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Date: November 13, 2017

Carolyn Swed
Field Supervisor
U.S. Fish and Wildlife Service
Nevada Fish and Wildlife Office
1340 Financial Blvd., Suite 234
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Dear Carolyn,

I am submitting the biological assessment for the Revision of the Inyo National Forest Land Management Plan Final Environmental Impact Statement and upon your acceptance, I am requesting the initiation of formal Section 7 consultation (50 CFR 402.14). The attached biological assessment analyzes the effects of implementing the revised Land Management Plan (forest plan) identified by the Preferred Alternative, alternative B modified, for management of the National Forest System lands administered by the Inyo National Forest in California and Nevada.

A species list was requested on the U.S. Fish and Wildlife Service Information for Planning and Consultation website on March 27, 2017 and updated on July 26, 2017 and November 5, 2017 (Carlsbad Office, Consultation Code: 08ECAR00-2017-SLI-0651, Event: 08ECAR00-2018-E-00330; Reno Office, Consultation Code: 08ENVD00-2017-SLI-0273, Event: 08ENVD00-2018-E-00167; and Sacramento Office, Consultation Code: 08ESMF00-2017-SLI-1551, Event: 08ESMF00-2018-E-00887). A combined total of 17 threatened, endangered, and candidate species were identified. Critical habitat was identified for nine of those species. Of the combined species, eight species are analyzed in detail and nine species were determined to not occur within the Inyo National Forest and are not analyzed in the biological assessment. Designated critical habitat occurs within the forest plan area and is analyzed for four species.

The revision of the Inyo National Forest Land Management Plan is a framework programmatic action (50 CFR Part 402 at § 402.14) that approves for the development of future actions that are authorized, funded, or carried out at a later time. As such, any take of a listed species would not occur unless, and until those future actions, are authorized, funded, or carried out and subject to further Section 7 consultation, as appropriate. Once adopted through a Record of Decision, this forest plan will replace current direction provided by the 1988 Inyo National Forest Land and Resources Management Plan, as amended.

The biological assessment describes the plan components and plan content that would guide future project and activity proposals, focused on those that serve to avoid, minimize, or mitigate effects to threatened, endangered and candidate species. Since a focus of the Inyo National

Forest is placed on ecological restoration, watershed restoration, and recreation management, ground-disturbing actions and human activities that could cause disturbance are expected to occur over the life of the forest plan. Therefore, the biological assessment has determined that the revised forest plan "*may affect, and is likely to adversely affect*" the following species: Sierra Nevada bighorn sheep, Sierra Nevada yellow-legged frog, northern distinct population segment of the mountain yellow-legged frog, Yosemite toad, Lahontan cutthroat trout, Paiute cutthroat trout, and Owens tui chub.

The biological assessment also determined that the revised forest plan "*may affect, and is likely to adversely affect*" designated critical habitat for the following species: Sierra Nevada bighorn sheep, Sierra Nevada yellow-legged frog, northern distinct population segment of the mountain yellow-legged frog, and Yosemite toad.

Whitebark pine, a candidate species, is analyzed in the biological assessment and although the revised forest plan includes direction to reduce threats, enhance conditions, and protect mature whitebark pine, individual trees could be affected by future restoration activities, recreation management, and road maintenance. Therefore, the biological assessment has determined that the revised forest plan "*may affect, but is not likely to jeopardize the continued existence of the species.*"

If you have any questions regarding the biological assessment or if additional information is required, please contact Don Yasuda at 707-562-8970 (Vallejo) or 530-409-5405 (cell) or by email dyasuda@fs.fed.us.

Sincerely,

Susan Murphy

FOR Christopher Fischer
Acting Forest Supervisor

BIOLOGICAL ASSESSMENT

for

Revision of the Inyo National Forest Land Management Plan

Federally designated threatened and endangered species
and their designated critical habitat
and candidate species

Fresno, Inyo, Madera, Mono and Tulare Counties, California
Esmeralda and Mineral Counties, Nevada

November 2017

Prepared By: _____ Date: _____

Donald Yasuda
Planning Team Biologist (Regional Analyst)
USDA Forest Service, Pacific Southwest Regional

Executive Summary

The Inyo National Forest (Inyo NF) is preparing a final environmental impact statement (FEIS) for revising the Land Management Plan for the Inyo National Forest (hereafter referred to as the "forest plan"). The forest plan is a programmatic framework document prepared by the United States Department of Agriculture, Forest Service (USFS) that provides programmatic framework management direction for National Forest System lands administered by the Inyo NF but does not prescribe project-level activities or assign project locations. The action area is defined as all National Forest System lands within the administrative boundary of the Inyo NF. The revised forest plan was prepared in accordance with the National Forest Management Act of 1976 (16 U.S. Code 1604, et seq.) and the provisions of the 2012 planning regulations (36 Code of Federal Regulations (CFR) Part 219, 2012) and is expected to be revised at least every 15 years.

This biological assessment is prepared based upon alternative B modified, the "preferred alternative", which is supported by the FEIS and forest plan prepared for public release, expected in early 2018. This public release will initiate the pre-decisional administrative review period required by the 2012 planning regulations (36 CFR Part 219, Subpart B, 2012). Following the conclusion of the pre-decisional administrative review process, if any substantive changes to the alternative or forest plan are made, consultation will be re-initiated as appropriate. The Record of Decision will be issued following receipt of the final Biological Opinion for the revised forest plan.

This document was prepared to meet the following specific objectives:

- Comply with requirements of the Endangered Species Act of 1973, as amended, so that actions by Federal agencies do not jeopardize the existence of federally listed species, or destroy, or adversely modify their critical habitat;
- Assess the effects of the Inyo NF revision to the forest plan on federally listed threatened, endangered, proposed, and candidate species known or likely to occur on the Inyo NF or on designated critical habitat on the Inyo NF that the forest plan potentially affects;
- Make full use of internal biological expertise and informal and formal consultation and conferencing with the U.S. Fish and Wildlife Service (USFWS) to reach supportable determinations of effect;
- Provide a process and standard by which to ensure that effects to federally listed threatened, endangered, and proposed species, known or likely to occur on the Inyo NF, as well as designated critical habitat, receive full consideration in the decision making process consistent with Forest Service policy (Forest Service Manual 2672.4).

Federally listed threatened, endangered, and candidate species and critical habitat that have been identified by the USFWS for the Inyo NF were analyzed in this biological assessment. There are no proposed species and no proposed critical habitat identified in the forest plan area. Although candidate species are not protected under the Endangered Species Act and are not formally addressed during consultation, we included whitebark pine in our analysis to disclose the contribution of the forest plan direction to conservation of the species.

Since the forest plan only provides framework programmatic direction for the development of later site-specific projects, it is possible that some future projects could have adverse effects to listed species or their habitat or to designated critical habitat. Therefore, while we expect that most project developed under the forest plan would have a determination of either no affect or

may affect, and not likely to adversely affect federally listed species or their critical habitat, we cannot ensure that some later analyzed projects would not have a determination of may affect, and likely to adversely affect species or their critical habitat. The determinations made for analyzed species and critical habitats are displayed in Table 1.

Table 1. Determinations for analyzed species and critical habitats

Species	Status	Determination
Sierra Nevada bighorn sheep	Endangered	May affect, likely to adversely affect
Sierra Nevada bighorn sheep critical habitat	Designated	May affect, likely to adversely affect
Mountain yellow-legged frog, northern DPS	Endangered	May affect, likely to adversely affect
Mountain yellow-legged frog, northern DPS critical habitat	Designated	May affect, likely to adversely affect
Sierra Nevada yellow-legged frog	Endangered	May affect, likely to adversely affect
Sierra Nevada yellow-legged frog critical habitat	Designated	May affect, likely to adversely affect
Yosemite toad	Threatened	May affect, likely to adversely affect
Yosemite toad critical habitat	Designated	May affect, likely to adversely affect
Lahontan cutthroat trout	Threatened	May affect, likely to adversely affect
Paiute cutthroat trout	Threatened	May affect, likely to adversely affect
Owens tui chub	Endangered	May affect, likely to adversely affect
Whitebark pine	Candidate	May affect, not likely to jeopardize the continued existence of the species

We determined, and the USFWS agreed, that the following species were not likely to occur on the Inyo NF nor be impacted by Forest Service actions addressed in the forest plan: North American wolverine, California condor, Least Bell's vireo, Yellow-billed cuckoo, western U.S. Distinct Population Segment (DPS), Western snowy plover, Pacific Coast DPS, Delta smelt, Little Kern golden trout, Steelhead, northern California DPS, Owens pupfish.

List of Acronyms Used

CDFW: California Department of Fish and Wildlife
CFR: Code of Federal Regulations
DPS: Distinct Population Segment
ESA: Endangered Species Act
FEIS: Final Environmental Impact Statement
FSM: Forest Service Manual
NF: National Forest
USDA: United States Department of Agriculture
USDI: United States Department of Interior
USFS: United States Forest Service
USFWS: USDI Fish and Wildlife Service

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I. Introduction

Purpose

The United States Forest Service (USFS) proposes to revise the Land Management Plan (hereafter referred to as the "forest plan"[1]) for the Inyo National Forest (Inyo NF) as required by the National Forest Management Act of 1976 (16 U.S. Code 1604) and directed by the 2012 planning regulations in 36 Code of Federal Regulations (CFR) Part 219 (hereafter referred to as the "2012 Planning Rule"[2]). This revision will update the national forest management direction that guides decisions on activities and uses of National Forest System lands administered by the Inyo NF. Plan direction is provided by required and optional plan components such as desired conditions, objectives, standards, guidelines, suitability of lands, and goals. The forest plan also includes other required content such as a plan monitoring program and includes optional plan content describing potential management approaches. Each of these specific plan components and plan content elements are defined by the 2012 Planning Rule and described below in Section III Overview of Forest Planning is under "Structure and Content of Forest Plans".

The revision of the forest plan considered five alternative management approaches: the no-action alternative (alternative A) which represents the existing forest plan (as amended) and four action alternatives (alternatives B, C, D, and B modified), which are described in detail in the: *Final Environmental Impact Statement for the Revised Inyo National Forest Land Management Plan* (FEIS) (United States Department of Agriculture 2017 (*in prep.*)-a). There are also seven alternatives considered but not analyzed in detail. Alternative B modified was developed to incorporate changes as a result of comments received on the draft environmental impact statement and draft forest plan.

The purpose of this biological assessment is to evaluate the potential consequences of the preferred alternative in the FEIS, alternative B modified, on federally listed endangered, threatened, proposed and candidate species and their habitats, including designated and proposed critical habitats. This analysis is conducted for conferencing or consultation with the U.S. Fish and Wildlife Service (USFWS), as required under Section 7 of the Endangered Species Act (ESA; 16 U.S. Code 1536(a)-(d)). The revision of the Inyo NF Land Management Plan is a framework programmatic action that approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time, and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further Section 7 consultation. This analysis is prepared in compliance with the requirements of Forest Service Manual (FSM) 2670 (United States Department of Agriculture 2005) and complies with the direction for interagency cooperation in implementing the Endangered Species Act of 1973, as amended (50 CFR Part 402).

The Forest Supervisor for the Inyo NF is the responsible official for the revision of the forest plan and will make a final decision in a Record of Decision.

[1] Forest plans developed under the 1982 Planning Rule (36 CFR 219, 1982) were commonly referred to as Land and Resource Management Plans while forest plans developed under the 2012 Planning Rule (36 CFR 219, 2012) are commonly referred to as Land Management Plans. They are also called forest plans.
[2] 36 CFR Part 219, National Forest System Land Management Planning was published in the Federal Register, Vol. 77, No. 68 on April 9, 2012.

Location

The Inyo NF encompass nearly 2 million acres of National Forest System lands located in the southeastern Sierra Nevada mountain range and includes the White Mountains of California and Nevada (Figure 1). The plan area includes 26,711 acres of parcels that are proclaimed to belong to the adjacent Sierra NF and Humboldt-Toiyabe NF, but that are managed by the Inyo NF and would be managed according to the direction in the Inyo NF forest plan. The plan area includes approximately 967,039 acres of designated wilderness areas.

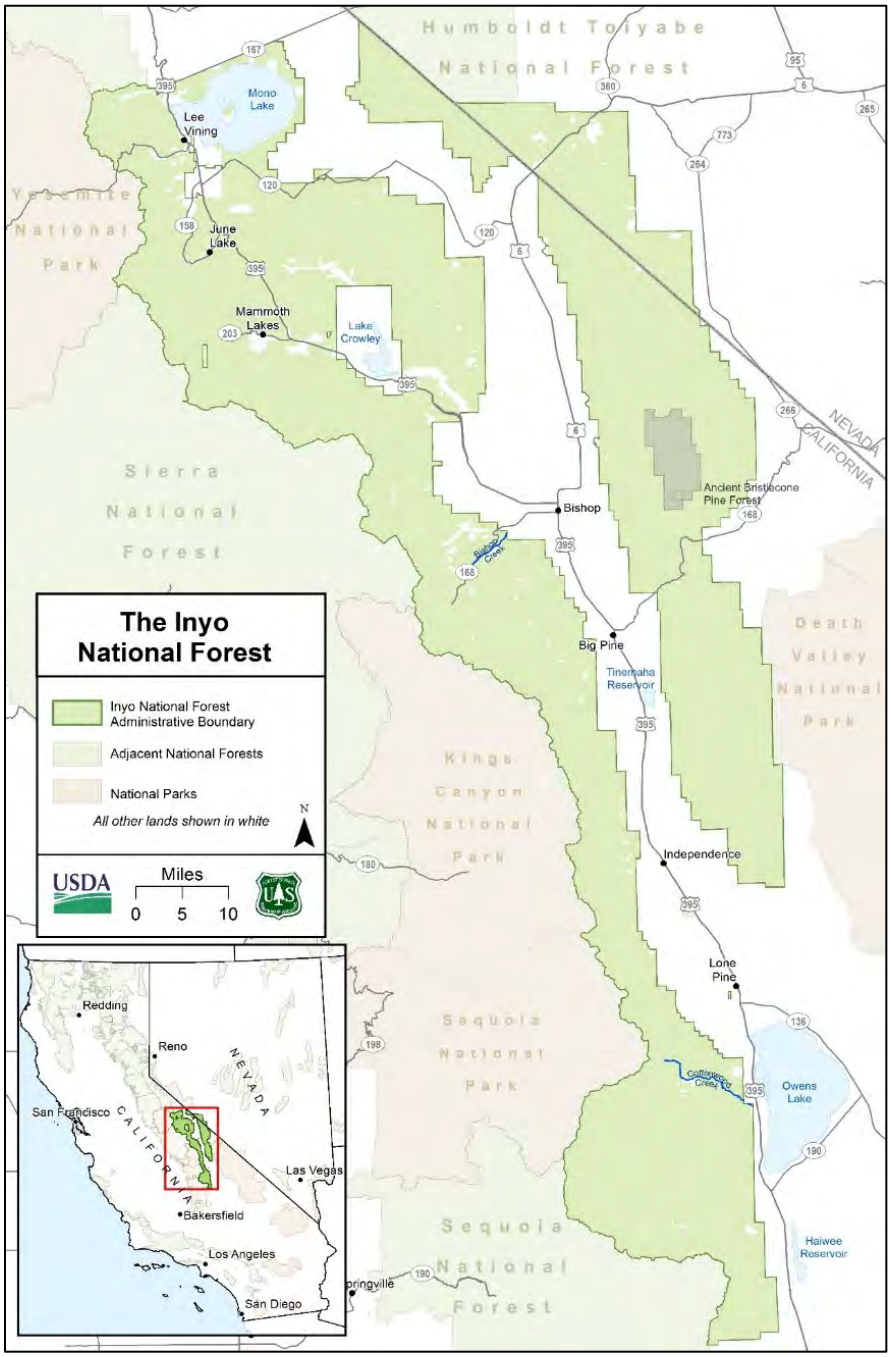

Figure 1. Location map of the Inyo National Forest plan area

Species Considered

A list of species and designated or proposed critical habitats considered for this biological assessment was obtained from the USFWS Information for Planning and Consultation (IPaC) website (https://ecos.fws.gov/ipac/) on March 27, 2017 and updated on July 26, 2017 and November 5, 2017 for the project "Forest Plan Revision, Inyo National Forest". Species lists were generated for the Carlsbad Fish and Wildlife Office, the Reno Fish and Wildlife Office, and the Sacramento Fish and Wildlife Office as described in the Consultation History section below. This resulted in a combined list of 17 threatened, endangered, and candidate species. No species proposed for federal listing were identified. We determined that only eight of these species are known to occur in the forest plan area or have habitat within the plan area that may be affected by the framework programmatic actions of the preferred alternative and these will be analyzed in detail in this biological assessment (Table 2). The remaining nine species are not known to occur in the forest plan area, nor do they have proposed or designated critical habitat within the plan area and are therefore not affected by the Inyo NF forest plan preferred alternative framework programmatic actions and are not analyzed in this biological assessment (Table 3). This list of species that did not require analysis was confirmed by the USFWS Reno Fish and Wildlife Office on April 28, 2017.

Table 2. Federally designated threatened, endangered, proposed, and candidate species that occur in the Inyo National Forest plan area

Common Name[3]	Scientific Name	Status[4]
Sierra Nevada bighorn sheep	*Ovis canadensis sierrae*	E
Mountain yellow-legged frog, northern DPS	*Rana muscosa*	E
Sierra Nevada yellow-legged frog	*Rana sierrae*	E
Yosemite toad	*Anaxyrus canorus*	T
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	T
Paiute cutthroat trout	*Oncorhynchus clarkii seleniris*	T
Owens tui chub	*Gila bicolor snyderi*	E
Whitebark pine	*Pinus albicaulis*	C

Table 3. Federally designated threatened, endangered, proposed, and candidate species that do not occur in the Inyo National Forest plan area

Common Name[3]	Scientific Name	Status[5]
North American wolverine	*Gulo gulo luscus*	PT
California condor	*Gymnogyps californianus*	E
Least Bell's vireo	*Vireo bellii pusillus*	E
Yellow-billed cuckoo, western U.S. DPS	*Coccyzus americanus*	T
Western snowy plover, Pacific Coast DPS	*Charadrius nivosus nivosus*	T
Delta smelt	*Hypomesus transpacificus*	T
Little Kern golden trout	*Oncorhynchus aquabonita whitei*	T
Steelhead, northern California DPS	*Oncorhynchus mykiss*	T
Owens pupfish	*Cyprinodon radiosus*	E

Table 4 identifies final designated critical habitat that occurs within the plan area identified for four species in the species lists. Table 5 identifies final designated habitat for five species identified in the species lists that do not overlap the plan area and will not be affected by the

[3] DPS = Distinct Population Segment
[4] E = Endangered; T = Threatened; C = Candidate
[5] E = Endangered; T = threatened; PT = Proposed Threatened

framework programmatic action and are not addressed in this document. There is no proposed critical habitat that overlaps the plan area.

Table 4. Designated critical habitat analyzed in the biological assessment

Species	critical habitat Status
Sierra Nevada bighorn sheep	Final Designated critical habitat
Mountain yellow-legged frog, northern DPS	Final Designated critical habitat
Sierra Nevada yellow-legged frog	Final Designated critical habitat
Yosemite toad	Final Designated critical habitat

Table 5. Designated critical habitat that does not overlap the plan area and is not analyzed in the biological assessment

Species	critical habitat Status
California condor	Final Designated critical habitat
Least Bell's vireo	Final Designated critical habitat
Yellow-billed cuckoo, western U.S. DPS	Final Designated critical habitat
Western snowy plover	Final Designated critical habitat
Owens tui chub	Final Designated critical habitat

Two species have had recent petition decisions that found that listing under the Endangered Species Act was not warranted: Bi-State population of greater sage-grouse (*Centrocercus urophasianus*) (United States Department of the Interior 2015b) and Ramshaw Meadows sand-verbena (*Abronia alpine*) (United States Department of the Interior 2015a). Consultation on these species is not required under the ESA or other agency policy. These species are considered Species of Conservation Concern for the Inyo NF and conservation approaches, plan direction, and consequences to them are addressed in the final environmental impact statement (United States Department of Agriculture 2017 (*in prep.*)-a).

II. Consultation History

Consultation with the USFWS is required for federal actions that may affect federally listed threatened and endangered species, or proposed species or their critical habitat under the ESA. Although species that are on the candidate list have no formal protections under the ESA, we are also evaluating them to ensure that federal actions would conserve them and contribute towards preventing them from being federally listed. The following summarizes the informal and formal consultation conducted for this biological assessment.

- The Forest Service sent a letter on December 12, 2014 to Jennifer Norris, Field Supervisor of the Sacramento, California USFWS Office, notifying her that the Sierra, Sequoia and Inyo National Forests were preparing to revise their Land and Resource Management Plans and that a biological assessment will be prepared. This letter identified Greg Schroer (USFS) as the lead for developing the biological assessment, as well as stating that the USFWS Sacramento Office website will be used for obtaining a list of federally listed, proposed and candidate species to consider for the biological assessment (as the USFWS previously requested).
- The USFWS Sacramento Fish and Wildlife Office website (http://www.fws.gov/sacramento/) was reviewed on December 18, 2014 and verified on February 25, 2015 to determine federally listed, proposed or candidate species that may be affected by the revision of the Sierra and Sequoia NF forest plans. The USFWS Sacramento Fish and Wildlife Office website was reviewed on May 27, 2015 to determine federally listed, proposed or candidate species that may be affected by the revision of the Inyo NF forest plan.
- A meeting was held on January 21, 2015 between Greg Schroer (USFS) and Chris Nagano and Robert Lusardi (USFWS) to introduce the biological assessment project, general timing, participants, and proposed species to be covered in the biological assessment.
- A meeting was held on August 20, 2015 between Mike Dietl (USFS), other USFS staff, and Chris Nagano, Steven Detwiler, and Lee Ann Carranza (USFWS) to continue discussion about the planning process and opportunities for the USFWS to engage on non-listed species of interest. The USFWS approach to programmatic consultation was discussed along with approaches to address conservation measures in the forest plans. The preliminary schedule was discussed along with initial dialog on whether to prepare one biological assessment for all three forests or if separate documents should be prepared. A list of species to consider was agreed to.
- The USFWS Sacramento and Reno Fish and Wildlife Offices were notified on June 23, 2016 that Don Yasuda (USFS) has been identified as the lead for developing the biological assessment.
- A meeting was held on March 24, 2017 to update the USFWS Sacramento and Reno Fish and Wildlife Offices on a decision to prepare a separate biological assessment for the Inyo NF and initiate formal consultation in 2017 and to supplement the draft environmental impact statement for the Sequoia and Sierra National Forests and prepare a separate biological assessment with consultation expected in 2018. At this meeting it was agreed to exclude species where federal listing was recently determined to be not warranted. It was also agreed to only analyze the preferred alternative and to use the online USFWS system to request a species list.
- On March 27, 2017, the USFWS Information for Planning and Consultation (iPaC) website was used to formally request and receive an official species list for the Inyo NF administrative forest boundary area.

  - Carlsbad Office: Consultation Code/Event: 08ECAR00-2017-SLI-0651/08ECAR00-2017-E-01334
  - Reno Office: Consultation Code/Event: 08ENVD00-2017-SLI-0273/08ENVD00-2017-E-00521
  - Sacramento Office: Consultation Code/Event: 08ESMF00-2017-SLI-1551/08ESMF00-2017-E-03888
- On April 28, 2017, the USFWS Reno Fish and Wildlife Office confirmed in an email the list of species that do not require analysis in the biological assessment (Appendix A - Species Not Considered).
- On July 26, 2017, the USFWS iPaC list was renewed for the same project area with no changes in the list of species.
  - Carlsbad Office: Consultation Code/Event: 08ECAR00-2017-SLI-0651/08ECAR00-2017-E-02468
  - Reno Office: Consultation Code/Event: 08ENVD00-2017-SLI-0273/08ENVD00-2018-E-00167
  - Sacramento Office: Consultation Code/Event: 08ESMF00-2017-SLI-1551/08ESMF00-2018-E-07484
- On October 18, 2017, a coordination call occurred between the USFS (Don Yasuda, MaryBeth Hennessy, Diane Macfarlane, Leeann Murphy) and USFWS (Shawna Theisen, Erin Nordin, Marcy Haworth). Discussed USFWS comments on draft biological assessment, suggestions for completing the biological assessment, USFS plan to work with USFWS at Inyo NF supervisor's office in Bishop, California the week of October 30.
- On October 31 and November 3, 2017, Don Yasuda and Leeann Murphy (USFS) met with Erin Nordin (USFWS) to discuss content, format, and submission of the biological assessment.
- On November 5, 2017, the USFWS iPaC list was renewed for the same project area with no changes in the list of species.
  - Carlsbad Office: Consultation Code/Event: 08ECAR00-2017-SLI-0651/08ECAR00-2018-E-00330
  - Reno Office: Consultation Code/Event: 08ENVD00-2017-SLI-0273/08ENVD00-2018-E-00167
  - Sacramento Office: Consultation Code/Event: 08ESMF00-2017-SLI-1551/08ESMF00-2018-E-00887
- On November 9, 2017, the Inyo NF submitted the biological assessment to the USFWS, Reno Office to initiate the formal consultation process upon acceptance.

III. Overview of Forest Planning

Purpose and Role of Forest Plans

Every national forest managed by the Forest Service is required to have a land management plan, or forest plan, that is consistent with the National Forest Management Act of 1976 (16 U.S. Code 1604) and other laws. The National Forest Management Act directs that these plans be amended as necessary and revised at least every 15 years. Forest plans are one of three levels of planning and decision-making that guide how we manage National Forest System lands.

The first and broadest level of planning occurs at the national level through the United States Department of Agriculture Forest Service Strategic Plan, a 5-year plan that allows public transparency of the agencies goals, objectives and accomplishments. The second level of planning occurs at the level of National Forest System administrative units through forest plans. The third level of planning includes development of on-the-ground projects and activities, which are designed to achieve the desired conditions and objectives of the forest plan. Future project and activity decision-making must be consistent with the forest plan and is subject to compliance with the Endangered Species Act and all other relevant and applicable laws and regulations.

A forest plan guides management of National Forest System lands so that they are ecologically sustainable and contribute to social and economic sustainability; consist of ecosystems and watersheds with ecological integrity and diverse plant and animal communities; and have the capacity to provide people and communities with ecosystem services and multiple uses that provide a range of social, economic, and ecological benefits for the present and into the future. These benefits include clean air and water; habitat for fish, wildlife, and plant communities; and opportunities for recreational, spiritual, educational, and cultural benefits.

Forest plans are intended to be strategic, meaning they identify long-term or overall desired conditions and provide general direction for achieving those desired conditions. Forest plans focus on outcomes, and are flexible to allow management to adapt to local conditions and uncertain or unknown future events and conditions such as fires, floods, climate change, changing economies, and social changes that may be important to consider at the time decisions are made for projects or activities.

Generally, forest plans are not tactical and do not specify particular methods that must always be used and do not require resources to be allocated. Forest plans emphasize strategic decisions: “why” and “what,” and to a lesser extent and only generally, “when” and “where.” The “how” decision is made at the tactical or project planning level, and includes the site specific details of time, place and circumstances of a particular project proposal. Forest plans do not attempt to prescribe detailed management direction to cover every possible situation. Forest plans themselves do not compel any action, authorize projects or activities, or guarantee specific results. The forest plan does not: a) create, authorize, or execute any ground-disturbing activity; b) grant, withhold, or modify any permit or other legal instrument; c) subject anyone to civil or criminal liability; or d) create legal rights.

A project might be needed because of a discrepancy between current conditions and desired conditions. Projects may be proposed in response to demands by the public or to respond to forest plan objectives. When a project is proposed, it is first checked against the suitability of areas. If the project is an appropriate use, then relevant design criteria, standards and guidelines are used to develop one or more alternatives to achieve the project purpose and need for action. The

proposed action for the project is then analyzed using appropriate National Environmental Policy Act procedures. Consequences to federally listed species are evaluated and consultation is initiated, if needed. If the project is not consistent with the forest plan, the project may be redesigned or rejected, or a forest plan amendment may be considered.

A forest plan guides and constrains Forest Service personnel, not the public. Any constraint on the public needs to be imposed by law, regulation, or through the issuance of an order by the responsible official under 36 CFR part 261, Subpart B. In addition to forest plans, management of National Forest System lands is also guided and constrained by laws; regulations; and policies, practices, and procedures that are in the Forest Service Directive System. These are generally not repeated in forest plans. In addition, the forest plan contains an appendix that lists existing resource plans and agreements that also guide management of the Inyo NF along with the land management plan. This appendix from the forest plan is included as Appendix D – List of existing resource plans from the Forest Plan in this document.

Forest planning is a continuous process, which includes assessment, plan development, amendment, revision and monitoring. The intent of this forest planning framework is to create an integrated approach to the management of resources and uses and incorporate the landscape-scale context for management. The planning framework creates a structure within which land managers and partners work together to understand what is happening on the land. It is intended to establish a flexible forest plan that allows the forest to adapt management to changing conditions and improve management based on new information and monitoring.

An adaptive forest plan recognizes that there is always uncertainty about the future of natural systems and the timing and type of disturbances. Social conditions and human values regarding the management of national forests are also likely to change. Given that the setting for forest plan implementation will be changing over time, the forest plan incorporates an effective monitoring program, capable of detecting change, with an adaptive flexibility to respond to those detected changes. A biennial monitoring evaluation report is required by the plan monitoring program. The forest plan monitoring program recognizes key management questions and identifies measurable indicators that can inform the questions. When conditions change beyond what was anticipated in the forest plan, a responsive process using narrow amendments can be used to adjust plans between revisions.

Structure and Content of Forest Plans

The forest plan includes management direction and explanatory material.

An integrated plan means that all plan components work together toward achieving or maintaining desired conditions and are internally consistent. The plan components work together as a whole to meet the requirements of the 2012 Planning Rule (36 CFR 219.8 through 219.11), but this does not mean that all uses must be provided for on all lands.

The forest plan, analyzed as alternative B modified, includes six plan components that guide future project and activity decision making. Five plan components are required: desired conditions, objectives, standards, guidelines, and suitability of lands. Goals are included as an optional plan component. The six components are described as:

> A **desired condition** is a description of specific social, economic, and/or ecological characteristics of the plan area, or a portion of the plan area, toward which management of the land and resources should be directed. A desired condition description is specific

enough to allow progress toward achievement to be determined but does not include a completion date.

An **objective** is a concise, measurable, and time-specific statement of a desired rate of progress toward a desired condition or conditions. Objectives are based on reasonable foreseeable budgets.

A **goal** is a broad statement of intent, other than desired conditions, usually related to process or interaction with the public. Goals are expressed in broad, general terms, but do not include completion dates. Goals may be used to describe overall desired conditions of the plan area that are also dependent on conditions beyond the plan area or Forest Service authority. Goals may be used in lieu of objectives if the outcome is the result of a partnership between the Forest Service and other land owners within the broader landscape, or if the outcome is uncertain, because it could be beyond the fiscal capability of the unit. A goal is an optional plan component.

The **suitability of lands** is determined for specific lands within the plan area. The lands are identified as suitable or not suitable for various uses or activities based on desired conditions applicable to those lands. The suitability of lands is not identified for every use or activity. If certain lands are identified as not suitable for a use, then that use or activity may not be authorized.

A **standard** is a mandatory constraint on project and activity decision-making, established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

A **guideline** is a constraint on project and activity decision-making that allows for departure from its terms, so long as the purpose of the guideline is met. Guidelines are established to help achieve or maintain the desired condition or conditions, to avoid or mitigate undesirable effects, or to meet applicable legal requirements.

Plan components can apply forestwide or to land of specific character (such as vegetation types). Plan components can also apply to specific parcels of land, such as management areas and designated areas.

Potential management approaches are included as additional plan content. Potential management approaches are not plan components but are used to describe the principal strategies and program priorities the responsible official intends to use to carry out projects and activities developed under the plan. Potential management approaches can convey a sense of priority and focus among objectives and the likely management emphasis. They should relate to desired conditions and may indicate the future course or direction of change, recognizing budget trends, program demands and accomplishments. Management approaches may discuss potential processes such as analysis, assessment, inventory, project planning, or monitoring.

Primary management direction and guidance for threatened, endangered, proposed, and candidate species can be found within the forest plan in Chapter 2 under “Ecological Sustainability and Diversity of Plant and Animal Communities” under the subsection on “Animal and Plant Species”. Additional relevant direction in Chapter 2 includes the subsections on “Watersheds”, “Terrestrial Ecosystems and Vegetation”, “Invasive Species”, and “Fire”. Management direction for “Conservation Watersheds”, “Riparian Conservation Areas”, and “Wilderness” can be found within the forest plan in Chapter 3 under Management Areas and under Designated Areas. The

relevant direction is included in Section IV of this document and is also compared with existing plan direction in Appendix B – Plan Components for At-risk Species and Appendix C – Plan Components for Aquatic and Riparian Ecosystems.

Forest Plan Monitoring Program

Monitoring forms the basis for continuous improvement of the forest plan and provides information for adaptive management within the plan area. The forest plan monitoring program enables the responsible official to help determine where and when changes are needed in the forest plan.

The forest plan monitoring program measures management effectiveness and assesses progress toward achieving or maintaining the forest plan desired conditions and objectives through a set of monitoring questions and associated indicators. These are designed to inform management of resources in the plan area, including testing relevant assumptions, tracking relevant changes, and measuring management effectiveness. By using appropriate indicators which can be measured, observed, or described over time, management actions can be evaluated to determine if they are trending conditions toward the anticipated results. Not every plan component will have a corresponding monitoring question or indicator because monitoring in the plan monitoring program is focused on priority management questions and related core information that are achievable within the means of the national forest.

The plan monitoring program is just one piece of the monitoring that occurs within the forest and region; project and activity monitoring, and resource or species monitoring conducted by other agencies and organizations may inform the plan monitoring program and adaptive management of the plan. To address plan monitoring program questions and associated indicators that can best be answered at a broader geographic scale than one plan area, the Regional Forester shall develop a broader-scale monitoring strategy. The intent of the broader-scale monitoring strategy is to inform decision-making regarding the effectiveness of the forest plan, within the context of an all-lands approach, and realize efficiencies by coordinating similar monitoring across units, integrating agency protocols and leveraging partner and adjacent landowner monitoring work.

The monitoring program considers the 2014 science synthesis for the Sierra Nevada bioregion (Long, Quinn-Davidson, and Skinner 2014) and the 2013 forest plan assessment (United States Department of Agriculture 2013a). Existing national and regional monitoring programs, like the Forest Inventory and Analysis National Program, the National Visitor Use Monitoring Program, the current forest plan monitoring, and ongoing monitoring with the states contribute to the plan monitoring program. Monitoring is also coordinated with other Forest Service program mission areas (i.e., State & Private Forestry and Research & Development), other federal and state agencies, tribes, partners and the public.

Monitoring information will be collected every year for many, but not all, monitoring questions and evaluated every two years. The first evaluation report is anticipated no later than two years after the effective date of the forest plan decision. This biennial evaluation includes information gathered through this plan monitoring program and may include relevant information from the Forest Service Pacific Southwest Region broader-scale monitoring strategy. A written report of the evaluation will be made available to the public. The evaluation will identify if changes are needed to the plan or plan monitoring program, or whether a new assessment is needed, or if no changes are warranted at that time. Where frequency of monitoring is longer than two years, evaluation of that information will be made in the next biennial evaluation. For example, a data

collection program that takes place once every five years, will then be included in every third evaluation report.

Some monitoring questions and associated indicators may address more than one of these required topics. The entire plan monitoring program must be within the financial and technical capability of the forest, augmented by broader-scale monitoring by the Pacific Southwest Region and other monitoring with partners.

The desired conditions are generally complex statements that cannot be fully monitored. Therefore, the monitoring questions and associated indicators focus on some core aspect of the desired condition related to the required monitoring item and that are practicable to be monitored. Details of the plan monitoring program—including monitoring and analysis protocols, data collection schedules, responsible parties, and data management—will be part of a separate monitoring guide that will be developed at a later date.

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IV. Description of Action Area and Proposed Alternative

Action Area

The Land Management Plan is a programmatic document that provides management direction for National Forest System lands comprising the area administered by the Inyo NF (see previous Figure 1). Therefore, at this programmatic level of planning, the action area for the evaluation of effects is defined as all National Forest System lands within the exterior administrative boundary of the Inyo NF. Management direction in the forest plan only applies to National Forest System lands and does not apply to, or constrain, projects or activities on private lands, adjacent national forests, or other land ownerships. The forest plan is assumed to have a lifespan of 15 years, as the National Forest Management Act directs plans to be revised at least every 15 years.

This section provides a summarized description of the action area relevant to evaluating effects to considered species. Additional details used in this summary and the biological assessment can also be found in the following documents:

- Science Synthesis to Support Socioecological Resilience in the Sierra Nevada and Southern Cascade Range (Long, Quinn-Davidson, and Skinner 2014), prepared by scientists of the Pacific Southwest Research Station.
- Natural Range of Variation assessment reports by Forest Service Pacific Southwest Region Ecology Program staff for subalpine (Meyer 2013b), red fir (Meyer 2013a), yellow pine and mixed conifer forests (Safford 2013), meadows (Gross and Coppoletta 2013), and non-meadow riparian (Sawyer 2013).
- Sierra Nevada Bio-Regional Assessment (United States Department of Agriculture 2013b) and Forest Assessment for the Inyo National Forest (United States Department of Agriculture 2013a, c).

Relevant Terrestrial Habitats

Major terrestrial habitats within the action area relevant to analyzed species (Sierra Nevada bighorn sheep and whitebark pine) includes primarily rocky slopes and alpine and subalpine forests along with adjacent more open forest patches of red-fir and Jeffrey pine. Low-elevation winter range for Sierra Nevada bighorn sheep is provided by areas with pinyon-juniper, mountain mahogany, sagebrush, xeric shrubs and blackbrush. The nature of each vegetation type varies by location but the forest plan identifies desired conditions that are designed to be broad enough to allow individual, site specific adjustments at the project level to account for these differences. Ecological zones and vegetation types are shown in Figure 2 and a general description of each vegetation type is provided below, with additional details provided in the FEIS.

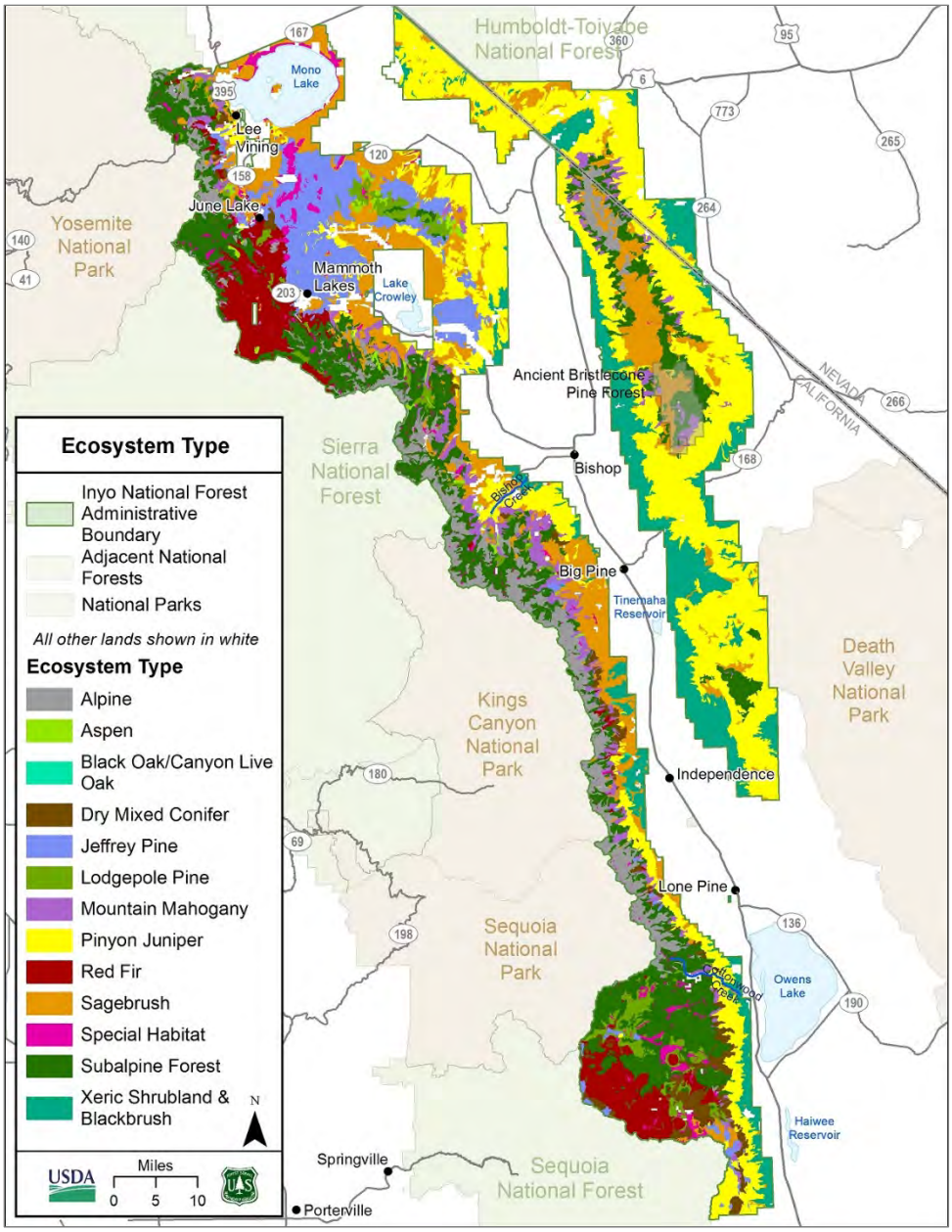

Figure 2. Major vegetation types from the Terrestrial Ecological Unit Inventory

Alpine and subalpine ecological zones are dominated by high elevation grasses and sedges in the alpine and subalpine meadows mixed with rock habitat. Combined, these types covers about 513,000 acres on the Inyo NF. These high elevation alpine areas have short growing seasons with the ground frozen for much of the year. Subalpine habitats are dominated by high elevation meadows, mountain hemlock (*Tsuga heterophyla*) with mixes of lodgepole pine (*Pinus contorta*), red fir (*Abies magnifica*), and some areas of western white pine (*P. monticola*) and other species. These areas provide summer range for Sierra Nevada bighorn sheep and habitat for whitebark pine.

Open forest patches with red fir and Jeffrey pine that occur in proximity to open rocky areas are also used by Sierra Nevada bighorn sheep. It is difficult to quantify the amount of this habitat

type that is in proximity to areas used by bighorn sheep, however on the Inyo NF, there is approximately 118,000 acres of red fir and 135,000 acres of Jeffrey pine vegetation types. Most of these mapped areas have higher and more continuous conifer canopy cover. Smaller patches of trees that may provide for bighorn sheep habitat are typically mapped as part of the alpine and subalpine ecological zones when they have less than 10 percent canopy cover or are not continuous enough to meet the minimum mapping size.

Pinyon-juniper is the most extensive vegetation type on the Inyo NF, covering 561,000 acres. However, not all of this vegetation type is available as low-elevation winter range for Sierra Nevada bighorn sheep and the usable portion is difficult to estimate. Pinyon-juniper dominates mid-elevations across the forest, and occurs in all ecological sub-regions. Pinyon-juniper types often occur in close proximity to and mixed with sagebrush shrublands, mountain mahogany, and xeric shrublands. Some of the areas on the forest currently classified as pinyon-juniper woodlands include sagebrush shrub communities that have experienced an increase in pinyon and/or juniper trees over the past several decades or longer. This “encroachment” is due to a combination of factors that include grazing, fire suppression, and climate changes, and have consequent effects on fine fuels, nutrient cycling (soil crusts), and community structure and composition. Invasive annual grasses are common near roads and in burned areas.

Sagebrush shrublands are a prominent vegetation type on the Inyo NF covering 308,000 acres. As with pinyon-juniper, not all of this vegetation type is available as low-elevation winter range for Sierra Nevada bighorn sheep. Dominant species include all subspecies of big sagebrush, low sagebrush, bitterbrush, and black sagebrush. Some of the areas currently dominated by pinyon-juniper were dominated historically by sagebrush, and a combination of management history and climate change has allowed pinyon-juniper to expand. Early and mid-seral ecosystems comprise approximately 15 percent of sagebrush areas. These mainly include burned areas currently dominated by herbaceous vegetation or by shrub species that increase rapidly following fire, such as rabbitbrush. Encroachment of conifers into sagebrush over the last century has resulted from the combined effects of fire suppression, grazing, and climate change, with an estimated 25,000 acres of sagebrush with encroachment of several trees per acre or more.

Large patches of mountain mahogany occur on steep cliffs, rocky slopes and outcrops and broad ridges, generally mixed with other assessment types, including subalpine forests and sagebrush shrublands. Curl-leaf mountain mahogany is the dominant shrub on most sites. On carbonate soils, little leaf mountain mahogany occurs. Mountain mahogany dominates less than five percent of the forest. Due to the steep, rocky nature of the mountain mahogany ecosystems, human use in these areas has been and continues to be relatively limited. Mineral development, roads, and dispersed recreation are the primary factors affecting the condition of this ecosystem on the forest where it occurs in lower elevations outside of wilderness.

The vegetation type of xeric shrubs and blackbrush is composed of a diverse array of desert shrubs, grasses and herbs composed of blackbrush, saltbush, goldenbush, and horsebrush. It occupies the very lowest elevations of the Inyo NF covering 214,000 acres, approximately 11 percent of the forest, in the foothills of the mountains, bordering the large valleys extending on adjacent land managed primarily by the Bureau of Land Management or Los Angeles Department of Water and Power. Past and current management activities and/or natural processes that have affected the current condition of xeric shrub and blackbrush ecosystems on the forest include livestock grazing, fire suppression, and wildland fire. Outside of wilderness, additional activities that have affected the current condition include mining, water spreading, various special uses

such as apiaries and weather stations, and recreation uses, particularly off-highway vehicle activity.

Relevant Aquatic Habitats

Aquatic ecosystems are characterized as lentic and lotic. Lentic ecosystems include lakes, ponds, tarns, lakes, springs and man-made lakes, or reservoirs. Lotic ecosystems include flowing water bodies, such as rivers, creeks, and streams.

The Inyo NF lies in the rain shadow of the Sierra Nevada Mountains, which reach their highest elevations on the Inyo NF. This has created a dry and precipitation-dependent and driven aquatic system. Streamflow is dependent on total precipitation and timing of snowmelt. Water flows can vary greatly from one year to the next, depending on precipitation levels. Some years, streams can be completely dry. Climate change is likely to magnify these shifts in two ways: with decreasing precipitation resulting in more dry years, and with earlier snowmelt and shifts in seasonal timing of flows (Hunsaker and Long 2014). The rain-snow interface zone is predicted to occur at higher elevations, causing warming of streams earlier in the season. Rivers in valleys usually provide a consistent, abundant flow of water throughout the year, and support more complex faunal ecosystems. Historically, the Owens River supported a guild of five different slow-water fish species, including the Owens tui chub, Long Valley and Owens speckled dace, Owens pupfish, and Owens sucker. Currently, the Owens River supports a diversity of introduced game fish, including rainbow and brown trout, and bass and catfish in some of the reservoirs.

There are many large and small, sometimes seasonally flowing streams. Many of the stream systems on the Inyo NF were fishless prior to stocking of non-native trout, except where native trout were found. Lahontan cutthroat trout were native to East and West Walker rivers in the northern part of Mono County just north of the Inyo NF. Paiute cutthroat trout were native to Silver King Creek in Alpine County. Native species found in all other permanent waters and meadows included the mountain yellow-legged frog, Sierra Nevada yellow-legged frog, and Yosemite toad. A variety of stream-dwelling macro-invertebrates, or the aquatic life-cycle stage of many aquatic insects, such as caddis flies, mayflies, and stone flies support native trout and amphibians.

Lakes on the eastern side of the Sierra Nevada Mountains range in size from one acre to hundreds of acres. No lakes occur in the White Mountains, Inyo Mountains or Glass Mountains. Approximately 479 lakes that are greater than two acres in size occur on the Inyo NF, totaling about 46,000 acres (United States Department of Agriculture 2013a). Historically the lakes of the high Sierra Nevada were fishless and supported native fauna such as amphibians, aquatic insects, and abundant zooplankton and phytoplankton. Native species in the high elevations were adapted to the cycles of snow and ice and short growing season. Currently, many of the high elevation lakes support introduced trout species of brook, brown, rainbow and golden trout, which has had an impact on frog populations (Knapp, Boiano, and Vredenburg 2007, Knapp and Matthews 2000b, Knapp and Matthews 2000a).

Ponds and other small water bodies, such as tarns and pools, occur throughout the higher elevations within the Sierra Nevada Mountains. There are 1,372 water bodies less than two acres on the Inyo NF that total 662 acres (United States Department of Agriculture 2013a). Due to the shallow nature of these water bodies, they are characteristically warmer during the summer months than lakes or streams. Most ponds occur in wilderness areas in the Sierra Nevada portion of the forest. Little to no information is available on their condition or trend. Impacts have been observed, but not collected systematically, from recreation, grazing, or pack stock use. Climate

change is likely to impact ponds and small water bodies. Although some tend to dry each year, drying may increase, and higher temperatures result in increased algal growth.

Meadows, seeps and springs in the drier habitat on the Inyo NF provide important habitat for plants and animals. Fens are a particular kind of wet meadow that receives abundant groundwater, and may support peat soils. Meadows and fens are dependent on snowpack to sustain the water throughout the long dry period of summer. Wet meadows occupy between 30,000 and 50,000 acres on the Inyo NF, depending on the definition and the scale of mapping (United States Department of Agriculture 2013a). Dry alpine or subalpine meadows are not included in these estimates. The extent of meadows varies across the forest. On the Kern Plateau, meadows occupy an estimated ten percent of the landscape but in the Ansel Adams and John Muir Wilderness areas, meadows encompass only about 1.5 percent of the landscape. There have been no systematic condition assessments of all the meadows on the Inyo NF but researchers sampled ten randomly selected meadows on the forest as part of a Sierra Nevada study (Fryjoff-Hung and Viers 2013). They conducted a meadow assessment which looked at vegetation cover, bare ground, and conifer or upland shrub encroachment. They found that vegetation cover and bare ground cover ranged from natural condition to moderately or heavily impacted, depending on location. Encroachment was the most common impact, with 60 percent moderately impacted and ten percent slightly impacted. Forest range monitoring data for 69 meadow key areas show that 35 percent are rated in excellent condition, 35 percent are rated as good, 23 percent are rated as fair, and 7 percent are rated as poor. Similar to meadows, a full assessment of fens on the Inyo NF does not exist. However proper functioning condition information for a sample of fens across the Sierra Nevada indicated that most either were properly functioning, or had an upward trend, or no trend and a small proportion was found to have a downward trend (Weixelman and Cooper 2009).

Little information is available on springs and seeps on the Inyo NF. It is estimated that there are approximately 1,472 springs scattered throughout different habitats on the forest. Since springs are small areas where groundwater comes to the surface, their water temperature is relatively constant and because of the drier condition on the Inyo NF, they often provide the only water over vast areas. Stressors on these systems include spring development, recreation use, concentrated livestock grazing use, diversions and unauthorized off highway vehicle use. Groundwater pumping can affect springs even miles away from the pumping source, causing springs to cease flowing. Many springs have been fenced from livestock use, and this is expected to improve function and condition of these springs. Off-highway vehicle use has been addressed through the travel management process which designated authorized roads and trails for motorized vehicle use (United States Department of Agriculture 2009). Even with predicted decrease in water throughout the area as a result of climate change, it is expected that springs will persist, but may become the only water sources available for animals. Springs could receive additional impacts from species such as mule deer, burros, wild horses, and other animals as other stream sources dry, especially in the White and Inyo Mountains and Pizona area.

