
**Sequoia National Forest
Western Divide River Ranger District**

**Biological Assessment of
Dry Meadow Restoration Project**
PROJECT LOCATION (Figure 1):
Tulare County, California
Sections 8 and 17, Township 24 S, Range 32 E

Prepared by: _____
Nina Hemphill, Forest Fish and Aquatic Biologist

This biological analysis of the potential effects of habitat disturbance associated with meadow restoration includes Conservation Measures and guidance to minimize the effects on federally listed species, including candidates and those proposed for listing. The environmental analysis evaluates one action alternative. The Action alternative was designed to meet the purpose and need and to respond to issues raised during the planning process. The action alternative uses a combination of treatment methods. These include reconnecting stream channels with the meadow floodplain through the use of partial channel fill, creation of swales, temporary ingress roads, riparian plantings, and other actions to support restoration. Treatments would be accomplished using both mechanical and hand methods. This project may also remove hazard trees when deemed an imminent safety risk, and propose road decommissioning work. Hand thinning of small conifers (under 10 inches dbh) will be done in the riparian conservation areas around the meadow.

Based on implementation of the Conservation measures, Best Management Practices, and use of our SNFPA Standards and Guidelines, surveys that have and will be completed, we anticipate no effects on Mountain Yellow-legged frogs. We anticipate no effects on California condor, California Red-legged frogs, and Delta smelt are not found within the project area. No Critical Habitat occurs in the project area. We anticipate no effects.

I. Introduction

This biological analysis of the potential effects of habitat disturbance associated with meadow restoration includes Conservation Measures and guidance to minimize the effects on federally listed species, including candidates and those proposed for listing. The environmental analysis evaluates one action alternative. The Action alternative was designed to meet the purpose and need and to respond to issues raised during the planning process. The action alternative uses a combination of treatment methods. These include reconnecting stream channels with the meadow floodplain through the use of partial channel fill, creation of swales, temporary ingress roads, riparian plantings, and other actions to support restoration. This project may also remove hazard trees when deemed an imminent safety risk, and propose road decommissioning work. Thinning of small conifers (under 10 inches dbh) will be done in the riparian conservation areas around the meadow. Treatments would be accomplished using both mechanical and hand methods.

Prior to the preparation of this document, a thorough review of the U.S. Fish and Wildlife Service (USFWS) IPAC site, the California Natural Diversity Data Base, and species habitat requirement information was conducted. According to the IPAC Species list updated February 2019 four endangered species might occur in the area. Based on the analysis of elevation range (California Red-legged Frog), and watershed connectivity (Delta Smelt), it was determined that only California condor, Mountain yellow-legged frog, and Pacific fisher needed to be examined further. There are no critical habitats within the project area. This BA was prepared in accordance with the standards established under Forest Service Manual direction (FSM 2672.42), and the legal requirements set forth under Section 7 of the Endangered Species Act (ESA) (19 U.S. C. 1536(c)) as amended.

