

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION**

**INITIAL STUDY  
AND  
DRAFT MITIGATED NEGATIVE DECLARATION**

**FOR**

**SEQUOIA NATIONAL FOREST, KERN RIVER RANGER DISTRICT  
OSA MEADOW RESTORATION PROJECT**

**TULARE COUNTY**

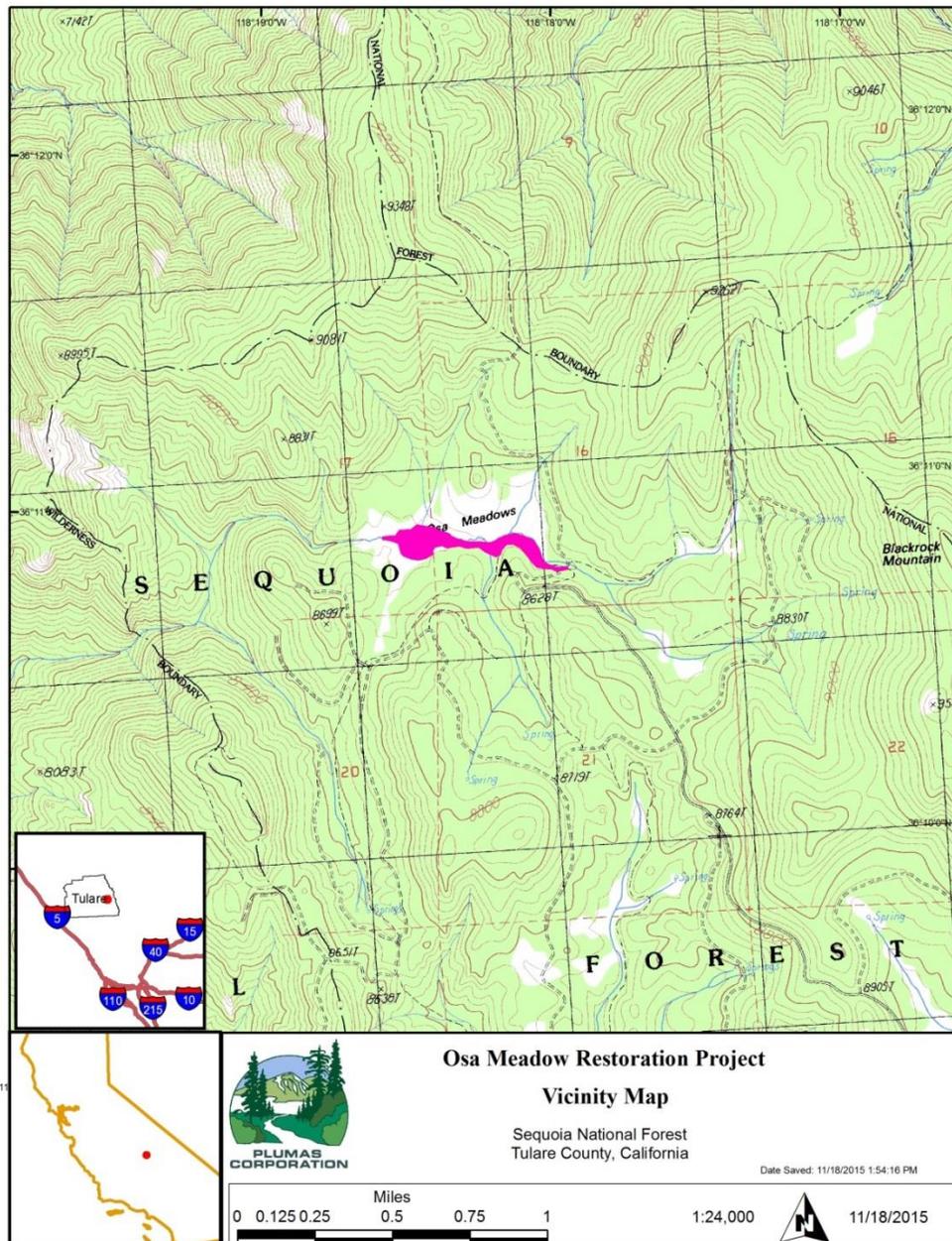
**March 2016**

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## SECTION 1: PROJECT DESCRIPTION

1. **Project Title:** Osa Meadow Restoration Project
2. **Lead Agency Name and Address:** California Regional Water Quality Control Board,  
Central Valley Region  
1685 E Street, Fresno, CA 93706
3. **Contact Person and Phone Number:** Debra Mahnke (559) 445-6281
4. **Project Location:** Sequoia National Forest, Kern River Ranger District, Tulare County  
Latitude: 36.18077°, Longitude: -118.30578°



Section 1 - PROJECT DESCRIPTION (Continued)

5. **Project Sponsor's Name and Address:** Sequoia National Forest,  
Kern River Ranger District  
P.O. Box 9  
Kernville, CA 93238  
Contact: Keith Andrew Stone (760) 376-3781
  
6. **Prepared By:** Plumas Corporation  
P.O. Box 3880  
Quincy, CA 95971  
Contact: Leslie Mink (530) 283-3739
  
7. **Edited By:** California Regional Water Quality Control Board,  
Central Valley Region  
1685 E Street, Fresno, CA 93706
  
8. **General Plan Designation:** General Forestry
  
9. **Zoning:** General Forestry
  
10. **Project Description and Background:**

The Osa Meadow Restoration Project encompasses 19 acres of meadow in the headwaters of Osa Creek, tributary to North Fork Kern River on lands administered by the USDA- Forest Service, Kern River Ranger District, Sequoia National Forest. Osa Meadow was identified as a meadow restoration project for a suite of ecosystem benefits, particularly for Kern River rainbow trout and greenhouse gas benefits. California Trout has partnered with the Sequoia National Forest to secure implementation funding for this project. The project area is located approximately 30 air miles northeast of Kernville, California in Tulare County.

The design approach utilized for the Osa Meadow project area applies the principles of fluvial geomorphology, 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. The approach combines significant quantitative data with qualitative observation and historical overview of land uses, both onsite and watershed-wide.

The existing incised (downcut) channel is the result of over 100 years of land use and natural events. The cumulative effects of these impacts can leave landscapes vulnerable to damage during major floods. The principal mechanisms that initiated this incision appear to be some channel modifications, past intensive livestock use and road building. This combination of cumulative effects is prevalent throughout the region. Once incision began to change the hydrology, the vigor and resilience of the vegetative community to livestock use was diminished.

Prior to the impacts to the vegetative armor of the meadow, surface flows were likely sheeting across the meadow or occupying multiple small channel features. With the reduction in surface armor, any small channel, livestock trail, or other bare linear feature could begin to 'etch' channels that did not exist prior to the 1850's. Despite having small drainage areas, these etched features have gradually deepened and widened to the incised

## Section 1 - PROJECT DESCRIPTION (Continued)

conditions that exist today with negative effects on meadow hydrology and meadow dependent species.

The 19-acre Osa Meadow Project area can be characterized as moderately incised in the lower 2/3 of the meadow, while the upper 1/3 is still functional. The functional reaches are at risk from the headcuts moving upstream from the degraded reaches. The drainage area to the bottom of the meadow is 2.58 square miles (1651 acres).

The design concept will restore channel/floodplain connectivity and function to the incised reaches of Osa Meadow (see Figure 1). The work will be accomplished by near complete fill of the existing incised channel/gully to restore the base level of the channel to the historic meadow elevation. Fill material will principally be generated by cutting an adjacent 1-acre terrace down to design meadow elevation. Additional suitable borrow areas were identified to generate any additional needed material. It will require approximately 5,500 cubic yards of fill to accomplish the work.

All vegetation and larger woody material (lodgepole pine) from either the borrow areas, plug fill areas, or access routes will be salvaged. Meadow sod and willow transplants will be planted into the plug surfaces with particular emphasis on seams and velocity reduction of overland flows. Wood material, though limited, would be used for large woody debris and added surface roughness in key areas of plug fill. The lower end of the project will be anchored by a valley grade structure. This allows a seamless transition of the new meadow gradient to the existing channel at the downstream end of the project. All rock used for previous channel stabilization work will be salvaged prior to channel/gully fill and used to armor the valley grade structure. Upon completion, all plug surfaces will be ripped to a depth of 12" to facilitate rainfall infiltration with the recovered topsoil spread and seeded with native seed. All native vegetation recovered from fill and borrow sites will be transplanted to plug edges, surfaces and key locations on the remnant channel.



Photo 1: Osa Meadow channel fill area, 5/19/2015.

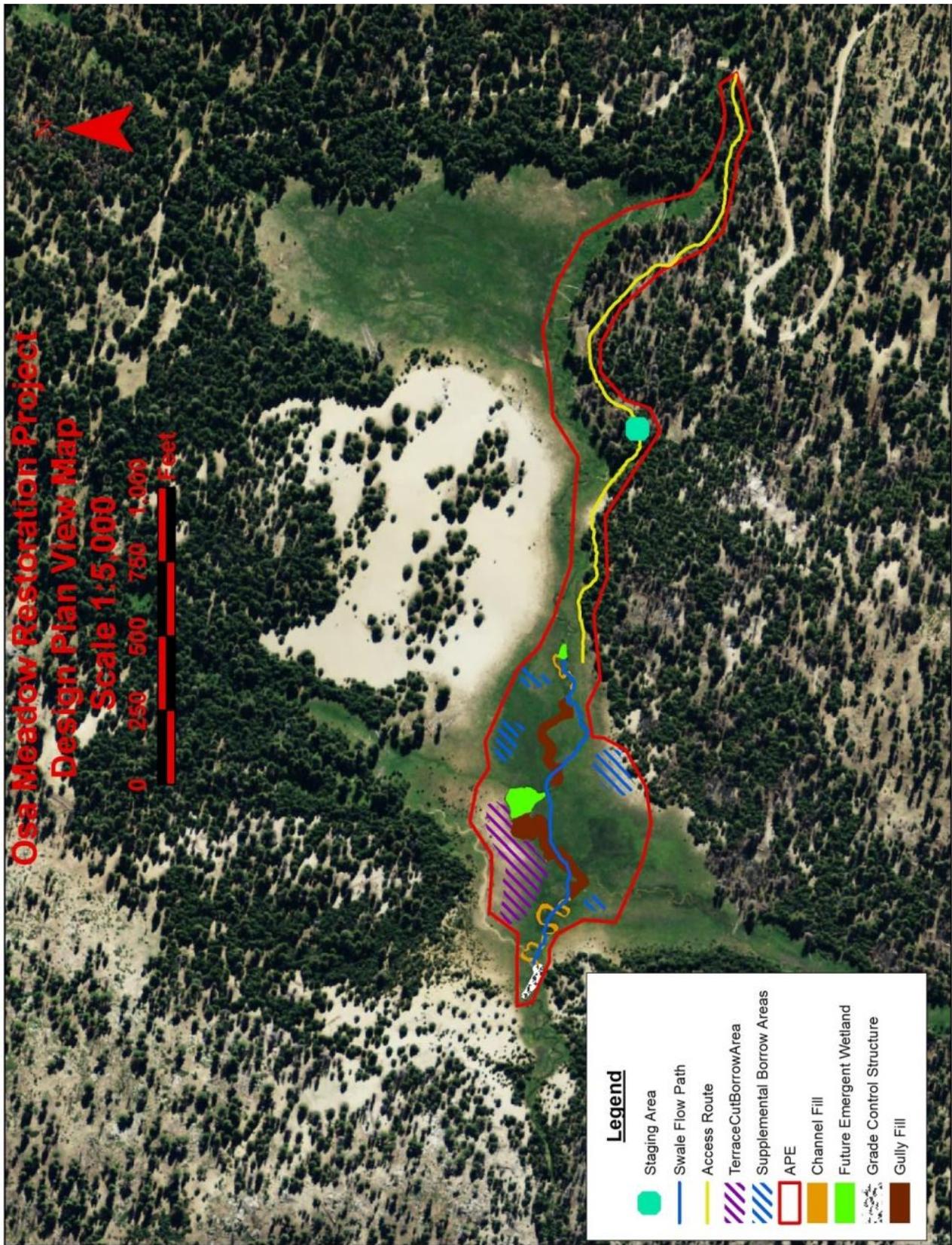


Figure 1- Design Plan View

## Section 1 - PROJECT DESCRIPTION (Continued)

Access for equipment will utilize approximately 1,523 feet of Trail #34E02 with some temporary widening or tree removal to a small staging area. From the staging area to the meadow a temporary access route of 987 feet will be cleared to provide passage for equipment. All equipment fueling and lubrication will be performed in the staging area.



**Photo #2: Osa Meadow Trail#34E02; smaller tree in center to be removed.**

Small conifers (<6" diameter at breast height) encroaching on the margins of the meadow would be removed by hand. Slash would either be left in place, or moved to bare areas.

This project is part of a proposed greenhouse gas research project in collaboration with the recently formed Sierra Meadow Restoration Research Partnership. The project area is being monitored before and after restoration for greenhouse gas emissions, soil carbon sequestration, groundwater levels, and vegetation.

- 11. Surrounding Land Uses and Setting:** Osa Meadow is in a natural setting, surrounded by forested slopes with shallow soils and rock outcrops. The area is accessible via a typical network of forest roads. Dispersed recreation is the primary land use, with historic grazing of cattle and sheep. No forest management projects are currently planned in the area; however, both wilderness designation and timber management are alternatives under consideration in the current round of the Sequoia National Forest Plan.
- 12. Other public agencies whose approval is required:** Central Valley Regional Water Quality Control Board 401 Water Quality Certification (in process), U.S. Army Corp of Engineers Clean Water Act Section 404 approval under Nationwide Permit #27 (in process), and Sequoia National Forest Decision Memo (signed July 24, 2015) (See Attachment 1).

## SECTION 2: ENVIRONMENTAL CHECKLIST

### Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" and subject to mitigation as indicated by the checklist on the following pages.

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Aesthetics                      | <input type="checkbox"/> Agriculture/Forestry Resources           | <input type="checkbox"/> Air Quality                          |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Cultural Resources            | <input checked="" type="checkbox"/> Geology /Soils            |
| <input type="checkbox"/> Greenhouse Gas Emissions        | <input checked="" type="checkbox"/> Hazards & Hazardous Materials | <input checked="" type="checkbox"/> Hydrology / Water Quality |
| <input type="checkbox"/> Land Use / Planning             | <input type="checkbox"/> Mineral Resources                        | <input type="checkbox"/> Noise                                |
| <input type="checkbox"/> Population / Housing            | <input type="checkbox"/> Public Services                          | <input type="checkbox"/> Recreation                           |
| <input type="checkbox"/> Transportation/Traffic          | <input type="checkbox"/> Utilities/Service Systems                | <input type="checkbox"/> Mandatory Findings of Significance   |

### DETERMINATION:

On the basis of this initial evaluation:

- I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

  
\_\_\_\_\_  
Signature

3/28/2010  
Date

Lonnie M. Wass

\_\_\_\_\_  
Printed Name

### SECTION 3: INITIAL STUDY AND CHECKLIST DISCUSSION

**Introduction:**

This checklist is to be completed for all projects that are not exempt from environmental review under the California Environmental Quality Act (CEQA). The information, analysis, and conclusions contained in the checklist are the basis for deciding whether an Environmental Impact Report (EIR) or Negative Declaration is to be prepared. Additionally, if an EIR is prepared, the checklist shall be used to focus the EIR on the effects determined to be potentially significant.

**1. AESTHETICS**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:**

The project encompasses restoration of a stream/meadow system. The meadow is not visible from any forest road, but is visible from a dispersed camping area and a recreational trail (34E02). The project would use the trail for access to the meadow, resulting in minimal tree removal to allow one-time heavy equipment access to the project area. The trail will not be widened or graded. The meadow itself will have bare areas for the first year resulting from the project; however, the degraded hydrology and current drought also result in substantial bare ground in the meadow. After the first growing season, meadow vegetation is expected to be more lush, resulting in an aesthetic benefit in the long term. In summary, the project would have a short term, less than significant impact on aesthetics during construction, and through the first winter/spring, and a long term benefit to aesthetics approximately one year after construction.

**Mitigation Measures:** No mitigation required.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**2. AGRICULTURE/FOREST RESOURCES**

**Environmental Setting:** The project area is a montane meadow surrounded by forested slopes with shallow soils and rock outcrops. The incised channel has de-watered the meadow, resulting in bare soil areas, vegetative conversion, and some conifer encroachment on the meadow margins.

Would the project:	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1 2220(g)) or timberland (as defined by Public Resources Code section 4526)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in the loss of forest land or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The proposed project area is on National Forest lands. With the incised channel, the current hydrologic trend in the meadow is toward drier conditions that favor a forested landscape more than meadow vegetation. The project would restore meadow hydrology to conditions that existed prior to channel incision, thus reversing the trend toward conversion of this meadow to forest. The project would also remove some of the small conifers (<6" diameter at breast height) that are encroaching on the margins of the meadow. Conifer removal would be accomplished by hand with chainsaws, loppers, etc. The material would remain on site.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**Mitigation Measures:** No mitigation required.

**3. AIR QUALITY**

**Environmental Setting:** The project is in a natural environment with few signs of humanity. The only sources of impact on air quality are dust from infrequent travel on the nearby dirt road, or smoke, which may blow into the project area from occasional controlled burns implemented by the Forest Service.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Expose sensitive receptors to substantial pollutant concentrations?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Create objectionable odors affecting a substantial number of people?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The proposed meadow restoration project will not have a significant impact on air quality resources. Project-related traffic on dirt roads will be limited to one-time heavy equipment mobilization, and daily commuting in pickup trucks by the contractors. No materials would be transported to the site. The only expected air pollutant would be emissions from diesel equipment during construction. Emissions from heavy equipment during construction will not cumulatively contribute to a decline in air quality nor substantially increase pollutant concentrations beyond existing levels in the project region. The duration of construction is short-term (two weeks) and would be conducted during the work week when recreational use would be minimal. There is no habitation near the project area that would be affected by the short-term construction activity.

**Mitigation Measures:** No mitigation required.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**4. BIOLOGICAL RESOURCES** [See Attachment 2 (Biological Assessment of Osa Meadow Restoration) and Attachment 3 (Osa Meadow Restoration Project Biological Evaluation (Plants))]

**Environmental Setting:**

**Wildlife-** The Osa Meadow Restoration Project area encompasses 19 acres of montane meadow and forest edge with aquatic/riparian, meadow, and meadow margin/forested habitats. The existing stream channel is incised in the lower portion of the meadow, where project work would take place, with less incision in the upper part of the meadow. The lower portion of the meadow is in a degraded condition due to the incised stream channel. The forested meadow margin included within the project boundary is included because heavy equipment will access the work area through the upland forest, rather than down the meadow. The Sequoia National Forest, in consultation with the US Fish & Wildlife Service (USFWS) identified eight federal endangered and threatened species that may be affected by the project. The Biological Assessment (BA) determination is that the project “may affect, not likely to adversely affect” the mountain yellow-legged frog (*Rana muscosa*). The other seven species would not be affected by the project.

**Botanical-** The proposed work area is within a drier portion of the meadow due to channel down-cutting. A search of the Sequoia National Forest sensitive plant database and geographic information system (GIS) layer found no records of special status plants in the vicinity of Osa meadow. A search of the California Natural Diversity Data Base (CDFW 2015) for the Casa Vieja, 7.5 minute map quadrangle, in which Osa Meadow is located, returned 11 occurrences for 7 plant species: Scalloped moonwort (*Botrychium crenulatum*), Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptridium pygmaeum*) are Forest Service sensitive species that are addressed in the Biological Evaluation. Field ivesia (*Ivesia campestris*) is located on the edges of Osa Meadow and is addressed here as a plant of local concern. Kern River Daisy (*Erigeron multiceps*), Tulare cryptantha (*Cryptantha incana*), and gray-leaved violet (*Viola pinetorum* var. *grisea*) are found at elevations or habitats that would not be affected by this project and were not further addressed. 73 other plant species were also considered in the Plant Biological Evaluation, but were not analyzed further because the project occurs outside of their range.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

- |  |                          |                                     |                                     |                                     |
|--|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?                 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.                                   | <input type="checkbox"/> | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?  | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?   | <input type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

**Impact Discussion:**

4a) Wildlife- The mountain yellow-legged frog (MYLF) (*Rana muscosa*) is the only special status species (federally endangered) with a “may affect” determination in the Wildlife BA. The full determination is that the project “may affect, not likely to adversely affect” the MYLF. In consultation with the USFWS, the following species were considered, and determined that the project would have “no affect” because the project is outside their range: big horn sheep (*Ovis canadensis sierrae*), Sierra Nevada yellow-legged frog (*Rana sierrae*), Yosemite toad (*Anaxyrus canorus*), Little Kern golden trout (*Onchorhynchus mykiss whitei*), and delta smelt (*Hypomesus transpacificus*). While the project is within the range of the fisher (*Martes pennanti*), the BA concluded a “no affect” determination due to the lack of habitat in and surrounding the project area, and time of year of construction, when noise should not be an issue.

### Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)

#### Direct, and Indirect, and Cumulative Effects on MYLF

In the long term, restoring floodplain connectivity and elevating the stream will have the beneficial effects of restoring habitat connectivity and complexity, and increasing the duration and areal extent of surface water in the meadow, for Kern River rainbow trout and MYLF. While surveys have found no MYLFs in the project area, there is the potential for some short term negative impacts. In the short term, there is a potential for loss of individual MYLFs from crushing or disturbance from the use of heavy equipment. The effect of crushing or disturbing frogs is expected to be minimal due to mitigations detailed below including surveys. The presence of a MYLF in the project area will require USFWS notification, cessation of project work, upstream relocation, and installation of block nets (see Mitigation 4g). There is also the potential for negative effects to MYLF (and the entire ecosystem) from pollution due to an accidental petroleum spill. Due to implementation of mitigations detailed below (Mitigation 4c), the potential to spill petroleum, hydraulic oil, or other fluids into water should be very low. Raising the level of the stream may cause a temporary increase in cumulative sediment movement, particularly during the first year following construction. Mountain yellow-legged frogs can be affected indirectly as a result of sedimentation causing a reduction of macro-invertebrates, which is a MYLF food source. Re-vegetation of the banks of the stream and stabilization of the meadow areas with weed free straw or other native mulch, before winter rains or snows occur should alleviate sediment movement.

4a) Botanical- The project would have no affect (direct, indirect or cumulative) on any plant species listed for protection under the Endangered Species Act, because no such plants occur in, or near, the project area. Three Forest Service sensitive species were addressed in the Biological Evaluation (BE): scalloped moonwort (*Botrychium crenulatum*), Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptridium pygmaeum*). One local interest species was also addressed: Field ivesia (*Ivesia campestris*). The project area has known populations or suitable habitat for each of these species; however, the BE determination for each species is “not likely to result in a trend toward federal listing or loss of species viability.” The rationale for the determination for rockcress and pussypaws is that both species occupy drier upland habitats and would, therefore, only occur on the drier fringes of the meadow where project work would not take place, other than equipment entry. The equipment path follows previously wet areas where there is no history of these species occurring. The scalloped moonwort is known to occur in the wetter, upper portion of the meadow, where no project activity would occur. The ivesia occurs in wet areas on the edges of meadows and seeps. Project work will occur in areas that have been desiccated from the downcut stream channel, so ivesia are not expected to be encountered. New field surveys will be conducted prior to construction to ensure that new or previously undetected populations of any of these species are avoided or transplanted. In the long term, the improved meadow hydrology from the project is expected to expand habitat for both the moonwort and the ivesia.

Potential direct negative effects of the restoration project include trampling of plants during construction by machinery and vehicles, and burying plants during the plugging of the incised channels. Plant surveys prior to construction, and flagging/avoiding plants or transplanting them would avoid this effect. Potential indirect negative effects from the introduction of noxious weeds, could result in competition that eliminates native and sensitive plants. Mitigations detailed below (Mitigation 4i) will eliminate this adverse effect.

4b and c) Effects on riparian habitat and wetlands- The project area to be treated likely had wetland characteristics prior to channel incision. A wetland delineation was completed and concluded that most of the project area is currently classified as non-wetland. The treatment is expected to expand riparian and wetland habitat and improve floodplain function. It is expected that by eliminating the incised channel and allowing the meadow to drain via an existing shallow

### Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)

swale will benefit riparian and wetland habitat. However, some existing riparian and wetland habitat within the incised channel would be affected by construction. All vegetation that would be affected by construction will be removed, stockpiled, and replanted into the expanded habitat areas (Mitigation 4f).

#### 4d) Migration or species movement, or nursery areas

Project activities would occur in late summer or early fall when reproductive activity, use of nursery areas, and aquatic migration is completed for the year. The current disconnection between the incised channel and the floodplain contributes to extended periods of intermittent channel flow. Channel incision increases the rate at which precipitation leaves the meadow, so that the shallow floodplain aquifer does not recharge as frequently as it would without the incision. Restoring flow to the surface of the meadow will improve floodplain aquifer recharge and restore the natural hydrologic cycle of the Osa Meadow ecosystem. Periods and sections of channel subject to intermittent flow are likely to continue, but the overall function of the system, and its resiliency to perturbation would improve.

4e and f) Conflict with policies, ordinances, or plans- The project area is within one mile of the South Sierra Inventoried Roadless Area and the Golden Trout Wilderness. The project is not within, nor would be visible from, these areas. The project area is under consideration for expansion of the wilderness area; however, the project would not conflict with potential future wilderness designation because it would use native materials to restore natural processes.

#### **Mitigation Measures:**

4a. A USFS biologist and/or hydrologist will be present to ensure compliance with all mitigations.

4b. Equipment will remain on road bed as much as possible during construction.

4c. Spill Plan: A spill plan will be in place with absorbent material on hand to mop up any accidental spills. Vehicles will be inspected to make sure all are in good functioning order (no leaks) before being brought to the site. All fueling, maintenance, and staging of equipment and vehicles will occur outside of active stream channels, above the top of the bank, and outside of riparian areas. Heavy equipment and pumps will be checked daily for leaks. Equipment with leaks will not be used until leaks are fixed. Any leaks, drips, or spills shall be immediately controlled to prevent entry into waterways, ditches, or other tributaries to waterways. The operator will have spill control kits on each piece of heavy equipment in order to quickly isolate and collect any spill should it occur.

4d. There will be no equipment use during rain events or soon thereafter. Construction would occur during the driest time of the year to avoid rain and higher stream flows. If significant rain occurs during construction; steps will be taken to control erosion and operations will be temporarily shut down. The project will obtain coverage under the "NPDES General Permit for Construction Activities" through the State Water Resources Control Board.

4e. Limited operating period: Project work will not commence prior to July 15. Construction will occur under hot and dry conditions when the likelihood of migrating frogs is low.

4f. Locally collected native graminoids and willows will be planted along the channel and in high-stress areas. Bare areas will be mulched. Riparian vegetation that would be disturbed by project activities will be removed, conserved, and re-planted. Erosion control fabric will not be used in any of the area to be restored as there is much better success planting native sedges, grasses, or

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

rushes; seeding with native species; and mulching using weed free straw or other native mulch materials.

4g. To protect MYLF, a biologist will survey the site prior to start of work and following rains during project implementation. If MYLF are detected in the work area, USFWS will be notified and project work will cease until the frog is moved out of harm's way. If, at any time, a mountain yellow legged frog is discovered, all work in the immediate area will cease. The frog will be placed in a sterile transport container, photographed for identification purposes, and be relocated upstream to the nearest appropriate habitat. GPS location will be noted for reference. USFWS will be contacted within 24 hours of discovery. If frogs are discovered, blocking nets will be placed to block migrating frogs upstream and downstream of the work area, and the whole area will be surveyed daily for frogs. Therefore, the effect of crushing or disturbing frogs is expected to be discountable.

4h. A botanical survey will be conducted prior to construction. Sensitive plants will be flagged and avoided and/or transplanted. The perimeter of populations of sensitive habitats will be marked with flagging to avoid trampling or impact to the species during project implementation. Construction personnel will be educated on the sensitivity of the species which are to be avoided.

4i. Noxious weed & disease prevention: All equipment will be steam-washed and inspected for noxious weeds and dirt prior to arrival at project site. Vehicles used to transport personnel and materials; personnel clothing and footwear; or any other equipment or hand tools used will be cleaned to remove soil, seed, and plant materials before entering the Forest. Boots and/or waders used by personnel will be decontaminated prior to entry into the meadow to help mitigate the spread of chytrid fungus. Any noxious weed occurrences found during project work will be reported to the Forest Botanist. Only certified weed-free materials may be brought into the site, and only to the minimal extent needed to stabilize bare soil. The project area will be monitored for three years after construction to identify and remove noxious weeds.