Riparian ecosystems are a critically important component of biodiversity, supporting a higher concentration of species diversity than most terrestrial ecosystems. They serve in part as a link between aquatic and terrestrial ecosystems, and play numerous important roles within the broader landscape, such as providing for wildlife habitat including habitat corridors, nutrient cycling, and proper watershed function. Riparian habitat is associated with the margins of seasonal and perennial drainages, and with seeps and wet meadow margins at scattered locations in the plan area. Riparian habitat is dominated by willows, alder, with occasional aspen.

Summary of the Major Proposed Action Programs and Activities

Overarching Approach to Managing for At-Risk Species

The 2012 Planning Rule at 36 CFR §219.9 addresses the approach to maintaining the diversity of plant and animal communities in the plan area. It requires developing a set of ecosystem plan components designed to maintain or restore the ecological integrity of terrestrial and aquatic ecosystems and watersheds in the plan area, including maintaining or restoring structure, function, and connectivity. Then for each federally listed, proposed, or candidate species known to occur within the plan area, the plan area is evaluated to determine if ecosystem plan components should be modified, additional ecosystem plan components should be added, or if species-specific plan components are needed to contribute to the recovery of federally listed species or to conserve proposed and candidate species. This approach was applied in the development of the plan components for the forest plan.

The 2012 Planning Rule also defines species of conservation concern as a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area. One category of species that must be considered to determine if they meet the criteria to become a species of conservation concern are species that were removed within the past 5 years from the federal list of threatened or endangered species, and other delisted species that the regulatory agency still monitors[6].

After the revision of the forest plan is adopted, individual projects or programmatic projects will be proposed that may affect federally listed species or their habitat. These projects will first be designed to be consistent with the direction and intents of the forest plan. Since a goal of the forest plan is to work with both the California Department of Fish and Wildlife (CDFW) and USFWS to restore and maintain essential habitats and contribute to the recovery of species, it is expected that additional project-level design features and mitigations to avoid, mitigate, or minimize effects to federally listed species or habitats would be considered and adopted where feasible. These could be applied to individual projects, even if not specifically addressed in the forest plan, provided they do not conflict with other forest plan direction. If site-specific, project level proposals or additional mitigations are not consistent with the forest plan direction, they would require a forest plan amendment, which could be specific to a single project or change forest plan direction more broadly. The level of analysis and type of consultation required under the ESA would be determined by the scope of the potential forest plan change.

For the purpose of this biological assessment, program actions and activities that may be expected to occur over the life of the forest plan and that may affect analyzed species are described for six major program areas: Fire Management, Vegetation and Fuels Management, Range Management, Recreation Management, Restoration Activities, and Roads and Other Infrastructure. Because the forest plan provides the framework for future management but does not authorize projects or require specific activities to occur, the types of actions and activities are presented generally to

[6] One of several criteria for species that must be considered when determining a potential list of species of conservation concern, Forest Service Handbook 1909.12, section 12.52d, January 30, 2015

provide context to evaluate the avoidance, minimization and mitigation measures developed for the Proposed Action.

Fire Management

Fire management includes planning and actions related to the management of wildfire ignitions. It is separated from fuels management and prescribed burning in this analysis to focus on the strategic approach to managing fire across the landscape and how wildfires are expected to be managed when they do occur.

During emergency activities such as wildfire suppression, the Forest Service will initiate emergency consultation in accordance with the Section 7 implementation regulations as outlined in 50 CFR §402 where suitable habitat or known occurrences of federally listed species are present. Because of the remote location of most occupied habitats and much is within designated wilderness, typical wildfire response may involve some combination of tactics that include using smokejumpers, hiking firefighters in, packing firefighters and equipment in, establishing spike camps, and monitoring the fire, both on the ground and in the air. Helicopters may be used to shuttle firefighters or equipment in to remote locations, although this typically does not occur within designated wilderness areas. Helicopters may also drop water on hot spots to aid in providing safety to firefighters or the public and to support fire suppression or fire management, but again, flights over wilderness and landing within wilderness are discouraged unless absolutely necessary. The use of aerial retardant would typically not occur within wilderness or remote areas unless it is determined necessary to protect life or property. Where there is access along roads, fire engines, water tenders, dozers, and other heavy equipment may be used to manage wildfires. Some cutting and clearing of trees and shrubs and downed materials may occur along firelines of varying width that are scraped to bare mineral soil. This is typically done by hand but could be done by dozers outside of wilderness and other sensitive areas when safe to do so. Within wilderness areas, direction emphasizes the use of minimum impact suppression tactics to reduce the amount of ground disturbance and to minimize the lasting physical and visual impacts of activities. Post-fire rehabilitation actions are taken to control erosion or to repair damage caused during fire suppression activities. The presence of people responding to and managing wildfires may last from days to months with a transition from rapid response and action during the "initial" response phase to more strategic and deliberate planning and action in the "extended" response phase. Although not specified in the forest plan, when managing wildfires in areas potentially affecting federally listed species, a standard practice is to identify a Resource Advisor for fire planning teams. The Resource Advisor identifies potential impacts of fire management activities on species and works with the fire planning team to identify actions to consider to avoid, mitigate, or minimize impacts to federally listed species. Since emergency actions are subject to emergency consultation, this analysis will focus on potential effects from the overall framework programmatic strategy of the Proposed Action and how it may influence future emergency wildfire responses and outcomes.

The Proposed Action replaces the fire management approach of focusing on the two distance-based areas closest to communities in the wildland urban interface: the Defense Zone and the Threat Zone with a risk assessment based approach that assigns the forest to four zones. The Inyo NF will be divided into four strategic fire management zones based upon a fire modeling approach that evaluates the likelihood and intensity of wildfire and the risk wildfire poses to highly valued resources and assets (Figure 3).

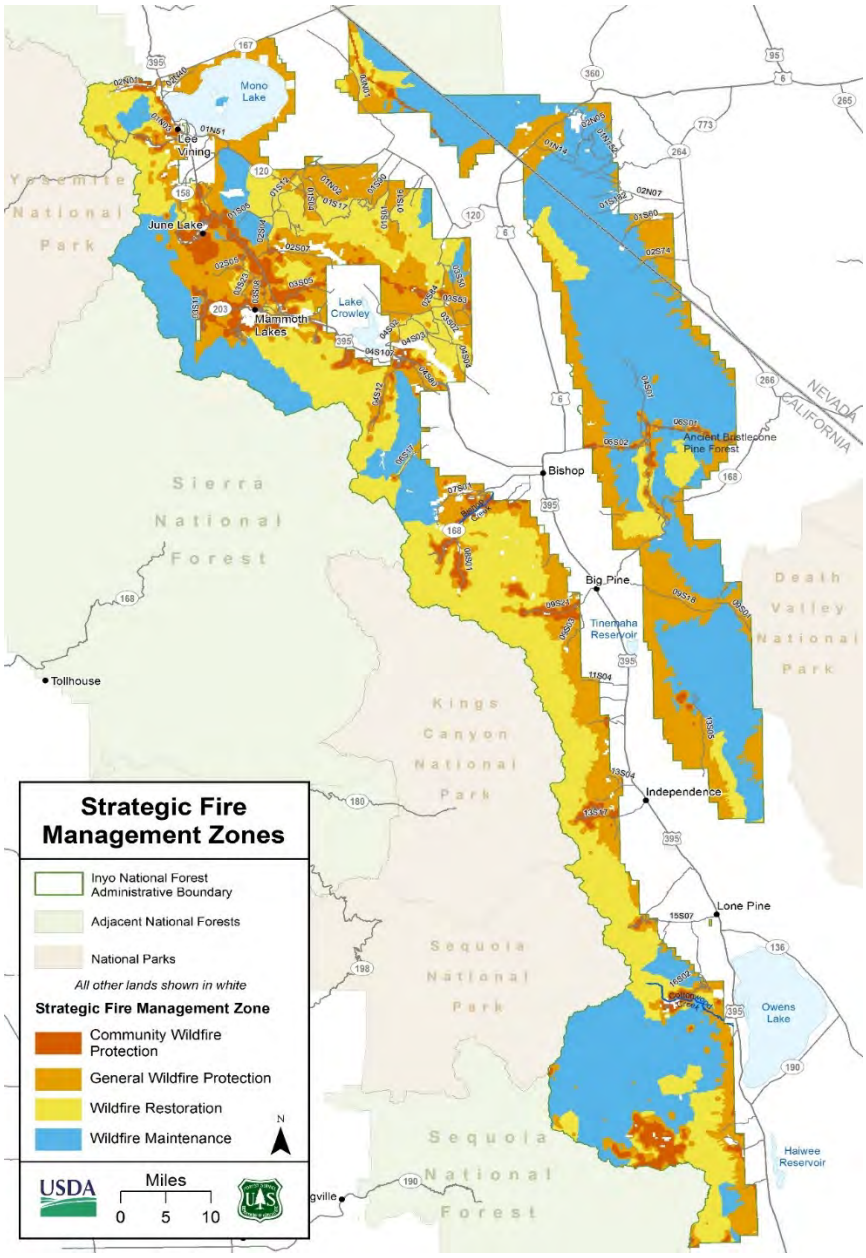

Figure 3. Strategic fire management zones of the Inyo National Forest

Although not covering exactly the same areas, the Community Wildfire Protection Zone and General Wildfire Protection Zone are conceptually analogous to the former Defense and Threat Zones. They represent areas where wildfires could pose a direct threat to communities and assets and are most likely to have high risk of negative outcomes. Within these areas, it is expected that most wildfires will continue to be highly managed with active fire suppression actions and vegetation and fuels management activities would be prioritized to lessen wildfire risks where feasible. The remaining forest is divided into a Wildfire Maintenance Zone and a Wildfire Restoration Zone where restoring fire to the landscape as an ecological function is desired. The Wildfire Maintenance Zone includes most designated wilderness areas and areas where most wildfires are expected to pose low risks to highly valued resources and assets and are likely to provide ecological benefits. All naturally ignited wildfires will be evaluated to determine if they

can be safely managed through a variety of fire management strategies and tactics to restore fire to the landscape. In some cases, wildfires that pose too high a risk will continue to be suppressed. The Wildfire Restoration Zone covers an area where fire risks are mixed. Some wildfires may pose a moderate to high risk to highly valued resources and assets while others may pose a low to moderate risk depending upon the current and predicted weather conditions and the condition of fuels and vegetation. There is an estimated potential to increase the amount of areas improved by wildfires managed to meet resource objectives by over five times the current amount per decade, from an estimated 11,300 acres per decade to an estimated 64,000 acres per decade.

Vegetation and Fuels Management

Vegetation management is conducted in the course of ecological restoration, timber harvest, reforestation, fuels treatment for hazard reduction, fire or fuels treatment, forest health and range land improvement, watershed restoration, and wildlife habitat enhancement. Due to a lack of sawmills and supporting forest product infrastructure for processing sawlogs in the influence zone of the Inyo NF, there is a limited projected timber sale program on the forest that is similar to the current situation. The harvest and removal of trees occurs primarily as commercial fuelwood and for other forest products, such as posts, poles, or other specialty wood products. Personal use fuelwood collection removes downed trees and small dead trees, mostly near roads. For vegetation management projects, excess material that cannot be utilized is piled and later burned or removed for personal fuelwood. Cutting of trees and vegetation can involve small to heavy equipment or work by hand using chainsaws. Associated activities can include road reconstruction, road maintenance, and construction of piling areas using heavy equipment. The construction of new permanent (system) roads is expected to be very limited and more typically activities would use existing roads or construct short sections of temporary road. Skid trails created during activities would have water bars installed for erosion control and temporary roads would have design standards to minimize dust and erosion and plans for rehabilitating the site when roads are no longer needed. It is expected that vegetation management will continue to focus on thinning forest stands that have increased tree densities, primarily as a result of a history of fire suppression, especially in areas that would facilitate larger prescribed burns or that can be strategically used to manage wildfires.

Some salvage of dead trees may occur, however, due to the limited forest product infrastructure, most projects in areas with dead trees will focus on hazard tree management and fuels management and support fuelwood collection where possible.

Vegetation treatment can be followed by conifer reforestation, which can include: preparation of the treated site to remove excess fuels and competing vegetation by means of mechanical or hand piling; single or multiple chemical applications to reduce competing vegetation; tree planting or allowing for natural seeding; and stand management over time, as needed. Reforestation may also be associated with rehabilitating trails and roads and planting within and adjacent to facilities to provide shade and restore scenic character. Reforestation may also occur in areas that burn at high severity outside of the natural range of variation that leave large areas without future conifer seed sources which could cause a long-term shift in habitats. In some cases, other non-conifer native vegetation is planted at restoration sites to restore native species diversity.

Fuels management activities are intended to reduce the size, cost, and damage from wildfire as well as restore fire to the landscape as a natural ecological process. Fuel biomass is altered by: changing fuel type (horizontal and vertical continuity); creating fuel breaks; reducing or altering fuels over extensive areas as described above; conducting prescribed burns; or managing naturally ignited wildfires. Fuels management is also focused on reducing heavy concentrations

of dead biomass such as logs and slash where they would damage nearby resources if burned under wildfire conditions. These materials may be rearranged, removed, or burned to reduce fuel loading.

Within both the General Wildfire Protection Zone and the Wildfire Restoration Zone, there is an emphasis on using strategically placed fuels reduction treatments along roads and ridgelines and restoring vegetation heterogeneity toward the natural range of variation over larger areas. Strategic areas are located where treatment could lessen the negative risks of wildfires and create opportunities for more naturally ignited wildfires to be managed to provide benefits to resources. It is expected that fuels reduction work will continue adjacent to communities and areas with human assets.

The Proposed Action recognizes the value provided by larger prescribed burns that create anchor points for other larger landscape prescribed burns or tactical locations to manage future wildfires. Activities associated with prescribed fire includes understory burning, pile burning, and broadcast burning by means of hand ignition using drip torches, other ignition devices, or by using helicopter mounted ignition devices. The construction of hand line or holding lines using hand equipment or mechanical equipment is often needed if existing roads or natural barriers do not exist. Prescribed burns can last for one or more days and burning or smoldering of materials inside of large burns could last for months until sufficient rainfall occurs. Repeat burning of areas may be needed to reduce fuels and to move vegetation towards desired conditions.

The estimated acres of mechanical treatments to address vegetation and fuels is expected to increase slightly from the current 20,000 acres per decade to 25,000 to 30,000 acres per decade under the Proposed Action. The estimated of prescribed burn treatments is expected to increase slightly from the current 18,000 acres per decade to 20,000 to 25,000 acres per decade under the Proposed Action.

Range Management

Range management includes activities related to the development, administration, and protection of range resources, and includes the permitting and regulation of grazing use of all kinds and classes of livestock on National Forest System lands. Rangeland use includes grazing by cattle, sheep, goats, horses, and saddle stock used to manage the range stock. A primary purpose of the range management program is to provide forage for commercial livestock operations while also protecting other resources.

The Forest Service has an established process for grazing permit administration. An allotment is a designated area of land capable and suitable for domestic livestock grazing. Term grazing permits are generally issued for a period of 10 years, and authorize a permittee to graze livestock on their designated allotment(s). Grazing on an allotment is conducted in accordance with an Allotment Management Plan which is incorporated into the term grazing permit. National Forests develop and implement Allotment Management Plans to ensure livestock use meets rangeland management objectives and are consistent with the forest plan. Allotment Management Plans identify the grazing strategies needed to meet rangeland and other conservation objectives within the allotment by establishing grazing systems, stocking rates, kind and class of livestock, period of use, season of use, livestock distribution, and range improvements. The Allotment Management Plan is implemented through Annual Operating Instructions which include annual adjustments to management based on monitoring and site specific objectives, and are revised to reflect changes in required project design criteria.

Activities associated with range management include livestock handling, moving, herding, gathering, salting, and other ordinary husbandry practices. Range management may also include implementation and maintenance of structural and non-structural improvements. Structural improvements are permanent features designed to facilitate livestock management and control distribution and movement of livestock. Some examples of structural improvements are dams, impoundments, ponds, pipelines, fences, corrals, wells, and trails. An example of non-structural improvement is managing vegetation to improve forage values or to control invasive species.

The Proposed Action does not substantially change program direction for range management and is not expected to result in substantial changes from the current situation. Many mitigations to avoid or reduce impacts of permitted domestic livestock on federally listed species have already been implemented by the Inyo NF and are part of the environmental baseline. The Proposed Action is not expected to change any of these existing allotment and permit level decisions made to protect federally listed species.

Plan direction was substantially clarified to remove some administrative and implementation level guidance found in Forest Plan Amendment 6 outside of the forest plan to become part of an Inyo NF Supplement to the Pacific Southwest Region's "Rangeland Analysis and Planning Guide" (R5-EM-TP-004) where it can be periodically updated with new best available scientific information. The Proposed Action continues direction to avoid and mitigate risks of disease transmission between domestic livestock and Sierra Nevada bighorn sheep and expands the direction to include evaluation and mitigation, as needed, for recreational pack goat use.

The Proposed Action does not change the status of allotments across the forest. Any proposed changes in allotment status would require site-specific analysis to change the Allotment Management Plan and would require consultation if it may affect federally listed species.

Recreation Management

Developed recreation management includes the development, operation, and maintenance of facilities such as family and group campgrounds, day use (picnic) areas, trailheads, sno parks, visitor centers or visitor information sites, corrals, boat ramps, pastures, and developed ski areas. Management of these facilities include operation and maintenance to provide safe and functional use. Dispersed recreation includes camping, picnicking, hiking, and other recreation uses that occurs outside of developed recreation sites. These uses are allowed anywhere on National Forest System lands unless specifically prohibited, although most use occurs along designated system roads and near lakes, streams, and other water bodies. Some dispersed use locations have a low to moderate density of users. Amenities and facilities like restrooms, water, or trash collection are generally not provided for dispersed recreation.

Substantial recreation use occurs along popular trails, including some trails in wilderness areas. Wilderness permits are required to manage the number of visitors, intensity of use, and wilderness experience. Individual pack stock use is allowed on the forest and commercial outfitter-guide services are managed through special use permit. Trails are maintained which can include actions such as cutting trees and vegetation for clearance, removing fallen trees or obstacles, and clearing, rebuilding, and adjusting trail treads. Off-highway vehicle use is allowed on designated system roads and trails. The analysis to determine which roads and trails should be open to motorized uses considered proximity and potential impact to federally listed species(United States Department of Agriculture 2009). Special use permits are issued for use of sites, scheduled events, and other activities that occur on the Inyo NF.

Typical management activities include routine operation and maintenance to protect and preserve facilities and minor re-construction to replace or rehabilitate damaged or outdated facilities. Dead or dying trees and hazard trees within falling distance of administrative facilities and within developed sites are routinely felled and/or removed in order to provide for public safety. Vegetation management of both native and non-native species to protect facilities and infrastructure is also a typical maintenance activity. Some fuels reduction activities around facilities may cut smaller vegetation and the material is typically chipped or piled and burned or otherwise removed from the area.

The Proposed Action includes a simplified three-zone approach to recreation outside of designated or recommended wilderness areas that replaces the management prescription approach of the current forest plan. The Proposed Action identifies a Destination Recreation Area that allows for the most intensive recreational development to meet high demand around well-known attractions and iconic destinations such as the Mammoth Lakes Basin and Whitney Portal. The Challenging Backroad Recreation Area includes largely undeveloped landscapes that have few amenities, low visitor use, and limited management making them suited to dispersed recreation uses. The remainder of the non-wilderness area is in the General Recreation Area where management for multiple-use is most evident. These three Recreation Areas replace the current management prescription areas for: Concentrated Recreation Area (#12); Alpine Ski Area, Existing and Under Study (#13); Potential Alpine Ski Area (#14); Developed Recreation Site (#15); Dispersed Recreation Site (#16); Semi-Primitive Recreation (#17); and Multiple Resource Area (#18). The result is a management approach which incorporates three different zones which span a continuum from areas of more concentrated recreation to areas of remote, less-concentrated, low density recreation. This approach focuses management where it is most intensely needed, as well as manages recreation differently from one place to another, based on a zone's particular resource needs. Within these zones, the landscapes will be managed for sustainable, balanced, multiple uses rather than for specific sites or places for specific types of use. This alternative provides a framework for future management actions with regards to recreation management and resource protection and works toward a sustainable balance among the three spheres of environmental, social, and economic conditions.

Overall, the Proposed Action does not, in and of itself, substantially change the expected magnitude or intensity of the recreation program from the current forest plan direction. It recognizes that there will be increased recreation demand in the future and provides clearer direction to manage future recreation demand sustainably within the capability of the plan area. The Proposed Action includes increased emphasis on partnerships as a means to increase capacity to provide quality recreation opportunities as well as increased opportunities to provide interpretive services to increase public awareness of natural resources and human impacts.

Restoration Activities

The Proposed Action includes an increased emphasis on restoration of degraded ecosystems to improve resilience of ecological systems to stressors and ultimately increase sustainability of systems. A major emphasis is placed on managing vegetation and fuels in strategic locations in order to increase the potential to conduct larger prescribed burns and to manage some wildfires when they can meet resource objectives as discussed above for Fire and for Vegetation and Fuels Management. Additional emphasis is placed on restoring degraded watersheds and aquatic systems, managing and restoring sagebrush and pinyon-juniper habitats, and treating and eradicating non-native and invasive species. The Proposed Action also recognizes increased

opportunity for partnerships to engage in ecological restoration to increase the pace and scale of restoration accomplishments.

Watershed management and restoration is the art and science of protecting, maintaining, and enhancing soil, water, riparian vegetation and geologic resources for the multiple beneficial uses that depend upon adequate water quality and quantity. Activities can involve the use of heavy equipment and work using hand tools and can include ecological restoration of meadow, lake, and stream habitats, improving road drainage and stream crossings, decommissioning of unneeded roads, and revegetation of damaged habitats. The Proposed Action recognizes that an emphasis on aquatic restoration will be focused in Priority Watersheds identified during the Watershed Condition Framework process and in improving and retaining watershed conditions within the Conservation Watersheds. Additional watershed and aquatic habitat restoration will occur as projects are planned in other areas and in working with partners to accomplish special restoration projects. The amount of riparian areas improved is expected to increase slightly in the Proposed Action, dependent upon the amount of additional partner interest and support.

On the Inyo NF, a substantial amount of restoration is expected to maintain and improve the ecological condition of sagebrush ecosystems and pinyon-juniper forests. Much of the restoration will be focused on restoring vegetation towards desired conditions for species composition and structure and to restore fire regimes toward the natural range of variation for these vegetation types. In sagebrush ecosystems, an additional focus will be on managing invasive species such as cheatgrass and maintaining and restoring habitats for greater sage-grouse. In the Proposed Action, up to 14,900 acres per decade of sage-grouse habitat is expected to be maintained, improved, or restored, an increase from the estimated 1,500 to 7,450 acres per decade that would be expected under the current forest plan.

Invasive species management includes activities that detect, prevent, control, and eradicate invasive species. Activities include surveying for early detection, monitoring known occurrences, and treating or re-treating occurrences. Invasive plant removal includes manual removal and the use of selected herbicides using focused ground based application methods. Most of the activities related to removal of non-native plants involve little ground disturbance. This program also applies to removal of non-native animals such as invasive aquatic mussels and snails and certain non-native fish. These activities generally do not result in ground disturbance but are accomplished through inspection and cleaning, manual removal, trapping, electro-shocking, or other techniques.

Roads and Other Infrastructure

The other routine forest management activities not associated with the major program areas discussed above that could affect federally listed species is the operation and maintenance of other non-recreation infrastructure and operation and maintenance of roads.

Administrative infrastructure addresses the routine use and maintenance of facilities located on National Forest System lands. Examples of facilities include buildings, camps, towers, pipelines, stream gauging stations, water storage and conveyance facilities, or other permanent or semi-permanent structures and infrastructure associated with Forest Service-administered facilities. Other facilities on National Forest System lands may be operated by the private sector through easements or special use authorizations. Examples of these third-party facilities include work and organizational camps, electronic and communication sites, public water and sanitation systems, power transmission lines, pipelines, research equipment and structures, and access routes to

private land in-holdings. These third-party administrative sites are generally administered by special use permit.

The system of roads on National Forest System lands is managed to provide periodic maintenance to ensure safe public use and to protect resources. Activities can include surface maintenance, reconstruction of the road base and surface, maintenance, replacement, or improvement of stream crossings and culverts, management of road drainage, clearing roadside vegetation, and stabilizing slopes.

Management of dead, dying, and hazardous trees along roads and near facilities and other infrastructure such as utility lines will occur. The necessity to remove hazardous trees is often driven by other regulatory requirements to reduce utility line risks, to manage safety for humans and as directed by other agency policy. Where hazard trees are cut and left near roads, they are often removed for personal use fuelwood.

Relevant Plan Direction

The forest plan contains a specific coding system to identify plan components and where they apply using the following pattern: AAA-BBB-CCC. The series of letters before the first dash references either a resource area (for example, WTR for watersheds) or a type of spatial area (such as MA for management areas or TERR for terrestrial ecosystems and vegetation). The middle series of letters reference where the plan components apply (for example, FW for forestwide), land of specific character (such as ALPN for the subalpine and alpine zones), or mapped parcels of land (such as CWPZ for the community wildfire protection zone). The third series of letters references the type of plan components (such as DC for desired conditions). So the unique coding for air resources forestwide desired conditions begins with AIR-FW-DC, followed by the specific code number; and the codes for the management area wildfire restoration zone guidelines begins with MA-WRZ-GDL. Since potential management approaches are not plan components, they are listed by relevant resource but they are not identified by a coding system.

Note: Only direction relevant for assessing effects on analyzed species is listed here. *As a result some of the numbers in the tables below are not sequential.*

Overarching Plan Direction and Conservation Approaches

Forestwide Direction for Animal and Plant Species

This and subsequent sections under this heading include plan direction designed to maintain the diversity of plant and animal communities and support the persistence of native species within the plan area, subject to the extent of Forest Service authority and the inherent capability of the plan area. This includes plan components that address the needs of at-risk species within the plan area. The term “at-risk species” include (1) federally listed threatened, endangered, proposed, or candidate species under the federal Endangered Species Act, and (2) species of conservation concern.[7] This section also includes direction that provides for the sustainable use and enjoyment of fish, wildlife, and plants.

[7] The Regional Forester’s species of conservation list is dynamic and may be periodically updated. The current Regional Forester’s species of conservation concern list for the Inyo National Forest can be found on the Pacific Southwest Region’s website at http://www.fs.usda.gov/main/r5/landmanagement/planning.

For each species or group of species, the forest plan considers the extent that ecosystem-level plan components provide for ecosystem integrity and diversity to meet the ecological conditions necessary for those species within their range. Species-specific plan components are added as needed. Additional direction is provided for special habitats under the "Terrestrial Ecosystems and Vegetation" section to address unique habitats of some at-risk species.

Desired Conditions (SPEC-FW-DC)

Num	Plan language
01	Sustainable populations of native and desirable nonnative, plant and animal species are supported by healthy ecosystems, essential ecological processes, and land stewardship activities, and reflect the diversity, quantity, quality and capability of natural habitats on the national forest. These ecosystems are also resilient to uncharacteristic fire, climate change, and other stressors, which supports the long-term sustainability of plant and animal communities.
02	Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that: contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern (including minimal impacts from diseases); and sustain both common and uncommon native species.
03	Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of activities to species survival and reproduction.
04	The structure and function of the vegetation, aquatic and riparian system, and associated microclimate and smaller scale elements (like special features such as carbonate rock outcrops, fens, or pumice flats) exist in adequate quantities within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions.
05	The national forest provides high quality hunting and fishing opportunities. Habitat for nonnative fish and game species is managed in locations and ways that do not pose substantial risk to native species, while still contributing to economies of local communities.
06	Residents and visitors have ample opportunities to experience, appreciate, and learn about the Inyo National Forest's wildlife, fish and plant resources.

Goals (SPEC-FW-GOAL)

Num	Plan language
01	Cooperate with partners and private landowners to encourage resource protection and restoration across ownership boundaries.
03	Work with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans.
04	Communicate and collaborate with other agencies, Tribes, landowners, and partners to maximize opportunities to improve conditions in the plan area for at-risk species and the habitats and ecological processes on which they depend for survival.
05	Develop a regional whitebark pine conservation and restoration strategy in collaboration with other Federal agencies, research organizations, and other partners.

Standards (SPEC-FW-STD)

Num	Plan language
01	Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.

Guidelines (SPEC-FW-GDL)

Num	Plan language
03	Habitat management objectives and nonhabitat recovery actions from approved recovery plans should be incorporated, if appropriate, in the design of projects that will occur within federally listed species habitat to contribute to recovery of the species.
04	Habitat management objectives or goals from approved conservation strategies or agreements should be incorporated, if appropriate, in the design of projects that will occur within at-risk species habitat.
05	Water developments (such as a diversion or well) should be avoided near streams or seeps and springs where there is high risk of dewatering aquatic and riparian habitats where at-risk species occur.

Potential Management Approach

- Incorporate the conservation of at-risk species into all program areas at appropriate times and scales, including but not limited to recreation, fire and fuels, vegetation management, minerals, range, engineering, and special uses.

Forestwide Direction for Invasive Species

Desired conditions and other plan components under this heading address reducing populations of invasive species and minimizing their impacts on native species and ecosystems. Invasive species on the Inyo National Forest comprise all life forms including plants, animals, invertebrates and fungi.

Desired Conditions (INV-FW-DC)

Num	Plan language
01	Terrestrial and aquatic invasive species are controlled or eradicated when possible, and establishment of new populations is prevented.
02	The area affected by invasive species and introduction of new invasive species is minimized.

Objectives (INV-FW-OBJ)

Num	Plan language
01	Within 10 years of plan approval, take action to eliminate nonnative invasive plant species on at least 800 acres.
02	Within 10 years of plan approval, take action to eradicate at least three species of high priority nonnative invasive plants from the Inyo National Forest.

Goals (INV-FW-GOAL)

Num	Plan language
01	Coordinate and cooperate with local, State and Federal agencies and Tribes to manage and control invasive and nonnative species.
03	Coordinate with research and other organizations to evaluate the potential effects of climate change on the spread of invasive and nonnative species.

Standards (INV-FW-STD)

Num	Plan language
01	When working in waterbodies with known aquatic invasive species, clean equipment and vehicles before moving to other waterbodies.

Num	Plan language
02	Select weed-free plant material for seeding and revegetation projects to reduce the risk of introducing noxious weeds to the disturbed area.
03	Use an integrated pest management approach in the planning and implementation of all projects and activities.

Guidelines (INV-FW-GDL)

Num	Plan language
01	Projects should be designed to minimize invasive species spread by incorporating prevention and control measures into ongoing management or maintenance activities that involve ground disturbance, terrestrial or aquatic habitat alteration, or the possibility of spreading invasive species. When feasible, projects should include measures to use invasive species-free gravel, fill, and topsoil; include follow-up inspections as needed and specified in regional or national strategies.
02	Hay, straw and other crop-related forage or mulch products used for animal feed or bedding, soil stabilization and land rehabilitation, or other purposes should be certified by California or Nevada or the North American Invasive Species Management Association (NAISMA) standards as being weed-free to prevent unintentional introduction of invasive species. Deviations from this guideline may be approved on a case-by-case basis when certified weed-free material is not reasonably available, in consultation with the Inyo National Forest Invasive Species Coordinator.
03	To the extent feasible, plant and seed materials used for revegetation, restoration, and rehabilitation projects should be native, genetically appropriate to the site, and capable of becoming established to restore natural species composition and ecosystem function.
04	Weed control and prevention measures should be included as necessary when issuing, amending or reissuing permits, including but not limited to livestock grazing, special uses, and pack stock operator permits.
05	Vegetation management projects on lands outside of wilderness should include measures to minimize the risk of introducing nonnative invasive species into wilderness.

Potential Management Approach

- Develop a forestwide treatment prioritization strategy for invasive plant species considering ecological impact, extent and location of populations, and effectiveness of available treatment methods.

Forestwide Direction for Fire

Desired conditions and other plan components under this heading apply to forestwide fire management, including reducing damages and enhancing benefits from wildland fire. Other plan direction related to fire management is provided for each “Strategic Fire Management Zones” management areas (MA-CWPZ; MA-GWPZ; MA-WRZ; MA-WMZ).

Desired Conditions (FIRE-FW-DC)

Num	Plan language
01	Wildland fires burn with a range of intensity, severity and frequency that allow ecosystems to function in a healthy and sustainable manner. Wildland fire is a necessary process, integral to the sustainability of fire-adapted ecosystems (see TERR-FW-DC related to fire).

Goals (FIRE-FW-GOAL)

Num	Plan language
01	Reduce fuel accumulations, help maintain and protect habitat for a variety of species, reduce smoke from larger fires, provide added protection for communities, and restore fire on the

Num	Plan language
	landscape. These actions are also an integral part of achieving sustainable recreation, particularly by maintaining scenic attractiveness, integrity, and character.
03	Plan restoration and fire management projects for large landscapes (subwatershed or larger) when and where possible to improve economic feasibility of restoration and effectiveness of changing the negative fire effects from large wildfires.
05	Restore ecosystems to a more fire resilient condition and lessen the threat of wildfire to communities.
08	Coordinate with researchers, partners, and Tribes to help achieve desired conditions in ecosystems that are experiencing (or may experience in the future) more frequent, severe, or large fires than the natural range of variation due to factors such as invasive annual grasses and changing climate.

Standards (FIRE-FW-STD)

Num	Plan language
02	If fire management actions are required within designated wilderness areas, research natural areas, the Ancient Bristlecone Pine Forest, or the Pacific Crest National Scenic Trail: a. Apply minimum impact strategies and tactics to manage wildland fire, unless more direct attack is needed to protect people or adjacent property. b. When possible, allow naturally ignited wildfires to function in their natural role. c. In cases where fire may damage the ecological values for which a research natural area was established, measures should be taken to exclude fire from the research natural area.

Guidelines (FIRE-FW-GDL)

Num	Plan language
01	Use naturally ignited and prescribed wildland fires to meet multiple resource management objectives, where and when conditions permit and risk is within acceptable limits.
02	When managing wildland fire (wildfire and prescribed fire), use a variety of fire management options, including hand and aerial ignitions, to achieve a mix of fire effects. When safe and feasible, limit extensive continuous areas of high-severity fire effects in old forest habitat.
04	When managing wildland fire, allow fire to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function.
05	Where possible during wildland fire management activities, locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside of riparian conservation areas to avoid impacts to aquatic- and riparian-dependent resources.
06	During wildfires, avoid fire management activities in special habitats (see Terrestrial section, chapter 2) except when necessary to protect life and property. This includes activities such as line construction, staging areas, safety zones, water drafting and camps. When conducting fire management activities near special habitats, take extra measures to avoid spread of invasive plants.

Potential Management Approaches

- When determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season.

- Where feasible and suitable, use grazing, mechanical treatment, prescribed fire, or wildfires managed to meet resource objectives to reduce vegetation buildup to lower the risk of unwanted wildfire.
- Work with adjacent land management agencies to identify methods to reduce costs and increase effectiveness of restoring fire to the landscape.
- During ecological restoration treatments, reduce fuels along ridges, roads, or other natural or man-made features that can be useful during large prescribed fires and in managing wildfire, including wildfires managed to meet resource objectives.
- Integrate terrestrial ecosystem desired conditions into spatial patterns for fuel reduction treatments. Incorporate heterogeneity by increasing variation in tree spacing, enhancing tree clumps, creating canopy gaps, promoting fire resilient tree species, increasing the ratio of large to small trees, and using topographic variation (such as slope, aspect, and position) to guide treatment prescriptions.
- Use appropriate wildfire management techniques to limit impacts to sensitive habitat of at-risk species, while considering the safety of people.

Direction for Community Wildfire Protection Zone

The community wildfire protection zone encompasses locations where communities, community assets, and private land could be at a very high risk of damage from wildfire where high fuel loadings exist. Wildfires that start in this zone contribute more to potential loss of community assets than any other strategic fire management zone. Wildfire is suppressed under most weather and fuel conditions due to the very significant risk of potential economic loss and public safety concerns posed by a wildfire occurring within this zone.

Goals (MA-CWPZ-GOAL)

Num	Plan language
02	Reduce the impacts of wildfire by creating fire-adapted communities through fuel reduction treatments, prescribed fire, and managing wildfires that can benefit natural resources while reducing risk.

Direction for General Wildfire Protection Zone

The general wildfire protection zone identifies where conditions currently put some natural resource and/or community values at high risk of damage from wildfire. In some areas, wildfires in the general wildfire protection zone may have negative effects on natural resources due to the natural fire regime and condition of the ecosystem. Managing wildfires to meet resource objectives in this zone is often considerably constrained due to fuel conditions, the high risk of loss of natural resources, and the potential adverse impacts to communities threatened by wildfires starting in this zone.

Desired Conditions (MA-GWPZ-DC)

Num	Plan language
02	The landscape is resilient and can tolerate varying effects of wildfires. Over time, risk to values is reduced sufficiently in the general wildfire protection zone to allow some areas to be placed in a lower risk zone including the wildfire restoration and wildfire maintenance zones.

Goals (MA-GWPZ-GOAL)

Num	Plan language
02	Reduce the threat of wildfire spreading to communities through fuel reduction treatments, prescribed fire, wildfires managed to meet resource objectives, and when appropriate and feasible, livestock grazing, while also reducing risk to natural resources.

Direction for Wildfire Restoration Zone

The wildfire restoration zone identifies where conditions currently put some natural resource values at moderate risk of damage from wildfire. In general, wildfires that start in this zone pose a low to moderate threat to communities in average fire season conditions. Wildfires that burn in this zone can potentially benefit natural resources, but only under limited environmental conditions. Managing wildfires to meet resource objectives in this zone can be constrained due to fuel conditions and moderate risk to natural resources from wildfire. This zone is where some ecological restoration may be needed before using wildland fire under a wider range of weather, fuel moisture, and other environmental conditions.

Desired Conditions (MA-WRZ-DC)

Num	Plan language
01	The landscape is resilient to a range of fire effects, and wildland fire has a predominately positive benefit to ecosystems and resources.
02	Wildfire is managed to meet resource objectives under a wide range of environmental conditions.

Goal (MA-WRZ-GOAL)

Num	Plan language
01	Create fire resilient landscapes that can be restored and maintained by managing wildfire to meet resource objectives, and prescribed fire and fuel reduction treatments.

Standards (MA-WRZ-STD)

Num	Plan language
01	Use natural barriers and features like creeks, old fire footprints, ridges, and human-made features (such as roads and trails) when managing wildfires to meet resource objectives or managing unwanted wildfires that have surpassed the initial attack phase, unless unsafe, or impractical. Heavy equipment use may be limited due to resource and safety concerns. Variation from this standard due to safety or practicality concerns will be documented by the responsible line officer in the current fire decision support system.

Potential Management Approach

- Fuel treatments include prescribed fire, mechanical treatments, and managing wildfire to meet resource objectives.

Direction for Wildfire Maintenance Zone

The wildfire maintenance zone encompasses areas where wildfire poses a low threat to communities in average fire season conditions and where conditions allow natural resources to benefit from wildland fire. Managing wildfire to meet resource objectives in this zone is the least constrained, and implementing prescribed fire for ecological restoration is favorable. Ecological maintenance can be carried out by the management of wildland fire under a wide range of weather, fuel moisture, and other environmental conditions. Using prescribed fire to meet resource objectives is also appropriate.

Desired Conditions (MA-WMZ-DC)

Num	Plan language
01	Ecosystems are resilient to the impacts of wildfire and wildland fire has predominantly positive benefits to ecosystems and resources.
02	Lands within this zone are maintained in a predominately low risk condition, with high potential benefit relative to wildland fire.

Goals (MA-WMZ-GOAL)

Num	Plan language
01	Manage wildfires to maintain fire resilient landscapes.

Standards (MA-WMZ-STD)

Num	Plan language
01	Following current wildland fire policy, manage wildfires to meet resource objectives and restore and maintain fire as an ecological process. The responsible line officer must use the current decision support system for wildfire management to document cases when naturally caused wildfires are promptly suppressed.
02	Use natural barriers and features, such as creeks, old fire footprints, ridges, and man-made lines, such as roads and trails, when managing wildfires to meet resource objectives or unwanted wildfires that have surpassed the initial attack phase, unless unsafe or impractical. Variation from this standard due to safety or practicality concerns will be documented by the responsible line officer in the current fire decision support system.

Direction for Rangeland Livestock Grazing

Desired conditions and other plan components under this heading apply to rangeland management, which includes the authorized use and management of National Forest System lands for the purpose of livestock production and utilization of forage resources by livestock. Note additional direction in the sections “Animal and Plant Species,” “Wilderness” (pack stock), and “Riparian Conservation Areas” also applies.

Rangeland utilization is determined for different vegetation types based on similarity to desired vegetation condition and hydrologic function at grazing key areas. Allowable utilization can differ between the grazing systems being implemented. Definitions of the grazing systems are found in the glossary. The standards and guidelines for rangeland utilization are organized by the grazing systems potentially used within each vegetation type. After this initial allowable utilization standard is determined based on vegetation conditions, they are adjusted based on watershed conditions.

Desired Conditions (RANG-FW-DC)

Num	Plan language
02	Forage, browse, and cover meet the needs of wildlife, and authorized livestock are managed in balance with available forage. Areas that are grazed have, or are trending toward having, satisfactory soils, functional hydrology, and biotic integrity.

Goals (RANG-FW-GOAL)

Num	Plan language
01	Develop livestock management strategies for aspen and woody riparian ecosystems that are grazed and browsed to encourage regeneration of hardwood and riparian woody vegetation.

Num	Plan language
03	Consider the impacts to animals and plants, recreation, watershed, and rangelands when designing rangeland improvements or structures, such as water storage structures.

Standards (RANG-FW-STD)

Num	Plan language
04	New livestock handling facilities and stock driveways, salting, and supplemental feeding are prohibited in meadow and riparian locations. Placement must be consistent with meeting watershed or water quality best management practices if located in riparian conservation areas.
05	If the results of rangeland condition evaluations indicate the grazing key area is less than fully functional, use an interdisciplinary team to incorporate corrective actions that address specific on-the-ground problems. There may be more than one corrective action needed to achieve a trend towards fully functional watershed condition. No adjustments are needed if the results of a rangeland condition assessment indicate that the grazing key area is fully functional and there are no off-site factors that need to be addressed.
07	Within riparian conservation areas that are properly functioning or functional at risk with an upward trend, limit annual livestock disturbance to streambanks and shorelines of natural lakes and ponds (caused by trampling and trailing) from exceeding 20 percent of the stream reach, or natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. Allow no more than 15 to 20 percent disturbance if the riparian conservation area is functional at risk with a downward trend, as defined in the appropriate technical reports.

Guidelines (RANG-FW-GDL)

Num	Plan language
01	If recovery of desired vegetation conditions and related biophysical resources are necessary in recently burned areas, then rest from livestock grazing.

Direction for Sustainable Recreation

Desired conditions and other plan components under this heading apply to forestwide recreation. The plan also describes recreation management areas that provide management direction for particular recreation experiences and activities in Sustainable Recreation Management Zones.

Desired Conditions (REC-FW-DC)

Num	Plan language
04	Areas of the national forest provide for a variety of activities with minimal impact on sensitive environments and resources.
08	Dispersed recreation occurs in areas outside of high visitation, developed facilities, or communities, and does not adversely impact natural or cultural resources.
09	Permitted recreation uses, such as recreation special events or guided activities, are consistent with recreation settings, protect natural and cultural resources, and contribute to the economic sustainability of local communities.

Goals (REC-FW-GOAL)

Num	Plan language
02	Manage dispersed recreation activities when evidence of impacts to natural resources emerge or are causing damage.

Guidelines (REC-FW-GDL)

Num	Plan language
01	Avoid locating new recreation facilities within environmentally and culturally sensitive areas, such as at-risk species breeding habitat or at-risk plant species habitat.
03	Use integrated resource planning when designing projects to address impacts to at-risk species habitat and changing conditions in recreation settings.

Potential Management Approach

- Redesign, restore, or rehabilitate recreation sites where recreation activities have caused unacceptable natural or cultural resource damage.
- Use management methods, such as seasonal road or trail closures, when appropriate to manage and protect resources and infrastructure.
- Use informational signs to inform the public on trail etiquette, wildlife awareness, and other responsible behaviors.
- Use available technology, interpretive messages and interactions, and partnerships to educate national forest users and develop sustainable recreation opportunities that are focused on the long-term sustainability of the land, animals, fish, and plant species that support a healthy forest ecosystem.

Direction for Destination Recreation Areas

This management area provides the most intensive recreation development within the natural setting of the Inyo National Forest. Iconic destinations and well know attractions create a high demand for recreation experiences at specific locations (areas such as Mammoth Lakes Basin and Whitney Portal). These places, along with the close proximity to other attractions, make these destinations highly desirable to many visitors from all over the world and are often the singular focus of their visit to the Inyo National Forest.

The public should expect areas of high-density recreation activity, with high use levels. Recreationists are attracted to this setting because of the variety of opportunities. Motorized access and support facilities (roads, parking lots, water access, amenities, campgrounds, and resorts) are emphasized. Conservation education and interpretation focus on developing a land ethic as part of the recreation experience.

Desired Conditions (MA-DRA-DC)

Num	Plan language
02	A natural appearing landscape is retained outside the development footprint.

Direction for Volunteers, Interpretation, Partnerships and Stewardship

Desired conditions and other plan components for interacting and partnering to work together on shared interests with people, organizations, agencies (local, State, and Federal), Tribes, nonprofits, businesses, and communities are included under this heading.

Desired Conditions (VIPS-FW-DC)

Num	Plan language
03	Interpretation and conservation education materials and activities convey up-to-date and clear messages about natural and cultural resources, climate change, land stewardship, responsible recreation use and etiquette, and Native American heritage and culture.

Direction for Designated Wilderness

Individual wilderness plans provide wilderness area-specific guidance in addition to the strategic-level guidance provided in this land management plan.

Desired Conditions (DA-WILD-DC)

Num	Plan language
01	The wilderness character of each wilderness, including the qualities of untrammeled, natural, undeveloped, opportunities for solitude or primitive recreation, and other features of value (such as ecological, geological or other features of scientific, educational, scenic, cultural or historical value specific to each wilderness area) are preserved and, when possible, enhanced.
02	Watersheds are functioning properly and exhibit high geomorphic, hydrologic, and biotic integrity relative to their natural and current potential condition.
03	Fire is restored as an ecosystem process and natural disturbance agent in wilderness where possible.
05	Each wilderness area accommodates levels of recreation use that are ecologically sustainable.
08	Forest system trails that access wilderness are part of a high-quality wilderness experience for visitors. Forest system trails meet national quality standards, with minimal deferred maintenance and adhere to the national trail classification system. Trails in wilderness are located in resilient areas, and do not cause adverse impacts to at-risk species, water quality, soils, hydrologic connectivity, or cultural resources.
10	Resource impacts of user-created trails are reduced.

Goal (DA-WILD-GOAL)

Num	Plan language
01	Restore to natural conditions campsites that adversely affect water quality.

Guidelines (DA-WILD-GDL)

Num	Plan language
01	Limit party size and number of stock per party to a level that protects social and natural resource values. The level may vary within or between wilderness areas.

Direction for Eligible Wild and Scenic Rivers

Desired Conditions (MA-EWSR-DC)

Num	Plan language
01	Eligible or recommended wild and scenic rivers retain their free-flowing condition, water quality, and specific outstandingly remarkable values. Recommended preliminary classifications remain intact until further study is conducted or until designation by Congress.

Standards (MA-EWSR-STD)

Num	Plan language
01	For interim management of Forest Service-identified eligible or recommended suitable rivers, use interim protection measures identified in FSH 1909.12 – 84.3.

Relevant to Terrestrial Ecosystems and Species

The terrestrial ecosystem direction in this section is written for several different levels of vegetation classification. It begins with a general direction for all vegetation. Following that is direction for several zones or groups of ecological types that have common direction because of

their disturbance history, risks, or geographic distribution. Finally the major ecological types across the Inyo have specific direction. Ecological zones with specific direction are the Sierra Nevada Montane Zone and the Subalpine and Alpine Zone.

Following the plan direction for each of these broad areas, there is direction specific to the major ecological types. Where these ecological types occur within the zones described above, the ecological type direction gives more specific information and takes precedence. Additional direction for specific management areas (such as strategic fire management zones, research natural areas, Ancient Bristlecone Pine Forest, Mono Basin Scenic Area) may apply. Additional direction specific to management of sagebrush and vegetation within the range of the bi-state greater sage-grouse population is described in the "Animal and Plant Species" section. Where there is overlap, direction for sage-grouse takes precedence.

Terrestrial ecosystem plan components do not apply to administrative or developed recreation sites. Areas covered by special use permits are subject to guidance in their operating plans.

Forestwide Direction for Terrestrial Ecosystems and Vegetation

Desired Conditions (TERR-FW-DC)

Num	Plan language
01	Each vegetation type contains a mosaic of vegetation conditions, densities and structures. This mosaic, which occurs at a variety of scales across landscapes and watersheds, reflects conditions that provide for ecosystem integrity and ecosystem diversity given the inherent capabilities of the landscape that is shaped by site conditions and disturbance regimes.
02	Vegetation structure and composition provide ecosystem resilience to climate change and other stressors including altered fire regimes, drought, and flooding in riparian systems.
03	Functioning ecosystems retain their essential components, processes and functions.
04	Native insect and disease populations are generally at endemic levels with occasional outbreaks. Vegetation structural diversity usually restricts the scale of insect and disease outbreaks to local levels.
05	Ecological conditions contribute to the recovery of threatened and endangered species, conserve proposed and candidate species and support the persistence of species of conservation concern.
08	Fire occurs as a key ecological process in fire-adapted ecosystems where it does not pose an unacceptable risk to life and property. Fire occurs within an ecological appropriate regime of frequency, extent, and severity, and enhances ecosystem heterogeneity and habitat and species diversity.
09	Composition, density, structure, and condition of vegetation help reduce the threat of undesirable wildfires to local communities, ecosystems and scenic character.
12	Ecological conditions in untrammeled landscapes (e.g., wilderness and recommended wilderness areas) are primarily the result of natural ecological processes, which occur with little direct human influence across the larger landscape.

Objectives (TERR-FW-OBJ)

Num	Plan language
01	Restore species composition and structure on at least 20,000 acres of vegetation within 10 to 15 years following plan approval.
02	Restore low and moderate severity fire mosaics using prescribed fire on at least 20,000 to acres within 10 to 15 years following plan approval.

All Sierra Nevada Montane Zone

The montane zone occurs at mid- to higher elevations in the Sierra Nevada and Glass Mountains and receives a high percentage of precipitation as snow. This zone is primarily comprised of

mixed conifer, red fir forests, Jeffrey pine forests, wet and dry lodgepole pine forests, meadows, and riparian areas. These ecosystem types occur in a patchy mosaic across the montane landscape, depending on elevation, topography, soils, climate, and prior disturbance history. Fire is an especially important ecological process in this zone, influencing forest structure and composition, such as canopy patch and gap dynamics. Decades of fire exclusion, past timber harvest, and patterns of increasing high-severity fire have resulted in increasing degrees of structural homogenization in montane forests at the landscape and stand scales.

Desired Conditions (TERR-MONT-DC)

Num	Plan language
03	At the landscape scale, white pines (such as western white pine) are healthy and vigorous with a low incidence of white pine blister rust. Individual trees and the stands they occur in are resilient to moisture stress, drought, and bark beetles. White pine blister rust-resistant trees are regenerating and populations are sustained.

Subalpine and Alpine Zones

The subalpine and alpine zones of the eastern escarpment of the southern Sierra Nevada are characterized by mostly steep slopes, poorly developed granitic-based soils, and a very high percentage of precipitation that falls as snow. While shrublands and other ecosystems occur in the subalpine zone, the direction below is focused on subalpine forests. Subalpine forests and woodlands in the Sierra Nevada and Glass Mountains are often dominated by high-elevation white pines (whitebark pine, foxtail pine, limber pine). Lodgepole pine, mountain hemlock, red fir, western white pine, and Sierra juniper may also occur.

