and Threatened Yosemite Toad" (ref # FFO8ESMFOO-2014-F-0557) was signed into effect on December 19, 2014 (USDI 2014). The Foster Meadow Restoration has been designed to be consistent with all of the Conservation Measures and Terms and Conditions described in the programmatic Biological Opinion (USDI 2014).

Coordination and informal consultation with the USFWS has been initiated to discuss biological concerns related to the Foster Meadow Restoration Project. A summary of the coordination and consultation to date is provided below.

1. The USFWS's IPaC web site (https://ecos.fws.gov/ipac/) was accessed on June 6, 2017 to request a list of, threatened, endangered, candidate and proposed species and proposed or designated critical habitat that may occur in the vicinity of the project. This list is incorporated in this report as Appendix C.

2. Personnel from the USFWS Endangered Species Program conducted a site visit with Forest Service Biologist on 9/20/2017 to review the project.

III. CURRENT MANAGEMENT DIRECTION

Current Forest Service policy (FSM 2670 [USDA 1990]) is to manage National Forest System lands so that the special protection measures provided under the Endangered Species Act will no longer be necessary, and threatened or endangered species will become de-listed. The Sierra Nevada Forest Plan Amendment Environmental Impact Statement (EIS) (USDA 2004) provides direction for the management of threatened and endangered species. The Aquatic Management Strategy in the EIS directs that Forests utilize administrative measures to protect and restore aquatic, riparian, and meadow ecosystems and provide for the viability of native animal species associated with these ecosystems. The following Riparian Conservation Objectives pertain to aquatic endangered, threatened, and sensitive species in the Foster Meadow Restoration Area:

- Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including instream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species.

- Ensure a renewable supply of large down logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the RCA.

- Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species.

- Preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas.

- Identify and implement restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species.

The Record of Decision for the Sierra Nevada Forest Plan Amendment Final Supplemental. Environmental Impact Statement (USDA Forest Service 2004b) directs the Agency to conduct a Riparian Conservation

Objectives analysis for projects occurring within Riparian Conservation. Areas (RCAs). This analysis can be found in Panther ERP RCO Consistency Report as part of the project record.

The Foster Meadow Restoration will implement management direction provided by the Eldorado National Forest Plan, as amended by the Sierra Nevada Forest Plan Amendment (SNFPA 2004).

Forest Service Manual (FSM);
Forest Service Manual (FSM) 2672.42 (USDA Forest Service 1990) directs that a biological assessment (BA) be prepared for all proposed projects that may have effects upon US Fish and Wildlife Service (USFWS) listed threatened, endangered, and proposed species. In addition, FSM 2670.32 (USDA Forest Service 1990) directs that a biological assessment (BA) be prepared to determine the effects of proposed projects on USDA Forest Service Region 5 designated threatened, endangered and sensitive species.

Eldorado National Forest Land Management Plan (USDA 1989);
IV. Management Direction, B. Goals and Objectives, 1. Goals, Wildlife and Fish:

- Maintain and enhance populations of Threatened and Endangered wildlife and plant species and maintain viable populations of Sensitive Species.
- Provide a diverse habitat for all species, including harvestable game fish and wildlife.

IV. Management Direction, F. Forest Practices, Element C – Fish and Wildlife:

- Maintain and enhance plant and animal communities (including Threatened and Endangered species) in accordance with federal law, regional guidelines, and Forest needs.

IV. Management Direction, G. Standards and Guidelines, 1. Forest-wide Standards and Guidelines, General Direction, Fish and Wildlife:

- Maintain and enhance habitat for fish and wildlife species.
- Provide cover and forage for wildlife species depended on meadows and the adjacent forest edge. Maintain the integrity of the meadow ecosystem.
- Utilize administrative measures to protect and improve Threatened, Endangered, Rare, and Sensitive wildlife species.

Species Specific Direction

The USFWS, in consultation with the Forest Service Region 5, issued a programmatic biological opinion (BO) on December 19, 2014 that provides guidance to avoid or minimize the effects of Forest Service projects on three federally listed species, the Sierra Nevada yellow-legged frog, the Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad (USDI 2014). The programmatic BO covers nine National Forests in the Sierra Nevada including the Eldorado and relates to nine broad categories of projects: vegetation management, road and trail maintenance, maintenance of developed recreation sites and administrative infrastructure, special use permits, rangeland management, biological resource management, invasive species management, mining, and lands (real estate). The detailed conservation measures in the programmatic BO are based on Forest Service Standards and Guides documented in the SNFPA Final Supplemental Environmental Impact Statement Record of Decision (USDA Forest Service, 2004b) and the Region 5 Best Management Practices (USDA Forest Service 2011).

Critical Habitat

The U.S. Fish and Wildlife Service designated Critical Habitat for the SNYLF on August 26, 2016 (USFWS 2016). This final ruling codifies the proposed Critical Habitat and designated approximately 1,082,147 acres as Critical Habitat for the SNYLF. Subunit 2E (the Crystal Range unit) occupies approximately 71,138 acres and 2F (East Amador Unit) occupies 92,943acres on the Eldorado National Forest. The Foster Meadow project boundary is 0.5 miles from the East Amador Unit, but does not fall within designated critical habitat.

No critical habitat is located within the Foster Meadow project boundary and will not be impacted from the proposed actions. Therefore, no further analysis and discussion of critical habitat will occur.

IV. DESCRIPTION OF PROPOSED ACTIONS

The Amador Ranger District on the Eldorado National Forest in Eldorado County, California has developed a set of proposed actions designed to restore hydrologic function within Foster Meadow. This Biological Assessment analyzes proposed actions for implementation of a meadow restoration project using the plug-n-pond method. The Foster Meadow Restoration Project encompasses **27** acres of meadow along the Middle Fork Cosumnes River on lands administered by the USDA- Forest Service, Amador Ranger District, Eldorado National Forest. Foster Meadow was identified as a target meadow for restoration in the Amador Calaveras Consensus Group (ACCG) Collaborative Forest Landscape Restoration Project (December, 2006). The ACCG CFLR Project is a multi-stakeholder process which includes the National Forests as a stakeholder and works to collaboratively address common natural resource concerns over a large geographic area.

The project area is located in Amador County approximately 40 miles east of Jackson, CA, 1-mile north of State Highway 88, in the vicinity of the Peddler Hill maintenance station; location **T19N, R16E sections 1, 29, 30, 31 and 32; MDBM.**

Plumas Corporation, a meadow restoration group in Plumas County, conducted data collection and design services for this meadow project. Plumas Corporation design work has been funded under a grant contract with the National Fish & Wildlife Foundation.

Proposed Action

The Amador Ranger District, El Dorado National Forest and project stakeholders are seeking to restore the natural hydrologic functions of the Foster Meadow system to provide improved water quality, timing of flows and enhanced aquatic and terrestrial habitats onsite and downstream. Attendant with that objective is to remove barriers to aquatic organism passage in this reach of the Middle Fork Cosumnes River. The Foster Meadow Restoration Project proposes to meet these objectives by filling gullies within the meadow using local fill taken from meadow margins and terraces, and installing an aquatic organism passage structure at Foster Meadow road (9N14) crossing. This will require excavation and placement of approximately 22,533 cubic yards in seven (7) total plugs to eliminate the existing gullies as a conduit for flow. The design of the proposed action applies the principles of fluvial geomorphology and the science of landscapes formed by flowing water, to understand the processes that have governed the development of the meadow through the Holocene period (last 10,000 years). This method also helps determine the possible mechanisms that have led to channel degradation and loss of floodplain connection/ecosystem function. This approach combines quantitative data with qualitative observations and historical overviews of land uses, both onsite and watershed-wide.

Table 2 summarizes the action items proposed to restore the hydrologic functions of Foster Meadow utilizing a modified pond-and-plug restoration technique. The design for Foster Meadow is a near-complete gully fill ("plugs"), with the majority of fill material generated from terrace grading and a smaller amount coming from four small borrow ponds along the margins of the meadow. The purpose of the fill material is to raise/restore the base elevation of surface water flow in the meadow. Generally, surface flows will be re-directed to remnant channel(s) elsewhere in the meadow. Surface flows would only cross the "plugs" during floods. Specific features of the project design are discussed in greater detail in the Meadow Component section, below.

Table 2. Action items of the Foster Meadow Restoration Project

Item Number	Action
1	Fill and stabilize the gullied channel of the Middle Fork Cosumnes River in Foster Meadow through (Figures 2 through 4): • Excavation of approximately 22,500 yd^3 of material from 4 small borrow pits along the margins of the meadow and 4 terrace cuts areas in the meadow. This material will be used to construct the plugs. • Construction of 7 plugs in the meadow to achieve the partial or complete filling or approximately 4,400 feet of channels. The plugs will total approximately 3.1 acres in size. • Construction of 9 in-channel rock riffles in the meadow just down-gradient of the plugs and ponds. It is expected that rock for the riffles will be imported from the Tragedy Pit. Motorized equipment in the meadow would be used in order to accomplish this action item. Approximately 20.72 acres are wet meadow floodplain, 2.20 acres are intermittent and perennial channels, and 4.51 acres are upland.
2	Improve aquatic organism passage at Forest Highway 54 crossing by: • Placing rock/soil/vegetation in the channel and floodplain to raise the elevation and eliminate current 'waterfall' at the main culvert. Rock will be imported from Tragedy Pit for this component. • Replacing the existing culvert and adding at least three culverts at floodplain elevation. Motorized equipment would be used in order to accomplish this action item.
3	Plant riparian vegetation throughout portions of the meadow in those areas that are currently deficient in riparian vegetation. Sod and willow transplants would be excavated and placed using heavy equipment. Native seeding, planting of container stock, and willow plantings would be done by hand.

The 27-acre Foster Meadow Project area can be delineated into several reaches of work separated by reaches that are still functional. The functional reaches are at risk from headcuts moving upstream from the degraded reaches. Figure 1 (Vicinity and Project Area Map) shows the relative location of the treatment reaches under the proposed action. At the upstream end of the project, the culvert at the Forest Highway (FH) 54/Foster Meadow Road (9N14) crossing is a fish barrier and a risk for failure. Downstream of the road crossing there are three (3) distinct meadow sections: Pocket 1, Pocket 2, and Main Meadow.

Meadow Restoration Component

Ultimately, the design concept for degraded meadows in the Foster Meadow project areas is to implement near-complete gully fill. The fill material would be excavated from four (4) small borrow ponds along the margins of the meadow and grading four (4) areas of in-meadow terrace down to the design floodplain elevation. This design significantly reduces risk associated with frequent overland flow over plugs and into ponds. Given meadow slopes of 1% -3% and a gully near the center of the meadow, the more traditional pond and plug technique would have some risk.

The principal function of the borrow ponds is to provide native fill material for plug construction. Since the ponds will fill with groundwater and maintain ponded water year-round, habitat features and diversity are incorporated into their construction. These include varying water depths, islands, peninsulas, basking logs, etc., which are determined as fill needs are met. Topsoil is removed and stockpiled adjacent to the plug fill zone to top dress the completed plug. Meadow vegetation such as sod mats and willow wads would be salvaged by excavating and stockpiling the material to use for revegetation of the completed project.

All plugs and borrow ponds are sited and configured to accommodate surface and subsurface through flow as well as adjacent hillslope-generated surface and groundwater inflows. Plugs are constructed with wheel

loader(s) to provide wheel compaction of the fill. The compaction levels are intended to match the porosity/transmissivity of the native meadow soils. This allows moisture to move freely within the plug soil profile and support erosion resistant meadow vegetation for long term durability as well as preventing preferential pathways for subsurface flows either in the plug or the native material.

Design features specific to the Pocket Meadows #1 and #2 are as follows (Figure 2). All gully fill for Pocket Meadow #1 will be generated from the one borrow pond excavated into the timbered terrace to the south. Approximately 11 trees (red fir/lodgepole) will be incorporated into the plug fill surfaces and the remnant channel for velocity reduction. This borrow pond will provide an off-channel, in-forest, perennial surface water habitat feature. The majority of the earth fill for the gully in Pocket Meadow #2 will be generated from cutting terrace features down to floodplain elevation. This will provide more meadow area and floodplain extent, but not open water habitat. One borrow pond will be excavated into the forested terrace to the north. This will be an off-channel, in-forest, perennial surface water habitat feature. Approximately 4 red fir trees would be removed and used for habitat in the pond.