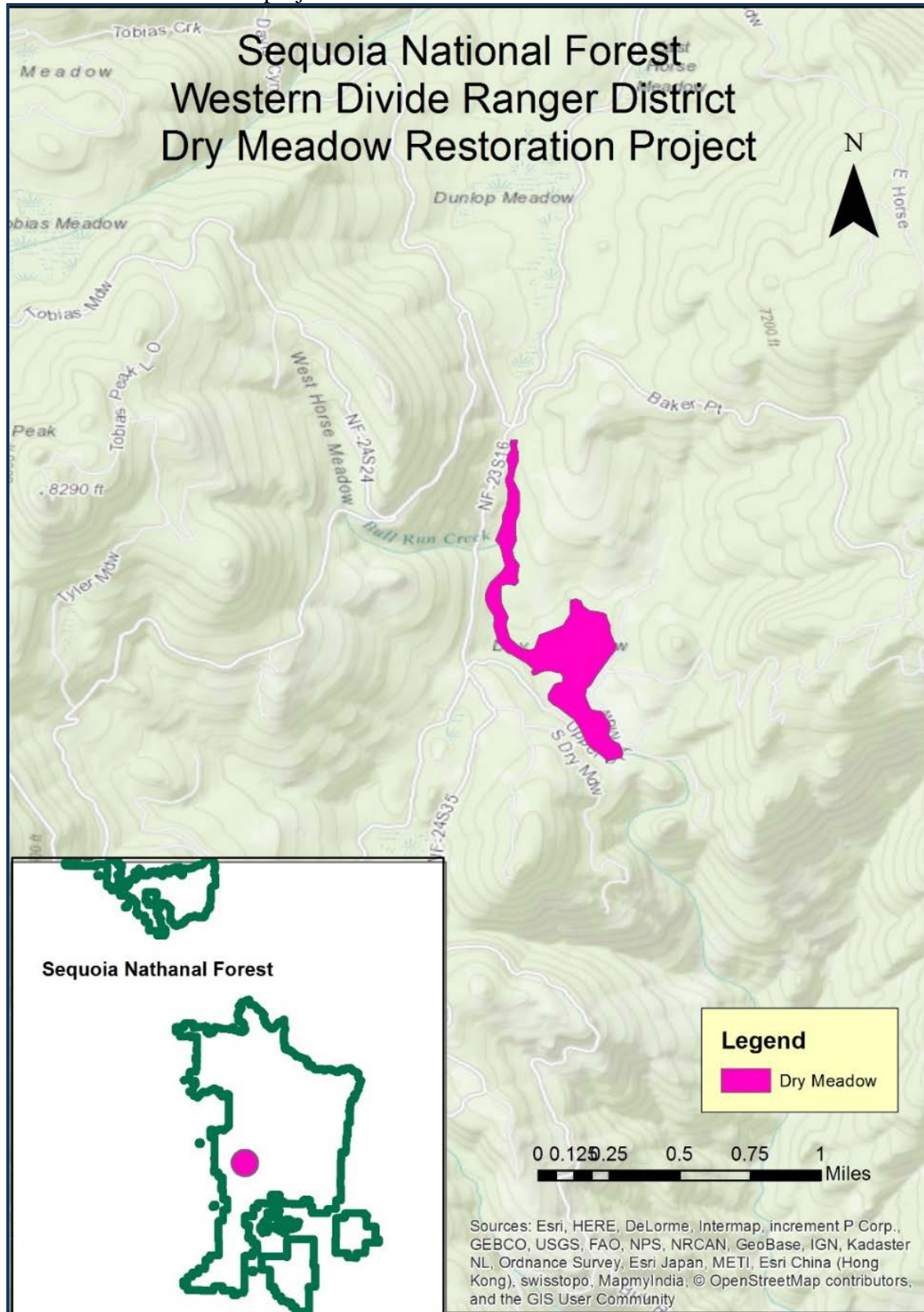
Table 1. Federal Endangered and Threatened Species considered.

Species	TES Status	Elevation Range of Habitat	Preferred Habitat	Potential for Project to Affect this Species
Delta smelt	Threatened	Low elevation ¹	Found in San Joaquin and Sacramento Delta and up rivers to man-made and natural barriers	None
California Condor	Endangered	Range throughout the forest	Nests in cliffs or tall trees (Giant Sequoias)	Discountable effects
California red-legged frog	Threatened	Elevations range from sea level to approximately 4,000 ft. (1,500 meters (m) ² .	Ponds and slow-moving streams	None
Mountain yellow-legged frog	Endangered	Above 4,000 ft. ¹	Lakes , streams, meadows springs	Discountable Effects
Pacific fisher	Threatened	2,000-8,000 ft	Late seral closed canopy coniferous forest	Discountable Effects

¹ USFWS

² IUCN

Figure 1. The project area showing location of the Dry Meadow Restoration project. A sub-map shows the location of the project within the forest.



II. Consultation to Date

Pursuant to Section 7(c) of the Endangered Species Act of 1973 as amended, the U. S. Fish and Wildlife Service (USFWS) IPaC website was consulted on May 30, 2017, to request a list of threatened, endangered, proposed, and candidate species present in the project area. (<https://ecos.fws.gov/ipac/>). The species are listed in Table 1. U.S. Fish and Wildlife Consultation Code from the Sacramento Office is 08ESMF00-2017-SLI-1728, with event code 08ESMF00-2019-E-03878, February 28, 2019. No critical habitat was present in the area for any listed species.

Mountain Yellow-Legged Frogs

On April 24, 2014, the U.S. Fish and Wildlife Service published the final rule under the Endangered Species Act to list the mountain yellow-legged frog (*Rana muscosa*, Northern Distinct Population Segment NDPS) as an endangered species, effective June 2014 (Federal Register: 79 FR 24255 24310). Critical habitat has also been identified in August 2016 (Federal Register: 81 FR 59045 59119). None of the areas identified as critical habitat occur within the project area or its watersheds. A programmatic Biological Assessment (BA) was completed by the Pacific Southwest Regional Office of the Forest Service. The Programmatic BA and the US Fish and Wildlife Service Biological Opinion were signed in 2015. The Regional BA and the USFWS Biological Opinion (FF08ESMF00-2014-F-0557) are incorporated by reference for this analysis.