**5. CULTURAL RESOURCES** (Information taken from Heritage Resource Survey and Evaluation Report for the Osa Meadow Restoration Project, Oct. 2015. Please note that this report is administratively confidential and is not available for public review.)

**Environmental Setting:** Prior to historic impacts and drought conditions, the landscape would have supported a more lush meadow system than currently exists, with a variety of native foods including plants, fish, and mammals. The meadow was also within the annual "great circuit" sheep drive area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Cause a substantial adverse change in the significance of a archaeological resource as defined in 15064.5?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Disturb any human remains, including those interred outside of formal cemeteries?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Impact Discussion:** A review of heritage resource records, a literature search, and an intensive archaeological field survey significantly larger than the 19-acre project area were conducted. Native American consultation is to be conducted by the Sequoia National Forest. Heritage resource information is confidential, however, a “Finding of No Effect” for the proposed project was made in the Heritage Resource Survey and Evaluation Report.

**Mitigation Measures:**

5a. Archaeological site boundaries near the project work area would be re-flagged and avoided during construction. A project manager on site at all times will ensure the avoidance of sites, and all project personnel would be trained to avoid sites.

5b. An archeologist would be on-site during certain construction activities near sensitive areas.

5c. Although a surface survey has been completed, this does not fully eliminate the chance of subsurface remains within the project boundary. If project ground disturbance exposes a cultural deposit, it is recommended that the disturbance stop until an archaeologist can evaluate the material. In the event that human remains are discovered during project activity, existing law requires that project managers contact the Tulare County Coroner. 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 Section 7050.5, Public Resources Code Section 5097.94 and 5097.98).

**6. GEOLOGY AND SOILS**

Environmental Setting: Osa Meadow is located on the Kern plateau. A Custom Soil Resource Report was obtained from the USDA Natural Resource Conservation Service website for Osa Meadow and the surrounding area. Most of the project area is comprised of Monache variant (drained), with granite-derived, alluvium parent material. The landform setting for this soil type is marshes. The remainder of the project area is Cagwin-Toem rock outcrop complex in a mountain setting and parent material of residuum weathered from granite.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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Would the project:

- a) Expose people or structures to potential substantial adverse

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
effects, including the risk of loss, injury, or death involving:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Strong seismic ground shaking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Seismic-related ground failure, including liquefaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Landslides?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Result in substantial soil erosion or the loss of topsoil?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project area is not located along an earthquake fault. The project area does not occur on a geologic unit or soil that is unstable, or would become unstable, as a result of the proposed activities. The project is located in a meadow floodplain with adjacent gentle slopes covered with timber and rock outcrops. The project would restore floodplain function and reduce ongoing soil erosion from the incised channel and expanding gullies. Project activities would entail the excavation of 5,500 cubic yards of adjacent terrace and other designated supplemental borrow areas to fill the incised channel to allow the meadow to drain via sheet flow in an existing shallow swale. Restoring floodplain function would have a long term beneficial effect on soils by reducing erosion, increasing the frequency of floodplain sediment deposition, and retaining moisture. Prior to the establishment of vegetation, there is a short term potential for negative impacts from soil erosion on newly disturbed areas in the event of significant storms. The following mitigation measures are designed to ensure that soil resources remain on-site.

### Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)

**Mitigation Measures:** 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 (Last Chance Creek, 2002-5; Red Clover/McReynolds, 2006; Long Valley Creek, 2008; etc).

6a. 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 will be 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.

6b. Topsoil and any organic material in the area of excavation will 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 will be cross-ripped to a depth of 12" to restore deep infiltration capacity. Stockpiled topsoil with associated organics and native seed will 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.

6c. All desirable plant material that would be excavated or buried in plugs will be removed and transplanted. Locations of transplants are prioritized according to need for maximum soil protection in bare areas and areas of potentially high stress.

6d. Equipment travel into the project area will be restricted to the designated access route shown on the plan view map. Following construction, routes from the borrow sites to plug areas that may have been compacted by equipment travel will be scarified perpendicular to expected surface water flow and dressed with scattered organic material.

6e. Staging areas and temporary haul routes used during the project will be minimized to minimize soil compaction and disturbance to the greatest extent possible. After construction, they will be sub-soiled, perpendicular to surface flow directions, to the full depth of compaction to restore soil porosity. Areas with residual meadow sod will 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.

6f. 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. Re-vegetation will consist of transplanting as many live plants as possible, planting locally collected native seed at a rate of 15 pounds per acre, and mulching with certified weed-free straw or other local native mulch material.

6g. The project includes 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, so this mitigation requires no further action.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**7. GREENHOUSE GAS EMISSIONS**

**Environmental Setting:** The project is located in a natural setting in a remote area of the Kern River Ranger District. The only greenhouse gas emissions in this area are from normal ecosystem function, and emissions from vehicles engaged in dispersed recreation. This project is part of a proposed greenhouse gas research project in collaboration with the recently formed Sierra Meadow Restoration Research Partnership. The overall objective of the research component of the project is to quantitatively investigate the net greenhouse gas emissions and sequestration associated with mountain meadows. The hypothesis is that re-establishing the hydrologic channel/floodplain connectivity of mountain meadows will increase net carbon sequestration.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
b) Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:**

The project is expected generate estimated vehicle and equipment emissions during design and construction of 37 metric tons (tonnes) of carbon dioxide (CO<sub>2</sub>). Implementation of the project is expected to sequester an estimated 1,254 tonnes of carbon dioxide within the meadow soil, resulting in a net 1,217 tonnes of sequestered CO<sub>2</sub>. The sequestration of carbon in the soil is expected to last in perpetuity, as long as the hydrology of the meadow remains in a functional condition. Expected project effects on nitrous oxide (N<sub>2</sub>O) and methane (CH<sub>4</sub>) are not sufficiently well understood to be quantifiable. The research component of the project is expected to provide quantitative figures on the effects of meadow restoration on these two greenhouse gases, as well as soil CO<sub>2</sub> gas emissions. The expected reduction in CO<sub>2</sub> is based on a conservative estimate of a 50% increase in soil carbon. Restored versus unrestored meadow soil carbon comparisons, conducted by Plumas Corporation and partner agencies in 2010 (see white paper entitled Quantification of Carbon Sequestration Benefits of Restoring Degraded Montane Meadows – Technical Report at [www.plumascorporation.org](http://www.plumascorporation.org) under services, stream and meadow restoration, publications) showed a 100% increase in soil carbon at the restored sites. Existing high altitude and drought conditions at Osa Meadow warrant a conservative 50% reduction in the expected outcome.

**Mitigation Measure:** No mitigation is required.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**8. HAZARDS AND HAZARDOUS MATERIALS**

**Environmental Setting:** The project area is in a natural setting. There are no known hazards, nor hazardous materials, in the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Impair implementation of or physically interfere with an adopted emergency response plan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
or emergency evacuation plan?				
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Impact Discussion:** The project area is not near any residences; therefore, there will be no impacts to residences from the project. The heavy equipment used to construct the project will be fueled with diesel fuel. A spill of this material could be hazardous to the environment. Mitigation measures listed below in Section 9 (Hydrology and Water Quality) ensure that an accidental spill would not harm the environment. While the project area is located in a meadow, 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 will be on site to assist with vegetation transplants and dust control, as well as to reduce the risk of wildfire.

**Mitigation Measures:**

8a. Equipment will be re-fueled and serviced at the designated staging area, which is outside of the riparian area and meadow. No fuel will be stored on-site. In the event of an accidental spill, hazmat materials for quick on-site clean-up will be kept at the project sites during all construction activities and in each piece of equipment. For fire prevention, a trash pump will be on-site.

**9. HYDROLOGY AND WATER QUALITY** [Information partially from the USGS Streamstats website, and the Osa Meadow Restoration Project Hydrology Report and Erosion Control Plan (Attachment 4)]

**Environmental Setting:** Osa Creek is the main channel draining Osa Meadow, a montane meadow at approximately 8,500 feet elevation. The watershed area above the project area is 2.58 square miles with an annual precipitation of 26.6 inches; 40% forested coverage, and 5% impervious area. Osa Creek is a tributary to the North Fork Kern River. The two-year return interval peak flow ranges from 4.4 to 42.6 ft<sup>3</sup>/sec (cfs). The 100-year return interval peak flow could range from 106 to 722 cfs. The meadow was used for seasonal grazing from the late 1800's to 2003. Since the 1940s, numerous attempts have been made to stabilize Osa Creek in Osa Meadow. Check dams installed in the 1970s treated headcut development, but did not treat the water table or cut banks.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Substantially deplete groundwater supplies or interfere substantially	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d) Create or contribute runoff which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Otherwise substantially degrade water quality?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
g) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
h) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
i) Inundation by seiche, tsunami, or mudflow?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

### Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)

**Impact Discussion:** Construction activities associated with the project could have the potential if impacting the water quality of Osa Creek. Potential water quality effects from project-related construction activities can be minimized and reduced through implementation of Best Management Practices (BMPs) and compliance with existing regulatory requirements. The project is expected to improve groundwater supplies and water quality due to restored function of the floodplain. Groundwater recharge and release are expected to improve over existing conditions because the drainage pattern will be re-connected to the floodplain allowing more frequent flood flows to spill onto the floodplain to increase infiltration into the shallow floodplain aquifer. Groundwater recharge would generally occur in conjunction with precipitation in the winter and spring with negligible effects on any downstream uses. Typically, in functional and restored meadows, the floodplain aquifer continues to drain (albeit, more slowly than in the degraded condition) through the summer, and provides groundwater recharge to the channel until surface and subsurface inflows to the meadow resume in fall. The project would have a negligible overall effect on water supply in the seven square mile Osa Creek watershed. The improved vegetative vigor on the floodplain is expected to improve infiltration by improving soil porosity and filtering out sediments entrained in overland flow. Water temperatures would be reduced via improved exchange between cooler groundwater and surface water. Water quality is expected to improve via improved filtration and fine soil deposition on the floodplain, and reduced water temperatures. There is a potential for an increase in sediment to Osa Creek if soil particles are entrained from bare ground via overland flow. The following mitigation measures, and those discussed under Soils and Geology would minimize sedimentation in the first year after construction.

#### **Mitigation Measures:**

Best Management Practices (BMPs), as described in this document, have been effective in protecting beneficial uses of water within the affected watersheds. These practices have been applied to other projects on the Sequoia National Forest. Where proper BMP implementation has occurred there have not been any substantive adverse impacts to beneficial uses. The practices specified herein are expected to be equally effective in maintaining the identified beneficial uses. The following management requirements are designed to address the watershed management concerns. All of the BMPs are from the Forest Service publication "Water Quality Management Handbook" (*R5 FSH 2509.22 – Soil and Water Conservation Handbook, Chapter 10 – Water Quality Management Handbook. 2011.*).

**BMP 2.13 Erosion Control Plan:** Implementation of this BMP is required since the restoration site is greater than 50 square feet located in a riparian area and wheeled or tracked equipment will be utilized for construction. This plan is further discussed in detail under Appendix A of the hydrology report.

**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 2.11 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 will be located a minimum of 100 feet away from the meadow edge. Site specific locations for equipment fueling will 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 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

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

reflect state-of-the-art techniques and have been chosen to custom fit the unique hydrologic, physical, biological, and climatic characteristics of Osa Meadow. The proposed design for restoration of Osa 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 will 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. Please refer to the SPCC for further information regarding pollutants and their associated spill plan design for this project.

**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 the particular watershed. This BMP is implemented through establishment of Stream Condition Inventory (SCI) site prior to project implementation to establish a pre-project condition.

**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 watershed area analysis and are summarized in the attached hydrology report.

**10. LAND USE AND PLANNING**

**Environmental Setting:** The project site is within the National Forest in a remote area, and within one mile of the Golden Trout Wilderness and the South Sierra Inventoried Roadless Area. The site is primarily used for dispersed recreation. The site has potential for timber management use as well.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**Impact Discussion:** Project activities will not alter any existing land uses or any land uses under consideration in the Draft Revised Management Plan for the Sequoia National Forest. The primary current land use is dispersed recreation. Both wilderness designation and timber management are being considered in the Draft Revised Plan. There are no other known plans for the project area. There is no established community in, or close, to the project sites.

**Mitigation Measures:** No mitigation required.

**11. MINERAL RESOURCES**

**Environmental Setting:** There are no known mineral resources in or near the project sites.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** There are no known mineral resources in or near the project area, so there will be no impact on mineral resources in, or near, the project area.

**Mitigation Measures:** No mitigation required.

**12. NOISE**

**Environmental Setting:** The project is within a natural setting, with occasional bird song, and vehicles passing on the nearby road. There are no sources of noise in, or near, the project area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The restoration project will require construction with heavy equipment. There will be temporary noise during project construction, which is expected to last two weeks. Noise easily disperses in the open meadow environment. Once the work is completed, the area will revert to its natural state with no sources of noise other than those already existing from dispersed recreation vehicles.

**Mitigation Measures:** No mitigation required.

**13. POPULATION AND HOUSING**

**Environmental Setting:** There is no housing near the project site.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
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Would the project:

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** This meadow restoration project, in this remote location, would not affect population or housing in any way.

**Mitigation Measures:** No mitigation required.

**14. PUBLIC SERVICES**

**Environmental Setting:** The project is within a natural setting. No public services are available in the area.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Police protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Schools?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Parks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Other public facilities?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project is a restoration project in a natural setting, and would not affect populations or public services.

**Mitigation Measures:** No mitigation required.

**15. RECREATION**

**Environmental Setting:** The project is located on public National Forest land, and is occasionally used for dispersed recreation such as hunting, camping, and OHV touring. The meadow is accessible by foot, with 20S25 as the nearest road. There is also a single-track recreation vehicle trail adjacent to the meadow (34E02).

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project does not include recreational facilities, nor would it lead to a need for recreational facilities. The project is not expected to increase recreational use of the area, because the primary character of the area, open meadow, would not change. The recreational trail will undergo minimal tree removal to allow heavy equipment passage for access to the meadow (one time each, in and out), although, the character of the trail will not change.

**Mitigation Measures:** No mitigation required.

**16. TRANSPORTATION/TRAFFIC**

**Environmental Setting:** The surrounding area is occasionally used for dispersed recreation such as hunting, camping, and OHV touring. The meadow is accessible by foot, with 20S25 as the nearest road. There is also a single-track recreation vehicle trail adjacent to the meadow (34E02). The 20S25 road is not a primary route to any destination.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed the capacity of the existing circulation system, based on an applicable measure of effectiveness (as designated in a general plan policy, ordinance, etc.), taking into account all relevant components of the circulation system, including but limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Result in inadequate emergency access?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project would not affect the existing capacity of the transportation system near Osa Meadow. The project would not affect air transportation, as there is no airfield near the project sites. The project would not change the nature of travel in the area, and therefore, would not increase hazardous conditions or affect emergency access. There are no alternative transportation plans that affect the project area because of its natural setting and low use.

**Mitigation Measures:** No mitigation required.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**17. UTILITIES AND SERVICE SYSTEMS**

**Environmental Setting:** The project area is within a natural setting with no utilities or service systems.

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
d) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
e) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
f) Comply with federal, state, and local statutes and regulations related to solid waste?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project is a restoration project that will not affect utilities, as none exist in this uninhabited area.

**Mitigation Measures:** No mitigation required.

**Section 3 - INITIAL STUDY AND CHECKLIST DISCUSSION (Continued)**

**18. MANDATORY FINDINGS OF SIGNIFICANCE**

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporation	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable " means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**Impact Discussion:** The project is a restoration project in a natural setting, in a 2.58 square mile watershed, within the seven square mile Osa Creek watershed. Upstream effects are naturally cumulative in a stream system; however, there would be no adverse cumulative effects on Osa Creek. The project is expected to have beneficial indirect effects on downstream stream flows and water quality. Implementation of the project would result in improved watershed function. Details of the project's short and long-term impacts (positive and negative) are discussed above, particularly in sections 4, 6, and 9 that discuss biological resources, geology and soils, and hydrology and water quality, respectively. In the short term, project construction would involve ground disturbance. Best management practices, standard operating procedures, and project-specific mitigation measures described in this initial study would ensure that resources are protected, and that there would be no significant impacts during the construction phase of the project or in the long term. Because of the remote location and infrequent use, there would be no impact on humans.

**SECTION 4: PROPOSED MITIGATED NEGATIVE DECLARATION  
PURSUANT TO THE TITLE 14, CALIFORNIA CODE OF REGULATIONS  
SECTION 15000, et seq.**

PROJECT TITLE: Osa Meadow Restoration Project

LEAD AGENCY: Central Valley Regional Water Quality Control Board

APPLICANT: Sequoia National Forest, Kern River Ranger District

**PROJECT DESCRIPTION:**

Sequoia National Forest, Kern River Ranger District (hereinafter Discharger) will restore channel/floodplain connectivity and function of the incised reaches of Osa Meadow, approximately 19 acres of the 55-acre meadow area, by filling the incised channel/gully to restore the base level of the channel to the historic meadow elevation. The project is part of a proposed greenhouse gas research project in collaboration with the Sierra Meadow Restoration Research Partnership. The project area is being monitored before and after restoration for greenhouse gas emissions, soil carbon sequestration, groundwater levels, and vegetation.

**PROJECT LOCATION:**

The project site is located in the Sequoia National Forest, Kern River Ranger District in Tulare County.

**MITIGATION MEASURES:**

This subsection includes the full text of project-specific mitigation measures identified in the Initial Study/Proposed Mitigated Negative Declaration.

**Mitigation Measures to Protect Biological Resources (Section 4):**

4a. A USFS biologist and/or hydrologist will be present to ensure compliance with all mitigations.

4b. Equipment will remain on road bed as much as possible during construction.

4c. Spill Plan: A spill plan will be in place with absorbent material on hand to mop up any accidental spills. Vehicles will be inspected to make sure all are in good functioning order (no leaks) before being brought to the site. All fueling, maintenance, and staging of equipment and vehicles will occur outside of active stream channels, above the top of the bank, and outside of riparian areas. Heavy equipment and pumps will be checked daily for leaks. Equipment with leaks will not be used until leaks are fixed. Any leaks, drips, or spills shall be immediately controlled to prevent entry into waterways, ditches, or other tributaries to waterways. The operator will have spill control kits on each piece of heavy equipment in order to quickly isolate and collect any spill should it occur.

4d. There will be no equipment use during rain events or soon thereafter. Construction would occur during the driest time of the year to avoid rain and higher stream flows. If significant rain occurs during construction; steps will be taken to control erosion and operations will be temporarily shut down. The project will obtain coverage under the "NPDES General Permit for Construction

## Section 4 - PROPOSED MITIGATED NEGATIVE DECLARATION (Continued)

Activities” through the State Water Resources Control Board.

4e. Limited operating period: Project work will not commence prior to July 15. Construction will occur under hot and dry conditions when the likelihood of migrating frogs is low.

4f. Locally collected native graminoids and willows will be planted along the channel and in high-stress areas. Bare areas will be mulched. Riparian vegetation that would be disturbed by project activities will be removed, conserved, and re-planted. Erosion control fabric will not be used in any of the area to be restored as there is much better success planting native sedges, grasses, or rushes; seeding with native species; and mulching using weed free straw or other native mulch materials.

4g. To protect MYLF, a biologist will survey the site prior to start of work and following rains during project implementation. If MYLF are detected in the work area, USFWS will be notified and project work will cease until the frog is moved out of harm's way. If, at any time, a mountain yellow legged frog is discovered, all work in the immediate area will cease. The frog will be placed in a sterile transport container, photographed for identification purposes, and be relocated upstream to the nearest appropriate habitat. GPS location will be noted for reference. USFWS will be contacted within 24 hours of discovery. If frogs are discovered, blocking nets will be placed to block migrating frogs upstream and downstream of the work area, and the whole area will be surveyed daily for frogs. Therefore, the effect of crushing or disturbing frogs is expected to be discountable.

4h. A botanical survey will be conducted prior to construction. Sensitive plants will be flagged and avoided and/or transplanted. The perimeter of populations of sensitive habitats will be marked with flagging to avoid trampling or impact to the species during project implementation. Construction personnel will be educated on the sensitivity of the species which are to be avoided.

4i. Noxious weed & disease prevention: All equipment will be steam-washed and inspected for noxious weeds and dirt prior to arrival at project site. Vehicles used to transport personnel and materials; personnel clothing and footwear; or any other equipment or hand tools used will be cleaned to remove soil, seed, and plant materials before entering the Forest. Boots and/or waders used by personnel will be decontaminated prior to entry into the meadow to help mitigate the spread of chytrid fungus. Any noxious weed occurrences found during project work will be reported to the Forest Botanist. Only certified weed-free materials may be brought into the site, and only to the minimal extent needed to stabilize bare soil. The project area will be monitored for three years after construction to identify and remove noxious weeds.

Mitigation Measures to protect cultural resources (Section 5):

5a. Archaeological site boundaries near the project work area would be re-flagged and avoided during construction. A project manager on site at all times will ensure the avoidance of sites, and all project personnel would be trained to avoid sites.

5b. An archeologist would be on-site during certain construction activities near sensitive areas.

5c. Although a surface survey has been completed, this does not fully eliminate the chance of subsurface remains within the project boundary. If project ground disturbance exposes a cultural deposit, it is recommended that the disturbance stop until an archaeologist can evaluate the material. In the event that human remains are discovered during project activity, existing law

#### **Section 4 - PROPOSED MITIGATED NEGATIVE DECLARATION (Continued)**

requires that project managers contact the Tulare County Coroner. 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 Section 7050.5, Public Resources Code Section 5097.94 and 5097.98).

Mitigation Measures to protect geology and soils (Section 6):

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 (Last Chance Creek, 2002-5; Red Clover/McReynolds, 2006; Long Valley Creek, 2008; etc).

6a. 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 will be 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.

6b. Topsoil and any organic material in the area of excavation will 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 will be cross-ripped to a depth of 12" to restore deep infiltration capacity. Stockpiled topsoil with associated organics and native seed will 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.

6c. All desirable plant material that would be excavated or buried in plugs will be removed and transplanted. Locations of transplants are prioritized according to need for maximum soil protection in bare areas and areas of potentially high stress.

6d. Equipment travel into the project area will be restricted to the designated access route shown on the plan view map. Following construction, routes from the borrow sites to plug areas that may have been compacted by equipment travel will be scarified perpendicular to expected surface water flow and dressed with scattered organic material.

6e. Staging areas and temporary haul routes used during the project will be minimized to minimize soil compaction and disturbance to the greatest extent possible. After construction, they will be sub-soiled, perpendicular to surface flow directions, to the full depth of compaction to restore soil porosity. Areas with residual meadow sod will 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.

## Section 4 - PROPOSED MITIGATED NEGATIVE DECLARATION (Continued)

6f. 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. Re-vegetation will consist of transplanting as many live plants as possible, planting locally collected native seed at a rate of 15 pounds per acre, and mulching with certified weed-free straw or other local native mulch material.

6g. The project includes 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, so this mitigation requires no further action.

Mitigation Measures to protect the environment from hazards and hazardous materials (Section 8):

8a. Equipment will be re-fueled and serviced at the designated staging area, which is outside of the riparian area and meadow. No fuel will be stored on-site. In the event of an accidental spill, hazmat materials for quick on-site clean-up will be kept at the project sites during all construction activities and in each piece of equipment. For fire prevention, a trash pump will be on-site.

Mitigation Measures to protect hydrology and water quality (Section 9):

Best Management Practices (BMPs), as described in this document, have been effective in protecting beneficial uses of water within the affected watersheds. These practices have been applied in other projects on the Sequoia National Forest. Where proper BMP implementation has occurred there have not been any substantive adverse impacts to beneficial uses. The practices specified herein are expected to be equally effective in maintaining the identified beneficial uses. The following management requirements are designed to address the watershed management concerns. All of the BMPs are from the Forest Service publication "Water Quality Management Handbook" (*R5 FSH 2509.22 – Soil and Water Conservation Handbook, Chapter 10 – Water Quality Management Handbook. 2011.*).

BMP 2.13 Erosion Control Plan: Implementation of this BMP is required since the restoration site is greater than 50 square feet located in a riparian area and wheeled or tracked equipment will be utilized for construction. This plan is further discussed in detail under Appendix A of the hydrology report.

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 2.11 Equipment Refueling and Servicing: This BMP prevents pollutants such as fuels, lubricants, bitumen 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 will be located a minimum of 100 feet away from the meadow edge. Site specific locations for equipment fueling will 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 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 Osa Meadow. The proposed design for

## **Section 4 - PROPOSED MITIGATED NEGATIVE DECLARATION (Continued)**

restoration of Osa 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 will 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. Please refer to the SPCC for further information regarding pollutants and their associated spill plan design for this project.

**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 the particular watershed. This BMP is implemented through establishment of Stream Condition Inventory (SCI) site prior to project implementation to establish a pre-project condition.

**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 watershed area analysis and are summarized in the attached hydrology report.

### **Monitoring & Reporting**

Monitoring is a means to determine if conditions in Osa Meadow are meeting or moving toward the desired conditions. Extensive surveys have been conducted to document the existing conditions within the meadow and stream channel. Amphibian surveys were performed in 2010, and again in 2015. Additional monitoring would take place immediately after the project is implemented and annually for five years to document the effectiveness of the project. This monitoring would be conducted by Kern River Ranger District staff and project partners, and include: ground water, carbon sequestration/greenhouse gas emissions, sedimentation, planted vegetation success or mortality, noxious weeds, the integrity of the restoration, and the presence of new headcuts.

During construction, Plumas Corporation staff would be on-site continuously, and responsible for ensuring that Best Management Practices are followed, mitigations measures are implemented, and water quality leaving the project area is sampled (in the event of surface water during construction). Once the project is completed, a report on construction will be sent to the funding agency and to any permitting agencies that require it. The report will outline how environmental protection requirements were met.

### **PROPOSED FINDING:**

Based on the Initial Study prepared for the project, the California Regional Water Quality Control Board, Central Valley Region, has determined that potential project impacts on the environment would be mitigated to a less than significant level through incorporation of mitigation measures and therefore, the preparation of an Environmental Impact Report is not required. A copy of the Initial Study is attached.

**Section 4 - PROPOSED MITIGATED NEGATIVE DECLARATION (Continued)**

Any person may object to dispensing with such Environmental Impact Report or respond to the findings herein. If there is no response within 30 days, this Board will assume that there are no comments and the Mitigated Negative Declaration will be adopted. Information relating to the proposed project is on file in the office of the department identified below, at the address shown below. Any person wishing to examine or obtain a copy of that information or this document, or seeking information as to the time and manner to so object or respond, may do so by inquiring at said office during regular business hours.