In the Great Basin ranges, (White and Inyo Mountains) the subalpine and alpine zones are characterized by diverse geologic substrates and a more arid climate than the Sierra Nevada. Subalpine forests and woodlands in these ranges are dominated by Great Basin bristlecone pine and limber pine, and pinyon-juniper woodlands can also occur.

Alpine vegetation in the Sierra Nevada and Great Basin ranges occurs above treeline and is dominated by shrubs and herbs, with occasional patches of krummholz (windblown and stunted) trees.

Desired Conditions (TERR-ALPN-DC)

Num	Plan language
02	Fires occur infrequently, are mostly very small, and burn with mixed severity. Fire intensity is highly variable, but crown fires are usually limited in size.
03	Subalpine woodlands are resilient to insects, diseases, fire, wind, and climate change. High-elevation white pines (whitebark pine, Great Basin bristlecone pine, limber pine, and foxtail pine) are healthy and vigorous, with a low incidence of white pine blister rust, and resilient to moisture stress and drought. White pine blister rust-resistant trees are regenerating and populations of high elevation white pines have the potential to expand above the tree line.
04	Mature cone-bearing whitebark pine trees are spatially well distributed to produce and protect natural regeneration and conserve genetic diversity.
05	Alpine ecosystems are resilient to climate change, and fires are small and occur infrequently.

Proposed and Possible Actions

- Cooperate with the Pacific Southwest Region Ecology Program to monitor health of whitebark pine stands.

- Educate the public about the unique properties of subalpine and alpine ecosystems and the potential impacts of climate change, recreation use, and other stressors.

Species-Specific Direction for Bighorn Sheep

Note: The following forest plan direction applies to both subspecies of bighorn sheep that occur on the Inyo National Forest (Sierra Nevada bighorn sheep and Nelson's desert bighorn sheep), although Guideline 01 is specific to actions that may affect Sierra Nevada bighorn sheep.

Desired Conditions (SPEC-SHP-DC)

Num	Plan language
01	An adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range within mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches.
02	The risk of disease transmission from domestic sheep and goats to bighorn sheep (based upon the best available risk assessment model) is reduced to the maximum extent practicable.

Goals (SPEC-SHP-GOAL)

Num	Plan language
01	Coordinate with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service to conduct a risk assessment of pack goat use on the Inyo National Forest and develop mitigations strategies to manage the risk of disease transmission, if needed.

Standards (SPEC-SHP-STD)

Num	Plan language
01	Do not allow domestic sheep or goat grazing or pack goat use adjacent to bighorn sheep populations where relevant bighorn sheep risk assessment models show there is a high risk of contact and spread of disease, unless risks can be adequately mitigated.
02	Manage recreation, or other disturbances, where research has found it to cause Sierra Nevada bighorn sheep to avoid important habitat as described in the Sierra Nevada Bighorn Sheep Recovery Plan or other guidance from the U.S. Fish and Wildlife Service.

Potential Management Approaches

- If reintroduced bighorn sheep establish themselves in drainages outside the reintroduction sites, take advantage of opportunities to extend bighorn sheep range, consistent with other resource activities.

Relevant to Aquatic Ecosystems and Species

The Proposed Action includes a broader and more comprehensive approach to aquatic habitat conservation. It strengthens and replaces the approach using small, isolated critical aquatic refuges and independently identified priority watersheds with an approach centered on larger conservation watersheds and a more integrated prioritization of watershed restoration opportunities. It retains but clarifies direction applied to riparian conservation areas.

Forestwide Components for Watersheds

Plan components for Watersheds (WTR) cover the broad area of soils and water throughout the Inyo NF at the watershed scale. Watersheds include Riparian Conservation Areas and the riparian

and aquatic environments contained within them, such as rivers, streams, meadows, springs, and seeps. Figure 4 shows the relationship among watersheds, riparian conservation areas, and riparian and aquatic environments. Conservation watersheds are a specific subset of watersheds selected by national forest managers to provide for continued high-quality water sources and the long-term persistence of at-risk species.

The Forest Service's national Watershed Condition Framework is used to identify priority watersheds for restoration. Priority watersheds are where plan objectives for restoration would concentrate on maintaining or improving watershed condition. Under the framework, the Forest Supervisor is responsible for identifying priority watersheds using an interdisciplinary team process.

The list of priority watersheds can be changed administratively without a forest plan amendment. Watershed Condition Framework priority watersheds are mapped online at the Forest Service's Watershed Condition and Prioritization Interactive Map at http://www.fs.fed.us/biology/watershed/condition_framework.html.

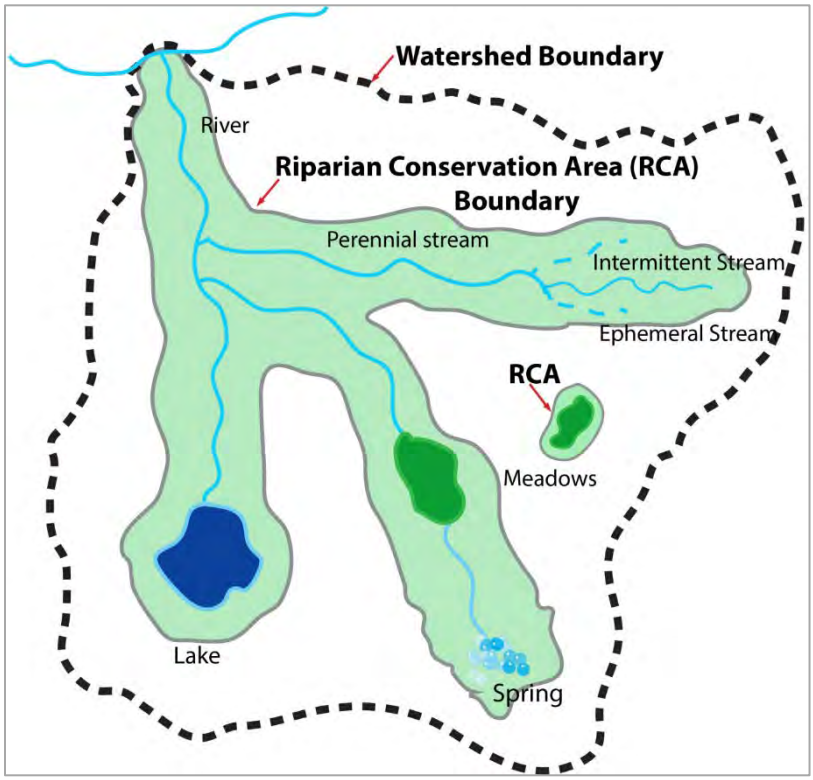

Figure 4. A schematic of the relationship of watersheds, riparian conservation areas, and riparian and aquatic environments

Desired Conditions (WTR-FW-DC)

Num	Plan language
01	Adequate quantity and timing of water flows support ecological structure and functions, including aquatic species diversity and riparian vegetation. Watersheds are resilient to changes in air temperatures, snowpack, timing of runoff, and other effects of climate change.
02	Water quality supports State-designated beneficial uses of water. Water quality is sustained at a level that retains the biological, physical, and chemical integrity of aquatic systems and benefits the survival, growth, reproduction and migration of native aquatic and riparian species.

Num	Plan language
03	Watersheds are fully functioning or trending toward fully functioning and resilient; recover from natural and human disturbances at a rate appropriate with the capability of the site; and have a high degree of hydrologic connectivity laterally across the floodplain and valley bottom and vertically between surface and subsurface flows. Physical (geomorphic, hydrologic) connectivity and associated surface processes (such as runoff, flooding, in-stream flow regime, erosion, and sedimentation) are maintained and restored. Watersheds provide important ecosystem services such as high quality water, recharge of streams and shallow groundwater, and maintenance of riparian communities. Watersheds sustain long-term soil productivity.
04	Soil and vegetation functions in upland and riparian areas are sustained and resilient. Healthy soils provide the base for resilient landscapes and nutritive forage for browsing and grazing animals, and support timber production. Healthy upland and riparian areas support healthy fish and wildlife populations, enhance recreation opportunities, and maintain water quality.
05	Infrastructure (administrative sites, recreation facilities, and roads) has minimal adverse effects to riparian and aquatic resources.
06	The sediment regime within water bodies is within the natural range of variation. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage and transport.
07	Where stream diversions or other flow modifications are not regulated by the Federal Energy Regulatory Commission, at-risk species and beneficial uses are sustained. In-stream flows allow for at-risk species habitat and sustain riparian resources, channel integrity, and aquatic passage.

Objectives (WTR-FW-OBJ)

Num	Plan language
01	Priority watersheds achieve or are moving toward a higher functioning condition class, as defined by the national Watershed Condition Framework within 10 years of plan approval.

Goals (WTR-FW-GOAL)

Num	Plan language
01	Collaborate with Tribes, local, State and Federal agencies, adjacent landowners, and other interested parties on watershed restoration across ownership boundaries.

Standards (WTR-FW-STD)

Num	Plan language
01	Use best management practices as described in agency technical guides and handbooks to mitigate adverse impacts to soil and water resources during the planning and implementation of forest activities.
02	Restoration projects will not result in long-term degradation of aquatic and riparian conditions, including connectivity, at the watershed or subwatershed scale. Adverse effects from project activities are acceptable when they are short-term, site-scale, and support or do not diminish long-term recovery of aquatic and riparian resources.
03	For exempt hydroelectric facilities on national forest system 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.
04	After restoration actions, including soil disturbance or seeding activities, avoid subsequent soil-disturbing management activities until project objectives have been met, unless a resource team determines that disturbance will help achieve project objectives.

Proposed and Possible Actions for Water, Soils and Watersheds

- Plan and implement improvement activities in priority watersheds that are functionally at risk or impaired.

- Update the priority watershed list to reflect actual needs on the ground.

Management Area Components for Conservation Watersheds

Conservation watersheds are identified as a network of watersheds (multiple 12-digit hydrological unit codes) that have been determined to have a functioning or functioning-at-risk rating based on the Watershed Condition Framework; provide for connectivity of species of conservation concern; and provide high quality water for beneficial uses downstream. The management emphasis for conservation watersheds is to maintain or improve, where possible, the functional rating of these systems for the long term and to provide for persistence of species of conservation concern by maintaining connectivity and refugia for these species. The intent of plan direction in conservation watersheds is to focus restoration and monitoring over the long term, while still allowing for other resource uses or activities within these areas.

Desired Conditions (MA-CW-DC)

Num	Plan language
01	Conservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species.
02	Conservation watersheds exhibit long-term (multiple planning cycles) high watershed integrity and have aquatic, riparian, and terrestrial ecosystems resilient to stochastic disturbance events such as wildfires, floods, and landslides.
03	The drainage connections between floodplains, wetlands, upland slopes, headwaters, and tributaries are intact and provide for breeding, dispersal, overwintering, and feeding habitats for at-risk species. These areas provide refugia if other areas of the watershed are disturbed by events such as floods, landslides, and fires.

Objectives (MA-CW-OBJ)

Num	Plan language
01	Within 20 years of plan approval, 5 percent of the indicators within the Watershed Condition Framework with a condition rating of 2 or 3 will be improved to a higher rating leading to or trending towards a functional condition rating.

Guidelines (MA-CW-GDL)

Num	Plan language
01	Accept adverse effects from project activities when they are short-term, site-specific, and support the long-term functionality of aquatic, riparian, and terrestrial systems.
02	Design project activities in conservation watersheds to attain functional Watershed Condition Framework indicators.
03	When building new roads within conservation watersheds, avoid or minimize increases in sediment production; increases in water capture; and loss of stream connectivity unless these actions increase the benefit of ecological function in aquatic ecosystems.

Potential Management Approaches

- Within conservation watersheds, restoration projects and actions are given a high priority for implementation and monitoring.
- Consider Watershed Condition Framework indicators when developing restoration activities within conservation watersheds.

Management Area Components for Riparian Conservation Areas

Riparian conservation area widths are defined by type:

- perennial streams, 300 feet on each side of the stream, measured from the bankfull edge of the stream;
- seasonally flowing streams (includes intermittent and ephemeral streams), 150 feet on each side of the stream, measured from the bankfull edge of the stream;
- streams in inner gorge (defined by stream adjacent slopes greater than 70 percent gradient), top of inner gorge;
- special aquatic features (including lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs) or perennial streams with riparian conditions extending more than 150 feet from edge of streambank or seasonally flowing streams with riparian conditions extending more than 50 feet from edge of streambank, 300 feet from edge of feature or riparian vegetation, whichever width is greater; and
- other hydrological or topographic depressions without a defined channel, riparian conservation area width, and protection measures determined through project-level analysis.

Riparian conservation area widths may be adjusted at the project level if interdisciplinary analysis demonstrates a need for different widths to meet or improve riparian conservation area desired conditions.

Riparian conservation area plan components apply to the entire riparian conservation area, as well as the specific riparian and aquatic environments contained within them, such as rivers, streams, meadows, springs and seeps. Riparian and aquatic environments also have additional direction specific to each environment.

Plan Components for All Riparian Conservation Areas

Desired Conditions (MA-RCA-DC)

Num	Plan language
01	The connections of floodplains, channels, and water tables distribute flood flows and sustain diverse habitats.
02	Riparian conservation areas have ecological conditions that contribute to the recovery of threatened and endangered species and support persistence of species of conservation concern as well as native and desired nonnative aquatic and riparian-dependent plant and animal species.
03	The distribution and health of biotic communities in special aquatic habitats perpetuates their unique functions and biological diversity.
04	Native fish, amphibians, and other native aquatic species are present within their historic distribution and have adjusted for climate change. Habitat conditions support self-sustaining populations, except where distributions are altered by areas managed for desirable nonnative fish species. Streams and rivers provide a variety of habitats for aquatic species, including deep pools and overhanging banks, structure provided by large wood, off-channel areas and cover within their natural range of variation. Woody and herbaceous overstory and understory regulate stream temperatures. Aquatic and upland components are linked, providing access to food, water, cover, nesting areas, and protected pathways for aquatic, riparian, and upland species.
05	Riparian areas provide a range of substrates to sustain habitat for a variety of aquatic and terrestrial fauna within their natural capacity of the system.

Num	Plan language
06	Soil structure and function is sustained to infiltrate and disperse water properly, withstand erosive forces, sustain favorable conditions of stream flow, and cycle nutrients. Associated water tables support riparian vegetation and restrict nonriparian vegetation.
07	Key riparian processes and conditions (including slope stability and associated vegetation root strength, wood delivery to streams and floodplains, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality) operate consistently with local disturbance regimes.
08	The condition of riparian vegetation, including riparian species composition, stand density, and fuel loading, is consistent with healthy riparian systems and reduces risks from high-intensity wildfire in the watershed.
09	Riparian areas in frequent fire landscapes (such as montane areas) have low to moderate-severity fire restored as an ecological process. Fire effects occur in a mosaic and support restoration and ecological integrity and function of composition, structure, and ecological resilience.
10	Riparian areas protect or improve riparian area-dependent resources while allowing for management of other compatible uses like recreation, vegetation management, or livestock grazing.

Objectives (MA-RCA-OBJ)

Num	Plan language
01	Restore the structure and composition of at least 400 acres in riparian areas within 10 years following plan approval, emphasizing riparian areas that face the most risk from large-scale high-intensity fire, past fire exclusion, or accelerated flooding events associated with climate change.

Goals (MA-RCA-GOAL)

Num	Plan language
01	Coordinate and collaborate with the State fish and wildlife agencies to address native aquatic species issues, including evaluating management and monitoring needs to address aquatic species requirements across ownership boundaries.
02	Where invasive species are adversely affecting the persistence of native species, work with the appropriate State and Federal wildlife agencies work to reduce impacts of invasive species to native populations.

Standards (MA-RCA-STD)

Num	Plan language
01	Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.
02	Limit pesticide applications to cases where project-level analysis indicates that pesticide applications are consistent with riparian conservation areas desired conditions.
03	Prohibit storage of fuels and other toxic materials except at designated administrative sites and sites covered by special use authorization. Prohibit refueling within riparian conservation areas except if there are no other alternatives.
04	Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species, except where desired to protect native species.
05	All new or replaced permanent stream crossings shall accommodate at least the 100-year flood, its bedload, and debris. Estimates for 100-year flood potential will reflect the best available science regarding potential effects of climate change.
06	Locate water drafting sites to minimize adverse effects to instream flows and depletion of pool habitat.
07	Prevent disturbance to streambanks and shorelines of natural lakes and ponds (caused by resource management activities, or factors such as off-highway vehicles or dispersed recreation)

Num	Plan language
	from exceeding 20 percent of 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 may not be met within Destination Recreation Management Areas; sites authorized under special use permits; and designated off-highway vehicle routes, but activities will be designed and managed to reduce the percent of impact to the extent feasible.
08	In fen ecosystems, limit disturbance from livestock and pack stock to no more than 15 to 20 percent annually. Reduce disturbance further if a fen is nonfunctional or functional at risk with a downward trend.
09	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 from aquatic habitats, including juvenile fish, amphibian egg masses and tadpoles.
10	Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality, or water temperature critical to sustaining fen ecosystems and the plant species that depend on these ecosystems.
11	Prevent activities from causing significant degradation of fens from trampling, such as by livestock, pack stock, wheeled vehicles, and humans.
12	Manage livestock grazing to attain desired conditions in riparian conservation areas. Where livestock grazing is found to be contributing to a decline in the function of riparian systems, modify grazing practices as prescribed in the Inyo Forest Supplement to the R5 Rangeland Analysis and Planning Guide. If adjusting practices is not effective, remove livestock from that area using appropriate administrative authorities and procedures.
13	Assess the hydrologic function of riparian areas, meadows, fens, and other special aquatic features during rangeland management analysis. Ensure that characteristics of special features are, at a minimum, at proper functioning condition or functional at risk[8] and trending toward proper functioning condition, as defined in appropriate technical reports.[9] If systems are functioning at- risk, assess appropriate actions to move towards proper functioning condition.
14	Complete initial inventories of fens within active grazing allotments prior to completing the allotment environmental analysis. If more than 10 fens occur on an allotment, ensure at least 25 percent of all fens are inventoried initially. Establish a 5-year schedule to complete inventory.
15	Designate equipment exclusion zones within riparian conservation areas when designing projects. The default is half of the riparian conservation area width (150 feet for perennial streams, 75 feet for intermittent streams): a. These widths may be adjusted on a project-by-project basis based on geomorphology, slope, or soil conditions, as long as best management practices and other plan direction are met. Adjustments may be made only after consultation with experts in aquatic ecology, soils, and/or hydrology. b. If further mechanical incursion is warranted, use methods that limit soil disturbance within the riparian conservation area, such as low ground pressure equipment, helicopters, over-the-snow logging, extra ground cover requirements, or other soil protective actions to achieve desired conditions consistent with best management practices and other plan direction. c. When vegetation is treated in the near stream area, meet the needs for coarse wood in stream channels where possible.
17	Locate new livestock handling facilities and stock driveways, salting, and supplemental feeding outside of meadows and riparian areas except where there are no other feasible alternatives and where placement is consistent with meeting watershed or water quality best management practices if located in riparian conservation areas.

[8] The Inyo National Forest has a forest supplement for evaluation of hydrologic function at the site-specific key grazing area. These other protocols are incorporated into the R5 Rangeland Analysis Guide R5-EM-TP-004. Citation: Inyo National Forest Supplement 1-2017 to USDA Forest Service Pacific Southwest Region Rangeland Analysis and Planning Guide R5-EM-TP-004 (March 1997)

[9] USDI Bureau of Land Management. 2003. Riparian Area Management: A User Guide to Assessing Proper Functioning Condition and Supporting Science for Lentic Areas, Technical Reference 1737-16. National Applied Resource Sciences Center, Denver, CO. 109 pp.

Num	Plan language
18	Avoid construction of new skid trails or temporary roads for access into riparian conservation areas, unless it is the only feasible option to conduct restoration activities for protection and improvement of riparian conservation areas.
19	Ensure that post-wildfire management activities enhance native vegetation cover, stabilize channels, and minimize adverse effects from the existing road network to protect the riparian systems.

Guidelines (MA-RCA-GDL)

Num	Plan language
01	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.
02	Minimize impacts from roads, trails, off-highway-vehicle trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites that have been identified as contributing to degradation of water quality or habitat for aquatic and riparian-dependent species.
03	During permit reissuance for livestock, evaluate impacts of facilities on the riparian conservation areas and consider relocating existing livestock facilities outside of meadows and riparian areas.
04	Avoid wildfire control methods and activities that would impact the riparian conservation area, including dozer-built lines, unless alternative control methods are not safe or practical.
05	Stream reaches of all State-designated wild trout waters (designated as of February 2001) should be managed according to the following: Any activity that results in trampling and chiseling should not exceed 10 percent of any given stream reach in order to reduce sedimentation into wild trout waters. A reach is defined as a continuous portion of a stream with homogeneous physical characteristics.
06	Unstable or eroding streambanks should be restored to attain a streambank system that is no more than 10 percent unstable of the reaches current potential.
07	To prevent impacts to spawning habitat, stream-modifying construction activities within or immediately adjacent to the aquatic zone should be prohibited during the following spawning seasons: a. In streams with spring spawning species (rainbow, cutthroat, and golden trout), February 15 to August 20. b. In streams with fall spawning species (brown and brook trout), October 1 to April 15. The Forest Supervisor has the authority to make exceptions to these seasons.

Potential Management Approach

- When conducting proper functioning condition assessments, if information is available to show the historic potential of an area and the current potential is different from that historical potential, consider restoration measures that would be necessary to attain the historical potential.
- Determine if stream characteristics are within the range of natural variation; if characteristics are outside the range of natural variation, restoration should be considered.

Plan Components for Meadows

Desired Conditions (RCA-MEAD-DC)

Num	Plan language
01	Meadows are hydrologically functional. Sites of accelerated erosion, such as gullies and headcuts are stabilized, recovering, or within the natural range of variation. Vegetation roots occur throughout the available soil profile. Meadows with perennial and intermittent streams have the following characteristics: (1) stream energy from high flows is dissipated, reducing erosion and improving water quality; (2) streams filter sediment and capture bedload, aiding floodplain development; (3) meadow conditions enhance floodwater retention and groundwater recharge; and (4) root masses stabilize streambanks against cutting action.
02	Wetlands and groundwater-dependent ecosystems (including springs, seeps, fens, wet meadows, and associated wetlands or riparian systems) support stable herbaceous and woody vegetative communities that are resilient to drought, climate change, and other stressors. Root masses stabilize stream channels, shorelines, and soil surfaces. The natural hydrologic, hydraulic, and geomorphic processes in these ecosystems sustain their unique functions and biological diversity.
03	Meadows are resilient and recover rapidly from natural and human disturbances. They exhibit a high degree of hydrologic connectivity laterally across the floodplain and vertically between surface and subsurface flows. They provide important ecosystem services such as high-quality water, recharge of streams and aquifers, and moderation of climate variability and change.
04	Soils in wet and headwater meadows are influenced by a shallow water table and function to filter water. These soils also store and release water over an extended period of time, which helps to maintain streamflow during dry summer months.
05	Meadows have substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity with multiple successional functional types represented. Perennial streams in meadows contain a diversity of age classes of shrubs along the streambank, where the potential exists for these plants.
06	A complexity of meadow habitat types and successional patterns support native plant and animal communities. Meadow species composition is predominantly native, where graminoid (grass-like) species are well represented and vigorous, and regeneration occurs naturally. Healthy stands of willow, alder, and aspen are present within and adjacent to meadows with suitable physical conditions for these species. Natural disturbances and management activities are sufficient to maintain desired vegetation structure, species diversity, and nutrient cycling.
07	Meadows in montane and upper montane areas have low to moderate-severity fire restored as an ecological process, especially on meadow edges, limiting conifer encroachment and enhancing native understory plant composition and cover.
08	Fen condition is within the natural range of variation. Fens are resilient with continual peat accumulation and carbon sequestration. The hydrologic regime, and vegetation, soil, and water characteristics sustain the fen's ability to support unique physical and biological attributes.

Objectives (RCA-MEAD-OBJ)

Num	Plan language
01	Maintain, enhance, or improve conditions on at least five meadows of any size, within 10 years following plan approval.

Rivers and Streams

Desired Conditions (RCA-RIV-DC)

Num	Plan language
01	Stream ecosystems, riparian corridors, and associated stream courses sustain ecosystem structure; are resilient to natural disturbances (such as flooding) and climate change; promote the natural movement of water, sediment and woody debris; and provide habitat for native aquatic species or desirable nonnative species.

Num	Plan language
02	Stream ecosystems, including ephemeral watercourses, exhibit full connectivity where feasible to maintain aquatic species diversity, except where barriers are maintained in good condition to protect native aquatic species. Ephemeral watercourses provide for dispersal, access to new habitats, perpetuation of genetic diversity, and nesting and foraging habitat for riparian and aquatic species.
03	Instream flows are sufficient to sustain desired conditions of riparian, aquatic, wetland, and meadow habitats and retain patterns of sediment, nutrients, and wood routing as close as possible to those with which aquatic and riparian biota evolved. The physical structure and condition of streambanks and shorelines minimize erosion and sustain desired habitat diversity.
04	Streams and rivers maintain seasonal water flow over time, including periodic flooding, which promotes natural movement of water, sediment, nutrients, and woody debris. Flooding creates a mix of stream substrates for fish habitat, including clean gravels for fish spawning, large wood structures, and sites for riparian vegetation to germinate and establish.
05	Stream channel conditions exhibit a sediment regime under which aquatic and riparian ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport. The sediment regime should be similar to the natural distribution of reference conditions.
06	Within rivers and streams, the level of coarse large woody debris is within the natural range of variation.

Objectives (RCA-RIV-OBJ)

Num	Plan language
01	Maintain or restore structure, composition, or function of habitat for fisheries and other aquatic species along at least 10 stream miles over a 10-year period.
02	Eliminate or mitigate one priority barrier to aquatic organism passage or ecological connectivity within 10 years following plan approval.

Lakes, Pools, Ponds

Desired Conditions (RCA-LPP-DC)

Num	Plan language
01	Natural lakes and ponds retain necessary attributes, such as adequate vegetation and large woody debris to function properly and support native biotic communities. Attributes include floodwater retention and groundwater recharge, stabilized islands and shoreline features, and diverse characteristics to provide for amphibian production, waterfowl breeding and biodiversity.

Springs and Seeps

Desired Conditions (RCA-SPR-DC)

Num	Plan language
01	Springs provide sufficient water to maintain healthy habitats for native riparian and aquatic species.
02	Springs are resilient to natural disturbances, groundwater diversions, and changing climate conditions. Springs function across the landscape within their type and water availability.
03	Springs and associated streams and wetlands have the necessary soil, water, and vegetation attributes to be healthy and functioning at or near potential. Water flow is similar to historic levels and persists over time, within constraints of climate change.

Species-Specific Direction for Lahontan cutthroat trout

Standard (SPEC-LCT-STD)

Num	Plan language
01	In stream reaches occupied by or identified as essential habitat in the recovery plan for the Lahontan cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or essential habitat stream reach. Take corrective action where streambank disturbance limits have been exceeded.

Species-Specific Direction for Paiute cutthroat trout

Standard (SPEC-PCTR-STD)

Num	Plan language
01	In stream reaches occupied by or identified as essential habitat in the recovery plan for the Paiute cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or “essential habitat” stream reach. Take corrective action where streambank disturbance limits have been exceeded.

Species-Specific Direction for Yosemite toad and Mountain yellow-legged frog

Standard (SPEC-AMPH-STD)

Num	Plan language
01	Where pesticide applications are proposed within 500 feet of known occupied sites for Yosemite toad, Sierra Nevada yellow-legged frog, and Mountain yellow-legged frog, design applications to avoid adverse effects to individuals and their habitats.

Plan Monitoring Program

The portions of the plan monitoring program for the Inyo NF relevant to analyzed species is presented below in a set of tables. Of the eight required topics for the monitoring program, six include elements that are related to ecological conditions relevant to federally listed species or critical habitats:

- The status of select watershed conditions.
- The status of select ecological conditions including key characteristics of terrestrial and aquatic ecosystems.
- The status of focal species to assess the ecological conditions required under the Code of Federal Regulations, specifically 36 CFR 219.9.
- The status of a select set of the ecological conditions required under 36 CFR 219.9 to contribute to the recovery of federally listed threatened and endangered species, conserve proposed and candidate species, and maintain a viable population of each species of conservation concern.
- Measurable changes on the plan area related to climate change and other stressors that may be affecting the plan area.
- Progress toward meeting the desired conditions and objectives in the plan, including for providing multiple use opportunities.

For clarity, monitoring questions for terrestrial ecosystems and aquatic ecosystems are presented in separate tables. In the tables, each row represents a single monitoring question and associated indicators used to respond to a selected desired condition or objective. The desired conditions are generally complex statements that cannot be fully monitored. Therefore, the monitoring questions and associated indicators focus on some core aspect of the desired condition related to the required monitoring item and that are practicable to be monitored. Details of the plan monitoring program – including monitoring and analysis protocols, data collection schedules, responsible parties, and data management – will be part of a separate monitoring guide. See the discussion in Section III, Forest Plan Monitoring Program for a broad discussion of how monitoring informs the need to change the forest plan.

Watershed Conditions

These monitoring questions and their associated indicators are related to water resources and watershed conditions in the plan area. The geographic scale may extend beyond the plan area and may include receiving areas for water that flows from the plan area to outside the plan area.

Table 6. Monitoring questions and associated indicators: select watershed conditions

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
WS01	WTR-FW-DC-03 Watersheds are fully functioning or trending toward fully functioning and resilient; recover from natural and human disturbances at a rate appropriate with the capability of the site; and have a high degree of hydrologic connectivity laterally across the floodplain and valley bottom and vertically between surface and subsurface flows. Physical (geomorphic, hydrologic) connectivity and associated surface processes (such as runoff, flooding, in-stream flow regime, erosion, and sedimentation) are maintained and restored. Watersheds provide important ecosystem services such as high quality water, recharge of streams and shallow groundwater, and maintenance of riparian communities. Watersheds sustain long-term soil productivity.	To what extent are watersheds in proper functioning condition being maintained, and watersheds in altered or impaired condition being improved?	• Watershed Condition Framework classification.
WS02	WTR-FW-DC-05 Infrastructure (administrative sites, recreation facilities, and roads) has minimal adverse effects to riparian and aquatic resources.	To what extent has erosion from temporary and permanent roads and trails affected water quality and soil sustainability in the forest?	• Road and motorized trail condition; • Implementation and effectiveness monitoring results from the Best Management Practice Evaluation Program; • Number and type of stream crossing and bank stabilization projects.

Aquatic Ecosystems

A select set of ecological conditions are monitored for riparian and aquatic ecosystems. The monitoring questions and indicators are selected to measure the effectiveness of the plan to maintain or restore ecological conditions for key ecosystem characteristics associated with composition, structure, function and connectivity.

Table 7. Monitoring questions and associated indicators: select ecological conditions for key characteristics of aquatic ecosystems

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
AE01	RCA-MEAD-DC-05 Meadows have substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity with multiple successional functional types represented. Perennial streams in meadows contain a diversity of age classes of shrubs along the streambank, where the potential exists for these plants.	What is the vegetative condition of selected grazed and ungrazed meadows?	• Rangeland ecological condition • Species richness, species diversity, and plant functional groups • Range greenline monitoring • Vegetation community types

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
AE02	MA-RCA-DC-05 Riparian areas provide a range of substrates to sustain habitat for a variety of aquatic and terrestrial fauna within the natural capacity of the system. MA-RCA-DC-06 Soil structure and function is sustained to infiltrate and disperse water properly, withstand erosive forces, sustain favorable conditions of stream flow, and cycle nutrients. Associated water tables support riparian vegetation and restrict nonriparian vegetation.	To what extent are riparian areas functioning properly across different management areas and levels of disturbance.	• Vegetation cover, structure, and composition • Floodplain and channel physical characteristics

Focal Species

Focal species are a small subset of species whose status permits inference to the integrity of the larger ecological system to which they belong. Focal species monitoring provides information regarding the effectiveness of the plan in providing the ecological conditions necessary to maintain the diversity of plant and animal communities and the persistence of native species in the plan area. They should act as indicators for the attributes of community composition, structure, connectivity or function, or factors that regulate them.

An effective focal species, or assemblage of species, will be sensitive to the ecosystem components or habitat attributes of concern. There are a few key qualities of well-selected focal species: the species is taxonomically well known and stable; the species is specialized within a narrow habitat; and the species is a permanent resident (migrants are subject to a variety of sources of mortality and stress on their wintering grounds and during migration). A focal species could be a keystone species, an ecological engineer, an umbrella species, a link species, or a species of conservation concern, but need not be any of these species categories. Monitoring questions should relate the species to the ecological condition and reason for its selection, and indicators may include affected attributes of the species, such as presence or occupancy, habitat use, reproductive rate, and population trends. If the focal species' sensitivity to habitat changes cannot be directly attributable to a cause-and-effect relationship, then the influence of habitat change on the focal species may not be separable from the influence of other factors on the species, such as climate change, predation, disease, or competition.

Focal species, as used by the Forest Service, are not meant to act as surrogates for other species. Focal species monitoring is also not the same as monitoring those species in which we have a particular interest, such as threatened or endangered species, invasive species, or other species for which we deliberately manage the landscape.

Focal species are intended to reduce the cost and effort of ecosystem monitoring and should only be used when direct measurement of resources is not efficient or practical.

Table 8. Monitoring questions and associated indicators: the status of focal species

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
FS02	WTR-FW-DC-02 Water quality supports State-designated beneficial uses of water. Water quality is sustained at a level that retains the biological, physical, and chemical integrity of aquatic systems and benefits the survival, growth, reproduction and migration of native aquatic and riparian species.	How are aquatic benthic macroinvertebrate communities indicating stream ecosystem integrity is being maintained in high quality waters or improved in degraded waters?	• Benthic macroinvertebrate diversity, species composition, and related metrics.

Ecological Conditions for At-risk Species

For select at-risk species, a select set of ecological conditions, including habitat, is monitored. The selected ecological conditions are necessary to provide for diversity of plant and animal communities and to contribute to the recovery of, conserve, or maintain the viability of at-risk species within the plan area. At-risk species include federally recognized threatened, endangered, proposed, and candidate species plus the species of conservation concern identified for the Inyo NF. The select set of ecological conditions monitored for select at-risk species may include characteristics at both the ecosystem and species-specific levels of terrestrial, riparian, or aquatic ecosystems.

Table 9. Monitoring questions and associated indicators: the status of a select set of ecological conditions for at-risk species

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
AR02	SPEC-SHP-DC-01 An adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range within mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches.	What is the quality of bighorn sheep winter range?	• Acres of vegetation management in the winter range for bighorn sheep; • Tree cover in winter bighorn sheep range.

Climate Change and Other Stressors

The plan monitoring program includes monitoring questions and associated indicators to determine whether there are measurable changes on the plan area resulting from climate change and other stressors.

Table 10. Monitoring questions and associated indicators: changes on the plan area related to climate change and other stressors

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
CC01	TERR-ALPN-DC-03 Subalpine woodlands are resilient to insects, diseases, fire, wind and climate change. High-elevation white pines (e.g., whitebark pine, Great Basin bristlecone pine, limber pine and foxtail pine) are healthy and vigorous, with a low incidence of white pine blister rust, and resilient to moisture stress and drought. White pine blister rust-resistant trees are regenerating and populations of high elevation white pines have the potential to expand above the tree line.	How are high-elevation white pines responding to the effects of climate change and other stressors?	• Spatial extent, by forest type; • Tree mortality, incidence of insects, disease, and pathogens; • Spatial extent of tree regeneration.
CC02	WTR-FW-DC-01 Adequate quantity and timing of water flows support ecological structure and functions, including aquatic species diversity and native riparian vegetation. Watersheds are resilient to changes in air temperatures, snowpack, timing of runoff, and other effects of climate change.	What changes have occurred to the timing, amount, and duration of natural and managed runoff into the forest's waterways?	• Annual in-stream flow regime for selected waterways (not those regulated by the Federal Energy Regulatory Commission).
CC03	FIRE-FW-DC-01 Wildland fires burn with a range of intensity, severity, and frequency that allows ecosystems to function in a healthy and sustainable manner. Wildland fire is a necessary process, integral to the sustainability of fire-adapted ecosystems.	How are fire regimes changing compared to the desired conditions and the natural range of variation?	• Fire return interval departure; • Number and acres of fire by ecosystem type; • Fire severity by ecosystem type.

Progress toward Meeting the Desired Conditions, Objectives, or other Plan Components

Progress toward meeting desired conditions, objectives, or other plan components that do not fall under one of the other eight required items are included in the monitoring program. Specifically, the plan monitoring program must contain one or more questions and associated indicators addressing the plan contributions to communities, social and economic sustainability of communities, multiple-use management in the plan area, or progress toward meeting the desired conditions and objectives related to social and economic sustainability.

Table 11. Monitoring questions and associated indicators: progress toward meeting the desired conditions and objectives in the plan

Code	Selected Desired Condition and Objective or Other Plan Component	Monitoring Question	Associated Indicators
PC03	FIRE-FW-GOAL-01 Reduce fuel accumulations, help maintain and protect habitat for a variety of species, reduce smoke from larger fires, provide added protection for communities, and restore fire on the landscape. These actions are also an integral part of achieving sustainable recreation, particularly by maintaining scenic attractiveness, integrity, and character.	What management actions are contributing to the achievement of desired conditions relating to fire regimes?	• Acres of fires managed for resource objectives by ecosystem type; • Acres of fire by objective within each fire management zone; • Acres of prescribed fire; • Acres of mechanical treatment

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V. Affected Species and Environmental Effects

This section summarizes legal status, habitat requirements, and historic and current occurrences of the federally listed species on the Inyo NF. Species that are not known to occur within the action area are not anticipated to be impacted by framework programmatic actions of the forest plan indirectly or cumulatively and are described briefly in Appendix A - Species Not Considered, but are dismissed from further effects analysis in this biological assessment.

This section presents the analysis of effects of adopting the Proposed Action, the forest plan described by alternative B modified, as summarized in Part IV above. Since forest plans themselves do not compel any action, authorize projects or activities, or guarantee specific results and do not directly affect any existing activity, project, or action, there are no direct effects from adopting the Proposed Action. This analysis focuses on potential indirect and cumulative effects from implementing the framework programmatic action. Project-level effects will be evaluated in a separate site-specific analysis at the time that projects and activities are proposed and may require project-level consultation with the USFWS as directed by Section 7 of the ESA and Forest Service policy.

Plan Analysis Approach

Assumptions and Methodologies

Effects analyzed in this biological assessment are done at a programmatic level, taking into account the general strategies and management direction of the Proposed Action. In evaluating the potential effects of the Proposed Action on listed and candidate species, we focused the bulk of our analysis on the distribution of a species' habitats and the possible effects to those habitats and species as a result of implementing the major programs and activities that might occur over the life of the forest plan. This analysis includes considering how the forest plan management framework provides for the conservation of habitat and species, and for the avoidance, minimization, or mitigation of potential effects during project planning and implementation.

We assume that over the life of the forest plan, the Inyo NF will design projects to achieve or make progress towards the forest plan desired conditions and objectives. We also assume that during project design and implementation, forest plan standards will be applied as written and the intent of forest plan guidelines will be met, especially those designed to avoid, minimize or mitigate adverse impacts to federally listed species and habitats. These assumptions are based on the fact that future proposed projects will require site-specific evaluation of effects to species protected by the ESA, including consultation with the USFWS as required by agency policy.

Furthermore, we assume that monitoring will be conducted as described in the plan monitoring program to address monitoring questions and to measure management effectiveness and progress toward achieving the forest plans' desired conditions and objectives. We assume that the forest plan will be amended or revised when identified by a need for change from monitoring evaluation reports or other substantially new best available scientific information or every 15 years as required by National Forest Management Act.

Sources of information used in the analysis include USFWS species Recovery Plans, species 5-Year Reviews, Species Assessments, and other documents or reports prepared by the USFWS or CDFW. Additional sources include peer-reviewed literature, surveys, studies and data, personal observations and communications, project specialist reports, and other Forest Service reports. For

the purposes of this consultation, we recognize two types of habitat: occupied habitat and critical habitat.

> Occupied Habitat: Occupied habitats are habitats of the types and locations known to be used by the species that may occur inside or outside of designated critical habitats.
>
> Critical habitat: critical habitat is composed of areas important to the conservation and recovery of listed species as proposed and designated by the USFWS pursuant to their authorities under Section 4 of the ESA.

This analysis evaluates the potential effects of implementing the forest plan on the environmental baseline. Regulations for the Endangered Species Act (50 CFR § 402.02) define the environmental baseline as including the past and present impacts of all Federal, State, or private actions and other human activities in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have undergone Section 7 consultation, and the impacts of State and private actions which are contemporaneous with the consultation in progress.

The effects of implementing the Proposed Action are considered, together with the effects of other activities that are interrelated and interdependent with the action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. The adoption of a forest plan does not compel any action, authorize projects or activities, or guarantee specific results and does not immediately or directly affect any existing authorized use or previous decision made by the Forest Service, including any actions that have undergone consultation. Therefore, there are no interrelated or interdependent actions dependent upon the adoption of a revised forest plan evaluated in the Proposed Action.

The Council on Environmental Quality NEPA Regulations defines effects on the environment as follows:

Direct Effects: Direct effects are caused by proposed project action and occur at the same time and place as the action. However, this biological assessment addresses a programmatic management framework and the forest plan proposes or authorizes no ground disturbing activities and therefore, there will be no direct effects from adopting the forest plan described by the Proposed Action.

Indirect Effects: Indirect effects are reasonably foreseeable effects expected from implementing the proposed forest plan components and plan content (e.g. desired conditions, objectives, goals, standards, guidelines, and potential management approaches) through future projects that are designed and implemented at a later time after adopting the forest plan.

The analysis involves identifying:

1. the typical management activities associated with each major program area (i.e., fire, vegetation and fuels, range, recreation, restoration activities, and roads and other infrastructure),
2. the potential magnitude and intensity of these actions,
3. the potential effects from these management activities, and

4. movement towards plan-level desired conditions from implementation of strategies and objectives and the degree that implementing standard operating procedures, standards, and guidelines that would be expected to avoid, minimize, or mitigate potential effects.

Analysis Uncertainty

Because the effects associated with the forest plan are associated with future implementation actions, an effects analysis for the forest plan is very difficult to quantify. It is not possible to predict the specific location, timing, duration, extent, or intensity of the hundreds of site-specific actions that may be implemented over the life of the plan. In addition, while the forest plan contains desired conditions and goals and specific constraints on future actions in the form of standards and guidelines, they also preserve broad decision-making space at the project level. This is appropriate because of the variability of terrain and ecological conditions within the action area, the unpredictability of natural systems over time, and the ever-changing state of scientific knowledge related to natural systems, among other factors. Future actions are also dependent upon national, regional, and local budgets and priorities which may vary over the life of the forest plan.

Identification of occupied habitat was largely done using existing information in readily available corporate or publicly available databases of credible species observations, scientific reports, USFWS and CDFW documentation and communications with staff, and knowledge by Forest Service staff. The difference between actual occupied habitats and known occupied habitats may result in an over-prediction or under-prediction of effects for listed and candidate species as it is possible that unknown occurrences exist and that areas considered to be known occupied habitat are no longer actually occupied and used by analyzed species.

Geographic information system datasets of critical habitat were obtained from the USFWS as managed in USFS corporate data systems. In determining where to propose or designate critical habitat, the USFWS generally has to rely on coarse scale data applied to large geographic areas. In proposed and final rules for designating critical habitat, the USFWS frequently includes caveats that not all acres of critical habitat contain the primary constituent elements needed for the conservation and recovery of listed species. Thus, using geographic information system datasets of critical habitat as an analytical tool may result in an overestimate or underestimate of potential effects to critical habitat.

Despite these limitations, we recognize that forest plans are strategic documents that guide future uses and management of National Forest System lands over a broad geographic area, and thus the application of these analytical tools is a reasonable and prudent use of available data. As future project are proposed consistent with the forest plan management framework, detailed site-specific analyses using refined information will be conducted to determine more accurately and precisely the expected effects of specific actions on federally listed species.

Cumulative Effects Analysis

From a regulatory perspective, the Inyo NF is situated in a highly regulated environment where the majority of land surrounding the Inyo NF is managed by federal land managers, including: the USFS (Sierra, Sequoia, and Humboldt-Toiyabe National Forests); National Park Service (Yosemite, Sequoia, Kings Canyon, and Death Valley National Parks and Devils Postpile National Monument); and the Bureau of Land Management in California and Nevada. There is some consistency in management of listed species on the adjacent federally managed lands

because federal agency actions are managed to contribute to the recovery of federally listed species and federally funded activities are governed by Section 7 of the ESA.

Within the administrative boundary of the Inyo NF, the Los Angeles Department of Water and Power owns and manages approximately 20,400 acres of lands primarily around Pumice Valley southwest of Mono Lake and around Lake Crawley. Other private entities own approximately 32,300 acres scattered in mostly smaller parcels. The forest plan only applies to National Forest System land and does not apply direction or restrict uses on these other lands.

The majority of non-federal managed lands adjacent to the Inyo NF is located in the Owens Valley and major landowners include the Los Angeles Department of Water and Power and various private entities. Much of the forest boundary in the Owens Valley has a buffer of Bureau of Land Management lands directly buffering it from these lands.

Under the Endangered Species Act (50 CFR 402.02), cumulative effects are "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Therefore, the cumulative effects analysis in this biological assessment considers the non-federal actions that may affect the plan area, and which may indirectly add to the potential effects to the species resulting from implementing the Proposed Action. The following are the most likely sources of nonfederal activities that may affect analyzed species within the plan area.

Private Land Uses: Private land uses include a wide variety of activities, some of which may also affect species and habitats in the plan area. These activities may include: land conversion from habitat to developments, road development and uses, maintenance and development of power line right-of-ways and facilities, and noise and actions from typical land use activities that create disturbances. Private land actions may also include agriculture, livestock grazing, fire suppression and prescribed burning, vegetation management including timber and vegetation management, rangeland management, and other uses that occur on those lands. Actions on private lands are difficult to analyze because private landowners do not typically publish their long-term management plans except when required by state or county agencies.

California Department of Forestry and Fire Protection: The California Department of Forestry and Fire reviews and permits timber management on private and State lands, as well as providing for fire suppression and support for prescribed fire on state and private lands. They also support private land actions to address fuels management, remove dead and dying trees, reforest and revegetate lands, and support sustainable forest lands by private landowners.

California Department of Fish and Wildlife: The CDFW is responsible for management of fish and wildlife populations on and adjacent to the plan area. They conduct or coordinate surveys and monitoring of federally listed species in collaboration with the Inyo NF. They may also conduct species management activities, such as fish removal, removal of individuals for captive rearing, and reintroductions or translocation within the Inyo NF consistent with relevant direction in the forest plan. As part of its duties, the CDFW stocks fish at select sites within the plan area, however, that fish stocking is coordinated with the national forest and stocking sites have been evaluated to reduce the probability of effects to federally listed species (ICF Jones & Stokes 2010). The CDFW also monitors mortality in Sierra Nevada bighorn sheep and manages mountain lion predation, as needed, in coordination with the USFWS, USDA Wildlife Services, and landowners, including the Inyo NF.

Water Management Operation: Public utility companies, primarily the Los Angeles Department of Water and Power and Southern California Edison, operate and manage hydroelectric dams, reservoirs, and water conveyances in or adjacent to the plan area. The Los Angeles Department of Water and Power operates the Los Angeles Aqueduct that transports water from the Owens Valley to southern California. Those actions are licensed, monitored and regulated by the Federal Energy Regulatory Commission, including maintaining minimum instream flows. The Forest Service has conditioning authority under the Federal Power Act to recommend conditions consistent with forest plan goals, objectives, standards, and guidelines during licensing and re-licensing or projects. Relevant to analyzed species, Federal Energy Regulatory Commission licenses affect the headwaters of Rush Creek and Lee Vining Creek where Yosemite toad occurs. Additional management direction and guidance is provided by the California Department of Water Resources.

Los Angeles Department of Water and Power: The 2010 Owens Valley Land Management Plan (Los Angeles Department of Water and Power and Sciences 2010) describes major management actions for Los Angeles Department of Water and Power lands covered by the plan. Goals include: continued water supply to Los Angeles, sustainable land management practices for agriculture and other resource uses such as livestock grazing, continued recreation opportunities on city-owned lands such as fishing, camping, and off-highway vehicle use, improved biodiversity and ecosystem health, and protected and enhanced habitat for threatened and endangered species.

Species Effects Matrix

The following matrix (Table 12) displays the primary forest programs and activities that may adversely affect analyzed species.

Table 12. Matrix of programs and activities that may affect species

Species	Fire Mgmt	Veg & Fuels Mgmt	Range Mgmt	Recreation Mgmt	Restoration Activities	Roads / Infra-structure
Sierra Nevada Bighorn Sheep	X	X	X	X		
Mountain Yellow-legged frog, Northern DPS	X	X	X	X	X	X
Sierra Nevada Yellow-legged Frog	X	X	X	X	X	X
Yosemite Toad	X	X	X	X	X	X
Lahontan Cutthroat Trout	X	X	X	X	X	X
Paiute Cutthroat Trout	X		X	X	X	
Owens Tui Chub	X	X		X	X	
Whitebark Pine	X	X	X	X	X	X

Sierra Nevada Bighorn Sheep and Critical Habitat

The Sierra Nevada Bighorn Sheep Recovery Plan (United States Department of the Interior 2004, 2007), the 5-Year Review (United States Department of the Interior 2008c) and the 2014 and 2010 annual reports from the California Department of Fish and Wildlife (Runcie et al. 2015, Stephenson et al. 2012) describes key habitat, life history requirements, distribution and threats compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

Classification, Critical Habitat and Recovery Plan

The Sierra Nevada DPS of California bighorn sheep was listed as an endangered species on January 3, 2000, following emergency listing on April 20, 1999 (United States Department of the Interior 1999, 2000). At the time of the emergency listing, the population was thought to total no more than 125 animals distributed across five separate areas of the southern and central Sierra Nevada (United States Department of the Interior 2000). The Sierra Nevada DPS of the California bighorn sheep (*Ovis canadensis californiana*) was classified as its own Sierra Nevada bighorn sheep subspecies (*Ovis canadensis sierrae*) in 2005 (Wehausen, Bleich, and Ramey II 2005). In 2008 the taxonomic name change to the Sierra Nevada Bighorn sheep (*Ovis canadensis sierra)* was officially recognized (United States Department of the Interior 2008a).

In 2008, the USFWS designated approximately 417,577 acres of critical habitat for this species in Tuolumne, Mono, Fresno, Inyo and Tulare Counties (United States Department of the Interior 2008a). Critical habitat includes 12 herd units within the recovery area on portions of the Humboldt-Toiyabe, Inyo, and Sierra National Forests and in Yosemite, Sequoia, and Kings Canyon National Parks. Ten of these herd units occur on the Inyo NF as shown in Figure 5 and Figure 6 and listed in Table 13. Of these ten herd units, 75 percent, approximately 278,805 acres, occur on the Inyo NF. The majority of the remaining portions of the herd units occurs in designated wilderness managed by the National Park Service. On the Inyo NF, 94 percent, approximately 262,948 acres, occurs with designated wilderness and much of the remaining acres occur in adjacent inventoried roadless areas.