This project is consistent with the USDA Forest Service Region 5 Biological Assessment for the three Sierra amphibians, and 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 2014. This project was not submitted to USFWS because no effects were found for any listed species as a result of this project. Conservation Measures including project specific measures for frogs are incorporated into the Dry Meadow Project.

California Condor

The California condor (*Gymnogyps californianus*) was listed as endangered on March 11, 1967 (32 Federal Register (FR) 4001), with critical habitats designated on September 24, 1976 (41 FR 187) within Tulare, Kern, Los Angeles, Ventura, Santa Barbara, and San Luis Obispo Counties. Designated critical habitats in Kern and Tulare Counties closest to the project vicinity include two areas. The Tulare Country Rangelands (Critical Habitat #9, USDI 1985, USFWS 1996) and the Kern County Rangelands (Critical Habitat #8) are both considered important foraging zones located west of the Forest boundary. Neither of these designated critical habitats overlap with any portion of the Dry Meadow Project area.

Pacific Fisher

U.S. Fish and Wildlife Service, reopened the comment period on their October 7, 2014, proposed rule to list the West Coast distinct population segment West Coast distinct population segment (DPS) of fisher (*Pekania pennanti*) as a threatened species (January 31, 2019, 84 FR 644- 645). The fisher is a Forest Service Sensitive Species in Region 5. The fisher is a candidate for threatened status under the California ESA; it is designated as a SSC by CDFW.

III. Current Management Direction

Current Forest Service policy (FSM 2670 [USDA 2005]) 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 Record of Decision (USDA 2004) and Forest Service endangered and threatened species policies (FSM 2670 and CFR 50 part 402) provide direction for the management of threatened and endangered species.

Management direction for the mountain yellow-legged frog is provided under the Biological Opinion for the Three Sierra Amphibians (USFWS 2015) and the Conservation Assessment for the mountain yellow-legged frog (Brown et al. 2014). The Aquatic Management Strategy stated in SNFPA (pages 32-33 of the SNFPA ROD (USDA 2004) provides guidance for management of the biological and physical integrity of the watershed; and includes measures to maintain: water quality, species viability, special habitats, connectivity, sediment regimes and maintenance of stream banks to reduce erosion and enhance habitat diversity.

The Forest Plan strategy for the California condor and its habitat is to follow the most current U.S. Department of the Interior (USDI) Fish and Wildlife Service California Condor Recovery Plan (USDI 1996). The 1996 California Condor Recovery Plan instructs forests to continue to implement enforcement of guidelines that protect known suitable nest and roost sites on public lands. As such, the forest has identified one historic nest site and a series of historic roost areas that were used by condors. These include sites on the Breckenridge Mountains south of the Kern River, along the west slope of the Greenhorn Mountains (Basket Pass, Lion Ridge, Starvation Grove), and further to the north at Blue Ridge. Recent activity has been seen in the Springville area and the lower Kern River.

IV. Description of the Project

This biological analysis of the potential effects of habitat disturbance associated with meadow restoration includes Conservation Measures and guidance to minimize the effects on federally listed species, including candidates and those proposed for listing. Drainage through the meadow would be restored to the elevation of the meadow floodplain. The restored drainage base elevation would be anchored with a valley grade structure at a bedrock constriction just upstream of the 8.5-foot diameter culvert crossing for Forest Road No. 24S80. The design would eliminate the seven active headcuts on the mainstem, tributary, and remnant channels in the meadow. All restoration design features proposed in this alternative are presented in a Plan View Map shown in Figure 2.

The principal function of the borrow sites is to provide native fill material for gully plug construction. Borrow sites that are located within the floodplain and adjacent to the gully typically fill with groundwater, at least on a seasonal basis. Because of the existing intermittent nature of stream flows within Dry Meadow, it is difficult to predict whether or not the floodplain borrow sites would maintain perennially ponded water or would seasonally dry out. In any case, water levels within the floodplain borrow sites reflect the rise and fall of the groundwater elevation. Within the borrow sites, habitat features, and diversity are incorporated into the construction. These can 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 for final top dressing of the completed plugs.

