Project Management Indicator Species Report

Burke Creek Highway 50 Crossing and Realignment Project

Lake Tahoe Basin Management Unit

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1. Introduction

The purpose of this report is to evaluate and disclose the impacts of the Burke Creek Highway 50 Crossing and Realignment Project on the habitat of the thirteen (13) Management Indicator Species (MIS) identified in the Forest (NF) 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). This report documents the effects of the proposed action and alternatives on the habitat of selected project-level MIS. Detailed descriptions of the Burke Creek Highway 50 Crossing and Realignment Project alternatives are found in the Burke Creek Highway 50 Crossing and Realignment Project NEPA document (USDA Forest Service 2015).

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 Lake Tahoe Basin Management Unit 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 Lake Tahoe Basin Management Unit 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 Lake Tahoe Basin Management Unit 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 Lake Tahoe Basin Management Unit LRMP, as amended, for MIS analyzed for the Burke Creek Highway 50 Crossing and Realignment 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 Burke Creek Highway 50 Crossing and Realignment Project.

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

The bioregional scale monitoring strategy for the Lake Tahoe Basin Management Unit'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 Lake Tahoe Basin Management Unit 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 Lake Tahoe Basin Management Unit 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 Burke Creek Highway 50 Crossing and Realignment Project (4th column).

Table 1. Selection of MIS for Project-Level Habitat Analysis for the Burke Creek Highway 50 Crossing and Realignment 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	3
Riparian	montane riparian (MRI), valley foothill riparian (VRI)	yellow warbler *Dendroica petechia*	3
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*	1
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*	2

[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.

The habitat types Early Seral Coniferous Forest, Mid Seral Coniferous Forest, Late Seral Open Canopy Coniferous Forest and Late Seral Closed Canopy Coniferous Forest, as they are defined in Table 1, do not occur within the analysis area for the Burke Creek Highway 50 Crossing and Realignment Project, therefore there will be no effects to these habitat types. The Snags in Green Forest habitat type does occur within the analysis area however, snag removal will only occur where it poses a safety risk, therefore neither of the habitat components will be affected a measureable amount. The above habitat types will not be carried forward in this analysis.

The MIS whose habitat would be either directly or indirectly affected by the Burke Creek Highway 50 Crossing and Realignment 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 Burke Creek Highway 50 Crossing and Realignment Project are: Riverine and Lacustrine, Riparian and Wet Meadow.

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 Lake Tahoe Basin Management Unit. The habitat and/or population monitoring requirements for Lake Tahoe Basin Management Unit'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 Burke Creek Highway 50 Crossing and Realignment 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 Burke Creek Highway 50 Crossing and Realignment Project.

Habitat monitoring at the bioregional scale is identified for all the habitats and ecosystem components, including the following analyzed for the Burke Creek Highway 50 Crossing and Realignment Project: riparian; wet meadow.

Bioregional Monitoring for aquatic macroinvertebrates: Index of Biological Integrity (IBI) and habitat condition and trend are measured by collecting aquatic macroinvertebrates, and analyzing the resulting data using the 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. In addition, stream habitat features are measured according to the Stream Condition Inventory (SCI) manual (Frasier et al. 2005).

Population monitoring at the bioregional scale for yellow warbler, Pacific tree frog: Distribution population monitoring. Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time (also see USDA Forest Service 2001, Appendix E).

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.

A full description of the Burke Creek Highway 50 Crossing and Realignment Project and projects considered for cumulative effects analysis can be found in the Burke Creek Highway 50 Crossing and Realignment Project Environmental Assessment (EA) (NTCD 2015). This MIS report only analyses those actions that occur on Forest Service (FS) Property (as detailed in the proposed action in the EA).

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: aquatic macroinvertebrates, yellow warbler and Pacific tree frog. The analysis of the effects of the Burke Creek Highway 50 Crossing and Realignment Project on the MIS habitat for the selected project-level MIS is conducted at the project scale. The analysis used the following habitat data: existing vegetation GIS layer (S_R05_TMU.ExistingVegetation; 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).

Reference the Burke Creek Highway 50 Crossing and Realignment project Environmental Assessment for a complete description of past, present, and foreseeable future actions and there likely affects (NTCD 2015). The cumulative effects analysis is bounded by 400 meters on all sides of the FS project area.

Lacustrine/Riverine Habitat (Aquatic Macroinvertebrates)

Habitat/Species Relationship.

Aquatic or Benthic Macroinvertebrates (BMI) were selected as the MIS for riverine and lacustrine habitat in the Sierra Nevada. They have been demonstrated to be very useful as indicators of water quality and aquatic habitat condition (Resh and Price 1984; Karr et al. 1986; Hughes and Larsen 1987; Resh and Rosenberg 1989). They are sensitive to changes in water chemistry, temperature, and physical habitat; aquatic factors of particular importance are: flow, sedimentation, and water surface shade.