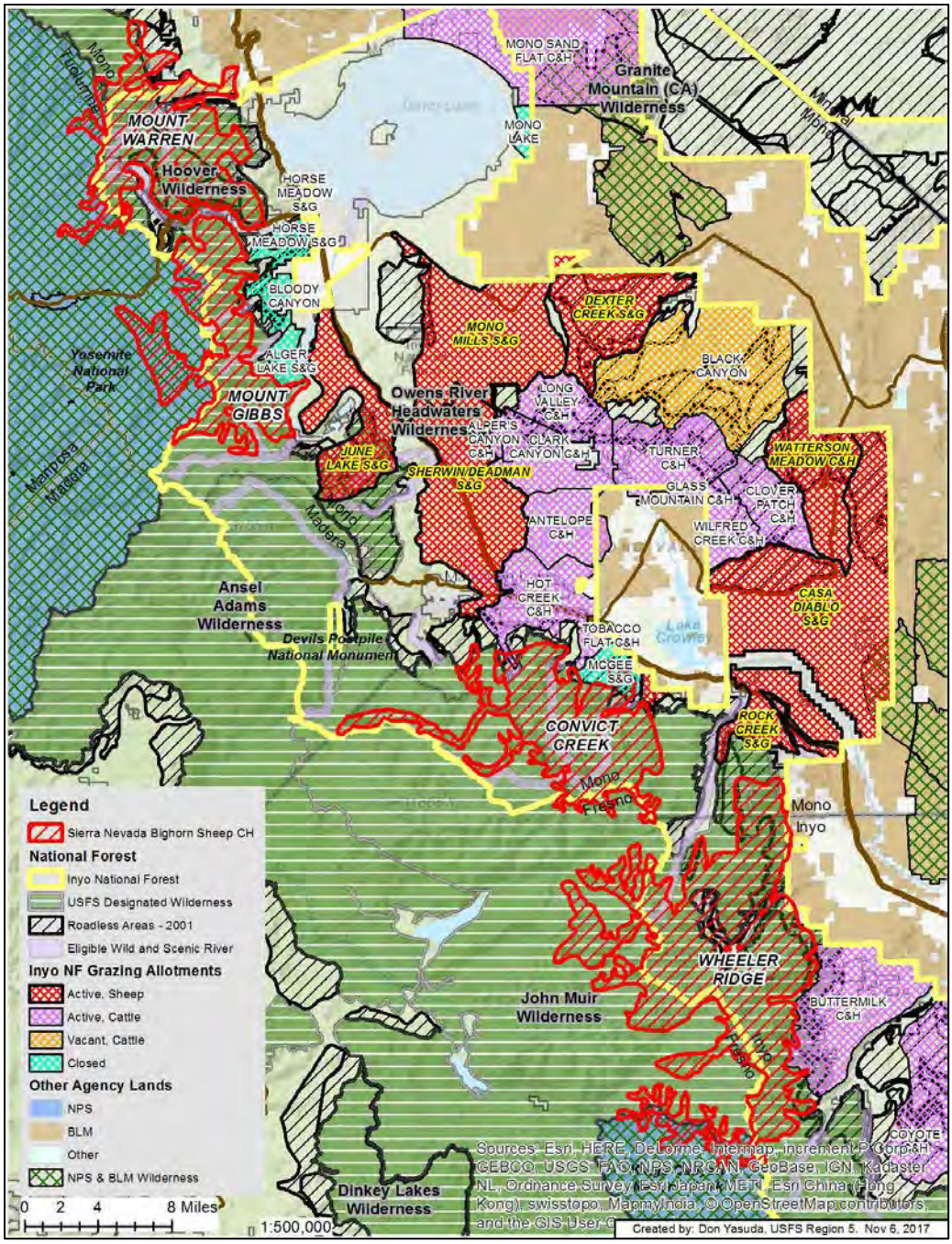

Figure 5. Critical habitat herd units for Sierra Nevada bighorn sheep and livestock grazing allotments, north half of Inyo National Forest

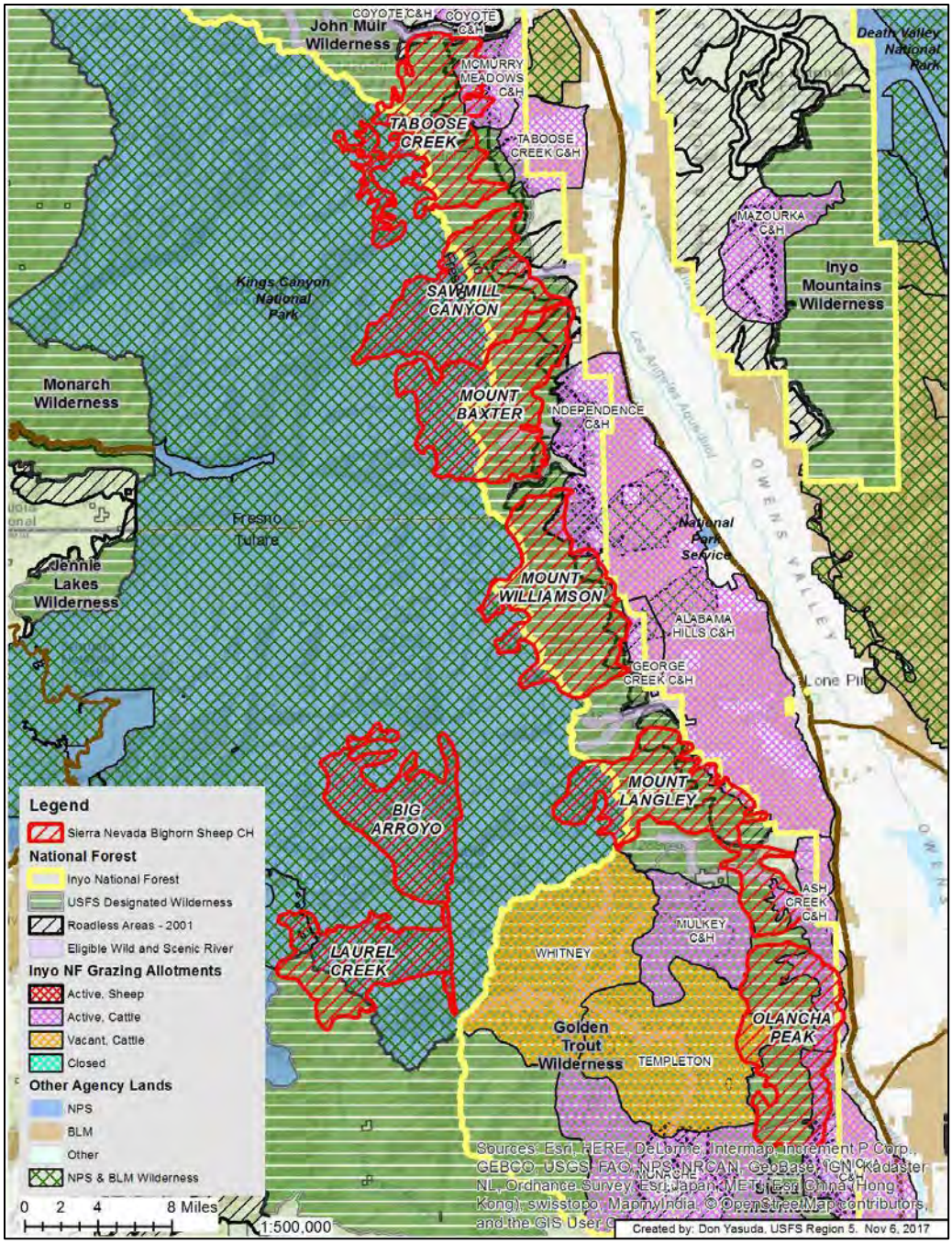

Figure 6. Critical habitat herd units for Sierra Nevada bighorn sheep and livestock grazing allotments, south half of Inyo National Forest

Table 13. Acres of Sierra Nevada bighorn sheep critical habitat herd units in wilderness and total acres on the Inyo National Forest

Herd Unit Number	Herd Unit Name	Recovery Unit	Total Herd Unit Acres	Total Herd Unit Acres, Inyo NF	Total Herd Unit Acres, Inyo NF Wilderness
1	Mt. Warren	Northern	36,005	27,474	23,483
2	Mt. Gibbs	Northern	29,698	21,134	20,425
3	Convict Creek	Central	36,519	35,042	32,240
4	Wheeler Ridge	Central	80,985	55,981	51,449
5	Taboose Creek	Southern	28,816	21,644	21,036
6	Sawmill Canyon	Southern	30,521	13,470	13,028
7	Mt. Baxter	Southern	32,234	18,851	18,621
8	Mt. Williamson	Southern	32,576	28,427	27,981
10	Mt. Langley	Southern	32,862	26,693	24,982
12	Olancha Peak	Southern	30,438	30,089	29,703

The USFWS, in identifying critical habitat, also identified primary constituent elements (PCEs), which are physical or biological features considered essential to the conservation of the species and that may require special management considerations or protection (United States Department of the Interior 2008a). Relevant to management on the Inyo NF, these include:

- Non-forested habitats or forest opening within the Sierra Nevada from 4,000 feet to 14,500 feet in elevation with steep (greater than or equal to 60 percent slope), rocky slopes that provide for foraging, mating, lambing, predator avoidance, and bedding as well as seasonal elevation movements between these areas.
- Presence of a variety of forage plants as indicated by the presence of grasses (e.g., *Achnanthera* spp.*; Elymus* spp.) and browse (e.g., *Purshia* spp.) in winter, and grasses, browse, sedges (e.g.. *Carex* spp.) and forbs (e.g., *Eriogonum* spp.) in summer.
- Presence of granite outcroppings containing minerals such as sodium, calcium, iron, and phosphorus that could be used as mineral licks in order to meet nutritional needs.

The Final Recovery Plan for Sierra Nevada Bighorn Sheep was completed in 2007 (United States Department of the Interior 2007). The recovery area for Sierra bighorn includes four Recovery Units: Northern, Central, Southern, and Kern. Within these Recovery Units there are sixteen herd units, and the Inyo NF contains portions of 10 herds as shown in Table 13.

The Recovery Plan identifies several Recovery Actions that are relevant to management on the Inyo NF:

Task 1. Protect bighorn sheep habitat.

> Task 1.2. Maintain and/or enhance integrity of bighorn sheep habitat. Habitat integrity could be compromised by fire suppression that affects vegetation succession (see Task 2.2.3), or a variety of human uses (see Task 2.4).

Task 2. Increase population growth by enhancing survivorship and reproductive output of bighorn sheep.

Task 2.1. Prepare and implement a management plan to temporarily protect Sierra Nevada bighorn sheep herds from predation losses, where needed, until viable herd sizes are reached.

Task 2.2. Increase use of low elevation winter ranges.

Task 2.2.1 Reduce influences of predation on winter habitat selection by Sierra Nevada bighorn sheep.

Task 2.2.3 Enhance bighorn sheep winter range habitat to increase visibility where appropriate.

Task 2.3. Minimize probability of bighorn sheep contracting diseases causing mortality and morbidity.

Task 2.3.1. Prevent contact between bighorn sheep and domestic sheep or goats.

Task 2.4. Manage human use locally where it is found to cause bighorn sheep to avoid important habitat and thereby compromises survivorship or reproductive success.

Task 6. Initiate or continue needed research.

Task 6.4. Investigate and analyze human use patterns relative to habitat use patterns of bighorn sheep.

Task 7. Engage in public outreach and sharing of information.

Task 7.2. Develop and distribute information related to recovery efforts.

Habitat and Life History

Optimal habitat is visually open and contains steep, generally rocky slopes that provide for detection of predators. Sierra Nevada bighorn sheep generally avoid dense forests and thick brush, which tend to increase susceptibility to predation, but will use open woodland habitats on rocky slopes (United States Department of the Interior 2008d). They use a wide range of elevations, from alpine peaks in excess of 13,000 feet to the base of the eastern escarpment as low as 4,000 feet (United States Department of the Interior 2008a). The species uses a wide variety of vegetation communities, including: (1) Great Basin sagebrush-bitterbrush-bunchgrass scrub; (2) pinyon-juniper woodland and mountain mahogany scrub; (3) mid-elevation and subalpine forests, woodlands, and meadows; and (4) alpine meadows and other alpine habitats varying from cliffs to plateaus (United States Department of the Interior 2008a). In winter, they occupy high, windswept ridges, if weather conditions allow, or migrate to the lower elevation sagebrush-steppe habitat (United States Department of the Interior 2008a). Both sexes utilize the same breeding and winter ranges, but in summer females use alpine environments along the Sierra Nevada crest and males are often found at lower elevations in subalpine habitats (United States Department of the Interior 2008a).

Bighorn sheep tend to live in groups, which allow for more visual awareness of predators. Bighorn sheep are primarily diurnal and daily activity can show some predictable patterns that consist of feeding and resting periods. Nights are spent on rocky slopes, but feeding activities may occur short distances away from rocky escape terrain. This distance to escape terrain can be influenced by visual openness of vegetation or weather, wind, gender, season and abundance of predators (United States Department of the Interior 2007). Birthing season begins at the end of April and extends through early July, with most of the births occurring in May and June (United States Department of the Interior 2007).

Historic and Current Distribution

Historically, Sierra Nevada bighorn sheep were once scattered along, and east of, the alpine crest of the Sierra Nevada from the Sonora Pass area south to Olancha Peak. They also occurred in similar habitat west of the Kern River as far south as Maggie Mountain, with concentrated use in the regions of Mineral King, Big Arroyo, and Red Spur. Of the 16 areas in the Sierra Nevada that likely had separate bighorn sheep herds, only nine are known to have persisted to the beginning of the twentieth century (United States Department of the Interior 2007). Sierra Nevada bighorn sheep persisted in only two areas in the Sierra Nevada by the 1970s, constituting three herds (Wehausen 1980). These included the Mount Baxter, Sawmill Canyon, and Mt. Williamson herds. Because of the large population size and productivity, the Mt. Baxter and Sawmill Canyon herds were used as sources of reintroduction stock beginning in 1979, with subsequent translocations in 1980, 1982, 1986, 1987, and 1988. Those sheep were used to reestablish populations at Wheeler Ridge, Mt. Langley, and Lee Vining Canyon. Since listing, Sierra Nevada bighorn sheep have been introduced and populations augmented into the Mt. Warren and Mt. Baxter herd units.

Currently, Sierra Nevada bighorn sheep occur in the Mt. Warren and Mt. Gibbs herd units of the Northern Recovery Unit; Convict Creek and Wheeler Ridge herd units of the Central Recovery Unit in Inyo and Sierra National Forests; and Taboose Creek, Sawmill Canyon, Mt. Baxter, Mt. Williamson, Bubbs Creek, Mt. Langley and Olancha Peak herd units in the Southern Recovery Unit in Mono and Inyo Counties (Runcie et al. 2015). In the summer, animals from the Convict Creek and Wheeler Ridge area use summer range on both the Sierra NF and Inyo NF. Both of these populations use high elevations along the Sierra Nevada crest during the spring through fall and migrate east into the Inyo NF to lower elevation winter ranges.

Natural colonization and range expansion has occurred in the Bubbs Creek area, a non-essential herd unit, and the Convict Creek herd unit. Sierra Nevada bighorn sheep from the Mt. Williamson and Mt. Baxter herd units occupied the Bubbs Creek area in 2002. In 2011 three adult ewes, three lambs, and a yearling ram were observed on Esha Peak in the Convict Creek herd unit (Stephenson et al. 2012). Evidence of range expansion in the Sawmill Canyon herd has also been documented. In 2009, one collared ewe moved north over Taboose Pass into the Taboose Creek herd unit. Since that time the CDFW has observed several animals in this herd unit and believe that natural colonization is occurring between this herd unit and the Taboose Creek herd unit (Runcie et al. 2015). Two bighorn sheep were observed in the Coyote Ridge herd unit, a non-essential herd unit, in 2009, but further use of this area by bighorn sheep has not been observed (Stephenson et al. 2012).

Translocations have been implemented over the last several years and have led to the expansion of Sierra bighorn sheep within the recovery area (Runcie et al. 2015). In 2013, fourteen bighorn (10 ewes and 4 rams) were introduced into the Olancha Peak herd unit. This population was augmented with several rams in 2014. Also in 2014, ewes and rams were introduced into the Big Arroyo herd unit in Sequoia and Kings Canyon National Parks. Introductions occurred in the spring of 2015 into the Laurel Creek herd unit and the Cathedral Range herd unit, a new area within the Northern Recovery Unit in Yosemite National Park. With these introductions and the natural colonization of the Taboose Creek herd unit, 14 herd units are occupied by Sierra Nevada bighorn sheep, meeting the distribution requirements identified in the Recovery Plan (Runcie et al. 2015).

Population and Habitat Status and Trends

The total population of bighorn sheep in the Sierra Nevada prior to settlement is unknown, but it probably exceeded 1,000 individuals (United States Department of the Interior 2007). At the time of emergency endangered listing in the spring of 1999, a minimum of 117 sheep could be accounted for. Bighorn numbers have increased dramatically in the Sierra Nevada since the time of the listing. At the time the Recovery Plan was written the population was projected at 325 to 350 individuals (United States Department of the Interior 2008a). The 2010-2011 Annual Report of the Sierra Nevada Bighorn Sheep Recovery Program: A Decade in Review reported that the population as of 2012 was above 400 bighorn sheep and had expanded into ten of the twelve essential herd units needed for recovery (Stephenson et al. 2012). Reproduction and recruitment in the two largest herds, Wheeler Ridge and Mt. Langley, have declined with increasing population size, suggesting that density-dependent mechanisms may affect small endangered populations (Stephenson et al. 2012). The static population decline at Wheeler Ridge in the early 2000s may also reflect emigration events leading to natural colonization of adjacent habitat (Stephenson et al. 2012). Recent population estimate shows the population climbing over 600 animals and range expansion into all twelve essential herd units (Runcie et al. 2015).

The vast majority of the herd units are comprised of the alpine and subalpine vegetation type with smaller amounts of other vegetation types as shown in Table 14.

Table 14. Acres of vegetation types within Sierra Nevada bighorn sheep critical habitat herd units

Herd Unit Name	Alpine and Subalpine	Mountain Mahogany	Conifer	Pinyon-juniper, Sagebrush, Xeric Shrubs	Lake and Other
Mt. Warren	21,961	1,917	1,310	2,007	279
Mt. Gibbs	17,386	953	1,503	943	350
Convict Creek	23,776	1,459	1,337	7,031	1,440
Wheeler Ridge	41,789	5,541	673	6,581	1,397
Taboose Creek	11,108	4,949	282	4,920	384
Sawmill Canyon	6,522	1,710	2,756	2,423	59
Mt. Baxter	10,982	2,695	2,459	2,538	177
Mt. Williamson	16,910	3,166	1,465	6,704	181
Mt. Langley	13,010	1,914	1,325	10,401	42
Olancha Peak	5,943	689	6,060	17,247	149

Due to the rocky and harsh conditions, the alpine and subalpine vegetation types are still largely similar to the expected natural range of variation with some increases in small tree densities as a result of fire suppression (Meyer 2013b). However, an evaluation of climate envelopes suggests that there is a high climate vulnerability of subalpine forests by the end of the century which could result in increased vegetation impacts from future wildfires and from increased tree mortality from insects (mountain pine beetle) and disease (white pine blister rust) (Meyer 2013b). There is the potential that these stressors on vegetation could benefit bighorn sheep by reducing vegetation density and improving visibility of predators but changes to forage plants could also occur.

Threats

The Recovery Plan and 5-Year Review evaluated the five reasons for listing and determined that two were not substantial or a reason for listing: the present or threatened destruction, modification, or curtailment of its habitat or range, and overutilization for commercial, recreational, scientific, or educational purposes. The remaining three are discussed below:

Disease or Predation

The CDFW reported that predation and stochastic weather events such as avalanches account for much of the spatial and temporal variation in survival rates (Stephenson et al. 2012). They identified mountain lion predation as a significant cause of ewe mortality in the Southern Recovery Unit, but avalanche is the most significant natural cause of ewe mortality in the Central and Northern Recovery Unit. Predator management is within the authority of the CDFW and the Inyo NF coordinates and cooperates with the CDFW and USDA Wildlife Services to support efforts to manage the predation risks to Sierra Nevada bighorn sheep. These agencies, not the Forest Service, would be the primary agents to evaluate and take action on managing predators to Sierra Nevada bighorn sheep.

The main mortality factors for Sierra bighorn include diseases and parasitism and predation. Numerous diseases of bighorn sheep have been documented (Bunch et al. 1999), of which pneumonia and psoroptic scabies have had the greatest population-level effects. Bighorn sheep show a high susceptibility to pneumonia, usually caused by bacteria *Mycoplasma ovipneumoniae*. Just recently researchers have learned that the bacteria *M. ovipneumoniae* influences the immune system, allowing secondary infections, like *Mannheimia haemolytica* to destroy lung tissues and often, lead to morality (Besser et al. 2008, Besser et al. 2014). The greatest risk of disease transmission is between bighorn sheep and domestic sheep and goats, which are carriers of Pasteurella-family bacteria. The potential for the transfer of disease from domestic sheep to bighorn sheep was a key factor in the endangered species listing (United States Department of the Interior 2000).

The Inyo NF has coordinated with the USFWS and the CDFW to vacate, close, or not authorized domestic sheep or goat grazing within the high risk area identified by Clifford et al (2009) using a risk assessment model. These existing forest actions have minimized the risk of disease transmission in the high risk area from authorized livestock grazing. Despite this reduction in risk on the National Forest System lands, the risk of disease transmission has remained high in some areas due to domestic sheep grazing on private lands adjacent to low elevation winter ranges in the Northern Recovery Unit and Central Recovery Unit (Runcie et al. 2015). However, in 2017, with input from the USFWS and the CDFW, the Mono County Board of Supervisors voted to not re-issue a sheep grazing lease on the Conway and Mattly Ranches when it expires in November 2017.

Although there is no goat grazing within authorized allotments, recreational pack goat use is currently allowed on the Inyo NF but actual use is believed to be very low. Between 2000 and 2008 there were temporary or annual forest orders issued to restrict recreational pack goat use and free-running domestic dogs within identified areas within the bighorn sheep range. In coordination with the USFWS and the CDFW, these forest orders were allowed to expire in 2008 and analysis of management alternatives for recreational pack goat use is pending a new project analysis that has been contemplated but not initiated to date. To better track goat packing, the Inyo NF added a new category in the wilderness permitting process used by visitors. Under the section titled “number of stock” a new category for pack goat use was added in 2012. Since 2014,

one to two permits are issued annually for July and August. The trails used all differ as does the ratio of people to goats but the average is 2 people and 2 goats which suggests a low use and no pattern of concentration or regular annual use. Although there is potential for error in this electronic tracking process, the low number of reported use is consistent with the overall understanding of visitors with pack goats by forest staff. Furthermore, the Inyo NF has no records of pack goat contact with bighorn sheep. The forest is continuing to better understand the recreational demand for pack goat use and determine the area and amount of use by pack goat visitors by working closely with user groups and organizations such as the North American Packgoat Association.

In the Sierra Nevada, mountain lions have been identified as the primary predator of bighorn sheep, accounting for 96 percent of losses attributed to predation (United States Department of the Interior 2007). Mountain lion predation of bighorn sheep on winter ranges has accounted for the majority of documented mortalities since the 1970s. This predation increased from the 1970s to the 1980s and is postulated as the cause of a coincident and marked decrease in winter range use by Sierra Nevada bighorn sheep (Wehausen 1996). Subsequent population declines have been attributed to this change in winter habitat selection. Mountain lion predation was one of the listing factors (United States Department of the Interior 2000). The CDFW has the primary responsibility for managing mountain lions and has implemented an adaptive management strategy with regard to mountain lion predation. Since listing in 1999, the CDFW, working with USDA Wildlife Services, has selectively removed mountain lions that preyed on bighorn sheep in the Central and Southern Recovery Units (Stephenson et al. 2012). The CDFW believes this has lessened the pressure on bighorn sheep populations in these recovery units (Stephenson et al. 2012).

The Inadequacy of Existing Regulatory Mechanisms

A California mountain sheep zoological area was identified in the 1988 Inyo NF forest plan within the Mount Baker and Mount Williamson Herd Units and was managed under a forest order prohibiting possession, transporting, or storing domestic goats and restricting recreational use within the zoological area. In 2011, the Inyo NF coordinated with the USFWS and CDFW and came to an agreement to officially stop issuing a forest order restricting recreational use from this area and since this area no longer had specific management direction it ceased being managed as a zoological area.

Numerous efforts to conserve bighorn sheep in the Sierra Nevada have occurred in recent decades including continued research, translocations to augment and re-establish herd units, establishing the Sierra Nevada Bighorn Sheep Interagency Advisory Group, and predator management. However, a regulatory inadequacy identified at the time of developing the recovery plan, was the inability of the Forest Service to eliminate or reduce the threat of contact between domestic sheep and Sierra Nevada bighorn sheep.

Other Natural or Manmade Factors

At the time of its listing, the Sierra Nevada bighorn sheep population was very small and limited in geographic distribution. The threats of random naturally occurring population fluctuations and loss of genetic variation resulting from small population size contribute to the vulnerability to extinction.

Analysis of Effects

For Sierra Nevada bighorn sheep, the baseline environmental condition includes past project-level decisions, made in coordination with the USFWS and CDFW, that vacated, closed, or changed annual operations on domestic sheep grazing allotments in areas of high risk of contact between domestic sheep and bighorn sheep.

The current forest plan includes seven items that apply to Sierra Nevada bighorn sheep but does not clearly differentiate the plan direction into specific types of plan components and includes some overlap between items. The Proposed Action replaces and strengthens these plan components for bighorn sheep with clearer and broader plan components designed to better describe the plan's contribution to the species' recovery. The Proposed Action includes two desired conditions, one goal, two standards, and one potential management approach specific to Sierra Nevada bighorn sheep. In addition, there are two overarching relevant goals that apply to all at-risk species. A summary crosswalk of plan direction for bighorn sheep is found in Appendix B – Plan Components.

Indirect Effects

To address the concern about small populations, the Proposed Action includes a potential management approach for Bighorn Sheep which expresses the intent to expand the area occupied by bighorn sheep, *"[i]f reintroduced bighorn sheep establish themselves in drainages outside the reintroduction sites, take advantage of opportunities to extend bighorn sheep range, consistent with other resource activities."* The plan also includes a desired condition, SPEC-SHP-DC-01 that better describes the need for the forest to provide *"[a]n adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range within mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches."* The amount is left unspecified to allow for future population expansion beyond the current critical habitat and current herd units. Projects and activities within the range of bighorn sheep on the Inyo NF would be designed to maintain, move towards, or not preclude attaining this desired condition. This will contribute to **Recovery Task 1.2**, to maintain and/or enhance integrity of bighorn sheep habitat.

The following program areas include actions guided by the forest plan that could potentially affect Sierra Nevada bighorn sheep: Fire Management, Vegetation and Fuels Management, Range Management, and Recreation Management. The following program areas are not expected to affect this species because of the remote locations where this species lives: Restoration Activities and Roads and Other Infrastructure.

Fire Management

Wildfires will continue to burn across the Inyo NF and they will continue to be actively managed using a range of fire management responses. During emergency response to wildfires, the Forest Service will initiate emergency consultation in accordance with the section 7 implementation regulations as outlined in 50 CFR §402 where suitable habitat or known occurrences are present.

The Proposed Action aims to manage more naturally ignited wildfires where and when it can do so safely and where the expected fire effects are likely to provide a positive benefit to resources. As wildfires are managed for resource benefits, it is likely that there will be longer periods of human activity when monitoring or managing the fire, but with less intensity than if full suppression actions

occur. Human presence related to monitoring wildfires or taking limited suppression actions would be expected to occur and could disturb and displace individual Sierra Nevada bighorn sheep in areas around active fires. In addition, aircraft reconnaissance or aerial firefighting actions may be associated with fire management activities, although landing of helicopters and low-level flights are more restricted within and over designated wilderness areas and the use of aerial retardants in wilderness areas is generally limited to protecting immediate threats to life and property. Resource Advisors would consider the timing of activities related to life history cycles such as lambing when advising fire managers on the effects of actions and potential mitigations to consider.

Over time if more wildfires are managed to restore the patchy distribution of fires, it's expected that the opportunities to manage more wildfires will increase as new fire ignitions have areas with lower fuels surrounding them. To the extent this occurs, the magnitude and intensity of firefighters needed to manage these fires may decrease which would lower the exposure to disturbance.

Vegetation and Fuels Management

The 5-Year Review identified a concern for degraded vegetation condition in the winter range due in part to a history of fire suppression. It is thought that reductions in winter range habitat quality, possibly amplified by other factors like mountain lion predation, may limit population growth and increase mortality for Sierra Nevada bighorn sheep. This may be especially true in harsher winters when bighorn sheep remain in high elevation ranges instead of migrating to lower elevation winter range.

The desired condition for bighorn sheep (SPEC-SHP-DC-01) recognizes "*[a]n adequate amount of suitable habitat…*" "*throughout the elevational range*" that meets "*different seasonal needs for each sex*". This would include providing adequate winter range habitat. To date, although prescribed burning to improve conditions within bighorn sheep winter range has occurred, a list of specific areas for prescribed burning or restoring fire to benefit bighorn sheep has not been identified by the Forest Service, USFWS, or CDFW. As areas are identified and if prescribed fire projects are proposed, SPEC-SHP-DC-01 along with forestwide desired condition for Animal and Plant species (SPEC-FW-DC-03) would guide their design to "*…maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction.*" As needed, standard SPEC-FW-STD-01 requires additional project constraints such as "*[d]esign features, mitigation, and project timing considerations*" to reduce adverse impacts to bighorn sheep to be "*incorporated into projects that may affect occupied habitat for at-risk species.*" The forest would use the goal SPEC-FW-GOAL-03 to work with the CDFW and USFWS to identify areas where prescribed fire would benefit winter range. This will contribute to **Recovery Task 1.2**, to maintain and/or enhance integrity of bighorn sheep habitat, and **Recovery Task 2.2.3**, to enhance bighorn sheep winter range habitat to increase visibility where appropriate.

There could be some disturbance to individual animals from prescribed fire management activities, but any adverse effects from those activities would be mitigated during project level decision-making that would require compliance with Section 7 of the ESA.

Range Management

As described above, the Inyo NF has worked with the USFWS and CDFW to evaluate the risk of contact between bighorn sheep and authorized domestic sheep grazing using a risk assessment model (Clifford et al. 2009). Considering the risk assessement for livestock and bighorn sheep

contact and disease spread, the Inyo NF made site-specific decisions to close portions of active livestock grazing allotments west of Highway 395 to domestic sheep grazing where there was an identified high risk of contact.

Although this minimization of contact within the areas identified as high risk is part of the environmental baseline, the Proposed Action includes plan direction to support continuing to manage to minimize the risk of contact if conditions change. A desired condition for bighorn sheep (SPEC-SHP-DC-02) directly addresses this by describing a desired condition that *"[t]he risk of disease transmission from domestic* sheep *and goats to bighorn sheep (based upon the best available risk assessment model) is reduced to the maximum extent practicable."* An associated standard (SPEC-SHP-STD-01) specifically directs *"[d]o not allow domestic sheep or goat grazing or pack goat use adjacent to bighorn sheep populations where relevant bighorn sheep risk assessment models show there is a high risk of contact and spread of disease, unless risks can be adequately mitigated."*

There is a concern about domestic sheep that escape from adjacent lands and wander in trespass onto the Inyo NF and present a risk of disease contact with Sierra Nevada bighorn sheep. The Forest Service has existing regulations and policies that would be used to address trespass livestock, which includes procedures to remove trespass animals when they are made known to the Inyo NF. Two additional goals would be used to increase the awareness of the risk of disease spread and importance of notifying officials when trespass livestock are discovered within the Sierra Nevada bighorn sheep range. SPEC-FW-GOAL-01 would focus on cooperating with "*…partners and private landowners to encourage resource protection … across ownership boundaries*" and SPEC-FW-GOAL-03 would focus on ensuring the CDFW and USFWS are aware of the procedures to report trespass livestock to the Inyo NF. The desired condition SPEC-FW-DC-05 supports continuing to develop and distribute appropriate educational material to local residents and visitors about Sierra Nevada bighorn sheep and the actions needed to protect them and supports **Recovery Task 7.2**.

There is also a concern for disease spread from domestic goats. Although there are no livestock grazing allotments that permit domestic goats on the Inyo NF, there is currently a limited amount of recreational pack goat use that occurs. Since recreational pack goats are typically under close control of their handlers, the risk of contact with bighorn sheep is unknown but expected to currently be low. To address the risk of pack goat use, the Proposed Action includes a goal (SPEC-SHP-GOAL-01) which expresses the intent to *"[c]oordinate with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service to conduct a risk assessment of pack goat use on the Inyo National Forest and develop mitigations strategies to manage the risk of disease transmission, if needed."* If upon completion of the risk assessment, risk mitigation actions are needed, the same standard as described above (SPEC-SHP-STD-01) would require that pack goat use would not be allowed or the risks would be mitigated in any areas having high risk of disease transmission. This contributes to **Recovery Task 2.3.1** to prevent contact between bighorn sheep and domestic sheep or goats.

Recreation Management

Other than fire management, habitat within wilderness areas will remain essentially undisturbed by management activity (DA-WILD-DC-01), but Sierra Nevada bighorn sheep may be exposed to periodic, low-level, dispersed wilderness travel by individuals and small groups of hikers primarily on trails that could disturb or displace individuals. Give the rocky nature of these wilderness areas, some off-trail dispersed recreation uses, such as cross-country travel, overnight camping, and climbing on rock faces, may create disturbance for some bighorn sheep individuals, but such activity

is ephemeral and limited in extent, thus not anticipated to be a major adverse impact on population viability. A standard (SPEC-SHP-STD-02) was developed to *"[m]anage recreation, or other disturbances, where research has found it to cause Sierra Nevada bighorn sheep to avoid important habitat as described in the Sierra Nevada Bighorn Sheep Recovery Plan or other guidance from the U.S. Fish and Wildlife Service."* If areas of concern are identified, the Inyo NF will coordinate with the USFWS and CDFW to determine the studies that should be conducted as described by **Recovery Task 6.4**, to investigate and analyze human use patterns relative to habitat use patterns of bighorn sheep. If the research determines human uses are compromising survivorship or reproductive success, the forest plan guides the Inyo NF to conduct a site-specific analysis to evaluate actions to mitigate the disturbance, which could include regulating public uses as part of one or more alternative. Within wilderness, two desired conditions (DA-WILD-DC-08 and DA-WILD-DC-10) express that *"[t]rails in wilderness are located in resilient areas, and do not cause adverse impacts to at-risk species, water quality, soils, hydrologic connectivity or cultural resources"* and *"Resource impacts of user-created trails are reduced."* Such future analyses would be subject to Section 7 of the ESA and Forest Service policy and may require consultation with the USFWS if they may affect Sierra Nevada bighorn sheep. This will contribute to address **Recovery Task 2.4**, to manage human use locally where research finds human use is causing bighorn sheep to avoid important habitat which may compromise survivorship or reproductive success.

In addition, **Recovery Task 7.2** to develop and distribute information related to recovery efforts is supported by a conservation education related desired condition (VIPS-FW-DC-03) to have "*[i]nterpretation and conservation education materials and activities [that] convey up-to-date and clear messages about natural and cultural resources…*".

Effects to Critical Habitat

As described above, the majority of the designated critical habitat for the Sierra Nevada bighorn sheep is within the Inyo NF plan area, and most (94 percent) is within designated wilderness areas (see Figure 5 and Figure 6 and Table 13 above). Within designated wilderness, most active, ground-disturbing management, such as direct vegetation management, prescribed burning, and other habitat improvement is inconsistent with maintaining the wilderness character required by the Wilderness Act (DA-WILD-DC-01) of providing *"…untrammeled, natural, undeveloped"* qualities. Therefore, active ground-disturbing management activities is unlikely to be proposed within the majority of critical habitat. The desired condition for Sierra Nevada bighorn sheep habitat will primarily be attained through guiding decisions related to managing wildfires by considering the expected fire effects on habitats. A guideline (FIRE-FW-GDL-01) directs the Inyo NF to *"[u]se naturally ignited and prescribed wildland fires to meet multiple resource management objectives, where and when conditions permit and risk is within acceptable limits."* Within wilderness, a desired condition (DA-WILD-DC-03) is that *"[f]ire is restored as an ecosystem process and natural disturbance agent in wilderness where possible."*

The Proposed Action substantially improves the ability to consider the risks and benefits of wildfire to resources compared to the current forest plan. The Proposed Action identifies Strategic Fire Management Zones across the forest based upon the risks and benefits from wildland fire to highly valued resources and assets. The majority of the Sierra Nevada bighorn sheep habitat and critical habitat is located in the Wildfire Maintenance Zone and Wildfire Restoration Zone (See Figure 3). Fire management may have short-term effects but are expected to have minimal long-term adverse effects on suitable habitat considering the rugged rocky terrain favored by bighorn sheep. Fires in the bighorn sheep range are expected to occur infrequently, and are expected to mostly be small in size with mixed severity fire effects given the sparse fuel conditions. Fire intensity is also

expected to be highly variable in the subalpine zone with large higher severity fire patches usually limited in size to the matrix of clumpy forest and forested meadows.

In the Wildfire Maintenance Zone, most wildfires are expected to burn at a severity that would result in low risk to communities and generally positive benefits to resources under most weather conditions. The desired condition for this zone (MA-WMZ-DC-01) is *"[e]cosystems are resilient to the impacts of wildfire and wildland fire has predominantly positive benefits to ecosystems and resources."* A goal for this zone (MA-WMZ-GOAL-01) is to "*[m]anage wildfires to maintain fire resilient landscapes.*" Two standards encourage restoring fire to the landscape. One standard (MA-WMZ-STD-01) requires the responsible line officer to "*…document cases when naturally caused wildfires are promptly suppressed*" and another (MA-WMZ-STD-02) requires documentation when "*…natural barriers and features, such as creeks, old fire footprints, ridges, and man-made lines, such as roads and trails*" are not used to manage wildfires within the Wildfire Maintenance Zone. Providing for firefighter and public safety and practicality are considered when determining where fire management actions are planned. MA-WMZ-STD-02 is designed to minimize ground disturbing creation of new firelines to the extent possible which is further supported by standard FIRE-FW-STD-02 that in designated wilderness, fire management would "*[a]pply minimum impact strategies and tactics to manage wildland fire, unless more direct attack is needed to protect people or adjacent property.*"

In the Wildfire Restoration Zone, wildfires are expected to burn at a severity that would result in a low to moderate risk to communities and could have either positive benefits to resources or moderate risk to resources depending upon the weather conditions. The desired conditions for this zone (MA-WRZ-DC-01) is *"[t]he landscape is resilient to a range of fire effects, and wildland fire has a predominately positive benefit to ecosystems and resources."* A goal for this zone (MA-WRZ-GOAL-01) recognizes that some actions such as prescribed burning or fuels management may be needed to "*[c]reate fire resilient landscapes that can be restored and maintained by managing wildfire to meet resource objectives, and prescribed fire and fuel reduction treatments.*" Similar to the Wildfire Maintenance Zone, a standard (MA-WRZ-STD-01) requires documentation when "*…natural barriers and features like creeks, old fire footprints, ridges, and human-made features (such as roads and trails)*" are not used due to safety or practicality concerns.

Within these two Strategic Fire Management Zones, fires from natural sources such as lightning, would be evaluated to determine if they could be managed with less than a full fire suppression response, considering safety to firefighters and the public and potential positive and negative effects from expected fire behavior to various resources. A potential management approach for Fire describes our intent for making fire management decisions as: *"[w]hen determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season."* The location of designated critical habitat is included in these decision-support systems. Implementing these fire management approaches will contribute to **Recovery Task 1.2**, to maintain and/or enhance integrity of bighorn sheep habitat, and **Recovery Task 2.2.3**, to enhance bighorn sheep winter range habitat to increase visibility where appropriate.

Effects of use of managed wildland fire may have some ephemeral adverse effects, but the desired condition is to restore fire as a natural ecosystem process for the long-term benefit of this species and would provide for the primary constituent elements identified for critical habitat. Overall increasing

the amount of fire within the bighorn sheep range would generally be beneficial where it restores more open conditions and increases visibility and reduces hiding cover for predators.

Restoring fire to critical habitat or habitats used by Sierra Nevada bighorn sheep would be designed to protect or restore vegetation structure and composition that would sustain or improve the primary constituent elements within critical habitat and improve the condition of forage and cover outside of critical habitats. Prescribed fires are not likely to occur within wilderness areas, where most of the critical habitat occurs. Wildfire and prescribed burning in the winter range would have short-term effects to forage but would be expected to have longer term benefits by increasing visibility and potentially improving forage value.

Cumulative Effects

The cumulative effects analysis area for the Sierra Nevada bighorn sheep includes the area around critical habitat on the Inyo NF and adjacent non-federal lands that are used by Sierra Nevada bighorn sheep. This is an appropriate scale for determining cumulative effects since it includes all habitat potentially affected by implementing the Proposed Action. The cumulative effects time frame is 15 years into the future, which is the expected timeframe when the forest plan would be revised. The cumulative effects of all past non-federal actions are incorporated into the environmental baseline condition.

Some non-federal future actions, such as those identified in the overall Cumulative Effects Analysis section above, may affect this species and habitats in the plan area. The California Department of Fish and Wildlife conducts actions to help restore the Sierra Nevada bighorn sheep population throughout its range and as guided by the 2007 Recovery Plan. Specifically, the CDFW has and is expected to continue to conduct population surveys, evaluate and monitor mortality in bighorn sheep, and evaluate and implement translocation efforts as determined necessary to meet recovery plan distribution and population criteria.

The CDFW will also continue to evaluate and oversee the management of mountain lions that are affecting species recovery. A forest plan goal (SPEC-FW-GOAL-03) to *"[w]ork with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans"* would facilitate cooperation and support if those activities occur on National Forest System lands. Also, a desired condition (SPEC-FW-DC-03) describes the condition where *"[l]and management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction."* Supporting these activities will contribute to **Recovery Task 2.1**, to temporarily protect Sierra Nevada bighorn sheep herds from predation losses where needed and could support **Recovery Task 2.2.1**, to reduce influences of predation on winter habitat selection, if CDFW determines this action is necessary.

As a result of these efforts and natural range expansion, Sierra Nevada bighorn sheep, and their off-spring, will potentially expand into other areas of their range within the plan area. To the extent this occurs and bighorn sheep expand beyond the existing herd units, the forest plan includes a potential management approach to expand the bighorn sheep range and evaluate consistency with other resource activities.

As mentioned above, with input from the USFWS, Mono County has decided to not re-issue permits for domestic sheep grazing on county managed lands on the Conway and Mattly Ranches after they expire in November 2017. The cessation of domestic sheep grazing in this area will lessen the risk of disease transmission to individuals in the Mt. Warren herd, which have been radio collared coming in close proximity to these ranches. It will also lessen the risk of escaped animals from these operations wandering in trespass onto the Inyo NF. It is anticipated that the CDFW and USFWS will continue to evaluate the risk of disease transmission from domestic livestock grazing on other non-federal lands and work with landowners and managers to reduce the risk where possible.

Given these and other potential nonfederal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to Sierra Nevada bighorn sheep. All future project level activities that may affect this species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- A combination of ecosystem level plan components and species-specific plan components for bighorn sheep provide for the ecological conditions that would contribute to the recovery of the species.

- The forest plan includes direction to avoid, mitigate or minimize the risk of disease spread from domestic sheep and recreational pack goats but cannot eliminate the risk entirely.

- The forest plan includes direction to evaluate areas where recreation uses may be adversely affecting Sierra Nevada bighorn sheep. Nonetheless, individual animals are likely to be affected by short-term disturbance and displacement by human activities.

- Critical habitat within wilderness areas will remain essentially undisturbed by management activity and may be benefited by restoring the ecological role of fire. There is an opportunity to improve portions of the winter range with prescribed burning and restoring fire which could improve forage quality and maintain open conditions to reduce predation risk. This could have short-term effects on habitat leading to long-term benefits.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the Sierra Nevada bighorn sheep.

Because almost all critical habitat occurs in wilderness or inventoried roadless areas and this limits our management actions, we determined that adoption of the Proposed Action ***may affect and is likely to adversely affect designated critical habitats*** on the Inyo National Forest.

Effects Common to Aquatic Habitats and Species

The Proposed Action includes an aquatic and riparian conservation strategy that provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area. The management framework for aquatic and riparian conservation retains the essential elements of the existing management direction for riparian conservation areas. The riparian conservation areas provide guidance that applies for up to 300 feet on each side of all perennial streams and 150 feet on each side of seasonal flowing (intermittent and ephemeral) streams, as well as similar distances around lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs. This framework provides more emphasis on ecosystem restoration and focuses on improving hydrologic function in order to better enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

Although the Proposed Action does not continue to manage areas identified as critical aquatic refuges, it strengthened forestwide direction for watersheds and strengthened forestwide direction for at-risk animal and plant species and identifies large conservation watersheds with a goal of longer-term maintenance of watershed integrity and function. These comprehensive Watershed, Conservation Watershed, and Riparian Conservation Area measures help assure sustainable water quality, water temperatures and nutrient supplies by avoiding, minimizing, or mitigating ground disturbances and vegetation changes that could substantially affect aquatic and riparian conditions. See Appendix C – Plan Components for Aquatic and Riparian Ecosystems for a comparison of the current forest plan direction to the revised plan direction.

Five desired conditions for Watersheds provide a broad overarching framework for all projects that occur on the forest that could affect watershed conditions. They describe the ecological conditions met by: having "*…adequate quantity and timing of water flows*" to "*support aquatic species diversity and riparian vegetation*" (WTR-FW-DC-01); having water that has sufficient "*…biological, physical, and chemical integrity*" to support life history needs of aquatic species (WTR-FW-DC-02); and having "*…sediment regime within waterbodies ... within the natural range of variation*" (WTR-FW-DC-06). Fully functioning watersheds are recognized as a desired condition but WTR-FW-DC-03 also recognizes that some degraded watersheds should be managed so they will be "*…trending toward fully functioning and resilient*" and WTR-FW-DC-04 recognizes that riparian areas are also dependent upon healthy and resilient adjacent uplands. WTR-FW-DC-07 provides that stream diversions or flow modification sustain at-risk species even for smaller projects not regulated by the Federal Energy Regulatory Commission. A nested set of desired condition were developed for Riparian Conservation Areas to provide further guidance. A general set of desired conditions applies to the five different riparian conservation area types (perennial streams, seasonally flowing streams, streams in inner gorge, special aquatic features like lakes, springs, wet meadows, and bogs, and other hydrological or topographic depressions without a defined channel) and additional desired conditions are described for: Meadows; Rivers and Streams; Lakes, Pools and Ponds; and Springs and Seeps. These finer scale desired conditions provide additional detail about ecological conditions more specific to the individual type. In this hierarchy, the Watersheds desired conditions apply overall to the entire plan area, but within a meadow, the relevant direction for all Riparian Conservation Areas (those labeled MA-RCA-x) would also apply along with specific direction for Meadows (those labeled RCA-MEAD-x). These desired conditions would function to better ensure that future projects were designed to meet or move towards ecological conditions more likely to sustain the ecological function of aquatic systems and make them more resilient to stressors such as those influenced by climate change. A potential management approach for Riparian Conservation Areas expresses the intent to "*[d]etermine if stream characteristics are within the range of natural variation; if characteristics are outside the range of natural variation, restoration should be considered.*"

The Proposed Action provides direction related to avoiding, mitigating, and minimizing impacts to aquatic and riparian habitats. A broad Watersheds desired condition (WTR-FW-DC-05) recognizes the desire to have "*..minimal adverse effects to riparian and aquatic resources*" from infrastructure like "*…administrative sites, recreation facilities, and roads*". We anticipate that outside of wilderness there will be more acreage restored with upland, terrestrial vegetation management (e.g., tree and shrub thinning, tree removal to improve sagebrush ecosystems, and prescribed fire and managed wildfire) compared to the current forest plan. Some of these restoration projects could include mechanical ground disturbing silvicultural treatments, fuels treatments, hazard tree removal, salvage harvest, or commercial fuelwood cutting and may occur to a limited extent within conservation watersheds or riparian conservation areas. These restoration actions could result in localized and short-term increased amounts of soil disturbance, road use, and other disturbances but would be subject to the constraints of the standards and the guidelines designed to avoid, mitigate and minimize impacts. A combination of standards and guidelines provide project guidance on avoiding adverse impacts: to water temperature (MA-RCA-STD-01); to remove or mitigate barriers to restore connectivity or maintain barriers when needed to provide separation of species (MA-RCA-STD-04, MA-RCA-GDL-01); to limit impacts from contaminants (MA-RCA-STD-02, MA-RCA-STD-03); to protect individuals and habitats from water drafting (MA-RCA-STD-06, MA-RCA-STD-09); to limit disturbance to streambanks and shorelines (MA-RCA-STD-07); to limit new skid trails and temporary roads in riparian conservation areas (MA-RCA-STD-18); to limit recreation impacts (MA-RCA-GDL-02); and to provide for an equipment exclusion zone to limit soil impacts (MA-RCA-STD-15).

The desired condition for Rangeland Livestock Grazing recognizes the need for balance between wildlife and authorized livestock use and forage, browse, and cover to meet the needs of wildlife (RANG-FW-DC-02). Several standards and guidelines are designed to reduce impacts from livestock grazing in Riparian Conservation Areas by: requiring mitigation where livestock grazing is contributing to a decline in the function of riparian systems (MA-RCA-STD-12); evaluating and designing rangeland practices to ensure meadows, fens, and other special aquatic features are at or trending towards fully functional watershed condition (RANG-FW-GDL-05, MA-RCA-STD-13, MA-RCA-STD-14); locating or relocating livestock handling and operational facilities outside of meadows and riparian conservation areas wherever feasible (RANG-FW-STD-04, MA-RCA-STD-17, MA-RCA-GDL-03); limiting the amount of annual disturbance to streambanks and shorelines from livestock trampling and trailing (RANG-FW-STD-07); limiting the annual disturbance to fens (MA-RCA-STD-08); and including weed control and prevention measures in permits (INV-FW-GDL-04). Grazing has the potential to adversely affect aquatic species; however, these effects are addressed at the project level, and the grazing allotments identified as affecting the two cutthroat trout species have been consulted on and are governed by project-level biological opinions.

The Proposed Action strengthens and clarifies current direction regarding invasive species. It includes desired conditions that "*[t]errestrial and aquatic invasive species are controlled or eradicated when possible, and establishment of new populations is prevented*" (INV-FW-DC-01) and that "*[t]he area affected by invasive species and introduction of new invasive species is minimized*" (INV-FW-DC-02). The Proposed Action recognizes that managing invasive species usually requires collaborative action across ownership boundaries and has several goals to emphasize the need to coordinate and cooperate with other governmental agencies and Tribes to manage and control invasive species (INV-FW-GOAL-01, INV-FW-GOAL-02). There is also direction to coordinate to develop a non-native annual grass management strategy (INV-FW-GOAL-04) and work with research to better understand the potential effects of climate change on the spread of invasive and non-native species (INV-FW-GOAL-03). A set of standards and guidelines are developed: to address consideration of invasive species when planning projects (INV-FW-STD-03, INV-FW-GDL-01); to require cleaning

equipment to avoid spreading invasive species (INV-FW-STD-01); to use weed free materials in revegetation projects and for animal feed and bedding (INV-FW-STD-02, INV-FW-GDL-02); to use plant and seed material appropriate for the site to restore natural species composition (INV-FW-GDL-03); and considering the risk of invasive species spread into wilderness when designing projects (INV-FW-GDL-05).

The Proposed Action increases recognition and emphasis on managing fire to restore fire as an ecosystem element to the extent possible (FIRE-FW-DC-01, FIRE-FW-GDL-01) and recognizes that fire management activities are needed to maintain and protect habitats and increase ecosystem resilience (FIRE-FW-GOAL-01, FIRE-FW-GOAL-05) and a variety of tools should be considered (Potential Management Action for Fire). Emphasis would be placed on managing wildfires in the Wildfire Restoration Zone and Wildfire Maintenance Zone to meet resource objectives when safe and feasible. An important resource objective is to restore fire as an essential ecosystem component, to use fire to manage vegetation towards desired conditions, and to improve the overall sustainability of watershed conditions by creating conditions where processes function more similar to the natural range of variation. The benefit of restoring fire within riparian ecosystems is recognized (MA-RCA-DC-09, RCA-MEAD-DC-07, and FIRE-FW-GDL-04) along with the need to manage fire management activities, including the locations of incident camps, to limit direct impacts to riparian conservation areas (FIRE-FW-GDL-05, MA-RCA-GDL-04) and other sensitive habitats (Potential Management Approach for Fire) and minimize erosion and restore riparian areas and conservation watersheds in post-wildfire management activities (MA-RCA-STD-19). In some cases, vegetation management within and surrounding the riparian areas may be needed prior to using prescribed fire, in order to lessen the severity of fire effects and remain within the natural range of variation and have acceptable short-term impacts to riparian resources balanced with long-term benefits of improved ecological function (FIRE-FW-GDL-02).