California Regional Water Quality Control Board  
Central Valley Region  
1685 E Street, Fresno, CA 93706  
(559) 445-5116

  
\_\_\_\_\_  
LONNIE WASS  
Supervising Engineer

3/28/2016  
Date

# SECTION 5: NOTICE OF COMPLETION

## Notice of Completion & Environmental Document Transmittal

Mail to: State Clearinghouse, P.O. Box 3044, Sacramento, CA 95812-3044 (916) 445-0613  
 For Hand Delivery/Street Address: 1400 Tenth Street, Sacramento, CA 95814

<b>SCH #</b>
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**Project Title:** Osa Meadow Restoration Project

Lead Agency: Central Valley Regional Water Quality Control Board Contact Person: Debra Mahnke  
 Mailing Address: 1685 E Street Phone: 559-445-6281  
 City: Fresno Zip: 93706 County: Fresno

**Project Location:** County: Tulare City/Nearest Community: Kernville  
 Cross Streets: Forest Route 20S25 Zip Code: \_\_\_\_\_  
 Longitude/Latitude (degrees, minutes and seconds): 118 ° 18 ' 20.5 " N / 36 ° 10 ' 51.2 " W Total Acres: 19  
 Assessor's Parcel No.: N/A Section: 16 & 17 Twp.: 20S Range: 34E Base: MD BLM  
 Within 2 Miles: State Hwy #: \_\_\_\_\_ Waterways: Osa Creek  
 Airports: \_\_\_\_\_ Railways: \_\_\_\_\_ Schools: \_\_\_\_\_

**Document Type:**

CEQA:  NOP  Draft EIR NEPA:  NOI Other:  Joint Document  
 Early Cons  Supplement/Subsequent EIR  EA  Final Document  
 Neg Dec (Prior SCH No.)  Draft EIS  Other: \_\_\_\_\_  
 Mit Neg Dec Other: \_\_\_\_\_

**Local Action Type:**

General Plan Update  Specific Plan  Rezone  Annexation  
 General Plan Amendment  Master Plan  Prezone  Redevelopment  
 General Plan Element  Planned Unit Development  Use Permit  Coastal Permit  
 Community Plan  Site Plan  Land Division (Subdivision, etc.)  Other: \_\_\_\_\_

**Development Type:**

Residential: Units \_\_\_\_\_ Acres \_\_\_\_\_  
 Office: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_  Transportation: Type \_\_\_\_\_  
 Commercial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_  Mining: Mineral \_\_\_\_\_  
 Industrial: Sq.ft. \_\_\_\_\_ Acres \_\_\_\_\_ Employees \_\_\_\_\_  Power: Type \_\_\_\_\_ MW \_\_\_\_\_  
 Educational: \_\_\_\_\_  Waste Treatment: Type \_\_\_\_\_ MGD \_\_\_\_\_  
 Recreational: \_\_\_\_\_  Hazardous Waste: Type \_\_\_\_\_  
 Water Facilities: Type \_\_\_\_\_ MGD \_\_\_\_\_  Other: Meadow Restoration Project

**Project Issues Discussed in Document:**

<input checked="" type="checkbox"/> Aesthetic/Visual	<input type="checkbox"/> Fiscal	<input checked="" type="checkbox"/> Recreation/Parks	<input checked="" type="checkbox"/> Vegetation
<input checked="" type="checkbox"/> Agricultural Land	<input checked="" type="checkbox"/> Flood Plain/Flooding	<input type="checkbox"/> Schools/Universities	<input checked="" type="checkbox"/> Water Quality
<input checked="" type="checkbox"/> Air Quality	<input checked="" type="checkbox"/> Forest Land/Fire Hazard	<input type="checkbox"/> Septic Systems	<input checked="" type="checkbox"/> Water Supply/Groundwater
<input checked="" type="checkbox"/> Archeological/Historical	<input checked="" type="checkbox"/> Geologic/Seismic	<input type="checkbox"/> Sewer Capacity	<input checked="" type="checkbox"/> Wetland/Riparian
<input checked="" type="checkbox"/> Biological Resources	<input checked="" type="checkbox"/> Minerals	<input checked="" type="checkbox"/> Soil Erosion/Compaction/Grading	<input type="checkbox"/> Growth Inducement
<input type="checkbox"/> Coastal Zone	<input checked="" type="checkbox"/> Noise	<input type="checkbox"/> Solid Waste	<input checked="" type="checkbox"/> Land Use
<input checked="" type="checkbox"/> Drainage/Absorption	<input checked="" type="checkbox"/> Population/Housing Balance	<input type="checkbox"/> Toxic/Hazardous	<input type="checkbox"/> Cumulative Effects
<input type="checkbox"/> Economic/Jobs	<input checked="" type="checkbox"/> Public Services/Facilities	<input checked="" type="checkbox"/> Traffic/Circulation	<input type="checkbox"/> Other: _____

**Present Land Use/Zoning/General Plan Designation:**

General Forestry

**Project Description:** (please use a separate page if necessary)

Project entails restoring meadow floodplain function by redirecting flow out of an incised channel to into an existing shallow swale flow path on the meadow surface. Flow will be redirected by filling the channel with native plug and rock material.

Note: The State Clearinghouse will assign identification numbers for all new projects. If a SCH number already exists for a project (e.g. Notice of Preparation or previous draft document) please fill in.

Section 5 - Notice of Completion (Continued)

**Reviewing Agencies Checklist**

Lead Agencies may recommend State Clearinghouse distribution by marking agencies below with an "X".  
If you have already sent your document to the agency please denote that with an "S".

- |   |  |
|---|--|
| <input checked="" type="checkbox"/> Air Resources Board                         | <input checked="" type="checkbox"/> Office of Historic Preservation          |
| <input type="checkbox"/> Boating & Waterways, Department of                     | <input type="checkbox"/> Office of Public School Construction                |
| <input type="checkbox"/> California Emergency Management Agency                 | <input checked="" type="checkbox"/> Parks & Recreation, Department of        |
| <input type="checkbox"/> California Highway Patrol                              | <input type="checkbox"/> Pesticide Regulation, Department of                 |
| <input type="checkbox"/> Caltrans District # _____                              | <input type="checkbox"/> Public Utilities Commission                         |
| <input type="checkbox"/> Caltrans Division of Aeronautics                       | <input type="checkbox"/> Regional WQCB # _____                               |
| <input type="checkbox"/> Caltrans Planning                                      | <input checked="" type="checkbox"/> Resources Agency                         |
| <input type="checkbox"/> Central Valley Flood Protection Board                  | <input type="checkbox"/> Resources Recycling and Recovery, Department of     |
| <input type="checkbox"/> Coachella Valley Mtns. Conservancy                     | <input type="checkbox"/> S.F. Bay Conservation & Development Comm.           |
| <input type="checkbox"/> Coastal Commission                                     | <input type="checkbox"/> San Gabriel & Lower L.A. Rivers & Mtns. Conservancy |
| <input type="checkbox"/> Colorado River Board                                   | <input type="checkbox"/> San Joaquin River Conservancy                       |
| <input checked="" type="checkbox"/> Conservation, Department of                 | <input type="checkbox"/> Santa Monica Mtns. Conservancy                      |
| <input type="checkbox"/> Corrections, Department of                             | <input type="checkbox"/> State Lands Commission                              |
| <input type="checkbox"/> Delta Protection Commission                            | <input type="checkbox"/> SWRCB: Clean Water Grants                           |
| <input type="checkbox"/> Education, Department of                               | <input checked="" type="checkbox"/> SWRCB: Water Quality                     |
| <input type="checkbox"/> Energy Commission                                      | <input type="checkbox"/> SWRCB: Water Rights                                 |
| <input checked="" type="checkbox"/> Fish & Game Region # <u>4</u>               | <input type="checkbox"/> Tahoe Regional Planning Agency                      |
| <input checked="" type="checkbox"/> Food & Agriculture, Department of           | <input type="checkbox"/> Toxic Substances Control, Department of             |
| <input checked="" type="checkbox"/> Forestry and Fire Protection, Department of | <input checked="" type="checkbox"/> Water Resources, Department of           |
| <input type="checkbox"/> General Services, Department of                        | <input type="checkbox"/> Other: _____  |
| <input type="checkbox"/> Health Services, Department of                         | <input type="checkbox"/> Other: _____  |
| <input type="checkbox"/> Housing & Community Development                        |  |
| <input checked="" type="checkbox"/> Native American Heritage Commission         |  |

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**Local Public Review Period (to be filled in by lead agency)**

Starting Date 1 April 2016 Ending Date 2 May 2016

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**Lead Agency (Complete if applicable):**

Consulting Firm: <u>Plumas Corporation</u>	Applicant: _____
Address: <u>P.O.Box 3880</u>	Address: _____
City/State/Zip: <u>Quincy, CA 95971</u>	City/State/Zip: _____
Contact: <u>Leslie Mink</u>	Phone: _____
Phone: <u>530-283-3739</u>	

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**Signature of Lead Agency Representative:** *Annice M. Pass* **Date:** 3/20/2016

Authority cited: Section 21083, Public Resources Code. Reference: Section 21161, Public Resources Code.

## **SECTION 6: ATTACHMENTS**

1. 24 July 2015, Decision Memo, Osa Meadow Restoration Project, U.S. Forest Service, Sequoia National Forest
2. 20 July 2015, Sequoia National Forest, Biological Assessment of Osa Meadow Restoration Project
3. 23 July 2015, Osa Restoration Project, Biological Evaluation (Plants)
4. 22 July 2015, Osa Meadow Restoration Project, Hydrology Report and Erosion Control Plan



**DECISION MEMO**  
**OSA MEADOW RESTORATION PROJECT**  
**U.S. FOREST SERVICE**  
**SEQUOIA NATIONAL FOREST**  
**KERN RIVER RANGER DISTRICT**  
**TULARE COUNTY, CA**

**INTRODUCTION**

The Osa Meadow Restoration Project is located near the northern boundary of the Kern River Ranger District, Sequoia National Forest (Map 1). Access is via the East Beach Creek Road (FS Road 20S25) off of the Blackrock Road (FS Road 21S03). The restoration area is located on the Kern Plateau in the southwest quarter of Section 16 and southeast quarter of Section 17, Township 20 South, Range 34 East, Mount Diablo Base Meridian, within the Soda Creek-Kern River HUC12 watershed (HUC12# 180300010404). The affected project area (i.e., the area that will be physically manipulated as part of the restoration) will be approximately 19 acres within the 55 acre Osa Meadow proper, but the restoration benefit (e.g., elevation of the ground water table) is expected to restore 30 to 40 acres of meadow.

The Forest Service is implementing the Osa Meadow Restoration Project (Osa Project) for watershed improvement along a portion of Osa Creek in Osa Meadow. The Osa Project would improve hydrologic and ecological function; improve conditions so overbank flows can access the entire meadow; and enhance meadow vegetative and aquatic species while creating a sustainable recreation experience.

Restoration treatment focuses on reconnecting the stream channel to its naturally-evolved floodplain. The project would provide the following ecosystem benefits: 1) increase the wetted areal extent of the meadow, 2) reduce peak flows and increase/extend summer baseflows, 3) increase in-stream cover and shading, 4) enhance aquatic and terrestrial habitat, 5) improve water quality, and 6) raise the local groundwater level within the meadow.

Previously installed rock structures have effectively stopped or slowed the down-cutting of the stream and reduced bank erosion, however the stream channel remains downcut, with high width-depth ratios (too wide to transport sediment) and subsequently flood flows are not able to access the floodplain or meadow uplands. The streambed elevation and associated water table in the meadow is approximately 2.5- 4.0 feet lower than the historic floodplain and is currently draining the meadow of groundwater. Conditions on the natural (remnant) floodplain and upland meadow terraces currently favor dry plant communities. These areas were once occupied by wet meadow vegetative species and are at risk of being lost as the plant communities convert to dry site species. The lowering of the water table has led to encroachment of upland plants such as lodgepole pine and sage. Roughly 70% of the meadow area is at risk of conversion to non-meadow habitat.

The 2002 McNally Fire burned over 150,000 acres on the forest and included headwaters surrounding Osa Meadow. The fire was followed by a rainstorm event in November of 2002, which dropped twenty inches of rain in a twenty-four hour period. The combination of the past gullying, 2002 McNally Fire, and the November storm increased down-cutting (and de-watering) in Osa Meadow.

Because montane meadows like Osa serve a vital role as water storage and release systems, it is essential that the hydrologic function of Osa Meadow be restored such that water storage and residence time is maximized, improving water quality and increasing annual water availability to riparian-aquatic systems.

Restoring hydrologic function and floodplain connectivity in Osa Meadow is necessary to meet the desired condition as set forth in the Sequoia National Forest Land and Resources Management Plan (SQF-LRMP USDA, 1988), as amended by the Mediated Settlement Agreement (SQF-MSA) and the Sierra Nevada Forest Plan Amendment ROD (SNFPA USDA, 2004). Guidance Includes:

- SQF-LRMP B1 (p.4-3): Maintain or improve long term soil productivity.
- SQF-LRMP B4 (p.4-4): Emphasize protection management and improvement of riparian areas during the planning and implementation of land and resource management activities along stream courses on the forest.
- SQF-LRMP C3n3 (p. 4-9): Meadows will be managed to a fair and better condition and to maintain their existing acreage and restore any that have been damaged. Trails will be rerouted away from meadows where unacceptable damage is occurring. On the meadow edge, large tree character and a diverse environment of structural “edge” effects will be provided.
- SQF-MSA Exhibit D (p.9): “...Plans will be developed from prioritized WINI inventories to re-establish hydrologic characteristics and riparian habitat...”
- SNFPA RCO#2-105 (p.64): At either the landscape or project scale, determine if the age class, structural diversity, composition and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.
- SNFPA RCO#6-122 (p.66): Recommend restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered ground water tables, or (3) areas that are either actively down cutting or that have historic gullies. Identify other management practices, for example, road building, recreational use, grazing, and timber harvests that may be contributing to the observed degradation.

## DECISION

I have decided to implement the Osa Project, as described below. This project proposes four activities:

1. Fill the incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from an adjacent Holocene terrace.
2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6” dbh) encroaching lodgepole pine along southern periphery of the meadow.

## BACKGROUND

Osa Meadow and many meadows in the neighboring watersheds (e.g., Little Horse, Coppersmith, Dead Dog) share similar hydrogeomorphic characteristics, of which overland or “sheet” flow is the dominate hydrological mechanism by which water moves. Small single thread channels and broad swales can be present, but are often discontinuous. Much of Osa Meadow is believed to have operated as an overland flow system, but grazing stressors during the turn-of-the-century removed most of the vegetation, causing concentrated flow and the development of a single thread channel. With the reduction in vegetative surface armor, any small channel, livestock trail, or other bare linear feature could begin to ‘etch’ channels that did not exist prior to the 1850’s. Despite having small drainage areas, these etched features could gradually deepen and widen to the incised conditions that exist today with negative effects on meadow hydrology and meadow dependent species. Although historic grazing is thought to be the initial stressor, cumulative effects from road building, fire, and other landscape activities have exacerbated the impacts.

## GULLY CHANNEL FILL

Surveys show that the channel in Osa Meadow has down-cut in at least two stages causing the development of an inset floodplain or gully. Currently, water flowing in the channel cannot reach the inset floodplain much less the natural remnant floodplain that existed before the system began to down-cut. The objective of the gully channel fill restoration, therefore, is to reconnect overland flow to the natural floodplain.

To reconnect the natural floodplain, barrow material will be “scalped” from an adjacent Holocene terrace and used to fill the channel and inset floodplain (gully) to the elevation of the natural remnant floodplain (Map 2). The Holocene terrace will only be lowered to the elevation of the natural floodplain; no “ponds” will be excavated to accommodate barrow material. This will have the benefit of increasing the floodplain area and decreasing the depth to ground water in the barrow site (Map 2), thus increasing the wetted perimeter of the meadow. This type of restoration method was recommended by Cooper and Wolf (2006) for Halstead Meadow in Sequoia National Park.

Approximately 5,500 cubic yards of barrow material will be moved from the Holocene terrace to fill the gully. Additional contingency barrow sites have been identified if more material is needed (Map 2). The barrow material will be moved by a loader and tracked excavator. Equipment will only enter the meadow in late summer/early fall when the soil moisture conditions are the lowest seasonally, thus reducing the possibility of adverse compaction and impacts to soil productivity.

## **VALLEY GRADE CONTROL STRUCTURE**

Rock used in previous restoration efforts will be re-purposed to build the valley grade-control structure. This structure is designed to buttress and maintain the respective grade (i.e., elevation) of the restoration network, allowing for a seamless transition of the new meadow gradient to the existing channel at the downstream end of the project. The structure will accommodate the passage of flows, but would prevent further down-cutting and degradation of the meadow (Map 2).

## **SUPPLEMENTAL REVEGETATION**

Native willows would be live-staked throughout the restoration area. Sod, rushes, and sedges, established in the gully bottom or barrow areas will be stockpiled and transplanted in the disturbance areas and the gully fill corridor. Wood material, though limited, would be used for large woody debris (LWD) and added surface roughness in key areas. The willows and propagating meadow vegetation will help stabilize the fill areas.

## **ENCROACHING CONIFER REMOVAL**

Approximately 2 acres of small (<6" dbh) encroaching lodgepole pine will be removed along the southern periphery of the meadow. The conifers will be removed by hand using chainsaws, hand saws, and/or loppers. The slash will be left in place or placed in the restoration area to increase surface roughness and decrease water velocities to prevent rilling.

### **Monitoring:**

Monitoring is a means to determine if conditions in Osa Meadow are meeting or moving toward the desired conditions. Extensive surveys have been conducted to document the existing conditions within the meadow and stream channel. Amphibian surveys were performed in 2001, 2011, and again in 2015. Additional monitoring would take place immediately after the project is implemented and annually for five years to document the effectiveness of the project. This monitoring would include ground water, carbon sequestration/GHG emissions, sedimentation, planted vegetation success or mortality, noxious weeds, the integrity of the installed structures, and the presence of new headcuts.

This action is categorically excluded from documentation in an environmental impact statement (EIS) or an environmental assessment (EA). I have reviewed the resource conditions pertaining to extraordinary circumstances (see below), including associated reports, and have determined that no extraordinary circumstances exist that would preclude use of categorical exclusion in accordance with Council on Environmental Quality regulations at 40 CFR 1508.4. The project, as designed, will have no adverse effect on the natural or human environment.

The decision meets the requirements found at 36 CFR 220.6 – Categorical Exclusions. Specifically, the project meets Category 36 CFR 220.6(e)(7) and 36 CFR 220.6(e)(18):

- FSH 1909.15 Sec. 32.2 (7) *Modification or maintenance of stream or lake aquatic habitat improvement structures using native materials or normal practices* (36 CFR 220.6 (e)(7)).

This category of action(s) is applicable because this project will modify stream aquatic habitat improvement structures by using native materials and normal practices to establish an overland flow condition in the meadow;

and

- FSH 1909.15 Sec. 32.2 (18) *Restoring wetlands, streams, riparian areas or other water bodies by removing, replacing, or modifying water control structures such as, but not limited to, dams, levees, dikes, ditches, culverts, pipes, drainage tiles, valves, gates, and fencing, to allow waters to flow into natural channels and floodplains and restore natural flow regimes to the extent practicable where valid existing rights or special use authorizations are not unilaterally altered or canceled.* (36 CFR 220.6 (e)(18)).

This category of action(s) is applicable because this project will reconnect the meadow's overland flow regime to its naturally-evolved floodplain, improve hydrologic function; improve conditions so overbank flows can access the entire meadow; help restore flow regimes and raise the local groundwater level within the meadow.

## EXTRAORDINARY CIRCUMSTANCES

I find that there are no extraordinary circumstances that would warrant further analysis and documentation in an EA or EIS. I took into account resource conditions identified in agency procedures that should be considered in determining whether extraordinary circumstances might exist:

- **Federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species-** This area is within suitable habitat and within the historic range for mountain yellow-legged frogs (MYLF). MYLF surveys were conducted by California Academy of Science in 2000, and the U.S. Forest Service in 2011 and 2015; all surveys showed no individuals occupying the meadow. The design features listed in Appendix A (A1, A2) are mandatory, and will ensure that effects of the project on MYLF habitats and individual are beneficial, and will be documented in all work contracts/agreements. A report to USFWS will be made if any take occurs.

- **Flood plains, wetlands, or municipal watersheds** – There are no municipal watersheds within or affected by the Osa Meadow Restoration. Accomplishment of this project will improve ecological function of the subwatershed. Implementation using mandatory Best Management Practices and other Conservation Measures and monitoring for effectiveness will reduce short and long term negative effects to water quality, floodplains, or wetlands from this project (see Appendix A2).
- **Congressionally designated areas such as wilderness, wilderness study areas, or national recreation areas** –no congressionally designated areas would be affected by the Osa Meadow Restoration. The project is within 1 mile of the Golden Trout Wildernesses, but will not be visible from or affect aesthetic qualities the wilderness.
- **Inventoried roadless areas or potential wilderness areas** –The project is within a mile of the South Sierra Inventoried Roadless Area. This inventoried roadless areas will not be affected by the Osa Project. The project is also within an area being considered in 2015 for potential wilderness designation under the Draft Revised Management Plan for the Sequoia National Forest. It is unknown at this time whether this area will be designated as wilderness in the future. However, once implemented, the meadow restoration activities would not conflict with wilderness designation as they use native materials to restore natural processes.
- **Research natural areas** –There are no research natural areas located nearby, so none will be affected by the Osa Project.
- **American Indians and Alaska Native religious or cultural sites** – The operations covered under the project will not conflict with Native American Indian religious or cultural sites. It is expected that the operations covered under the project will not adversely affect cultural resource values or place restrictions on cultural traditional practices.

**Archaeological sites, or historic properties or areas** – The District Archaeologist completed a review of the project area in 2015 (R2015051354022). The project area is outside of any prehistoric or historic archeological sites. With the resource protection measures in Appendix A3, the Sequoia National Forest determined that no heritage resources will be adversely affected by the proposed restoration activities.

## **PUBLIC INVOLVEMENT**

This action was originally listed as a proposal on the July 1, 2010 Sequoia National Forest Schedule of Proposed Actions and updated periodically during the analysis. Public notification was completed by mail distribution of 119 scoping notices on September 2, 2010. Groups notified included those who have previously expressed environmental concerns, local tribes, residents, other governmental agencies, public officials, media, utilities, the 1990 Mediated Settlement Agreement participants, and off-road enthusiasts.

One comment letter was received, from Rene Voss, attorney for Sequoia ForestKeeper, who expressed environmental concerns. The issues raised included:

- Alternatives- consider an alternative to the plug-and pond technique, such as the method used at Halstead Meadow in the Sequoia National Park
  - NEPA- a full environmental assessment should be completed due to impacts from construction;
- These issues have been addressed by the project or by reference Specialist's Reports.

## FINDINGS REQUIRED BY OTHER LAWS AND REGULATIONS

This decision is consistent with the Sequoia National Forest Land Management Plan as amended by the 1990 Mediated Settlement Agreement. The project was designed in conformance with:

National Historic Preservation Act. The project, as designed, will have no effect on cultural resources. This project complies with the *Programmatic Agreement among the U.S.D.A. Forest Service, Pacific Southwest Region (Region 5), California State Historic Preservation Officer, Nevada State Historic Preservation Officer and the Advisory Council on Historic Preservation Regarding the Processes for Compliance with Section 106 of the National Historic Preservation Act for Management of Historic Properties by the National Forests of the Pacific Southwest Region* (Regional PA).

Report (R2015051354022) identifies that there are sites near, but outside the project area. The project area was completely surveyed in June, 2015 and sites adjacent to the project area were re-recorded. 10-meter buffer areas were established and flagged around site boundaries. The design elements of the project were developed expressly to avoid the sites and buffer zones. Site boundaries for the project were determined by the extent of surficial archaeological deposits. To better ensure avoidance of historic properties, monitoring is additionally prescribed for ground-disturbing work associated with gully fill and installation of the grade control structure at the western side of the project area. Given the design of the project, and avoidance of the buffered site boundaries, the project would not adversely affect historic properties. Design criteria have been developed to protect the known sites from potential adverse impacts of implementing the Osa project (See Appendix A3).

Endangered Species Act. The only endangered species with potential habitat within the project area is the mountain yellow-legged frog. Osa Meadow Restoration "may affect, not likely to adversely affect" mountain yellow-legged frogs. The effects are most likely beneficial effects on habitat based on the findings of the 2015 *Biological Assessment of Osa Meadow Restoration Project*, incorporated by reference. This finding is consistent with the Regional Programmatic Biological Assessment for the three Sierra Amphibians, this BA tiers to the Programmatic BA and is consistent with the USFWS Biological Opinion for the three Sierra amphibians. See section above, *federally listed threatened or endangered species or designated critical habitat, species proposed for Federal listing or proposed critical habitat, or Forest Service sensitive species* (See Appendix A1).

Botanical biological evaluation documents analysis of effects of land disturbance associated with meadow restoration on approximately 19 acres at Osa Meadow on the Kern Plateau. Based on timing, habitat affected and other factors, the project would have no effect on species listed for protection under the Endangered Species Act of 1973, would not cause or contribute to a trend leading to loss of viability or listing for protection under the Endangered Species Act for Forest Service designated sensitive species.

Clean Water Act. The project is in accordance with requirements of the California Central Valley Regional Water Quality Control board to ensure compliance with the California Water Code and the Federal Clean Water Act. Best management practices (BMP's) and Riparian Conservation Objectives have been incorporated into the project and are mandatory for protection of suitable habitat for MYLF (See appendix A2). The 2015 *Osa Meadow Restoration Project Hydrology Report* is incorporated by reference.

National Forest Management Act. This action is consistent with the goals, objectives, and management direction of the 1988 *Sequoia National Forest Land and Resource Management Plan*, as amended by the 2004 *Sierra Nevada Forest Plan Amendment* (2004 SNFPA) supplemental EIS and ROD. This includes being consistent with the Standards and Guidelines for Riparian Conservation Areas (2004 SNFPA ROD p. 62-66). It is also consistent with the 1990 *Sequoia National Forest Land Management Plan Mediated Settlement Agreement*.

Flood Plains and Wetlands (Executive Orders 11988 and 11990). These executive orders require federal agencies to avoid, to the extent possible, short- and long-term effects resulting from occupancy and modifications of floodplains, and the modification or destruction of wetlands. This project should have discountable effects on floodplains/wetlands.

### **ADMINISTRATIVE REVIEW OPPORTUNITIES**

This decision is not subject to Forest Service Regulations at 36 CFR 218.

### **IMPLEMENTATION DATE**

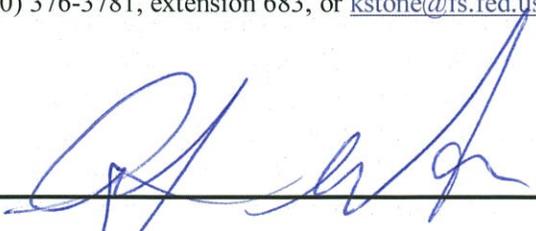
Implementation is expected to begin summer of 2015 and be completed by summer of 2017.

### **CONTACT**

For additional information concerning this decision, contact: Keith Andy Stone, District Hydrologist at (760) 376-3781, extension 683, or [kstone@fs.fed.us](mailto:kstone@fs.fed.us).

