Project Management Indicator Species Report
For the
Long Meadow Restoration Project

Western Divide Ranger District

Sequoia National Forest

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1. Introduction

The purpose of this report is to evaluate and disclose the impacts of the Long Meadow Restoration Project on the habitat of the thirteen (13) Management Indicator Species (MIS) identified in the Sequoia National Forest (SQF) Land and Resource Management Plan (LRMP) (USDA 1988) as amended by the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (USDA Forest Service 2007a) and the 2012 Giant Sequoia National Monument Management Plan. This report documents the effects of the proposed action and alternatives on the habitat of selected project-level MIS. Descriptions of the Long Meadow Restoration Project provided in this MIS Report is summarized from the Long Meadow Restoration Project Scoping Letter, Dated December 30, 2011.

MIS are animal species identified in the SNF MIS Amendment Record of Decision (ROD) signed December 14, 2007, which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the SQF LRMP as amended by the 2007 SNF MIS Amendment ROD directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitat of each MIS affected by such projects, and (2) at the bioregional scale, monitor populations and/or habitat trends of MIS, as identified in the SQF LRMP as amended.

1.a. Direction Regarding the Analysis of Project-Level Effects on MIS Habitat

Project-level effects on MIS habitat are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the LRMP as amended by the SNF MIS Amendment ROD. Hence, where the SQF LRMP as amended by the SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level habitat effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale. The bioregional scale monitoring identified in the SQF LRMP, as amended, for MIS analyzed for the Long Meadow Restoration Project is summarized in Section 3 of this report.

Adequately analyzing project effects to MIS generally involves the following steps:

- Identifying which habitat and associated MIS would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Summarizing the bioregional-level monitoring identified in the LRMP, as amended, for this subset of MIS.
- Analyzing project-level effects on MIS habitat for this subset of MIS.
- Discussing bioregional scale habitat and/or population trends for this subset of MIS.

- Relating project-level impacts on MIS habitat to habitat and/or population trends at the bioregional scale for this subset of MIS.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination" (May 25, 2006) (USDA Forest Service 2006a). This Management Indicator Species (MIS) Report documents application of the above steps to select project-level MIS and analyze project effects on MIS habitat for the Long Meadow Restoration Project.

1.b. Direction Regarding Monitoring of MIS Population and Habitat Trends at the Bioregional Scale.

The bioregional scale monitoring strategy for the Sequoia NF's MIS is found in the Sierra Nevada Forests Management Indicator Species Amendment (SNF MIS Amendment) Record of Decision (ROD) of 2007 (USDA Forest Service 2007a). Bioregional scale habitat monitoring is identified for all twelve of the terrestrial MIS. In addition, bioregional scale population monitoring, in the form of distribution population monitoring, is identified for all of the terrestrial MIS except for the greater sage-grouse. For aquatic macroinvertebrates, the bioregional scale monitoring identified is Index of Biological Integrity and Habitat. The current bioregional status and trend of populations and/or habitat for each of the MIS is discussed in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a).

- **MIS Habitat Status and Trend.**

All habitat monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a).

Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components (USDA Forest Service 2007a), as listed in Table 1. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005). The CWHR System provides the most widely used habitat relationship models for California's terrestrial vertebrate species (ibid). It is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Habitat status is the current amount of habitat on the Sierra Nevada Forests. Habitat trend is the direction of change in the amount or quality of habitat over time. The methodology for assessing habitat status and trend is described in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

- **MIS Population Status and Trend.**

All population monitoring data are collected and/or compiled at the bioregional scale, consistent with the LRMP as amended by the 2007 SNF MIS Amendment ROD (USDA Forest Service 2007a). The information is presented in detail in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Population monitoring strategies for MIS of the Sequoia NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment ROD (USDA Forest Service 2007a). Population status is the current condition of the MIS related to the population monitoring data required in the 2007 SNF MIS Amendment ROD for that MIS. Population trend is the direction of change in that population measure over time.