In addition to the forestwide desired condition for providing habitat conditions that contribute to the survival, recovery, and delisting of federally listed species and preclude the need to list new species (SPEC-FW-DC-02), a desired condition is repeated for all Riparian Conservation Areas to emphasize the often unique ecological conditions of aquatic and riparian ecosystems that contribute to the recovery of federally listed species (MA-RCA-DC-02). These desired conditions, coupled with forestwide direction for Animal and Plant Species would ensure that projects that may affect aquatic habitats or listed species are designed to consider ecological conditions needed for federally listed species during project planning (SPEC-FW-STD-01). The forest plan also emphasizes the need to coordinate and collaborate with state fish and wildlife agencies to address aquatic species issues, including evaluating management and monitoring needs to address aquatic species requirements across ownership boundaries (MA-RCA-GOAL-01).

The Proposed Action increases the amount of meadow and riparian restoration over the current situation, with an emphasis on creating and maintaining ecosystem integrity and resilience (MA-RCA-OBJ-01 and RCA-MEAD-OBJ-01). Watershed restoration work is prioritized within Priority Watersheds identified using the Watershed Condition Framework process (WTR-FW-OBJ-01), within Conservation Watersheds (Potential management approach for Conservation Watersheds), and within other integrated restoration projects (MA-RCA-GDL-01, MA-RCA-GDL-02). Some of these restoration activities may be focused on areas where federally listed species occur.

The Proposed Action includes species specific plan direction similar to the current forest plan for Sierra Nevada yellow-legged frog, mountain yellow-legged frog, Yosemite toad, Lahontan

cutthroat trout, and Paiute cutthroat trout. These are discussed in the species specific analysis sections below and shown in Appendix B – Plan Components for At-risk Species.

The 2014 Sierra Nevada Amphibian Biological Opinion identified six conservation recommendations for the Sierra Nevada yellow-legged frog, northern DPS of the mountain yellow-legged frog, and the Yosemite toad (United States Department of Interior and Service 2015). The forest plan addresses these recommendations as described in Table 15 below.

Table 15. Forest plan direction for 2014 Sierra Nevada amphibians biological opinion conservation recommendations

2014 Conservation Recommendation	Forest Plan Direction
The Forest Service should continue their collaborative efforts to eliminate non-native trout from suitable habitat where they have been introduced within the ranges of the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad.	(SPEC-FW-GOAL-03) Work with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans. (INV-FW-GOAL-01) Coordinate and cooperate with local, State and Federal agencies and Tribes to manage and control invasive and nonnative species.
The Forest Service should assist the Service in implementing the Conservation Strategy, and when completed, the final recovery plan for the Sierra Nevada yellow-legged frog, Northern Distinct Population Segment of the mountain yellow-legged frog, and the Yosemite toad.	(SPEC-FW-GOAL-03) Work with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans.
The Forest Service should avoid land trades/sales of parcels of land that contain suitable habitat of the three amphibian species.	The Forest Service Manual 2670.5 identifies “any action involving the disposal of land that is essential to achieving recovery objectives” of a federally listed species as an “adverse effect” and would therefore require consultation with the USFWS prior to project-level decision-making. (FSM 2670.5, 2600-2005-1, effective Sept 23, 2005)
The Forest Service should implement management strategies that specifically protect and manage the three amphibian species.	(SPEC-FW-GDL-04) Habitat management objectives or goals from approved conservation strategies or agreements should be incorporated, if appropriate, in the design of projects that will occur within at-risk species habitat. (SPEC-FW-DC-02) Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern including addressing threats (e.g. minimal impacts from disease); and sustain both common and uncommon native species. (SPEC-FW-DC-03) Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction. (SPEC-FW-DC-04) The structure and function of the vegetation, aquatic and riparian system, and associated microclimate and smaller scale elements (like special features such as carbonate rock outcrops, fens, or pumice flats) exist in adequate quantities

2014 Conservation Recommendation	Forest Plan Direction
	within the capability of the plan area to provide habitat and refugia for at-risk species with restricted distributions.
Where recreation conflicts with the three amphibian species and area closures are not practicable, the Forest Service should complete on-site scientifically based Service-approved monitoring, and education for users.	(SPEC-FW-DC-03) Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction. (REC-FW-GOAL-02) Manage dispersed recreation activities when evidence of impacts to natural resources emerge or are causing damage. (REC-FW-GDL-01) Avoid locating new recreation facilities within environmentally and culturally sensitive areas, such as at-risk species breeding habitat or at-risk plant species habitat. (REC-FW-GDL-03) Use integrated resource planning when designing projects to address impacts to at-risk species habitat and changing conditions in recreation settings. (Sustainable Recreation Potential management approaches) • Redesign, restore, or rehabilitate recreation sites where recreation activities have caused unacceptable natural or cultural resource damage. • Use informational signs to inform the public on trail etiquette, wildlife awareness, and other responsible behaviors. • Use available technology, interpretive messages and interactions, and partnerships to educate national forest users and develop sustainable recreation opportunities that are focused on the long-term sustainability of the land, animals, fish, and plant species that support a healthy forest ecosystem.
The Forest Service should provide interpretive signs and other information to educate visitors about the three amphibian species.	(SPEC-FW-DC-06) Residents and visitors have ample opportunities to experience, appreciate, and learn about the Inyo National Forest's wildlife, fish, and plant resources. (VIPS-FW-DC-03) Interpretation and conservation education materials and activities convey up-to-date and clear messages about natural and cultural resources, climate change, land stewardship, responsible recreation use and etiquette, and Native American heritage and culture.

The collective and robust aquatic conservation measures provide for an improvement in stream and riparian habitat integrity. Despite implementing activities with protection measures to avoid impacts to aquatic species, some management, such as livestock grazing, road development, road uses, recreation uses, and vegetation and fire management, may result in localized adverse impacts to aquatic species and their habitats, similar to the current forest plan. However, the overall ecosystem and species desired conditions will benefit populations and habitats by improving ecological integrity of aquatic and riparian systems. Comprehensive conservation measures under the Proposed Action will help contribute to the recovery of federally listed aquatic species throughout the plan period by providing more emphasis on creating more resilient ecosystems and including guidance for project design to avoid, minimize, or mitigate project effects.

Mountain Yellow-legged frog and Sierra Nevada Yellow-legged Frog

The 2014 Mountain Yellow-legged Frog Conservation Assessment (Brown et al. 2014) describes in detail the current habitat, life history, and risk factors for this species and is the source for the following species information unless otherwise noted. Since this biological assessment was summarized from the Conservation Assessment; many of the original supporting literature citations contained in the Conservation Assessment are not repeated here. Much of literature was published prior to the classification split and addresses the species collectively as mountain yellow-legged frog. Because both species remain in the mountain yellow-legged frog complex, much of the data on the species complex is applicable to the following discussion for each species, although species details are noted where possible. Where possible, information relevant to the individual species is presented below; however, much of the information is from more widespread studies of populations and locations on the west side of the Sierra Nevada rather than those populations on the Inyo NF.

Planning watersheds have been identified by CDFW for these two species and are referred to as managements units. There are 18 managements units within lands administered by the Inyo NF, 16 for Sierra Nevada yellow-legged frogs and two for Mountain yellow-legged frogs (California Department of Fish and Wildlife 2016). Coordination between the Inyo NF, CDFW and USFWS on implementation of habitat expansion through non-native fish removal or ceasing stocking in non-self sustaining fisheries; translocation of frogs; and surveys of fish, frogs and disease surveillance is ongoing. While some fish removal sites result in successful amphibian reproduction and/or recruitment, some have failed, most likely due to heavy infections by disease.

Taxonomy Changes

The mountain yellow-legged frog was once thought to have four evolutionarily distinct lineages from the northern Sierra Nevada, central Sierra Nevada, southern Sierra Nevada, and southern California mountains (Macey et al. 2001). In 2007, the mountain yellow-legged frog in the Sierra Nevada was determined to constitute two species; Sierra Nevada yellow-legged frog (*Rana sierra*) north of the Kern River watershed and east of the Sierra Nevada crest and mountain yellow-legged frog (*Rana muscosa*) south of the Kern River watershed and west of the Sierra Nevada crest (Vredenburg et al. 2007). The USFWS accepted this taxonomic distinction of the Sierra Nevada populations of *Rana muscosa* in the final rule to list the two species as shown in Figure 7 which depicts the map of the estimated historic range of both species (United States Department of the Interior 2014b).

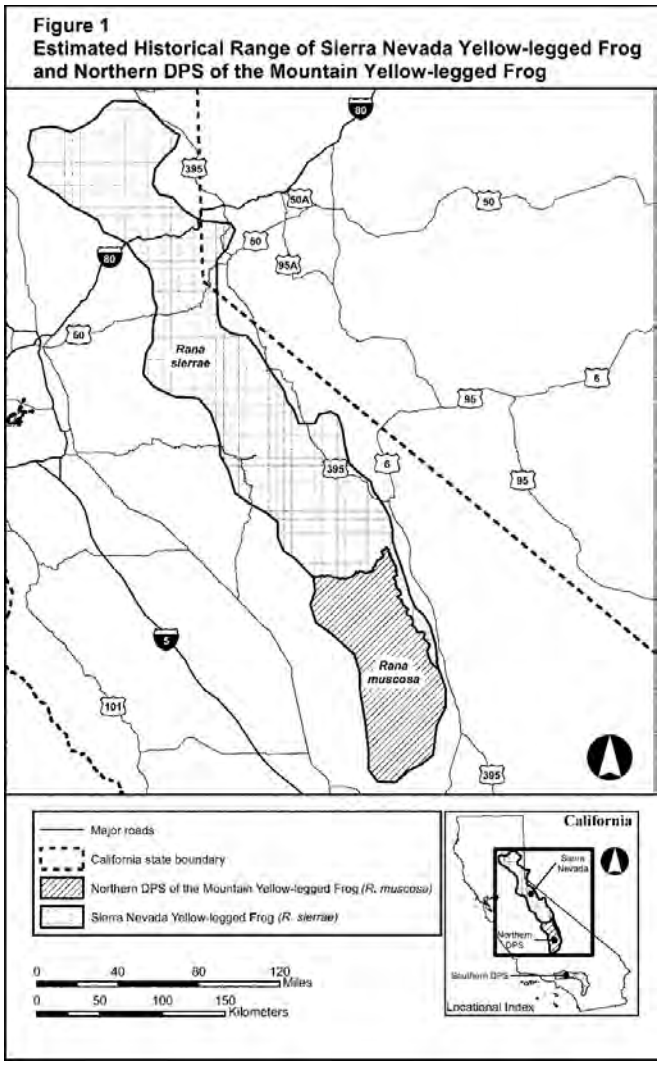

Figure 7. Map of estimated historic range of mountain yellow-legged frog complex

Habitat and Life History (combined for both species)

The Mountain Yellow-legged Frog Conservation Assessment (Brown et al. 2014), USFWS listing rule (United States Department of the Interior 2003a), and USFWS rule designating critical habitat (United States Department of the Interior 2016a) describe key habitat, life history requirements, distribution and threats compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

These frogs are highly aquatic and are found in a variety of habitats including lakes, ponds, marshes, tarns, meadows, and streams. They have been most studied in high alpine lakes in the central and southern parts of the Sierra Nevada, thus less is known about the ecology of these species in non-lake habitats such as streams and meadows. At the lower elevations in the Sierra Nevada, these species are usually associated with rocky stream beds and wet meadows surrounded by coniferous forest. The borders of alpine lakes and montane meadow streams used by yellow-legged frogs are frequently grassy or muddy; this differs from the sandy or rocky shores that are inhabited in lower elevation streams. Adults typically are found sitting on rocks

along the shoreline, usually where there is little or no vegetation. These frogs also use stream habitats, especially in the northern part of their range, which vary from those having high gradients with numerous pools, rapids, and small waterfalls, to those with low gradients with slow flows, marshy edges, and sod banks. These frogs may move several hundred meters between breeding, feeding, and overwintering habitats following lake shores and streams, but they will also move short distances across dry land.

Breeding occurs shortly after snowmelt and, in the central and southern Sierra, most commonly in permanent, deep lakes. They breed less commonly in streams and meadows but this is the case for some populations like at Mulkey Meadow where there are several populations in these habitats. Because larvae take two to three years to metamorphose, breeding typically occurs in permanent water. In high elevation habitats, these frogs may spend up to nine months overwintering under ice in lakes and streams. Die-off of adults in shallower lakes was observed in high elevation lakes in a year of exceptional snowpack, but it is unclear if these were due to depletion of dissolved oxygen or were disease related.

Mountain yellow-legged frog, northern Distinct Population Segment and critical habitat

Classification, critical habitat and Recovery Plan

The mountain yellow-legged frog was petitioned for listing under the ESA in 2000 and the USFWS determined that listing was warranted as threatened or endangered for this species in 2003, however, the listing was precluded at the time based on other higher priorities (United States Department of the Interior 2003b). The northern DPS of the mountain yellow-legged frog was recognized as a species and listed as an endangered species in 2014 (United States Department of the Interior 2014b). Final critical habitat was designated in 2016 (United States Department of the Interior 2016a). There are seven designated critical habitat subunits covering approximately 221,498 acres within Fresno, Inyo and Tulare Counties, California. There are portions of three critical habitat subunits covering approximately 12,325 acres occur on the Inyo NF as shown in Figure 8 and listed in Table 16. Unit 4C overlaps with small slivers along the boundary between Sequoia and Kings Canyon National Parks. A Recovery Plan for the species has not been completed.

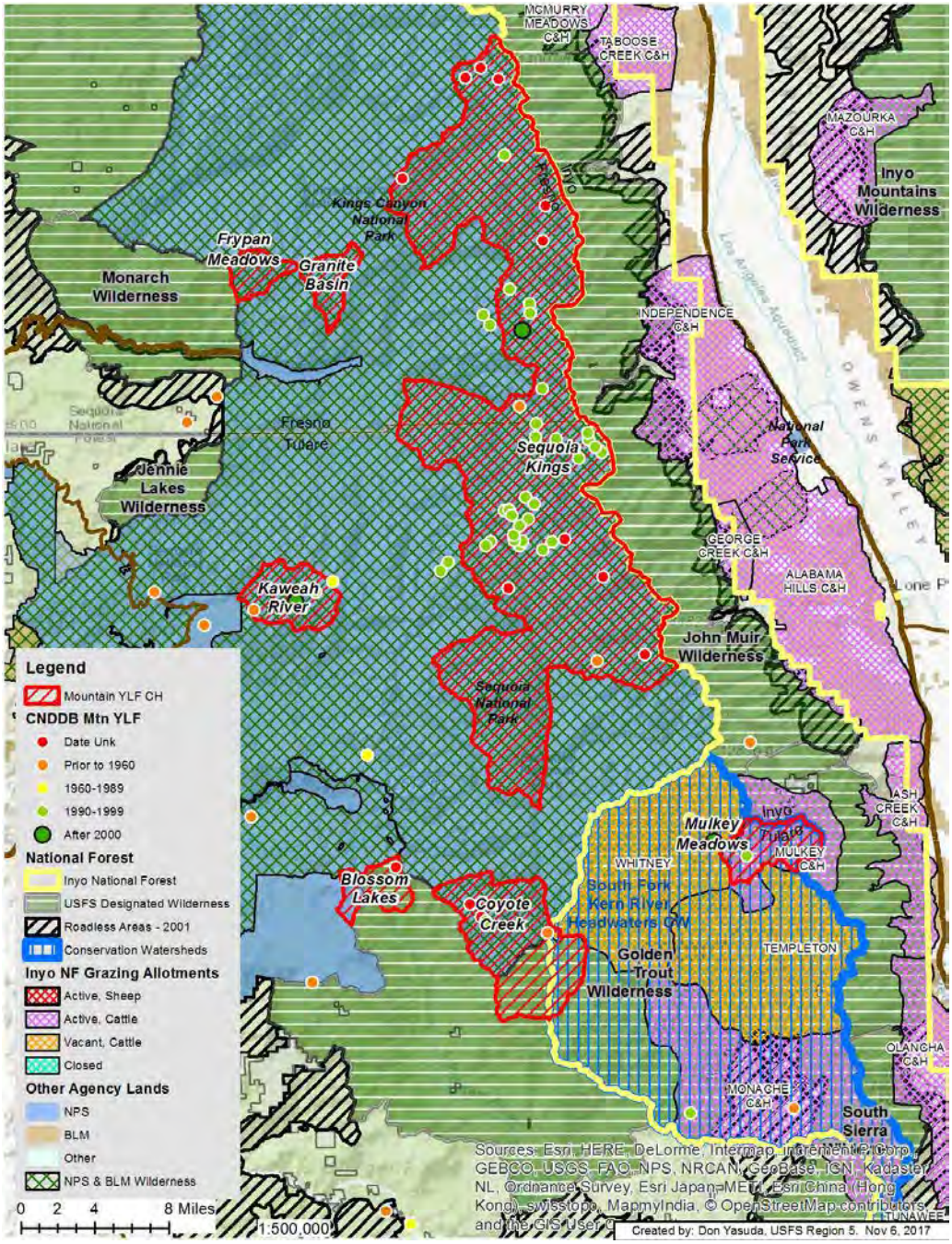

Figure 8. Map of critical habitat subunits for mountain yellow-legged frog, northern DPS, livestock grazing allotments, and conservation watersheds

Table 16. Acres of northern DPS Mountain yellow-legged frog critical habitat subunits

Subunit Number	Subunit Name	Total Subunit Acres	Total Subunit Acres, Inyo NF	Total Subunit Acres, Inyo NF Wilderness
4C	Sequoia Kings	166,405	199	189
5B	Coyote Creek	24,141	4,309	4,309
5C	Mulkey Meadows	7,817	7,817	7,817

Mountain yellow-legged frog is also listed by the State of California as an endangered species under the California Endangered Species Act (California Fish and Game Commission 2012). A collaborative inter-agency conservation assessment was completed in 2014 with the USFS, CDFW, National Park Service, and USFWS (Brown et al. 2014). The conservation assessment, which covered both the mountain yellow-legged frog and the Sierra Nevada yellow-legged frog, was developed and reviewed by a mountain yellow-legged frog working group that included representatives from the above mentioned agencies along with species experts and academic institutions such as the University of California, Berkeley and Sierra Nevada Aquatic Research Laboratory (Brown et al. 2014).

Historic and Current Distribution

Mountain yellow-legged frog occur south of the Monarch Divide between the Middle and South Forks of the Kings River and north of the Tehachapi Mountains. The northern DPS in the southern Sierra Nevada and southern California DPS of the mountain yellow-legged frog are currently separated by the Tehachapi Mountains, a distance of about 140 miles (United States Department of the Interior 2014b) (see Figure 7).

The Conservation Assessment for Mountain Yellow-legged Frogs provides a detailed summary of the historic and current distribution of the mountain yellow-legged frog complex on the Inyo NF (Brown et al. 2014) (see pages 124-127). Historically this species is known to occur in the Mukley Meadows and Coyote Creek area on the Inyo NF.

The current distributions of the mountain yellow-legged frog is restricted primarily to publicly managed lands at high elevations (United States Department of the Interior 2014b). As of 2016, the CDFW reported that on the Inyo NF, the two mountain yellow-legged frog populations in the Mulkey Meadows and Coyote Creek areas remain occupied (California Department of Fish and Wildlife 2017).

CDFW has identified 2 proposed native species restoration projects on the Inyo NF in the Coyote Flat management unit (California Department of Fish and Wildlife 2017). One is fish removal in Hidden Lake in the Golden Trout Wilderness which would also require reintroduction as no mountain yellow-legged frogs currently exist at this location. The second is fish removal near the West Fork Coyote Creek population. Both are only proposed future projects. No native species restoration projects were identified by the CDFW in the Monache management unit, although a possible future project to consider noted was reintroduction into Rocky Basin Lakes.

Population and Habitat Status and Trends

As discussed in the 2014 listing decision (United States Department of the Interior 2014b), "*[m]onitoring efforts and research studies have documented substantial declines of mountain yellow-legged frog populations in the Sierra Nevada. The number of extant populations has declined greatly over the last few decades. Remaining populations are patchily scattered throughout the historical range.*" In the southern Sierra Nevada, substantial declines overall have occurred; however, modest to relatively large populations of mountain yellow-legged frogs still remain but some large populations have been extirpated in recent years.

The CDFW continues to monitor populations on the Inyo NF (California Department of Fish and Wildlife 2016) and has documented population and habitat status at Mulkey Creek/Bullfrog Meadow and Coyote Flats as of 2016. Populations continue to exist in Mulkey Creek and Bullfrog Meadow in 2016. The population trend was believed to be stable or potentially increasing with more than 100 frogs were seen in 2016. This population tested positive for *Bd* in

2013. The habitat is marginal as the stream has fish and only one isolated larvae site did not have existing fish. The Coyote Flats management unit, which includes the Baker Creek, Cow Creek, and West Fork Coyote Creek populations was last surveyed in 2012. Population trend in Baker Creek and Cow Creek shows a *Bd* die off occurred in 2008-2009 as surveys between 2010 and 2012 found no frogs and the CDFW considers these sites to be extirpated (California Department of Fish and Wildlife 2017). However, CDFW noted that a hiker reported 2 frogs seen in 2016, which may be repopulation from the West Fork Coyote Creek which still had frogs present in 2012. The West Fork Coyote Creek population was found to be *Bd* negative in 2012, but that was based on few samples so the current *Bd* status is not known. The habitat in West Fork Coyote Creek is limited and marginal.

Sierra Nevada yellow-legged frog and critical habitat

Classification, critical habitat and Recovery Plan

The Sierra Nevada yellow-legged frog was petitioned for listing under the ESA in 2000 and the USFWS determined that listing was warranted as threatened or endangered for this species in 2003, however, the listing was precluded at the time based on other higher priorities (United States Department of the Interior 2003a). The Sierra Nevada yellow-legged frog was recognized as a species and listed as an endangered species in 2014 (United States Department of the Interior 2014b). Final critical habitat was designated in 2016 (United States Department of the Interior 2016a). There are 24 designated critical habitat subunits covering approximately 1,082,147 acres within Lassen, Plumas, Sierra, Nevada, Placer, El Dorado, Amador, Calaveras, Alpine, Tuolumne, Mono, Mariposa, Madera, Fresno, and Inyo Counties, California. There are portions of six critical habitat subunits covering approximately 97,046 acres occur on the Inyo NF as shown in Figure 9 and Figure 10 and listed in Table 17. A Recovery Plan for the species has not been completed.

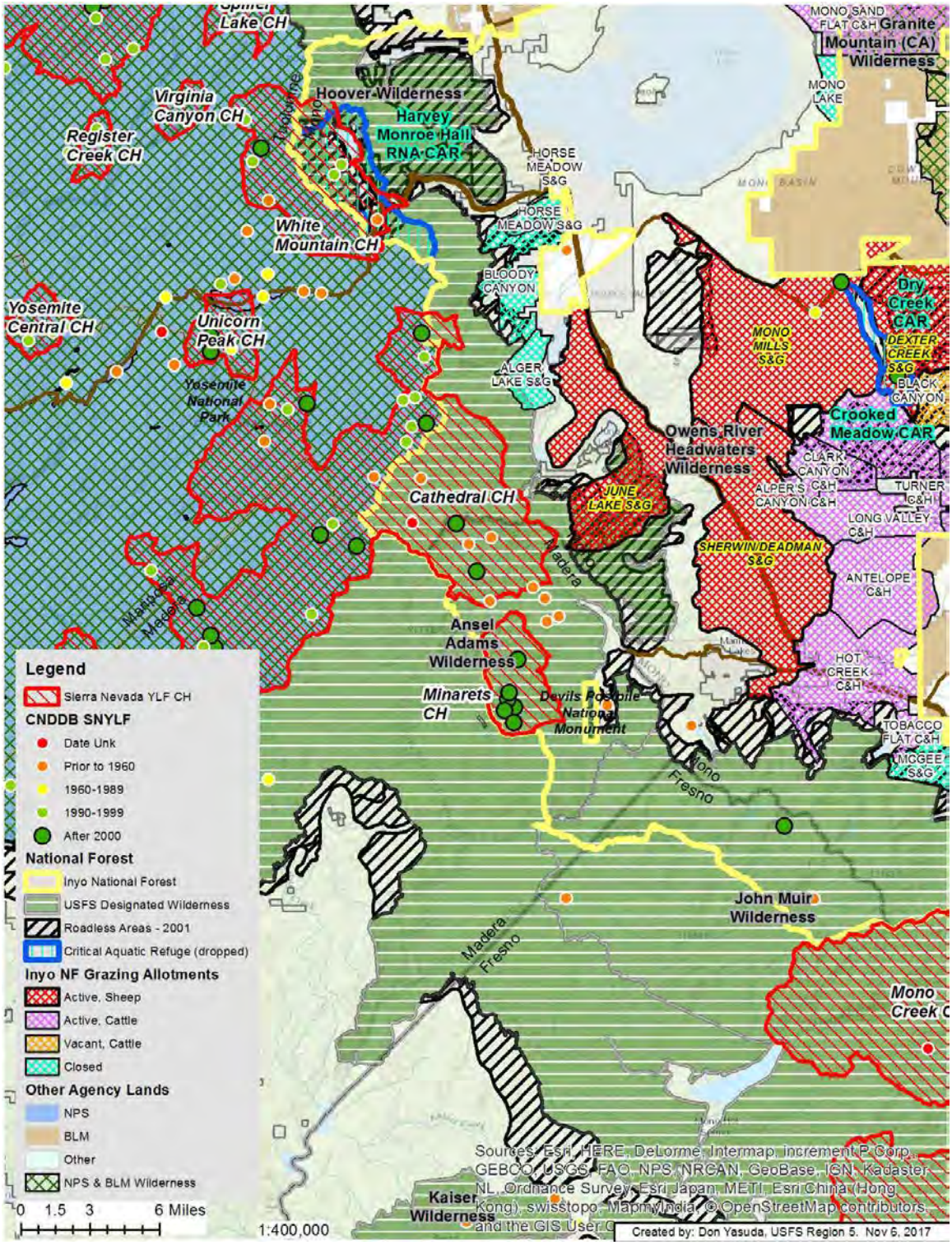

Figure 9. Map of critical habitat units for Sierra Nevada yellow-legged frog, livestock grazing allotments, and existing plan critical aquatic refuges, north area

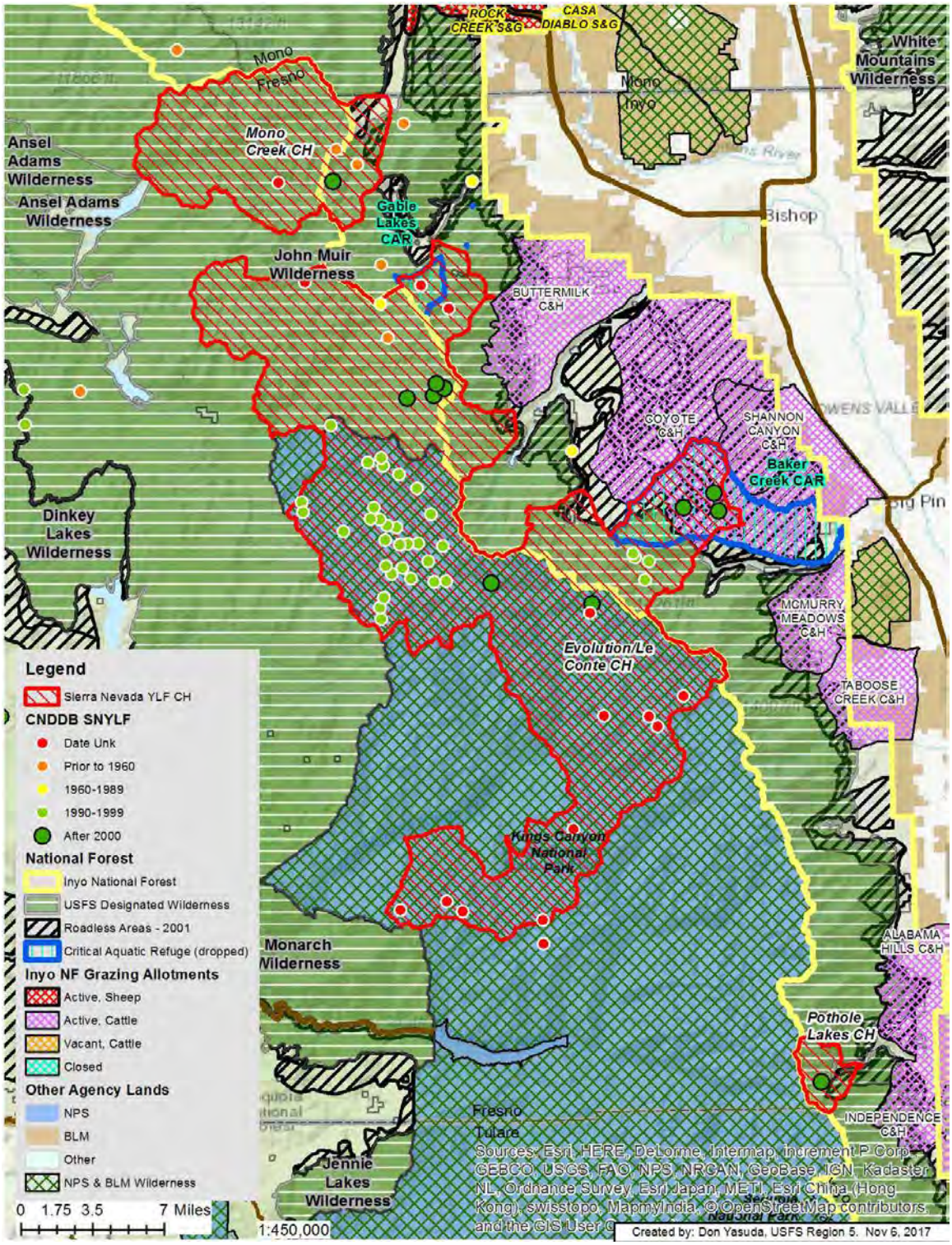

Figure 10. Map of critical habitat units for Sierra Nevada yellow-legged frog, livestock grazing allotments, and existing plan critical aquatic refuges, south area

Table 17. Acres of Sierra Nevada yellow-legged frog critical habitat subunits

Subunit Number	Subunit Name	Total Subunit Acres	Total Subunit Acres, Inyo NF	Total Subunit Acres, Inyo NF Wilderness
2M	White Mountain	15,699	8,331	5,171
3B	Cathedral	95,930	26,556	26,458
3C	Minarets	7,621	7,620	7,607
3D	Mono Creek	45,607	8,315	6,527
3E	Evolution/Le Conte	214,952	41,953	31,030
3F	Pothole Lakes	4,274	4,271	4,011

A collaborative inter-agency conservation assessment was completed in 2014 with the USFS, CDFW, National Park Service, and USFWS (Brown et al. 2014). The conservation assessment, which covered both the mountain yellow-legged frog and the Sierra Nevada yellow-legged frog, was developed and reviewed by a mountain yellow-legged frog working group that included representatives from the above mentioned agencies along with species experts and academic institutions such as the University of California, Berkeley and Sierra Nevada Aquatic Research Laboratory (Brown et al. 2014).

Historic and Current Distribution

The USFWS determined that the Sierra Nevada yellow-legged frogs occupy the western Sierra Nevada north of the Monarch Divide (in Fresno County) and the eastern slope of the Sierra Nevada (east of the crest) from Inyo County through Mono County (including the Glass Mountains), to areas north of Lake Tahoe (United States Department of the Interior 2014b) (see Figure 7). As shown in Figure 9, there were historically a few populations in the Glass Mountains disconnected from the rest of the populations in the Sierra Nevada range. However, between 2000 and 2009, these populations were extirpated, likely by *Bd* infection.

The Conservation Assessment for Mountain Yellow-legged Frogs provides a detailed summary of the historic and current distribution of the mountain yellow-legged frog complex on the Inyo NF (Brown et al. 2014) (see pages 124-127). Historically this species is known to occur in most high elevation lakes and streams on the northern portion of the Inyo NF. The historically known populations in the Glass Mountains appears to have been extirpated by the early 2000's and was not identified as providing critical habitat by the USFWS or identified by the CDFW as containing areas being monitored or considered for restoration opportunities.

The CDFW identifies 16 management units on the Inyo NF that are assessed for native species restoration projects. As of 2016, the CDFW (California Department of Fish and Wildlife 2017) reported that on the Inyo NF, Sierra Nevada yellow-legged frog populations exist in 10 of the identified management units and do not occur in six management units: Convict, Hilton-McGee, Goodale, Lone Pine, Cottonwood, and Southern Owens. In that report, CDFW reported on the status of existing native species restoration projects and evaluated the potential for projects within the watersheds of each management unit and that information on restoration potential is provided below.

In the Independence management unit there are no identified additional native species restoration projects. Fish removal has been successful for the Bench/Matlock/Slim Lakes population.

In the Big Pine management unit, one potential fish removal and reintroduction native species project was identified in Big Pine Lake 4. One completed fish removal project in Big Pine Lakes

6 & 7 appeared to be successful but the population is believed to now be extirpated as a result of disease infection.

In the Bishop Creek management unit, eight additional fish removal native species restoration projects were identified: Emerald Lakes, Fishgut Lakes, George Lake, Hurd Lake, Margaret Lake, Schober Hole Lakes, Treasure Lakes 1 & 2, and Wonder Lakes 1, 2 & 3.

In the Rock Creek management unit, two fish removal native species restoration projects were identified: Hidden Lakes and Treasure Lakes. Hidden Lakes also needs investigation of barriers that would keep it fishless.

In the San Joaquin management unit, five fish removal native species restoration projects were identified: Deadhorse Lake, Emily/Vivian Lakes, Holcomb/Noname Lakes, Nydiver Lakes, and Olaine Lake. Four projects have had fish removal and need further analysis and translocation: Castle Lake, Clarice Lake, Lois Lake, and Summit Lake.

In the Rush Creek management unit, three additional fish removal native species restoration projects were identified: Clark Lakes, Koip Crest/Lost Lakes, and Upper Marie Lake.

In addition, CDFW identified native species restoration projects for fish removal in three management units that currently do not contain Sierra Nevada yellow-legged frog populations.

- Mono Lake Management Unit: Conness Lakes, Green Treble/Maul Lakes (Includes Alpine, Bighorn and Finger lakes), Hidden Lake, Ida Lake, and Sardine Lakes.
- Mammoth Management Unit: Sherwin Creek
- Fish Creek Management Unit: Bench Lakes, Cecil and Lee Lakes, and Red and White Lake

One fishless site has been identified for native species restoration projects: Bunny Lake in the Convict management unit. Five management units do not contain populations and were determined to have no native species restoration project opportunities at the present time: Hilton-McGee, Goodale, Lone Pine, Cottonwood, and Southern Owens.

Population and Habitat Status and Trend

The CDFW continues to monitor populations on the Inyo NF (California Department of Fish and Wildlife 2016) and has documented population and habitat status in the Independence, Big Pine, Bishop Creek, Mount Tom, Rock Creek, San Joaquin, and Rush Creek management units as of 2016. A brief summary of the 2016 report information on population status and trend and habitat condition is provided below.

Populations continue to exist in the Independence management unit in the Bench/Matlock/Slim Lakes population in 2016, a successful restoration site. The population trend was believed to be increasing with a large population of over 1,000 frogs. This site was tested in 2013 and 2016 and remains *Bd* negative. The habitat is excellent with three lakes plus a network of habitats.

In the Big Pine management unit, Big Pine Lakes 6 & 7 was a successful native species reintroduction project with fish remove, but it was affected by a *Bd* die off in 2013 and is now in the process of reintroductions with 26 tadpoles removed in 2014 and 4 adults reintroduced in 2016. In 2016, an additional 37 tadpoles were removed for captive rearing in the Oakland Zoo. The habitat is considered excellent with two lakes plus a network of habitats. The population in Sam Mack Meadow was surveyed in 2016 and the population trend shows increases and decreases which might be due to winter die-off events. The population is currently *Bd* negative

with testing in 2013 and 2016. The habitat is limited and marginal. The population in 4th Lake Meadow shows a decreasing population trend and currently no frogs in 2016. The site was *Bd* negative, but it was based on few samples and *Bd* status is considered unknown. The habitat is marginal and it was a small population of less than 10 frogs, so causes for the decline are not known but it may be related to drought effects or possibly *Bd*.

In the Bishop Creek management unit, there are two populations, a metapopulation in Treasure Lakes that had fish removal and Wonder Lakes where egg mass translocation was unsuccessful. The Population trend in Treasure Lakes 3 & 4 and at Treasure Lakes 5-7 were increasing as of 2016 and constitute a large meta-population in two slightly separate drainages. These populations were tested in 2013 and 2016 and are *Bd* negative. The habitat is excellent, consisting of five lakes and a network of habitats. The Wonder Lakes native species restoration project of egg mass translocations by the Sierra Nevada Aquatics Research Laboratory was determined to be unsuccessful when last surveyed in 2015 as the population trend is nonexistent with no frogs present. The *Bd* status is unknown but is believed to be positive. The habitat is good to fair but may need additional fish removal.

In the Mount Tom management unit, there are two populations, Gable Lakes has had fish removal completed and Horton Creek is in the process of having fish removed. Gable Lakes has a large population of over 1,000 frogs and trend was increasing in 2016. Testing in 2013 and 2016 was *Bd* negative. The habitat is excellent consisting of four lakes and a network of habitats. The Horton Creek population has ongoing fish removal from Horton Lakes 3 and 4 which will likely need reintroduction because the small downstream population has a decreasing trend and distance and terrain likely preclude natural population expansion. The site was *Bd* negative in 2013 and 2016 testing. Outside of the two lakes with fish removal, additional habitat is marginal with one small shallow pond and two stream sites with fish and no fish removal opportunities.

In the Rock Creek management unit, there is one current population and one failed population on the Inyo NF and one captive rearing site population on private land. The Birch Creek population has a stable trend with 88 and 90 egg masses recorded in 2014 and 2015 respectively. The site is *Bd* negative with testing in 2013 and 2016 and is used as a source population for larvae translocations. The habitat is limited and marginal because the springs are weak and the pools are silting in. The Eastern Brook Lakes population had unsuccessful reintroductions of larvae and adult frogs. Although there are two fishless lakes and a network of habitats, the site is *Bd* positive and was unoccupied in the last 2016 survey. Larvae from the Birch Creek population were used to establish the Swall Meadows captive rearing site on private land. This population was found to be stable or increasing in 2016 and may be at carrying capacity. It is *Bd* negative from 2013 and 2016 testing. The habitat is a recycling network of ponds.

In the San Joaquin management unit there are 11 populations that all are *Bd* positive and are considered persistent with *Bd*. The Gertrude Lake population, including Anona, Ashley and Holcomb Lakes, was surveyed in 2016 and found to have a decreasing population trend. Habitat is limited in Gertrude Lake, but other options are Anona, Ashley, and Holcomb Lakes, which all contain fish. The Minaret Meadow population is very small with less than 10 frogs and is also decreasing when last surveyed in 2015. The *Bd* status is assumed positive but there were few samples. Habitat is marginal and limited with shallow sites that are drought affected. The Garnet Lake Ponds population is also very small but the population trend was stable in 2015. Habitat is limited consisting of two large shallow lakes with one breeding site. The Banner Lakes population is a medium population that had a stable population trend in 2016 and it is used as a source population for larvae translocations. The habitat is good with two deep lakes with a warm

breeding pond. Yosemite toads are also present. The Garnet Ridge population showed a decreasing trend in 2016 with low numbers of adults seen and the numbers of larvae decreasing. This site is used as a source population for larvae translocations but habitat is limited with one breeding lake that is heavily affected with *Bd*. The Emerald Lake population is a successful native species restoration project where larvae were translocated and in 2016 the population trend is stable, but has low numbers. Although the habitat is good, the breeding pond is affected by drought. The Badger Lakes population is an active native species restoration project where 6 years of larvae translocations has occurred, but as of 2016 the population trend is nonexistent and there are no frogs present and the translocations have stopped. The habitat has two deep lakes and a network of shallow ponds.

In the Rush Creek management unit there are three populations that all are *Bd* positive and are considered persistent with *Bd*. The Island Pass population had a stable, but variable population trend in 2016 and it is used as a source population for larvae translocations. The habitat is good with two breeding lakes and a large network of habitats. The Rodgers Lakes population was small but with a stable population trend in 2015. The habitat is limited with shallow sites. The Donahue Ponds population was stable with two separate distinct habitat types of stream and ponds. The habitat is excellent with a varied network of habitats.

Critical Habitat Primary Constituent Elements (both species)

The USFWS (United States Department of the Interior 2016a) determined that the primary constituent elements specific to the Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog are:

1) *Aquatic habitat for breeding and rearing.* Habitat that consists of permanent water bodies, or those that are either hydrologically connected with, or close to, permanent water bodies, including, but not limited to, lakes, streams, rivers, tarns, perennial creeks (or permanent plunge pools within intermittent creeks), pools (such as a body of impounded water contained above a natural dam), and other forms of aquatic habitat. This habitat must:
    a) For lakes, be of sufficient depth not to freeze solid (to the bottom) during the winter.
    b) Maintain a natural flow pattern, including periodic flooding, and have functional community dynamics in order to provide sufficient productivity and a prey base to support the growth and development of rearing tadpoles and metamorphs.
    c) Be free of introduced predators.
    d) Maintain water during the entire tadpole growth phase and have suitable bank and pool habitats with appropriate thermal characteristics, refugia, and food resources.
2) *Aquatic nonbreeding habitat (including overwintering habitat).* Habitat may contain the same characteristics as aquatic breeding and rearing habitat (often at the same locale), and may include lakes, ponds, tarns, streams, rivers, creeks, plunge pools within intermittent creeks, seeps, and springs that may not hold water long enough for the species to complete its aquatic life cycle. This habitat provides for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult mountain yellow-legged frogs. Aquatic nonbreeding habitat contains suitable bank and pool habitats with appropriate thermal characteristics, refugia, food resources, overwintering refugia, and movement corridors.
3) *Upland areas.* Upland areas adjacent to or surrounding breeding and nonbreeding aquatic habitat that provide area for feeding and movement by mountain yellow-legged frogs. Habitats are up to 82 feet from streambanks, shorelines or between adjacent proximate water bodies, or mesic habitats such as lake or meadow systems. Upland areas also include

catchments adjacent to and surrounding both breeding and nonbreeding aquatic habitat that provide for the natural hydrologic regime (water quantity) of aquatic habitats. These upland areas should also allow for the maintenance of sufficient water quality to provide for the various life stages of the frog and its prey base.

Threats (both species)

The USFWS (United States Department of the Interior 2016a) identified the following threats: the persistence of introduced trout populations in essential habitat; the risks related to the spread of pathogens; the effects from water withdrawals and diversions; impacts associated with timber harvest and fuels reduction activities; impacts associated with inappropriate livestock grazing; and intensive use by recreationists, including pack stock camping and grazing.

The 2014 Conservation Assessment provides a detailed examination of risks to the mountain yellow-legged frog complex throughout its range (Brown et al. 2014). It identified 13 risk factors relevant to land and resource management. Three are considered focal risk factors that are linked to declines: Introduced fish and other predators, disease, and habitat loss and fragmentation. Ten additional risk factors are within the authority of the Forest Service to address but are not currently linked to declines: fire suppression activities, habitat restoration, livestock grazing, locally applied pesticides, mining, recreational activities (including pack stock), research activities, roads, vegetation and fuels management, and water development and diversion. Of these, the most relevant to consider on the Inyo NF are: fire suppression activities, habitat restoration, livestock grazing, and recreational activities (including pack stock).

Introduced fish and other predators.

Predation by introduced fish, especially non-native salmonids (rainbow trout, golden trout, brook trout, and brown trout), is a recognized cause of decline of mountain yellow-legged frogs in the Sierra Nevada. In 2010, the CDFW and USFWS analyzed and adopted direction for the management of the state's hatchery and stocking program (ICF Jones & Stokes 2010). That action adopted a process for addressing potentially significant stocking effects on sensitive, native, and legally protected fish and wildlife species that prohibits fish stocking where it conflicts with conservation goals of federal recovery plans or within federally designated critical habitat for considered species, which include the currently listed Sierran amphibian species. Thus, fish stocking no longer occurs within the areas occupied by these species. Although continued fish stocking has ended, many trout populations are self-sustaining and are likely to continue to persist unless purposely removed. Study of areas with fish removal has shown success at improving yellow-legged frog populations. Some fish removal in native species restoration projects has been implemented by the CDFW within the Inyo NF as noted in the Historic and Current Distribution sections above. The CDFW has identified additional opportunities for fish removal and subsequent reintroduction of yellow-legged frogs as noted in the Historic and Current Distribution sections above.

Disease

The Conservation Assessment includes a discussion of disease risk and concludes that disease, particularly chytridiomycosis, is a serious contributor to mountain yellow-legged frog declines. It documents that major population crashes have resulted from chytridiomycosis infections, and the amphibian chytrid fungus, *Bd*, has been confirmed as a widespread threat to mountain yellow-legged frog persistence in the Sierra Nevada. Other pathogens may be contributors to declines, but their status is unknown. Of the 27 populations on Inyo NF ten of the 27 are *Bd* negative

(California Department of Fish and Wildlife 2016). Populations that are *Bd* positive result in die offs or are persisting in the presence of *Bd* which is being investigated by researchers.

The disease risk to mountain yellow-legged frog populations is considered focal because current populations are small and isolated, increasing the potential for local extirpations which could further isolate remaining populations, increasing the likelihood of extinction for the mountain yellow-legged frog in the Sierra Nevada. However, the Conservation Assessment also recognized that little can be done to manage for this risk factor unless vectors of these pathogens over which management can influence are identified. Despite this uncertainty, the Conservation Assessment suggests that actions should be taken to reduce other environmental stressors that may facilitate or augment the effects of these pathogens; recognizing that interactive effects between pathogens and other stressors remain largely unstudied. In particular, too few data exist to inform management about which stressors interact with disease and how they might be effectively reduced to prevent the onset of disease and alleviate its effects.

The introduction and spread of *Bd* effects are much more challenging to overcome, because this pathogen is highly virulent for Sierran amphibians and once it has arrived in a population it cannot be eradicated. As such, it is hoped that although most populations are extirpated following *Bd* arrival some will persist and over time become less susceptible to *Bd* infection ("persistent" populations). The Inyo NF has cooperated with state and private research efforts to have an emergency response plan to prevent the extirpation of populations following disease-caused mass-mortality events that allows intervention to conduct antifungal treatments in the field and capture animals for rearing at zoos to increase frog survival and the probability of long-term population persistence. A temporary special-use permit from 2017 to 2021 was issued to Sierra Nevada Aquatic Research Laboratory, the lead research lab for continued recovery actions on the mountain yellow-legged frog across both the Inyo and Sierra National Forests.

Habitat loss and fragmentation

Direct habitat loss is not a relevant factor for the Inyo NF given the extent of habitat and number of populations located in designated wilderness areas and in remote areas. However, the practical effects of other risk factors could reduce populations which could result in increased fragmentation of populations. Further isolation of existing populations may be a high risk to the species. To address this, species conservation approaches should protect existing populations and also provide mechanisms for re-establishing mountain yellow-legged frogs in nearby areas.

Fire suppression activities

In the parts of the species' range that occurs in wilderness areas, intensive fire suppression activities are rarely conducted and mechanized equipment generally is not used. In these remote areas, minimum-impact fire suppression techniques are used and may represent the best alternative to protecting mountain yellow-legged frogs and their habitat.

Concerns regarding the effects of aerial application of fire retardant on aquatic systems and federally listed species were addressed in the Forest Service decision that directs aerial retardant tanker pilots to avoid application of retardant or foam within 300 feet of waterways (United States Department of Agriculture 2011). A "waterway" is considered to be any body of water including lakes, rivers, streams and ponds irrespective of whether they contain aquatic life. Although the initial analysis was completed prior to these species becoming federally listed, the analysis is being updated (P. Krueger, pers. comm.) Areas to avoid for the mountain yellow-legged frog, Sierra Nevada yellow-legged frog, and Yosemite toad are currently included in aerial retardant avoidance maps.

Habitat restoration

Restoration is an activity that is anticipated to increase. Fish removal restoration in multiple experiments has successfully led to increased mountain yellow-legged frog populations. Examples of habitat restoration by removing non-native fish have occurred on the Inyo NF. Starting in 1999, brook and rainbow trout were removed from Big Pine Lakes #6 and #7 and by 2013 Sierra Nevada yellow-legged frog populations had increased demonstrating the potential of habitat restoration by fish removal (Erdman 2013). Unfortunately, in 2013, a virulent *Bd* infection severely affected the adults in this population and it is believed to be extirpated. Restoration of fish-free habitat would greatly contribute to the conservation of this species. There currently remains several "native species restoration areas" identified within the 18 Management Units on Inyo NF that are in coordination with CDFW (California Department of Fish and Wildlife 2017).

Livestock grazing

There is no livestock grazing in any occupied habitats for the Sierra Nevada yellow-legged on the Inyo NF. Similarly, livestock grazing has been eliminated from all occupied habitats for the northern DPS of the mountain yellow-legged frog with the exception of livestock grazing by cattle that still occurs in the Mulkey Allotment around Mulkey Meadows. Livestock grazing is guided by the Allotment Management Plan which requires setting an annual on-date determined by meadow conditions and breeding chronology for the mountain yellow-legged frog. In addition, although utilization standards are set to protect stream and riparian habitat conditions, a trampling standard that exists to protect golden trout habitat typically results in livestock being removed from occupied habitats before the utilization standards are met. Thus, in the environmental baseline, localized threats to habitat related to livestock grazing practices have been avoided for the Sierra Nevada yellow-legged frog on the Inyo NF and avoided over most of the forest for the mountain yellow-legged frog and minimized in the Mulkey Meadows area.

Recreational activities (including pack stock)

The risk level of recreational impacts to the mountain yellow-legged frog is unknown. The nature of many recreational activities places humans in direct contact with mountain yellow-legged frogs or their habitat. Recreational activities may be localized, but in some cases, such as trails and campsites that are persistent and long term, uses must be properly managed to mitigate and minimize their adverse effects. In high-use areas, recreational activities are likely to add cumulatively to stressors on small populations. Lakes with non-native fish (see Introduced Fish and Other Predators section) and recreation sites close to occupied habitats pose the greatest risk to the mountain yellow-legged frog. Dispersed activities like hiking, camping, and mountain biking may pose a more moderate risk to the species because they may have localized impacts; however, the degree of impact is largely a function of the volume of human use and mountain biking is prohibited within designated wilderness. On Inyo NF numerous areas in wilderness have restrictions on the number of visitors with or without pack stock and commercial pack stock is managed with quotas. These management restrictions are designed to limit the impact on resources while providing for the highest quality wilderness experience. No specific data exists for this risk factor relative to the mountain yellow-legged frog but the USFWS stated that "*[p]ackstock use is likely a threat of low significance to mountain yellow-legged frogs at the current time, except on a limited, site-specific basis*" (United States Department of the Interior 2014b). However, habitat changes due to pack stock grazing may pose a risk to some remnant populations of frogs and, in certain circumstances, may slow recovery of populations in heavily used areas, although no specific sites where this situation occurs are known.

Other risk factors

Locally applied pesticides, mining, research activities, and water development and diversion are other risk factors evaluated in the Conservation Assessment that are not expected to be a substantial risk to yellow-legged frogs on the Inyo NF. Since most occurrences are within wilderness, pesticide application, mining, and water development and diversion would not occur. Research activities affecting federally listed species require permits from the CDFW and USFWS and may require permits from the USFS if they involve ground disturbing activities or affect other public uses. In all cases, standard SPEC-AMPH-STD-01 would require that any pesticide application within 500 feet of known occupied sites would avoid adverse effects to individuals or their habitats and future projects would require compliance with Section 7 of the ESA and consultation with the USFWS as needed.