All plugs and borrow sites are sited and configured to accommodate natural meadow and hillslope surface and subsurface through-flow. To reduce the risk of cutting through the plug during infrequent flood events, the elevation, distance, and plantings between plugs is designed to carry high flows. The downstream edges of the plugs will be planted with sedge mats recovered from the gully bottom prior to plug construction.

Plugs are constructed with a wheel loader 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. Figures 3a. and 3b. display schematic details of gully plugs and adjacent borrow sites with seasonally ponded water.

Upon completion, plug surfaces are ripped to a depth of 12 inches (to facilitate rainfall infiltration). The stockpiled topsoil is spread and then seeded with native seed, and mulched. All native vegetation recovered from the fill and borrow sites is transplanted to plug edges, surfaces, and key locations on the remnant channel.

Once the project is completed, a temporary fence will be installed around the restoration site. This measure would exclude livestock from impacting the restoration site. The fence would remain in place for two to three years, or until stabilizing vegetation becomes established. Fence installation would present only small localized disturbance to the area where posts are installed. There is no erosion potential associated with installing a temporary fence. The fence would be aligned so that cattle trailing would not be encouraged in sensitive areas. Grazing impacts to the newly restored meadow would be monitored. Where necessary to protect re-vegetation and sensitive areas, grazing management options would be considered by the Forest Service, in consultation with the permittee. Options may include a change in numbers or the season of use, longer-term fencing, off-site watering, or mineral supplement placement.

Hand-thinning of conifers (less than 10 inches in diameter) along meadow margins in designated upland areas on Dry Meadow including all its feeder areas would occur. Thinning will be done using hand tools or chainsaws. Riparian associates will be retained, and conifers will be targeted if they are 10 inches or less. No vehicles will be allowed in these areas to minimize ground disturbance. The design criteria and the use of hand tools or occasionally chainsaws should minimize ground disturbance so that sensitive plants, amphibians, birds, and archeological or historic features are not disturbed.

Restoring hydrologic function and/or floodplain connectivity is necessary to meet the desired condition as set forth in the Sequoia National Forest Land and Resources Management Plan (USDA, 1988), as amended by the Sierra Nevada Forest Plan Amendment ROD (USDA, 2004), and is consistent with the Mediated Settlement Agreement (SQF MSA). Treatment of the meadow would result in high-quality wet meadow habitat and improve habitat connectivity and habitat resilience for the federally endangered southern mountain yellow-legged frog (*Rana muscosa*), and other amphibians such as toads and tree frogs. These species thrive in wetter types of meadow systems.

Figure 2. Project area with all proposed design features. Three potential access routes are proposed into the project area boundary.