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA Forest Service 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment, except for the greater sage-grouse (USDA Forest Service 2007a). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding how these presence data are assessed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

- **Aquatic Macroinvertebrate Status and Trend.**

For aquatic macroinvertebrates, condition and trend is determined by analyzing macroinvertebrate data using the predictive, multivariate River Invertebrate Prediction And Classification System (RIVPACS) (Hawkins 2003) to determine whether the macroinvertebrate community has been impaired relative to reference condition within perennial water bodies. This monitoring consists of collecting aquatic macroinvertebrates and measuring stream habitat features according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005). Evaluation of the condition of the biological community is based upon the "observed to expected" (O/E) ratio, which is a reflection of the number of species observed at a site versus the number expected to occur there in the absence of impairment. Sites with a low O/E scores have lost many species predicted to occur there, which is an indication that the site has a lower than expected richness of sensitive species and is therefore impaired.

2. Selection of Project level MIS

Management Indicator Species (MIS) for the Sequoia NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007a). The habitats and ecosystem components and associated MIS analyzed for the project were selected from this list of MIS, as indicated in Table 1. In addition to identifying the habitat or ecosystem components (1st column), the CWHR type(s) defining each habitat/ecosystem component (2nd column), and the associated MIS (3rd column), the Table discloses whether or not

the habitat of the MIS is potentially affected by the Long Meadow Restoration Project (4th column).

Table 1. Selection of MIS for Project-Level Habitat Analysis for the Long Meadow Restoration Project.

Habitat or Ecosystem Component	CWHR Type(s) defining the habitat or ecosystem component[1]	Sierra Nevada Forests Management Indicator Species *Scientific Name*	Category for Project Analysis [2]
Riverine & Lacustrine	lacustrine (LAC) and riverine (RIV)	aquatic macroinvertebrates	1
Shrubland (west-slope chaparral types)	montane chaparral (MCP), mixed chaparral (MCH), chamise-redshank chaparral (CRC)	fox sparrow *Passerella iliaca*	1
Oak-associated Hardwood & Hardwood/conifer	montane hardwood (MHW), montane hardwood-conifer (MHC)	mule deer *Odocoileus hemionus*	1
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler *Dendroica petechia*	1
Wet Meadow	Wet meadow (WTM), freshwater emergent wetland (FEW)	Pacific tree (chorus) frog *Pseudacris regilla*	3
Early Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree sizes 1, 2, and 3, all canopy closures	Mountain quail *Oreortyx pictus*	1
Mid Seral Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 4, all canopy closures	Mountain quail *Oreortyx pictus*	2
Late Seral Open Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), eastside pine (EPN), tree size 5, canopy closures S and P	Sooty (blue) grouse *Dendragapus obscurus*	1
Late Seral Closed Canopy Coniferous Forest	ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6.	California spotted owl *Strix occidentalis occidentalis*	1
		American marten *Martes americana*	
		northern flying squirrel *Glaucomys sabrinus*	
Snags in Green Forest	Medium and large snags in green forest	hairy woodpecker *Picoides villosus*	1
Snags in Burned Forest	Medium and large snags in burned forest (stand-replacing fire)	black-backed woodpecker *Picoides arcticus*	1

[1] All CWHR size classes and canopy closures are included unless otherwise specified; **dbh** = diameter at breast height; **Canopy Closure classifications:** S=Sparse Cover (10-24% canopy closure); P= Open cover (25-39% canopy closure); M= Moderate cover (40-59% canopy closure); D= Dense cover (60-100% canopy closure); **Tree size classes:** 1 (Seedling)(<1" dbh); 2 (Sapling)(1"-5.9" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh); 6 (Multi-layered Tree) [In PPN and SMC] (Mayer and Laudenslayer 1988).

[2] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

Mid Seral Coniferous Forest: Mid Seral Coniferous Forest habitat occurs within the treatment and analysis areas, and would have a minimal alteration associated with project implementation. A few small trees may need to be felled to allow for access to the meadow site, anticipated impact is estimated at less than 1 acre.

The MIS whose habitat would be either directly or indirectly affected by the Long Meadow Restoration Project, identified as Category 3 in Table 1, are carried forward in this analysis, which will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of these MIS. The MIS selected for project-level MIS analysis for the Long Meadow Restoration Project is the pacific tree frog.