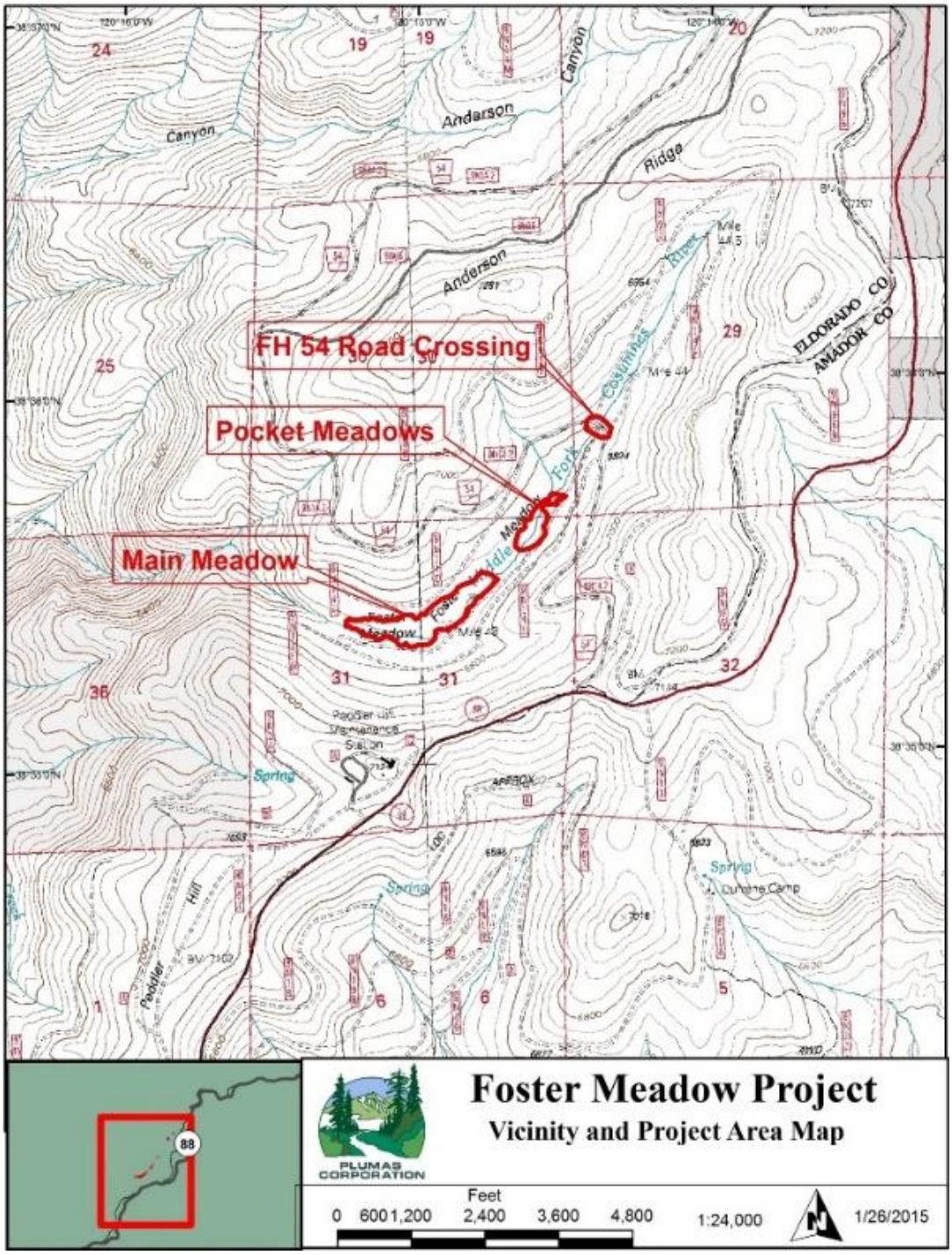

Figure 1. Foster Meadow Restoration Project Treatment Reaches.

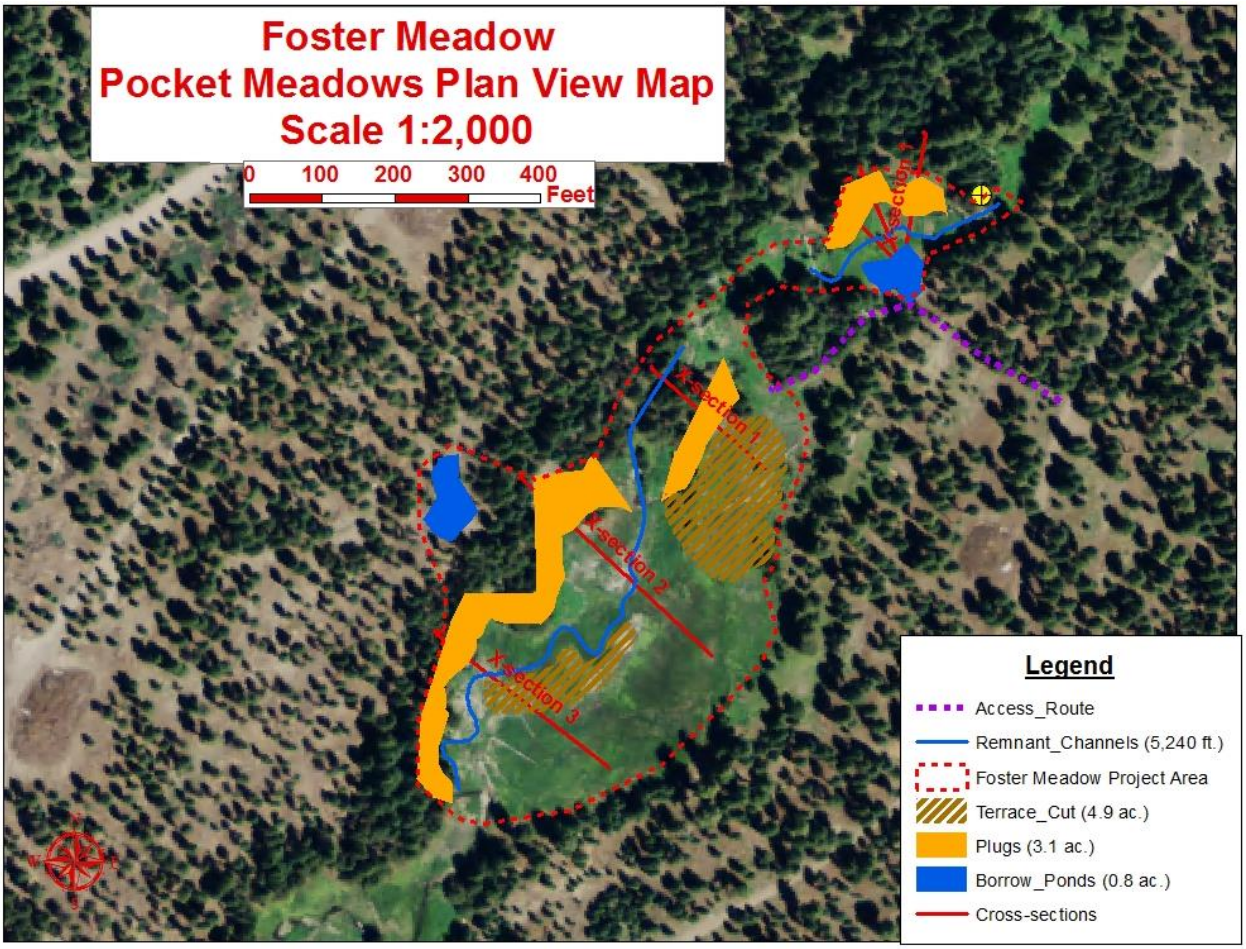

Figure 2. Foster Pocket Meadows Restoration Design Schematic.

Design features specific to the Main Meadow include having the bulk of the gully fill being generated from terrace cut (Figure 3). This will reduce shear stresses on the remnant channel and reverse the xeric trend on approximately 5 acres of wet meadow that are currently transitioning to upland vegetation. The lower end of the project will require using 9 rock riffles to raise the base level of the channel, in lieu of gully fill, in its existing alignment. The installation of riffles in the existing channel will raise the base level at the downstream end of the project, allowing a seamless transition of the new meadow gradient to the existing channel at the downstream end of the project. All access for equipment and materials will be on existing open or closed roads and recent timber harvest skid trails and landings.

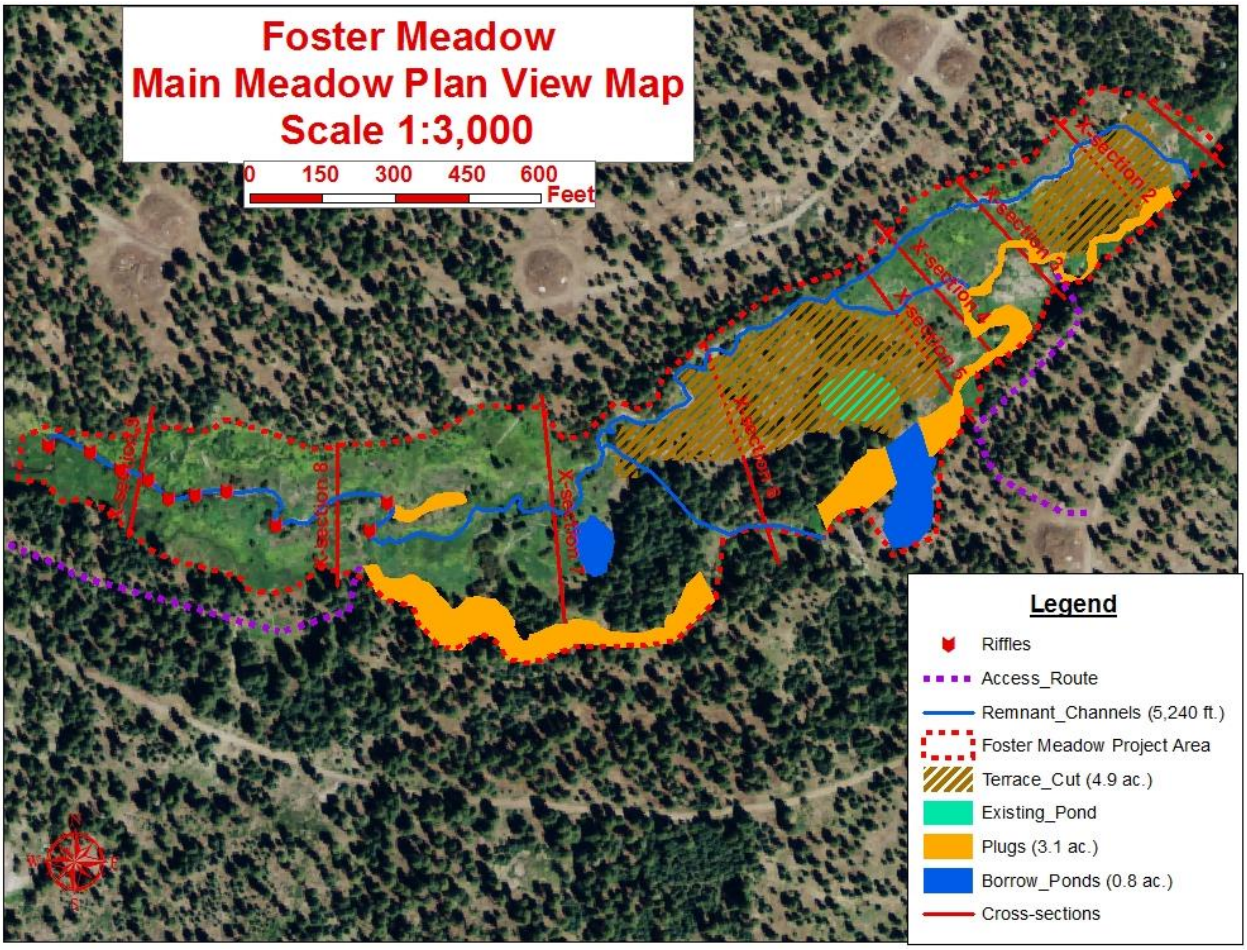

Figure 3. Foster Meadow Main Meadow Restoration Design Schematic.