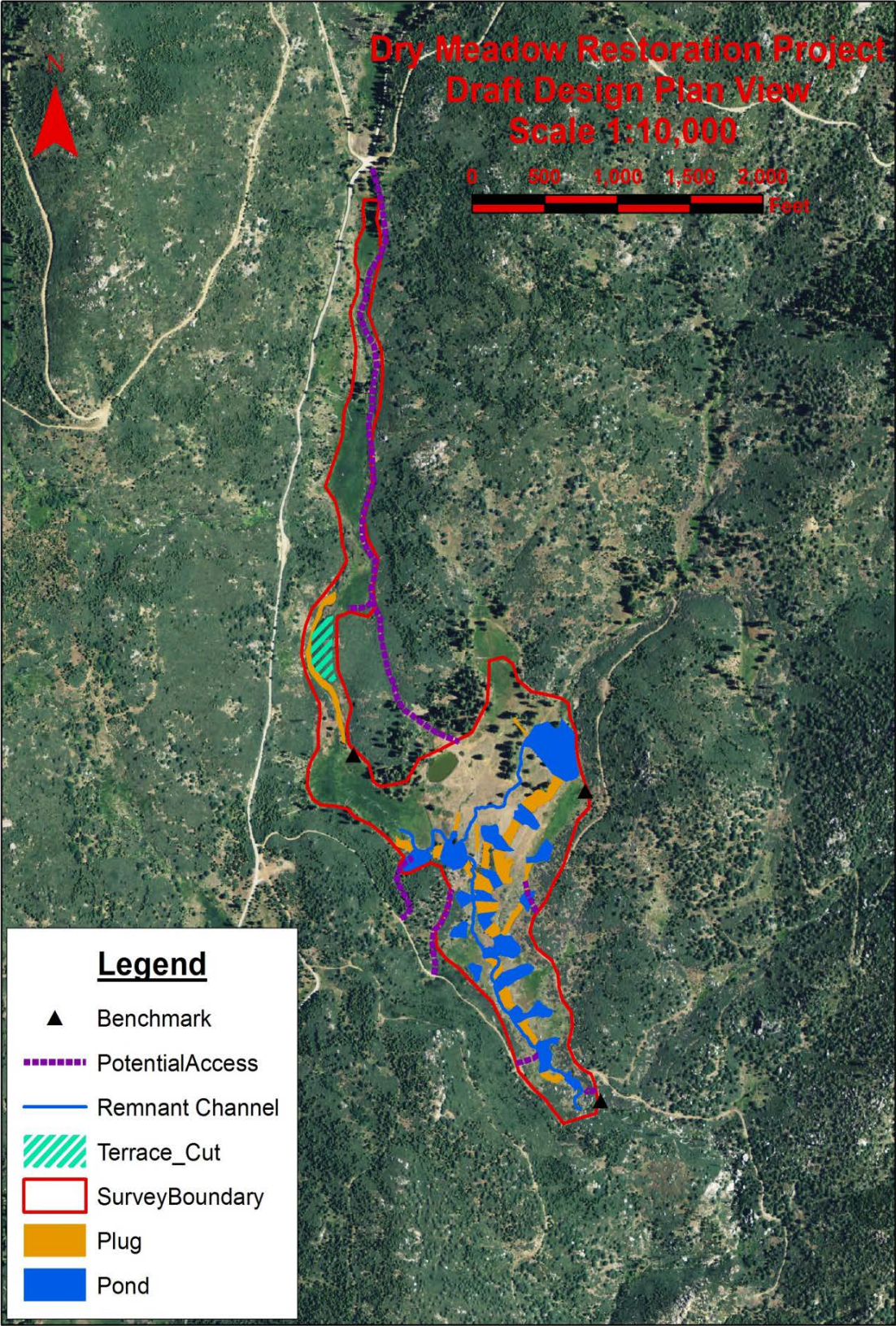


Figure 3a. Plug Schematic: Profile View

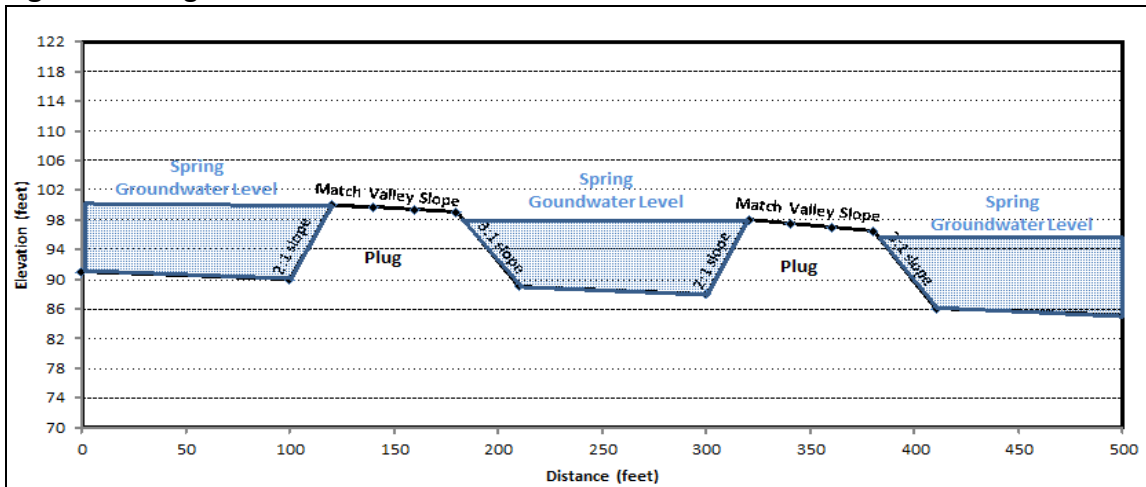
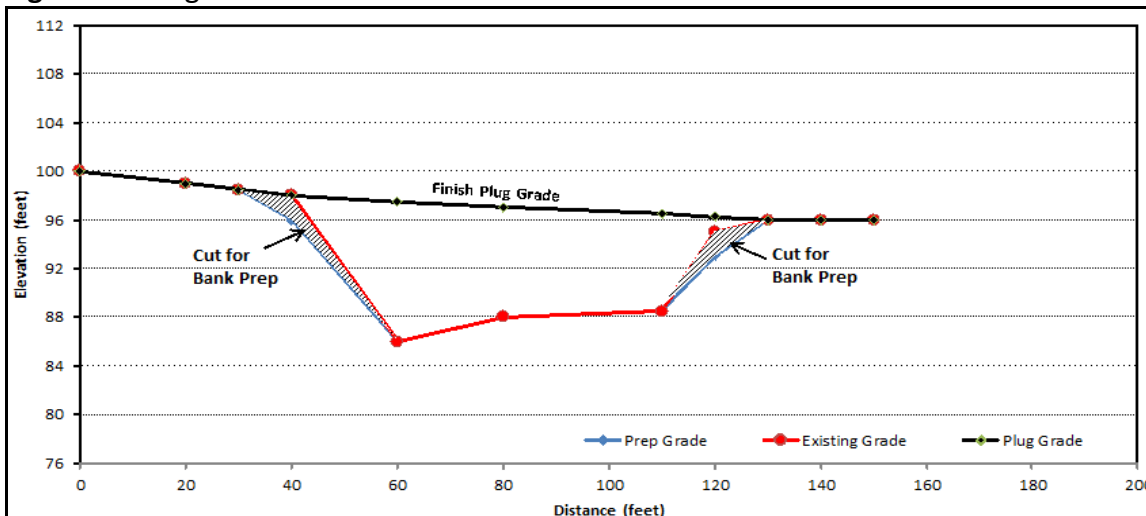