Four risk factors fall largely outside the authority of the Forest Service but have the potential to impact populations on a regional or global scale. These include acid deposition, airborne contaminants (including pesticides), climate change, and UV-B radiation. The Forest Service has few options to reduce the risk these factors pose to the two species of yellow-legged frogs and their habitat. The U.S. Fish and Wildlife Service determined that acid deposition, airborne contaminants, and UV-B radiation are not known to pose a threat (current or historical) to the mountain yellow-legged frog complex (United States Department of the Interior 2014b). Climate change poses a substantial future threat to the persistence of mountain yellow-frog species given their highly aquatic nature. The effects can be expressed in a variety of ways such as changes in hydrological systems that reduce habitat quantity and quality or that contribute to other stressors that impact individuals and ultimately population persistence. Improving ecosystem integrity in the aquatic and riparian systems that provide yellow-legged frog habitats may ameliorate local risk factors by improving the resiliency of populations.

Analysis of Effects

Indirect Effects

The Sierra Nevada yellow-legged frog and mountain yellow-legged frog, northern DPS require similar habitats as shown in the species descriptions. Therefore, the effects of implementing the Proposed Action management framework will be similar, and their analysis is collectively presented here. The majority of the habitat and critical habitat is located within designated wilderness where limited direct management would occur.

As noted in the section*: Effects Common to Aquatic Habitats and Species*, the Proposed Action provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area which will provide habitat conservation that would contribute towards the recovery of the Sierra Nevada yellow-legged frog and mountain yellow-legged frog. This proposed management framework contains ecosystem restoration forest plan components that build resilience into watershed systems and habitats to better enable them to adapt to drought and climate change. This framework specifically promotes restoration actions that will enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

For the Sierra Nevada yellow-legged frog, there is a small portion of the Evolution / Le Conte critical habitat subunit that lies outside of the John Muir Wilderness in the area around Baker Creek as shown in Figure 11. This area in the Coyote Flat management unit contains the Cow

Creek population that was extirpated in 2010 and the Baker Creek/Mother Meadow population that is believed extirpated in 2010 (California Department of Fish and Wildlife 2017).

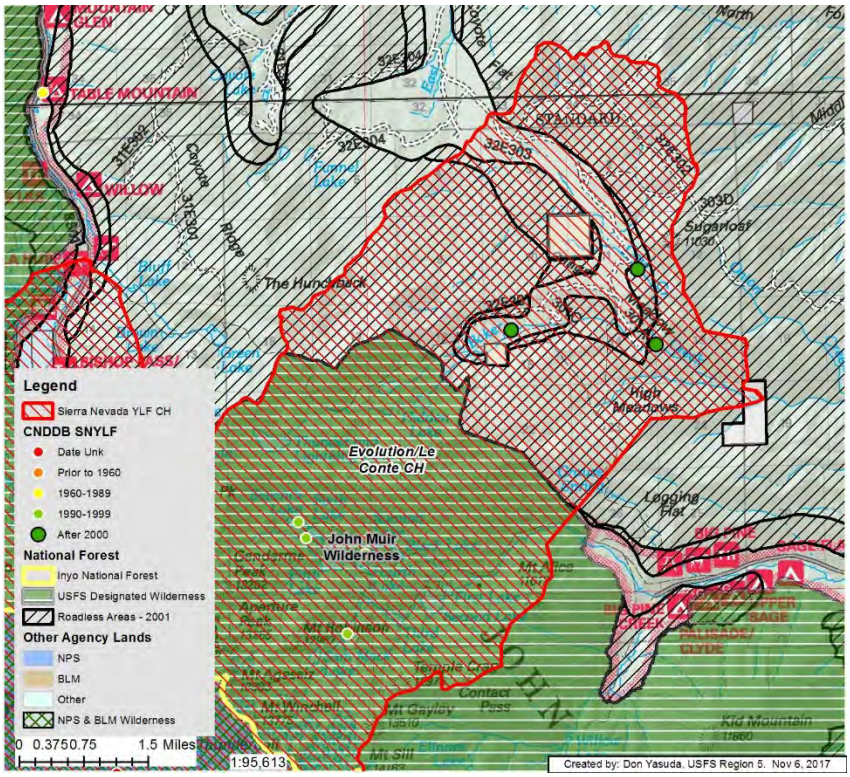

Figure 11. Map of portion of Evolution/Le Conte critical habitat subunit for Sierra Nevada yellow-legged frog in the area of Baker Creek

Although this area is within the Coyote C&H Allotment (see Figure 10 above), livestock grazing has been discontinued in occupied habitats.

This area outside of wilderness is also within the former Baker Creek critical aquatic refuge (see Figure 10 above) and a portion of the White Mountain critical habitat subunit is within the former Harvey Monroe Hall RNA critical aquatic refuge (see Figure 9 above). As described in the section *Effects Common to Aquatic Habitats and Species* above, critical aquatic refuges are not continued in the Proposed Action because watershed direction was strengthened forestwide and adequate direction exists to manage for the ecological conditions needed by at-risk species forestwide. Direction for riparian conservation areas along the streams and meadows would provide guidance for riparian and aquatic desired conditions and standards and guidelines provide direction to avoid, minimize or mitigate effects to aquatic habitats and key aquatic conditions.

In the Proposed Action, the Mono Lake Headwaters and Middle Fork San Joaquin River Headwaters are identified as conservation watersheds, in part because they provide habitat for several at-risk species (Figure 12). A desired condition for conservation watersheds (MA-CW-DC-01) is to "*…provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species.*"

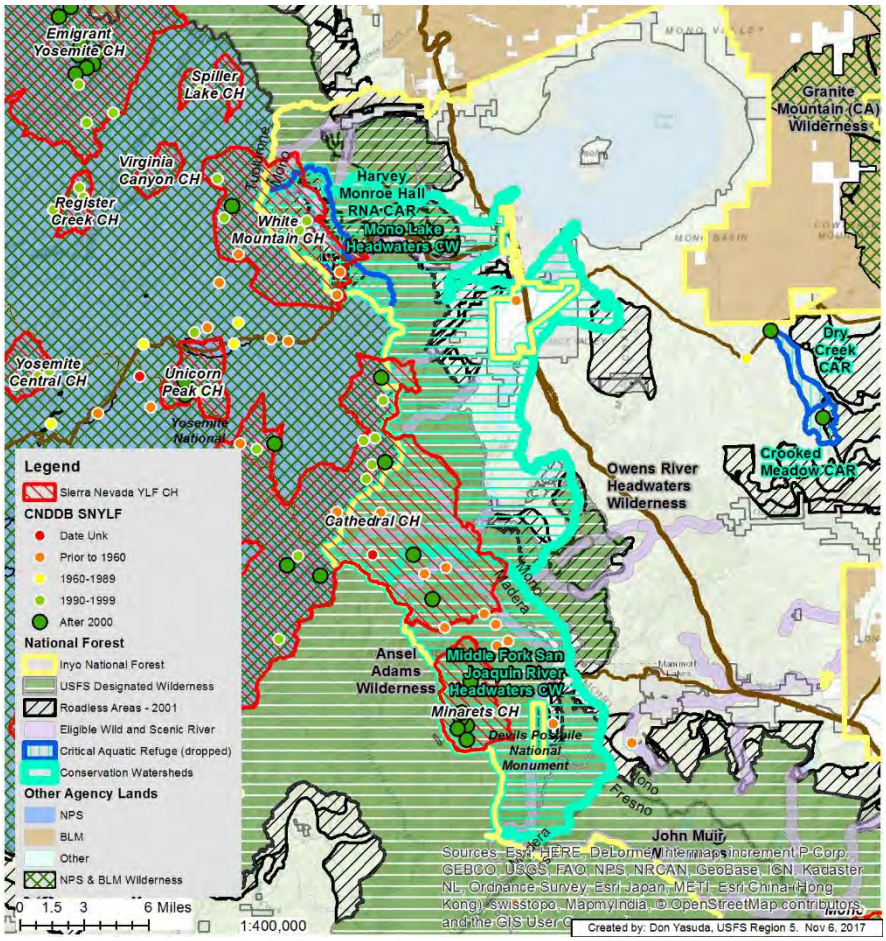

Figure 12. Map of conservation watersheds, existing plan critical aquatic refuges and critical habitats for the Yosemite toad

The California Department of Fish and Wildlife has ceased stocking in waters that may affect federally listed species (ICF Jones & Stokes 2010). If there is a need to change stocking practices in the future because of new species detections, those decisions would be made by CDFW in coordination with the USFWS. If those changes require a change in land management, the Inyo NF would address those as a function of recreation management or restoration activities.

The following program areas include actions guided by the forest plan that could potentially affect mountain yellow-legged frog, northern DPS or the Sierra Nevada yellow-legged frog: Fire Management, Vegetation and Fuels Management, Range Management, Recreation Management, Restoration Activities, and Roads and Other Infrastructure.

Fire Management

The majority of the designated critical habitat for the mountain yellow-legged frog and Sierra Nevada yellow-legged frog on the Inyo NF plan area is within designated wilderness areas as shown in Table 16 and Table 17 and described in the Description of Affected Species section above. Within designated wilderness, most active, ground-disturbing management, such as direct vegetation management or prescribed burning, is inconsistent with maintaining the wilderness character required by the Wilderness Act (DA-WILD-DC-01). In designated wilderness, the desired condition for the two yellow-legged frog species will primarily be attained through guiding

decisions related to managing wildfires by considering the expected fire effects on habitats (FIRE-FW-GDL-01) and striving to maintain and restore fire as an ecological process (DA-WILD-DC-03).

The Proposed Action identifies Strategic Fire Management Zones based upon the risks and benefits from wildland fire to highly valued resources and assets. The majority of the critical habitat for both species is located in the Wildfire Maintenance Zone and Wildfire Restoration Zone which has desired conditions to be "…*resilient to the range of fire effects*" (MA-WRZ-DC-01) and where "…*wildland fire has predominantly positive benefits to ecosystems and resources*" (MA-WMZ-DC-01). Within these two Strategic Fire Management Zones, fires from lightning would be evaluated to determine if they could be managed with less than a full fire suppression response considering safety to firefighters and the public and potential positive and negative effects from expected fire behavior to various resources. To aid in determining the appropriate wildfire management strategy, spatial support tools are used to identify the locations of special habitats and key habitat areas, including critical habitat areas, so they can be considered (potential management approach for Fire).

Vegetation and Fuels Management

Only a small portion of critical habitat occurs outside of wilderness on the Evolution / Le Conte critical habitat for the Sierra Nevada yellow-legged frog (see Figure 11 above). All other critical habitat or occupied habitats are within designated wilderness where ground-disturbing vegetation or fuels management is not expected to occur. There are roads within the area outside of wilderness; however, it is otherwise surrounded by inventoried roadless area. Given the surrounding inventoried roadless area, it is unlikely that vegetation management would occur but fuels management could occur if treatments were found to be needed to reduce the risk of wildfire or to facilitate prescribed fire or to strategically manage future wildfires.

Range Management

Livestock grazing has been discontinued in areas occupied by Sierra Nevada yellow-legged frog and mountain yellow-legged frog on the Inyo NF in the environmental baseline with the exception of continued livestock grazing in the Mulkey Allotment in the area around Mulkey Meadows which could affect the mountain yellow-legged frog.

The Proposed Action does not directly change the status or use on individual allotments, nor does it substantively change current direction for livestock grazing. As described in the summary of major program actions above, some protocol and process-related language was removed from the forest plan and is issued as supplemental implementation guidance so it can be kept more current as protocols improve with better knowledge.

Livestock grazing in the Mulkey Allotment is guided by the Allotment Management Plan which requires setting an annual on-date determined by meadow conditions and breeding chronology for the mountain yellow-legged frog. In addition, although utilization standards are set to protect stream and riparian habitat conditions, a trampling standard developed to protect golden trout habitat typically results in livestock being removed from occupied habitats before the utilization standards are met. This ongoing activity is addressed under the Programmatic Biological Opinion (FFOSESMF00-2014-F-557) for the nine national forests in the Sierra Nevada.

Recreation Management (including pack stock)

Other than fire management, habitat within wilderness areas will remain essentially undisturbed by management activity (DA-WILD-DC-01), but meadows and streams used by these species may be exposed to periodic, low-level, dispersed wilderness travel, by individuals and small groups of hikers

primarily on trails. Some use by recreational pack stock occurs which could impact individuals or habitats used by these species. Current use levels collected during wilderness permit issuance show that use is low to moderate and has decreased over past historic levels. Within designated wilderness, if the level of recreation use were found to be adversely impacting these species, guideline DA-WILD-GDL-01 provides guidance to "*[l]imit party size and number of stock per party to a level that protects social and natural resource values. The level may vary within or between wilderness areas.*"

Within the small areas outside of wilderness in the Evolution / Le Conte critical habitat subunit for Sierra Nevada yellow-legged frog, recreation activities are expected to continue because of the road access. There are no known conflicts with recreation at these sites.

Restoration Activities

Within designated wilderness, direct restoration of habitat involving ground-disturbing action will be limited and the primary means of achieving restoration of aquatic habitats will be passive by managing actions or activities that cause impacts. Effects related to Range Management and Recreation Management are described above.

Roads and Other Infrastructure

There are no effects from roads and other infrastructure that would affect the northern DPS of the mountain yellow-legged frog because all occupied habitats and critical habitat are located within designated wilderness. Within the portion of the Evolution / Le Conte critical habitat unit for the Sierra Nevada yellow-legged frog, road maintenance would occur as needed along the existing roads. However, any road maintenance activities in this area would be designed to avoid, mitigate, or minimize effects to the Sierra Nevada yellow-legged frog and consultation would occur if any project may affect the species or its habitat. Because of the proximity to Baker Creek and other streams in the area, additional direction to protect riparian conservation areas would also apply to many road related activities that might be proposed.

Effects to Critical Habitats

As described above, all of the designated habitat for the northern DPS of the mountain yellow-legged frog and the majority of the designated critical habitat for the Sierra Nevada yellow-legged frog is within designated wilderness areas. Within designated wilderness, most active, ground-disturbing management, such as direct vegetation management, prescribed burning, and other habitat improvement is inconsistent with maintaining the wilderness character required by the Wilderness Act (DA-WILD-DC-01) of providing *"…untrammeled, natural, undeveloped"* qualities. Therefore, active ground-disturbing management activities is unlikely to be proposed within the majority of critical habitat limiting the potential for adverse effects. The desired condition for both species of yellow-legged frog habitat will primarily be attained through managing recreation uses, including pack stock use and managing wildfires to restore the role of fire to the landscape. A guideline (FIRE-FW-GDL-01) directs the Inyo NF to *"[u]se naturally ignited and prescribed wildland fires to meet multiple resource management objectives, where and when conditions permit and risk is within acceptable limits."* Within wilderness, a desired condition (DA-WILD-DC-03) is that *"[f]ire is restored as an ecosystem process and natural disturbance agent in wilderness where possible."* The role of fire in riparian ecosystems is recognized by standard FIRE-FW-STD-04 that "*[w]hen managing wildland fire, allow fire to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function.*"

The Proposed Action substantially improves the ability to consider the risks and benefits of wildfire to resources compared to the current forest plan. The Proposed Action identifies Strategic Fire Management Zones across the forest based upon the risks and benefits from wildland fire to highly valued resources and assets. The majority of the critical habitat located in wilderness is in the Wildfire Maintenance Zone or Wildfire Restoration Zone (See Figure 3). When wildfires occur within designated wilderness areas, FIRE-FW-STD-02 requires the use of "*…minimum impact strategies and tactics to manage wildland fire, unless more direct attack is needed to protect people or adjacent property.*"

In the Wildfire Maintenance Zone, most wildfires are expected to burn at a severity that would result in low risk to communities and generally positive benefits to resources under most weather conditions. The desired condition for this zone (MA-WMZ-DC-01) is *"[e]cosystems are resilient to the impacts of wildfire and wildland fire has predominantly positive benefits to ecosystems and resources."* A goal for this zone (MA-WMZ-GOAL-01) is to "*[m]anage wildfires to maintain fire resilient landscapes.*" Two standards encourage restoring fire to the landscape. One standard (MA-WMZ-STD-01) requires the responsible line officer to "*…document cases when naturally caused wildfires are promptly suppressed*" and another (MA-WMZ-STD-02) requires documentation when "*…natural barriers and features, such as creeks, old fire footprints, ridges, and man-made lines, such as roads and trails*" are not used to manage wildfires within the Wildfire Maintenance Zone. Providing for firefighter and public safety and practicality are considered when determining where fire management actions are planned. MA-WMZ-STD-02 is designed to minimize ground disturbing creation of new firelines to the extent possible which is further supported by standard FIRE-FW-STD-02 that in designated wilderness, fire management would "*[a]pply minimum impact strategies and tactics to manage wildland fire, unless more direct attack is needed to protect people or adjacent property.*"

In the Wildfire Restoration Zone, wildfires are expected to burn at a severity that would result in a low to moderate risk to communities and could have either positive benefits to resources or moderate risk to resources depending upon the weather conditions. The desired conditions for this zone (MA-WRZ-DC-01) is *"[t]he landscape is resilient to a range of fire effects, and wildland fire has a predominately positive benefit to ecosystems and resources."* A goal for this zone (MA-WRZ-GOAL-01) recognizes that some actions such as prescribed burning or fuels management may be needed to "*[c]reate fire resilient landscapes that can be restored and maintained by managing wildfire to meet resource objectives, and prescribed fire and fuel reduction treatments.*" Similar to the Wildfire Maintenance Zone, a standard (MA-WRZ-STD-01) requires documentation when "*…natural barriers and features like creeks, old fire footprints, ridges, and human-made features (such as roads and trails)*" are not used due to safety or practicality concerns.

Within these two Strategic Fire Management Zones, fires from natural sources such as lightning, would be evaluated to determine if they could be managed with less than a full fire suppression response, considering safety to firefighters and the public and potential positive and negative effects from expected fire behavior to various resources. A potential management approach for Fire describes our intent for making fire management decisions as: *"[w]hen determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season."* The location of designated critical habitat is included in these decision-support systems. Implementing these fire management approaches that restore fire regimes towards the natural range of variation will contribute to providing for the primary constituent elements related to upland

areas by reducing the risk of uncharacteristic impacts to riparian and upland vegetation that may be used by frogs to travel between breeding and nonbreeding aquatic habitats. It would also contribute to the primary constituent elements related to aquatic habitat by and reducing the risk of post-fire sediment affecting aquatic habitats.

Where livestock grazing occurs in the occupied habitats in the Mulkey Meadows area, the risk of habitat degradation is minimized by use the use of annual on-dates set based upon the use of a combination of a utilization standard designed to protect stream and riparian habitat conditions and a separate trampling standard designed to protect habitat for golden trout that results in a shortened period of livestock utilization. The risk of impacts from trampling and adverse effects to critical habitat are also lessened by having a shorter period of livestock occupancy set by a later on date and off-dates determined by levels of grazing use and levels of ground disturbance within critical habitat. Any future actions to consider use of vacant allotments would require a site-specific analysis and would be guided by forestwide direction in SPEC-FW-STD-01 that "*[d]esign features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.*" A goal, SPEC-FW-GOAL-03 would guide the Inyo NF to "*[w]ork with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans.*" Any site-specific action would require consultation in compliance with Section 7 of the ESA.

As with Range Management above, if recreation impacts or pack stock impacts are identified at specific locations, goal SPEC-FW-GOAL-03 would be used to work with the USFWS to determine what actions may be needed to "*…restore and maintain essential habitat for at-risk species.*" Several standards for Riparian Conservation Areas also address limiting trampling and disturbance impacts to streambanks, lakeshores, and fens (MA-RCA-STD-07, MA-RCA-STD-08, and MA-RCA-STD-11).

This direction for range management recreation management provide the approach to addressing adverse effects to critical habitats as they are identified which will minimize the potential and the consequences of activities that may cause adverse effects to critical habitat for these species.

Restoration actions that affect aquatic habitats outside of wilderness have the potential to alter stream shading (solar radiation); water temperature; water quantity; water quality; sediment, nutrient, and litter inputs; woody debris; and channel structure. All project activities that may affect these species will require separate site specific evaluations and consultation under Section 7 of the ESA.

The Proposed Action provides direction to give primary management emphasis in riparian areas to protect and enhance riparian ecosystem, riparian vegetation, water quality, soils, fish, and wildlife resources. Plan components guide projects to be designed to protect and improve beneficial functions such as providing cold, clean water; stream shading; and aquatic and riparian habitat. These plan components collectively help assure stream and riparian habitats are conserved and restored for long-term sustainability and resilience, and species long-term viability, although they may have short-term impacts. Summaries of these actions are provided in the section: *Effects Common to Aquatic Habitats and Species.* To the extent that restoration activities improve the ecological conditions of streams, lakes, and ponds they may provide opportunities for re-establishing populations to reduce population fragmentation in the future.

Cumulative Effects

The cumulative effects analysis area for the Sierra Nevada yellow-legged frog and mountain yellow-legged frog is the Inyo NF plan area encompassing the designated critical habitats for both species. This is an appropriate scale for determining cumulative effects since this area includes all habitat potentially affected by implementation of the Proposed Action. The cumulative effects time frame is 15 years into the future. The cumulative effects of all past non-federal actions are incorporated into the existing condition.

The majority of the critical habitat for these species occurs within designated wilderness. As such, there are few non-federal lands within or near critical habitats. There are a few scattered isolated private land parcels in the area outside of wilderness in the Evolution / Le Conte critical habitat subunit. It is unknown what activities occur on those parcels.

Some non-federal actions, such as those identified in the Cumulative Effects section in the Plan Analysis section, may affect these species and their habitats in the plan area. The CDFW is expected to continue to monitor populations of these species and to analyze and implement native species restoration projects involving fish removal and activities related to translocation of populations or other actions to manage and restore populations. CDFW also engages in and is expected to continue to engage in management for other state threatened or endangered species or species of state concern such as the golden trout. The other substantial non-federal action that may occur in the cumulative effects area is fish stocking by CDFW into designated locations for recreational sportfishing. However, fish stocking was evaluated in 2010 by the CDFW and stocking near locations of federally listed species, including the species in this analysis was discontinued in or near occupied locations (ICF Jones & Stokes 2010).

Given these and other potential non-federal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to threatened and endangered species. All future project level activities that may affect these species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- The Proposed Action includes plan components and plan direction functionally similar to the conservation measures of the 2014 Sierra Nevada Amphibian Biological Opinion. A separate consultation will occur to address ongoing activities on the Inyo NF under the revised forest plan once it is adopted.

- Livestock grazing in the Mulkey Allotment is allowed within the Mulkey Meadows designated critical habitat unit for the northern DPS of the mountain yellow-legged frog. Although limitations in the Allotment Management Plan mitigate the risk to individuals and to habitat, this use is likely consistent with the revised forest plan and would not be precluded under the Proposed Action.

- A small portion of the Evolution / Le Conte critical habitat unit for the Sierra Nevada yellow-legged frog occurs outside of designated wilderness and contains roads that will be maintained and that could facilitate fuels management and continues to support dispersed recreation uses.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the northern distinct population segment of the mountain yellow-legged frog and Sierra Nevada yellow-legged frog.

Although most Sierra Nevada yellow-legged frog critical habitat occurs in wilderness and this limits our management actions, a small portion occurs outside of designated wilderness and vegetation and fuels management could occur there, we determined that adoption of the Proposed Action ***may affect, and is likely to adversely affect designated critical habitats*** for the Sierra Nevada yellow-legged frog on the Inyo National Forest.

All of the critical habitat for the northern DPS of the mountain yellow-legged frog occurs in wilderness and this limits our ground disturbing management actions; however, livestock grazing occurs in the Mulkey Meadows critical habitat unit. Therefore, we determined that adoption of the Proposed Action ***may affect, and is likely to adversely affect designated critical habitats*** for the northern DPS of the mountain yellow-legged frog on the Inyo National Forest.

Yosemite Toad and Critical Habitat

The 2015 Yosemite Toad Conservation Assessment (Brown et al. 2015); USFWS listing rule (United States Department of the Interior 2014b); and USFWS rule designating critical habitat (United States Department of the Interior 2016a) describes in detail the current habitat, life history, and risk factors and is the source for the following species information unless otherwise noted. Since this biological assessment summarized from these sources, many of the original supporting literature citations are contained in them and are not repeated here unless needed for clarity.

Classification, critical habitat and Recovery Plan

In 2002, the USFWS determined that listing was warranted for this species; however, the listing was precluded at the time based on other higher priority issues (United States Department of the Interior 2002). The Yosemite toad was listed as a threatened species in 2014 (United States Department of the Interior 2014b). Final critical habitat was designated in 2016 to include approximately 1,812,164 acres in Alpine, Amador, Calaveras, El Dorado, Fresno, Inyo, Lassen, Madera, Mariposa, Mono, Nevada, Placer, Plumas, Sierra, Tulare, and Tuolumne Counties, California. (United States Department of the Interior 2016a). Of the 16 critical habitat units, five are located on the Inyo NF, covering approximately 83,939 acres as listed in Table 18 and show in Figure 13. Critical habitat Unit 15, Upper Goddard Canyon, has approximately 4 acres of overlap on the Inyo NF which are essentially small slivers along the forest boundary with Kings Canyon National Park and are all in the John Muir Wilderness. A Recovery Plan for Yosemite toad has not been completed.

Yosemite toad is also listed by the State of California as a Species of Special Concern. A collaborative inter-agency Yosemite Toad Conservation Assessment was completed in 2015 with the USFS, CDFW, National Park Service, and USFWS (Brown et al. 2015). The Conservation Assessment was developed and reviewed by a Yosemite toad working group that included representatives from the above mentioned agencies along with species experts and academic institutions such as the University of California, Berkeley and Sierra Nevada Aquatic Research Laboratory (Brown et al. 2015).

Table 18. Acres of Yosemite toad critical habitat Units (CHU)

CHU Number	CHU Name	Total CHU Acres	CHU Acres – Inyo NF	CHU Acres – Inyo NF Wilderness
4	Hoover Lakes	5,679	698	687
5	Tuolumne Meadows/Cathedral	139,434	37,797	34,095
12	Silver Divide	98,578	36,160	33,720
13	Humphreys Basin/Seven Gables	50,930	9,281	8,723
15	Upper Goddard Canyon	36,731	4	3

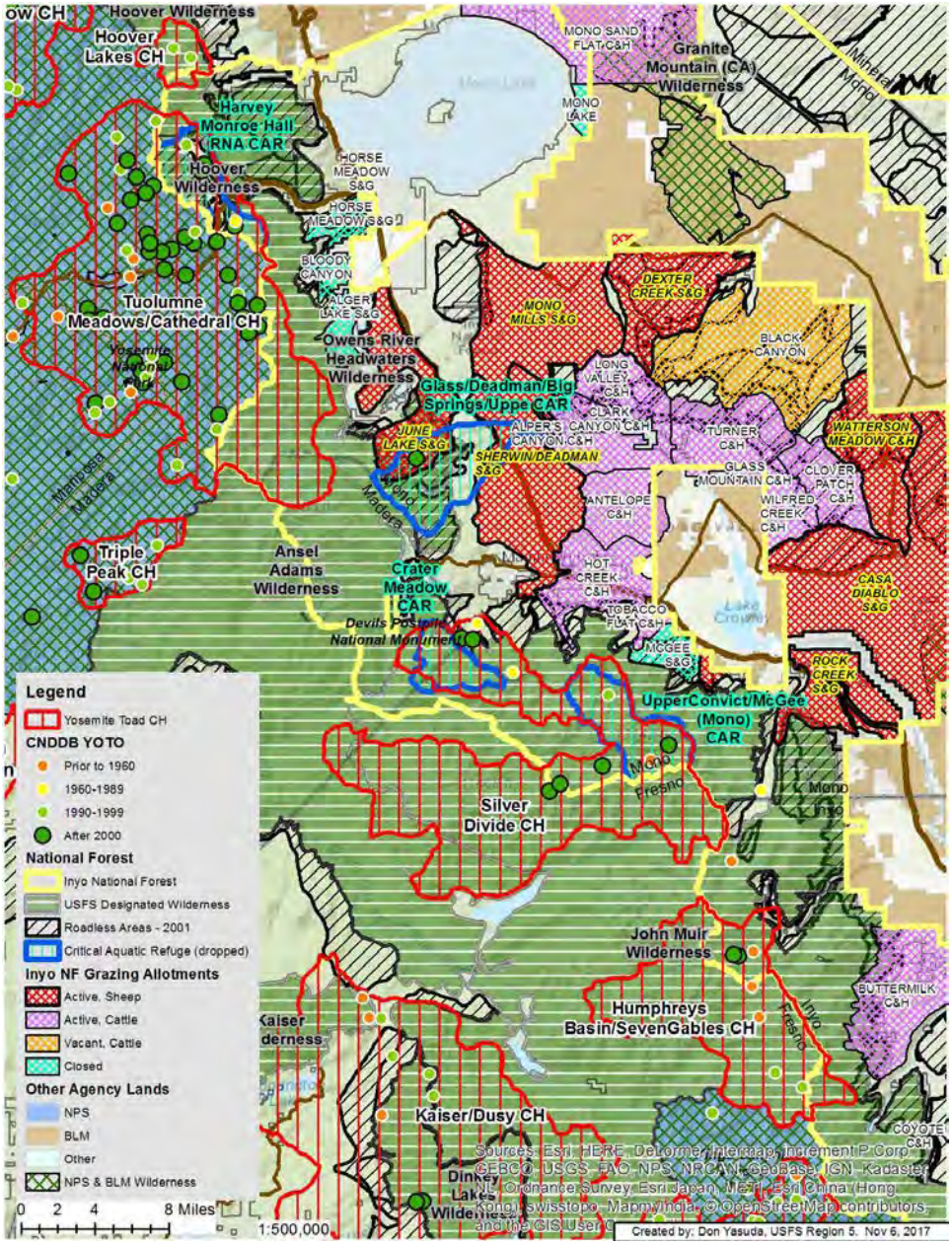

Figure 13. Map of critical habitat units, livestock grazing allotments, and existing plan critical aquatic refuges for Yosemite toad

The USFWS (United States Department of the Interior 2016a) has determined that the primary constituent elements specific to the Yosemite toad are:

1) *Aquatic breeding habitat.*
   a) This habitat consists of bodies of fresh water, including wet meadows, slow-moving streams, shallow ponds, spring systems, and shallow areas of lakes, that:
      i) are typically (or become) inundated during snowmelt;
      ii) Hold water for a minimum of 5 weeks, but more typically 7 to 8 weeks; and
      iii) Contain sufficient food for tadpole development.

b) During periods of drought or less than average rainfall, these breeding sites may not hold surface water long enough for individual Yosemite toads to complete metamorphosis, but they are still considered essential breeding habitat because they provide habitat in most years.

2) *Upland areas.*
   a) This habitat consists of areas adjacent to or surrounding breeding habitat up to a distance of 1.25 km (0.78 mi) in most cases (that is, depending on surrounding landscape and dispersal barriers), including seeps, springheads, talus and boulders, and areas that provide:
      i) Sufficient cover (including rodent burrows, logs, rocks, and other surface objects) to provide summer refugia,
      ii) Foraging habitat,
      iii) Adequate prey resources,
      iv) Physical structure for predator avoidance,
      v) Overwintering refugia for juvenile and adult Yosemite toads,
      vi) Dispersal corridors between aquatic breeding habitats,
      vii) Dispersal corridors between breeding habitats and areas of suitable summer and winter refugia and foraging habitat, and/or
      viii) The natural hydrologic regime of aquatic habitats (the catchment).
   b) These upland areas should also maintain sufficient water quality to provide for the various life stages of the Yosemite toad and its prey base.

Habitat and Life History

Yosemite toads occupy both aquatic and terrestrial habitats. They breed and rear primarily in shallow still water habitat; use meadows, springs, and terrestrial upland habitats for foraging, refuge, and movements; and overwinter in underground terrestrial sites. Tadpoles develop rapidly in very shallow, typically ephemeral aquatic habitats. Mortality from the period of eggs through metamorphosis can be very high, with abiotic factors (desiccation and/or freezing) sometimes causing total or near loss of a year's cohort. Mortality of small postmetamorphic toads also appears high, likely because of high overwinter mortality. The long-lived adults may be key to long-term persistence of populations given the low recruitment in some years. Post-metamorphic life stages (juveniles and adults) occupy habitats some distance from breeding sites seasonally. Little is known about seasonal movements, especially for juveniles, but movements that range several hundred meters from breeding sites are recorded for adults.

These features provide breeding habitat for the Yosemite toad, which prefer meadow edges without deep water or adjacent steep terrain. Terrestrial habitats utilized by Yosemite toad adults vary, particularly by elevation, and include forests, meadows, shrublands, rock outcrops, and talus. Mid-elevation meadows occur in yellow pine (mixed conifer) and lower edges of lodgepole-red fir forests. Meadows above 7,500 feet generally occur in lodgepole-red fir, subalpine and alpine ecosystems. Higher subalpine and alpine areas tend to be more open than lower elevation regions.

A geographic information system analysis identified 2,133,951 acres within 4,100 feet surrounding meadows above 6,000 feet elevation on the Inyo NF. These distances and elevations reflect the maximum extent of potentially suitable habitat and are based upon information in the listing findings (United States Department of the Interior 2014b). An evaluation of this data

further refined by examining areas of known occupancy and professional opinions about the potential for occupancy estimates that approximately 420,643 acres of this potentially suitable habitat surround areas that are known to be occupied, or utilized, and an additional 29,053 acres surround areas potentially occupied as shown in Figure 14.

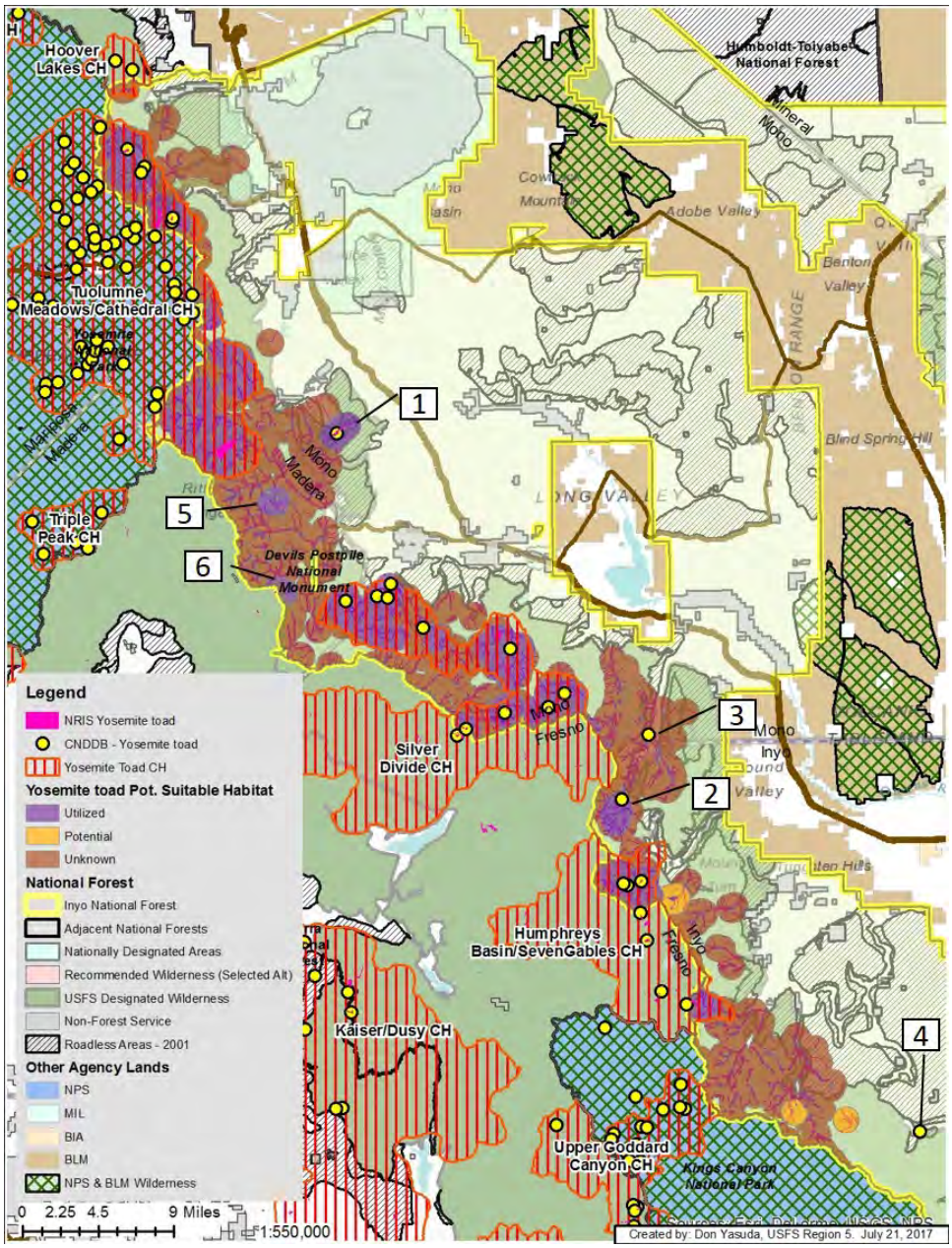

Figure 14. Map of potential suitable habitat and known occurrences of Yosemite toad

Historic and Current distribution

The elevational range for Yosemite toad is approximately 6,000 feet to more than 11,910 feet (United States Department of the Interior 2014b). The Yosemite toad is endemic to the Sierra Nevada and its range extends from north of Ebbetts Pass (Alpine County) south to approximately the Kings River (Fresno County). This includes the southern portion of the Eldorado NF south through the Stanislaus NF, Toiyabe NF, Inyo NF, Yosemite National Park, and Sierra NF to the

northern portion of Sequoia and Kings Canyon National Parks as shown in Figure 15 from Fig. 6 in (Brown et al. 2015).

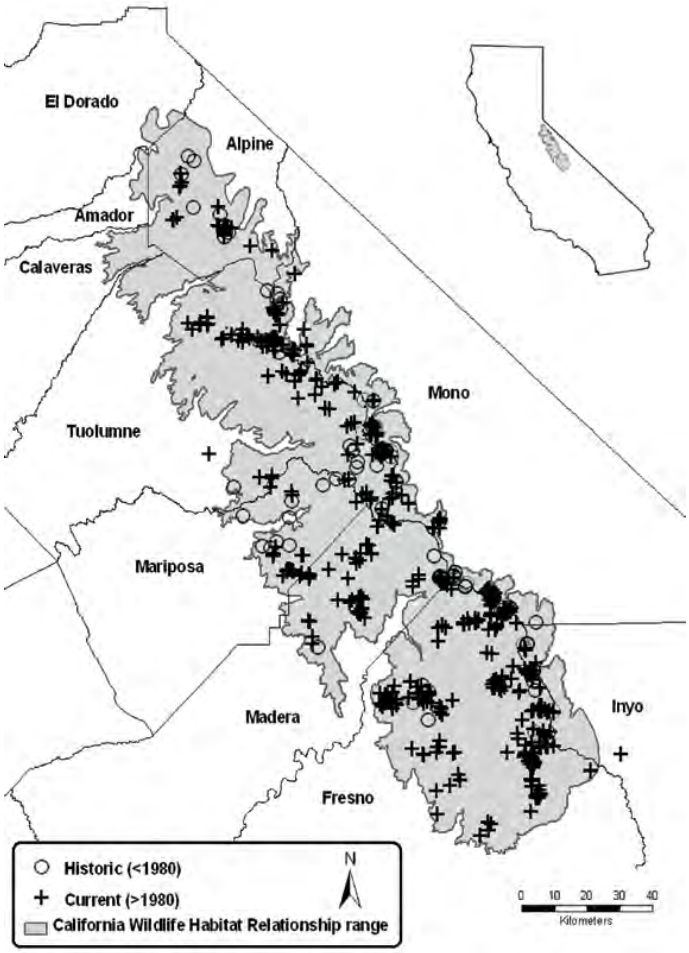

Figure 15. Historical and recent localities (2002-2003) for the Yosemite toad (*Anaxyrus canorus*) in the Sierra Nevada, California

Yosemite toad is currently found in many parts of the historic range but at lower abundance and with many individual sites no longer occupied. On the Inyo NF, there are 22 sites, with 276 known Yosemite toad locations. Populations are found in the higher elevations of the forest from the Lundy Canyon area south to the Piute Pass area. Of these 276 locations, 238 (or 86 percent) are located within designated wilderness areas and 38 are found outside designated wilderness. The current records from the California Natural Diversity Database and the USFS Natural Resource Information System (NRIS) wildlife observation database are shown in Figure 14 above. Most known occurrences are located with critical habitat units. However, six occurrences are outside of critical habitat units as identified in Figure 14 above and briefly described in Table 19 below.

Table 19. Notes on six Yosemite toad occurrences outside critical habitat

Map Number	General Location	Detections
1	Glass Creek Meadow	Single CNDDB detection from August 2003; NRIS detections 1993, 1994, 1999, 2000, 2004 from single adult to 200 unreported age

Map Number	General Location	Detections
2	Little Lakes Basin	Single CNDDB detection from August 1933; NRIS detections 2000, 2002, 2003, 2009 from single adult to 200 unreported age
3	Rock Creek	One CNDDB detection from September 1960
4	Glacier Lodge	One CNDDB detection from August 1984
5	Lois Lake	NRIS detection July 2002, one unreported age
6	Summit Meadow	NRIS detection August 2004, 62 unreported age

A small portion of the Silver Divide unit of critical habitat lies outside of wilderness and includes the recreation areas in the Mammoth Lakes Basin around Lake Mary and Crystal Lake (Figure 16).

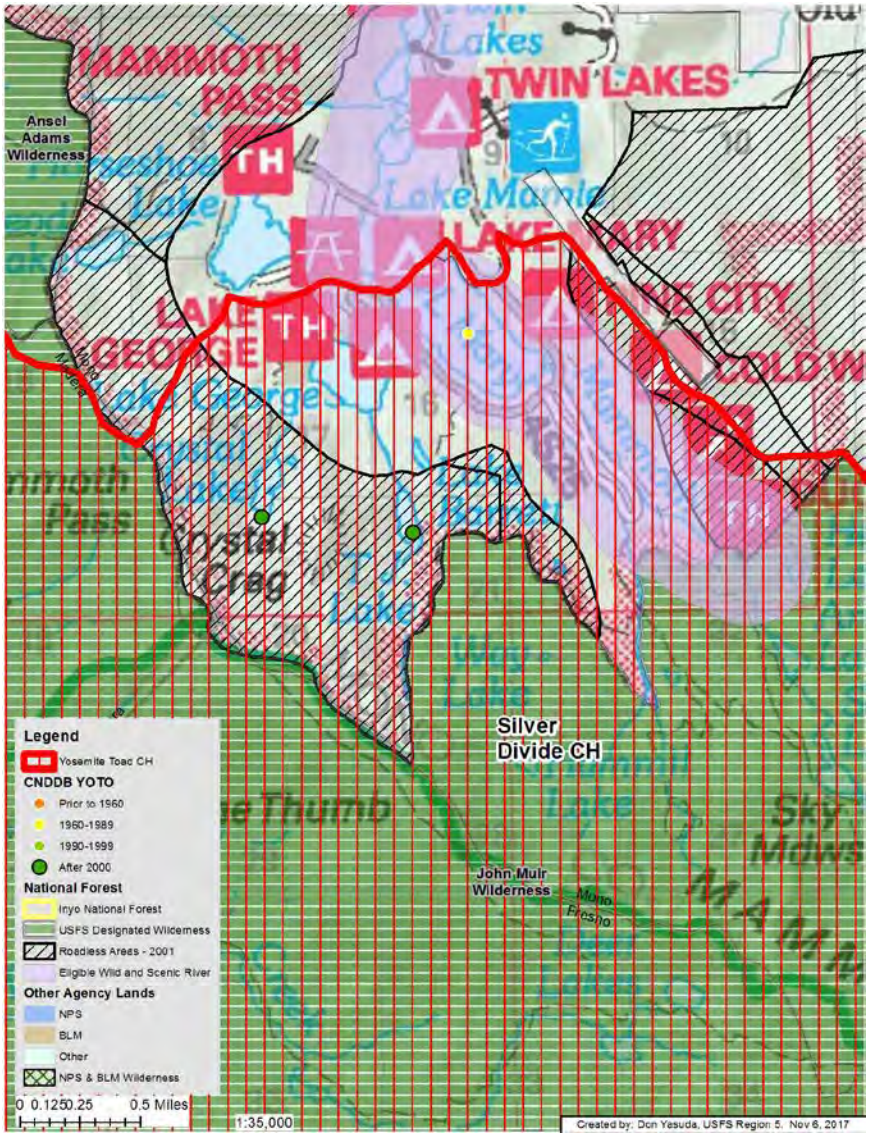

Figure 16. Map of Silver Divide critical habitat Unit outside wilderness near Lake Mary

Population and Habitat Status and Trend

The Yosemite toad was once a common amphibian in high-elevation aquatic ecosystems of the Sierra Nevada. Historical data is limited so changes in population are uncertain, but evidence suggests it has declined over the last 20 years. The conservation assessment summarized several studies that have examined the distribution of Yosemite toad prior to 1990 and in 1999-2000 which suggest that Yosemite toads only occupied 13 percent of historical locations. Yosemite toad populations in the Sierra Nevada declined from their local historical abundance levels and some populations appear very small. It is not known whether these populations are persisting at low numbers or whether they are on a slow trajectory to extirpation.

The decline in occupancy and abundances suggest fragmentation may be an increasing problem for this species. If the species typically functions as metapopulations, opportunities for these dynamics to exist have become more limited. Small, isolated populations are more susceptible to local extirpation and loss of genetic diversity, while fragmentation reduces the chances of recolonization following extirpation events.

Although the numbers and abundances of Yosemite toad populations have been reduced, populations remain in many parts of the toad's historical range. Thus, the opportunity exists for pro-active conservation to prevent further declines.

Threats

The Conservation Assessment was completed after the species listing and provides a detailed examination of risks to the Yosemite toad throughout its range (Brown et al. 2015). It identified several risk factors that currently are not likely to be major causes of rangewide declines but may be important in specific situations, particularly where toad populations are small. There are 11 risk factors relevant to land and resource management: 1) Fire Management, including fire suppression; 2) Habitat Loss, Urbanization and Fragmentation; 3) Introduced fish and other predators; 4) Livestock Grazing; 5) Locally Applied Pesticides; 6) Recreational Activities including Pack stock; 7) Research Activities; 8) Restoration; 9) Roads; 10) Vegetation and Fuels Management; and 11) Water Development and Diversion. It further identified that legacy effects from some of these risk factors (e.g., livestock grazing) may have contributed to Yosemite toad declines, particularly those that resulted in meadow drying, shortened hydroperiods of breeding habitats, and potentially, lowered breeding success. Some improved management may have lessened the impacts of some of these risk factors but other legacy impacts may remain.

Of these risk factors, three are a low risk on the Inyo NF because almost all of the habitat and critical habitat for Yosemite toad is within designated wilderness where the following risk factors are not contemporary or relevant:

- Habitat loss, urbanization, and fragmentation is not a threat because human development and associated road development does not occur within wilderness.
- Research activities are a generally considered a low risk because permits are required from the USFWS and CDFW before impacting the species or its habitat. Some elements of research activities would be governed by direction in the forest plan. In particular, within wilderness, there are restrictions on mechanized activities and ground-disturbing activities. If ground disturbing activities are proposed, a separate permit from the Inyo NF might also be required.
- Water development and diversions would not occur within wilderness.

Five risk factors fall largely outside the authority of the Forest Service but have the potential to impact populations on a regional or global scale. These include acid deposition, airborne contaminants, including pesticides, climate change, disease, and UV-B radiation. The Forest Service has few options to reduce the risk these factors pose to Yosemite toads and their habitat. Climate change likely poses the most risk to the species given the Yosemite toad's reliance on very shallow ephemeral water for reproduction. Reduced snowpacks may result in less available surface water, fewer breeding pools, and faster drying of breeding sites, all of which may lead to less successful reproduction. Early snowmelt and warmer temperatures may affect the Yosemite toad's behavior, the timing of reproduction and other phenological events, the duration of tadpole development, and resulting effects on survivorship. Improving ecosystem integrity in the meadows and uplands that provide Yosemite toad habitats may ameliorate local risk factors by improving the resiliency of Yosemite toad populations.

Fire Management

Fire management, including suppression has occurred within the Inyo NF since the early 1900's and has resulted in an alteration of the fire regime with a longer fire return interval and subsequent increase in vegetation and fuels in some areas. This has led to an increase on many fires of higher fire severity effects when fires do occur and larger extent of fires where fuels have become more continuous. This effect has occurred slightly less in the higher elevations and remote areas where Yosemite toads occur due to naturally longer fire return intervals and sparser vegetation due to harsher conditions and shorter growing season. In addition there is an emphasis to use minimum impact fire suppression techniques within wilderness areas when fires do occur which has allowed some fires to burn more areas like they would have naturally.

Introduced fish and other predators

Introduced fish and other predators is a legacy threat that lingers where introduced fish populations remain persistent. In 2006, the CDFW, complying with a court order, ceased fish stocking where it could impact federally listed species of amphibians or native trout (Lentz and Clifford 2014). By 2010, CDFW had evaluated their program and in working with the USFWS has reduced stocking to areas where native trout or other native aquatic species occurred (ICF Jones & Stokes 2010). While high mountain lake stocking ceased in 90 percent of previously stocked lakes (Lentz and Clifford 2014); some high elevation waters still contain remnant populations from previously stocked fish. The conservation assessment discusses the risks of introduced fish on Yosemite toad and determined that the risk appears low and addressing the direct effects of introduced fish is not a high priority for conservation options (Brown et al. 2015). However, it recognizes that indirect effects to changes in food webs, nutrient cycling, and pathogen transmission are unknown and worthy of future studies.

Livestock Grazing

After the Yosemite Toad was listed as a threatened species, livestock grazing in active allotments on the Inyo NF was evaluated and project-level decisions were made to adjust livestock grazing permits to remove livestock grazing from occupied Yosemite toad habitats. Livestock grazing may occur in other portions of livestock grazing allotments and the allotments were not administratively closed.

Locally Applied Pesticides

Locally applied pesticides could be considered in the portion of critical habitat outside of wilderness near Lake Mary if needed to control invasive species or to provide for vector control

for human safety. The application of pesticides is generally prohibited within designated wilderness.

Recreation Management, including pack stock

Recreational activities, including pack stock grazing is widespread across the range of the Yosemite toad, and generally has high overlap with the species and its habitats because of the human attraction to meadows and ponds and water bodies. The specific impacts of this risk factor to the species on the Inyo NF are unknown. Effects to the species may occur locally affecting meadow hydrology or potentially to the toads themselves, including in nonbreeding habitats. In general, the level of risk is probably low at the broader range scale because of the dispersed nature of many recreational activities. On the Inyo NF, numerous areas within wilderness have restrictions on the number of visitors with or without pack stock. Commercial pack stock have limited quotas as well. These restrictions are designed to limit the impact on resources while providing for the highest quality wilderness experience. Commercial pack stock is allowed in occupied habitat but not until after the breeding cycle. The chronology is based on annual precipitation, for example in 2013 the “on-date” was July 23 and in 2017, following a record wet year, the “on-date” was determined to be August 10 for elevations between 6,000 feet to 8,000 feet and September 12 for elevations above 8,000 feet.