Project-level Effects Analysis – Lacustrine/Riverine Habitat

Habitat Factor(s) for the Analysis: Flow; Sedimentation; and Water surface shade.

Current Condition of the Habitat Factor(s) in the Project Area: According to CWHR the only Lacustrine/Riverine habitat in the analysis area is Jennings Pond (0.6 acres). However, in this case the CWHR layer is known to be incorrect. Based on USFS Region 5 hydrography data, in addition to Jennings Pond there is also 1,204 meters of perennial stream within the analysis area.

Immediately upstream of US50, Burke Creek is largely confined by a steep, forested canyon reach and, to a minor extent, fill material associated with the construction of the Kahle Community Center ball fields immediately south of the channel. The stream corridor opens as it enters the parking lot and the US50 crossing where it has formed an alluvial fan that transitions to Rabe Meadow. Flow between US50 and Lake Tahoe is characterized by sediment deposition, and unconfined flow with the multiple channels, all of which are heavily vegetated with meadow vegetation. The 5–100 year peak flow is approximately 32-121 cfs with the majority of the flow being in the springtime during snowmelt and rain-on-snow precipitation events. Flow is largely characterized by runoff from forested areas which concentrates in defined channels prior to crossing US50 and entering the analysis area. A portion of the flow is from urbanized storm runoff which is conveyed through road shoulders, earthen roadside ditches and storm drain systems which drain to Burke Creek at intervals throughout the analysis area.

Sedimentation within the analysis area appears to be caused by incisions and head cuts and from channelization east of US50.

Water surface shade in the analysis area is in the form of willow and aspen west of US50 and mixed riparian and conifers east of US50. According to the canopy cover data in CWHR, the canopy cover in riparian areas is approximately 25%.

<u>Alternative 1 (No Action)</u>
Direct and Indirect Effects to Habitat. The no action alternative would avoid effects to Lacustrine/Riverine habitat, but would also forgo the opportunity to treat stormwater runoff to Burke Creek and Folsom Spring, reduce sediment load from Burke Creek, reduce flooding of the Kahle Drive trailhead facility and improve plant community by reducing non-native and invasive plant species.

Cumulative Effects to Habitat in the Analysis Area. Since the no action alternative would have no effect on Lacustrine/Riverine habitat in the analysis area, no cumulative effects are expected.

> **Cumulative Effects Conclusion:** There will be no cumulative effect to the Lacustrine/Riverine habitat type as a result of Alternative 1 of this project.

Alternative 2 (Proposed Action)

Direct and Indirect Effects to Habitat. The flow and stream surface shade through Jennings Pond will not be affected by this project. The amount of flow in Burke Creek and Jennings Pond within the analysis area would not be altered as a result of the proposed action; however the flow would be split between three channels leading into Jennings Pond. The northern and central channels would receive flow from Burke Creek and US50 runoff, while the southern channel will continue to receive flow from the urban area runoff. Additionally, since the channel depth in the northern and central channels will be less incised, the water is likely to spread out during high flows.

Sedimentation should be reduced in the analysis area as a result of repairing incised channels and headcuts.

Water surface shade will be reduced in the southern channel due to a decrease in the amount of water in that channel. It is surmised that approximately 20% of the current riparian shrubs will be cut and utilized in the new northern and central channels. More riparian shrubs may die off over time due to a lack of water. Water surface shade in the northern and central channels will increase over time as plantings mature.

Cumulative Effects to Habitat in the Analysis Area. The proposed action, when combined with past, present, and reasonably foreseeable future actions is not expected to have a cumulative effect on Lacustrine and Riverine habitat because this project should result in a decrease in the amount of sedimentation, flow would essentially be unchanged and water surface shade would be increased in some areas but reduced in others. These effects should result in a net improvement in Lacustrine and Riverine habitat in the analysis area.

Cumulative Effects Conclusion: While the Lacustrine/Riverine habitat within the analysis area will be altered the amount should be an overall positive effect. Additionally, the amount of habitat affected is very small compared to the amount of Lacustrine/Riverine habitat in the LTBMU as a whole.