Figure 3b. Plug Schematic: Cross-section View



Conservation Measures

Conservation Measures are intended to reduce, minimize, or eliminate impacts to listed species. They are provided here because they are expected to benefit the species addressed in the BA and their habitats. The following measures and monitoring are mandatory. A USFS Biologist and/or hydrologist will be present to ensure compliance.

- a. A Service-approved biologist knowledgeable in the life histories and ecologies of the listed species in the region, survey for the species, prior to the onset of construction.
- b. The Forest will maintain records of, and notify the Service of any listed species observations within the action area. The forest will immediately notify the Service if any injury or mortality to listed species occurs as a result of the proposed action.
- c. All project personnel who may potentially enter meadows, streams or riparian areas during pre-construction, construction; repair or maintenance of the project will follow the Forest Service's decontamination protocol to prevent spread of *Batrachochytrium dendrobatidis*. All project personnel will follow decontamination before entering meadows, streams and riparian areas, and again prior to entering adjacent aquatic habitat.
- d. Timing of work to coincide with late summer dry period.

- e. Equipment, when not in use, will be stored in upland areas outside of the boundaries of waterways/wet meadows.
- f. When handling and/or storing chemicals (fuel, hydraulic fluid, etc.) necessary for equipment near waterways, applicable BMPs will be followed to prevent spills and contamination; any and all applicable laws and regulations will be followed. Appropriate materials will be stored and accessible on site to prevent and manage spills. Service and refueling procedures will not be conducted where there is potential for fuel spills to seep or wash into waterways.
- g. Dedicated fueling and refueling practices will be designated and will be protect storm water run-off and will be located at least 50 feet from downslope drainage and water courses. Fueling will be performed on level-grade areas.
- h. Spill containment kits will be maintained onsite at all times during construction operations and/or staging or fueling of equipment.
- i. All construction equipment will be well maintained to prevent leaks of fuels, lubricants or other fluids into waters of the United States.
- j. All equipment will be free of mud and dirt prior to bringing it within the Sequoia National Forest to prevent the spread of Chytrid fungus.
- k. During project activities, all trash that may attract predators will be properly contained in covered garbage receptacles and removed from the site daily. Following treatment, all debris will be removed from project sites.
- l. Drafting intakes will be completely screened with wire mesh no larger than 0.2 inch.
- m. To prevent dewatering of aquatic habitat, all natural water bodies used for drafting for project activities must be reviewed by the Hydrologist or Forest Aquatic Biologist prior to use.
- n. Use only water for dust abatement within 165 feet of streams and hydrologically connected tributaries or meadows. If water diversion is necessary for any project related activities, no de-watering of suitable stream habitats will occur during implementation, even if temporarily.
- o. Monitoring of the condor satellite tracking website for condor activity will be conducted prior to restoration activities.
- p. If condor satellite tracking suggests use of a roost site in any part of the project area, a limiting operating period restricting activities within 1/2 mile radius of the roost site will be implemented. The duration of the LOP will be determined in consultation with the Service, Condor Recovery Team, and the District Biologist if necessary.
- q. Protect fisher den site buffers in the vicinity from disturbance with a LOP from March 1 through June 30 as long as habitat remains suitable or until another regionally approved management strategy is implemented.