Restoration Activities

Restoration intended to minimize legacy impacts and restore meadow conditions may result in increases in greater connectivity among high elevation meadow systems. Approximately 33 percent of the estimated range of the Yosemite toad in the Sierra Nevada is within active USFS administered grazing allotments (Brown et al. 2014, Brown et al. 2015). However, current management direction for Yosemite toads was adopted in 2004 to mitigate effects of livestock grazing to individuals and habitat (United States Department of Agriculture 2004). This direction calls for excluding livestock from areas occupied by Yosemite toads during the breeding and rearing season through metamorphosis. Currently, on the Inyo NF, there is no active grazing allotments within Yosemite toad critical habitat units (see Figure 13 above) or in habitats occupied by Yosemite toads. Since the vast majority of the critical habitat units are within designated wilderness, passive restoration following the removal of livestock has occurred in meadows and areas occupied by Yosemite toad.

Roads

The construction, re-construction, and maintenance of roads as well as the use of roads can affect Yosemite toads by direct mortality of individuals moving overland or by impacts to habitat from changes in water flow or increased sediment. In the area of critical habitat near Lake Mary, several roads currently exist around Lake Mary, primarily to provide recreation access to developed campgrounds and trailheads. Within developed campgrounds, a series of roads exist to individual campsites. The Yosemite toad sites near Crystal Lake and TJ Lake are within an inventoried roadless area and roads do not exist and road construction is unlikely.

Vegetation and Fuels Management

Vegetation management could occur in the non-wilderness portions of the critical habitat near Lake Mary. Vegetation management would primarily be focused on improving the resilience of forest vegetation to contribute to the scenic character of this heavily used recreation area and providing for public safety by managing dead and dying trees. Fuels management, primarily management of surface and ladder fuels where they may increase the risk of adverse wildfire

behavior and threaten recreation sites, could occur within around roads and campgrounds and facilities. This could involve large heavy equipment, but is more commonly accomplished by smaller equipment and work by hand and often involves piling and burning smaller fuels and prescribed burning.

Analysis of Effects

Indirect Effects

As noted in the section*: Effects Common to Aquatic Habitats and Species*, the Proposed Action provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area which will provide habitat conservation that would contribute towards the recovery of the Yosemite toad. This proposed management framework contains ecosystem restoration forest plan components that build resilience into watershed systems and habitats to better enable them to adapt to drought and climate change. This framework specifically promotes restoration actions that will enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

The use of pesticides generally would not occur within designated wilderness and existing and expected use of pesticides is limited on the Inyo NF, primarily being used for treatment of invasive species. Any pesticides would typically be applied by hand application with buffers around aquatic features to mitigate impacts to riparian resources (MA-RCA-STD-02). In addition, a plan standard (SPEC-AMPH-STD-01) specifically requires that pesticide applications within 500 feet of known occupied sites be designed to avoid adverse effects to Yosemite toad individuals and habitat.

The following program areas include actions guided by the forest plan that could potentially affect Yosemite toad: Fire Management, Vegetation and Fuels Management, Range Management, Recreation Management, Restoration Activities, and Roads and Other Infrastructure.

Fire Management

The majority of the designated critical habitat for the Yosemite toad on the Inyo NF plan area is within designated wilderness areas as shown in Table 18 and described in the Description of Affected Species section above. Within designated wilderness, most active, ground-disturbing management, such as direct vegetation management or prescribed burning, is inconsistent with maintaining the wilderness character required by the Wilderness Act (DA-WILD-DC-01). In designated wilderness, the desired condition for Yosemite toad will primarily be attained through guiding decisions related to managing wildfires by considering the expected fire effects on habitats to provide benefits for resources (FIRE-FW-GDL-01) and striving to maintain and restore fire as an ecological process (DA-WILD-DC-03).

The Proposed Action identifies Strategic Fire Management Zones based upon the risks and benefits from wildland fire to highly valued resources and assets. The majority of the critical habitat for Yosemite toad is located in the Wildfire Maintenance Zone and Wildfire Restoration Zone which has desired conditions to be resilient to the range of fire effects (MA-WRZ-DC-01) and where wildland fire has predominantly positive benefits (MA-WMZ-DC-01). Within these two Strategic Fire Management Zones, fires from lightning would be evaluated to determine if they could be managed with less than a full fire suppression response considering safety to firefighters and the public and potential positive and negative effects from expected fire behavior to various resources. To aid in determining the appropriate wildfire management strategy, spatial support tools are used to identify the locations of special habitats

and key habitat areas, including critical habitat areas, so they can be considered (Potential management approach for Fire).

Vegetation and Fuels Management

Vegetation and fuels management could occur within the portion of the Silver Divide critical habitat unit outside of wilderness. This area is part of the Mammoth Lakes Destination Recreation Zone and is within the Community Wildfire Protection Zone and General Wildfire Protection Zone due to the scattered structures and high recreation values. Vegetation management would primarily be focused on improving the health of forest vegetation to provide the desired scenic character and to provide for public safety, primarily by managing dead and dying trees. Any future projects would include necessary "*[d]esign features, mitigation, and project timing considerations…*" to avoid, minimize, or mitigate adverse effects on the Yosemite toad required by standard SPEC-FW-STD-01.

Fuels might be managed to lessen wildfire risks to assets by reducing understory fuels where they are outside the natural range of variation and restoring fire using prescribed burning where feasible.

Range Management

Livestock grazing has been discontinued in permitted grazing allotments occupied by Yosemite toads on the Inyo NF in the environmental baseline. If additional Yosemite toad occupied sites are found or if the livestock grazing in other areas are found to be impeding recovery of the species, site-specific analysis would be initiated to determine if changes are needed to existing permitted livestock uses.

Any future actions to consider livestock use of vacant allotments in and near occupied habitats would require a site-specific analysis and would be guided by forestwide direction in SPEC-FW-STD-01 that "*[d]esign features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.*" A goal, SPEC-FW-GOAL-03 would guide the Inyo NF to "*[w]ork with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans.*" Any site-specific action would require consultation in compliance with Section 7 of the ESA.

Recreation Management (including pack stock)

Other than fire management, habitat within wilderness areas will remain essentially undisturbed by management activity (DA-WILD-DC-01), but meadows and streams used by these species may be exposed to periodic, low-level, dispersed wilderness travel, by individuals and small groups of hikers primarily on trails.

Some use by recreational pack stock occurs which could impact individuals or habitats where use occurs in breeding and rearing habitat prior to metamorphosis. Current use levels collected during wilderness permit issuance show that use is low to moderate and has decreased over past historic levels. Currently, because recreational pack stock use may occur within occupied habitats, additional protection to Yosemite toads is provided by an Order for Injunctive Relief (No. C-00-01237 EDL, May 8, 2008) that states:

> *"The Forest Service shall prohibit all pack stock grazing and entry in occupied Yosemite toad breeding and rearing habitat throughout the breeding cycle (through*

> *metamorphosis). In addition, during the breeding and rearing cycle, the Forest Service shall prohibit any pack stock entry or grazing within 100 yards of any permanent water source within occupied toad habitat. The duration of the breeding and rearing cycle each year shall be based on the "wet" or "dry" year predictions based on the California Department of Water Resources Bulletin 120 (issued May 1of each year). The prohibition on entry into Yosemite toad habitats shall begin ten days before and extend for 80 days after the estimated start of breeding based upon Bulletin 120." (pg. 13-14)*

The estimated start of breeding considers snow depth and temperature data collected from the Department of Water Resources Kaiser Point snow survey station and a lower elevation site is used to annually determine the estimated "on-date" for pack stock grazing and entry in occupied Yosemite toad breeding and rearing habitat. An additional stipulation protects Yosemite toad tadpoles if they are detected after the "on-date,"

> *"If Yosemite toad tadpoles are observed in a meadow, and then confirmed by the Aquatic biologist after the "on-dates" listed above, grazing will need to halt from all breeding and rearing habitat and up to 100 yards of any permanent water source in that meadow until after metamorphosis can be confirmed by the Aquatic biologist."*

The direction of this Order is consistent with Animal and Plant Species desired condition, SPEC-FW-DC-03, which provides that "*[l]and management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction.*". Where conflicts are known to occur, guideline for riparian conservation areas, MA-RCA-GDL-02 requires actions to "*[m]inimize impacts from … special use permits, grazing permits, and day use sites that have been identified as contributing to degradation of water quality or habitat for aquatic and riparian-dependent species.*"

In the small area of critical habitat and the occupied habitat outside of wilderness in the Lake Mary area, the potential application of pesticides would be generally limited to site-specific herbicide applications for invasive species and potential treatment of campgrounds for vector control of diseases from rodents. In all cases, standard SPEC-AMPH-STD-01 would require that any pesticide application within 500 feet of known occupied Yosemite toad sites would avoid adverse effects to individuals or their habitats and future projects would require compliance with Section 7 of the ESA and consultation with the USFWS as needed.

Restoration Activities

Within designated wilderness, direct restoration of habitat involving ground-disturbing action will be limited and the primary means of achieving restoration of aquatic habitats will be passive by managing actions or activities that cause impacts. Effects related to Recreation Management are described above.

Roads and Other Infrastructure

There are existing roads around Lake Mary but no roads around the other occupied sites (Crystal Lake and T.J. Lake) outside of designated wilderness. Since the area around Lake Mary is within a destination recreation area, roads will likely be maintained to a standard that supports the higher use levels, similar to the current condition. Use of these roads are not known to be a current mortality factor for Yosemite toads.

Effects to Critical Habitats

The effects to critical habitat for Yosemite toad are very similar to those described for the mountain yellow-legged frog and Sierra Nevada yellow-legged frog above because the majority of critical habitat is also located in designated wilderness.

The risk of adverse effects to critical habitat occurs primarily in the small portion of critical habitat located outside of designated wilderness around Lake Mary. In this area, active suppression of wildfires might occur to protect life and property. This could result in some risk of adverse effects but would be subject to emergency consultation. Similarly, there could be a need and opportunities for vegetation and fuels management to reduce fire risks and to provide for public safety given the heavy recreation use that occurs in this area; however, this would not be likely to adversely affect critical habitat as there are several plan components that provide for Riparian Conservation Areas. Some relevant examples are that Riparian Conservation Areas: have "*…ecological conditions that contribute to the recovery of threatened and endangered species…"* (MA-RCA-DC-02); "*…provide a range of substrates to sustain habitat for a variety of aquatic and terrestrial fauna within their natural capacity of the system*" (MA-RCA-DC-05); "*…do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages*" (MA-RCA-STD-01); and "*[p]revent disturbance to streambanks and shorelines of lakes and ponds (caused by resource management activities, or factors such as off-highway vehicles or dispersed recreation) from exceeding 20 percent of stream reach, or 20 percent of natural lake and pond shorelines*" (MA-RCA-STD-07). Restoring fire to the ecosystem would contribute to the primary constituent elements related to aquatic habitat by and reducing the risk of post-fire sediment affecting aquatic habitats.

There are limited opportunities for restoration activities given that most of the critical habitat is located within designated wilderness where ground disturbing activities are generally prohibited. In the portion of critical habitat outside of wilderness some habitat improvements could occur. Guideline MA-RCA-GDL-02 is designed to "*[m]inimize impacts from roads, trails, off-highway-vehicle trails, staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites that have been identified as contributing to degradation of water quality or habitat for aquatic and riparian-dependent species.*"

Restoration activities around meadows and ponds occupied by Yosemite toads would be guided by direction for riparian conservation areas (MA-RCA-DC-02) to "*…have ecological conditions that contribute to the recovery of threatened and endangered species…*" and would include be designed to include "*[d]esign features, mitigation, and project timing considerations…*" that would avoid, minimize, or mitigate effects to occupied habitats (SPEC-FW-STD-01).

Cumulative Effects

The cumulative effects analysis area for the Yosemite toad is area surrounding designated critical habitat within the Inyo NF plan area. This is an appropriate scale for determining cumulative effects since this area includes all suitable habitat potentially affected by implementation of the Proposed Action in this biological analysis. The cumulative effects time frame is 15 years into the future. The cumulative effects of all past non-federal actions are incorporated into the existing condition.

The majority of the critical habitat for Yosemite toad on the Inyo NF occurs within designated wilderness. There is only one approximately 20 acre parcel of non-federal lands in the upper end of the Humphreys Basin/Seven Gables critical habitat unit that is privately owned. The uses on

this parcel are unknown but it appears to be an old mining claim with no obvious surface activities.

Some non-federal future actions, such as those identified in the Cumulative Effects section in the Plan Analysis section, may affect these species and their habitats in the plan area, such as fish stocking by CDFW. However, fish stocking was evaluated in 2010 by the CDFW and stocking near locations of federally listed species, including the Yosemite toad was discontinued in or near occupied locations (ICF Jones & Stokes 2010).

Given these and other potential nonfederal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to threatened and endangered species. All future project level activities that may affect these species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- Livestock grazing has been discontinued in Yosemite toad occupied habitats in the environmental baseline and would not change without site-specific analysis and consultation with the USFWS.

- Pack stock use within occupied Yosemite toad breeding and rearing habitat will continue to be restricted annually through metamorphosis of tadpoles.

- Almost all critical habitat occurs within designated wilderness area and this would limit ground-disturbing activities that could adversely affect habitat except for impacts from recreation uses. A portion of critical habitat exists outside of wilderness in the Lake Mary area that has heavy recreation uses and could be adversely affect by forest management actions and allowed activities.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the Yosemite toad.

Since a small portion of critical habitat exists outside of wilderness we determined that adoption of the Proposed Action ***may affect, and is likely to adversely affect designated critical habitat*** of the Yosemite toad on the Inyo National Forest.

Lahontan Cutthroat Trout

The Lahontan cutthroat trout Recovery Plan (United States Department of the Interior 1995a) and latest 5-Year Review (United States Department of the Interior 2009a) describes key habitat, life history requirements, distribution and threats compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

Classification, Critical Habitat and Recovery Plan

Lahontan cutthroat trout was listed as endangered in 1970 (United States Department of the Interior 1970), but was subsequently reclassified as threatened in 1975 to facilitate management and allow regulated angling (United States Department of the Interior 1975). Critical habitat has not been designated for this species. There is one "out-of-basin" population on the Inyo NF. Out-of-basin populations are those located outside of the historical range of the species. The species is managed according to the Recovery Plan published in 1995 (United States Department of the Interior 1995b).

The Lahontan Cutthroat Trout Recovery Plan identified a criteria for delisting by population segment when management has been instituted to enhance and protect habitat required to sustain appropriate numbers of viable self-sustaining populations (United States Department of the Interior 1995b).

The 1995 recovery plan applies to the out-of-basin populations on the Inyo NF. **Recovery Action 17** focuses on managing and monitoring the species in the out-of-basin locations so they have the potential to serve as donor stock for reintroduction within the historic range.

The 2009 5-Year status review recommended the following range-wide actions: revise the 1995 recovery plan; develop state and tribal hatchery management plans; improve utility of monitoring/accomplishment databases; and develop regulations to help conserve Lahontan cutthroat trout (United States Department of the Interior 2009a). The revision to the 1995 recovery plan not been formally initiated.

Habitat and Life History

The 5-Year Review (United States Department of the Interior 2009a) summarizes the habitat and life history of the Lahontan cutthroat trout. Optimal habitat is characterized by 1:1 pool-riffle ratios; well-vegetated, stable stream banks; over 25 percent cover, and relatively silt free rocky substrates. Lahontan cutthroat trout inhabits areas with overhanging banks, vegetation, or woody debris. In-stream cover (brush, aquatic vegetation, and rocks) is particularly important for juveniles. Lahontan cutthroat trout are unique since they can tolerate much higher alkalinities than other trout. Lahontan cutthroat trout have an optimal range in waters with average maximum water temperature of less than 72 degrees Fahrenheit and average daily summer water temperatures of 55 degrees Fahrenheit.

Some fluvial-adapted fish remain for 1 or 2 years in nursery streams before emigrating in the spring. Growth rates for stream dwelling Lahontan cutthroat trout are fairly slow. Stream-dwelling Lahontan cutthroat trout generally have a life span of less than 5 years, while those living in lakes may live 5 to 9 years. Fluvial Lahontan cutthroat trout are opportunistic feeders whose diets consist of drift organisms.

Historic and Current Distribution

The Recovery Plan describes the historic and current distribution (United States Department of the Interior 1995a). Prior to the 19th century, Lahontan cutthroat trout occurred in 11 lacustrine populations occupying about 334,000 acres of lakes and an estimated 400 to 600 fluvial populations inhabiting more than 3,600 miles of streams. Many of the basins in which cutthroat trout occur contain remnants of more extensive bodies of water which were present during the wetter period of the late Pleistocene epoch, 25,000 years ago. Lake Lahontan was one of these bodies of water that covered much of northwestern Nevada and parts of northern California and southeastern Oregon. Lahontan cutthroat trout historically occurred in most cold waters of the Lahontan Basin including the Humboldt, Truckee, Carson, Walker and Summit Lake/Quinn River drainages. These trout also occurred in Tahoe, Cascade, Fallen Leaf, Upper Twin, Lower Twin, Pyramid, Winnemucca, Summit, Donner, Walker, and Independence lakes.

Native Lahontan cutthroat trout are now extirpated from Tahoe, Cascade, Fallen Leaf, Upper Twin, Lower Twin, Pyramid, Winnemucca, Donner, and Walker lakes. They have also been extirpated from most of the western portion of its range in the Truckee, Carson, and Walker river basins, and from much of its historic range in the Humboldt basin. Lahontan cutthroat trout currently exist in about 155 streams (10.7 percent of historic habitat) and six lakes or reservoirs (0.4 percent of historic habitat) in Nevada, California, Oregon and Utah (United States Department of the Interior 2009a). Many of the fluvial populations occupy isolated stream segments of larger river systems with no opportunity for natural recolonization.

Recent genetic analyses have confirmed that the Lahontan cutthroat trout population on the Inyo NF was transplanted from Carson River populations (Peacock and Kirchoff 2007), the exact contributing location unknown. The fish were released into O'Harrel Creek, an approximately 2.0 mile dis-continuous stream within the Owens River watershed in the Crowley Lake area (Figure 17). The creek occurs on a south-facing alluvial fan that has been incised, creating a small stream within the incision. The fish occupy the upper half of the wetted channel. The amount of suitable habitat is likely contained within a 0.5 mile reach of stream with 0.2 miles of that occurring on Los Angeles Department of Water and Power land. In the 2001 Sierra Nevada Forest Plan Amendment, the 1,830 acre O'Harrel critical aquatic refuge was identified to protect habitat for this species. The stream does not connect with the main stem of the Owens River, which isolates the population from brown trout (*Salmo trutta*) and rainbow trout (*O. mykiss*). Extensive watershed repair and restoration has been implemented along O'Harrel Creek since the 1960's. The last restoration effort in 1999 included installing sills along 1 mile of stream to raise the level of the stream within the incision and create plunge-pool habitat to increase habitat diversity within the stream. The sill installation showed some success, but some failed structures returned to pre-installment condition. Changing the grazing regime along this segment has had the most positive influence on riparian function by creating a dense vegetative component within the floodplain and stabilizing sediment deposited along the streambanks.

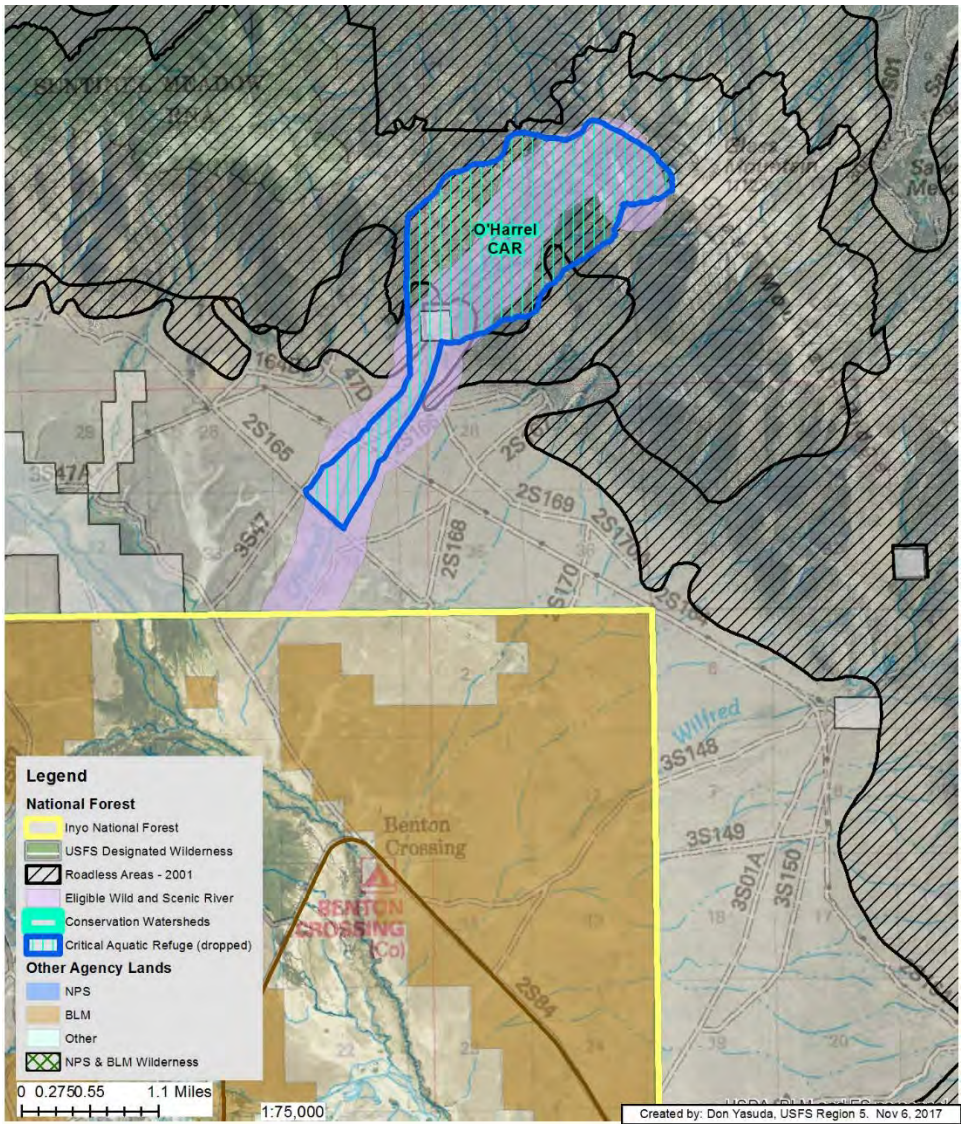

Figure 17. Map of Lahontan cutthroat trout location, former critical aquatic refuge and eligible wild and scenic river

Population and Habitat Status and Trends

The California Department of Fish and Wildlife monitors the population on the Inyo NF semi-annually using the Visual Encounter Survey protocol, validated by electroshocking every 5 to 10 years, when necessary. It is difficult to determine population trends from this limited annual survey data because population counts appear to fluctuate primarily due to water levels affected by climatic conditions such as snow pack and summer precipitation. A habitat restoration project to install log sills was implemented in 1999. The numbers of fish declined shortly after implementation of the structures, but numbers rebounded in 2005. The cause of the decline is unknown but it could possibly be accounted for by the late season timing of the survey when temperatures were high and fish may have retreated to other portions of the stream above the "campsite" (located on Los Angeles Department of Water and Power land) where water is typically cooler and shadier. O'Harrel Creek typically exceeds 80 degrees Fahrenheit in the

summer, with temperatures recorded at 90 degrees Fahrenheit, limiting available habitat for the fish. Fish typically move upstream into the shady areas around the “campsite” location during these hot summer temperatures. In 2001 it was noted that many of the structures were failing; however, since then it appears that many of the log sills may have been successful at increasing habitat availability as evidenced by the occurrence of pools occupied by Lahontan cutthroat trout. In November, 2011 an electroshocking survey was conducted by the CADFW and USFS with poor results: one 7.5 inch adult and four 3 inch sub-adults were recovered, without injury. All fish were retrieved just below the “campsite” area. It is assumed that the 560 acre “Oharel” wildfire which occurred at the top of the O’Harrel watershed in 2007 contributed to a high volume of sediment that severely reduced the population. Fish were still observed in the stream during the springs of 2008 and 2009, but were difficult to find in 2010 and 2011. Photos from the area indicate an abundant sediment load after the 2010 spring run-off, indicating a lag in sediment movement after the wildfire. The electroshocking survey in 2011 confirmed the reduction in numbers of this population. No official surveys have been conducted since 2011, although casual observations of a few fish have been reported to the CDFW.

Lahontan cutthroat trout are managed by the State of California under the4(d) rule published in 1975, which states that Lahontan cutthroat trout can be taken in accordance with applicable State law and that violation of State law will also be a violation of the Endangered Species Act (Code of Federal Regulations Title50, Section 17.44). There are no special State angling regulations for O’Harrel Creek. Currently, the CDFW stocks Lahontan cutthroat trout into several lakes and rivers in the Sierra Nevada, including several lakes in Inyo and Mono Counties.

Threats

The severe decline in occupied range and numbers of Lahontan cutthroat trout in its endemic range is attributed to a number of factors including hybridization and competition with introduced trout species; alteration of stream channels and morphology; loss of spawning habitat due to pollution and sediment inputs from logging, mining, livestock grazing practices; urbanization; migration blockage due to dams; reduction of lake levels and concentrated chemical components in lakes; loss of habitat due to channelization; de-watering due to irrigation and urban demands; and overfishing (United States Department of the Interior 1995a). Within the out-of-basin population along O’Harrel Creek, the following are relevant threats to consider.

Loss of Habitat

For the out-of-basin O’Harrel population, the primary threat to the population essentially is due to habitat that is primarily unsuitable for trout habitation. Streams on alluvial fans are subject to flashy flows and instability due to the alluvial nature of the substrate. Although much work has been completed within this channel to stabilize portions to create suitable habitat, portions of the stream are subject to low flows, high temperatures and constant re-location of the channel across the fan. Historic grazing in the area most likely created conditions that channelized the stream through the fan, however, now the channel is established and all occupied habitat is fenced and excluded from grazing. High volumes of sediment from the effects of wildfire, important for the geomorphology of alluvial fan development, are also a constant threat to the resident trout, as noted in the decline of population numbers above resulting from the 2007 “Oharel” fire.

Other Threats

Other threats include impacts from dispersed recreation activities and camping within the section of private land located at the middle of the available habitat. Since this activity occurs on private lands, it is outside the authority of the Inyo NF to manage.

Analysis of Effects

Indirect Effects

The Proposed Action includes an aquatic and riparian conservation strategy that provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area which will indirectly provide for Lahontan cutthroat trout habitat conservation to the extent that activities occur within the occupied portions of O'Harrel Canyon Creek – Owens River watershed. The aquatic and riparian conservation strategy retains the essential elements of the existing management direction for Riparian Conservation Areas, a variable distance buffer area surrounding streams and bodies of water, and identifies larger Conservation Watersheds with a goal of longer-term maintenance of watershed integrity and function. The direction for Watersheds and Riparian Conservation Areas would build resilience into watershed systems and habitats to better enable them to adapt to drought and climate change and enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

As described in the *Effects Common to Aquatic Habitats and Species* above, there are many specific desired conditions that would shape the purpose and need and project design outcomes of future projects. Desired conditions for the Riparian Conservation Areas is to provide beneficial functions such as providing cold, clean water; stream shading; aquatic/riparian habitat for indicator; and nutrients. There are also many specific standards and guidelines that would avoid, mitigate, or minimize certain types of activities or intensities or magnitudes of effects within riparian conservation areas and to riparian resources. These plan components collectively help assure stream and riparian habitats are conserved and restored for long-term sustainability and resilience, and species long-term viability.

With the forestwide direction for Animal and Plant Species coupled with the multi-scale aquatic and riparian conservation strategy approach, it has been determined that the proposed plan no longer needed to continue to identify and manage the O'Harrel critical aquatic refuge as a management area since functionally equivalent plan direction is provided. The primary direction for critical aquatic refuges was to apply a watershed focus for activities occurring in the upland portions. In the Proposed Action, this is replaced by stronger direction to provide for at-risk species (SPEC-FW-DC-02, SPEC-FW-DC-03, SPEC-FW-STD-01, and SPEC-FW-GDL-03) and forestwide direction for upland portions of watersheds (WTR-FW-DC-03, WTR-FW-DC-04, and WTR-FW-STD-02) that apply to all watersheds. The current forest plan also included direction to consider proposing areas within critical aquatic refuges for withdrawal from mineral location and entry. The Forest Service retains this ability under policy to propose areas for withdrawal from mineral location and entry and is required to evaluate proposals for occupancy and use of lands for valid existing claims prior to authorizing such uses. Potential effects to federally listed species or their habitats would be evaluated as a basis for proposing a withdrawal or for determining if uses should be authorized. As a result, there are no substantial changes expected from the change in management approach that no longer manages for critical aquatic refuges.

The following program areas include actions guided by the forest plan that could potentially affect Lahontan cutthroat trout: Fire Management, Vegetation and Fuels Management, Range Management, Recreation Management, Restoration Activities, and Roads and Other Infrastructure.

Fire Management

The Proposed Action addresses wildfire management as described in the section on *Effects Common to Aquatic Habitats and Species* described above. The O'Harrel Creek area is predominately within the Wildfire Restoration Zone in the upper portions and General Wildfire Protection Zone in the lower portion. In the Wildfire Restoration Zone, the desired condition (MA-WRZ-DC-01) is that *"[t]he landscape is resilient to a range of fire effects, and wildland fire has a predominately positive benefit to ecosystems and resources."* When naturally caused wildfires occur, they will be evaluated to determine if they could be managed to restore fire to the landscape while having acceptable effects to highly valued resources, such as habitats for at-risk species. In the General Wildfire Protection Zone, the desired condition (MA-GWPZ-DC-02) is that *"[t]he landscape is resilient and can tolerate varying effects of wildfires. Over time, risk to values is reduced sufficiently in the general wildfire protection zone to allow some areas to be placed in a lower risk zone including the wildfire restoration and wildfire maintenance zones."* In this zone, many wildfires will likely continue to have some fire suppression actions taken because of the higher risk of threats to communities and highly valued resources and assets. Fires would be managed whenever possible to reduce the potential future sediment inputs from large wildfires that burn outside the natural range of variation as occurred in the "Oharel" Fire.

The occupied portions of O'Harrel Creek are identified as terrestrial aerial retardant avoidance areas on maps used when suppressing wildfires (United States Department of Agriculture 2011). When wildfires are managed within riparian conservation areas, guideline FIRE-FW-GDL-04 directs that managed fires should be allowed "*…to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function.*"

Vegetation and Fuels Management

Vegetation and fuels management projects would require evaluation for consistency with the eligible wild and scenic river status as described below for Recreation Management. Any planned vegetation or fuels management projects would generally be designed to be of low intensity in order to maintain the scenery characteristics of a recreational class wild and scenic river.

Additional plan direction further limits the potential for impacts to riparian resources when prescribed fires are planned. MA-RCA-STD-09 would require water drafting to "*[u]se 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 from aquatic habitats, including juvenile fish, amphibian egg masses and tadpoles.*" However, prior to determining if water drafting would be suitable for occupied habitats, the proposed sites would be evaluated for effects to Lahontan cutthroat trout and if needed, SPEC-FW-STD-01, "*[d]esign features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species*" would be used to prohibit water drafting. Efforts to manage the impacts of wildfires and to implement vegetation and fuels management to lessen the risk of habitat loss or the potential for sediment from adjacent burned areas from impacting occupied habitats would contribute towards **Recovery Action 17** to protect this out-of-basin population.

Range Management

In the area around O'Harrel Creek, all occupied habitat is fenced and excluded from domestic livestock grazing to protect the Lahontan cutthroat trout in the environmental baseline. Any proposals to discontinue the fencing or to consider additional fencing would be guided by the desired condition (SPEC-FW-DC-03) that *"[l]and management activities are designed to*

maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction" and guideline (SPEC-FW-GDL-03) that *"[h]abitat management objectives and nonhabitat recovery actions from approved recovery plans should be incorporated, if appropriate, in the design of projects that will occur within federally listed species habitat to contribute to recovery of the species."* If livestock grazing occurs in areas important to Lahontan cutthroat trout it would be guided by standard SPEC-LCT-STD-01 which requires "*[i]n stream reaches occupied by or identified as essential habitat in the recovery plan for the Lahontan cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or essential habitat stream reach. Take corrective action where streambank disturbance limits have been exceeded.*"

Recreation Management

For the Lahontan cutthroat trout, the entire segment of O'Harrel Canyon Creek (Stream ID 1.141) was evaluated and has been found to meet the eligibility requirements to be considered for inclusion in the National Wild and Scenic Rivers System (see Figure 17 above). The assigned preliminary classification is "recreational river". Classification is based on the level of human development of the shoreline, watercourse and access at the time a river is found eligible. A "recreational river" is defined as rivers, or sections of rivers, that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Eligible wild and scenic rivers are managed by a standard (MA-EWSR-STD-01) that applies interim protection measures identified in the Forest Service Handbook. That direction specifies that Forest Service-identified eligible and suitable rivers are protected sufficiently to maintain free flow and outstandingly remarkable values unless a determination of ineligibility or non-suitability is made. Fisheries, because of the presence of Lahontan cutthroat trout, is identified as one of the outstandingly remarkable values. Future in-stream habitat restoration projects, such as, construction of structures and vegetation management to protect and enhance wildlife and fish habitat, can occur within recreational rivers as long as they fully protect identified river values and do not affect the river's free-flowing character. Additional information about this river segment can be found in Appendix C in Volume 2 of the FEIS.

While the Inyo NF does not manage activities that occur on private lands, including the private land parcel along O'Harrel Creek, the Proposed Action includes a goal (SPEC-FW-GOAL-01) to *"[c]ooperate with partners and private landowners to encourage resource protection and restoration across ownership boundaries."* If activities on adjacent private lands are influencing recreation impacts on National Forest System lands, a desired condition for sustainable recreation (REC-FW-DC-04) describes that *"[a]reas of the national forest provide for a variety of activities with minimal impact on sensitive environments and resources."* In addition a sustainable recreation goal (REC-FW-GOAL-02) is to *"[m]anage dispersed recreation activities when evidence of impacts to natural resources emerge or are causing damage"* and a guideline (REC-FW-GDL-03) requires use of "*…integrated resource planning … to address impacts to at-risk species habitat and changing conditions in recreation settings.*"

Restoration Activities

Restoration activities, particularly the installation of instream structures to benefit Lahontan cutthroat trout have occurred in the past and could occur in the future, including installation of new structures or maintenance of existing structures. If additional restoration activities are needed, such as restoration if wildfires burn within the watershed, the Inyo NF would coordinate

with CDFW and USFWS "*…to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans*" (SPEC-FW-GOAL-03).

Roads and Other Infrastructure

Roads exist in the area of O'Harrel Creek, however the occupied portions of the creek have been fenced to limit impacts from road associated uses. Road maintenance will implement best management practices and SPEC-FW-STD-01 would require incorporating site-specific measures to avoid, minimize, or mitigate potential impacts to occupied habitat when projects are planned. Most of the roads exist downstream of the occupied habitat.

Cumulative Effects

The cumulative effects analysis area for the Lahontan cutthroat trout is the Inyo NF plan area in the vicinity of O'Harrel Creek. This is an appropriate scale for determining cumulative effects since this area includes all suitable habitat for this isolated out-of-basin population potentially affected by implementation of the Proposed Action. The cumulative effects time frame is 15 years into the future. The cumulative effects of all past non-federal actions are incorporated into the existing condition.

The CDFW is expected to continue to monitor populations and assess habitat conditions and make recommendations on species and habitat management opportunities as necessary.

Dispersed recreation activities are assumed to continue on the private land along O'Harrel Creek managed by the Los Angeles Department of Water and Power. If those uses expand and affect adjacent National Forest System lands, a goal (SPEC-FW-GOAL-01) that describes the intent to *"[c]ooperate with partners and private landowners to encourage resource protection and restoration across ownership boundaries"* could be used to work towards minimizing or mitigating effects.

Given these and other potential nonfederal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to threatened and endangered species. All future project level activities that may affect these species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- Vegetation and fuels management may occur along O'Harrel Creek, primarily designed to lessen the risk of adverse effects from wildfires but would incorporate measures to minimize effects to riparian habitats.

- O'Harrel Creek would be managed as an eligible wild and scenic river with any restoration actions or project activities designed to retain or enhance the free flowing characteristics and the outstandingly remarkable values of prehistory and fisheries.

- Some dispersed recreation use occurs and will continue to occur that may impact Lahontan cutthroat trout and habitat, including cumulative effects from dispersed recreation on adjacent private lands.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the Lahontan cutthroat trout.

Paiute Cutthroat Trout

The Paiute cutthroat trout Recovery Plan (United States Department of the Interior 2004) and 5-Year Review (United States Department of the Interior 2013b) describes key habitat, life history requirements, distribution and threats compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

Classification, critical habitat and Recovery Plan

The Paiute cutthroat trout was originally listed as endangered in 1967 (United States Department of the Interior 1967) but was subsequently reclassified as threatened in 1975 to facilitate management and allow regulated angling (United States Department of the Interior 1975). Critical habitat for this species has not been designated. A Recovery Plan for the Paiute cutthroat trout was developed in 1985, and revised in 2004 (United States Department of the Interior 2004). The most recent 5-Year Review was completed in 2013 (United States Department of the Interior 2013b).

The objective of the 2004 Recovery Plan (United States Department of the Interior 2004) is to improve the status and habitat of Paiute cutthroat trout and eliminate competition from nonnative salmonid species. Recovery Plan actions relevant to the Inyo NF include: **Recovery Action 3** - Protect and enhance all occupied Paiute cutthroat trout habitat; **Recovery Action 4** - Continue to monitor and manage existing and reintroduced populations; **Recovery Item 5** - Develop a long-term conservation plan and conservation agreement; and **Recovery Item 6** - Provide public information.

Habitat and Life History

The 5-Year Review (United States Department of the Interior 2013b) summarizes the habitat and life history of the Paiute cutthroat trout. There have been few studies on the biology of Paiute cutthroat trout. It is thought that life history and habitat requirements are similar to other western trout, such as cool, well-oxygenated water for all life stages. They are obligatory stream spawners and adult fish are noted as preferring pool habitat in low gradient meadows with undercut or overhanging banks and abundant riparian vegetation.

They feed on drift organisms, both terrestrial and aquatic insects. Natural predators noted for Paiute cutthroat trout eggs and fry are water shrews *(Sorex palustris);* dippers *(Cinclus mexicanus);* trichopteran larvae; and caddis fly larvae but adults have few predators. Disease may be a significant factor in adult mortality, especially post-spawning, as evidenced in the North Fork of Cottonwood Creek population (United States Department of the Interior 2013b).

Paiute cutthroat trout have a distinctive evolutionary history that complicates management efforts to recover this fish. Paiute cutthroat trout evolved in isolation from other fish species, and accordingly faced substantially different selection pressures than most other North American salmonids. This subspecies has behavioral traits that make coexisting with potential competitors highly unlikely. The Paiute cutthroat trout is eventually displaced when other salmonids invade their habitats through introgressive hybridization or competition. Similar to many subspecies of cutthroat trout, Paiute cutthroat trout are vulnerable to angling and their unwariness makes them susceptible to population declines with even light fishing pressure.

Historic and Current Distribution

The Paiute cutthroat trout became isolated from the Lahontan cutthroat trout during the last 10,000 years by a series of physical barriers in Silver King Creek. The presumed historic distribution of the Paiute cutthroat trout is limited to 11.1 miles of habitat in Silver King Creek and reaches of small connected tributaries on the Humboldt-Toiyabe NF but there is a lack of early records and confusion related to unofficial transplants (United States Department of the Interior 2013b).

The Inyo NF supports two of the four self-sustaining out-of-basin stream populations (located outside of the historical range of the species): North Fork Cottonwood Creek and Cabin Creek in the White Mountains as shown in Figure 18 (United States Department of the Interior 2013b). In 1946, Paiute cutthroat trout from the Silver King Creek drainage were stocked into the North Fork of Cottonwood Creek. Cabin Creek was originally stocked in 1968 with individuals from the North Fork of Cottonwood Creek. Both of these populations are within the White Mountain Wilderness and both populations are established and reproducing. The other two current out-of-basin populations are in streams located on the Sierra NF and are not considered in this biological assessment.

The North Fork of Cottonwood Creek is a small, spring-fed brook that originates on the east slope of Paiute Mountain. It flows southeasterly for approximately 4.5 miles before merging with the South Fork to form Cottonwood Creek. Only one major tributary, Tres Plumas Creek, enters the North Fork of Cottonwood Creek approximately 1.0 mile above its mouth. Occupied habitat in the North Fork of Cottonwood Creek is limited to the uppermost 3.4 miles of stream above a 7 foot tall barrier that is located just above the confluence with Tres Plumas Creek. In the 2001 Sierra Nevada Forest Plan Amendment, the 28,770 acre Cottonwood Creek critical aquatic refuge was identified to protect habitat for this species (Figure 18). The occupied area is within the Cottonwood Creek Wild and Scenic River which was designated in 2009.

Occupied habitat in Cabin Creek is approximately 1.5 miles of stream habitat. Subsequently, fish have migrated downstream from Cabin Creek into Leidy Creek, which were observed during an electroshocking exercise in the fall of 2014 with CDFW and Nevada Department of Wildlife biologists. Leidy Creek became isolated from other down-stream, rainbow occupied streams when a diversion was installed, capturing all flows and effectively removing the threat of hybridization from downstream trout. Further investigation needs to be completed to determine if this newly established population is isolated from downstream trout and determine if additional management actions are necessary.

The Silver King Creek population declined dramatically during the 2013 to 2016 significant drought. In August of 2017, the North Fork Cottonwood Creek population was used as a source population to augment the existing population in Silver King Creek on the Humboldt-Toiyabe NF to ameliorate the effects from the drought.

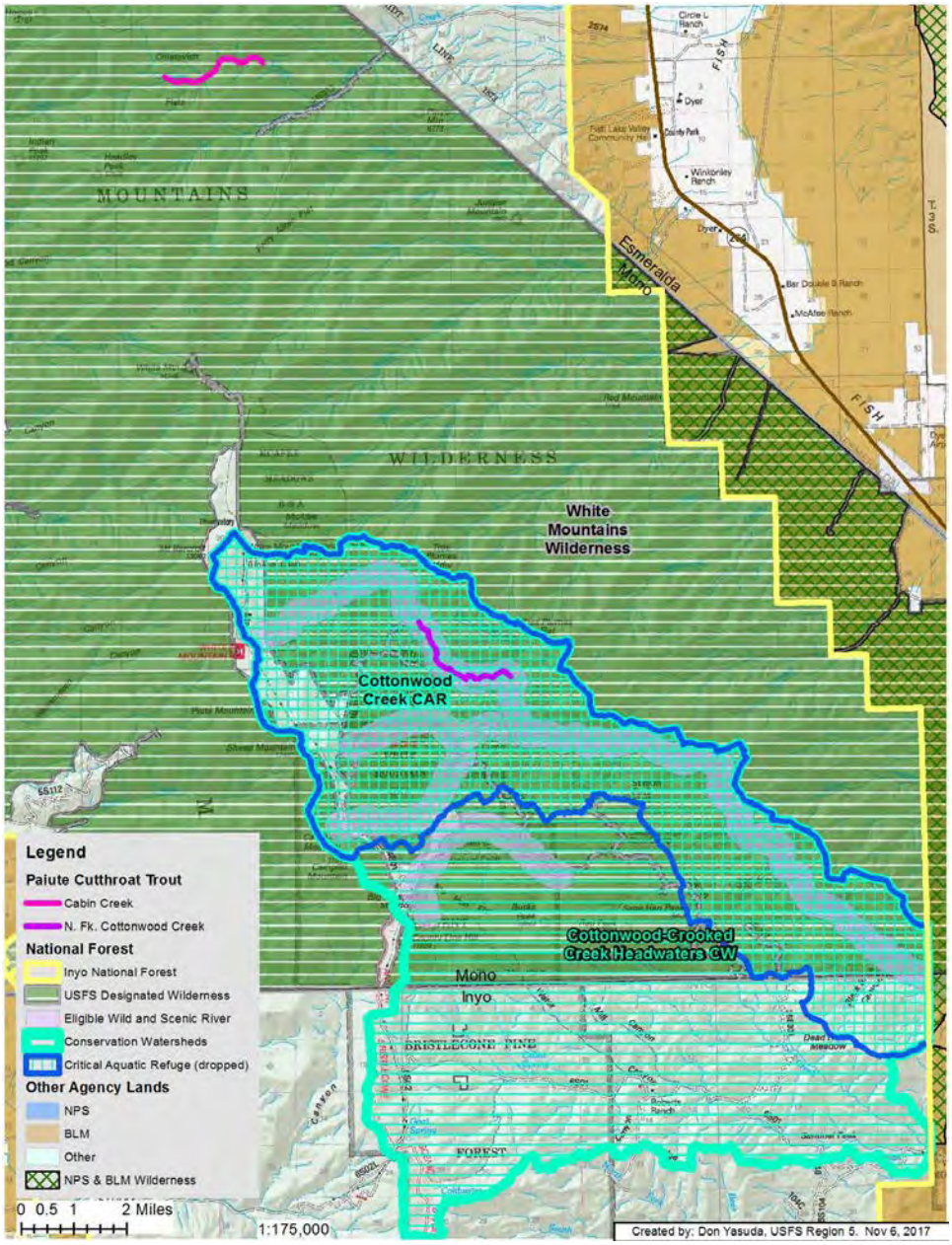

Figure 18. Locations of Paiute cutthroat trout, former critical aquatic refuge, conservation watersheds, and eligible wild and scenic rivers

Population and Habitat Status and Trend

Endemic Paiute cutthroat trout habitat and the majority of the currently occupied streams are located in the Silver King Creek drainage on the Humboldt-Toiyabe NF and outside the boundaries of the Inyo NF.

The North Fork of Cottonwood Creek has been surveyed by the CDFW using visual surveys from Granite Meadow downstream to just above the Tres Plumas barrier since 1989 (United States Department of the Interior 2013b). These visual surveys indicate a stable population, with numbers ranging from 150 observed in 1986, to over 200 fish from 1996 through 2004, and 120 fish observed in 2005 (United States Department of the Interior 2008b). The exclusion of grazing

since 1993 and spawning enhancement projects in 1995 and 1996, which created 51 spawning sites, appear to have increased Paiute cutthroat trout numbers (United States Department of the Interior 2004). More recent gravel enhancement work in 2007, prompted by the depressed population estimates in 2005, also created additional spawning sites throughout the 3 miles of habitat.

A fungal infection has been observed on the dorsal and caudal fins of spawned-out fish in the North Fork of Cottonwood Creek which has resulted in post-spawning mortality. The population level effects are unknown since the disease has been known since the early 1970's but the population continues to exist.

Visual surveys were conducted on Cabin Creek in 1995, 2000, and 2009 but no trend was determined. In 1995, 139 fish were observed and in 2000, 186 fish were observed. Fish were also observed throughout the stream during a survey attempt in 2009 but no numbers were recorded due to time constraints and heavy willow growth (United States Department of the Interior 2013b). CDFW attempted to develop a population index for the North Fork of Cottonwood Creek Paiute cutthroat trout population due to high electrofishing mortality and injury rates compared to other cutthroat trout populations. It is possible the high mortality rates had to do with the elevated pH of the stream, but the reason is ultimately unknown.

Paiute cutthroat trout are managed by the State of California under the4(d) rule published in 1975, which states that Paiute cutthroat trout can be taken in accordance with applicable State law and that violation of State law will also be a violation of the Endangered Species Act (Code of Federal Regulations Title50, Section 17.44). Angling closures have also been established to protect the populations in the North Fork of Cottonwood Creek. The Cabin Creek population is relatively inaccessible and lightly used and is managed as a wild trout fishery without special protective regulations.

Threats

The Recovery Plan (United States Department of the Interior 2004) and subsequent 5-Year Review (United States Department of the Interior 2013b) was reviewed and three threats in the five-factor analysis were determined to be of higher concern to Paiute cutthroat trout and its habitat relevant to the plan area.

Destruction or modification of habitat

Nonnative fish pose a threat, primarily from hybridization that can result in loss of available habitat or range restrictions. Nonnative rainbow trout are present downstream of these two populations but are currently isolated by barriers: a natural barrier for the North Fork of Cottonwood Creek and an artificial barrier for Cabin Creek.

There are threats of population isolation and habitat fragmentation due to limited stream extents for these two locations, Neither of these populations meet long-term persistence criteria for the minimum amount of stream habitat thought to be necessary to sustain at least 2,500 individuals. The North Fork of Cottonwood Creek has approximately 3.4 miles of occupied habitat and Cabin Creek has approximately 1.5 miles of occupied habitat which are less than the 5.8 miles of stream habitat estimated to provide for persistence.

Historically livestock grazing (both cattle and sheep) occurred over much of the high Sierra Nevada mountain range, wherever forage was available. Grazing of livestock is noted as having potential to degrade habitat for Paiute cutthroat trout.

Considerable effort in the 1990's was put into reducing sediment input into the North Fork of Cottonwood Creek, along with the suspension of grazing in the Cottonwood Creek and Tres Plumas Allotments in 2000. The grazing allotments are in non-use status but are not closed. If stream and riparian conditions can be maintained or continue to improve, future use of the allotments could be considered but this would require a site-specific analysis that would require consultation under the ESA. The removal of livestock has resulted in stabilized streambanks and the re-establishment of willows; however, spawning substrate is still a limiting factor in this high elevation, dolomitic-dominate landscape.

Cabin Creek is a remotely located stream in the White Mountain Wilderness at elevations above 11,000 feet. Cabin Creek is located within the Cabin Creek Allotment and grazing was authorized in the allotment in 2010 as a continuation of the grazing permit and is covered under Biological Opinion File No. 84320-2010-F-0088, dated June 1, 2010, by the Reno Field Office of the US Fish and Wildlife Service. However, the Cabin Creek area has not been grazed since 2005 due to restrictions in timing that is not compatible with the current grazing operation.

Inadequacy of Existing Regulatory Mechanisms

The Inyo NF is currently guided by an aquatic management strategy adopted in 2004 through the Sierra Nevada Forest Plan Amendment which provides for several standards and guidelines to meet a set of riparian conservation objectives designed to protect and restore aquatic, riparian, and meadow ecosystems. There is a concern that these protections designed to provide for the viability of associated native species may be reduced when the forest plan is revised under the 2012 Planning Rule. There is a concern about the adequacy of regulatory mechanisms absent the species having status under the ESA.

Other Natural or Manmade Factors

Increases in water temperature as a result of increased summer air temperature and changes in precipitation affecting streamflow could increase stress levels which may increase the susceptibility to disease. Since a fungal disease already exists within the North Fork of Cottonwood Creek population, if stress levels increase, it could result in higher levels of post-spawning mortality which could affect the persistence of the population.

There is a risk of adverse effects if wildfires burn outside of the characteristic fire regime and affect occupied habitat because there are no opportunities for recolonization if the entire occupied segment is affected. Cottonwood Creek is a narrow boulder canyon with few signs of single tree lightning strikes. North facing trees are widely spaced on the steep rocky slope. The opposite side is riparian vegetation then sage brush that is not likely to carry fire. Willows were planted following changes in grazing management and are well established in the creek and have enough dead woody debris to provide fuel. In 2017 the willow recruitment was separated by unoccupied sections reducing the risk for fire to carry throughout the entire riparian of the North Fork of Cottonwood Creek.

Analysis of Effects

Indirect Effects

As described in the *Effects Common to Aquatic Habitats and Species* above, there are many specific desired conditions that would shape the purpose and need and project design outcomes of future projects. Desired conditions for the riparian conservation areas is to provide beneficial functions such as providing cold, clean water; stream shading; aquatic/riparian habitat for

indicator; and nutrients. There are also many specific standards and guidelines that would avoid, mitigate, or minimize certain types of activities or intensities or magnitudes of effects within riparian conservation areas and to riparian resources. These plan components collectively help assure stream and riparian habitats are conserved and restored for long-term sustainability and resilience, and species long-term viability.