Aquatic Passage Component

The second phase of the project will be construction of the AOP. The AOP will reduce the backwater effect of high flow from a single culvert with additional culverts set at floodplain elevation. The floodplain culverts would be installed in the road crossing with invert elevations approximately 1 foot above the invert elevation of the channel culvert. Ideally, no less than 3 additional culverts should be installed. These floodplain culverts would be 'squash' type, and set at as close an interval practicable across the floodplain. The AOP also includes the construction of a valley grade structure (VGS). The VGS will provide a durable, aquatic organism-passable channel/floodplain transition reach (125 feet long) between the road crossing elevation and downstream channel elevation, which would eliminate the current "waterfall" at the culvert outlet. Because the project is a forest highway road crossing, the AOP and VGS will be engineered. The VGS will require approximately 500 yds^3 of 2.0-foot minus rock and soil, sourced from the USFS Tragedy Pit (approximately 8 miles from the Project site). A water truck will be required on-site for dust suppression during rock transport. One excavator (36" bucket)

and four rock trucks will be required to load and transport rock to the Project site, and placement of rock at the VGS will require the use of a second excavator.

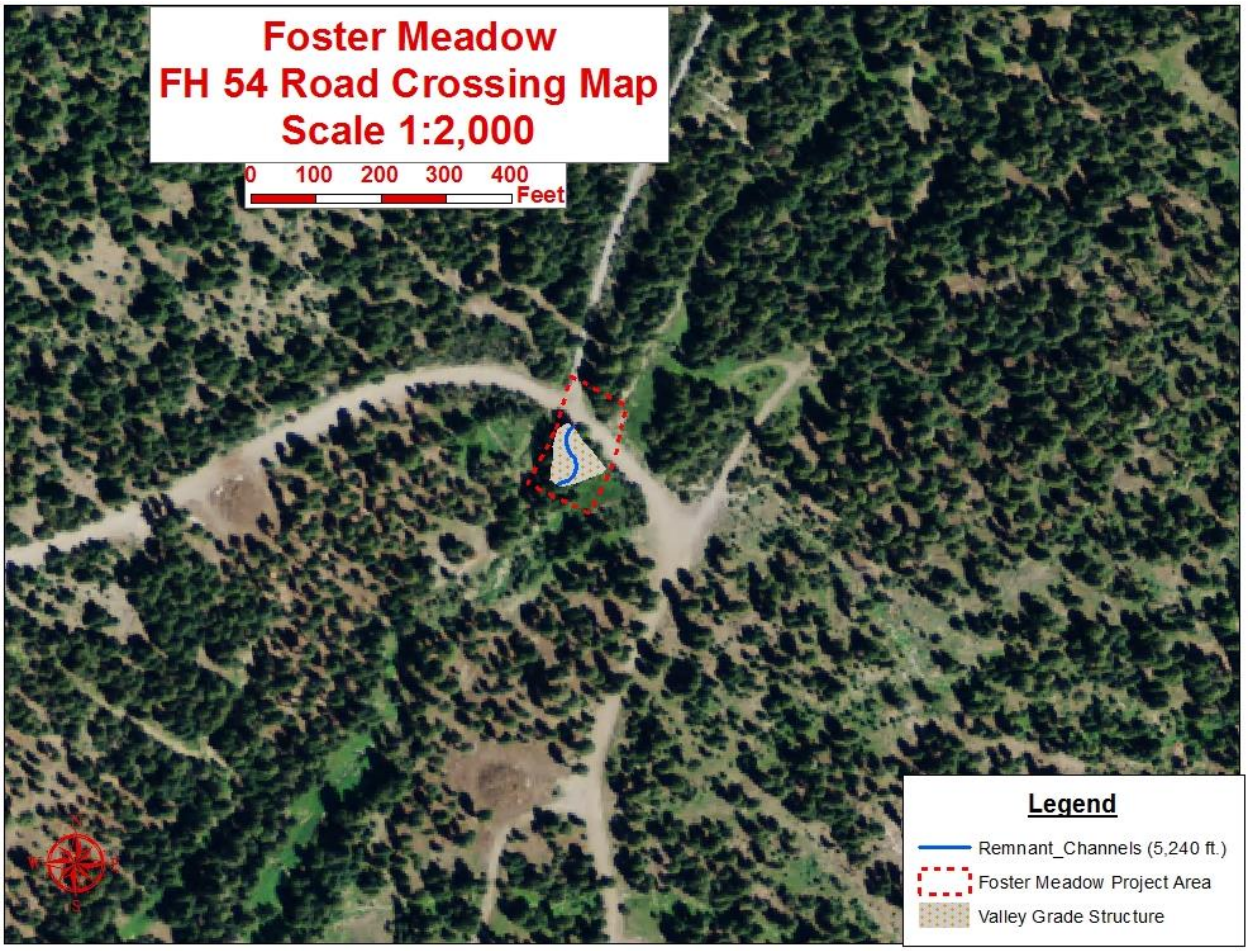

Figure 4. Foster Meadow FH 54/Foster Meadow road (9N14) crossing aquatic passage structure.

Revegetation

Upon completion, all plug surfaces are ripped to a depth of 12" to facilitate rainfall infiltration, dressed with the recovered topsoil, and seeded with native seed. Sod mats, willow wads, and other meadow vegetation from fill and borrow sites will be transplanted to plug edges, terraces and key locations on the remnant channel. Willow stakes will be planted next to stream channels and disturbed areas following construction in the fall to reduce immediate post-project vulnerability to erosion. In the spring following project construction, disturbed areas in the meadow and on graded terraces will be seeded using native seeds collected from Foster Meadow. In key locations during spring seeding, there will also be supplementary willow staking and hand-planting of container stock from locally-sourced material. Container stock will consist of rhizomatous species that can quickly colonize the terrace cuts and plugs. ENF staff will monitor survival of willow cuttings and percent cover of seeded areas for three years following construction. Successful revegetation will be achieved with 70% survival of willow cuttings and 50% cover of seeded areas. Any areas that do not meet the survival or cover area would be replanted.

Project Monitoring

The Foster Meadow Restoration Project is expected to benefit multiple resources by restoring the hydrological and ecological functions of the meadow floodplain system. The purpose of project monitoring is to measure project effectiveness on water quality, timing of flows, and enhancement of wildlife and aquatic habitats. Monitoring parameters and methods that would be utilized are outlined in Table 3.

Table 3. Project Effectiveness Monitoring of the Proposed Action

Monitoring Parameter	Method	Responsible Party
Water Temperature	Water temperature data loggers installed above and below project area May-Sept*	Plumas Corporation**
Aquatic Habitat	California Rapid Assessment Method (CRAM) and Forest Service Stream Condition Inventory (SCI) conducted once pre- and post-project	Plumas Corporation (CRAM); USFS-ENF (SCI)
Groundwater	4 groundwater wells (approximately 6 to 12 ft in depth) made of 3/4" galvanized perforated pipe, measured monthly*	Plumas Corporation**
Stream Flow	Staff gage and pressure transducer installed at the bottom of project area; monthly* manual calibration flow measurements; quarterly* collection of oxygen isotope samples and measurement of electrical conductivity (EC) from inflows, springs, and wells	Plumas Corporation**
Sediment Supply	Channel cross-section surveys; CRAM and SCI	Plumas Corporation (CRAM); USFS-ENF (SCI)
Meadow Vegetation	All revegetation areas would be monitored for three years following project completion. Monitoring will quantify willow survival and percent cover of native meadow vegetation.	USFS-ENF

**As access permits*
***Plumas Corporation has secured funding for monitoring through 2019, and is working with the Cosumnes Coalition so that this group can continue monitoring outside of the existing funding window.*

Design Criteria

The following mitigation measures and coordinating requirements are incorporated into the Proposed Action:

Air Quality - Soil-disturbing activities that generate fugitive dust PM10 emissions that are visible beyond the project property lines would be controlled through the implementation of the following measures as needed:

- Construction fill and cut areas would be watered as necessary to prevent visible emissions from extending more than 100 feet beyond the active work areas unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
- Disturbed surface areas would be watered in sufficient quantity and frequency to suppress dust and maintain a stabilized surface.
- At least 80 percent of all inactive disturbed surface areas would be watered on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible due to excessive slope or other safety conditions.
- All unpaved roads used for any vehicular traffic would be watered at least once per every two hours of active operations.
- A water truck will be available on site. Water will be drafted from Lower Bear River Reservoir, approximately one-quarter mile from the project area. See the aquatic resources design criteria for aquatic resource protection measures to be implemented during drafting activities.

Range – There are no active range allotments in the project area.

Heritage – Management measures, other than avoidance, are not required to protect heritage resources from project activities (Foster Meadow Restoration Design Cultural Resource Report, R2016-05-03-10015, 9/09/2016). Known historic properties will be flagged for avoidance prior to project implementation. This does not fully eliminate the chance of discovering unrecorded sites or subsurface remains within the project

boundary. If project ground disturbance should expose a cultural deposit, disturbance activities will be suspended until a qualified archaeologist can examine the area, evaluate the material, and adequate protection measures are incorporated. In the event that human remains are uncovered during project activity, project managers must stop work and contact El Dorado National Forest. If the remains are determined to be of Native American origin, both the Native American Heritage Commission and any identified descendants shall be notified (Health and Safety Code 7050.5, Public Resources Code Section 5097.94 and 5097.98).

Terrestrial Wildlife – Should project activities take place during the nesting/reproductive periods for these species (February 15-September 15), surveys of the project adjacent CA spotted owl, and northern goshawk Protected Activity Centers (PACs) would be conducted in an attempt to determine nesting status and species presence. Based on the survey results efforts will be made to minimize potential disturbance impacts based on recommendations of the project biologist.

Aquatic – There are no LOPs proposed for aquatic and riparian species. The proposed activities meet the standards and guidelines for aquatic and riparian dependent species. Additional design criteria for botanical species, hydrology, and soils provide additional protection measures for aquatic resources.

- The project activities will conform to the conservation measures and terms and conditions requirements in the Biological Opinion (USFWS 12/19/2014), and subsequent letter which appends this and other projects to that document (USFWS 02/08/2018).
- Visual Encounter surveys will be conducted for Sierra Nevada yellow-legged frogs by a qualified forest service biologist within 24 hours of construction at the Foster Meadow Road 9N14 stream crossing and within the entire Foster Meadow project area.
- If the Sierra Nevada yellow-legged frog are found within the project area during project implementation, their safety shall be assessed by qualified personnel and dealt with according to the Terms and Conditions described in the 2014 Programmatic Biological Opinion issued by the US Fish and Wildlife Service.
- Existing waterholes and other aquatic sites including ponds, lakes and streams used for water drafting would be surveyed for Aquatic TES species and flow levels taken prior to use. In the event TES species are found to occur at drafting sites; sites will not be used and future surveys would be conducted by an aquatic specialist to determine presence of potential populations. Dufrene Pond, a nearby manmade pond designated for drafting, contains a small breeding population of SNYLF and will **not** be used for drafting water for dust abatement or other construction needs.
- The use of low velocity water pumps and screening devices for pumps (per S&G 110) will be utilized during drafting for project treatments to prevent mortality of eggs, tadpoles, juveniles, and adult SNYLF. A drafting box measuring 2 feet on all sides covered in a maximum of 0.25 inch screening is required.