Summary of Aquatic Macroinvertebrate Status and Trend at the Bioregional Scale

The Lake Tahoe Basin Management Unit LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale Index of Biological Integrity and Habitat monitoring for aquatic macroinvertebrates; hence, the lacustrine and riverine effects analysis for the Burke Creek Highway 50 Crossing and Realignment Project must be informed by these monitoring data. The sections below summarize the Biological Integrity and Habitat status and trend data for aquatic macroinvertebrates. This information is drawn from the detailed information on habitat and population trends in the 2010 Sierra Nevada Forests Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat and Index of Biological Integrity Status and Trend. Aquatic habitat has been assessed using Stream Condition Inventory (SCI) data collected since 1994 (Frasier et al. 2005) and habitat status information from the Sierra Nevada Ecosystem Project (SNEP) (Moyle and Randall 1996). Moyle and Randall (1996) developed a watershed index of

biotic integrity (IBI) based on distributions and abundance of native fish and amphibian species, as well as extent of roads and water diversions. According to this analysis, seven percent of the watersheds were in excellent condition, 36 percent were in good condition, 47 percent were in fair condition and nine percent were in poor condition.

Sierra Nevada MIS monitoring for aquatic (benthic) macroinvertebrates (BMI) was conducted in 2009 and 2010 (Furnish 2010). Benthic macroinvertebrates were collected from stream sites during both the 2009 and 2010 field seasons according to the Reachwide Benthos (Multihabitat) Procedure (Ode 2007). The initial BMI data from 2009 and 2010 found 46% (6 of 13) of the surveyed streams indicate an impaired condition and 54% (7 of 13) indicate a non-impaired condition (see USDA Forest Service 2010a, Table BMI-1). This is similar to the IBI conditions estimated by Moyle and Randall (1996). Therefore, current data from the Sierra Nevada indicate that status and trend in the RIVPACS scores appears to be stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Aquatic Macroinvertebrates Habitat Trend. **A**s the change in flow, sedimentation, and shade will be largely positive and small compared to the amount of habitat within the LTBMU the Burke Creek Highway 50 Crossing and Realignment Project will not alter the existing trend in the habitat or aquatic macroinvertebrates across the Sierra Nevada bioregion.

Riparian Habitat (Yellow warbler)

Habitat/Species Relationship.
The yellow warbler was selected as the MIS for riparian habitat in the Sierra Nevada. This species is usually found in riparian deciduous habitats in summer (cottonwoods, willows, alders, and other small trees and shrubs typical of low, open-canopy riparian woodland) (CDFG 2005). Yellow warbler is dependent on both meadow and non-meadow riparian habitat in the Sierra Nevada (Siegel and DeSante 1999).

Project-level Effects Analysis – Riparian Habitat

Habitat Factor(s) for the Analysis: (1) Acres of riparian habitat (CWHR montane riparian (MRI) and valley foothill riparian (VRI)). (2) Acres with changes in deciduous canopy cover (Sparse=10-24%; Open=25-39%; Moderate=40-59%; Dense=60-100%). (3) Acres with changes in total canopy cover (Sparse=10-24%; Open=25-39%; Moderate=40-59%; Dense=60-100%). (4) Acres with changes in CWHR size class **[**1/2 (Seedling/Sapling)(<6”" dbh); 3 (Pole)(6"-10.9" dbh); 4 (Small tree)(11"-23.9" dbh); 5 (Medium/Large tree)(≥24" dbh)].

Current Condition of the Habitat Factor(s) in the Project Area: There are currently 3.6 acres of MRI habitat and no VRI habitat within the analysis area. Of this 1.5 acres are hardwood (aspen) and 2.1 acres are riparian shrub (willows and alders). The LTBMU existing vegetation data does not include canopy cover or size class for riparian habitat types. The hardwood habitat has 60-100% canopy cover and 6-11 inch dbh trees. The

surrounding habitat is perennial grassland and wet meadow, so the total canopy cover equals the riparian habitat canopy cover.

Alternative 1 (No Action)

Direct and Indirect Effects to Habitat. The no action alternative would avoid effects to riparian habitat, but would also forego the opportunity to restore ecological function and processes within the Burke Creek channel and its adjacent floodplain, reduce pollutant loading to Lake Tahoe and improve public safety on US Highway 50 related to flooding.

Cumulative Effects to Habitat in the Analysis Area. Since the no action alternative would have no effect on riparian habitat in the analysis area, no cumulative effects are expected.

> **Cumulative Effects Conclusion:** There will be no cumulative effect to the Riparian habitat type as a result of Alternative 1 of this project.

Alternative 2 (Proposed Action)

Direct and Indirect Effects to Habitat. There will be 192 meters of new channel construction. It is highly likely that riparian habitat will expand along the new channel. Some of the riparian habitat may be lost along 76 meters of the old channel. That channel will not be removed but will have a greatly reduced flow, likely resulting in the loss of some of the existing riparian habitat. With the combination of expanded riparian habitat around the new channels and some remaining habitat around the existing channel, there should be a net increase in riparian habitat, although it is not possible to estimate the amount with the available data.