3. Bioregional Monitoring Requirements for MIS Selected for Project-Level Analysis

3.a. MIS Monitoring Requirements.

The Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007a) identifies bioregional scale habitat and/or population monitoring for the Management Indicator Species for ten National Forests, including the Sequoia NF. The habitat and/or population monitoring requirements for Sequoia NF's MIS are described in the 2010 Sierra Nevada Forests Bioregional Management Indicator Species (SNF Bioregional MIS) Report (USDA Forest Service 2010a) and are summarized below for the MIS being analyzed for the Long Meadow Restoration Project. The applicable habitat and/or population monitoring results are also described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) and are summarized in Section 5 below for the MIS being analyzed for the Long Meadow Restoration Project.

Habitat monitoring at the bioregional scale is identified for all the habitats and ecosystem components, including the following analyzed for the Long Meadow Restoration Project: wet meadow.

3.b. How MIS Monitoring Requirements are Being Met.

Habitat and/or distribution population monitoring for all MIS is conducted at the Sierra Nevada scale. Refer to the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a) for details by habitat and MIS.

4. Description of Proposed Project.

The Long Meadow Restoration Project is located just north east of Long Meadow Grove, east of the Western Divide Highway, in Township 22 South, Range 31 East, Sections 25 and 36, (Mount Diablo Base and Meridian). Long Meadow comprises approximately 35 acres with the restoration site estimated to encompass 3 acres. The Long Meadow Restoration Project is contained entirely within Tulare County, California. The project area boundary is based on Long

Meadow sub-watershed 8H-D which encompasses 2,400 acres and is therefore, much larger than the actual acres proposed for restoration.

The Long Meadow sub-watershed 8H-D ranges from 7,200 feet to 4,200 feet in elevation with Long Meadow Grove residing in the headwaters and Bone Creek at its terminus (Map 1). The restoration site is located along Long Meadow Creek at the north end of Long Meadow. Long Meadow Creek encompasses approximately 3.5 linear miles of stream before reaching its confluence with Bone Creek. The restoration site encompasses approximately 325 feet of Long Meadow Creek, with the entire site area for restoration activities encompassing an estimated 3 acres, or 0.1% of the Long Meadow sub-watershed. The higher elevations are dominated by Sierra mixed conifer (SMC) stands, while the lower elevations are in the transition zone between the conifer and hardwood/shrub/grassland vegetation types. The only MIS vegetation type influenced by the Long Meadow Restoration Project is Wet Meadow.

The purpose of the Long Meadow Restoration Project is to repair a large headcut that has become established in the meadow. This restoration work is needed to move toward, or achieve, the desired condition of returning the stream channel and encompassing meadow to its proper hydrological function while decreasing erosion and sedimentation.

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Alternative 1 (No Action). Under this alternative, no management actions would take place within the project area at this time.

Alternative 2 (Proposed Action). The proposed action implements five activities for the (described in more detail following this list) to restore and enhance Long Meadow and move it toward the desired conditions. These proposed activities are:

- Install plug structures.
- Install rock and vegetation (also known as a valley grade control structure).
- Plant various riparian species in the meadow, including willows and sod.
- Use an existing access road during the implementation of the project.
- Install a temporary fence.

Project implementation will take place when flows are at their lowest and meadow conditions are at their driest, often in late summer to early fall. Equipment use will only be allowed in the meadow during this time period as the meadow is dry enough to support the weight. Water upstream of the project area may need to be diverted to other parts of the meadow during excavation to prevent unnecessary sediment delivery downstream.
To minimize equipment disturbance in the meadow, all equipment routes will remain near the gully and along the meadows margins. The shortest and most durable route from the meadow's margin to the installation points will be identified and used for equipment access throughout the implementation of the project.

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. 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.

Plug Structures (also known as Pond and Plug)
This technique plugs the existing gully system through the creation of ponds, decreasing the water's velocity that is currently undercutting the existing headcut and causing it to continue to migrate upstream further into the meadow.