Hydrology – Construction activities in Foster Meadow would occur during the time of year when the flow of the Middle Fork Cosumnes River is at its lowest. This typically occurs between August 1 and October 30. Required permits would be obtained including, at the least, the 404 permit from the U.S. Army Corps of Engineers and the 401 Permit from the Central Regional Valley Water Board. Additionally, construction would be supervised on-site by at least one person who has worked on at least one previous pond and plug project. Watershed mitigation measures also would include the use of Best Management Practices (BMPs) to protect water quality. The following management requirements from the U.S. Forest Service Region 5 *Water Quality Management Handbook* (USDA 2011) would be applied to prevent impacts to on-site and downstream water quality during implementation:

- **BMP 1.18 Meadow Protection –** The objective of this BMP is to avoid damage to ground cover, soil, and the hydrologic function of meadows.
- **BMP 2.5 Water Source Development and Utilization -** The objective of this BMP applies to dust abatement and other management activities requiring the use of water while protecting and maintaining water quality. Water may be needed to assist in construction of structures. Approved drafting sites designated by the district hydrologist would be utilized.

- **BMP 2.8 Stream Crossings** – This BMP minimizes water, aquatic and riparian resource disturbances and related sediment production when constructing, reconstructing, or maintaining temporary and permanent water crossings.
- **BMP 2.11 Equipment Refueling and Servicing -** This BMP prevents pollutants such as fuels, lubricants, bitumens and other harmful materials from being discharged into or near rivers, streams and impoundments, or into natural or man-made channels. Servicing and refueling activities would be located a minimum of 100 feet away from the meadow edge. Site specific locations for equipment fueling would be identified prior to or during project implementation. A non-porous mat or equivalent would be used for the refueling at the staging area.
- **BMP 2.13 Erosion Control Plan -** The requirements of this BMP are met through: 1) the Design Features for hydrology and soil resources that are in the proposed action, 2) the erosion control measures and monitoring that will be contained in the 404 permit (U.S. Army Corps of Engineers) and 401 Permit (State Water Quality Control Board, and 3) other applicable BMP's in the 2011 WQMH as listed in this section.
- **BMP 5.3 Tractor Operation Limitation in Wetlands & Meadows –** The objective of this BMP is to limit turbidity and sediment production resulting from compaction, rutting, run-off concentration, and subsequent erosion by excluding the use of mechanical equipment in wetlands and meadows except for the purpose of restoring wetland meadow and meadow function.
- **BMP 7.1 Watershed Restoration -** The objective of this BMP is to repair degraded watershed conditions and improve water quality and soil stability. Restoration measures described herein reflect state-of-the-art techniques and have been chosen to custom fit the unique hydrologic, physical, biological and climatic characteristics of Foster Meadow. The proposed design for restoration of Foster Meadow restores the meadow condition and hydrologic function to the watershed as described in this document.
- **BMP 7.4 Forest and Hazardous Substance Spill Prevention Control and Countermeasure (SPCC) Plan -** The objective of this BMP is to prevent contamination of waters from accidental spills. BMP 7.4 would be implemented when a total oil product at a site exceeds 1,320 gallons or any single container exceeds 660 gallons. The forest has a SPCC spill plan designed to guide the emergency response to spills during construction.
- **BMP 7.6 Water Quality Monitoring -** The objective of this BMP is to collect representative water data to determine base line conditions for comparison to established water quality standards, which are related to beneficial uses for that particular watershed. This BMP is implemented through establishment of Stream Condition Inventory (SCI) site prior to project implementation to establish a pre-project condition, and through the requirements of the 401 Water Quality Certification that will be obtained for the project..

  BMP 7.8 Cumulative Off-site Watershed Effect - This BMP serves to protect the identified beneficial uses of water from the combined effects of multiple management activities. Beneficial uses and effects have been documented in the Hydrology Report. Impacts of past and present activities including impacts of the proposed future management activities were considered in the evaluation of the analysis area, and summarized in the attached hydrology report.

Botany - Management of botanical resources, special habitats, and noxious weeds would follow the standards and guidelines in the Sierra Nevada Forest Amendment Record of Decision (SNFPA ROD 2004). Specific design criteria and protection measures for the Foster Meadow project include:

- Any new occurrences of sensitive plants identified within the project area would be flagged and avoided when necessary.
- A watchlist species, *Botrychium simplex*, occurs within Foster meadow. All known occurrences will be flagged for avoidance during project implementation. Should any new threatened, endangered, sensitive (TES) or watchlist species be located during the proposed project, available steps will be taken to evaluate and mitigate effects.
- Fens within Foster Meadow would be flagged prior to project implementation for avoidance. Crews conducting repair work at Foster Meadow would be informed of the location of the fen.

- All off-road equipment would be cleaned to insure it is free of soil, seeds, vegetative matter or other debris that could contain seeds before entering the project area.
- Infestations of invasive plants that are discovered during project implementation would be documented and locations mapped. New sites would be reported to the Forest botanist. Rock for riffle construction would be weed free.
- Onsite sand, gravel, rock, or organic matter would be used where possible.
- Any seed used for restoration or erosion control would be from a locally collected source (ENF, Seed, Mulch and Fertilizer Prescription, 2000).

Soil Resources - Standard mitigation measures have been developed under consultation with soil scientists and engineers as an integral component of meadow floodplain restoration. These mitigation measures have been monitored and refined based on previous projects of this type.

- Construction would occur during the low flow period, and coincides with the most favorable moisture conditions to the depth of borrow site excavation. The subsurface soil material excavated is used to plug the adjacent channel incision. This material requires enough moisture to allow for compaction to background condition of the adjacent native soil. The purpose of compaction is to preclude subsidence of the plug material during saturated conditions. Subsidence can lead to the initiation of erosion on the plugs. Utilization of onsite fill material allows the best match of soil types at the least cost. Material too wet to efficiently transport and work would be avoided. The subsurface (compacted) portions of the plug are constructed using the 'layer lift' method, which entails spreading the material in a thin veneer over the general area of the plug with each delivered bucket load of material. This repeated action, with occasional re-cutting of the working surface allows for efficient wheel compaction without supplemental equipment.
- Topsoil, and any organic material, in the area of excavation would be removed to a depth of approximately one foot and stockpiled adjacent to the plugs. When the plugs have been constructed to the design elevation, the plug surface would be cross-ripped to a depth of 12" to restore a deep infiltration capacity. Stockpiled topsoil with associated organics and native seed bank would be spread across the plug with a low ground-pressure track loader. The final pass with equipment is to dress and roughen the topsoil surface for microclimate roughness and to fully incorporate the topsoil with the surface of the subsoil.
- Equipment travel into the project area would be restricted to existing open or closed roads and recent timber harvest skid trails and landings. During construction, routes from the borrow sites to plug areas with compaction resulting from construction would be scarified perpendicular to expected surface water flow and dressed with scattered organic material.
- Staging areas and temporary haul routes used during the project would be minimized to minimize soil compaction and disturbance to the greatest extent possible. After construction, they would be sub-soiled, perpendicular to surface flow directions, to the full depth of compaction to restore soil porosity. Areas with residual meadow sod would only be lightly scarified to preserve sod integrity. The emphasis is on the least soil disruption while loosening the soil. Extensive mixing or plowing can have a negative effect on soil microorganisms. This technique has been successful in loosening the soil, restoring soil porosity, providing a high infiltration capacity, and thereby reducing cumulative watershed effects.
- The project will require re-vegetation. Access routes are expected to have residual sod, and thus not require seeding, but may receive mulching and possibly seed, depending on the condition of the sod. Revegetation will consist of the following measures:
    - All desirable plant material that would be excavated or buried in plugs, such as sod mats and willow wads, will be removed and transplanted to plugs, terraces and at key locations in the remnant channel. Locations of transplants are prioritized according to need for maximum soil protection in bare areas and areas of potentially high stress.
    - During the spring and summer following project completion, locally collected seeds would be dispersed into terrace cuts, plugs, and other heavily disturbed areas.
    - Container stock from locally-sourced material would be hand planted in the spring and summer in key locations. Container stock will consist of rhizomatous species that can quickly colonize the terrace cuts and plugs.

- All revegetation areas would be monitored for three years following project completion. Successful revegetation would consist of 70% survival of willow cuttings and transplanted seedlings. Seeded areas would have at least 50% cover of native vegetation. Any areas that do not meet the survival or cover criteria would be reseeded or replanted.

- Erosion control would be accomplished using locally collected materials (wood chips, duff, pine needles, etc.). Straw would not be used.
- Meadow restoration projects include rest from grazing in disturbed areas for up to three years after construction in order to allow the newly planted vegetation to become established. Currently, the project area is not grazed and the allotment will not be re-opened, so this mitigation requires no further action.

Fire/Fuels Management - While the project area is located in a meadow and outside of state identified very fire hazard severity zones, portions of the meadow are expected to be dry, with a risk for wildfire associated with the use of any internal combustion engine. A trash pump and/or water truck will be on site to assist with vegetation transplants and dust control, as well as to reduce the risk of wildfire. In addition, equipment would be re-fueled and serviced at the designated staging area, which is outside of the riparian area and meadow. No fuel would be stored on-site. In the event of an accidental spill, hazmat materials for quick on-site clean-up would be kept at the project sites during all construction activities, and in each piece of equipment.

V. EXISTING ENVIRONMENT – SPECIES ACCOUNTS

Sierra Nevada Yellow-legged Frog (SNYLF)

Rana sierrae

The Sierra Nevada yellow-legged frog inhabits high elevation lakes, ponds, marshes, meadows, tarns, and streams. They are highly aquatic at all life stages and are more commonly associated with deep water habitats (greater than 2 meters or 6.5 feet) that lack introduced fish. While the frog populations show a positive correlation with deep water habitats (Knapp 2005), both tadpoles and adults are most commonly found along open, gently sloping shorelines that provide shallow waters of only 5 to 8 centimeters (2 to 3 inches) in depth (Mullally and Cunningham 1956, Jennings and Hayes 1994, Federal Register 2013).

At lower elevations within their historical range, the frog is associated with rocky streams and wet meadows surrounded by coniferous forests (Zweifel 1955). Streams utilized by adults vary from high gradients with numerous pools, rapids, and small waterfalls, to streams with low gradients and slow flows, marshy edges, and sod banks (Zweifel 1955). Aquatic substrates vary from bedrock to fine sand, rubble rock fragments, and boulders (Zweifel 1955). The SNYLF is rarely found exclusively in small or ephemeral streams which typically lack sufficient depth and hydroperiods for adequate refuge and overwintering habitat (Jennings and Hayes 1994). However, these small streams at lower elevations locally provide suitable habitat for post-metamorphic life stages, especially when they maintain permanent water.

The timing of breeding varies annually, but occurs shortly after snowmelt and typically between May and July. Females lay clutches varying from 15 to 350 eggs per mass (Vredenburg et al. 2005) attached to rocks, gravel, and vegetation or under banks (Pope 1999). Eggs hatch in about 2.5 to 3 weeks (Pope 1999). Tadpoles often require 2 to 4 years to reach metamorphosis (Bradford et al. 1993, Knapp and Matthews 2000) depending on local climate conditions and site-specific variables. In high mountain lakes, adult frogs typically move only a few hundred meters (Pope 1999), but single-season distances of up to 3.3 kilometers (2.05 miles) have been recorded along streams (Wengert 2008). It should be noted however, that there is some concern that the frogs studied by Wengert (2008) were actually Foothill Yellow-Legged Frogs (FYLF). Adults may move between selected breeding, feeding, and overwintering habitats during the course of the year. Though typically found

near water, occasional overland movements by adults of over 66 meters (217 feet) have been recorded (Pope 1999). The farthest reported movement distance from water is 400 meters (1,300 feet) (USDI 2013a).

SNYLF has been found throughout the Eldorado National Forest at elevations between 5,187 feet and 8,986 feet in records dating as far back as 1939. Surveys have recorded detections in streams, streams or potholes in meadows, and lakes. The highest frequencies of SNYLF occurrences on the ENF occur in high elevation lake habitats. The Foster Meadow Restoration lies within the known elevation range of the SNYLF on the ENF.