ALFRED WATSON  
District Ranger

Date

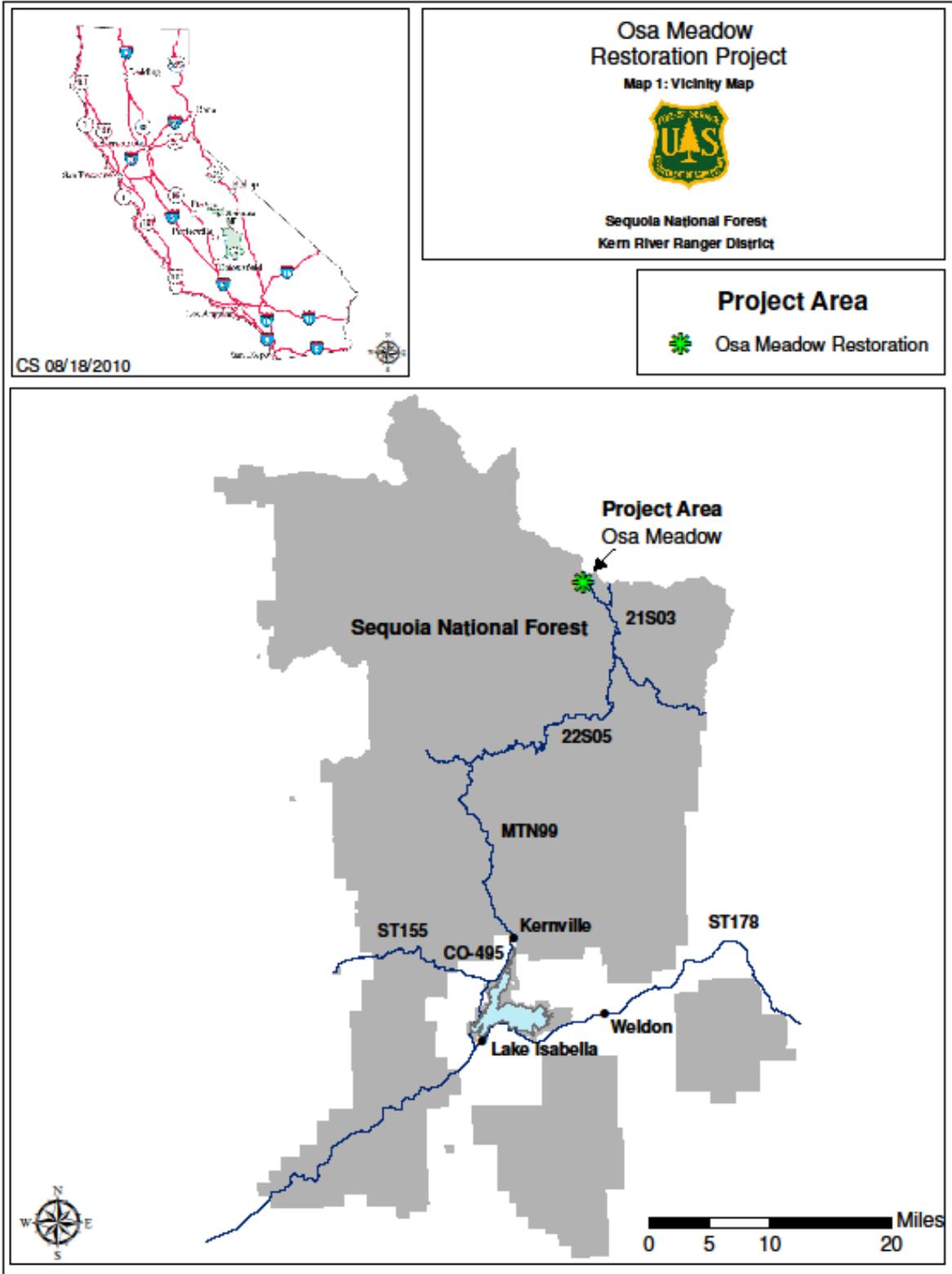
 

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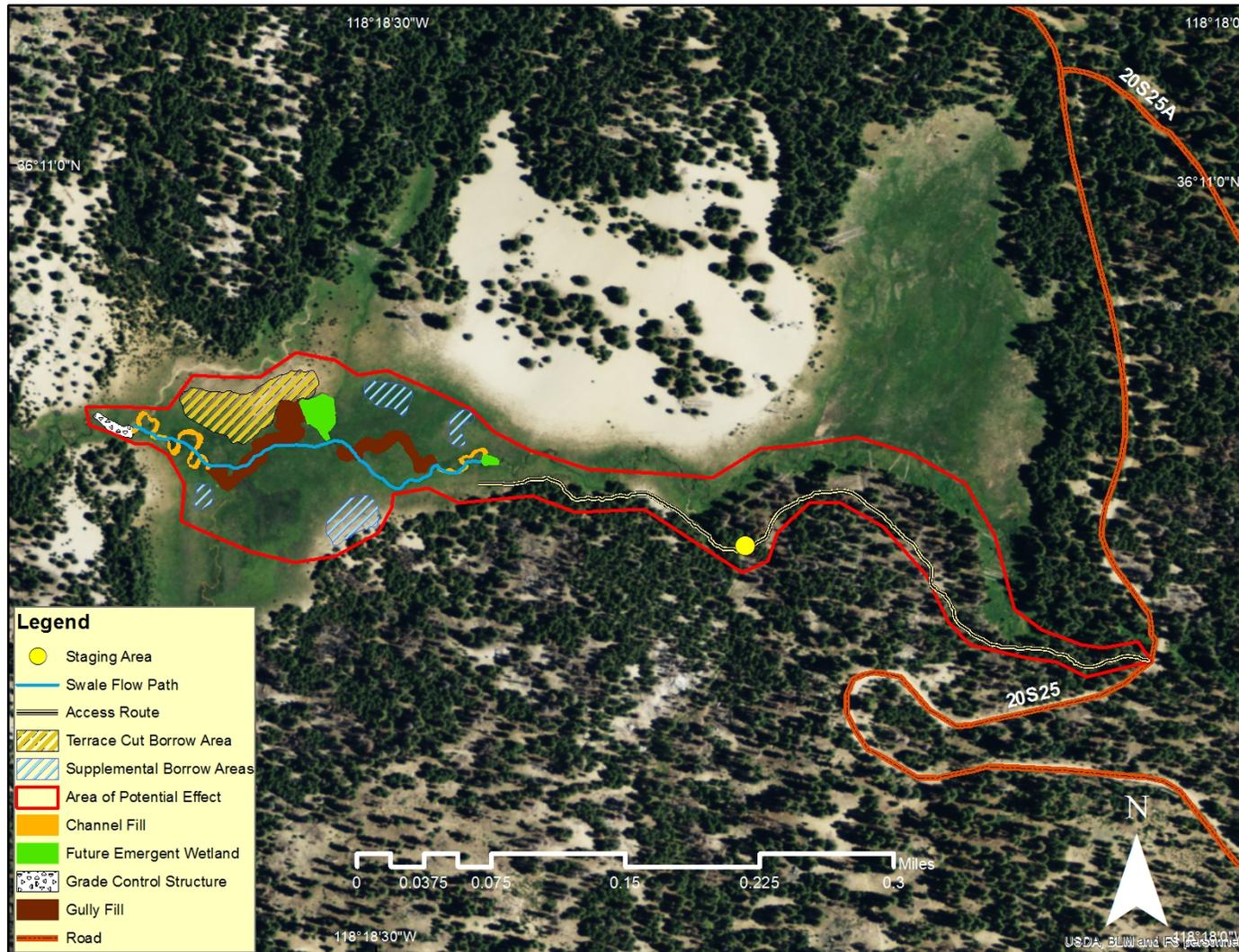
Attached:

Map 1: Project Vicinity

Map 2: Project Area



Map 2. Project Area



— Osa Meadow Restoration Project —

## REFERENCES

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## APPENDIX A: PROJECT DESIGN FEATURES

### A1. AQUATIC AND BOTANICAL SPECIES PROTECTION

Project erosion control measures and Best Management Practices are detailed in the hydrology specialist report and the Erosion Control Plan (Appendix A of the hydrology specialist report).

- A limited operating period will be from May 1 through July 15 when frogs and tadpoles may be present in the system. Construction will occur when the likelihood of migrating frogs is low. Survey for adults or subadults will be made immediately before heavy machinery enters the meadow. Since the area to be restored has been dry since June, 2015 we do not anticipate any subadults or adult frogs in the area.
- All fueling, maintenance, and staging of equipment and vehicles will occur a minimum distance of 100-feet from the meadow (BMP 2.11), a spill plan will be in place with absorbent material on hand to mop up any accidental spills; vehicles will be inspected daily for leaks before being brought to the site and will not be used until leaks are fixed. There will be no equipment use during rain events or soon thereafter.
- Re-vegetation of the banks of the stream the same year and stabilization of the meadow areas with weed free straw before winter rains or snows occur.
- Riparian Conservation Objectives (RCO) Standards and Guidelines Associated with RCO 1, 2, and 4; have been incorporated into the project and are mandatory for protection of Suitable Habitat for MYLF (see detail in 2015 Hydrology Report, Osa Meadow Restoration Project Hydrology Report).
- The effectiveness and success of any Conservation Measures used in mitigating and minimizing adverse effects on MYLF will be analyzed. The Final report on the project will document how well these conservation measures were met.
- All equipment will be washed and inspected for noxious weeds prior to arrival at project area.
- Only certified weed-free erosion control materials will be used, and only to the minimum extent needed to stabilize bare soil.
- Any noxious weed occurrences found during project layout or implementation will be reported to the Forest botanist.

### A2. BEST MANAGEMENT PRACTICES

Best Management Practices, as described in this document, have been effective in protecting beneficial uses of water within the affected watersheds. These practices have been applied in other projects on the Sequoia National Forest. Where proper BMP implementation has occurred there have not been any substantive adverse impacts beneficial uses. The practices specified herein are expected to be equally effective in maintaining the identified beneficial uses.

The following management requirements are designed to address the watershed management concerns. Most are BMPs from the Forest Service publication "Water Quality Management Handbook"<sup>1</sup> (USDA Forest Service, 2011). All applicable water quality BMPs shall be implemented. Below are listed the applicable BMP's for this project.

**BMP 2.13 Erosion Control Plan:**

Implementation of this BMP is required since the restoration site is greater than 50 square feet located in a riparian area and wheeled or tracked equipment will be utilized for construction. This plan is further discussed in detail under Appendix A of this report.

**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 2.11 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 will be located a minimum of 100 feet away from the meadow edge. Site specific locations for equipment fueling will 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 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 Osa Meadow. The proposed design for restoration of Osa 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 will 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. Please refer to the SPCC for further information regarding

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<sup>1</sup> R5 FSH 2509.22 – Soil and Water Conservation Handbook, Chapter 10 – Water Quality Management Handbook. Effective as of 12-5-2011.

pollutants and their associated spill plan design for this project.

**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.

**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 document 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. Results of the analysis are summarized in this document.

### **A3. CULTURAL RESOURCES PROTECTION**

- Two weeks prior to commencement of construction, district Heritage staff shall be notified at 760-376-3781.
- Staging areas shall be located within previously disturbed areas such as existing roads, pullouts or campgrounds. Should alternative staging areas be necessary, that location will need additional heritage clearance.
- If any additional or previously unidentified cultural resources are located during project implementation, the find must be protected from operations and reported immediately to the Heritage Resource Staff. All operations in the vicinity of the find will be suspended until the site is visited and appropriate recordation and evaluation is made by the District Archaeologist.

### **A4. OTHER PROVISIONS: EROSION CONTROL PLAN**

#### **Pre-Project Implementation**

Prior to implementing the Osa Meadow Restoration Project, several attributes of the Erosion Control Plan must be in place. These include mitigations measures developed through project analysis, requirements to meet Best Management Practices (BMP), project plans and specifications, and required State and Federal permits.

Ground-disturbing activities are expected to occur as a result of the Osa Meadow Restoration Project. There are a total of four anticipated activities, which include:

1. Fill incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from adjacent Holocene terraces.

2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6" dbh) encroaching lodgepole pine along southern periphery of the meadow.

A plan view map has been prepared for the Osa Meadow Restoration Project. The map shows the haul route for equipment and barrow sites for the gully fill material (Map 2).

Directions from Kernville, CA, are as follows: Take Mountain Highway 99 north to Sherman Pass Road (FS road 22S05). Continue on Sherman Pass road to Black Rock Station, which is on FS road 21S03. Continue on FS road 21S03 to FS road 20S25. Turn left onto FS road 20S25 and continue to Osa Meadow. The area is not accessible year round due to snow.

Best Management Practices have been determined for the Osa Meadow Restoration Project and are discussed in detail in the Hydrology report. A summary of what is applicable to the project is as follows: BMP 2.13 – Erosion Control Plan, BMP 2.5 – Water Source Development and Utilization, BMP 2.11 – Equipment Refueling and Servicing, BMP 7.1 – Watershed Restoration, BMP 7.4 – Forest and Hazardous Substance Spill Prevention Control and Countermeasure (SPCC) Plan, BMP 7.6 – Water Quality Monitoring, and BMP 7.8 – Cumulative Off-site Watershed Effect. Some of these BMPs are required during the planning stages or pre-project stage:

- As required by BMP 2.13 – Erosion Control Plan, a plan to control erosion is required prior to project implementation. This document addresses this BMP requirement.
- As required by BMP 7.6 – Water Quality Monitoring, baseline conditions have been established within and outside of Osa Meadow. Baseline conditions were collected following Region 5 Steam Condition Inventory protocol. Results of the baseline conditions are discussed within the hydrology report.

There are two permits required from other agencies prior to implementation. One is a 404 Nationwide 27 blanket dredge and fill permit from the Army Corps of Engineers. The other is a 401 certification from the California Central Valley Water Quality Control Board. Both of these must be approved in order to proceed with the project.

Flagging will be used to identify the project perimeter, avoidance areas, location of the haul route and staging area, and fuel storage and equipment servicing locations prior to or during implementation. Orange flagging will designate the project boundary. Pink will be used to show the haul route access to the staging and work areas within the meadow. Red and blue combo are areas to avoid either for archeological or resource reasons. Yellow and black combo will be used for fuels and equipment. White and pink combination will be used for staging restoration materials. Contact personnel on the Osa Meadow Restoration Project are listed below. Their full name, position, and contact phone numbers are included.

Name	Position	Phone Number
Keith Andy Stone	District Hydrologist Erosion Control Plan Preparer and Project Lead	760-376-3781 x683
Keith Andy Stone	Contracting Officer Representative	760-376-3781 x683
Al Watson	District Ranger Erosion Control Plan Approver	760-376-3781 x610

## Project Implementation

The Project Implementation portion of the Erosion Control Plan discusses the when, where, why, and how the project activities will be implemented while minimizing or preventing erosion. Project activities during implementation include:

1. Fill incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from adjacent Holocene terraces.
2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6” dbh) encroaching lodgepole pine along southern periphery of the meadow.

Implementation would occur during the driest time of the year, typically August thru October. This will minimize effects on meadow soil resources and reduce the potential for compaction and loss of soil productivity. Work would not occur during wet weather.

Staged equipment would be kept at least 100 feet or more from the meadows edge. BMP 2.11 would go into effect for any servicing and refueling needs in the staging area. The staging area would require non-porous mat around the area used for refueling. BMP 7.4 would be implemented if fuel stored onsite and above ground exceeds 1320 gallons or a single container exceeds 660 gallons, which produces a Hazardous Substance Spill Prevention Control and Countermeasure Plan.

The use of heavy machinery will be limited to the staging area, designated haul routes and the restoration sites within the meadow. The Osa Meadow Restoration Plan layout, (Map 2), shows the locations of the restoration work and equipment haul route. Soil used to fill the gully would be derived locally by “scalping” the upper few feet of soil from an adjacent Holocene terrace. Rock used for the valley grade control structure would be re-purposed from rock used in previous restoration efforts already located in the meadow.

Onsite sod and/or native seed (if available) and/or woody material will be used to cover the bare soil of the barrow area(s) and valley grade control structure. Native willows would be planted throughout the restoration area for stability and improvement for future wildlife habitat. In bare soil areas not sufficiently

covered with native vegetation and/or woody debris, certified weed-free, biodegradable rice straw and/or coir blanket will be installed to stabilize the soil and prevent erosion from rain spatter impact.

Once the project is completed, Best Management Practices protocol requires that BMP evaluations be conducted. The Contracting Officer assigned to the project (or CO Representative) will be responsible for completing all required BMP evaluations. Submission of the evaluation forms will go to the Kern River Ranger District Hydrologist. If the hydrologist is not available for any reason, the forms will go to the District Ranger.

## **Post Project Implementation**

Post project procedures include removal of heavy equipment, removal of any items stored in the staging area, waste management and disposal, and post project water management. The staging area may contain waste generated during project implementation. The contractor will be responsible for removing any and all waste from the site in accordance to all applicable laws. The goal of waste management and disposal is to return the project area to pre-project conditions.

Post project monitoring will occur as required by BMP protocol. BMPs used during pre and project implementation would be evaluated the following year. A Forest Service hydrologist is required during post project BMP monitoring.

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**Sequoia National Forest  
Kern River Ranger District**

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**Biological Assessment of  
Osa Meadow Restoration Project**

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**PROJECT LOCATION:  
Tulare County, California**

Section 17, Township 20 S, Range 34 E,

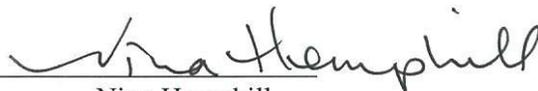
Prepared by: /s/Nina Hemphill, Forest Fish Biologist July 20, 2015

Reviewed by: /s Ernest R. Garcia, Amphibian Specialist

**Effects Determination**

<b>Species</b>	<b>TES Status</b>	<b>Determination</b>
Mountain yellow legged frog	Endangered	may affect, not likely to adversely affect
Sierra Nevada Bighorn sheep ( <i>Ovis canadensis sierrae</i> ) Population: Sierra Nevada	Endangered	No Effects, not in current range
Sierra Nevada yellow legged frog	Threatened	No Effects, not in range
Yosemite toad ( <i>Anaxyrus canorus</i> )	Threatened	No Effects, not in range
Little Kern golden trout	Threatened	No Effects, not in range
delta smelt	Threatened	No Effects, not in range
Fisher ( <i>Martes pennanti</i> ) Population: West coast DPS	Proposed Threatened	No effects

Prepared by: \_\_\_\_\_



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email: [nhemphills@fs.fed.us](mailto:nhemphills@fs.fed.us)

## I. INTRODUCTION

The Osa Meadow Restoration Project is located near the northern boundary of the Kern River Ranger District, Sequoia National Forest (Figure 1). Elevation is 8487 feet in most of the meadow. Access is via the East Beach Creek Road (FS Road 20S25) off of the Blackrock Road (FS Road 21S03). The restoration area is located on the Kern Plateau in the southwest quarter of Section 16 and southeast quarter of Section 17, Township 20 South, Range 34 East, Mount Diablo Base and Meridian, within the Soda Creek-Kern River HUC12 watershed (HUC12# 180300010404).

The purpose of this biological assessment is to review the Osa Meadow Restoration Project in sufficient detail to determine to what extent this proposed action may affect any threatened, endangered, or proposed species or their designated and/or proposed critical habitats listed below. In addition, the following information is provided to comply with statutory requirements to use the best scientific and commercial information available when assessing the risks posed to listed and /or proposed species and designated and/or proposed critical habitat by proposed federal actions. This report is prepared in accordance with legal requirements set forth under regulations implementing Section 7 of the Endangered Species Act (50 CFR 402; 16 U.S.C. 1536(c)) and the Programmatic Biological Assessment for the Three Sierra Amphibians and the Programmatic Biological Opinion. The listed and proposed species occurring on the Sequoia National Forest with their potential to be affected by the proposed action is shown in Table 1.

**Table 1.** Federal Endangered and Threatened Species that may occur in or may be affected by Osa Meadow Restoration Project in the Sequoia National Forest from Consultation Letter dated June 25, 2015.

Species	TES Status	Elevation Range of Habitat	Preferred Habitat	Potential for Project to Affect this Species
Mountain yellow legged frog	Endangered	Above 4,000 ft.	Lakes , streams, meadows springs	Beneficial effects
Sierra Nevada Bighorn sheep Population: Sierra Nevada	Endangered	13,120+ feet] to winter ranges at the eastern base of the range as low as 4,760 feet	habitats range from alpine to Great Basin sagebrush scrub	None no tin range or habitat type
Sierra Nevada yellow legged frog	Threatened	Above 4,000 ft.	Lakes , streams, meadows springs, north of Kings River	None, not in range
Yosemite toad	Threatened	1,950–3,444 m elevation	Fresno County north	None, not in range
Delta smelt	Threatened	Low elevation <sup>1</sup>	Found in San Joaquin and Sacramento Delta and up rivers to man-made and natural barriers	None, not in range, not upstream of smelt habitat.
Little Kern golden trout	Threatened	7-9,000 feet (ft.)	Little Kern River, tributary of the Kern River.	None, not in range
Sierra Nevada yellow legged frog	Threatened	Above 4,000 ft.	The mountain ridges separating South Fork Kings River from the Middle Fork Kings River form the southern border of the range. <sup>1</sup>	None, not in range
Fisher	Proposed Threatened	Normal elevation range around 5100 ft.	Late-successional coniferous or mixed forests	None, no habitat and time of year noise should not be an issue

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## II. CONSULTATION TO DATE

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Pursuant to Section 7(c) of the Endangered Species Act of 1973 as amended, the U. S. Fish and Wildlife Service (USFWS) on June 25, 2015 sent a letter with Consultation Code 08ESMF00-2015-SLI-0767 with the species to be considered for Osa Meadow Restoration Project. Table 1 reflects this list.

As of April 29, 2014, the current status of mountain yellow-legged frogs Northern Distinct Population Segment (DPS) was federally listed as endangered. Designated critical habitat has also been proposed for this species (Federal Register: Vol. 78 No. 80, April 25, 2013). None of the areas identified as proposed critical habitat occur within the Osa Meadow Restoration Project area. Suitable Habitat exists in streams above 4500 feet and within the historic range of the species. Mountain yellow-legged frogs (MYLF) were surveyed in Beach (9/27/2007) and Jackass (9/28/2007) meadows by Phil Strand (USFS). Comprehensive surveys have been conducted to document the existing conditions within the meadow and stream channel. Amphibian surveys were performed in 2001, 2011, and again in 2015 in Osa Meadow. Rainbow trout were present in Osa meadow, no frogs were observed in either location. We will survey Osa meadow in fall of 2015 and spring of 2016 to determine if wetter conditions will bring frogs out to observe. USFWS will be contacted within 24 hours of discovery of any MYLF. Under the Biological Opinion for the three sierra amphibians (BO), the category for this project is “utilization unknown habitat”.

This project is consistent the USDA Forest Service Region 5 Biological Assessment for the three amphibians listed, and the BO. Conservation Measures from the BO are incorporated into this BA.

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## III. CURRENT MANAGEMENT DIRECTION

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Current Forest Service policy (FSM 2670 as amended) 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 Supplemental Environmental Impact Statement (EIS) (USDA 2004) provides direction for the management of riparian areas to protect species that use these areas. The Aquatic Management Strategy in the EIS directs that Forests use 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 Aquatic Management Strategy goals and Conservation Measures pertain to aquatic endangered, threatened, and sensitive species:

- To maintain and restore water quality to meet goals of the Clean Water Act and Safe Drinking Water Act, providing water that is fishable, swimmable, and suitable for drinking after normal treatment.
- To maintain and restore habitat to support viable populations of native and desired riparian-dependent species.
- Culverts and stream crossings will not create barriers for the three Sierra Amphibians.
- To maintain and restore the species composition and structural diversity of animal communities in riparian areas, wetlands, and meadows to provide desired habitats and ecological functions.

- To maintain and restore the distribution and health of biotic communities in special aquatic habitat to perpetuate their unique functions and biological diversity, and
- To maintain and restore spatial and temporal connectivity for aquatic and riparian species within and between watersheds to provide physically, chemically and biologically unobstructed movement for their survival, migration and reproduction.
- A Limited Operating Period may be established to reduce the likelihood that adverse effects will occur.

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#### IV. DESCRIPTION OF PROPOSED ACTION

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This Biological Assessment analyzes the Osa Meadow Restoration Project located within the Osa Creek watershed on the Kern River Ranger District, Sequoia National Forest (Figure 1). Osa Creek is a tributary of the North Fork Kern River and home to Kern River Rainbow trout, a Forest Service sensitive species and a cousin of the California State Fish. The Forest Service is proposing a restoration project to increase habitat and passage for juvenile and adult Kern River Rainbow trout, mountain yellow legged frogs, and other aquatic organisms. Maps are located in Figures 1 and 2. The timeframe for implementation of the Osa Project is limited to August through October, 2015 or the same timeframe in 2016. This will be a Limiting Operating Period. No work will be done in the spring or early summer to avoid breeding season and associated activities for MYLF.

Osa Meadow and many meadows in the neighboring watersheds (e.g., Little Horse, Coppersmith, Dead Dog) share similar hydro-geomorphic characteristics, of which overland or “sheet” flow is the dominant hydrological mechanism by which water moves. Small single thread channels and broad swales can be present, but are often discontinuous. Much of Osa Meadow is believed to have operated as an overland flow system, but grazing stressors during the turn-of-the-century removed most of the vegetation, causing concentrated flow and the development of a single thread channel. With the reduction in vegetative surface armor, any small channel, livestock trail, or other bare linear feature could begin to ‘etch’ channels that did not exist prior to the 1850’s. Despite having small drainage areas, these etched features could gradually deepen and widen to the incised conditions that exist today with negative effects on meadow hydrology and meadow dependent species. Although historic grazing is thought to be the initial stressor, cumulative effects from road building, fire, and other landscape activities have exacerbated the impacts.

Restoration treatment focuses on reconnecting the stream channel to its naturally-evolved floodplain. The project would provide the following ecosystem benefits: 1) increase the wetted areal extent of the meadow, 2) reduce peak flows and increase/extend summer baseflows, 3) increase in-stream cover and shading, 4) enhance aquatic and terrestrial habitat, 5) improve water quality, and 6) raise the local groundwater level within the meadow.

In summary, the project need and work proposed consists of:

**1. Gully Channel Fill Restoration:**

Water flowing in the channel cannot reach the inset floodplain much less the natural remnant floodplain that existed before the system began to down-cut. The objective of the gully channel fill restoration, therefore, is to reconnect flow in the channel to the natural floodplain.

To reconnect the natural floodplain, barrow material will be “scalped” from an adjacent Holocene terrace and used to fill the channel and inset floodplain (gully) to the elevation of the natural remnant floodplain (Figure 3). The Holocene terrace will only be lowered to the elevation of the natural floodplain; no “ponds” will be excavated to accommodate barrow material. This will have the benefit of increasing the floodplain area and decreasing the depth to ground water in the barrow site (Figure 3), thus increasing the wetted perimeter of the meadow. The restored floodplain may extend the season of flow in Osa Creek to provide fish habitat for longer in to the summer than is currently provided. In addition, isolated off channel habitats may form when the meadow surface is reconnected to the water table.

Approximately 5,500 cubic yards of barrow material will be moved from the Holocene terrace to fill the gully. At the last survey in July this area was dry so we hope that the speed with which we can restore this area will enable us to fill a dry gully. Additional contingency barrow sites have been identified if more material is needed (Figure 3). The barrow material will be moved by a loader and tracked excavator. Equipment will only enter the meadow in late summer/early fall when the soil moisture conditions are the lowest seasonally, thus reducing the possibility of adverse compaction and impacts to soil productivity. In the fourth year of drought the meadow surface was dry in June 2015 which should minimize compaction.

## **2. Valley Grade Control Structure**

Rock in the meadow will be used to build the valley grade-control structure. This structure is designed to buttress and maintain the respective grade (i.e., elevation) of the restoration network. It will allow for a seamless transition of the new meadow gradient to the existing channel at the downstream end of the project. The structure will accommodate the passage of flows, but would prevent further down-cutting and degradation of the meadow (Figure 4).

## **3. Supplemental Revegetation**

Native willows would be live-staked throughout the restoration area. Sod, rushes, and sedges, established in the gully bottom or barrow areas will be stockpiled and transplanted in the disturbance areas and the gully fill corridor. Wood material, though limited, would be used for large woody debris (LWD) and added surface roughness in key areas. The willows and propagating meadow vegetation will help stabilize the fill areas.

## **4. Encroaching Conifer Removal**

Approximately 2 acres of small (<6” dbh) encroaching pine will be removed along the southern periphery of the meadow. The pines will be removed by hand using chainsaws, hand saws, and/or loppers. The slash will be left in place or placed in the restoration area to increase surface roughness and decrease water velocities to prevent rilling.

## **5. Monitoring:**

Monitoring will be used to determine if habitat conditions in Osa Meadow are meeting or moving toward the desired conditions. Comprehensive surveys have been conducted to document the existing conditions within the meadow and stream channel. Amphibian surveys were performed in 2001, 2011, and again in 2015, no amphibians were found. Additional monitoring would take place immediately after the project is implemented and annually for five years to document the effectiveness of the project. This monitoring would include ground water, carbon sequestration/GHG emissions, sedimentation, planted vegetation success or mortality, noxious weeds, the integrity of the constructed channel, and the presence of new headcuts.

## **Conservation Measures and Other Measures**

The following measures and monitoring are mandatory and will be implemented in all work contracts/agreements. A USFS Biologist and/or hydrologist will be present to ensure compliance. Equipment will remain on road bed as much as possible during construction. A spill plan will be in place with absorbent material on hand to mop up any accidental spills. Vehicles will be inspected to make sure all are in good functioning order (no leaks) before being brought to the site. All fueling, maintenance, and staging of equipment and vehicles will occur outside of active stream channels, above the top of the bank, and outside of riparian conservation areas. Heavy equipment and pumps will be checked daily for leaks. Equipment with leaks will not be used until leaks are fixed. Any leaks, drips, or spills shall be immediately controlled to prevent entry into waterways, ditches, or other tributaries to waterways. The operator will have spill control kits on each piece of heavy equipment in order to quickly isolate and collect any spill should it occur. There will be no equipment use during rain events or soon thereafter. We plan to construct during the driest time of the year to avoid rain and higher stream flows.

A limited operating period will be established outside of spring time when frogs and tadpoles may be present in the system. Construction will occur under hot and dry conditions when the likelihood of migrating frogs is low. If significant rain occurs during construction; steps will be taken to control erosion and temporarily shut down operations.

We plan to plant native sedges or rushes and plant native willow from a similar nearby system along the designed stream channel. Most riparian plants will be removed and placed in water to conserve them prior to construction. Native plants will be planted upstream and downstream of the new crossing structure in the upper part of the meadow to stabilize the banks. Erosion control fabric will not be used in any of the area to be restored as there is much better success, planting native sedges, grasses, or rushes, seeding with native species, and mulching using weed free hay.

## **Monitoring**

We will document and report to USFWS any take including the amount and type of incidental take for mountain yellow-legged frog (MYLF). We have monitored the site in the past and in 2015 for MYLF. We will survey for MYLF just prior to onset of construction, during construction if it rains, and after construction. The sites will be surveyed at least once during the spring and fall of 2016 and 2017. Pools, meadow streams (with and without fish) and off channel habitat will be surveyed for frogs and fish by an approved Fish Biologist.

The effectiveness and success of any Conservation Measures used in mitigating and minimizing adverse effects on MYLF will be analyzed. Sediment will be monitored during construction and compared to baselines from before construction (if any water is present). Ecological and hydrologic connectivity, stability to storm flows, frog migration corridors, fish habitat, erosion potential, and riparian vegetation will be monitored before and after meadow replacement. The effectiveness of the project in improving connectivity of habitat will be evaluated. Photos shall be taken and remedial measures taken for any erosional concerns over several years as vegetation becomes reestablished. The Final report on the project will document how well these conservation measures were met.