V. Existing Environment

Mountain Yellow-Legged Frogs

Within the project and aquatic analysis area, all perennial and intermittent stream channels, meadows and meadow edges, seeps, springs and damp headwater areas and riparian conservation areas surrounding these habitats provide potential habitat. While the area surrounding these habitats is typically, dry owing to the long Mediterranean summers; during the wettest times of year connectivity increases among these habitats. Most amphibians depend on both aquatic and terrestrial habitats to complete their lifecycle. Beyond the stream channel, the riparian and upland habitats provide important habitat for species that use these areas to forage and to connect to other habitats for breeding (Ficetola et al. 2009; Clinton et al. 2010). Recent

recognition that stream-breeding amphibians can disperse hundreds of meters into uplands implies that connectivity among neighboring habitats and drainages is important.

In the Greenhorn Mountains, fish were not native to some tributaries due to natural falls and barriers prevented fish access. Suitable habitat exists in streams and wet areas within the project area within the Bull Run Creek which drain from the Greenhorn Mountains into the North Fork Kern River.

Degradation, channel incision, and erosion in this meadow is resulting in a drying trend. To achieve full floodplain function, and the ancillary ecosystem benefits, the incised channels must be treated to allow the frequent dispersal of flood flows over the meadow floodplain. It is important to address these issues before they get worse (i.e., deeper or longer channel incision).

California condors

California condors soar over large areas of remote country for foraging (Walters et al. 2010). California condors were absent from Central California wild until 1997 when condors were reintroduced (USFWS 2013). Several pairs of condors have been seen on the Sequoia National Forest in the last two years. Nests are located in shallow caves and rock crevices on cliffs. Foraging habitat includes open grasslands and oak savanna foothills that support populations of large mammals such as deer and cattle. Birds are roosting at Blue Ridge near Springville Ca.

Courtship and nest site selection typically occur during November to March (USFWS 2013). The noise and activities associated with implementation will be finished by October of each year because rains begin to increase the wetness of the meadows. California condor nesting, and roosting locations do not occur near Dry Meadows in this project. California condors have altered their behaviors if humans approached within 555 m of a nest site and they can be alarmed by loud noises from distances of over 1.6 kilometers. Despite their wide range for foraging, California condors are currently not known to roost or nest near Dry Meadow.

Pacific Fisher

The fisher is a rare, permanent resident of the Greenhorn Mountains (USFWS 2016). Pacific Fisher has no cover within the project area and does not have denning habitat within the project area. The project will occur in late summer after denning. Therefore noise should not be an issue for the fisher. Cover from shrubs might take 3 to 5 years to grow. Cover exists on the hills around the meadow. Therefore we expect this project to have no effect on Pacific Fisher.

VI. Effects of the Project

Analysis indicators are used to compare and contrast the effects of the alternatives. Their selection was based on a review of the supporting documentation and identification of suitable habitat and limiting factors for the species. Direct and Indirect Effects are discussed under each indicator where relevant. Cumulative effects are discussed where relevant. The cumulative effects of this project could potentially occur due to motorized, bicycle, foot and other use of roads and trails in the area; cattle grazing; risk of fire; warming stream and air temperatures; and reduced snow pack.

Mountain Yellow-Legged Frogs

Direct and Indirect Effects

The following indicators were selected to evaluate the alternatives and their potential effects on the mountain yellow-legged frog and its habitat. Direct and Indirect Effects are discussed under each indicator and cumulative effects are discussed under resilience to climate change.

- **Indicator 1: Levels of ground disturbance in riparian conservation areas, streamside management zones and disturbance of stream and other habitats within the project area.**

Streamside and meadow edge forest habitats are extremely complex ecosystems that help provide optimum food and habitat for stream communities and function as a filter by removing sediment and other suspended solids from surface runoff and shallow groundwater. These habitats should provide shading for streams to optimize light and temperature for aquatic plants and animals. They function as a source of dissolved carbon compounds and organic detritus critical to the processes within the stream itself. However, the riparian areas around Dry Meadow are not functioning. Streams function to provide permanent water for development of tadpoles and refugia for young frogs during the hot summers. Moist areas within meadows provide habitat for juvenile or adult frogs. The current headcut has dewatered much of the meadow and these areas are not functioning as suitable habitat. Non-the –less a final survey of the area will be done to detect Mountain yellow-legged frogs and other amphibians in the spring before implementation. Therefore we do not anticipate any harassing or crushing of the frogs during implementation of this project. The project will restore the hydrologic connectivity but it will take several years to re-establish riparian vegetation within the meadow