Unlike other declining amphibian populations around the world, direct habitat modification does not seem to be a primary factor associated with the decline of SNYLF (Federal Register 2013). In most cases, SNYLF occur at high elevations in the Sierra Nevada, which have not had the types or extent of large-scale habitat conversion and physical disturbance that have occurred at lower elevations (Federal Register 2013).

Other human activities, however, have played a role in the modification of habitat and the curtailment of the species range. The aggregation of these threats has degraded and fragmented habitats range wide to a significant extent. These threats include: recreational activities, fish introductions, dams and water diversions, livestock grazing, timber management, road construction and maintenance, and fire management activities. Such activities have degraded habitat in ways that have reduced their capacity to sustain viable populations and have fragmented and isolated populations from each other.

One habitat feature that is documented to have a significant detrimental impact to SNYLF populations is the presence of trout from current and historical stocking for the maintenance of a sport fishery. To further angling success and opportunity, trout stocking programs in the Sierra Nevada started in the late 19th century (Federal Register 2013). This anthropogenic activity has community-level effects and constitutes the primary detrimental impact to SNYLF habitat and species viability. Prior to extensive trout planting programs, almost all streams and lakes in the Sierra Nevada at elevations above 1,800 m (6,000 feet) were fishless.

The significant role introduced trout play in the decline of the SNYLF has been well-established through repeated observation of the fact that nonnative fishes and frogs rarely coexist, and it is known that introduced trout can and do prey on all frog life stages (Federal Register 2013). It is estimated that 63 percent of lakes larger than 1 ha (2.5 ac) in the Sierra Nevada contain one or more nonnative trout species, and greater than 60 percent of streams contain nonnative trout (Federal Register 2013). In some areas trout bearing waters comprise greater than 90 percent of total water body surface area (Federal Register 2013). The multiple-year tadpole stage of SNYLF requires submersion in the aquatic habitat year round until metamorphosis. Moreover, all life stages are highly aquatic, increasing the frog's susceptibility to predation by trout (where they co-occur) throughout its lifespan. Overwinter mortality due to predation is especially significant because, when water bodies ice over in winter, tadpoles are forced from shallow margins of lakes and ponds into deeper unfrozen water where they are more vulnerable to predation; fish encounters in such areas increase, while refuge is less available. The predation of SNYLF by fishes observed in the early 20th century by Grinnell and Storer (1924) and the documented declines of the 1970s (Federal Register 2013) were not the beginning of the SNYLF decline, but rather the end of a long decline that started soon after fish introductions to the Sierra Nevada began in the mid-1800s (Federal Register 20132013). In 2004, Vredenburg et al. (Federal Register 2013) concluded that introduced trout are effective predators on SNYLF tadpoles and suggested that the introduction of trout is the most likely reason for the decline of the SNYLF complex. This threat is a significant, prevalent risk to SNYLF range-wide, and it will persist into the future.

Activities that alter the terrestrial environment, such as road and trail construction may impact amphibian populations in the Sierra Nevada (Federal Register 2013). These impacts are understandably in proportion to the magnitude of the alteration to the environment, and are more pronounced in areas with less stringent mitigation measures. Road construction and timber harvest were likely of greater significance historically, and may have acted to reduce the species' range prior to the more recent detailed studies and systematic monitoring that have quantified and documented these losses.

Chytridiomycosis is an infectious disease of amphibians caused by the fungus *Batrachochytrium dendrobatidis* ("*Bd*"; Longcore et al. 1999). The extraordinary virulence of *Bd* has caused the decline or extinction of hundreds of amphibian species around the world during the last several decades (Skerratt et al. 2007) and hundreds more are considered at risk as *Bd* spreads into new areas. SNYLF is particularly susceptible to *Bd*, and the spread of this pathogen across California during the past 30 years has caused the loss of hundreds of frog populations from remaining fishless habitats in the Sierra Nevada (Rachowicz et al. 2006, Vredenburg et al. 2010). *Bd* has been detected in populations found in the Lake Tahoe basin.

Existing Habitat Conditions

General Habitat Description

Information about the existing environment was gathered mainly from the hydrology design report for this project. The information gathered for species and their habitat was compiled from available literature. A forest wildlife biologist and the district hydrologist visited the project area in order to field verify the condition of the watersheds and aquatic habitat. The United States Geological Survey (USGS) mapping designation of perennial, intermittent, and ephemeral streams were used to determine the amount of stream habitat present within the project area. The presence and extent of meadow habitat was determined using the US Forest Service's Natural Resource Manager GIS database.

The Foster Meadow project area encompasses **27** total acres including the meadow complex and aquatic organism passage site (Figures 2, 3, and 4) within one watershed (HUC level 14) near the headwaters of the Middle Fork Cosumnes River. The project boundary includes Foster Meadow and a 1.3 mile stretch of the Middle Fork Cosumnes River. Elevation across the project area ranges from 6,600 to 7,200 feet and terrestrial habitats include a mosaic of vegetation types including sierra mixed conifer, and riparian corridors and meadows. Topography is gentle to moderate and the most common vegetation types in the project area include mixed conifer fir, red fir, white fir and lodegpole pine forests and wet meadows.

Foster Meadow and Middle Fork Cosumnes within the project area have been negatively impacted from past management practices, including heavy grazing (no longer occurring), recreational activities, past timber activities and poorly designed stream crossings at forest road 9N14. As a result, meadow and stream surface and subsurface flow paths have been altered, flow has become concentrated and channelized with some gullying occurring. Incisions have formed in many locations. Although grazing allotments in the area have been vacant since the late 1990s, the activities described above have converted many of the historically hydric or wet meadows into more mesic (moist) or xeric (dry) conditions.

Recreation

Recreation has played a moderate key role in the degradation to Foster Meadow as this area is used for hiking, dispersed camping, wildlife viewing, hunting and fishing, and snow mobile use. The most extensive recreation uses that occurs in this area is dispersed camping, hunting and snowmobile use. Snowmobile use occurs during winter when the meadow is not exposed, therefore, it likely hasn't played a significant role in meadow degradation.

Timber Harvest

No private timber harvest has occurred or is proposed within the project boundary (CA Dept. of Forestry 2017). Timber harvest on Sierra Pacific land has occurred 0.2 miles west of Foster meadow, however, timber harvest has likely not had any impact to the proposed project area as harvest has occurred downstream of the meadow. Some conifer removal, and linear piling of woody debris has occurred from the forest service within the past 10 years. The wood piles have been a benefit for aquatics creating terrestrial refugia along the stream and in the meadow.

The geographic scope of the direct, indirect, and cumulative effects analysis for this project falls within the following HUC 14th field watershed: **Upper Middle Fork Cosumnes River**. The streams in the project area vary from perennial to ephemeral. The larger perennial stream displays classic riffle-run-pool characteristics, has a moderate riparian zone (predominantly mixed conifer as understory), and cobble, boulder, and sand dominated substrates (Middle Fork Cosumnes River). A more complete description of the aquatic features within the project boundary can be found in Table 4.

Table 4. Description of Aquatic Features

Feature	Characteristics
Foster Meadow	▪ Meadow complex with the Middle Fork Cosumnes River flowing through it. The Stream is characterized by moderate to high spring flows, low to moderate (2-4%) gradients, that have low grade riffle habitat and is dominated by large mid-channel and trench pooling area, limited riparian vegetation and moderate sediment loads. ▪ Headwater sections are likely intermittent and are known to go dry in some years or be reduced to very light flow in other years. ▪ **Non-native Eastern Brook Trout are present throughout the meadow decreasing potential for SNYLF presence.**
9N14 Road Crossing	▪ Currently an 24" cylindrical pipe across the Middle Fork Cosumnes River located on the 9N14 road ▪ Deposition build up has occurred the on upstream side and created migration barrier for aquatic organisms. ▪ Deposition and sediment build up is likely a result of an undersized culvert.

Habitat Relative to the Sierra Nevada Yellow-legged Frog

The Foster Meadow Restoration Project boundary contains **71** acres of suitable (non-critical) SNYLF habitat (Table 5; Appendix A Figure 1). The term *suitable habitat (defined below)* will be used throughout the analysis of effects to collectively describe the potential effects to habitat. For the purposes of analysis, suitable habitat is defined as any perennial or intermittent stream, meadow, or lake habitats occurring 4,500 feet and above. Also included in the definition of suitable habitat is all land within a 25 m (82 ft.) buffer surrounding the aforementioned aquatic habitat. This habitat buffer is assumed to provide suitable terrestrial habitat. Since the SNYLF is highly aquatic, the potential for impacts beyond the 25m (82 ft.) buffer of suitable habitat is very low and would likely result in negligible effects to the species.

The Foster Meadow Restoration proposed actions directly overlap with **27** acres of suitable SNYLF habitat. No critical habitat occurs within the proposed project area, therefore, the proposed actions will have no effect on critical habitat; therefore, no further analysis of critical habitat will be discussed.

Potential habitat suitability for SNYLF is low to moderate within the Middle Fork Cosumnes River watershed and Foster Meadow, primarily due to an established brook trout population. The presence of trout decreases the likelihood of SNYLF breeding success and utilization. Egg masses and larvae would be unlikely to survive

with adult trout sharing the same deep water habitats. While breeding potential is low, adult frogs would still be able to use the meadow for dispersal, feeding and basking. Stream size, carrying capacity, and the moderate numbers of fish appear to limit fish growth in the project area and larger adult frogs may be able to escape predation due to gape limitations.

Table 5. Potential suitable (non-critical) SNYLF habitat within the project boundary (Appendix A Figure 1) for Foster Meadow.

Habitat Type	Acres	Miles
Suitable Habitat		
Perennial Stream	19	1.59
Intermittent Stream	18.5	0.39
Meadow	33	
Lake/Pond	0.4	
Total	**71**	**1.98**

Existing surveys and sightings

US Forest Service and California Department of Fish and Wildlife (CDFW) personnel conducted seven Visual Encounter Surveys (VES) within potential SNYLF habitat in the project boundary in the field seasons of 1993 to 2016 (Table 6, Appendix A Figure 2). No surveys have detected **SNYLF within the project boundary or the proposed action area.**

Since SNYLF presence has not been established in the project area, this habitat is classified as unknown utilization. An additional 17 surveys, focused on aquatics in general, have been conducted within 1-mile of the project boundary and are reported here to describe instances of SNYLF occupation in close proximity to the project. The nearest SNYLF was documented 0.59 miles to the south of Foster Meadow on the south side of Highway 88 along an unnamed location near Dufrene Spring.

Survey and species occurrence records are based on data in the USFS corporate Natural Resource Information System (NRIS 2016) geodatabase in the Aquatic Surveys (AqS) application and Wildlife (WL) application unless otherwise stated.

Table 6. Aquatic surveys with the potential to locate Sierra Nevada yellow-legged frogs that have occurred within the project boundary and within one mile.

Surveys within Project Boundary				
Date	**Survey Type**	**Miles From Project**	**Description**	**Detections***
6/28/1993	Amphibian	Within project boundary	Foster Meadow	None
7/7/1993	Amphibian	Within project boundary	Foster Meadow	None
8/8/2007	BMI (Benthic Macroinvertebrate)	Within Project Boundary	Middle Fork Cosumnes	None
7/2/2013	AOP	Within Project Boundary	Middle Fork Cosumnes	BT
8/8/2013	AOP	Within Project Boundary	Middle Fork Cosumnes	BT
6/1/2016	Temperature	Within Project Boundary	Middle Fork Cosumnes	None
6/1/2016	Amphibian	Within Project Boundary	Middle Fork Cosumnes	None

Surveys within 1 mile of the Foster Meadow Restoration Project				
Date	**Type**	**Miles From Project**	**Description**	
7/7/1993	Amphibian	0.76	Tributary near Little Bear River	None
8/9/1999	Amphibian	0.86	Little Bear River	SNYLF
5/30/2000	Temperature	0.67	Dufrene Pond	None
9/13/2000	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
6/25/2000	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
6/13/2001	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
6/13/2001	Amphibian	0.59	Unnamed location near Dufrene Spring	SNYLF
6/14/2001	Temperature	0.67	Dufrene Pond	None
8/20/2001	Amphibian	0.67	Unnamed location near Dufrene Pond	None
5/16/2002	Amphibian	0.63	Little Bear River	SNYLF
5/16/2002	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
5/30/2002	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
7/22/2002	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
7/26/2002	Amphibian	0.67	Unnamed location near Dufrene Pond	SNYLF
6/9/2003	Amphibians/ Lake Ponds	0.64	Unnamed Lake/ Pond	None
9/21/2004	Amphibian	0.67	Unnamed pond	None
8/20/2007	Spring Inventory	0.67	Unnamed pond	None
9/13/2013	Amphibian	0.67	Dufrene Pond	None

*SNYLF = Sierra Nevada Yellow-legged frog, BT = Brook Trout

VI. EFFECTS OF PROPOSED ACTIONS

SIERRA NEVADA YELLOW-LEGGED FROG

Direct and Indirect Effects

Restoration actions in the project include similar types of activities in several different meadows and stream systems. The effects analysis to SNYLF and their habitat are discussed by activity type as activities can be categorized based on the similarity of effects. The risk potential increases the closer an activity occurs to occupied habitat. For this reason, the amount (e.g., size) and type of actions proposed within habitat type, known occupancy, duration and magnitude of activity were used as indicators of risk and in formulating the effects determinations.