Figure 1. Osa Meadow Restoration Project Location

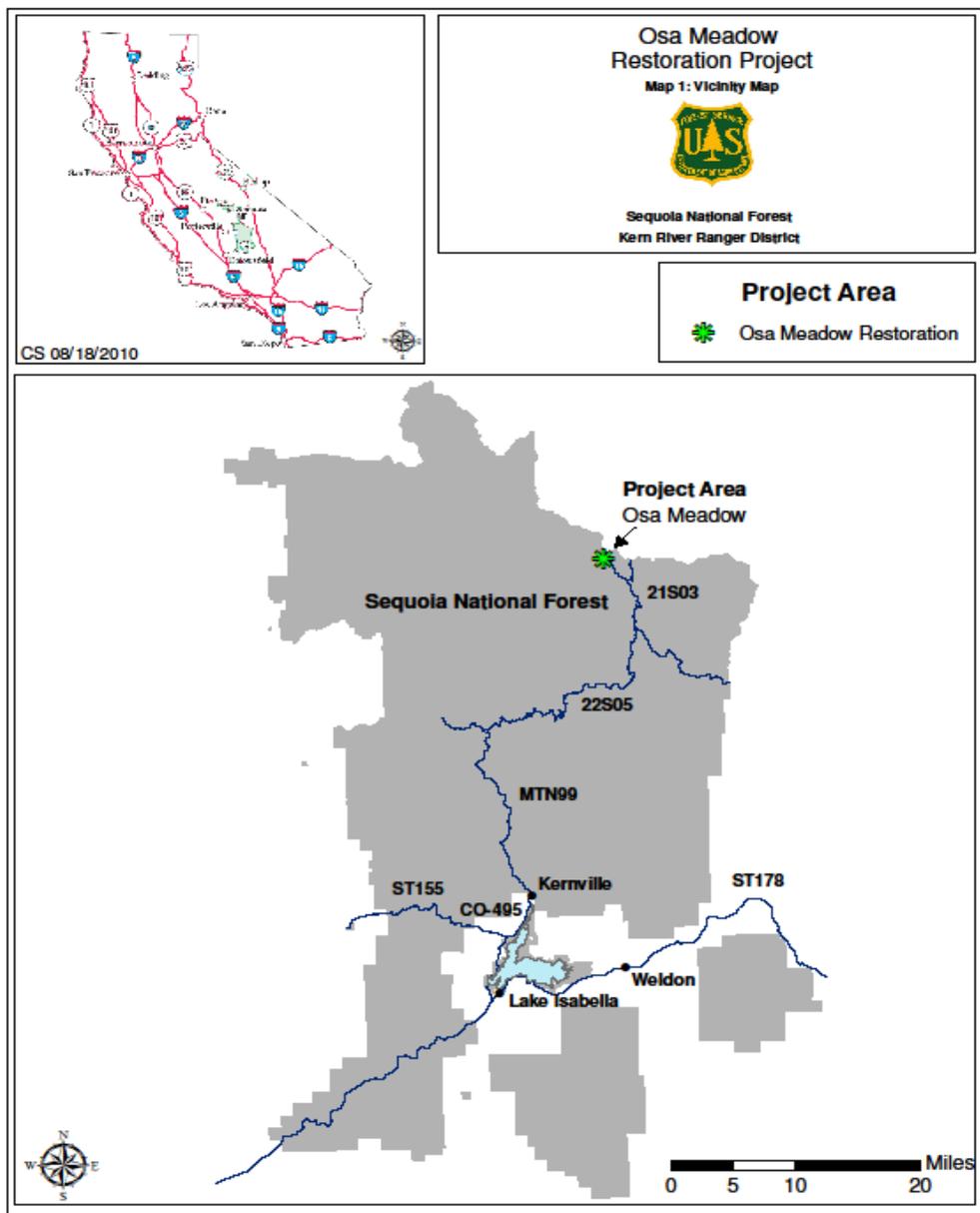


Figure 2. Osa Meadow Restoration Project Vicinity Map. Dark blue shows upper and lower parts of meadow and area of influence for restoration activities and restoration effects. Roads are shown to the south, east and northeast side of the meadow. A dispersed campground is present on the south side where Little Horse Meadow Road goes next to Osa Meadow.

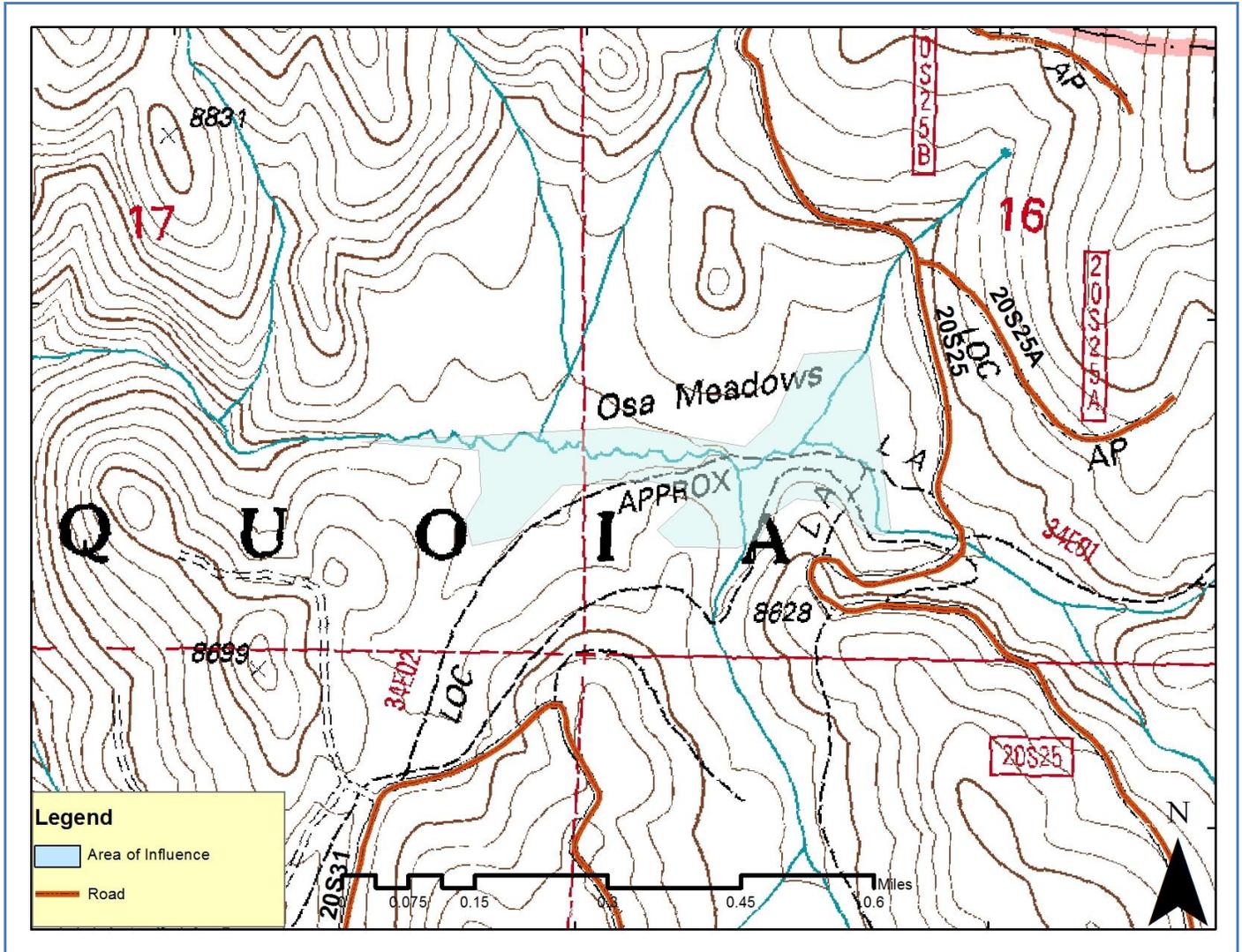


Figure 3. Detail of Osa Meadow and meandering Osa Creek.



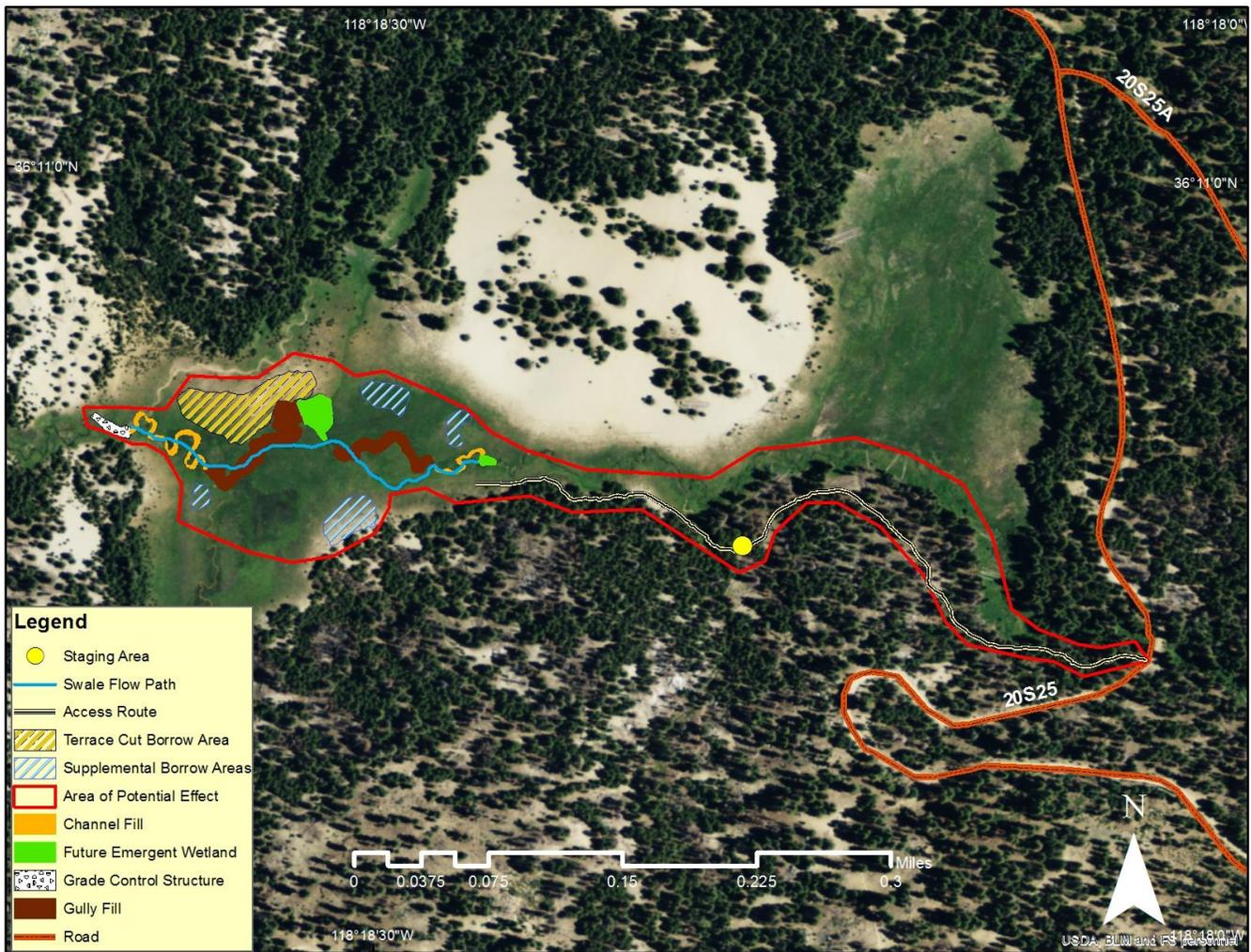


Figure 4. Plan of the restoration actions and staging areas at Osa Meadow.

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## V. STATUS OF THE SPECIES AND CRITICAL HABITAT IN THE ACTION AREA

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### Proposed Critical Habitat

Approximately 21,679 acres of NFS lands were designated as Proposed Critical Habitat for the mountain yellow-legged frog (Northern DPS) in the Sierra Nevada (USDI 2013). The Osa Meadow restoration project is not within proposed critical habitat for the MYLF. The nearest proposed critical habitat lies within the Little Kern River Basin in the Golden Trout Wilderness approximately 9 air miles north east of the project area.

### **Suitable Habitat**

The project site is at 8947 feet elevation. Fish were observed in June 2015 in the upper meadow. Osa Meadow was one of the last places potentially pure Kern River Rainbow was observed. The restoration will produce 30 acres of potential habitat for mountain yellow-legged frogs.

### **Potential threats to survival of the MYLF which are applicable to this project include:**

Lack of ecological and hydrologic connectivity of habitat; water quality and stream degradation from sediment deposition due to head cuts; and de-watering of Osa Creek during a fourth year of a drought are all potential threats to survival of MYLF. Although this project is not within a critical habitat area, it lies within an area that historically had mountain yellow-legged frogs. This stream is part of the native range for Kern River Rainbow trout, a native species.

### **Important Biological Requirements of the Mountain Yellow-legged Frog**

#### **Habitat**

The MYLF is highly aquatic and was found in a variety of Sierra habitats including lakes, ponds, tarns, wet meadows, and streams above 4,500 feet elevation (Grinnell and Storer 1924, Mullally and Cunningham 1956). The habitat includes sunny riverbanks, meadow streams, isolated pools, and lake borders in the southern Sierra Nevada. The species seems to prefer sloping banks with rocks or vegetation to the water's edge (Stebbins 1985). This frog is usually found near water, but it may cross upland areas while moving between summer and winter habitats (Matthews and Pope 1999). Wintering sites include areas near shore under ledges and in deep underwater crevices (Matthews and Pope 1999). Mullally and Cunningham (1956) found frogs more commonly along shallow, rocky shorelines often interspersed with vegetation rather than areas with large boulders from talus slope or sandy unprotected shorelines. Similarly, frogs selected undercut banks and willows in August and rocky habitats in September and October (Matthews and Pope 1999). Adults are long lived with a maximum recorded estimated age of 14 years (Matthews and Miaud 2009). Frogs appear to use a restricted set of lakes with suitable microhabitats for breeding and overwintering, and then disperse into a greater number of sites during the summer months for feeding (Matthews and Pope 1999, Matthews and Preisler 2010, Pope and Matthews 2001). Frogs were commonly found basking in open areas near cover and water (Grinnell and Storer 1924, Mullally and Cunningham 1956, Storer 1925).

#### **Breeding Habitat**

In the southern Sierra, current breeding most commonly occurs in permanent, deep lakes (Knapp and Matthews 2000, Knapp et al. 2003). Frogs used to breed in streams and meadows (Zweifel 1968) but is currently limited to lakes. Because larvae take two to three years to metamorphose, successful breeding requires permanent water (Bradford 1983). Similar to tadpoles, adults and sub-adults seek warmer water, and in one study, the abundance of frogs within a lake was significantly associated with warmer water (Bradford 1984). Suitable breeding habitat typically occurs above 4,500 feet in elevation and includes the following: permanent water bodies or those hydrologically connected with permanent water such as lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), and pools (such as a body of impounded water

contained above a natural dam) and their surrounding areas up to a distance of 25 meters (82 ft.). Based on this definition there are currently no acres of suitable habitat available in the Osa Meadow Restoration Project area. The affected project area (i.e., the area that will be physically manipulated as part of the restoration) will be approximately 19 acres within the 55 acre Osa Meadow proper, but the restoration benefit (e.g., elevation of the ground water table) is expected to affect 30 to 40 acres of meadow. Aquatic habitats that are used by MYLF for breeding purposes must maintain water during the entire tadpole growth phase, which can last for up to 2 to 4 years. Lacan et al. (2008) concluded that desiccation of tadpoles in habitats that dry during the summer was an important cause of mortality, and found little evidence of winterkill in shallow water habitats (also Bradford 1983). Larvae graze on algae and diatoms in the silt along rocky bottoms in streams (Zeiner et al. 1988). An open or semi-open canopy of riparian vegetation (canopy overstory not exceeding 85 percent, Backlin et al. 2013) is needed to ensure that adequate sunlight reaches the stream to allow for basking behavior and for photosynthesis by benthic algae and diatoms that are food resources for larval MYLF.

## **Project Area**

### **Aquatic Habitat: surveys and sightings**

The project site is at 8,875 feet elevation. Previously installed rock structures have effectively stopped or slowed the down-cutting of the stream and reduced bank erosion, however the stream channel remains downcut, with high width-depth ratios (too wide to transport course sediment) and subsequently flood flows are not able to access the floodplain or meadow uplands. The streambed elevation and associated water table in the meadow is approximately 2.5- 4.0 feet lower than the historic floodplain and is currently draining the meadow of groundwater.

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## **ENVIRONMENTAL BASELINE AND CUMULATIVE EFFECTS**

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### **Environmental Baseline**

Osa Meadow is located in the Upper North Fork Kern River Basin and is a Class III stream. Osa Creek has an incised channel through a dry meadow. Existing uses in the nearby area include jeep and OHV trails use and dispersed camping on the edge of the meadow. The camp ground is too close to the edge of the meadow and needs to be moved back away from the edge. Jeep Trail use in the area is at times heavy and common especially during hunting season and on major holidays. The grazing allotment has not been active since 2002. The geographic scope of the direct, indirect, and cumulative effects analysis for this project is confined to the Soda Creek HUC 6th field watershed.

### **Cumulative Effects**

Trail use by OHV can have more concentrated use during a shorter period of time and while illegal off trail riding can occur occasionally it is not the norm. Foraging or dispersing MYLF could potentially be affected by the following recreational activities: such as motorcycles, jeeps, OHV, horses, mountain bikes, cars and hikers within 25 m of the meadow. However peak recreational activity is in the fall when breeding animals are not present. Impacts that increase with increased trail use can include trail widening, direct displacement of soil (especially if the soil is wet), and

deterioration of water diversion structures, such as water bars. A culvert in the upper part of the meadow will have the erosion damage restored which will improve the condition of the road that is closest to the meadow. Decreased snow pack and winter warming can change the period of peak water runoff and change the late summer flows. This has the potential to change perennial streams into intermittent streams thus eliminating or reducing suitable breeding habitat. In addition warming water may make the habitat unsuitable for tadpoles by late summer. Projected warming trends in climate may both increase fire frequency and change seasons of peak fire earlier. Earlier fire may influence habitat for amphibians while they are actively moving around on the surface. This could result in reduction of upland habitat for migration. Drought has dried many sources of water in the Osa Creek area. Since this is potential habitat for MYLF; drought is a major deleterious factor in recent years. This project will improve resilience in Osa Meadow and Osa Creek to climate change and drought. 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 as no ponds are being created. No adverse cumulative effects are anticipated as a result of the Osa meadow restoration project.

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## VII. EFFECTS OF THE ACTION

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### Direct and Indirect Effects

This section analyzes effects to mountain yellow-legged frogs and their habitat by the restoration of connectivity and repairing depositional features and improving alignment and elevation of Osa Creek. Restoring floodplain connectivity and elevating the stream will restore connectivity of habitat for Kern River Rainbow trout and MYLF adults.

**Loss of individual MYLFs from crushing/killing/disturbance:** The use of heavy equipment for meadow work could crush frogs if present. This work is within 300 feet of streams, which is the most likely location for MYLF to reside during most months of the year. However these sections of the stream were dry in June, 2015. A FS biologist will survey the site prior start of to work and it following rains during implementation. If MYLF are detected in the work area, USFWS will be notified, and project work will cease until the frog is moved out of harm's way. If, at any time, a mountain yellow legged frog is discovered, all work in the immediate area will cease. The frog will be placed in a sterile transport container, photographed for identification purposes, and be relocated upstream to the nearest appropriate habitat. GPS location will be noted for reference. USFWS will be contacted within 24 hours of discovery. If frogs are discovered, blocking nets will be placed to block migrating frogs upstream and downstream of the work area, and the whole area will be surveyed daily for frogs, therefore the effect of crushing or disturbing frogs is expected to be discountable.

**Water quality effects, risk of pollution from petroleum spills:** All fueling, maintenance, and staging of equipment and vehicles is planned to occur outside of the meadow. Heavy equipment will be checked daily for leaks. Operators will have spill control kits on each piece of heavy equipment. Equipment will not enter the wetted stream channel. Since the project is to occur this fall and the area for stream work is dry we do not anticipate risk to water quality but all instructions in the hydrology report and in this report will be followed. Due to these factors: the potential to spill petroleum or hydraulic or other fluids into water should be very low.

**Habitat alteration from sedimentation:** The use of heavy equipment for meadow work can cause temporary compaction and raising the level of the stream could cause a temporary increase in sediment movement, particularly during the first year following construction. Re-vegetation of the banks of the stream the same year and stabilization of the meadow areas with weed free straw before winter rains or snows occur should alleviate sediment movement.

Mountain yellow-legged frogs can be affected indirectly as a result of sedimentation causing a reduction of macro-invertebrates, which is a food source. Since these streams are dry it may take a year to recolonize the full community of macroinvertebrates. By creating deeper pools as part of the restoration, cooler temperatures should be maintained. Planting vegetation should also lead to cooler temperatures. Sediment is not anticipated to move up into the fishless portions of Osa Creek therefore the effects on Suitable Habitat for MYLF should be beneficial overall.

**Beneficial effect:** The raising of Osa Creek and filling gullies will create a natural stream channel with flooding over the meadow. While this project is expected to greatly expand both access to spawning habitat and improve movement of Kern River Rainbow trout; dispersal habitat for MYLF will improve. Since a series of small perennial fishless tributaries and springs are found in this area, metapopulation dynamics for future longevity and survival of MYLF would be improved with this project. The repair of the stream and reconfiguring the position of the stream will create additional habitat complexity and improve connectivity of habitat for MYLF.

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## VIII. CONCLUSION

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Past surveys are inconclusive. Once protocols for surveys are implemented, the new methods will be used in fall of 2015 and spring of 2016 to detect MYLF. Sites do not have water in them in June 2015, temporary barriers to movement will be put in place if rain occurs, and a FS biologist will be on-site during the work near water. If a MYLF is observed, construction activity will cease, USFWS will be contacted, and the frog will be moved out of harm's way.

The project area is approximately 19 acres of meadow which will be reconnected to its floodplain. Osa Creek will be restored so that it functions well and provides more permanent habitat. Care will be taken to stop any erosion and sedimentation of the streams, and surveying the construction zone in prior to construction should ensure no frogs are harmed. Since Osa Creek naturally contains native trout, steps will be taken to exclude trout and frogs migrating near the edge of the streams. If all Conservation Measures from the USFWS Biological Opinion for the three Sierra amphibians and project specific criteria from this Biological Assessment are followed during implementation; then the project will be beneficial and improve connectivity of habitat for mountain yellow-legged frogs and Kern River rainbow Trout.

**Determination of Effects**

My determination for this project is “may affect, not likely to adversely affect” mountain yellow-legged frogs.

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

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United States  
Department of  
Agriculture

Forest  
Service

July 2015



# Osa Meadow Restoration Project

## Biological Evaluation (Plants)

Kern River Ranger District, Sequoia National Forest

Tulare County, California

SW 1/4 Section 16 and SE 1/4 of Section 17, Township 20 S, Range 34 E, MDBM

### SUMMARY:

This botanical biological evaluation documents analysis of effects of land disturbance associated with meadow restoration on approximately 19 acres at Osa Meadow on the Kern Plateau, Kern River Ranger District, Sequoia National Forest. Based on timing, habitat affected and other factors, the project would have no effect on species listed for protection under the Endangered Species Act of 1973 (ESA), would not cause or contribute to a trend leading to loss of viability or listing for protection under the ESA for Forest Service designated sensitive species or species identified as of local interest (see summary table below for species addressed).

Species <sup>Status</sup> <i>Scientific name</i>	Determination
<b>scalloped moonwort</b> <sup>FS</sup> <i>Botrychium crenulatum</i>	Not likely to result in a trend toward Federal listing or loss of species viability.
<b>pygmy pussypaws</b> <sup>FS</sup> <i>Calyptridium pygmaeum</i>	Not likely to result in a trend toward Federal listing or loss of species viability.
<b>Tulare rockcress</b> <sup>FS</sup> <i>Boechera tularensis</i>	Not likely to result in a trend toward Federal listing or loss of species viability.
<b>Field ivesia</b> <sup>LI</sup> <i>Ivesia campestris</i>	Not likely to result in a trend toward Federal listing or loss of species viability.

Status:

FS - FS Sensitive Species  
FP - Federal Proposed

FE - Federal Endangered  
FT - Federal Threatened

CH - Federal Critical Habitat  
LI - Local Interest

SP - State Fully Protected  
SC - State Special Concern

ST - State Threatened  
SE - State Endangered

Prepared by:

/s/ *Steven W. Anderson*

Steven W. Anderson, Resource Officer  
Kern River Ranger District

July 23, 2015

Date

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## INTRODUCTION

Table 1 lists Forest Service sensitive species (S) that may be affected by the proposed action. A full list of identified species at risk that may be found within or indirectly affected by actions within the Sequoia National Forest are listed in Appendix A with the rationale for inclusion in this document for detailed analysis or not.

This report meets the requirements of a biological evaluation (BE) and follows the standards established in Forest Service Manual direction (FSM 2672.42) (USDA-FS, 2011).

## CONSULTATION TO DATE

The forest-wide list (species list) of endangered, and threatened species (listed species) and species that are proposed or candidates for listing under the Endangered Species Act of 1973 as amended (ESA) which may occur in or be affected by projects in the area of the Sequoia National Forest was updated from the USDI, Fish and Wildlife Service (USFWS), Sacramento Field Office web site ([http://www.fws.gov/sacramento/es/spp\\_lists/NFActionPage.cfm](http://www.fws.gov/sacramento/es/spp_lists/NFActionPage.cfm)) as of July 10, 2015. No listed species will be affected by the project. No further consultation is required and a biological assessment will not be prepared.

## CURRENT MANAGEMENT DIRECTION

This project is consistent with the management direction including Riparian Conservation Areas and meets the Riparian Conservation Objectives outlined in the Supplemental Environmental Impact Statement for the Sierra Nevada Forests Plan Amendment and Record of Decision (USDA-Forest Service 2004)

## DESCRIPTION OF THE PROPOSED PROJECT

The Osa Meadow Restoration Project is located near the northern boundary of the Kern River Ranger District, Sequoia National Forest (Map 1). Access is via the East Beach Creek Road (FS Road 20S25) off of the Blackrock Road (FS Road 21S03). The restoration area is located on the Kern Plateau in the southwest quarter of Section 16 and southeast quarter of Section 17, Township 20 South, Range 34 East, Mount Diablo Base Meridian, within the Soda Creek-Kern River HUC-12 watershed (HUC12# 180300010404). The affected project area (i.e., the area that will be physically manipulated as part of the restoration) will be approximately 19 acres within the 55 acre Osa Meadow proper, but the restoration benefit (e.g., elevation of the ground water table) is expected to affect 30 to 40 acres of meadow.

The Forest Service is implementing the Osa Meadow Restoration Project (Osa Project) for watershed improvement along a portion of Osa Creek in Osa Meadow. The Osa Project would improve hydrologic function; improve conditions so overbank flows can access the entire meadow; and enhance meadow vegetative and aquatic species while maintaining existing land uses, including recreation.

Restoration treatment focuses on reconnecting the stream channel to its naturally-evolved floodplain. The project would provide the following ecosystem benefits: 1) increase the wetted areal extent of the meadow, 2) reduce peak flows and increase/extend summer baseflows, 3) increase in-stream cover and shading, 4) enhance aquatic and terrestrial habitat, 5) improve water quality, and 6) raise the local groundwater level within the meadow.

Previously installed rock structures have effectively stopped or slowed the down-cutting of the stream and reduced bank erosion, however the stream channel remains downcut, with high width-depth ratios (too wide to transport sediment) and subsequently flood flows are not able to access the floodplain or meadow uplands. The streambed elevation and associated water table in the meadow is approximately 2.5- 4.0 feet lower than the historic floodplain and is currently draining the meadow of groundwater. Conditions on the natural (remnant) floodplain and upland meadow terraces currently favor dry plant communities. These areas were once occupied by wet meadow vegetative species and are at risk of being lost as the plant communities convert to dry site species. The lowering of the water table has led to encroachment of upland plants such as lodgepole pine and sage. Roughly 70% of the meadow area is at risk of conversion to non-meadow habitat.

The 2002 McNally Fire burned over 150,000 acres on the forest and included headwaters surrounding Osa Meadow. The fire was followed by a rainstorm event in November of 2002, which dropped twenty inches of rain in a twenty-four hour period. The combination of the past gulying, 2002 McNally Fire, and the November storm increased down-cutting (and de-watering) in Osa Meadow.