- **Indicator 2: Changes in connectivity of habitat between breeding and foraging or dispersal habitat.**

Riparian areas can increase connectivity for wildlife (Cushman 2006). The areas between perennial and intermittent streams, ephemeral streams, and meadows and seeps across the landscape are part of the complex of habitats for these amphibians. Hydrologic connectivity is important to maintain habitat in perennial intermittent and ephemeral streams and meadows. We expect this project to provide additional connectivity of habitat by lengthen the period when meadows are wet within the drainage and proving longer base flows in historically fishless streams. This project is expected to have long term beneficial effects on connectivity of habitat for amphibians.

- **Indicator 3: Resilience to climate change.**

The areas between perennial and intermittent streams, ephemeral streams, and meadows and seeps across the landscape are part of the complex of habitats for these amphibians. Without a strong vegetative component, downed wood and a restored floodplain, these habitats are very vulnerable to rain on snow events. We expect this project to provide improved habitat resilience to climate change.

Cumulative Effects

Decreased snow pack and winter warming can change the period of peak water and change the later summer flows. This has the potential to change perennial streams into intermittent steams thus eliminating or reducing suitable breeding habitat. In addition, warming water may make the habitat unsuitable for tadpoles by late summer. This project by improving the shallow groundwater storage will keep water cooler and flowing longer into the year. Riparian plantings done to stabilize the restoration and to provide shade will help mitigate for warming temperatures. We expect this project to improve the resilience of these headwater meadows to climate change. This improved resilience will improve resilience of habitats to climate change.

Chytrid fungus is the most significant pathogen responsible for amphibian extirpations and reductions worldwide. The incidence of chytrid carrying species is not expected to be affected over time as a result of this project. .

Determination

Due to the difficulty of finding this rare species, and the unlikely potential to harm an individual it is my determination that Alternative 1 and 2 for the Dry Meadows Restoration Project will have "No Effect" on the mountain yellow-legged frog or its Critical Habitat

California condors

Direct and Indirect Effects

The following indicator was selected to evaluate the alternatives and their potential effects on the California condor and its habitat.

- **Indicator 1: Increased levels of disturbance within potential roosting habitat or known roost areas identified within the Forest Plan.**

If Condors are found to be roosting or nesting near Dry Meadow in the spring and summers before construction, we will consult with USFWS on the best way to proceed. At this time, no roosting or nesting occurs near any of the proposed meadows. Therefore, we do not expect any effects on California condor.

Cumulative Effects

While we expect this project to improve the resilience of this headwater meadow to climate change, it will not improve the habitat for California condor.

Determination

Given the tracking of condors and the ability to track roosting and use of areas by birds, it is my determination that the proposed action will have “No Effect” on California Condor or its Critical Habitat.

Pacific Fisher

Direct Effects

The LOP from March 1 through June 30 is designed to limit disturbance that would interrupt breeding efforts. While individuals may be disturbed during non-denning, it is expected that they could and would temporarily move into nearby suitable habitat.

Indirect Effects

Indirect effects may include an increase in habitat connectivity as riparian vegetation increases in diversity and structure. Prey availability and distribution in fisher habitat is expected to positively respond to riparian vegetation including understory shrubs. The Proposed Action is in the SSFCA; however, essential habitat structures for fishers such as canopy cover and large trees will not be negatively influenced during Proposed Action activities.

Cumulative Effects

We expect this project to improve the resilience of this headwater meadow to climate change, it will not improve the habitat for Pacific fisher.

Determination

It is my determination that the Proposed Action may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the Pacific fisher.

VII. Conclusion and Determination of Effects

Determination of Effects

It is my determination that the Dry Meadow Restoration Project will have ‘No Effect’ on mountain yellow-legged frogs.

It is my determination that the Dry Meadow Restoration Project will not affect Critical Habitat for the mountain yellow-legged frog.

It is my determination that the Dry Meadow Restoration Project will be beneficial to Suitable Habitat for the mountain yellow-legged frog.

It is my determination that the Dry Meadow Restoration Project will have 'No Effect' on California condor.

It is my determination that the Dry Meadow Restoration Project will not affect Critical Habitat for the California condor.

It is my determination that the Dry Meadow Restoration Project may affect individuals, but is not likely to result in a trend toward federal listing or loss of viability for the Pacific fisher.

IX. Literature Cited

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