Of the **71** acres of suitable SNYLF habitat within the project boundary, approximately **17** acres (24%; Table 7) of potential SNYLF habitat would be directly impacted by ground disturbing activities. However, because the project is expected to improve hydrologic conditions across the entire project area, another 10 acres are expected to see a beneficial indirect impact. The combined acreage of suitable habitat likely to be effected by the proposed project, including direct ground disturbing impacts and indirect impacts, equals a total of **27** acres.

In order to determine a relative measure of the direct and indirect effects to SNYLF and their habitats, the amount of suitable habitat potentially affected by project activities was quantified. The amount of SNYLF suitable habitat that may be directly and indirectly impacted by the proposed project activities are summarized

in Table 7. The acreages of suitable SNYLF habitat that may be affected were calculated in Geographical Information System (GIS) by:

1) Overlaying the suitable SNYLF GIS habitat shapefile layer over the Eldorado national forest base map and using the calculate geometry function to determine the area of habitat that overlaps with the project actions.

Table 7. Summary of suitable SNYLF habitat **directly** affected by project proposed actions.

Action	Location	Action #	Suitable Habitat (Acres)
Excavation of material from 4 borrow ponds and 4 terrace cuts	Foster Meadow	1	5.5
Construction of 7 plugs in meadow to fill 4,400 feet of channel	Foster Meadow	1	2.77
Construction of 9 in-channel rock riffles in the meadow	Foster Meadow	1	2
Aquatic Organism Passage – replacement of existing culvert, adding 3 additional culverts at flood plain elevation **Placing rock/ vegetation in channel and flood plain to raise elevation**	Forest Road 9N14– Middle Fork Cosumnes River	2	0.6
Plant riparian vegetation throughout meadow devoid of vegetation via mechanical and hand crews.	Foster Meadow	3	4.9
Use of Access Roads	Foster Meadow	All actions	1.23
Total			**17**

Table 8. Summary of effects of proposed action to SNYLF

Treatment	Direct Effects	Indirect Effects
In-channel treatments: pond and plug, riffles, and grade control	Mortality from crushing, disturbance or injury from mechanical equipment in channel and meadow habitat.	• Short-term increase (from disturbance), and long term decrease (eliminated bank erosion and head-cuts), in downstream sedimentation. • Enhanced habitat for brook trout, which degrades frog habitat suitability. • Improved breeding and overwintering habitat for frogs in wet meadow complex habitat.
Planting riparian vegetation	Mortality, injury or disturbance from mechanical equipment and hand crews trampling within meadow and near edge of creek.	• Increase in riparian cover for habitat and refugia. • Decreased erosion and downstream sedimentation from bare areas. • Improvement of incised and eroding banks along channel.
Aquatic Organism Passage Implementation	Mortality, injury or disturbance from road equipment, excavation equipment.	• Decreased sedimentation in channel habitats from road-related erosion. • Decrease in sediment deposition within channel and upstream of culvert. • Decreased potential for mortality due to recreational vehicle traffic

Effects of Proposed Action

Pond and plug implementation

In-channel construction work would consist of the pond and plug, nine rock riffles, culvert reconstruction and the rock grade control structure at the culvert site. Material would be taken from within the meadow as well as imported from the tragedy rock quarry. The rocky material required for the riffles and the grade control structure would be obtained from the road re-contour and modification. The native meadow soil material for the plugs would be obtained by excavating the "borrow ponds." Conifers (red fir/ lodgepole pine) would be removed within or adjacent to Foster meadow to be used in the plug-fill surfaces and placed in the remnant channel to reduce river velocity. Four of the conifers would also be placed in borrow ponds for aquatic habitat providing refugia for organisms. The excavator would be used to extract the conifers from the ground.

All of the in-channel work would occur entirely within SNYLF suitable habitat, with the use of an excavator and a bull dozer. Work at these locations would have very small footprints and direct effects would be restricted to work sites and access routes.

Direct Effects – Effects to species

The pond-and-plug work will occur directly in the meadow and along the river with the use of an excavator and a bull dozer to dig up the borrow ponds and remove conifers. Mechanical equipment will travel on existing access roads as well as within the meadow and along the river.

Mechanical operations within suitable habitat may cause a risk to SNYLF through disturbance, injury or mortality (e.g., crushing from equipment). Direct effects to individuals would be short-term occurring during operations when equipment and personnel are in close proximity and within suitable habitat.

Because SNYLF have a high affinity for aquatic habitat (Brown et al., 2014), they would likely retreat toward any wetted channels during construction. Any escape / retreat behavior caused by project activities would be considered a physical disturbance to the frog. Repeated disturbances may cause frogs to avoid an area, become temporarily displaced from preferred habitat or reduce the frog's fitness by interrupting foraging, basking, or other typical behaviors. Such behavior could make the frog more susceptible to predation as it is flushed from its cover or basking habitat. Prolonged behavioral disturbances or displacement from its habitat may detrimentally impact an individual's fitness (Rodriguez-Prieto and Fernandez-Juricic, 2005). However, after a period of time it is assumed that an individual would resume pre-disturbance behavior

Mechanical operations would be restricted to late summer or early fall, when meadows are dry or streams low flowing and SNYLF are expected to be closely associated with water (Brown et al., 2014), which in this case may increase the potential to impact to frogs. The impacts would increase because frogs in or in proximity to the channel could be injured or killed if buried by fill used to create the plugs. Using mechanical equipment within SNYLF habitat and the associated burial of stream channels that, at present, represent suitable habitat will increase the potential for impacts to the species. However, the likelihood of injury or take is still relatively low because 1) no SNYLF have ever been detected in the project area and 2) the presence of predatory trout in the stream means a SNYLF breeding population is unlikely to be present. Design criteria and BMPs (refer to page 14-15), including a requirement to survey for the presence of frogs prior to implementation, have been included in the aquatic and hydrologic project design to further reduce the potential for direct effects to SNYLF.

Indirect Effects –Effects to habitat

Meadow restoration work would involve ground disturbing activities and, as a consequence, may cause a temporary increase in sediment delivery to Middle Fork Cosumnes River and Foster Meadow which can indirectly affect both habitat suitability and individual frogs.

Operating mechanical equipment in riparian or meadow habitats can result in a reduction of riparian and meadow vegetation, cause compaction of soil, and decrease infiltration. Structures that provide cover may be damaged or crushed and large woody debris may be displaced. Herbaceous cover treated from mechanical operations would recover faster than woody vegetation.

An increase in sediment delivery to suitable aquatic habitat may cause a reduction in deep water habitat, fill the spaces between and under refuge features, and bury/cover foraging substrates. A reduction in depth of deep water habitats may affect individuals by making them more susceptible to annual freezing and potentially reduce the overwintering success of tadpoles and post-metamorphic adults. If the reduction in depth persists over multiple years, population abundance could be affected because reproductive success would be reduce or eliminated. A reduction in the quantity of interstitial spaces and underwater cover may lead to an increase in predation risk. As sedimentation begins to cover tadpole foraging substrates, the opportunities for feeding are reduced, leading to a retardation of tadpole growth and development. Any delay in time to metamorphosis increases the risk of predation on tadpoles and susceptibility to the chytrid fungus. A reduction in food may result in a smaller size at metamorphosis. These effects could impact recruitment rates and ultimately population size and abundance over longer periods of time. Damage to or the loss of cover (riparian vegetation, burrows, logs, tree roots, and stumps) could reduce the habitat suitability in the project area and negatively impact the SNYLF's ability to thermo-regulate, forage, or hide from predation.

Any indirect negative effects to individuals or suitable habitat resulting from pond excavating should be minimal because 1) most disturbances would be short-term, occurring only during the actual implementation period and 2) the proposed project is designed to improve the watershed condition class.

Furthermore, criteria have been included in the project design that would limit indirect effects. Implementation of an erosion control plan, designed to address the potential for sediment production at each work site, would work to limit the sediment-related negative effects of ground disturbance. Revegetation of disturbed areas would limit sediment production after the initial construction phase is completed. The proposed actions are designed to restore hydrologic connectivity and function within meadows which would have long-term beneficial effects to meadow water storage capacity, sediment filtration, water quality, and meadow vegetation. Therefore, once completed this work is expected to reduce future sediment delivery and improve stream water quality which would indirectly produce a net positive benefit for SNYLF.

Construction of in-channel riffle structures

Installation of 9 in-channel riffle rock structures within Middle Fork Cosumnes River will be done through use of an excavator. Rock will be picked up and placed in the stream using the excavator to construct the riffles structures. The mechanical equipment would need to travel through the meadow and along the river bank. The long-term results of this action will be beneficial for erosion control, hydraulic control and reduction of sedimentation from small head-cuts and incisions. The combined riffles will be approximately 0.08 stream miles/ 0.6 acres and located downstream of the Foster Meadow road 9N14 stream crossing.

Direct Effects – Effects to Species

There is potential for SNYLF individuals if present to be crushed or injured by the excavator driving through the meadow and adjacent to the river, but SNYLF are very quick and are usually able to hop away from disturbance. Disturbance from work activities may flush any frogs from the riffle construction site, either downstream or into cover away from activities. However, the behavior of individual frogs is not universal and actual flushing distance is unknown for any specific individual. Frogs that jump and then freeze and rely on concealment to avoid perceived risks would be more likely to be injured or killed during implementation.

SNYLF may also be disturbed from all of the activity in the channel causing them to retreat from aquatic cover or basking sites making them more susceptible to predation or changes in metabolic rates. Any disturbance would be temporary and would not cause a lasting effect on SNYLF behavior or persistence in the area. The lack of historic detections and the presence of predatory fish further reduce the likelihood of SNYLF being present in that area.

Indirect Effects – Effects to Habitat

Constructing the in-channel riffles is a restorative action, and should result in flow velocity reduction, bank stabilization and subsequently reduce the potential for future erosion, incision and sedimentation. Shorter-term impacts from this action could include localized increases in turbidity and minor scale ground disturbance, however, the long-term benefits of this action outweigh the short-term negative impacts. Construction of rock riffles will help move the system toward desired conditions by decreasing water velocity and reducing bank erosion and channel incision. These changes should improve water quality and stream conditions in the Middle Fork Cosumnes River and Foster Meadow and lead to an improvement in available aquatic habitat.

Planting Riparian Vegetation – Revegetation in Meadow

Revegetation would be accomplished by mechanical equipment and hand-crews. Planting would occur in existing denuded areas as well as on the plugs, stream banks, the terrace area and anywhere within the Foster meadow area vegetation is depleted or denuded. Planting would occur in the fall, immediately after the ponds and plugs have been constructed in the project area. Only locally available native species would be used, and would be specified by the project botanist.