Because montane meadows like Osa serve a vital role as water storage and release systems, it is essential that the hydrologic function of Osa Meadow be restored such that water storage and residence time is maximized, improving water quality and increasing annual water availability to riparian-aquatic systems.

Restoring hydrologic function and floodplain connectivity in Osa Meadow is necessary to meet the desired condition as set forth in the Sequoia National Forest Land and Resources Management Plan (SQF-LRMP USDA, 1988), as amended by the Mediated Settlement Agreement (SQF-MSA) and the Sierra Nevada Forest Plan Amendment ROD (SNFPA USDA, 2004).

## **PROJECT DESIGN REQUIREMENTS FOR WATERSHED RESOURCES**

- SQF-LRMP B1 (p.4-3): Maintain or improve long term soil productivity.
- SQF-LRMP B4 (p.4-4): Emphasize protection management and improvement of riparian areas during the planning and implementation of land and resource management activities along stream courses on the forest.
- SQF-LRMP C3n3 (p. 4-9): Meadows will be managed to a fair and better condition and to maintain their existing acreage and restore any that have been damaged. Trails will be rerouted away from meadows where unacceptable damage is occurring. On the meadow edge, large tree character and a diverse environment of structural “edge” effects will be provided.
- SQF-MSA Exhibit D (p.9): “...Plans will be developed from prioritized Watershed Improvement Needs Inventory (WINI) to re-establish hydrologic characteristics and riparian habitat...”
- SNFPA RCO#2-105 (p.64): At either the landscape or project scale, determine if the age class, structural diversity, composition and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.  
SNFPA RCO#6-122 (p.66): Recommend restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered ground water tables, or (3) areas that are either actively down cutting or that have historic gullies. Identify other management practices, for example, road building, recreational use, grazing, and timber harvests that may be contributing to the observed degradation.

## **PROJECT DESIGN REQUIREMENTS FOR BOTANICAL RESOURCES**

Mitigations to prevent the introduction and spread of noxious weeds into the proposed treatment areas have been built into the project. These mitigations include:

- All equipment will be washed and inspected for noxious weeds prior to arrival at project area.
- Only certified weed-free erosion control materials will be used, and only to the minimum extent needed to stabilize bare soil.
- Any noxious weed occurrences found during project layout or implementation will be reported to the Forest botanist.

## **AFFECTED ENVIRONMENT AND EFFECTS**

### **GENERAL HABITAT DISCUSSION**

The project area is comprised of 19 acres of the drier portions of Osa meadow affected by historic downcutting and desiccation of the meadow.

### **SPECIES ACCOUNTS**

A search of the Sequoia national Forest sensitive plant database and geographic information system (GIS) layer found no records of special status plants in the vicinity of Osa meadow. A search of the California Natural Diversity Data Base (CDFW 2015) for the Casa Vieja, 7.5 minute map quadrangle, in which Osa Meadow is located, returned 11 occurrences for 7 plant species tracked in that database. Scalloped moonwort (*Botrychium crenulatum*), Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptidium pygmaeum*) are Forest Service sensitive species that are addressed above. Field ivesia (*Ivesia campestris*) has no protected status, but is a species ranked 1B.2, Rare, threatened, or endangered in California and elsewhere, fairly endangered in the California, by the

California Native Plant Society rare plant database. This species is located on the edges of Osa Meadow and is addressed here as a plant of local concern. Kern River Daisy (*Erigeron multiceps*), Tulare cryptantha (*Cryptantha incana*), and gray-leaved violet (*Viola pinetorum* var. *grisea*) are found at elevations or habitats that would not be affected by this project and were not further addressed.

Species accounts are summarized here with specific intent to focus on location or habitat preferences that may be affected by the proposed action. Greater detail is available on biology, range wide distribution and cumulative effects for these species in the Sierra Nevada Forest Plan Amendment (USDA-FS, 2001) (SNFPA) (the 2001 plan amendment is used in this context for reference rather than direction, direction is provided by the Record of Decision for the 2004 SNFPA supplemental EIS) FEIS volume 3 and the associated supplemental EIS and specialists' reports. Information in this section uses the California Wildlife Habitat Relationships (CWHR) program (CDFW 2007), California Natural Diversity Database (CNDDDB) (RAREFIND) (CDFW 2014), species accounts available from the USDI Fish and Wildlife Service, recent published literature and local survey or knowledge to provide a summary of species accounts.

Table 1: Plant Species of Concern within the Project Area

Common Name <sup>Status</sup> <i>Scientific name</i>	Habitat Type / Soils / Elevation	Risk/Rationale
<b>scalloped moonwort</b> <sup>FS</sup> <i>Botrychium crenulatum</i>	Subalpine coniferous forest, upper montane coniferous forest. Rocky slopes. 6,000 – 11,000'	Low, in meadow.
<b>pygmy pussypaws</b> <sup>FS</sup> <i>Calyptridium pygmaeum</i>	Among thick grass and herbs in wet meadows. Moist fine sediment and peaty soils. 4,500 - 10,000'.	Moderate adjacent habitat
<b>Tulare rockcress</b> <sup>FS</sup> <i>Boechera tularensis</i>	Subalpine coniferous forest, upper montane coniferous forest. Sandy or gravelly soils. 6,500 – 10,200'.	Low, in range.
<b>Field ivesia</b> <sup>LI</sup> <i>Ivesia campestris</i>		Low, suitable habitat adjacent

Status: FS - FS Sensitive Species FE - Federal Endangered CH - Federal Critical Habitat SP - State Fully Protected ST - State Threatened  
 FP - Federal Proposed FT - Federal Threatened LI - Local Interest SC - State Special Concern SE - State Endangered

**FEDERALLY PROTECTED (LISTED) SPECIES**

There are no federally protected plants or suitable habitats for such species in the project vicinity.

**FOREST SERVICE SENSITIVE SPECIES (INCLUDING FEDERAL CANDIDATES)**

Forest Service sensitive species were eliminated from further consideration if: 1) they had no known occurrences in or near the project area; and/or 2) no potentially suitable habitat for the species exists in the project area (see full list of species considered in appendix A).

The analysis area has known populations or unsurveyed suitable habitat for the Pacific Southwest Region (R5) Forest Service Sensitive plant species displayed in Table 1.

**Scalloped moonwort**

*Botrychium crenulatum*

**Lifeform:** perennial rhizomatous herb      **Blooming Period:** June - September      **Elevation Range:** 1268 - 3280 meters  
**Habitat:** Bogs and fens, • Lower montane coniferous forest, Meadows and seeps, Marshes and swamps (freshwater), Upper montane coniferous forest  
**Abundance /Range /Distribution:** Species is widespread across the western US but not common anywhere. There are 74 recorded occurrences identified in California.  
**Trend:** Unknown; presumably stable.  
**Protection of Occurrences:** Listed as Forest Service Sensitive. Protected from most disturbance by meadow, fen standards and guidelines.  
**Threats / Fragility /Habitat specificity:** Potential for over-grazing or trampling in fens or meadows or inadvertent disturbance. Specific to wetlands which are usually excluded from disturbance other than grazing and recreational foot traffic. Down cutting or desiccation of meadows, bogs or fens is likely to adversely affect this species.

**Pygmy pussypaws**

*Calyptridium pygmaeum*

**Lifeform:** Annual herb      **Blooming Period:** June - August      **Elevation Range:** 1980 - 3110 meters  
**Habitat:** Sandy or gravelly dry openings in subalpine coniferous forest or upper montane coniferous forest.

**Abundance /Range /Distribution:** Known from 11 recorded occurrences. Endemic to southern and central California mountains, from Big Bear north to Mammoth Lakes.

**Trend:** Unknown; presumably stable.

**Protection of Occurrences:** Listed as Forest Service Sensitive. Found in dry sandy or gravelly opening with little potential for disturbance other than inadvertent recreation traffic.

**Threats / Fragility /Habitat specificity:** Found in dry open habitats at higher elevations where there is little competition or cause for disturbance.

## Tulare rockcress

### *Boecheera tularensis*

**Lifeform:** perennial herb

**Blooming Period:** June - August

**Elevation Range:** 1825 - 3350 meters

**Habitat:** Rocky slopes of subalpine coniferous forest and upper montane coniferous forest.

**Abundance /Range /Distribution:** Known from 28 recorded occurrences. Endemic to central California Sierra Nevada Mountains , from Sequoia National Forest north to Lake Tahoe.

**Trend:** Unknown; presumably stable.

**Protection of Occurrences:** Listed as Forest Service Sensitive. Habitat not specifically protected, but low potential for disturbance.

**Threats / Fragility /Habitat specificity:** Low potential for disturbance due to rocky habitat.

## Field ivesia

### *Ivesia campestris*

**Lifeform:** perennial herb

**Blooming Period:** June - August

**Elevation Range:** 1975 – 3395 meters

**Habitat:** Edges of meadows and seeps in subalpine coniferous forest and upper montane coniferous forest.

**Abundance /Range /Distribution:** There are 56 recorded occurrences. Species is endemic to the southern and central Sierra Nevada of California, from Sequoia National Forest north to Kings Canyon National Park.

**Trend:** Unknown; presumably stable.

**Protection of Occurrences:** No special status, addressed as a species of local interest. Protected from most disturbance by meadow, fen standards and guidelines. Nearest known occurrences are several miles away

**Threats / Fragility /Habitat specificity:** Potential for over-grazing or trampling in meadows or inadvertent disturbance. Specific to wetlands which are usually excluded from disturbance other than grazing and recreational foot traffic. Down cutting or desiccation of meadows is likely to adversely affect this species.

## EFFECTS

The effects section discusses effects to known occurrences as well as suitable habitat and any possible undiscovered sensitive plants that might grow in the project area.

## NO ACTION

### Direct and Indirect

No action forgoes the opportunity to reconnect Osa Creek with its floodplain, raise the water table and restore the native capacity of the meadow for water storage and prolonged release of water stored in saturated soils.

## PROPOSED ACTION

### Direct and Indirect

Shirley Meadows Star-tulip and Greenhorn Fritillary are both perennial herbaceous plants in the Lily family. They both sprout from

These practices would fully mitigate the risk of negative indirect effects from noxious weeds on sensitive plants.

### Cumulative

The area affected is a small proportion of the range and the plants appear to respond favorably to light or moderate soil disturbance

## DETERMINATION

### No Action

It is my determination that the direct, indirect and cumulative impacts of no action are **not likely to cause or contribute to a trend leading to protection under the Endangered Species Act or loss of viability** for scalloped moonwort (*Botrychium crenulatum*),

Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptidium pygmaeum*) which are Forest Service sensitive species or for field ivesia (*Ivesia campestris*), which is a species of local interest that has been addressed for this project.

### Rationale

No Action would have a missed opportunity to enhance habitat for scalloped moonwort and field ivesia, but would not have a direct adverse effect on these species. No action would not be likely to have any effect on the other species addressed.

### Proposed Action

It is my determination that the direct, indirect and cumulative impacts of the proposed action **are not likely to cause or contribute to a trend leading to protection under the Endangered Species Act or loss of viability** for the following Forest Service sensitive species: Scalloped moonwort (*Botrychium crenulatum*), Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptidium pygmaeum*) or the species of local concern: Field ivesia (*Ivesia campestris*). No plant species listed for protection, proposed or candidate for listing for protection under the federal Endangered Species Act of 1973 as amended would be affected by this project.

### Rationale

Tulare rockcress (*Boechera tularensis*) and pygmy pussypaws (*Calyptidium pygmaeum*) are upland species that are found or may occur on the drier fringes of Osa meadow or in upland rocky areas of the forest. No activity is planned for these areas with the possible exception of walking equipment into the meadow. The equipment path follows previously disturbed areas of potentially wet meadow where there is no history of these species occurring. Equipment movement is planned for late season when the ground should be dry and firm where disturbance and the potential for compaction is minimal as well as occurring during the period when these plants would likely be dormant. New field surveys will occur during the year of potential disturbance along any equipment movement corridors to ensure that new or previously undetected populations of these plants are avoided.

Scalloped moonwort (*Botrychium crenulatum*) is known to grow in the upper area of Osa Meadow in the wet meadow/ fen. Field ivesia (*Ivesia campestris*) is known to grow on the edge of a meadow several miles east of Osa and could occur along the drier edges of Osa meadow. The project area is the lower, dry portion of the meadow. No activity is planned in the area of the know populations for scalloped moonwort or field ivesia. Equipment movement may occur through the dry meadow during late season if there is a determination that the populations of these plants would not be affected, either through avoidance or dormancy during the dry, late season period when implementation is planned. Restoration of the meadow is likely to increase the area of fen or wet meadow and increase the area of saturated soils, which in turn increase potential habitat for this species. The project will likely have a beneficial effect on these species, specifically for scalloped moonwort and peripherally for field ivesia if present or suitable habitat is created as is planned..

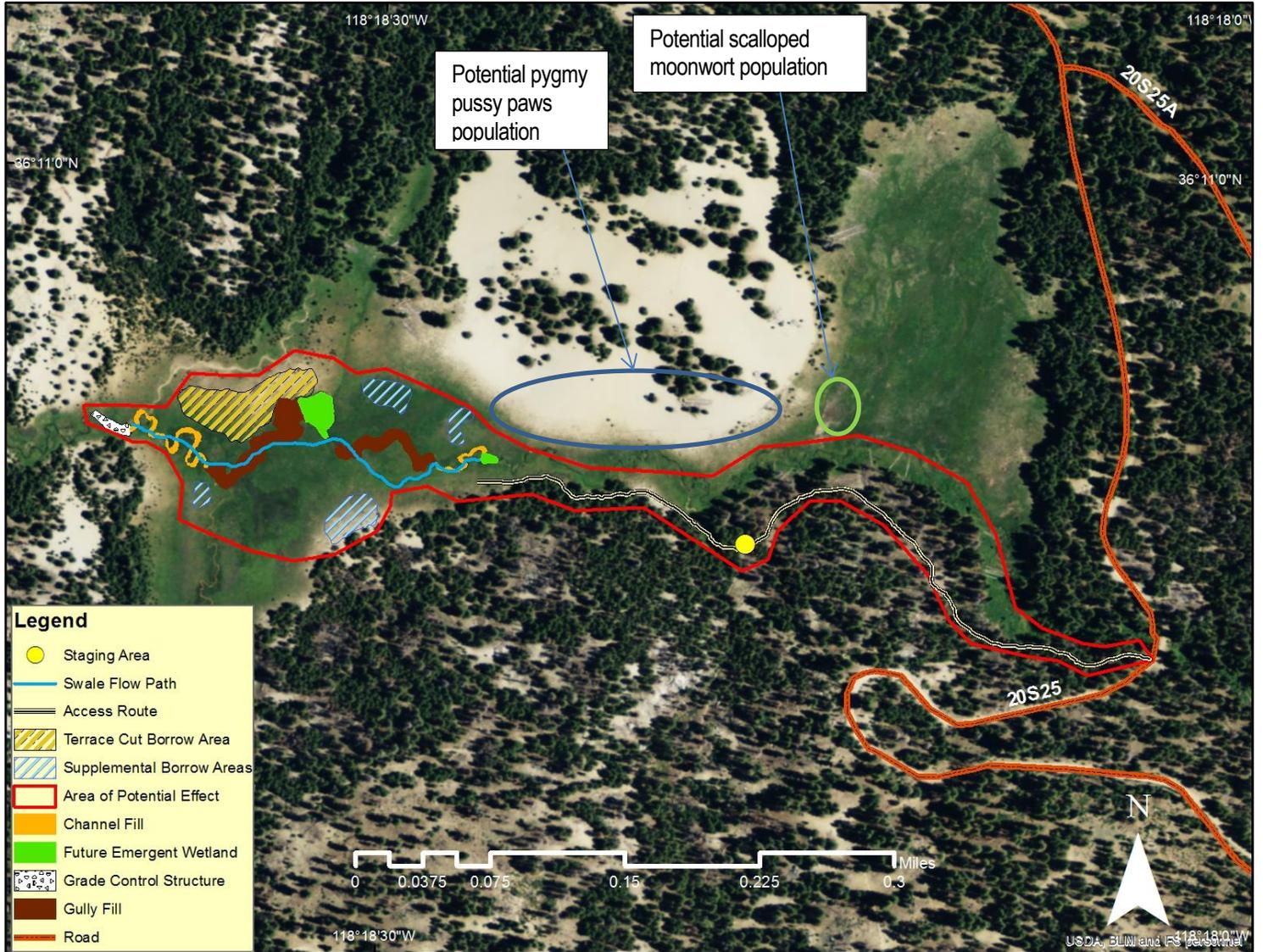
Appropriate mitigations have been incorporated into the project design to avoid or mitigate potential adverse effects.

## REFERENCES

Material has not been directly cited, but species account information came from the following sources:

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# MAP A: OSA PROJECT MAP



## APPENDIX A: SPECIES CONSIDERED

The following Pacific Southwest Region, USDA Forest Service, sensitive species and federally listed threatened, endangered and proposed species were reviewed for potential impacts. Species not addressed in detail are identified with a brief rationale for that determination. Additional species of local interest may be added for specific projects.

List 1: Plant Species of Concern, Sequoia National Forest (Regional Forester's Sensitive Species List: 7/3/2013) (USFWS species list: 7/10/2015)

Common Name <sup>Status</sup> <i>Scientific name</i>	Habitat Type / Soils / Elevation	Risk/Rationale
<b>Walker Pass milk-vetch</b> <i>Astragalus ertterae</i>	Openings in pinyon-juniper, canyon oak woodlands. Dry sandy-loam, granitic soils. 5,600 - 6,200'.	None, outside range.
<b>Kern Plateau milk-vetch</b> <i>Astragalus lentiginosus var. kemensis</i>	Open flats around montane meadows with sagebrush and lodgepole pine. Dry sandy- gravel, granitic soils. 7,700 - 8,500'.	None, outside range.
<b>Shevock's milk-vetch</b> <i>Astragalus shevockii</i>	Pine needle duff in upper montane Jeffrey pine forest. Sandy, granitic soils. 6,100 - 6,700'.	None, outside range.
<b>Hidden rockcress</b> <i>Boechea evadens</i>	Upper montane coniferous forest. Rocky soils. 8,400 - 9,400'.	None, outside range.
<b>Shevock's rockcress</b> <i>Boechea shevockii</i>	Upper montane coniferous forest. Granitic, rocky outcrop ledges. 8,000 - 8,200'	None, outside range.
<b>Tulare rockcress</b> <i>Boechea tularensis</i>	Subalpine coniferous forest, upper montane coniferous forest. Rocky slopes. 6,000 - 11,000'	Low, in range.
<b>scalloped moonwort</b> <i>Botrychium crenulatum</i>	Among thick grass and herbs in wet meadows. Moist fine sediment and peaty soils. 4,500 - 10,000'.	Moderate Historic detection
<b>Mingan moonwort</b> <i>Botrychium minganense</i>	Mesic* bogs and fens, lower montane coniferous forest, upper montane coniferous forest. 4,800 - 7,200'.	None, outside range.
<b>western goblin</b> <i>Botrychium montanum</i>	Mesic, lower montane coniferous forest, meadows and seeps. Upper montane coniferous forest. 4,800 - 7,200'	None, outside range.
<b>Kaweah brodiaea</b> <i>Brodiaea insignis</i>	Grassy slopes of foothill blue oak woodland. Loamy clay soils in granitic substrate. 800 - 1,600'.	None, outside range.
<b>Bolander's bruchia</b> <i>Bruchia bolanderi</i>	Upper montane stream banks of small meandering creeks. Moist fine sediment and peaty soils. 6,500 - 9,500'.	None, outside range.
<b>Palmer's Mariposa Lily</b> <i>Calochortus palmeri var. palmeri</i>	Openings in montane coniferous forest, chaparral, and meadows, moist upland or meadow soils. 3,500 - 7,500'	None, outside range.
<b>Alkali mariposa lily</b> <i>Calochortus striatus</i>	Alkaline seeps, meadows and springs, moist creosote bush scrub moist fine alkaline soils. 2,600 - 4,600'	None, outside range.
<b>Shirley Meadow star-tulip</b> <i>Calochortus westonii</i>	Meadow edges or openings in mixed conifer/black oak woodland deep loamy or shallow rocky soils derived from granitics or metamorphics. 4,900 - 6,800'	None, outside range..
<b>pygmy pussypaws</b> <i>Calyptidium pygmaeum</i>	Subalpine coniferous forest, upper montane coniferous forest. Sandy or gravelly soils. 6,500 - 10,200'.	Low, in range.
<b>Pygmy poppy</b> <i>Canbya candida</i>	Openings in Joshua tree woodland and Mojave desert scrub dry sandy alluvial soils. 1,800 - 6,200'	None, outside range.
<b>Muir's railardella</b> <i>Carquista muirii</i>	Openings in chaparral, ponderosa pine, or mixed coniferous forest granite ledges/cracks or gravelly/sandy flats. 3,600 - 8,200'	None, outside range.
<b>California jewelflower</b> <i>Caulanthus californicus</i>	Open areas in foothill grassland, p-j woodland, Joshua tree woodland loose loamy clay soils over granitic substrate. 225 - 3,300'.	None, outside range.
<b>Bolander's woodreed</b> <i>Cinna bolanderi</i>	Mesic, stream sides, meadows and seeps, upper montane coniferous forest. 5,500 - 8,000'.	None, outside range.
<b>Springville fairy fan</b> <i>Clarkia springvillensis</i>	Disturbed areas in grassland, blue oak woodland, & chamise chaparral loose sandy granitic soils. 1,300 - 4,000'	None, outside range.
<b>Kern Plateau bird's beak</b> <i>Cordylanthus eremicus ssp. kemensis</i>	P-j and Joshua tree woodland, upper montane coniferous forest. Steep rocky slopes in granitic or metamorphic substrate. 5,500 to 9,800 ft.	None, outside range.
<b>Rosette cushion cryptantha</b> <i>Cryptantha circumscissa rosulata</i>	Alpine boulder and rock field, subalpine coniferous forest. Gravelly (coarse), granitic soils. 9,700 - 12,000'.	None, outside range.
<b>Tulare cyptantha</b> <i>Cryptantha incana</i>	Openings in lower mixed conifer forest & p-j woodland. Gravelly soils, 5,600 - 7,400'.	none, above range.
<b>Mojave tarplant</b> <i>Deinandra mohavensis</i>	Desert edge chaparral and arid coastal slopes, mostly clay or silty soils, 2,800 - 5,250'.	None, outside range
<b>Unexpected larkspur</b> <i>Delphinium inopinum</i>	Open rock outcrops & ridges in conifer and red fir forest metamorphic substrates. Granite occasionally. 5,500 - 9,000'	None, outside range.
<b>Rose-flowered larkspur</b> <i>Delphinium purpusii</i>	Chaparral, cismontane woodland, pinyon and juniper woodland. Rocky, often carbonate soils. 1,000 - 4,500'	None, above elevation
<b>Tulare County bleedingheart</b> <i>Dicentra nevadensis</i>	Sandy, gravelly slopes or crevices in lodgepole & sub-alpine forest. Decomposed granite soil. 7,500 - 10,000'.	None, outside range.
<b>Mineral King draba</b> <i>Draba cruciata</i>	Subalpine coniferous forest, gravelly soils. 8,200 - 11,000'.	None, outside range.
<b>Pierpoint Springs dudleya</b> <i>Dudleya cymosa ssp. costafolia</i>	Rock outcrops within in canyon live oak woodland & chaparral. Metamorphic carbonate substrate (limestone & marble). 4,800 - 5,200'.	None, outside range.

Common Name <small>Status</small> <i>Scientific name</i>	Habitat Type / Soils / Elevation	Risk/Rationale
<b>Tracy's eriastrum</b> <i>Eriastrum tracyi</i>	Chaparral, cismontane woodland. 1,000 – 5,400'	None, above elevation
<b>Hall's daisy</b> <i>Erigeron aequifolius</i>	Steep, rocky, crevices in conifer forest & p-j woodland. Granitic substrate (carbonate or basalt occasionally). 5,200 - 8,000'.	None, outside range.
<b>Kern River daisy</b> <i>Erigeron multiceps</i>	Dry meadow edges in mixed conifer or aspen forest. Granitic gravelly banks and sandy flats. 5,000 - 8,400'	None, outside range.
<b>Piute buckwheat</b> <i>Eriogonum breedlovei</i> var. <i>breedlovei</i>	Rock outcrops in mixed conifer forest and p-j woodland carbonate bedrock. Limestone or marble. Occasionally schist. 6,200 - 8,500'	None, outside range.
<b>Kings River buckwheat</b> <i>Eriogonum nudum</i> var. <i>regirivum</i>	Cismontane woodland. Carbonate, rocky soils. 500 – 1,000'.	None, outside range.
<b>Monarch buckwheat</b> <i>E. ovalifolium</i> var. <i>monarchense</i>	Mojave desert scrub, pinyon and juniper woodland. Decomposed carbonate, rocky or sandy soils. 5,500 – 6,000'.	None, outside range.
<b>Twisselmann's buckwheat</b> <i>Eriogonum twisselmannii</i>	Rocky openings Jeffrey pine-red fir forests. Shallow rocky soil derived from metamorphic and granitic substrate. 7,800 - 9,200'	None, outside range.
<b>Kaweah Lakes fawn-ly</b> <i>Erythronium pusaterii</i>	Rock fields, ledges, and steep canyon walls in montane conifer forest. Outcrops and talus fields of metamorphic rock (granite occasionally). 7,300 - 9,100'	None, outside range.
<b>Greenhorn fritillary</b> <i>Fritillaria brandegeei</i>	Lower montane coniferous forest. Granitic soils. 4,600 – 6,900'.	Moderate, within range
<b>Striped adobe lily</b> <i>Fritillaria striata</i>	Open areas in grassland and blue oak woodland pockets or islands of heavy adobe clay. Granitic or metamorphic. 500 - 4,100'	None, no adobe clay soils observed in project vicinity.
<b>Kern Cyn. false goldenaster</b> <i>Heterotheca shevockii</i>	Rock crevices, and sandy bars in river forest & foothill woodland rock outcrop or sandy, gravelly soils below the 100-year floodplain. 750 - 3,000'	None, outside range
<b>Water fan lichen</b> <i>Hydrothyrta venosa</i>	Attached to rocks in small streams within montane coniferous forest streams that are fed by cold springs and/or groundwater. 5,000 - 8,000'.	None, no riparian habitat affected
<b>Kern Plateau horkelia</b> <i>Horkelia tularensis</i>	Rocky soils in montane conifer forest (Jeffrey pine & western juniper). Soils with surface rocks in metamorphic (gabbro & schist) substrate. 7,500 - 9,450'	None, outside range.
<b>Short-leaved hulsea</b> <i>Hulsea brevifolia</i>	Openings in lower and upper montane conifer forest. Soils formed in decomposed granite or volcanic pumice. 4,900 - 10,500'.	None, outside range.
<b>Pygmy hulsea</b> <i>Hulsea vestita</i> ssp. <i>pygmaea</i>	Alpine boulder and rock field, subalpine coniferous forest. Granitic, gravelly soils. 9,300 – 13,000'	None, outside range.
<b>Munz's iris</b> <i>Iris munzii</i>	Cismontane woodland in Tulare County (primarily Tule river drainage). 1,000 – 2,600'.	None, outside range.
<b>Madera leptosiphon</b> <i>Leptosiphon serrulatus</i>	Cismontane woodland, lower montane coniferous forest. 1,000 – 4,300'. Kern to Madera counties, north of Alta Sierra	None, outside range.
<b>Congdon's lewisia</b> <i>Lewisia congdonii</i>	Rocky cliffs and ledges within chaparral and conifer forest. Rock, talus and sand derived from granite or metamorphic rock. 1,650 - 9,200'.	None, outside range.
<b>Yosemite lewisia</b> <i>Lewisia disepala</i>	Gravel shelves in rock outcrops within conifer forest. Decomposed granite deposits. 3,400 - 11,500'.	None, outside range.
<b>Hockett Meadows lupine</b> <i>Lupinus lepidus</i> var. <i>culbertsonii</i>	Rocky slopes from 8,200-9,800'.	None, outside range.
<b>broad-nerved hump-moss</b> <i>Meesia uliginosa</i>	Primarily spring-fed, short-grass meadows that are permanently wet	None, outside range.
<b>elongate copper moss</b> <i>Melichhoferia elongata</i>	Cismontane woodland (metamorphic, rock, usually vernal mesic). 1,600 – 4,300' (Tulare County north)	None, no suitable habitat, not in known range
<b>Shevock's copper moss</b> <i>Melichhoferia shevockii</i>	Cismontane woodland (metamorphic, rock, mesic). 2,500 – 4,600'. Location near Hospital Flat	None, not in range, no suitable habitat
<b>two-colored monkey flower</b> <i>Mimulus discolor</i> (AKA <i>M. montoides</i> )	Yellow pine forest, red fir forest, lodgepole forest, subalpine forest, pinyon-juniper woodland. Disturbed areas along small streams, generally in granitic soils; > 6,000'.	None, outside range.
<b>slender stalked monkey flower</b> <i>Mimulus gracilipes</i>	Disturbed or burned areas on decomposed granite; 1,600 – 4,300'. C Sierra Nevada foothills.	None, outside range
<b>Kaweah monkey flower</b> <i>Mimulus norrisii</i>	Marble crevices; 2,000–4,300'. S Sierra Nevada foothills (Kaweah River drainage, Tulare co.).	None, outside range.
<b>Kelso Creek monkey flower</b> <i>Mimulus shevockii</i>	Openings in Joshua tree and p-j woodlands alluvial coarse sandy-loam and loose sandy gravels. 2,800 - 4,200'	None, outside range.
<b>sweet-smelling monardella</b> <i>Monardella beneolens</i>	Rocky granitic or metamorphic slopes in open conifer forest; 8,200–12,000'. S high Sierra Nevada.	None, outside range.
<b>Flax-like monardella</b> <i>Monardella linoides</i> ssp. <i>oblonga</i>	Sandy open areas in ponderosa pine forest decomposed granite and metamorphic substrates. 3,000 - 8,100'	None, outside range.
<b>San Joaquin wooly threads</b> <i>Monolopia congdonii</i>	Alkali scrub flats in the southern Central Valley from 300 to 1200 ft.	None, outside range.
<b>Baja navaretia</b> <i>Navaretia peninsularis</i>	Wet areas within chaparral and ponderosa pine forest saturated sandy soil along small creeks, meadows, and snowmelt seeps. 4,900 - 7,550'	None, outside range.
<b>Piute Mountains navaretia</b> <i>Navaretia setiloba</i>	Openings in oak woodland and p-j woodlands heavy clay soils. 2,000 - 3,800' ft.	None, outside range
<b>Chimney Creek nemacladus</b> <i>Nemacladus calcaratus</i>	Decomposed granite flats; 6,200 – 6,900'. S high Sierra Nevada (Chimney Creek).	None, outside range.