Two plugs would be installed and locations would be staked prior to implementation in 2013. Creation of the plug structure would include removing soil from the sides and bottom of the gully and the surrounding areas and using it to create the plugs. The soil removal would be done in a manner that sculpts the gully in preparation for the ponds, which would fill with water and help raise the water level to restore hydrologic function within the meadow. The ponds would be designed and constructed to have irregular shapes and varying depths that will provide numerous habitats for riparian-dependent species. This process would relocate approximately 1,000 cubic yards of existing soil through the use of mechanical equipment, such as a backhoe, dozer or a tracked excavator.

Sod and willows established in the gully bottom will be stockpiled and transplanted to pond edges and plug surfaces. Topsoil from all excavation areas will be stockpiled adjacent to the plugs and used on top of the plugs once constructed.

Valley Grade Control Structure
A valley grade control structure is made of rock and soil and used to stop the forward progression of the current head-cut as well as preventing future head-cuts. For this project, the valley grade control structure will be located downstream of the plug structures, and above an existing partially intact dam. An estimated 200 cubic yards of 0.5- 2.0 foot diameter rock would be used to provide armoring at the lower end of the meadow, plugs, and grade control structure. Creation of the grade structure would include removing soil from the sides and bottom of the gully and the surrounding areas and using it to create the structure.

Revegetation
Rooted willows (large enough to have established roots) would be planted along the stream banks and around ponds. The willows and transplanted vegetation used with rock is intended to assist in stabilizing the existing bank and trap sediment. Stockpiled sod and willows will be placed on the plug structures. Large conifers outside the meadow will not be cut as part of this project unless they pose a safety hazard or limit equipment access during implementation of the project.

Access
Mechanical equipment would access the meadow using Forest Service Road 22S08A that is currently not open to public vehicle travel. This road would be temporarily opened for the purpose of moving equipment and materials to the meadow to complete the restoration project. Water bars and/or rolling dips may be installed to prevent erosion during implementation. Once the project is completed, the road will be closed and the proper drainage and structures restored to minimize the potential for future erosion.

Temporary Fence
Install a temporary fence (approximately five to seven years) to prevent livestock access to the restoration site (see enclosed Map l). This fence will be approximately 700 feet total length and will originate and terminate at the existing fence. Fence will be constructed of wood and/or metal posts and a minimum of three wires. The fence will be a take-down type snow fence, where the wire and metal stays are disconnected from the posts during winter months. Prior to livestock entry into the area, the wire would be reconnected to the posts.

Monitoring
Monitoring is a means to determine if conditions in Long 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. Additional monitoring would take place within one year after the project is implemented and annually for five years to document the implementation and effectiveness of the project. This monitoring would include sedimentation, planted vegetation success or mortality, noxious weeds, the integrity of the installed structures, and the absence or presence of new headcuts.

5. Effects of Proposed Project on the Habitat for the Selected Project-Level MIS.

The following section documents the analysis for the following 'Category 3' species: pacific tree frog. The analysis of the effects of the Long Meadow Restoration Project on the MIS habitat for the selected project-level MIS is conducted at the project scale. The analysis used the following habitat data: Forest GIS layers based on 2002 aerial photo interpretation, updated in 2003 for major fires and Forest Inventory Analysis (FIA) plots competed in 2005.

Detailed information on the MIS is documented in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Cumulative effects at the bioregional scale are tracked via the SNF MIS Bioregional monitoring, and detailed in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Past, Current, and Potential Future Activities in the Analysis Area

The cumulative effects sections of this document places the proposed action in context with past, present, and reasonably foreseeable actions which, when considered collectively, may affect MIS habitat. The spatial scale for the cumulative effects analysis of the Long Meadow Restoration Project is the 2,400 acre Long Meadow sub-watershed 8H-D. This is an appropriate scale for determining cumulative effects to MIS, since it includes all suitable habitat potentially affected by implementation of the Long Meadow Restoration Project.

The temporal scale for this analysis extends from 2004 to 2016. Vegetation data for the Forest includes spatial ecological and vegetation layers created from remote-sensing imagery obtained at various points in time, which are verified using photo-imagery, on-the-ground measurements, and tracking of vegetation-changing actions or events (for example, timber sales and wildland fires). Past actions considered in this analysis are listed below and include those that have occurred since the last forest mapping update in 2003. For assessment of future projects, the Forest completes a quarterly "Schedule of Proposed Actions (SOPA)" which tracks proposals

that are ongoing or have sufficient detail to insure they are reasonably foreseeable. The total list of actions presented on the SOPA is not included here. Some projects have been cancelled or are undergoing revision, with others not included because they have limited scope and intensity and present no appreciative impact on available habitat.