Direct Effects – Effects to Species

Revegetation of riparian vegetation would be accomplished by the excavator and hand-crew for transplanting sods and willows and could lead to a disturbance, displacement, injury or mortality to frogs. There is potential for SNYLF individuals if present to be crushed or injured by the excavator driving through the meadow and adjacent to the stream channel, but SNYLF are very quick and are usually able to hop away from disturbance. Disturbance from work activities may flush any frogs from areas of re-vegetation, either downstream or into cover away from activities. However, the behavior of individual frogs is not universal and actual flushing distance is unknown for any specific individual. Frogs that jump and then freeze and rely on concealment to avoid perceived risks would be more likely to be injured or killed during implementation.

Any disturbance would be temporary and would not cause a lasting effect on SNYLF behavior or persistence in the area. Based on a lack of known detections and presence of predatory fish, likelihood of SNYLF being present in that area is highly unlikely. Disturbance impacts would be minimal and short-term as this action is designed to help restore meadow and riparian vegetation.

Indirect Effects – Effects to Habitat

Revegetation in the meadow and along the river bank is designed to restore denuded areas and reduce bank instability. Long term effects of improved vegetative cover and vigor are expected to be beneficial by decreasing sedimentation to aquatic habitats and providing cover.

Aquatic Organism Passage and Valley Grade Structure

The design for aquatic organism passage at the forest road 9N14 crossing would use a rock/soil fill with vegetation transplants to raise both the channel and floodplain to match the existing culvert invert/floodplain elevation. This would require approximately 500 yds^3 of 2.0-foot minus rock and soil. To reduce the backwater effect of high flow in a single culvert, additional culverts set at floodplain elevation would be installed in the road crossing with invert elevations 1 foot above the invert elevation of the channel culvert. These floodplain culverts would be 'squash' type, 30-inch diameter set at as close an interval practicable across the floodplain. Ideally, no less than 3 additional culverts should be installed. All road prism/culvert modification work should be closely coordinated with, or engineered by, the Forest engineering staff. A valley-grade structure will also be constructed where the culverts are to minimize impacts from high flows, sediment runoff and maintain gradient.

Direct Effects – Effects to Species

Aquatic organism passage (AOP) construction and implementation within Middle Fork Cosumnes River has the potential to directly impact individual SNYLF. Culvert installation would involve an excavator ripping up the road and digging up the current culvert in place. Once dug up, the present culvert will be removed and the new ones (at least 3 squash pipes) will be put in place. Fill and rock material from the borrow pits and tragedy rock quarry would then be placed around the culvert as a catch basin. SNYLF present at or near this construction site could be effected during implementation and the placement of fill/ rock material. Any SNYLF life stages may be crushed if they are present within stream crossings when the culverts are being placed.

Design criteria and BMPs (refer to page 14-15) requiring work in meadow habitats and in-channel to be conducted during the dry season (late summer to early fall), when SNYLF are not expected to be present in dry stream environments, would reduce the potential for direct effects. The culvert replacement site is located along the headwaters of the Middle fork Cosumnes River and is known to dry up in drought years. However, the outlet pool at the culvert can provide habitat for SNYLF if water is present. During wet years, a pool is present at the outlet of the culvert. A lack of stream flow is not enough to deter frogs from being present, as isolated pools can provide resting and foraging habitat. The likelihood of SNYLF in the area has been determined to be low not only because of the timing of the project, but because of a lack of sightings during protocol surveys and the established presence of predatory brook trout. The actions associated with improving stream crossing, would be short lived and disturbance to SNYLF would be temporary and minor in scale.

Indirect effects – Effects to Habitat

Potential indirect effects to SNYLF from in-channel and aquatic organism passage work would come from short-term increased sediment delivery to Middle Fork Cosumnes and Foster Meadow.

AOP work has the potential to increase erosion, water turbidity, and sediment delivery during excavation and fill placement. Although impacts from project activities should be short-term, sediment delivery to downstream habitats should be increased after the new culverts are in place. Proposed actions associated with this site are designed to improve drainage, improve hydrologic connectivity, reduce deposition build up on the upstream side of the crossing, and improve organism passage along the stream corridor. Culvert reconstruction will improve the gradient at the stream crossing which should facilitate the movement of aquatic organisms and open suitable habitat upstream in the drainage. Culvert improvement benefits likely outweigh any potential short-term impacts of in-channel sediment and disturbance. Standard BMPs and design criteria would be enforced to minimize any negative impacts during culvert implementation.

Cumulative Effects

Under the Endangered Species Act, cumulative effects are "those effects of future State or private activities, not involving Federal activities that are reasonably certain to occur within the action area of the Federal action

subject to consultation". This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Land disturbances that have been documented in the past include: road construction, reconstruction, and maintenance of culverts, cattle grazing, dispersed camping, developed hiking trails and over-snow trails.

Future state and private actions (timber, road work or construction) at this point are not expected to occur within the project boundary.

Natural changes that that are expected to occur outside of human actions include the effects of future climate conditions. Present and future climate conditions for the Foster Meadow project area are taken from the state of California's Cal-Adapt website (http://cal-adapt.org/) and associated data sources (IPCC, 2014). Many factors affect local climate conditions and it is difficult to accurately predict future conditions in an area as small as the cumulative effects assessment area for the Foster Meadow Restoration Project. Nevertheless, the region of California containing the Foster Meadow area is expected to see an average annual temperature increase, relative to a 1961-1991 baseline, from 6.1° to 6.7° Celsius by the end of the century depending on the carbon dioxide emissions scenario (low emissions level or high emissions level). Average April snow water equivalency values are expected to decrease in the region by 16% depending on emission scenario. Overall the region will likely be warmer and drier during important periods in the SNYLF life cycle.

Proposed actions associated with the Foster Meadow Restoration Project are designed to restore hydrologic function and improve aquatic within the meadow complex. As a result, the project would be expected to have positive effects of future climate conditions on SNYLFs and their habitat. For example, restoring dispersed flow patterns and correcting channel incision would increase infiltration, groundwater elevation, and groundwater storability in Foster Meadow. More importantly, the project actions are designed to correct poor conditions within meadows and associated infrastructure, the culvert crossing at Foster Meadow Road 9N14. The long-term impact would likely promote the persistence of aquatic habitat later into the summer in the meadow complex. These actions would likely reduce the severity of: sediment/ deposition build up at the stream crossing, sediment delivery and erosion into the stream resulting in pool depth decrease (decrease in SNYLF breeding potential), habitat degradation of stream banks causing stream widening and loss of meadow habitat, and the lowering of the water table resulting in riparian and meadow habitat loss.

An enhancement in meadow habitat and an increase in wetland persistence may potentially influence SNYLF to disperse towards this habitat during times of drought. Although this project is focused on restoring hydrologic function in Foster Meadow, the associated creation of aquatic habitat (i.e., the off channel ponds) will enhance the overall habitat suitability for SNYLF. Based on the expected impacts of the proposed action and the lack of future state or private actions, cumulative effects are expected to be primarily beneficial; improving hydrologic functionality, raising the water table, decreasing streambank failure, increasing wet meadow habitat, and creating ponds for potential breeding/ overwintering all lead to improved habitat quality and quantity for the SNYLF.

VII. DETERMINATION OF EFFECTS

Sierra Nevada Yellow-Legged Frog

Although SNYLF are not known to occupy Foster Meadow, the area does contain potentially suitable aquatic habitat. Sedimentation, disturbance, injury/ mortality and potential short-term loss of refugia/ habitat are the greatest direct and/or indirect effects that may occur to SNYLF or their suitable habitat through pond and plug meadow restoration activities. The short term negative impacts and risks are likely outweighed by positive benefits to suitable habitat in this project area. Overall, the actions of the Foster Meadow Restoration Project

will ultimately benefit SNYLF through the increase of wetland habitat via raising the water table, creation of potential breeding habitat from ponds, an increase in pool depth through sediment reduction and the improvement of aquatic organism passage at the Forest Road 9N14 crossing.

The total suitable habitat present within the project boundary is **71** acres. An estimated **27** acres of suitable SNYLF habitat may be impacted directly and indirectly by proposed actions, which is approximately 38% of the suitable SNYLF habitat within the project boundary.

Since the response of amphibians depends on the type and magnitude of disturbance, the amount and configuration of remaining habitat, as well as their life-history characteristics, project activities may still impact this species even when the outcome is positive. Given the known status of SNYLF habitat within the project boundary, potentially suitable (unoccupied) habitat and the extensive short-term impacts of mechanical equipment in meadow habitat a " ***It is my determination that the Foster Meadow Restoration Project may affect and is likely to adversely affect the Sierra Nevada yellow-legged frog"***. This determination reflects the degree to which the proposed actions may adversely affect suitable habitat and individuals. The actions proposed for this project 1) have the potential, however unlikely, to result in incidental take of SNYLF, 2) have been implemented in the past under similar conditions, 3) would be an overall benefit in habitat improvement for SNYLF and meadow hydrologic function, and 4) would employ standard practices (S&G's and BMP) and protection measures in design criteria, including applicable conservation measures in the 2014 USFWS Biological Opinion.