Common Name <small>Status</small> <i>Scientific name</i>	Habitat Type / Soils / Elevation	Risk/Rationale
<b>Twisselman's nemacladus</b> <i>Nemacladus twisselmannii</i>	Arid, decomposed granitic gravels and sands on ridgetops and rock outcrops in open Jeffrey pine forests, from 7,300 - 7,800'	None, outside range.
<b>Bakersfield cactus</b> <i>Opuntia treleasei</i>	Openings in oak woodland and chaparral dry sandy soils or rock outcrops. 300 - 3,000'.	None, outside range.
<b>San Joaquin adobe sunburst</b> <i>Psuedobahia peirsonii</i>	Valley grassland or oak woodland heavy adobe clay derived from metamorphic substrate. Ophiolite. 3,600 – 5,700'.	None, no adobe soils.
<b>purple mountain-parsley</b> <i>Oreonana purpurascens</i>	Ridgetops and rock outcrops and in gravelly openings of decomposed granitic or metamorphic soils in red fir forests, approximately 7,900 - 9,400'.	None, outside range.
<b>woolly mountain-parsley</b> <i>Oreonana vestita</i>	Ridge tops; 5,500–11,500'. San Gabriel Mtns., San Bernardino Mtns.	None, outside range.
<b>veined water lichen</b> <i>Peltigera gowardii</i>	Aquatic, usually on rock submerged in cool mountain streams.	None, outside range.
<b>marble rockmat</b> <i>Petrophyton caespitosum ssp. acuminatum</i>	Montane coniferous forest, on carbonate or granitic, rocky substrates or limestone cliffs from 4,000 – 7,500'.	None, outside range.
<b>Nine Mile Canyon phacelia</b> <i>Phacelia novemmillensis</i>	Dry, disturbed banks and gravelly, rocky, shallow soils in Jeffrey pine and pinyon-juniper woodland. 5400 – 8300'	None, outside range.
<b>Whitebark pine</b> <i>Pinus albicaulis</i>	Upper red-fir forest to timberline, especially subalpine forest; 6,500–12,000'; high Cascade, Klamath and Sierra ranges to British Columbia and east of Sierra Nevada.	None, outside range.
<b>Latimer's woodland-gilia</b> <i>Saltugilia latimeri</i>	Dry desert slopes, coarse sand to rocky soils; 1,300–6,200'. Transverse ranges, peninsular ranges, desert.	None, outside range.
<b>Keck's checkerbloom</b> <i>Sidalcea keckii</i>	Serpentine soils in blue oak woodlands and grasslands 600 - 2,000'	None, outside range.
<b>white-margined starry puncturebract</b> <i>Sidothea emarginata</i>	Gravel; 1200–2500 m. E peninsular ranges (San Jacinto Mtns., Santa Rosa Mtns., and Riverside Co.)	None, outside range.
<b>Piute Mtns. jewel-flower</b> <i>Streptanthus cordatus var. piutensis</i>	Cliffs and disturbed areas within p-j woodland, heavy red clay soil soils in meta-volcanic or gabbro substrate. 3,600 - 5,700'	None, outside range.
<b>Tehipite Valley jewel-flower</b> <i>Streptanthus fenestratus</i>	Carbonate and granite ledges, sand, open mixed-conifer/oak woodland; high Sierra Nevada (Kings river canyon, Fresno co.), middle Kings River Cyn. from 2,000 - 5,000'	None, outside range.
<b>Alpine jewel-flower</b> <i>Streptanthus gracilis</i>	Rocky slopes; 9,500–11,800'. High Sierra Nevada (Kings-Kern divide region).	None, outside range.
<b>Bay horsehair lichen</b> <i>Sulcaria badia</i>	Endemic to the Pacific northwest, known only from thirteen historic and contemporary localities in the US; in Washington, Oregon and northern California. None of the known localities is further than 85miles from the ocean.	None, likely mistake in listing for Sequoia NF.
<b>Howell's tauschia</b> <i>Tauschia howellii</i>	Granitic gravel, ridge tops, fir forest; 2000–2500 m. Klamath ranges (Salmon Mtns), n high Sierra Nevada; southern Oregon.	None, likely mistake in listing for Sequoia NF.
<b>Coastal triquetrella</b> <i>Triquetrella californica</i>	Near coast, SW OR to S CA. Loose mats, exposed to shaded, rocks, sand, or gravel; dry or moist sites w/in 10 miles of coast. Pinus contorta and grassland at north to dense chaparral on N-facing slopes at S end of range.	None, likely mistake in listing for Sequoia NF.

Status: FS - FS Sensitive Species FE - Federal Endangered CH - Federal Critical Habitat SP - State Fully Protected ST - State Threatened  
 FP - Federal Proposed FT - Federal Threatened LI - Local Interest SC - State Special Concern SE - State Endangered

# Osa Meadow Restoration Project

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## Hydrology Report and Erosion Control Plan

Sequoia National Forest  
Kern River Ranger District



Prepared by

Keith Andrew Stone  
District Hydrologist

7/22/15

Date

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# Introduction

The Osa Meadow Restoration Project is located near the northern boundary of the Kern River Ranger District, Sequoia National Forest (Figure 1). Access is via the East Beach Creek Road (FS Road 20S25) off of the Blackrock Road (FS Road 21S03). The restoration area is located on the Kern Plateau in the southwest quarter of Section 16 and southeast quarter of Section 17, Township 20 South, Range 34 East, Mount Diablo Base Meridian, within the Soda Creek-Kern River HUC12 watershed (HUC12# 180300010404). The affected project area (i.e., the area that will be physically manipulated as part of the restoration) will be approximately 19 acres in the 55 acre Osa Meadow area, but the restoration benefit (e.g., elevation of the ground water table) is expected to affect 30 or more acres of meadow.

The Forest Service is implementing the Osa Meadow Restoration Project (Osa Project) for watershed improvement along a portion of Osa Creek in Osa Meadow. The Osa Project would restore approximately 4,000 feet of degraded stream within the meadow to: improve hydrologic function; improve conditions so overbank flows can access the meadow floodplain; enhance meadow vegetative and aquatic species while maintaining existing land uses, including recreation.

Restoration treatment focuses on re-establishing overland flow to the meadow's naturally-evolved floodplain. The project would provide the following ecosystem benefits: 1) increase the wetted areal extent of the meadow, 2) reduce peak flows and increase/extend summer baseflows, 3) increase in-stream cover and shading, 4) enhance aquatic and terrestrial habitat, 5) improve water quality, and 6) raise the local groundwater level within the meadow.

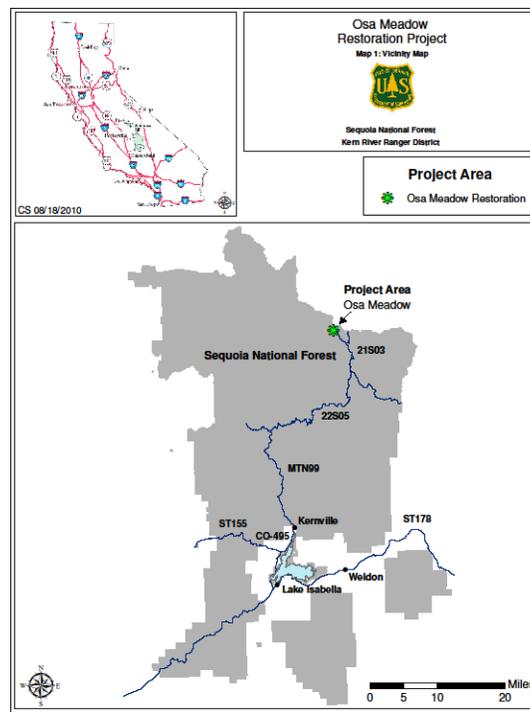


Figure 1. Osa Meadow project area location.

## Purpose and Need for Action

Meadows are sensitive to changes in the watershed and can be adversely affected by land management activities such as road building, timber harvest operations, grazing, and fire suppression. Cumulatively, these activities (coupled with climate change) have put stressors on forest watersheds, their drainage networks and their associated riparian-aquatic areas. This has resulted in a variety of watershed disturbances, with unstable stream channels and gully formation in meadows being a prime example. Osa Meadow is one such meadow, and has had a long history of grazing (since the late 1800's) as well as other cumulative watershed stressors. These stressors have caused the stream channel in Osa Meadow to down-cut, with a commensurate decrease in the water table elevation.

There have been numerous attempts to restore the hydrologic function of Osa Meadow. Check dams were installed in the late 1970's to help maintain channel grade and stabilize the system as a whole. These efforts have helped maintain grade, but have had little influence over the water table elevation and floodplain connectivity. The McNally Fire of 2002 (and the subsequent 100-year rain fall event that occurred in November of the same year) caused increased down-cutting and channel de-stabilization.

Because montane meadows like Osa serve a vital role as water storage and release systems, it is essential that the hydrologic function Osa Meadow be restored. The overall goal of meadow restoration is to improve, enhance or completely restore the hydrologic function of degraded meadow systems such that water storage and residence time is maximized, improving water quality and increasing annual water availability to riparian-aquatic systems.

Restoring hydrologic function and floodplain connectivity in Osa Meadow is necessary to meet the desired condition as set forth in the Sequoia National Forest Land and Resources Management Plan (SQF-LRMP USDA, 1988), as amended by the Mediated Settlement Agreement (SQF-MSA) and the Sierra Nevada Forest Plan Amendment ROD (SNFPA USDA, 2004). Guidance Includes:

- SQF-LRMP B1 (p.4-3): Maintain or improve long term soil productivity.
- SQF-LRMP B4 (p.4-4): Emphasize protection management and improvement of riparian areas during the planning and implementation of land and resource management activities along stream courses on the forest.
- SQF-LRMP C3n3 (p. 4-9): Meadows will be managed to a fair and better condition and to maintain their existing acreage and restore any that have been damaged. Trails will be rerouted away from meadows where unacceptable damage is occurring. On the meadow edge, large tree character and a diverse environment of structural "edge" effects will be provided.
- SQF-MSA Exhibit D (p.9): "...Plans will be developed from prioritized WINI inventories to re-establish hydrologic characteristics and riparian habitat..."

- SNFPA RCO#2-105 (p.64): At either the landscape or project scale, determine if the age class, structural diversity, composition and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.
- SNFPA RCO#6-122 (p.66): Recommend restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered ground water tables, or (3) areas that are either actively down cutting or that have historic gullies. Identify other management practices, for example, road building, recreational use, grazing, and timber harvests that may be contributing to the observed degradation.

## Project Scope

This project proposes four activities:

1. Fill the incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from an adjacent Holocene terrace.
2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6” dbh) encroaching lodgepole pine along southern periphery of the meadow.

## Background

Osa Meadow and many meadows in the neighboring watersheds (e.g., Little Horse, Coppersmith, Dead Dog) share similar hydrogeomorphic characteristics, of which overland or “sheet” flow is the dominate hydrological mechanism by which water moves through these meadow systems. Small single thread channels and broad swales can be present, but are often discontinuous. Much of Osa Meadow is believed to have operated as an overland flow system, but grazing stressors during the turn-of-the-century removed most of the vegetation, causing concentrated flow and the development of a single thread channel. With the reduction in vegetative surface armor, any small channel, livestock trail, or other bare linear feature could begin to ‘etch’ channels that did not exist prior to the 1850’s. Despite having small drainage areas, these etched features could gradually deepen and widen to the incised conditions that exist today with negative effects on meadow hydrology and meadow dependent species. Although historic grazing is thought to be the principal stressor, cumulative effects from road building and other landscape activities have exacerbated the impacts.

## Gully Channel Fill

Surveys show that the channel in Osa Meadow has down cut in at least two stages causing the development of an inset floodplain or gully. Currently, water flowing in the channel cannot reach the inset floodplain much less the natural remnant floodplain that existed before the system began to downcut. The objective of the gully channel fill restoration, therefore, is to reconnect overland flow to the natural floodplain.

To reconnect the natural floodplain, barrow material will be “scalped” from an adjacent Holocene terrace and used to fill the channel and inset floodplain (gully) to the elevation of the natural remnant floodplain (Figure 1). The Holocene terrace will only be lowered to the elevation of the natural floodplain; no “ponds” will be excavated to accommodate barrow material. This will have the benefit of increasing the floodplain area and decreasing the depth to ground water in the barrow site (Figure 1), thus increasing the wetted perimeter of the meadow. This type of restoration method was recommended by Cooper and Wolf (2006) for Halstead Meadow in Sequoia National Park, which is the appropriate restoration for meadows where the dominated natural flow mechanism is by subsurface and/or overland flow.

Approximately 5,500 cubic yards of barrow material will be moved from the Holocene terrace to fill the gully. Additional contingency barrow sites have been identified if more material is needed (Figure 1). The barrow material will be moved by a loader and tracked excavator. Equipment will only enter the meadow in late summer/early fall when the soil moisture conditions are the lowest seasonally, thus reducing the possibility of adverse compaction and impacts to soil productivity.

## Valley Grade Control Structure

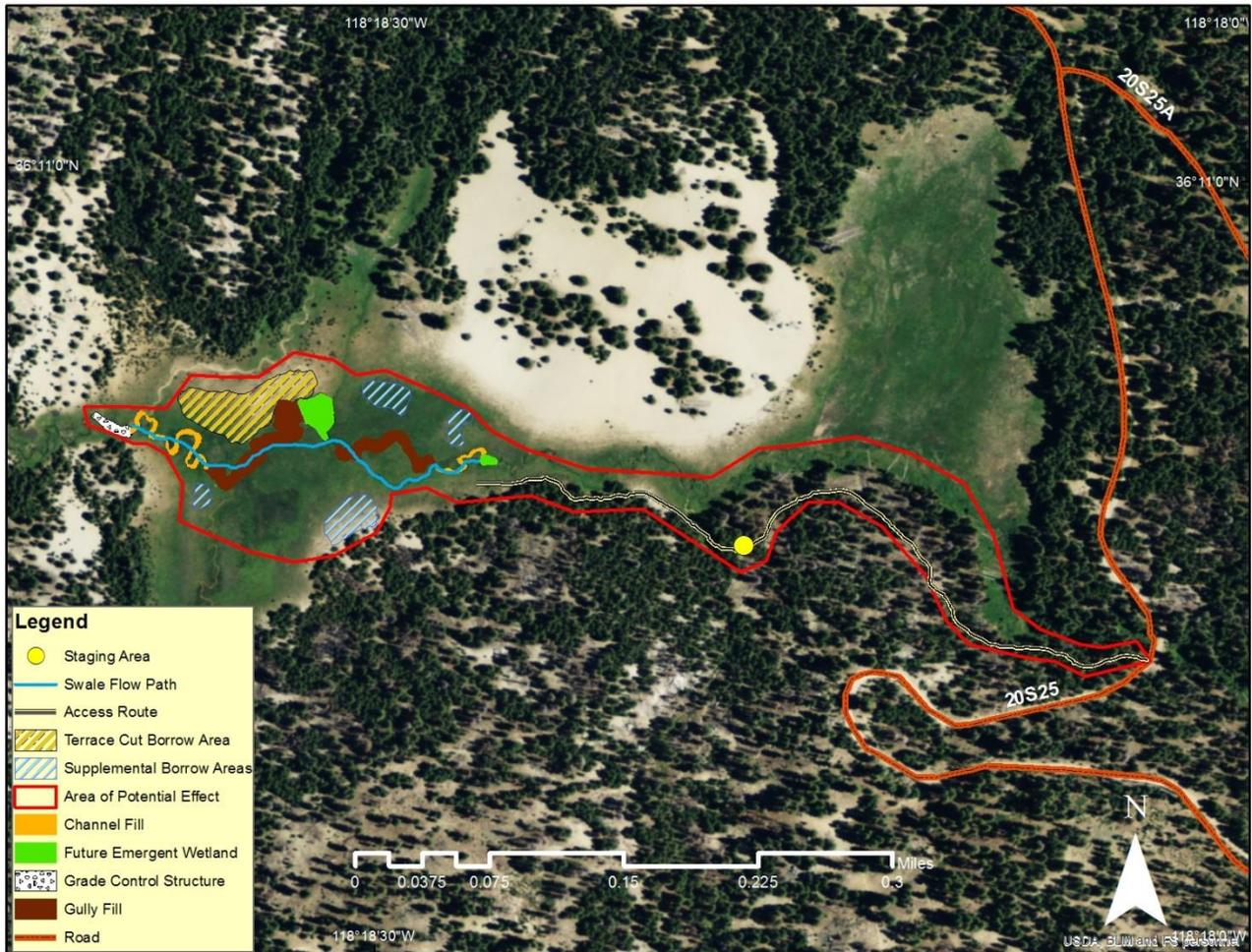
Rock used in previous restoration efforts will be re-purposed to build the valley grade-control structure. This structure is designed to buttress and maintain the respective grade (i.e., elevation) of the restoration network, allowing for a seamless transition of the new meadow gradient to the existing channel at the downstream end of the project. The structure will accommodate the passage of flows, but would prevent further down-cutting and degradation of the meadow (Figure 1).

## Supplemental Revegetation

Native willows would be live-staked throughout the restoration area. Sod, rushes, and sedges, established in the gully bottom or barrow areas will be stockpiled and transplanted in the disturbance areas and the gully fill corridor. Wood material, though limited, would be used for large woody debris (LWD) and added surface roughness in key areas. The willows and propagating meadow vegetation will help stabilize the fill areas.

## Encroaching Conifer Removal

Approximately 2 acres of small (<6” dbh) encroaching lodgepole pine will be removed along the southern periphery of the meadow. The conifers will be removed by hand using chainsaws, hand saws, and/or loppers. The slash will be left in place or placed in the restoration area to increase surface roughness and decrease water velocities to prevent rilling.



**Figure 2. Aerial plan view of Osa Meadow. yellow hatched area indicates the extent of the Holocene terrace area where the barrow material will be removed. Channel and gully fill are indicated by the orange and brown areas. Strategic placement of the fill sites will have the added benefit of creating emergent wetlands, as indicated by the green areas. Equipment ingress is indicated by the yellow line.**

The shortest and most durable route from the meadow's margin to the installation points will be used for equipment access throughout the implementation of the project (Figure 1). In addition, equipment would only be allowed in the meadow in the late summer or early fall when the meadow is dry and the chance of any soil compaction is negligible.

All mechanical equipment used in the construction will be cleaned to remove all soil, seed, and plant materials, prior to entering the forest, to prevent the spread of noxious weeds. Refueling of mechanical equipment will take place at least 100 feet from the meadow's edge (BMP 2.11). Vehicles used to transport personnel and materials, personnel clothing and footwear, or any other equipment or hand tools used will be cleaned to remove soil, seed, and plant materials before entering the Forest. Boots and/or waders used by

personnel will be decontaminated prior to entry into the meadow to help mitigate the spread of chytrid fungus.

## Monitoring

Monitoring is a means to determine if conditions in Osa Meadow are meeting or moving toward the desired conditions. Extensive surveys have been conducted to document the existing conditions within the meadow and stream channel. Amphibian surveys were performed in 2010, and again in 2015. Additional monitoring would take place immediately after the project is implemented and annually for five years to document the effectiveness of the project. This monitoring would include ground water, carbon sequestration/GHG emissions, sedimentation, planted vegetation success or mortality, noxious weeds, the integrity of the restoration, and the presence of new headcuts.

## Affected Environment

### Background

From the late 1800's to 2003, Osa Meadow was used for seasonal grazing and in 1908 became part of the Sequoia National Forest. The Osa Meadow area is located within the Beach grazing allotment. This allotment has been vacant since 2003 and will not be used until the NEPA is complete to reissue the permit for the allotment. Since as early as the 1940's, there have been numerous past attempts to restore and stabilize the stream channel in Osa Meadow. Check dams installed in the late 1970's helped maintain grade and vertical stability (i.e., no head-cutting has developed), but has not arrested the decline in the water table or stabilized cut banks on meander bends.

### Hydrography

The Osa Meadow Restoration Project is within the Soda Creek-Kern River HUC12 watershed (HUC12, 180300010404). The Soda Creek-Kern River HUC12 watershed is approximately 24,000 acres and contains 12 HUC14 subdrainages. The only subdrainage affected by the project is the Osa Meadow HUC14 (Local HU14 6BC). This subdrainage is approximately 2,560 acres with 4.1 miles of intermittent and 6.5 miles of perennial streams and is drained by Osa Creek, which is tributary North Fork of the Kern River.

## Water Quality

### Beneficial Uses

Water quality objectives and beneficial uses in the project area are managed by the Central Valley Regional Water Quality Control Board (CVRWQCB) under the Central Valley Basin Plan for the Tulare Lake Basin (CVRWQCB, 2004). This plan designates the beneficial uses to be protected, water quality objectives, and an implementation program for achieving objectives. Table 1 shows the designated beneficial uses for major perennial drainage(s) downstream of the project area. Water bodies tributary to these major perennial drainages also fall under the same beneficial use criteria (i.e., the "Tributary Rule"). Assuming that the water quality currently meets or exceeds water quality standards, the water is subject to the Anti-degradation Policy, which requires that wherever existing water quality is better than the established objectives, the existing quality will be maintained (CVRWQCB, 2004). Applicable beneficial uses extracted for the project are listed below.

**Table 1. Designated beneficial uses for major perennial drainages downstream of the project area.**

<b>Water Bodies</b>	<b>MUN</b>	<b>POW</b>	<b>REC1</b>	<b>REC2</b>	<b>WARM</b>	<b>COLD</b>	<b>WILD</b>	<b>RARE</b>	<b>SPWN</b>	<b>FRSH</b>
<i>Kern River Above Lake Isabella</i>	X	X	X	X	X	X	X	X	X	X

Municipal and Domestic Supply (MUN) - Uses of water for community, military, or individual water supply systems including, but not limited to, drinking water supply.

Hydropower Generation (POW) - Uses of water for hydropower generation.

Water Contact Recreation (REC-1) - Uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, wading, or fishing.

Non-contact Water Recreation (REC-2) - Uses of water for recreational activities involving proximity to water, but where there is generally no body contact with water, nor any likelihood of ingestion of water. These uses include, but are not limited to, picnicking, sunbathing, hiking, camping, hunting, sightseeing.

Cold Freshwater Habitat (COLD) - Uses of water that support cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.

Wildlife Habitat (WILD) - Uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources.

Threatened and Endangered Species (RARE) – uses of water that support habitats necessary, at least in part, for the survival and successful maintenance of plant or animal species established under state or federal law as, rare, threatened or endangered.

Spawning, Reproduction, and/or Early Development (SPWN) – Uses of water that support high quality aquatic habitats suitable for reproduction and early development of fish (SPWN shall be limited to cold water fisheries).

Freshwater replenishment (FRSH) – Uses of water for natural or artificial maintenance of surface water quantity or quality.

### Water Quality Objectives

Water Quality Objectives are narrative or numeric limits designed to protect beneficial uses of water. The parameters with specified objectives in the Central Valley Basin Plan include ammonia, bacteria, biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, methylmercury, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, tastes and odors, temperature, toxicity, and turbidity. The parameters that this project has the potential to affect are dissolved oxygen (DO), sediment, temperature, and turbidity. The other parameters are not likely to be affected by the Osa project.

### Existing Condition

Osa Creek is the only perennial stream within the Osa Meadow subwatershed (6BC). Stream surveys have been completed from Osa Meadow upstream to the headwaters of the subwatershed. The steeper

headwaters of Osa Meadow Creek are naturally-stable, moderate gradient, boulder/bedrock channel types. Where Osa Creek shifts to a lower gradient and flows through Osa Meadow, the stream channel changes to a sensitive E<sub>5</sub>, which is a low gradient, gravel/sand dominated channel. The remaining portion of Osa Creek, below Osa Meadow, was surveyed for presence of fish in 1981. Valley Type was identified as a Type II below Osa Meadow (8400 ft.) down to an elevation of 5640 ft., and below this the valley flattens to a Type III; fish were found in all streams below the meadow (Forest data). Averaged data from Stream Condition Inventory (SCI) surveys conducted in Osa Creek in Osa Meadow are summarized below:

**Table 2. Averaged geomorphic measurements from SCI surveys along Osa Creek in Osa Meadow**

Bankfull Width	Width-to-Depth Ratio	Flood Prone Width	Entrenchment Ratio
2.77	19.3	13.7	4.9

Although Osa Creek through Osa Meadow appears vertically stable (i.e., there are no active headcuts along the length of the affected channel), the McNally Fire of 2002 (and the subsequent 100-year rain fall event that occurred in November of the same year) caused down-cutting and channel de-stabilization. As a result of this incision, the lower (west) portion of the meadow no longer functions hydrologically because the channel has been disconnected from its natural floodplain. As a result of this dewatering, meadow vegetation composition has shifted from traditional moist meadow species to dryer upland meadow vegetation types allowing for conifers to grow (or encroach) into the meadow. Habitat for water-dependent or water-associated (aquatic) species is currently restricted at the site and threatens upstream and downstream resources.

### Cumulative Watershed Effects for Existing Condition

Past and present activities within the Osa Meadow Creek subwatershed include grazing, wildfire, prescribed burning, timber harvest, road construction, reconstruction and maintenance, trail construction and maintenance, and recreational use. The Sequoia National Forest Cumulative Watershed Effects (CWE) Model was used to determine existing condition of the subwatershed. Table 3 displays the Osa Meadow Creek subwatershed, equivalent roaded acres (ERAs) available, ERAs used from past disturbances/projects, and what ERAs remain before the subwatershed threshold of concern (TOC)<sup>1</sup> is reached.

**Table 3 – Subwatersheds, Equivalent Roaded Acres, and Percent Used**

Subwatershed	Subwatershed Name	ERA's Available	ERA's Used to Date	ERA's Remaining	ERA Percent Used
6BC	Osa Meadow Creek	102.44	6.82	96.16	6.13

## Effects of Project Activity

The Osa Meadow Restoration Project contains several components: gully fill, a valley grade control structure, revegetation, and conifer removal. Any of these could have potential direct and indirect effects on hydrologic resources. Concerns with these proposed actions include: increased erosion causing changes to water quality, hydrologic connectivity/elevation of the water table, increased sedimentation/ deposition, and bank stability. All of these concerns affect meadow and aquatic species habitats and water quality.

<sup>1</sup> The Threshold of Concern (TOC) is expressed as a percentage (% of ERA's used). The higher the percentage means the greater the possibility of a management action negatively impacting water quality within a subwatershed.