Past and Current Activities

Grazing: The Long Meadow Restoration analysis area is within the Summit grazing allotment. Because grazing is a past, ongoing, and foreseeable future action and because use levels and associated impacts from this activity are not expected to change as a result of implementation of the proposed action, cattle grazing activity is not expected to contribute measurable impacts to habitats. The restoration site will be fenced post implementation to eliminate horse use within that portion of the meadow.

Timber Harvest/fuels Treatments: No vegetation or fuels reduction projects have occurred in any of the cumulative effects analysis areas since the last mapping update completed in 2008.

Wildfires: The "Giant Wildfire" occurred in the Long Meadow Grove in 2011 and affected approximately 25 acres immediately adjacent to the Trail of 100 Giants on the west side of the grove. The wildfire occurred during summer months but burned at relatively low intensity overall, due to the extended and wet winter observed in 2011. Moist site conditions favored the retention of large woody debris and large trees, resulting in limited alteration in canopy cover from what existed. Some individual tree torching occurred where shrubs were dry resulting in higher flame lengths. No impact was noted to meadow or riparian habitats.

Recreation: Recreation facilities within Long Meadow Grove include a day use area, a campground, and the Trail of 100 Giants loop trail. The collective area has high recreation use by the public during the summer months with an estimated 5,000 visitors recorded on peak weekends such as Memorial Day, July 4th, and Labor Day. Ongoing recreation activities have likely increased levels of noise disturbance and may impact habitat to minimal degrees along the Trail of 100 Giants loop, Long Meadow Campground, and at Redwood Campground. The majority of recreation visitors stay on or near the trail loop. The species that occupy the grove (California spotted owl and northern goshawk) have continued to occupy the relatively same general area over the last 10 years despite ongoing recreation use. Surveys continue to show these pairs are reproducing, suggesting that they are able to tolerate current recreation levels. Impacts to stream environments have remained low since most users follow guidelines to stay on the trail. Therefore, impacts to riparian habitat from recreation use are non-existent.
action, recreation is not expected to contribute measurable impacts to habitats.

Potential Future Activities: During the summer of 2011 a large redwood fell on to the Trail of 100 Giants which no longer allowed recreation users to follow the loop trail. There was some evidence of recreationalists cross cutting through the forest to be able to continue the trail walk. The trail is being repaired in 2013 which will eliminate the need for the public to circumvent the trail.

Wet Meadow Habitat (Pacific tree (chorus) frog)

Habitat/Species Relationship.
The Pacific tree frog (now known as the Pacific chorus frog) was selected as an MIS for wet meadow habitat in the Sierra Nevada. This broadly distributed species requires standing water for breeding; tadpoles require standing water for periods long enough to complete aquatic development, which can be as long as 3 or more months at high elevations in the Sierra Nevada (CDFG 2005). During the day during the breeding season, adults take cover under clumps of vegetation and surface objects near water; during the remainder of the year, they leave their breeding sites and seek cover in moist niches in buildings, wells, rotting logs or burrows (ibid).

Project-level Effects Analysis – Wet Meadow Habitat

Habitat Factor(s) for the Analysis: (1) Acres of wet meadow habitat [CWHR wet meadow (WTM) and freshwater emergent wetland (FEW)]. (2) Acres with changes in CWHR herbaceous height classes [short herb (<12”), tall herb (>12”)]. (3) Acres with changes in CWHR herbaceous ground cover classes (Sparse=2-9%; Open=10-39%; Moderate=40-59%; Dense=60-100%). (4) Changes in meadow hydrology.