Deciduous canopy cover and size class will not change in the riparian hardwood habitat. Canopy cover will likely be increased in the riparian shrub habitat due to a long-term increase in riparian shrubs in the new channels (192 meters) and retention of a portion of the riparian shrub canopy cover in the existing channels (76 meters). Since there is no canopy cover other than riparian habitat the change in overall canopy cover will be the same. Size class will decrease initially due to smaller shrubs in the new channel but may increase in the long-term due to growth in the new channel and growth of the remaining shrubs in the existing channel.

Cumulative Effects to Habitat in the Analysis Area. The proposed action, when combined with past, present, and reasonably foreseeable future actions is not expected to have a cumulative effect on riparian habitat because this project should result in a net increase in riparian habitat.

> **Cumulative Effects Conclusion:** There should be no cumulative effect to the riparian habitat type as a result of Alternative 2. The habitat type as a whole should be increased and canopy cover may be increased as a result of this project.

Summary of Yellow Warbler Status and Trend at the Bioregional Scale
The Lake Tahoe Basin Management Unit LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the yellow warbler; hence, the riparian habitat effects analysis for the Burke Creek Highway 50 Crossing and Realignment 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 yellow warbler. 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 38,140 acres of riparian habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is stable.
>
> **Population Status and Trend.** Monitoring of the yellow warbler across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, hairy woodpecker, and fox sparrow (USDA Forest Service 2010a, http://data.prbo.org/partners/usfs/snmis/). Yellow warblers were detected on 13.7% of 160 riparian point counts in 2009 and 19.4% of 397 riparian point counts in 2010; additional detections were documented on upland point counts. The average abundance (number of individuals recorded on riparian passive point count surveys) was 0.166 in 2009 and 0.309 in 2010. In addition, the yellow warblers continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of yellow warbler populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Yellow Warbler Trend.
The long-term increase in habitat acres and canopy cover acres of riparian habitat on National Forest System lands in the Sierra Nevada will not alter the existing trend in the habitat, nor will it lead to a change in the distribution of yellow warblers across the Sierra Nevada bioregion.

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: According to CWHR there is 13.7 acres of Wet Meadow habitat in the analysis area. However, in this case the CWHR layer is known to be incorrect. Based on LTBMU riparian vegetation data, there is 20 acres of wet meadow habitat within the analysis area and no fresh emergent wetland. All of these acres contain herbaceous plants and herbaceous ground cover but the LTBMU riparian vegetation data nor the CWHR attributes in the LTBMU existing vegetation data set, does not include height classes or cover classes for this habitat type. The wet meadow habitat is in an impaired state due to siltation, incised channels and recreational impacts.

Alternative 1 (No Action)

Direct and Indirect Effects to Habitat. The no action alternative would avoid effects to Wet Meadow habitat, but would also forego the opportunity to restore ecological function and processes within the Burke Creek channel and its adjacent floodplain, reduce pollutant loading to Lake Tahoe and improve public safety on US Highway 50 related to flooding.

Cumulative Effects to Habitat in the Analysis Area. Since the no action alternative would have no effect on wet meadow habitat within the analysis area, no cumulative effects are expected.

Cumulative Effects Conclusion: There will be no cumulative effect to the Wet Meadow habitat type as a result of Alternative 1 of this project.

Alternative 2 (Proposed Action)

Direct and Indirect Effects to Habitat. The existing wet meadow habitat will not be affected by the proposed action. There may be an undetermined amount of wet meadow habitat added as a result of rerouting the stream. Most of the habitat around the new stream channel will likely become riparian habitat but some will likely be converted from perennial grassland to wet meadow. While this type conversion may not affect the height or amount of ground cover of herbaceous plants it should change the species present. Meadow hydrology will be affected in that the location of available water will change and siltation will be reduced because there should be less sediment transported by the 192 meters of new channel. However, impacts from the remaining incised channel below Jennings Pond and recreational impacts will not change.

Cumulative Effects to Habitat in the Analysis Area. The proposed action, when combined with past, present and reasonably foreseeable future actions is not expected to have a

cumulative effect on wet meadow habitat because it is expected to result in a long-term increase in habitat and habitat quality.

Cumulative Effects Conclusion: There should be no cumulative effect to the wet meadow habitat type as a result of Alternative 2. While an exact number is not available there should be a small amount of habitat added and a small improvement in habitat.

Summary of Pacific Tree (Chorus) Frog Status and Trend at the Bioregional Scale
The Lake Tahoe Basin Management Unit 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 Burke Creek Highway 50 Crossing and Realignment 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. The slight increase in the amount of Wet Meadow habitat and quality of habitat as a result of the proposed action will not lead to a change in the distribution of Pacific tree frogs across the Sierra Nevada bioregion.

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