## If No Action is Taken

### *Direct and Indirect Effects*

Climate change predictions are that an increased frequency of rain on snow events will occur. If the meadow is not restored these events could down-cut and widen the channel, further lowering the water table and creating excess erosion and sedimentation negatively effecting water quality, increasing stream channel instability, filling pools with fine sediment, and increasing the loss of aquatic species habitat for the native Kern River Rainbow trout within and downstream of the project area.

### *Cumulative Effects*

Cumulative effects analysis using the Sequoia National Forest Cumulative Watershed Effects (CWE) model will have the same results discussed previously in the Existing Condition section under Table 3. No management action will occur therefore Thresholds of Concern (TOC) for the watershed would remain the same as well as the Equivalent Roaded Acres.

## Proposed Project Activity

### *Direct and Indirect Effects*

Project activities could result in short term ground disturbance and transportation of loosened soils if left exposed during a natural rain event. However, an erosion control plan for the project would be implemented as part of the Best Management Practices. The erosion control plan effectively limits and mitigates erosion and sedimentation from these short term ground-disturbing activities. Detailed information regarding the erosion control plan can be read in Appendix A of this document.

### Gully Fill

Gully fill has the potential to affect water quality if loose soil associated with the construction is washed into the creek and later mobilized downstream. This is unlikely, however, because of the erosion mitigation measures specified in the Erosion Control Plan (Appendix A) and the Revegetation efforts that will occur as part of the proposed activity.

The positive effects of the restoration far outweigh the potential short term impacts. Gully fill will allow for the water table to rise, increase water storage, and reduce sediment transport back to natural background rates. It is expected within 1 to 3 years the beneficial effects to the connectivity of the meadow should be visible in the form of increased wetted meadow area, standing water across the lower portion of the meadow for longer periods of time each summer, and regeneration of more riparian vegetation, especially throughout the hydrologically revitalized floodplain.

The most downstream component of the restoration is a valley grade control structure. This structure is built to create added stability to the riffle augmentation structures above. Osa Creek would flow over and down the structure. In order to prevent erosion along the structure, a step-pool system would be built. The step-pool system is designed to dissipate the stream flow's energy and prevent erosion. Rock from previous restoration efforts would be re-purposed to build the step-pool system and accommodate the streams flow. Remaining bare soil created during construction would be re-vegetated with willows, native sod and/or seed to prevent erosion and further stabilize the structure.

Water temperatures before and after implementation of this project are not expected to be negatively affected. Implementation would occur when the lowest amount of water flows through Osa Meadow. Restoration efforts will improve meadow vegetative conditions allowing for an increase shading which is expected to at least maintain, if not improve, overall water temperatures. No adverse impacts to water temperature are expected as a result of implementing this project.

#### Staging Area

Servicing and refueling of equipment would follow Best Management Practices (BMP 2.11) to eliminate concerns for water contamination. Any servicing or refueling operations would be located a minimum of 100 feet away from the meadows edge. Site specific locations for equipment fueling will be identified during project layout. Refueling and servicing would occur only at these locations. A non-porous mat would be used at the serving/refueling area. Vehicles and heavy machinery needed for restoration purposes would be staged within the project area, but not within the meadow.

#### *Cumulative Effects*

Cumulative effects analysis for this action includes restoration activities such as mechanical equipment and streambed alteration. As previously discussed, these disturbances have the potential to contribute increases in sediment transport, soil compaction, and to negatively affect water quality. However, these disturbances would be short term and greatly minimized by using Best Management Practices. The long term benefits would reduce sedimentation back to natural levels, restoring Osa Meadow's hydrologic function and connectivity to its floodplain, and maintain/sustain diverse riparian and aquatic habitats.

The overall impact to the subwatershed will be a subtle shift back to a more stable and natural hydrologic function, reducing the CWE potential and increasing the available ERA's. As a result, there will be no measureable cumulative effects from implementing the project.

### **Riparian Conservation Objectives Consistency Analysis**

A consistency review of the applicable Riparian Conservation Objective (RCO) Standards and Guides was conducted to ensure that project activities adhered to the 2004 Sierra Nevada Forest Plan Amendment. The project (as proposed) is consistent with the Riparian Conservation Objectives Standard and Guides. Not implementing the project would be inconsistent with RCO Standard and Guides 102, 105, 108, 117, and 122. The complete RCO consistency analysis can be found in Appendix D.

### **Summary and Conclusion of Alternatives**

Allowing the erosional conditions to exist will negatively affect water quality and increase the loss of aquatic species habitat. Implementing the project could have short term disturbances to water quality and aquatic habitat; however, mitigation measures would minimize the short term disturbances created during project implementation. Upon completing the project, the long term benefits to water quality and aquatic habitat outweigh the short term disturbances.

## Best Management Practices

Best Management Practices, as described in this document, have been effective in protecting beneficial uses of water within the affected watersheds. These practices have been applied in other projects on the Sequoia National Forest. Where proper BMP implementation has occurred there have not been any substantive adverse impacts beneficial uses. The practices specified herein are expected to be equally effective in maintaining the identified beneficial uses.

The following management requirements are designed to address the watershed management concerns. Most are BMPs from the Forest Service publication "Water Quality Management Handbook"<sup>2</sup> (USDA Forest Service, 2011). All applicable water quality BMPs shall be implemented. Below are listed the applicable BMP's for this project.

### **BMP 2.13 Erosion Control Plan:**

Implementation of this BMP is required since the restoration site is greater than 50 square feet located in a riparian area and wheeled or tracked equipment will be utilized for construction. This plan is further discussed in detail under Appendix A of this report.

### **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 2.11 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 will be located a minimum of 100 feet away from the meadow edge. Site specific locations for equipment fueling will 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 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 Osa Meadow. The proposed design for restoration of Osa 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 will 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. Please refer to the SPCC for further information regarding pollutants and their associated spill plan design for this project.

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<sup>2</sup> R5 FSH 2509.22 – Soil and Water Conservation Handbook, Chapter 10 – Water Quality Management Handbook. Effective as of 12-5-2011.

**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.

**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 document 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. Results of the analysis are summarized in this document.

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# Appendix A

## Erosion Control Plan

The Erosion Control Plan provides detailed considerations and mitigations applicable to the completion of the project to reduce off site erosion and storm water runoff. The plan is broken up into three sections which are pre-project, project implementation, and post project. These sections will contain information regarding, but not limited to, mitigations measures, anticipated ground-disturbing activities, maps, and waste management strategies.

### Pre-Project Implementation

Prior to implementing the Osa Meadow Restoration Project, several components of the Erosion Control Plan must be in place. These include mitigations measures developed through project analysis, requirements to meet Best Management Practices (BMP), project plans and specifications, and required State and Federal permits.

Ground-disturbing activities are expected to occur as a result of the Osa Meadow Restoration Project. There are a total of four anticipated activities, which include:

1. Fill the incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from an adjacent Holocene terrace.
2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6” dbh) encroaching lodgepole pine along southern periphery of the meadow.

A plan view map has been prepared for the Osa Meadow Restoration Project. The map shows the haul route for equipment, barrow sites, and channel fill treatment areas. (Appendix B).

Directions from Kernville, CA, are as follows: Take Mountain Highway 99 north to Sherman Pass Road (FS road 22S05). Continue on Sherman Pass road to Black Rock Station, which is on FS road 21S03. Continue on FS road 21S03 to FS road 20S25. Turn left onto FS road 20S25 and continue to Osa Meadow. The area is not accessible year round due to snow.

Implementation would occur during the driest time of the year for the meadow, typically August thru October. The driest time of the year was chosen to avoid and or minimize effects on meadow and soil resources and reduce the potential for increased erosion. Work would not occur during wet weather.

Best Management Practices have been determined for the Osa Meadow Restoration Project and are discussed in detail in the Hydrology report. A summary of what is applicable to the project is as follows: BMP 2.13 – Erosion Control Plan, BMP 2.5 – Water Source Development and Utilization, BMP 2.11 – Equipment Refueling and Servicing, BMP 7.1 – Watershed Restoration, BMP 7.4 – Forest and Hazardous Substance Spill Prevention Control and Countermeasure (SPCC) Plan, BMP 7.6 – Water Quality Monitoring, and BMP 7.8 – Cumulative Off-site Watershed Effect. Some of these BMPs are required during the planning stages or pre-project stage:

- As required by BMP 2.13 – Erosion Control Plan, a plan to control erosion is required prior to project implementation. This document addresses this BMP requirement.
- As required by BMP 7.6 – Water Quality Monitoring, baseline conditions have been established within and outside of Osa Meadow. Baseline conditions were collected following Region 5 Steam Condition Inventory protocol. Results of the baseline conditions are discussed within the hydrology report.

There are two permits required from other agencies prior to implementation. One is a 404 Nationwide 27 blanket dredge and fill permit from the Army Corps of Engineers. The other is a 401 certification from the California Central Valley Water Quality Control Board. Both of these must be approved in order to proceed with the project.

Flagging will be used to identify the project perimeter, avoidance areas, location of the haul route and staging area, and fuel storage and equipment servicing locations prior to or during implementation. Orange flagging will designate the project boundary. Pink will be used to show the haul route access to the staging and work areas within the meadow. Red and blue combo are areas to avoid either for archeological or resource reasons. Yellow and black combo will be used for fuels and equipment. White and pink combination will be used for staging restoration materials. Contact personnel on the Osa Meadow Restoration Project are listed below. Their full name, position, and contact phone numbers are included.

Name	Position	Phone Number
Keith Andy Stone	District Hydrologist Erosion Control Plan Preparer and Project Lead	760-376-3781 x683
Keith Andy Stone	Contracting Officer Representative	760-376-3781 x683
Al Watson	District Ranger Erosion Control Plan Approver	760-376-3781 x610

### Project Implementation

The Project Implementation portion of the Erosion Control Plan discusses the when, where, why, and how the project activities will be implemented while minimizing or preventing erosion. Project activities during implementation include:

1. Fill the incised channel and inset floodplain (i.e., “gully”) to the elevation of the natural (remnant) floodplain using barrow material derived from an adjacent Holocene terrace.
2. Installation of a rock/vegetation valley grade control structure at the downstream end of the meadow.
3. Plant various native riparian species throughout the restoration site, including willows and sod.
4. Hand removal of small (<6” dbh) encroaching lodgepole pine along southern periphery of the meadow.

Staged equipment would be kept at least 100 feet or more from the meadows edge. BMP 2.11 would go into effect for any servicing and refueling needs in the staging area. The staging area would require non-porous mat residing around the portion used for refueling. BMP 7.4 would be implemented if fuel stored onsite and above ground exceeds 1320 gallons or a single container exceeds 660 gallons, which produces a Hazardous Substance Spill Prevention Control and Countermeasure Plan.

The use of heavy machinery will be limited to the staging area, designated haul routes and the restoration sites within the meadow (Appendix B). The Osa Meadow Restoration Plan layout, (Figure 1 in the hydrology report and Appendix B), shows the locations of the restoration work and equipment haul route. Soil used to fill the gully would be derived locally by “scalping” the upper few feet of soil from an adjacent Holocene terrace. Rock used for the valley grade control structure would be re-purposed from rock used in previous restoration efforts already located in the meadow.

Onsite sod and/or native seed (if available) and/or woody material will be used to cover the bare soil of the barrow area(s) and valley grade control structure. Native willows would be planted throughout the restoration area for stability and improvement for future wildlife habitat. In bare soil areas not sufficiently covered with native vegetation and/or woody debris, certified weed-free, biodegradable coir blanket will be installed to stabilize the soil and prevent erosion from rain spatter impact.

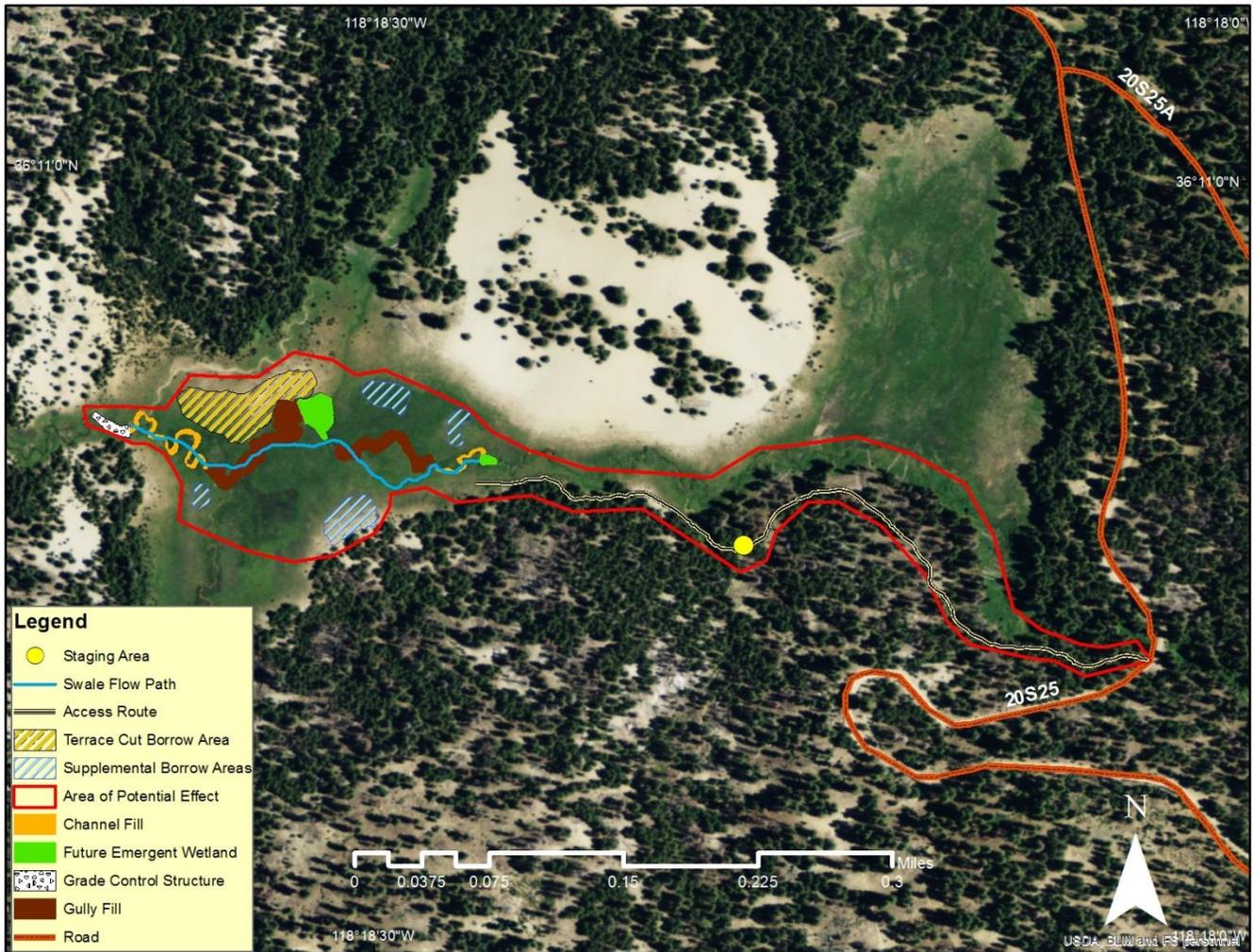
Once the project is completed, Best Management Practices protocol requires the BMP evaluations be conducted. The Contracting Officer assigned to the project (or CO Representative) will be responsible for completing all required BMP evaluations. Submission of the evaluation forms will go to the Kern River Ranger District Hydrologist. If the hydrologist is not available for any reason, the forms will go to the District Ranger.

### **Post Project Implementation**

Post project procedures include removal of heavy equipment, removal of any items stored in the staging area, waste management and disposal, and post project water management. The staging area may contain waste generated during project implementation. The contractor will be responsible for removing any and all waste from the site in accordance to all applicable laws. The goal of waste management and disposal is to return the project area to pre-project conditions.

Post project monitoring will occur as required by BMP protocol. BMPs used during pre and project implementation would be evaluated the following year. A Forest Service hydrologist is required during post project BMP monitoring.

Appendix B



Appendix C

Riparian Conservation Objectives Analysis			
Standard and Guideline	Does it Apply?		Why or Why Not?
	YES	NO	
<b>Riparian Conservation Objective 1:</b> Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses.			
S&G 95: For waters designated as “water quality limited” (Clean Water Act Section 303(d)), implement appropriate state mandates for the waterbodies, such as total maximum daily load (TMDL) protocols.		X	No waters designated as TMDL in project area.
S&G 96: Ensure that management activities do not adversely affect water temperatures necessary for local aquatic-and riparian-dependent species assemblages.	X		Water temperatures are not expected to be negatively impacted by the project. Detailed discussion can be found in the Effects Analysis portion of Hydrology and Erosion Control Plan report.
S&G 97: Limit pesticide applications to cases where project-level analysis indicates that pesticide applications are consistent with RCOs. Use local channel geometry curves to determine the location of flood prone areas. Do not apply pesticides, including gopher baiting, within the floodprone area of perennial or intermittent stream courses. If a project’s objectives include treatment of riparian areas, evaluate conditions on a site-by-site basis at the project level.		X	Not applicable to project. No pesticide used.
S&G 98: Within 500 feet of known occupied sites for the California red-legged frog, foothill yellow-legged frog, or mountain yellow-legged frog, design pesticide applications to avoid adverse effects to individuals and their habitats.		X	Not applicable to project. No habitat for these species within project area.
S&G 99: Prohibit storage of fuels and other toxic materials within RCAs and CARs except at designated administrative sites and sites covered by a special use authorization. Prohibit refueling within RCAs and CARs unless there is no other alternative. Ensure that spill plans are reviewed and up-to-date.	X		Staging area will be used for refueling equipment. Use mitigations from BMP 2.11 for equipment refueling and servicing. BMP 7.4 will be used if storage of fuels exceeds.
<b>Riparian Conservation Objective 2:</b> 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 in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species.			
S&G 100: Maintain and restore the hydrologic connectivity of streams, meadows, wetlands, and other special aquatic features by identifying roads and trails that intercept, divert, or disrupt natural surface and subsurface water flow paths. Implement corrective actions, where necessary, to restore connectivity.	X		There are no permanent roads or trails that intercept, divert, or disrupt natural surface and subsurface water flow paths in the project area.

<p>S&amp;G101: Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species. Locate water drafting sites to avoid adverse effects on stream flows and depletion of pool habitat. Where possible, maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows, wetlands, and other special aquatic features.</p>		X	No culverts or stream crossings in project area.
<p>S&amp;G 102: Prior to activities that could adversely affect streams, determine if relevant stream characteristics are within the range of natural variability. If characteristics are outside the range of natural variability, implement mitigation measures and short-term restoration actions needed to prevent further declines or cause an upward trend in conditions. Evaluate required Osa-term restoration actions and implement them according to their status among other restoration needs.</p>	X		As described in the Existing Condition portion of the Hydrology and Erosion Control Plan report, several portions of the meadow and stream channel are not within the range of natural variability at this time.
<p>S&amp;G 103: Prevent disturbance to streambanks and natural lake and pond shorelines caused by management activities and resource use (such as livestock and dispersed recreation) from exceeding 20 percent of a stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. This standard does not apply to developed recreation sites, sites authorized under special use permits, or roads.</p>		X	Grazing and recreation use with in the meadow is not part of the proposed project.
<p>S&amp;G 104: In stream reaches occupied by, or identified as “essential habitat” in the conservation assessment for the Little Kern golden trout, limit streambank disturbance from livestock to 10 percent of the occupied or “essential habitat” stream reach (conservation assessments are described in the 2004 SNFPA ROD, page 10; see <a href="http://www.tucalifornia.org/cgtic/GTCAssessmnt&amp;Strategy9-04.pdf">http://www.tucalifornia.org/cgtic/GTCAssessmnt&amp;Strategy9-04.pdf</a>). Cooperate with state and federal agencies to develop streambank disturbance standards for threatened, endangered, and sensitive species. Use the regional streambank assessment protocol. Implement corrective action where disturbance limits have been exceeded.</p>		X	Grazing is not part of the proposed project.
<p>S&amp;G 105: At either the landscape or project level, determine if the age class, structural diversity, composition, and cover of riparian vegetation are within the range of natural variability for the vegetative community. If conditions are outside the range of natural variability, consider implementing mitigation and/or restoration actions that will result in an upward trend. Actions could include restoration of aspen or other riparian vegetation where conifer encroachment is identified as a problem.</p>	X		The age class, structural diversity, composition, and cover of riparian vegetation are deviating away from the range of natural variability within the meadow due to the loss of hydrologic function. Conifers are encroaching on the meadow edges as well as a result.
<p>S&amp;G 106: Cooperate with federal, tribal, state, and local governments to secure in-stream flows needed to maintain, recover, and restore riparian resources, channel conditions, and aquatic habitat. Maintain in-stream flows to protect aquatic systems to which species are uniquely adapted. Minimize the effects of stream diversions or other flow modifications from hydroelectric projects on threatened, endangered, and sensitive species.</p>		X	No other agency has jurisdiction.

S&G 107: For exempt hydroelectric facilities on national forest lands, ensure that special use permit language provides adequate in-stream flow requirements to maintain, restore, or recover favorable ecological conditions for local riparian- and aquatic-dependent species.		X	No hydroelectric facilities.
<b>Riparian Conservation Objective 3:</b> 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.			
S&G 108: Determine if the level of coarse large woody debris is within the range of natural variability in terms of frequency and distribution and is sufficient to sustain stream channel physical complexity and stability. Ensure that proposed management activities move conditions toward the range of natural variability for coarse large woody debris.		X	CWD is within the range of natural conditions within the project area.
<b>Riparian Conservation Objective 4:</b> 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.			
S&G 109: Within CARs, in occupied habitat or “essential habitat” as identified in conservation assessments for threatened, endangered, or sensitive species, evaluate the appropriate role, timing, and extent of prescribed fire. Avoid direct lighting within riparian vegetation; prescribed fires may back into riparian vegetation areas. Develop mitigation measures to avoid effects to these species whenever ground-disturbing equipment is used.		X	Project is not located in a CAR.
S&G 110: Use screening devices for water drafting pumps (fire suppression activities are exempt during initial attack). Use pumps with low entry velocity to minimize removal of aquatic species, including juvenile fish, amphibian egg masses, and tadpoles.		X	Drafting screens will be utilized at all identified drafting sites to minimize removal or loss of aquatic species.
S&G 111: Design prescribed fire treatments to minimize disturbance of ground cover and riparian vegetation in RCAs. In burn plans for project areas that include or are adjacent to RCAs, identify mitigation measures to minimize the spread of fire into riparian vegetation. In determining mitigation measures, weigh the potential harm of mitigation measures (e.g., firelines) against the risks and benefits of prescribed fire entering riparian vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances when fire suppression or fuel management actions could be damaging to habitat or the Osa-term function of a riparian community.		X	Prescribed fire is not part of the project.
S&G 112: Post-wildfire management activities in RCAs and CARs should emphasize enhancing native vegetation cover, stabilizing channels by non-structural means, minimizing adverse effects from the existing road network, and carrying out activities identified in landscape analyses. Post-wildfire operations shall minimize the exposure of bare soil.		X	Not a post-wildfire project.
S&G 113: Allow hazard tree removal within RCAs or CARs if it is clearly needed for public safety. Allow mechanical ground-disturbing fuels treatments or fuelwood cutting within RCAs or CARs when the activity is consistent with RCOs and is clearly needed for ecological restoration and maintenance or public		X	Hazard tree removal is not part of the project.

<p>safety. Utilize low-ground-pressure equipment, helicopters, or other non-ground-disturbing actions off of existing roads when needed to achieve RCOs. Ensure that existing roads meet best management practices (BMPs). Minimize the construction of new roads into RCAs for access for fuel treatments, fuelwood cutting, or hazard tree removal.</p>			
<p>S&amp;G 114: As appropriate, assess and document aquatic conditions following the regional stream condition inventory protocol prior to implementing ground-disturbing activities within suitable habitat for California red-legged frogs, foothill yellow-legged frogs, and mountain yellow-legged frogs.</p>		X	<p>Osa Meadow contains pockets of suitable habitat for Mountain Yellow-legged Frogs, though none exist within the project area. Surveys were conducted by both Cal Academy of Science personnel (2001) and Forest Service staff (2011, 2015). No individuals were detected.</p>
<p>S&amp;G 115: During fire suppression activities, consider effects to aquatic- and riparian-dependent resources. Where possible, locate incident bases, camps, helibases, staging areas, helispots, and other centers for incident activities outside of RCAs or CARs. During pre-suppression planning, include guidelines for suppression activities that avoid potential adverse effects to aquatic- and riparian-dependent species.</p>		X	<p>Not a fire suppression activity.</p>
<p>S&amp;G 116: Identify roads, trails, staging areas, developed recreation sites, dispersed campgrounds, areas under special use permits or grazing permits, and day use sites during landscape analysis. Identify conditions that degrade water quality or habitat for aquatic- and riparian-dependent species. At the project level, evaluate and consider actions to ensure consistency with standards and guidelines.</p>		X	<p>Landscape analysis is not necessary for this size of a project.</p>
<p><b>Riparian Conservation Objective 5:</b> 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.</p>			
<p>S&amp;G 117: Assess the hydrologic function of meadow habitats and other special aquatic features during site-specific range management analysis. Ensure that characteristics of special features are, at a minimum, at proper functioning condition (PFC), as defined in the following technical reports (or their successor publications): (1) Process for Assessing PFC, TR 1737-9 (1993); (2) PFC for Lotic Areas, USDI TR 1737-15 (1998); (3) PFC for Lentic Riparian-Wetland Areas, USDI TR 1737-11 (1994); and (4) Assessing Proper Functioning Condition for Fen Areas in the Sierra Nevada and Southern Cascade Ranges in California: A User Guide, USDA Forest Service, R5-TP-028 (April 2009).</p> <p>Assess the hydrologic function of at-risk meadow habitats. Ensure that characteristics are, at a minimum, at PFC as defined in the Process for Assessing PFC, TR 1737-9 (1993); PFC for Lotic Areas, USDI TR 1737-15 (1998); or PFC for Lentic Riparian-Wetland Areas, USDI TR 1737-16 (Rev. 2003).</p>		X	<p>This is a restoration project to fix the hydrologic connectivity and aquatic habitat.</p>
<p>S&amp;G 118: Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality, or water temperature critical to sustaining bog and fen ecosystems and plant species that depend on these</p>		X	<p>There are no known bog or fen ecosystems within the project area.</p>

ecosystems. During project analysis, survey, map, and develop measures to protect bogs and fens from such activities as trampling by livestock, pack stock, humans, and wheeled vehicles. Criteria for defining bogs and fens include, but are not limited to, the presence of sphagnum moss ( <i>Sphagnum</i> spp.), mosses belonging to the genus <i>Meessia</i> , or sundew ( <i>Drosera</i> spp.). Complete initial plant inventories of bogs and fens within active grazing allotments prior to re-issuing permits.			
S&G 119: Locate new facilities for gathering livestock and pack stock outside of meadows and RCAs. During project-level planning, evaluate and consider relocating existing livestock facilities outside of meadows and riparian areas. Prior to re-issuing grazing permits, assess the compatibility of livestock management facilities located in RCAs with RCOs.		X	No new facilities for livestock use are part of the project.
S&G 120a: Determine ecological status on all key areas monitored for grazing utilization prior to establishing utilization levels. Use regional ecological score cards and range plant list in regional range handbooks to determine ecological status. Analyze meadow ecological status every 3 to 5 years. If meadow ecological status is determined to be moving in a downward trend, modify or suspend grazing. Include ecological status data in a spatially explicit geographic information system (GIS) database.		X	Not a grazing project.
S&G 120b. Under intensive grazing systems (such as rest-rotation and deferred rotation) where meadows are receiving a period of rest, utilization levels can be higher than the levels described above if the meadow is maintained in late seral status and meadow-associated species are not being affected. Degraded meadows (such as those in early seral status with greater than 10 percent of the meadow area in bare soil and active erosion) require total rest from grazing until they have recovered and have moved to mid- or late seral status.		X	Not a grazing project.
S&G 121: Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs and no more than 20 percent of individual seedlings. Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from herbaceous vegetation to woody riparian vegetation.		X	Grazing is not currently authorized as part of the project.
<b>Riparian Conservation Objective 6:</b> Identify and implement restoration actions to maintain, restore, or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species.			
S&G 122 Recommend restoration practices in: (1) areas with compaction higher than that allowed in soil quality standards, (2) areas with lowered water tables, or (3) areas with either active downcutting or historic gullies. Identify other management activities (e.g., road building, recreational use, grazing, and fuels reduction) that may be contributing to the observed degradation.		X	The Osa Meadow Restoration Project was prioritized because of the lowering of the meadow's water table and active down cutting.