Current Condition of the Habitat Factor(s) in the Project Area: Within the proposed treatment area, there are approximately 3 acres of WTM habitat. All of the acres are classed as WTM; grass heights are variable being lowest in height near the gully and headcuts where the soil is dryer from the loss of sheet flow, and higher in areas away from the site. Grass height ranges from 4 to 12 inches depending on location. The majority of the meadow has relatively dense ground cover and is fully occupied. Areas at the gully and gully edge exhibit lower grass heights and ground cover due to drying conditions resultant from the headcut. These factors have influenced hydrologic processes at the lower end of the meadow.

Photo 1 – Cross section of the C5b channel within the gully (looking downstream).

Proposed Action
Direct and Indirect Effects to Habitat.

WTM habitat at the project site would be altered through equipment and digging actions to construct several plugs, 3 ponds, and the valley grade control structure. The greatest disturbance would occur within the gully and at the gully rim where vegetation conditions have already been altered. Meadow vegetation will be temporarily moved with bare soil exposed, but this sod will be relayed to the extent possible along the plugs and pond edge. This method has been used in

other meadow restoration projects and results in successful re-establishment of meadow grass. Equipment travel patterns will have defined routes from the meadow edge to the site, and may impact meadow grass along these routes. Design features have been included limit the development of travel corridors minimizing this effect at the project site. It is anticipated that not all areas within the 3 acres will be impacted.

Implementation of this alternative will result in a short term (1) no change in acres of WTM or FEW habitat, (2) a possible short-term reduction in height classes on 3 acres following initial treatment, (3) a short-term reduction in ground cover class and (4) an improvement in meadow hydrological function following the restoration. Once the meadow restoration project is complete, it is anticipated that meadow conditions will quickly improve given proper functioning hydrologic processes at the lower end of the meadow. In the long-term, both herbaceous height and ground cover are expected to increase beyond current levels as the amount of water available to these plants increases. Project implementation is anticipated to result in greater stability and resiliency of wet meadow habitat through the removal of the existing headcuts which if left in their current condition, will continue to migrate further into the meadow resulting in the continued loss of wet meadow habitat.

Cumulative Effects to Habitat in the Analysis Area. Past, present, and reasonably foreseeable future actions affecting wet meadow habitat are described on page 9 and 10 of this document. In addition to the 3 acres of wet meadow habitat directly affected by this project, livestock grazing occurs on the remaining portion of the meadow from July 1 through September 15. The cumulative effect from this action does reduce grass height, but has little impact on cover. Appropriate grazing standards for use are incorporated in the annual operating instructions to minimize impact to meadow vegetation. The Long Meadow Restoration site is currently within an administrative pasture and fenced from cattle use. It is used only 2-3 times a year for the permittee's horse stock. The restoration site will be fenced post implementation, restricting any horse at the restoration site. Collectively continued grazing and use given current standards and guidelines have little appreciative impact on wet meadow habitat.

> **Cumulative Effects Conclusion:** The direct, indirect, and cumulative effects of the Long Meadow Restoration Project propose action will result in: (1) no change in acres of WTM or FEW habitat, (2) a possible short-term reduction in height classes on 3 acres following initial treatment, (3) a short-term reduction in ground cover class and (4) an improvement in meadow hydrological function following the restoration.
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> > The long-term cumulative effects of this project are expected to be an improvement of this habitat type in the Long Meadow subwatershed.

Summary of Pacific Tree (Chorus) Frog Status and Trend at the Bioregional Scale

The Sequoia NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the Pacific tree (chorus) frog; hence, the wet meadow effects analysis for the Long Meadow Restoration Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the Pacific tree (chorus) frog. This information is drawn from the detailed information on habitat and population trends in the 2010