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Appendix A

Foster Meadow Restoration Project Maps

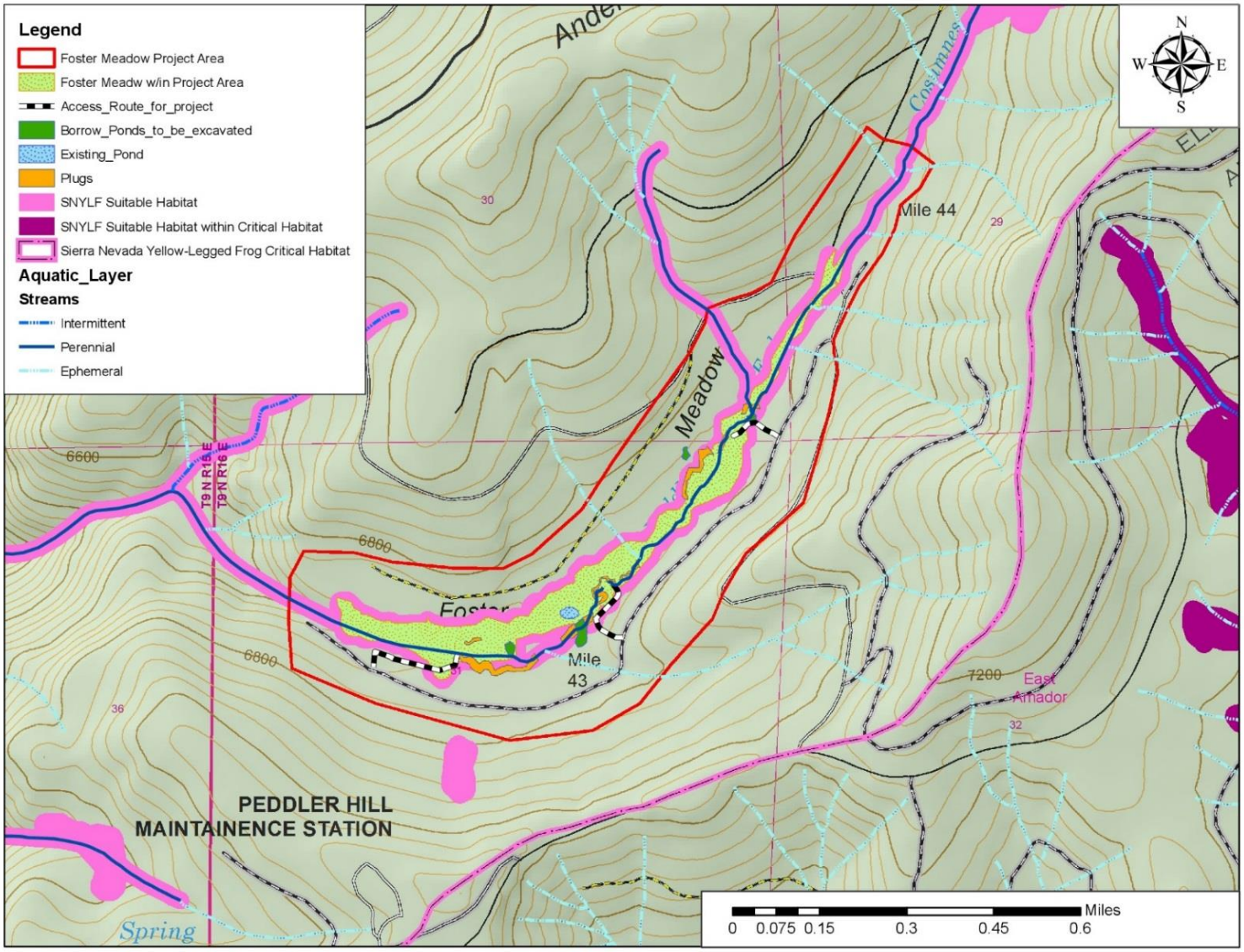


Figure 1. Foster Meadow Project Boundary

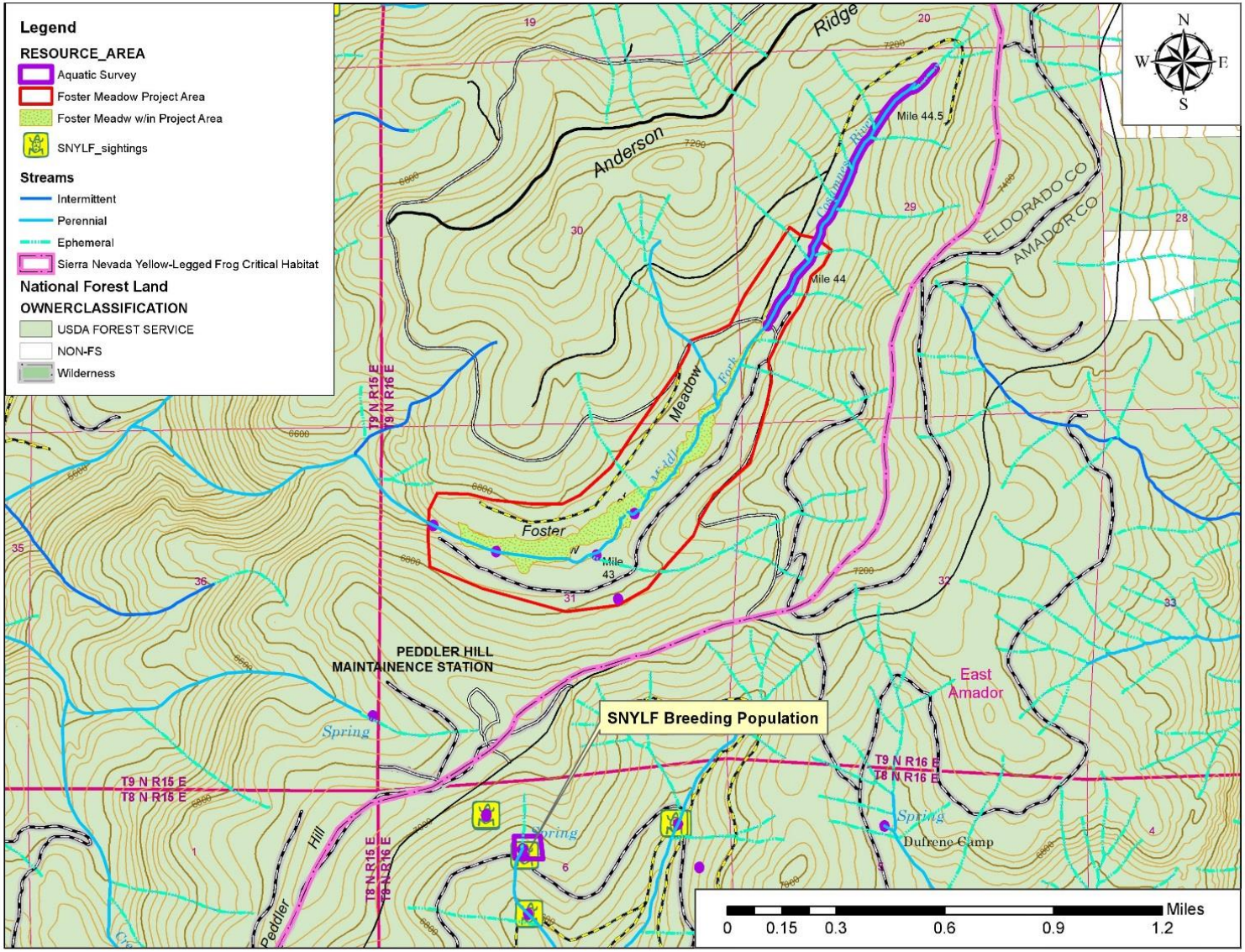


Figure 2. Foster Meadow Project area with aquatic/ amphibian surveys

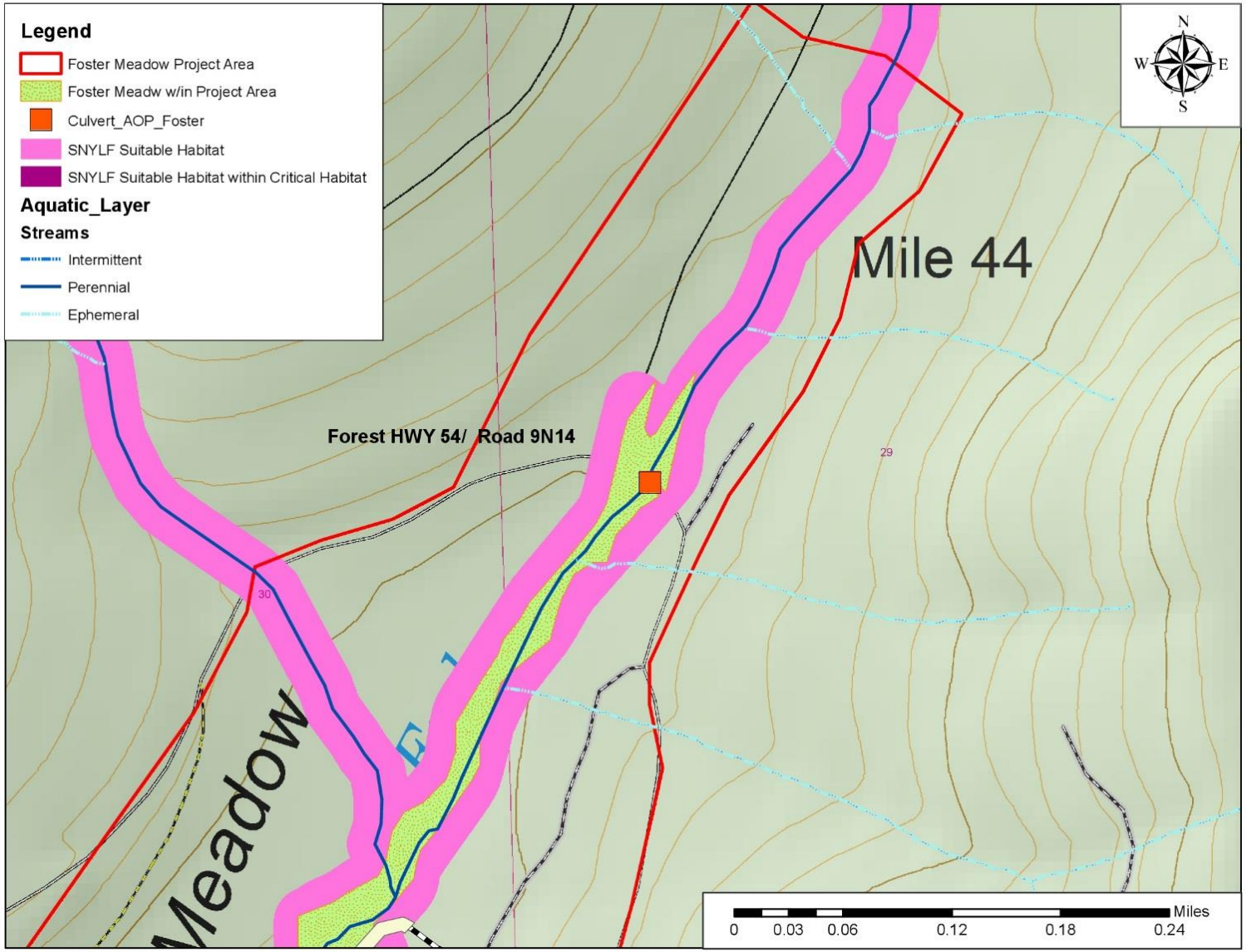


Figure 3. AOP stream crossing Middle Fork Cosumnes River

Appendix B

Foster Meadow Photographs

Figure 1: a) Erosion along the creek within the meadow and b) main body of Foster Meadow

Figure 2: a) Erosion along the creek within the meadow and b) main body of Foster Meadow

Figure 3: a) Middle Fork Cosumnes river gully in foster meadow near cross section #8. Breached rock dam in photo center.

Appendix C

IPAC List:

Threatened, Endangered, Candidate, and Proposed Species

Critical Habitat

Within the Foster Meadow Project Area

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: June 06, 2017
Consultation Code: 08ESMF00-2017-SLI-0398
Event Code: 08ESMF00-2017-E-06096
Project Name: Foster Meadow Restoration Project

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to

utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2017-SLI-0398

Event Code: 08ESMF00-2017-E-06096

Project Name: Foster Meadow Restoration Project

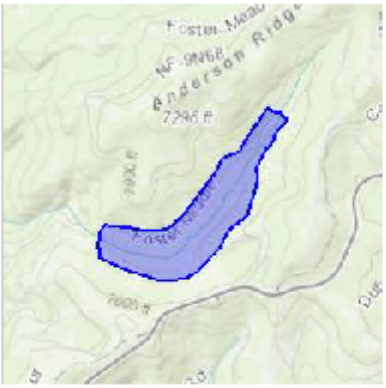
Project Type: LAND - RESTORATION / ENHANCEMENT

Project Description: Foster meadow, the project area is located approximately 40 miles east of Jackson, Ca., one mile north of State Highway 88, in the vicinity of the Peddler Hill maintenance station.The Foster Meadow Restoration Project encompasses 27 acres of meadow along the Middle Fork Cosumnes River on El Dorado National Forest lands. Foster Meadow was identified as a target meadow for restoration in the Amador Calaveras Consensus Group (ACCG) Collaborative Forest Landscape Restoration Project (December, 2006). The design concept for degraded meadows in the Foster Meadow project areas is to implement near-complete gully fill. The fill material would be excavated from 4 small borrow ponds along the margins of the meadow and grading 4 areas of in-meadow terrace down to the design floodplain elevation. This design significantly reduces risk associated with frequent overland flow over plugs and into ponds.

The design for aquatic organism passage at the Forest Highway 54 crossing would use a rock/soil fill with vegetation transplants to raise both the channel and floodplain to match the existing culvert invert/floodplain elevation. This would require approximately 500 yds3 of 2.0-foot minus rock and soil. To reduce the backwater effect of high flow in a single culvert, additional culverts set at floodplain elevation would be installed in the road crossing with invert elevations 1 foot above the invert elevation of the channel culvert. These floodplain culverts would be 'squash' type, 30-inch diameter set at as close an interval practicable across the floodplain. Ideally, no less than 3 additional culverts should be installed. Implementation is proposed for fall of 2018.

Project Location:

Approximate location of the project can be viewed in Google Maps:
https://www.google.com/maps/place/38.59439050400047N120.24399503267992W



Counties: El Dorado, CA

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area. Please contact the designated FWS office if you have questions.

Amphibians

NAME	STATUS
Sierra Nevada Yellow-legged Frog *(Rana sierrae)* There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9529	Endangered
Yosemite Toad *(Anaxyrus canorus)* There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7255	Threatened

Fishes

NAME	STATUS
Delta Smelt *(Hypomesus transpacificus)* There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened
Steelhead *(Oncorhynchus (=Salmo) mykiss)* Population: Northern California DPS There is a **final** critical habitat designated for this species. Your location is outside the designated critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1007	Threatened

Critical habitats

There are no critical habitats within your project area.