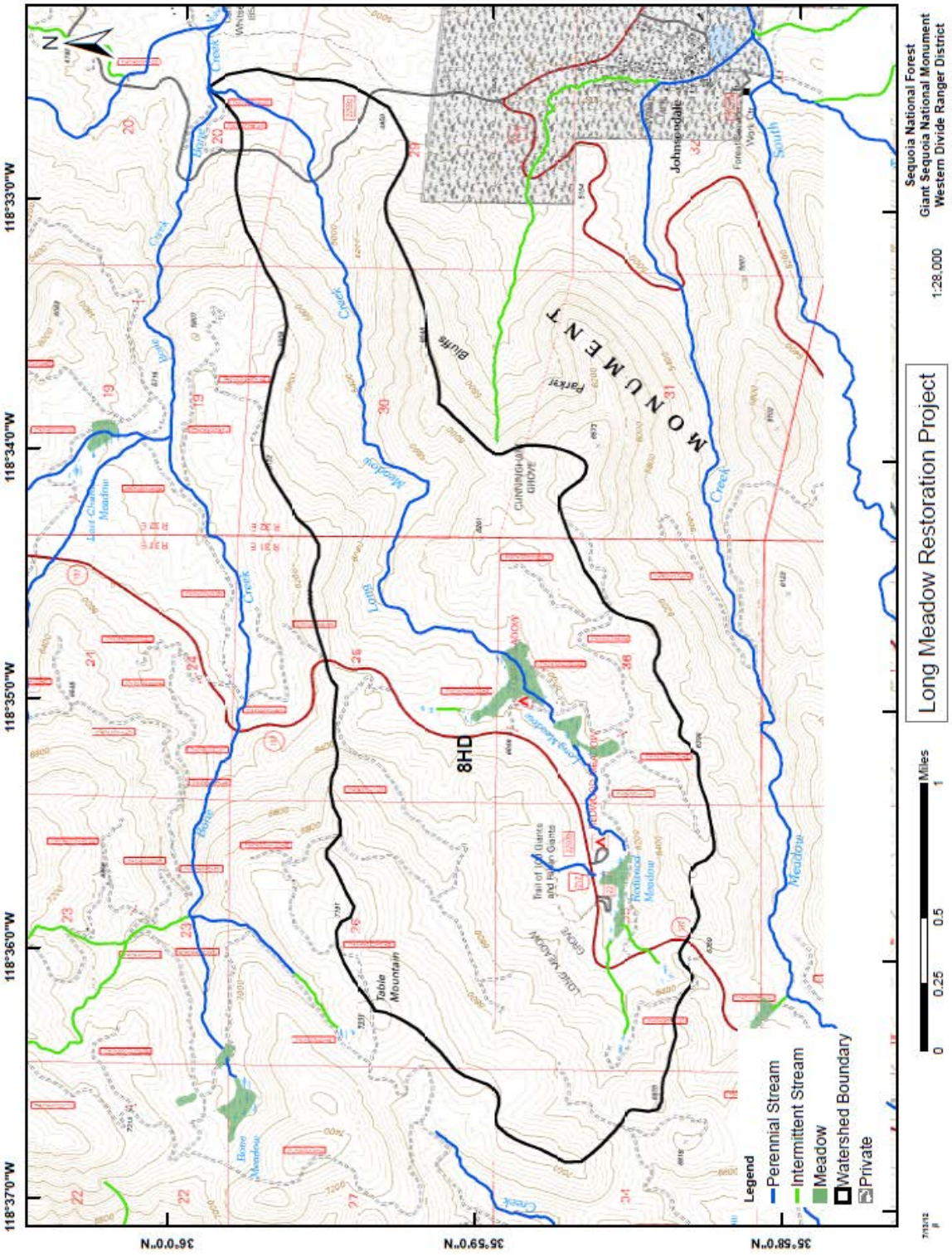
SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend. There are currently 61,247 acres of wet meadow habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is stable.

Population Status and Trend. Since 2002, the Pacific tree (chorus) frog has been monitored on the Sierra Nevada forests as part of the Sierra Nevada Forest Plan Amendment (SNFPA) monitoring plan (USDA Forest Service 2006b, 2007b, 2009, 2010b; Brown 2008). These data indicate that Pacific tree (chorus) frog continues to be present at these sample sites, and current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of Pacific tree (chorus) frog populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Pacific Tree (Chorus) Frog Trend. Since the direct, indirect and cumulative effects of the Long Meadow Restoration Project would only reduce herbaceous height and ground cover classes on less than one percent of the available habitat in the bioregion, it will not alter the existing trend in the habitat nor will it lead to a change in the distribution in Pacific chorus frogs across the Sierra Nevada bioregion.

Map 1 – Long Meadow Restoration Project in sub-watershed 8HD where proposed action would occur.



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