The Proposed Action includes an aquatic and riparian conservation strategy that provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area which will indirectly provide for Paiute cutthroat trout habitat conservation to sustain their viability to the extent that activities occur within the occupied portions of Leidy Creek watershed (Cabin Creek population) and the Cottonwood Creek watershed (North Fork of Cottonwood Creek population). The aquatic and riparian conservation strategy retains the essential elements of the existing management direction for riparian conservation areas, a variable distance buffer area surrounding streams and bodies of water, and identifies larger conservation watersheds with a goal of longer-term maintenance of watershed integrity and function. The direction for Watersheds and Riparian Conservation Areas would build resilience into watershed systems and habitats to better enable them to adapt to drought and climate change and enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

With the forestwide direction for Animal and Plant Species coupled with the multi-scale aquatic and riparian conservation strategy approach, it has been determined that the proposed plan no longer needed to continue to identify and manage the Cottonwood Creek critical aquatic refuge as a management area since functionally equivalent plan direction is provided by other plan direction and the area would be managed as the Cottonwood-Crooked Creek Headwaters Conservation Watershed. The primary direction for critical aquatic refuges was to apply a watershed focus for activities occurring in the upland portions. In the Proposed Action, this is replaced by stronger direction to provide for at-risk species (SPEC-FW-DC-02, SPEC-FW-DC-03, SPEC-FW-STD-01, and SPEC-FW-GDL-03) and forestwide direction for upland portions of watersheds (WTR-FW-DC-03, WTR-FW-DC-04, and WTR-FW-STD-02) that apply to all watersheds. The current forest plan also included direction to consider proposing areas within critical aquatic refuges for withdrawal from mineral location and entry. The Forest Service retains this ability under policy to propose areas for withdrawal from mineral location and entry and is required to evaluate proposals for occupancy and use of lands for valid existing claims prior to authorizing such uses. Potential effects to federally listed species or their habitats would be evaluated as a basis for proposing a withdrawal or for determining if uses should be authorized. As a result, there are no substantial changes expected from the change in management approach that no longer manages for critical aquatic refuges.

The desired condition for Conservation Watersheds emphasizes their importance for habitats for at-risk species, MA-CW-DC-01 "*[c]onservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species*." Additionally, there is an intent to give "*restoration projects and actions*" within Conservation Watersheds "*…a high priority for implementation and monitoring*" provided by a potential management approach for Conservation Watersheds. However, since the occupied portion of Cottonwood Creek is within designated wilderness, it is not likely that active, ground-disturbing restoration would be proposed or occur. Instead, passive restoration and non-ground-disturbing actions that improve Watershed Condition Framework indicators would be given priority.

Recovery Action 5 calls for developing a long term conservation plan and conservation agreement for managing the Paiute cutthroat trout. For the two out-of-basin populations of Paiute cutthroat trout that occur on the Inyo NF, a goal (SPEC-FW-GOAL-03) describes the intent of the forest to "*[w]ork with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans.*" If conservation strategies are developed or a conservation agreement is approved, actions to implement conservation actions would be provided by guideline (SPEC-FW-GDL-04) that "*[h]abitat management objectives or goals from approved conservation strategies or agreements should be incorporated, if appropriate, in the design of projects that will occur within at-risk species habitat.*"

The following program areas include actions guided by the forest plan that could potentially affect Paiute cutthroat trout: Fire Management, Range Management, Recreation Management, and Restoration Activities.

Vegetation and Fuels Management and Roads and Other Infrastructure would not be expected to affect Paiute cutthroat trout because occupied habitats are within designated wilderness areas.

Fire Management

The Proposed Action addresses wildfire management as described in the section on Effects Common to Aquatic Habitats and Species described above. The Cabin Creek area and North Fork of Cottonwood Creek area is within the Wildfire Maintenance Strategic Wildfire Management Zone. In the Wildfire Maintenance Zone, the desired condition (MA-WMZ-DC-01) is that "*[e]cosystems are resilient to the impacts of wildfire and wildland fire has predominantly positive benefits to ecosystems and resources.*" Within this zone, when natural ignitions occur, standard (MA-WMZ-STD-01) provides that "*[f]ollowing current wildland fire policy, manage wildfires to meet resource objectives and restore and maintain fire as an ecological process. The responsible line officer must use the current decision support system for wildfire management to document cases when naturally caused wildfires are promptly suppressed.*"

The occupied portions of Cabin Creek and North Fork of Cottowood Creek are identified as terrestrial aerial retardant avoidance areas on maps used when suppressing wildfires (United States Department of Agriculture 2011). When wildfires are managed within riparian conservation areas, guideline FIRE-FW-GDL-04 directs that managed fires should be allowed "*…to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function.*"

Range Management

In the area around the North Fork of Cottonwood Creek, the Cottonwood Creek and Tres Plumas Allotments are in non-use status which is contributing to a reduction in sediment and the improvement of habitat conditions for the Paiute cutthroat trout. In the future, if stream and riparian conditions improve, future livestock use of the allotments could be considered. Any proposals to authorize livestock grazing in these areas would be guided by the desired condition (SPEC-FW-DC-03) that *"[l]and management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction"* and guideline (SPEC-FW-GDL-03) that *"[h]abitat management objectives and nonhabitat recovery actions from approved recovery plans should be incorporated, if appropriate, in the design of projects that will occur within federally listed species habitat to*

contribute to recovery of the species." The Cabin Creek area has not been grazed since 2005. However, if livestock grazing occurs in the future, it would be managed by a grazing permit covered by Biological Opinion File No. 84320-2010-F-088. In both cases, livestock grazing would be mitigated by standard (SPEC-PCTR-STD-01) that requires "*[i]n stream reaches occupied by or identified as essential habitat in the recovery plan for the Paiute cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or "essential habitat" stream reach. Take corrective action where streambank disturbance limits have been exceeded.*"

Recreation Management

For the Paiute cutthroat trout, an additional 1.66 miles of the North Fork of Cottonwood Creek (Stream ID 1.028) was evaluated and has been found to meet the eligibility requirements to be considered for inclusion in the National Wild and Scenic Rivers System. The assigned preliminary classification is "wild river". Classification is based on the level of human development of the shoreline, watercourse and access at the time a river is found eligible. A "wild river" is defined as rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America. Eligible wild and scenic rivers are managed by a standard (MA-EWSR-STD-01) that applies interim protection measures identified in the Forest Service Handbook. Forest Service-identified eligible and suitable rivers are protected sufficiently to maintain free flow and outstandingly remarkable values unless a determination of ineligibility or non-suitability is made. Additional information can be found in Appendix C in Volume 2 of the FEIS. This additional section includes the headwaters of the North Fork of Cottonwood Creek above the occupied area as shown in Figure 18.

In addition, **Recovery Action 6** to provide public information related to recovery efforts is supported by a conservation education related desired condition (VIPS-FW-DC-03) to have "*[i]nterpretation and conservation education materials and activities [that] convey up-to-date and clear messages about natural and cultural resources…*".

Restoration Activities

Hybridization with rainbow trout is a threat because they occur downstream of both populations. It is important to maintain the existing barriers to avoid the risk of hybridization. A desired condition RCA-RIV-DC-02 recognizes in general the desire for stream ecosystems to "*…exhibit full connectivity where feasible to maintain aquatic species diversity, except where barriers are maintained in good condition to protect native aquatic species.*" If a change were to occur to these barriers to threaten their effectiveness, projects would be considered to meet the desired condition (SPEC-FW-DC-02) to manage for ecological conditions "*…that contribute to the survival, recovery, and delisting of species under the Endangered Species Act*" and the goal, SPEC-FW-GOAL-03, to coordinate with the USFWS and with CDFW "*…to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans*." Maintaining a functional barrier would contribute towards **Recovery Action 3** to protect and enhance occupied Paiute cutthroat trout habitat.

Cumulative Effects

The cumulative effects analysis area for the Paiute cutthroat trout is the Inyo NF plan area in the vicinity of North Fork of Cottonwood Creek and Cabin Creek. This is an appropriate scale for determining cumulative effects since this area includes all suitable habitat for these out-of-basin populations potentially affected by implementation of the Proposed Action. The cumulative

effects time frame is 15 years into the future. The cumulative effects of all past non-federal actions are incorporated into the existing condition.

There are no known or foreseeable non-federal actions that would affect habitats or individuals other than continued monitoring and management of Paiute cutthroat trout by the CDFW in support of **Recovery Action 4**. Given this, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to threatened and endangered species. All future project level activities that may affect these species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- If livestock grazing occurs within the Cabin Creek Allotment, it will comply with Biological Opinion File No. 84320-2010-F-0088. If livestock grazing is proposed within the Cottonwood Creek or Tres Plumas Allotments, the potential effects to Paiute cutthroat trout will be evaluated and consultation initiated if needed.

- Cottonwood Creek would be managed as part of the Cottonwood-Crooked Creek Headwaters Critical Watershed.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the Paiute cutthroat trout.

Owens Tui Chub

The Owens Basin Wetland and Aquatic Species Recovery Plan (United States Department of the Interior 1998) and 5-Year Review (United States Department of the Interior 2009c) describes key habitat, life history requirements, distribution and threats for Owens tui chub compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

Classification, Critical Habitat and Recovery Plan

The Owens tui chub was listed as endangered and critical habitat was designated in 1985 (United States Department of the Interior 1985). Designated critical habitat in proximity to the Inyo NF includes portions of the Owens River Gorge and the springs and outflow channels at the Hot Creek Hatchery, which fall within private owned land within the Inyo NF administrative boundary as shown in Figure 19. The Hot Creek critical habitat is mapped only on private lands and extends up to the forest boundary but no critical habitat occurs on the Inyo NF. A small portion of the settling ponds of the Hatchery does extend on to the Forest but are not mapped as being critical habitat as shown in Figure 20. Therefore, no designated critical habitat for the Owens tui chub occurs on lands managed by the Inyo NF and no critical habitat would be affected by the Proposed Action.

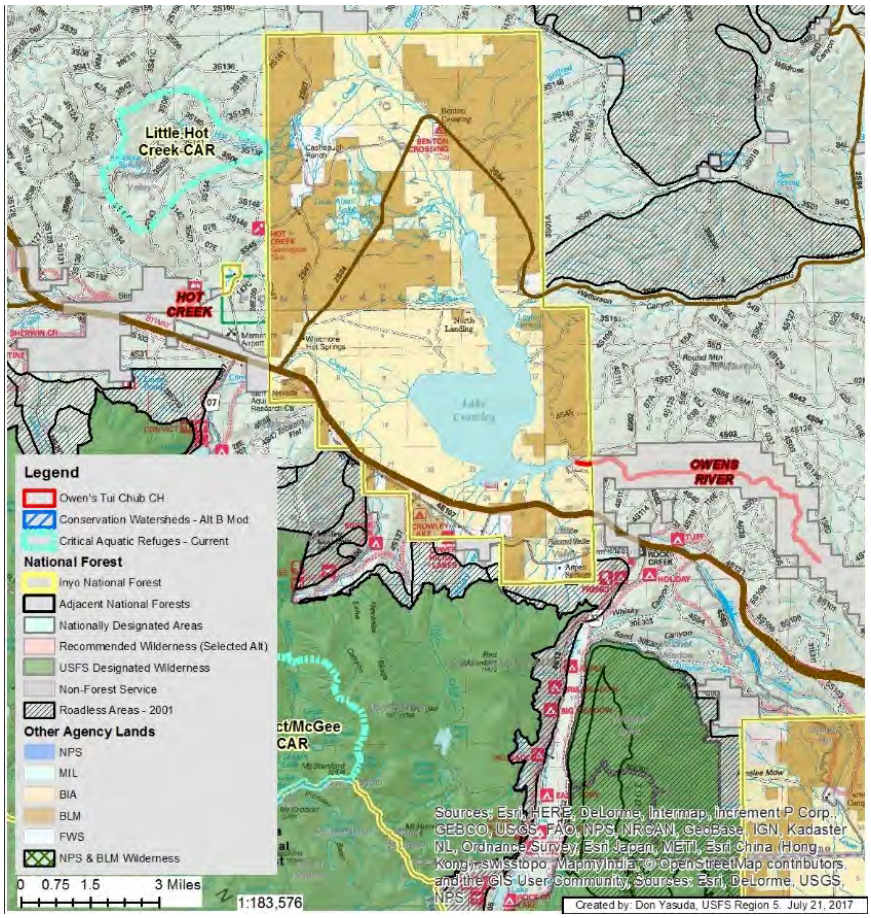

Figure 19. Owens tui chub critical habitat at Hot Creek and Owens River

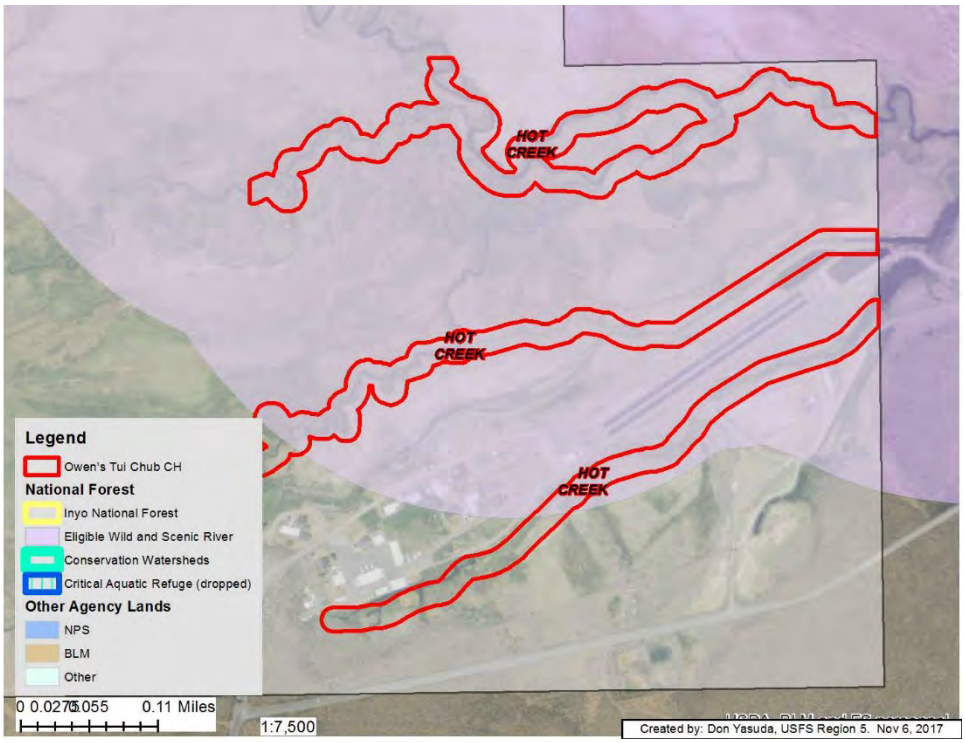

Figure 20. Hot Creek critical habitat, Owens tui chub

The Recovery Plan (United States Department of the Interior 1998) states that the Owens tui chub will be considered for down-listing to threatened status when the following goals have been achieved (To date, none of the six criterion have been met.):

1. Reproducing and self-sustaining populations of the Owens tui chub must exist throughout six Conservation Areas. Two of the Conservation Areas must be in the Long Valley and four in the Owens Valley. The Conservation Areas are Little Hot Creek, Hot Creek, Fish Slough, Round Valley, Warm Springs, Blackrock, and Southern Owens.
2. Threats must be controlled.
3. Each Conservation Area must have an approved management plan and implementing agreement with the landowner and the Service.
4. Successful establishment of populations includes presence of juveniles and three additional age classes of Owens tui chubs.
5. Ensure that hybrid tui chubs do not occur in the Conservation Areas.
6. The biomass of the Owens tui chub must exceed the biomass of deleterious, non-native fish species at each site.

The Recovery Plan identifies the Little Hot Creek Conservation Area and the Hot Creek Conservation Area as important for recovery of the Owens tui chub (Figure 21). The Recovery Plan acknowledges the Sotcher Lake population of Owens tui chub but does not provide any direction on managing this area to contribute to the recovery of the species.

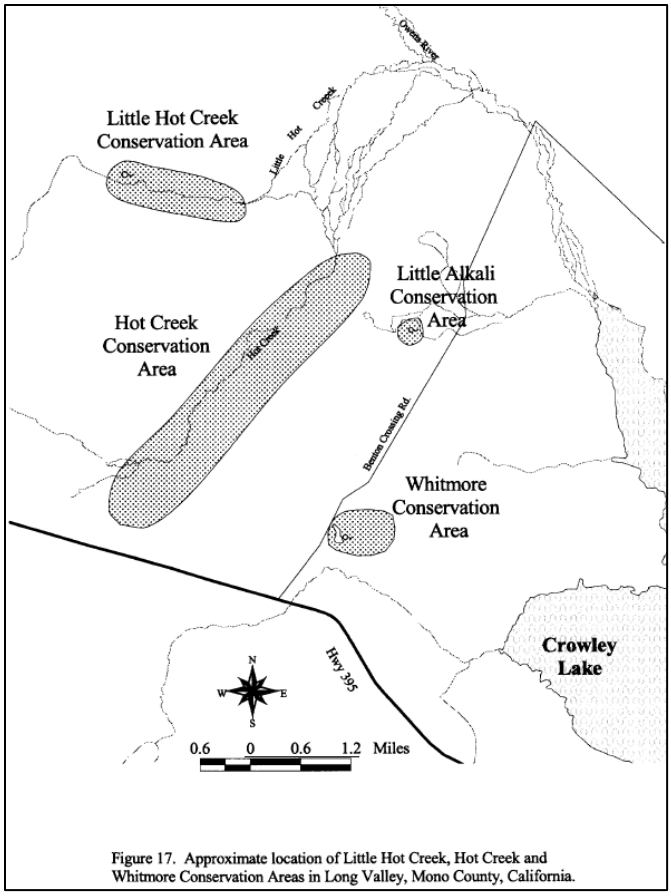

Figure 21. Conservation Areas identified for Owens tui chub in the Owens Basin Wetland Aquatic Species Recovery Plan (1998) relevant to the Inyo National Forest

The Recovery Plan lists the following tasks for the Little Hot Creek and Hot Creek Conservation Areas:

Recovery Plan Task 2.2. Little Hot Creek Conservation Area

Recovery actions in the Little Hot Creek Conservation Area should include expanding Owens tui chub habitat, eliminating non-native fishes and installing a fish barrier to prevent upstream movement into Little Hot Creek, protecting spring discharge from adverse impacts of ground water pumping and geothermal development, protecting vegetation from excessive livestock grazing and restoring vegetation communities. Recovery tasks for the Little Hot Creek Conservation Area include:

Recovery Plan Task 2.2.1. Control deleterious non-native species that are detrimental to Owens Basin native fish. Barrier construction may be necessary to control their reintroduction.

Recovery Plan Task 2.2.2. Expand aquatic habitat and fish populations. Native fish populations should be expanded downstream to include all of the aquatic habitat suitable to native fish. Long Valley speckled dace should be introduced into this habitat.

Recovery Plan Task 2.2.3. Evaluate livestock grazing practices and modify as necessary. Livestock grazing may affect alkali ivesia populations and the quality of the aquatic habitat.

Grazing practices should be modified and, eventually eliminated if necessary where livestock are changing vegetation structure and function or adversely affecting aquatic habitats or populations of rare plants and animals. Livestock management should be consistent with achieving and maintaining vegetation potential as described in the NRCS Ecological Site Descriptions, in the U.S. Bureau of Land Management's Desired Plant Community Definitions, and Bureau of Land Management documents on riparian area proper functioning condition (United States Department of Interior 1993, 1995).

Recovery Plan Task 2.2.4. Protect spring discharge. Geothermal development in Long Valley may be altering aquifer dynamics. Springs supporting Little Hot Creek should be protected from adverse impacts of decreased discharge, and changes in the thermal and chemical characteristics of water. Monitoring programs should be initiated to determine characteristics (temporal, chemical, physical) of natural spring discharge, if spring discharge is being affected, and the location of activities causing adverse effects. Actions should be taken to protect discharge at 1998 levels.

Recovery Plan Task 2.4. **Hot Creek Conservation Area**

Recovery actions for the Hot Creek Conservation Area should rehabilitate and protect aquatic habitats, maintain spring discharge, and reintroduce endemic species. Recovery tasks for the Hot Creek Conservation Area include:

Recovery Plan Task 2.4.1. Expand native fish habitat and distribution. The Long Valley native fish assemblage should be reestablished in the Hot Creek drainage. Successful reestablishment of this assemblage is probably most feasible near headsprings where non-native deleterious fish species can be most easily managed.

Reestablishing native fish in the drainage will require preventing fish pathogens from affecting Hot Creek Hatchery fish by ensuring that they are absent in donor fish. Impacts of hatchery activities on native fish populations should be identified and mitigation programs implemented.

Recovery Plan Task 2.4.2. Protect spring discharge. Geothermal development and groundwater pumping in Long Valley may alter aquifer dynamics. Springs supporting Hot Creek should be protected from adverse impacts of decreased discharge, and changes in the thermal and chemical characteristics of water. Monitoring programs should be determine characteristics (temporal, chemical, physical) of natural spring discharge, if spring discharge is being affected, and the location of activities causing adverse effects. Actions should be taken to protect discharge at 1998 levels. Natural spring discharge should continue to be used as the source providing for natural and naturalized aquatic habitats in the Conservation Area.

Habitat and Life History

The 5-Year Review (United States Department of the Interior 2009c) summarizes the habitat and life history of the Owens tui chub. It explains that the Owens tui chub evolved in the Owens River watershed with only three other smaller species of fishes, Owens pupfish (*Cyprinodon radiosus*), Owens speckled dace (*Rhinichthys osculus* ssp.), and Owens sucker (*Catostomus fumeiventris*) and with no aquatic predators. Little is known about the life history of the Owens tui chub, but it is thought to have similar requirements as other subspecies of tui chubs. The Owens tui chub prefers low velocity waters found in portions of the Owens River, associated tributaries, springs, sloughs, drainage ditches, and irrigation canals. Habitat includes waters with dense aquatic vegetation for cover.

Historic and Current Distribution

The Recovery Plan describes the historic distribution of the Owens tui chub by stating that the Owens tui chub is endemic to the Owens Basin (Owens Valley, Round Valley, and Long Valley) of Inyo and Mono Counties, California (United States Department of the Interior 1998). It explains that historically, the Owens tui chub occurred in large numbers in suitable habitat throughout the Owens Basin, including the Owens River and associated tributaries, springs, drainage ditches, and irrigation canals and was common in the Owens Valley floor from the late 19th to early-to-mid 20th centuries. However, when the official scientific description of the subspecies was published in 1973, the population size and range of the Owens tui chub had been drastically reduced (Miller 1973).

When listed in 1985, only two populations of Owens tui chub were believed to exist (United States Department of the Interior 1985). The Hot Creek Headwaters population is located at the headwaters of Hot Creek above the Hot Creek Fish Hatchery. The site consists of two springs, AB Spring and CD Spring. The Upper Owens Gorge population is located below Long Valley Dam and above the town of Bishop.

Prior to 2003, individuals from the Hot Creek Headwaters and Upper Owens Gorge populations were translocated to establish additional populations of Owens tui chubs. Currently, the Owens tui chub is limited to six isolated sites: Hot Creek Headwaters (AB Spring and CD Spring) and Hot Creek Hatchery settling ponds, Little Hot Creek Pond, Upper Owens Gorge, Mule Spring, White Mountain Research Station, and Sotcher Lake. The Hot Creek Headwaters (AB and CD Springs), Upper Owens Gorge, and White Mountain Research Station populations of the Owens tui chub are on lands owned by the Los Angeles Department of Water and Power. The White Mountain Research Station is operated by the University of California. The Mule Spring population is on land managed by the Bureau of Land Management. The populations at these six sites were thought to be genetically pure Owens tui chubs; however, recent genetic testing by the CDFW has determined that those in the Hot Creek Hatchery settling ponds and AB Spring are introgressed with Lahontan tui chub and are not genetically pure.

Three of these populations occur on National Forest System lands administered by the Inyo NF and include Little Hot Creek, Sotcher Lake and a very small portion of the settling ponds at the Hot Creek Hatchery.

The Little Hot Creek Pond is a human-created pond constructed in 1986 to enhance waterfowl habitat. It was created by impounding the stream channel downstream from the thermal headsprings of Little Hot Creek (Figure 22). The 2001 Sierra Nevada Forest Plan Amendment established the 3,610 acre Little Hot Creek critical aquatic refuge, which contained 3,520 acres on National Forest System Lands to provide habitat for the Owens tui chub around the occupied area in Little Hot Creek pond and the headwaters to this pond as shown in Figure 22.

Sotcher Lake is outside the historical range of the species in Madera County (Figure 23). The source of Owens tui chub in this lake are not known but it is believed to have occurred in the early 1950's and may have occurred inadvertently along with trout stocking from the Hot Creet Fish Hatchery (Chen, Parmenter, and May 2007). Sotcher Lake is located in the heavily used Reds Meadow area just east of Devils Postpile National Monument. It is within the Mammoth Lakes Destination Recreation Area in the Proposed Action. In 2010, the CDFW and USFWS evaluated the fisheries stocking program to address concerns about recreational fish stocking impacts on threatened and endangered species (ICF Jones & Stokes 2010). In that analysis, Sotcher Lake was not identified as a body of water containing Owens tui chub, thus Sotcher Lake

continues to be stocked with rainbow trout and also contains brown trout. The current status of Owens tui chub in Sotcher Lake is not known although they were collected from Sotcher Lake in 2002 (Chen, Parmenter, and May 2007)

As mentioned above, there is a small portion of the settling ponds of the Hot Creek Hatchery that extend on to the Forest that are not mapped as being critical habitat as shown in Figure 20. The extent that Owens tui chub use this portion of the settling ponds on National Forest System lands is not known although recent genetic testing by CDFW has determined that these fish are introgressed with Lahontan tui chub and therefore this population will not be analyzed further in this biological assessment.

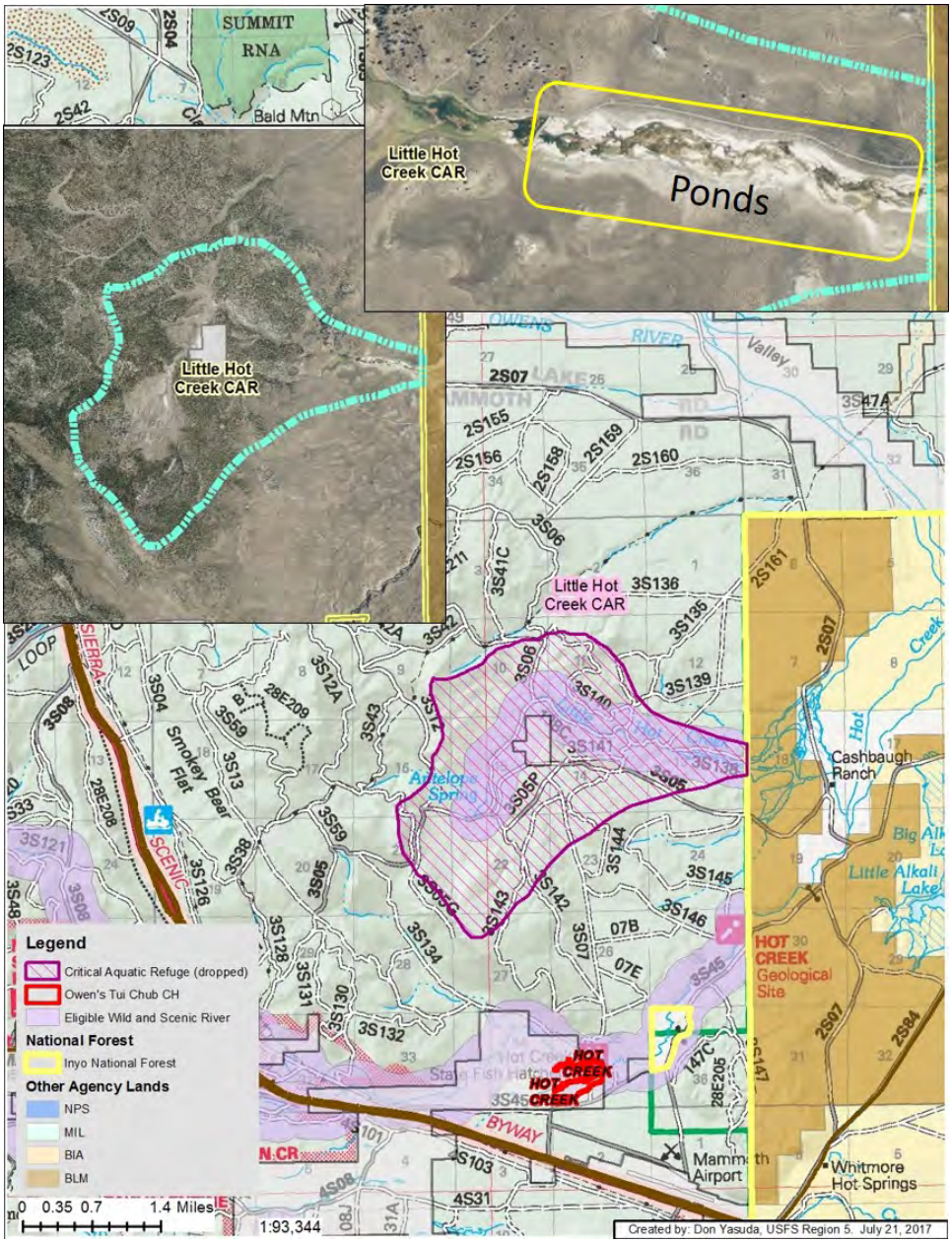

Figure 22. Little Hot Creek former critical aquatic refuge with insets of the occupied Little Hot Creek Ponds.

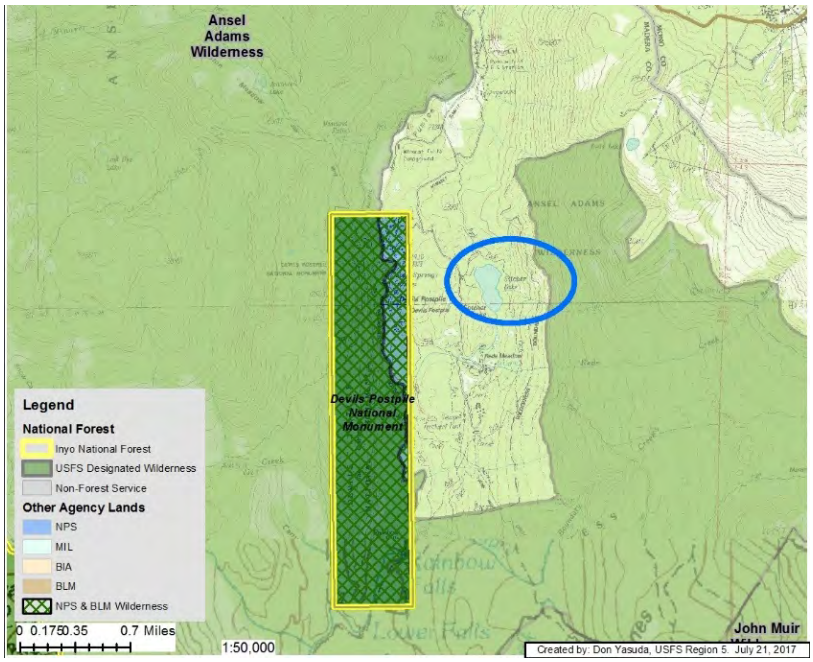

Figure 23. Location of Sotcher Lake, Owens tui chub location

Population and Habitat Status and Trend

The 5-Year Review discloses that information on Owens tui chub abundance or changes in population size is limited or unknown for the described populations. While it is known that these populations currently exist, it is not possible to determine whether they are increasing, decreasing, or stable because the methodologies used to conduct counts to estimate population size have varied. Thus, no information is available on population age structure, sex ratio, or mortality.

The Little Hot Creek Pond is shallow; covered with muskgrass (*Chara* sp.), an invasive alga which provides cover for the Owens tui chub; and has abundant cattail (*Typha* sp.). The pond is currently fenced to exclude livestock and recreation uses. The access road along the edge of the exclosure area has been surfaced with gravel to mitigate dust impacts to the pond.

No information exists on the population status and habitat trend for Sotcher Lake.

Threats

The Recovery Plan (United States Department of the Interior 1998) identified three categories of threats to be of higher concern to Owens tui chub and its habitat including:

(1) The present or threatened destruction, modification, or curtailment of habitat or range.
(2) Disease or predation
(3) Other natural and manmade factors affecting the species' continued existence.

Destruction or modification of habitat

The listing rule identified extensive habitat destruction and modification as threatening the Owens tui chub (United States Department of the Interior 1985). These continue to be threats. Currently, most streams and rivers in the Owens Basin have been diverted and some impounded. The Owens tui chub, which used to occur throughout the Owens River and its tributaries in the Owens Basin, is restricted to six isolated populations, five of which are within the historical range of the

species. Of these five populations, three (Hot Creek Headwaters, Little Hot Creek Pond, and Upper Owens Gorge) are located in small, isolated, man-altered portions of these waterways. The other two populations (Mule Spring and White Mountain Research Station) exist in man-made ponds at upland sites with water supplied by artificial methods. The occupied habitat at Hot Creek Headwaters, Little Hot Creek Pond, White Mountain Research Station, and Mule Spring is 2 acres or smaller at each site. The habitats for these five populations are threatened by water diversions, failure of infrastructures that deliver water to these habitats, and/or emergent vegetation.

Most of the water rights in the Owens Basin are owned by the city of Los Angeles. Currently, the demand for water from the Owens Basin is high and growing as Los Angeles continues to grow. The Los Angeles Department of Water and Power operates and maintains dams, diversion structures, groundwater pumps, and canals to capture and convey much of the water from the Owens Basin to Los Angeles. The remaining ground water, which provides water to isolated springs and springs that are the headwaters of streams in the Owens Basin, and surface water are used extensively for agriculture and municipal purposes in the Owens Basin. These man-made changes to aquatic habitat in the Owens Basin dramatically reduced suitable aquatic habitat for the Owens tui chub. They reduced the occurrence of the Owens tui chub from a common, wide-ranging species in the Owens Basin to a rare species occurring at a few sites, representing less than 1 percent of the fish's historical range (United States Department of the Interior 1985).

In addition to the increasing water demands for the greater Los Angeles area, areas adjacent to the Owens Valley (e.g., Round, Chalfant, and Hammil Valleys) are growing, and the demand for water is growing. This increased demand has resulted in an increased withdrawal of ground and surface water from the Owens Valley Groundwater Basin, which affects springs and other surface waters in the Owens Basin (Pinter and Keller 1991).

Habitat requirements for the Owens tui chub include aquatic submerged vegetation but not large amounts of emergent vegetation. At the spring sites (Hot Creek Headwaters, Little Hot Creek Pond, and Mule Spring), invasive emergent plants (e.g. cattail) have altered the aquatic habitat. Cattail proliferation results in deposition of large amounts of organic biomass, eventually converting aquatic habitat to upland habitat (Potter 2004). This conversion results in a loss of habitat for the Owens tui chub. In addition, dense emergent vegetation provides cover for nonnative predators of Owens tui chubs, such as bullfrogs and crayfish (*Procambarus* sp.), which enables non-native predators to thrive at these sites. California Department of Fish and Wildlife has installed a device in the waterway between the Hot Creek Hatchery and Hot Creek Headwaters to help remove emergent vegetation. This device requires routine, manual cleaning. No structures to remove emergent vegetation occur at the other population sites. These sites rely on routine, manual clearing of emergent vegetation. At Mule Spring, cattail has been removed by hand from littoral zone or nearshore aquatic areas. The area around Little Hot Creek pond was evaluated along with the California Department of Fish and Wildlife for management options for the emergent vegetation but the specific equipment needed wasn't available and no project has been initiated to date.

Disease or predation

Predation by introduced non-native fish, specifically brown trout, has been a major threat to the Owens tui chub. Predation by non-native largemouth bass and brown trout, both abundant in the Owens River system, has been identified as a factor eliminating Owens tui chubs from much of their historical range in the Owens River (Chen and May 2003). The presence of non-native

aquatic predators in the Owens Basin has greatly limited the locations in which the Owens tui chub can survive and persist.

Much of the recreation-based economy of the Owens Basin depends on recreational fishing, primarily for trout and largemouth bass. Because of the miles of riverine habitat and the historical and current practice of angling in the Owens Basin, it is unlikely that simply curtailing future stocking of these species would eliminate them from the Basin. Consequently, restoring the Owens tui chub to most of the Owens River or its connected tributaries is unlikely to occur.

Mosquitofish are abundant at Little Hot Creek Pond. It is known that mosquitofish will prey on small individuals of Mohave tui chub, a similar species, but data are not available regarding their interaction with the Owens tui chub. Observations over time suggest that the tui chub population at Little Hot Creek Pond appears to continue to reproduce and thrive in the presence of mosquitofish in this location.

Rainbow trout and brown trout exist within Sotcher Lake and continue to be stocked in that lake by the California Department of Fish and Wildlife (ICF Jones & Stokes 2010).

Other natural or manmade factors

The final listing rule identified introduction of the Lahontan tui chub and subsequent hybridization and competition as major threats to the Owens tui chub. Although not discussed in the listing rule, stochasticity (i.e., random events), catastrophic events, and climate change are also potential threats given the limited distribution of remaining populations.

Hybridization: Until recently, the Owens tui chub and the closely related Lahontan tui chub were isolated from each other. Lahontan tui chubs were introduced as baitfish into many of the streams in the Owens Basin. This was first observed at Crowley Lake in 1973, where fishermen illegally introduced the Lahontan tui chub (Miller 1973). Since that time, hybridization between the Owens tui chub and Lahontan tui chub has been documented for populations in Mono County at Hot Creek (downstream from the hatchery), Mammoth Creek, Twin Lakes-Mammoth, June Lake, and Owens River Upper Gorge Tailbay, and in Inyo County at A1 Drain, C2 Ditch, and McNally Canal. At the time of listing, only three populations of genetically pure Owens tui chubs existed, while at the present time, there are six genetically pure populations.

Using Lahontan tui chubs in the Owens Basin as baitfish is not allowed under fishing regulations set by the State of California. However, Lahontan tui chubs and hybrids are already present in the Owens Basin including Crowley Lake, Hot Creek and tributaries, including Little Hot Creek, and the lower portion of the Owens Gorge. If man-made barriers isolating the Owens tui chub populations at these sites are degraded or removed, this degradation/removal could result in the loss of the pure populations of Owens tui chubs at Hot Creek Headwaters, Little Hot Creek Pond, and the Upper Owens Gorge. In addition, the opportunities to establish new populations of Owens tui chubs in the Owens Basin is limited by the presence of hybrids in the Owens River and tributaries, the historical habitat for the Owens tui chub. Currently, the only viable locations for establishing the Owens tui chub are isolated springs or the headwaters of streams with downstream barriers to upstream movement of Lahontan tui chubs or hybrids. Since the Little Hot Creek Pond is close to the national forest boundary, the barriers on Little Hot Creek are primarily water diversion for irrigation off the National Forest System lands that keep the natural creek from connecting with the Owens River.

Competition: The final listing rule identified competition with non-native fish species as a threat to the Owens tui chub. However, little specific information on the impact of competition on the

Owens tui chub is available in the literature. Non-native insectivorous fish occur at Hot Creek Headwaters (rainbow trout) and Little Hot Creek Pond (mosquitofish). A major part of the diets for these non-native species is the same aquatic insects consumed by Owens tui chubs. Although information is not available for rainbow trout completion and predation on this species, mosquitofish are known to affect some southwestern native fishes through competition and predation.

Stochasticity: The creation and maintenance of small, often intensively managed populations have prevented extinction of the Owens tui chub. Only six populations of the Owens tui chub exist, and they are isolated from each other. Species consisting of small populations, such as the Owens tui chub, are recognized as being vulnerable to extinction from stochastic (i.e., random) threats, such as demographic, genetic, and environmental stochasticity and catastrophic events.

Demographic stochasticity includes random variability in survival and/or reproduction among individuals within a population. Random variability in survival or reproduction can have a significant impact on population viability for populations that are small, have low fecundity (reproduction rates), and are short-lived. Currently Owens tui chub populations are small, between 100 and 10,000 individuals; therefore, random events that may cause high mortality, or decreased reproduction may have a significant effect on the viability of Owens tui chub populations. Furthermore, because the number of populations is small (six) and each is vulnerable to this threat, the risk of extinction is exacerbated.

Genetic stochasticity results from the changes in gene frequencies caused by founder effect, random fixation, or inbreeding bottlenecks. Founder effect is the loss of genetic variation when a new population is established by a very small number of individuals. Random fixation is when some portion of loci is fixed at a selectively unfavorable allele because the intensity of selection is insufficient to overcome random genetic drift. Random genetic drift happens when only a portion of alleles in the population is transmitted from one generation to the next, because only a fraction of all possible zygotes become breeding adults. A bottleneck is an evolutionary event in which a significant percentage of a population is killed or prevented from breeding.

In small populations, such as the Owens tui chub, these factors may reduce the amount of genetic diversity retained within populations and may increase the chance that deleterious recessive genes are expressed. Loss of diversity could limit the species' ability to adapt to environmental changes and contributes to inbreeding depression (i.e., loss of reproductive fitness and vigor). Deleterious recessive genes could reduce the viability and reproductive success of individuals. Isolation of the six remaining populations preventing any natural genetic exchange will lead to a decrease in genetic diversity.

Environmental stochasticity is the variation in birth and death rates from one season to the next in response to weather, disease, competition, predation, or other factors external to the population. Drought or predation in combination with a low population year could result in extinction. The origin of the environmental stochastic event can be natural or human-caused. The Owens tui chub has experienced population loss from environmental stochastic events and will likely do so in the future. Owens tui chubs have disappeared from the Owens Valley Native Fishes Sanctuary (Fish Slough on Bureau of Land Management lands). Reasons for the loss of this population are not known, but the small, isolated nature of this population likely contributed to their extirpation.

Catastrophic events are an extreme form of environmental stochasticity. Although they generally occur infrequently, catastrophic events, such as severe floods or prolonged drought, can have disastrous effects on small populations and can directly result in extinction. All three of these

factors may also act in combination. One possible scenario of how these factors in combination could increase the risk of extinction for the Owens tui chub would be the loss of one or two populations during a drought period at the same time a predator is introduced to one of the remaining populations. Although one or two of the populations may survive and be a source for future reintroductions, the resulting loss of genetic diversity would further increase the risk of extinction.

Climate change: Impacts to the Owens tui chub under predicted future climate change are unclear. However, a trend of warming in the Sierra Nevada and Inyo Mountains is expected to increase winter rainfall, decrease snowpack, hasten spring runoff, reduce summer stream flows, and reduce ground water recharge. Increased summer heat may increase the frequency and intensity of wildfires. Loss of upland and riparian vegetation leads to soil erosion, increased sedimentation, downcutting of waterways, loss of bank stabilization, and decreased ability of soils to hold moisture and slowly release it into nearby waterways, all of which would negatively affect Owens tui chub habitat. While northward and/or higher elevation habitats could be important factors in the future conservation of this species, currently the isolated populations of the Owens tui chub are unable to access these habitats because of other threats, including a lack of connectivity of habitats caused by physical barriers (e.g., dams and diversion structures); habitat destruction and alteration; and predation, competition, and hybridization with introduced species.

Analysis of Effects

Indirect Effects

The current forest plan does not include species-specific plan direction for Owens tui chub so relevant direction is primarily found in direction for riparian conservation areas and critical aquatic refuges. The Proposed Action includes an aquatic and riparian conservation strategy that provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan area which will indirectly provide for Owens tui chub habitat conservation to sustain their viability to the extent that activities occur within the occupied portions of the Hot Creek watershed and in the upper portion of the Middle Middle Fork of the San Joaquin River watershed near Sotcher Lake. The aquatic and riparian conservation strategy retains the essential elements of the existing management direction for riparian conservation areas, a variable distance buffer area surrounding streams and bodies of water, and identifies larger conservation watersheds with a goal of longer-term maintenance of watershed integrity and function. The direction for Watersheds and Riparian Conservation Areas would build resilience into watershed systems and habitats by guiding projects to better enable watersheds to adapt to drought and climate change and enable stream systems and associated habitats to adapt to altered flow regimes and disturbances.

As described in the *Effects Common to Aquatic Habitats and Species* above, there are many specific desired conditions that would shape the purpose and need and project design outcomes of future projects. Desired conditions for the riparian conservation areas are to provide beneficial functions such as providing cold, clean water; stream shading; aquatic/riparian habitat for indicator; and nutrients. There are also many specific standards and guidelines that would avoid, mitigate, or minimize certain types of activities or intensities or magnitudes of effects within riparian conservation areas and to riparian resources. These plan components collectively help assure stream and riparian habitats are conserved and restored for long-term sustainability and resilience, and species long-term viability.

There is no specific species or habitat management direction for Sotcher Lake for Owens tui chub. As noted in the section*: Effects Common to Aquatic Species*, the Proposed Action provides a comprehensive and multi-scale management framework for watershed, riparian and stream conservation and management in the plan areas which will provide Owens tui chub habitat conservation to sustain their viability. This proposed management framework contains ecosystem restoration forest plan components that build resilience into watershed systems and habitats to better enable them to adapt to drought and climate change. This framework specifically promotes restoration actions that will enable stream systems and associated habitats to adapt to altered flow regimes and disturbances. Sotcher Lake occurs within the proposed Mammoth Lakes destination recreation area. This area receives and will continue to receive heavy recreational use. One standard for riparian conservation areas may not be met in all cases within Destination Recreation Management Areas, MA-RCA-STD-07, which states: "*[p]revent disturbance to streambanks and shorelines of lakes and ponds (caused by resource management activities, or factors such as off-highway vehicles or dispersed recreation) from exceeding 20 percent of 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 may not be met within Destination Recreation Management Areas, sites authorized under special use permits, and designated off-highway vehicle routes, but activities will be designed and managed to reduce the percent of impact to the extent feasible*." However, if these activities are found to affect Owens tui chub, then consultation with the USFWS would occur at the project-level.

With the forestwide direction for Animal and Plant Species coupled with the multi-scale aquatic and riparian conservation strategy approach, it has been determined that the proposed plan no longer needed to continue to identify and manage the Little Hot Creek critical aquatic refuge as a management area since functionally equivalent plan direction is provided. The primary direction for critical aquatic refuges was to apply a watershed focus for activities occurring in the upland portions. In the Proposed Action, this is replaced by stronger direction to provide for at-risk species (SPEC-FW-DC-02, SPEC-FW-DC-03, SPEC-FW-STD-01, SPEC-FW-GDL-03, SPEC-FW-GDL-05) and forestwide direction for upland portions of watersheds (WTR-FW-DC-03, WTR-FW-DC-04, and WTR-FW-STD-02) that apply to all watersheds. The current forest plan also included direction to consider proposing areas within critical aquatic refuges for withdrawal from mineral location and entry. The Forest Service retains this ability under policy to propose areas for withdrawal from mineral location and entry and is required to evaluate proposals for occupancy and use of lands for valid existing claims prior to authorizing such uses. Potential effects to federally listed species or their habitats would be evaluated as a basis for proposing a withdrawal or for determining if uses should be authorized. As a result, there are no substantial changes expected from the change in management approach that no longer manages for the Little Hot Creek critical aquatic refuge.

While the Forest Service regulates surface activities on National Forest System lands, regulating water rights and water withdrawals is under the authority of the State of California and is outside the authority of the Forest Service. Water withdrawal affecting Little Hot Creek Pond is not expected because the majority of the headwaters area affecting the pond are National Forest System lands and there are no known proposals. Water withdrawals or changes from activities that might affect the seeps and springs that feed the hydrology of the ponds are unlikely given direction in desired condition SPEC-FW-GDL-05 that water developments that might dewater aquatic habitat for at-risk species should be avoided. In additions, the desired condition WTR-FW-DC-01 describes that there is adequate quantity and timing of water flows to support aquatic species and RCA-RIV-DC-03 describes that there are sufficient in-stream flows to support aquatic biota.

There are geothermal energy development projects in the area. The proposed Casa Diable IV project is located in the Mammoth Lakes area and geothermal development must be approved by the Bureau of Land Management. It has the potential to affect Owens tui chub and the project proponent must develop an Owens Tui Chub Population and Habitat Monitoring Plan and amend the existing Remedial Action Plan, in coordination with the Bureau of Land Management and USFS. The Population and Habitat Monitoring Plan is intended to identify and quantify potential changes to fish habitat and populations at AB and CD springs and Little Hot Creek Pond. This process is consistent with **Recovery Plan Task 2.2.4** and **Recovery Plan Task 2.4.2** to protect spring discharge and monitor effects of geothermal development in the Little Hot Creek Conservation Area.

Demographic and genetic stochasticity are outside the authority of the Forest Service to directly address other than the Inyo NF would cooperate and coordinate with the USFWS or CDFW if recovery actions to augment or establish additional populations were determined to be necessary to contribute to the recovery of the Owens tui chub related to **Recovery Plan Task 2.2.2** or **Recovery Plan Task 2.4.1**.

The Little Hot Creek Pond may be buffered slightly from environmental stochasticity related to drought and annual weather variability because of the spring fed nature of the hydrologic system that feeds it. The dry grassland and shrublands that surround this area reduce the magnitude and risk of substantial impacts from wildfire, if it were to occur. The effects of climate change may be expressed in many ways, such as changes in precipitation patterns and runoff patterns that could affect streamflows and groundwater systems that feed the springs and seeps that supply the Little Hot Creek Pond. As described above, changes in water withdrawals that feed the ponds are not expected during the life of the forest plan and projects would be designed to consider watershed resilience to climate change (WTR-FW-DC-01) and if projects proposed changes in instream flows, they would consider the effects on Little Hot Creek Pond (SPEC-FW-GDL-05).

The following program areas include actions guided by the forest plan that could potentially affect Owens tui chub: Fire Management, Vegetation and Fuels Management, Recreation Management, and Restoration Activities.

The Range Management program areas is not expected to affect this species because the areas around the Little Hot Creek Ponds are fenced and not subject to livestock grazing and no livestock grazing occurs around Sotcher Lake in the environmental baseline meeting Recovery Action **Task 2.2.3**. Following a project level consultation with the USFWS, the Little Hot Creek Pond is currently fenced to exclude livestock and to discourage other uses. It is expected that this fence will be maintained through the life of the forest plan to avoid impacts to Owens tui chub habitat from domestic livestock grazing and incidental public uses.

Roads and Other Infrastructure are not expected to affect this species because the road adjacent to the Little Hot Creek Pond is maintained as a gravel road to minimize dust and erosion risks to the pond and routine maintenance along this section is not expected to impact the pond. There are no roads immediately adjacent to Sotcher Lake. The main access road to Reds Meadow has a small parking area near the road for the Sotcher Lake Picnic area but continued use and management of the road and picnic area infrastructure would not affect Sotcher Lake.

Fire Management

Fire management can affect Owens tui chub and its habitat primarily in terms of fire suppression impacts and potential post-fire erosion impacts. The risk is relatively low for the Little Hot Creek

Ponds population because of the sparse vegetation surrounding these areas where fire severity would generally be low (See Figure 20 and Figure 22). The risk is higher for the Sotcher Lake population because it is in a forested environment where fire risks are higher. The area around Sotcher Lake is in the Community Wildfire Protection Zone where a high priority is on protecting assets from wildfire impacts and where, due to risks, most wildfires are expected to be fully suppressed.

A potential management approach for Fire describes our intent for making fire management decisions as: *"[w]hen determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season."* Locations of federally listed species are typically identified as values at risk in fire management decision support systems. In addition, although not specified in the forest plan, when managing wildfires in areas potentially affecting federally listed species, a standard practice is to identify a Resource Advisor for fire planning teams. The Resource Advisor identifies potential impacts of fire management activities on species and works with the fire planning team to identify actions to consider to avoid, mitigate, or minimize impacts to federally listed species. In addition, a separate Forest Service analysis evaluated areas that may be adversely affected by the application of aerial fire retardants during fire suppression activities (United States Department of Agriculture 2011). All areas where Owens tui chub occurs on the Inyo NF are identified as terrestrial aerial retardant avoidance areas.

Vegetation and Fuels Management

The effects of the Vegetation Management program on this species is expected to be small because other than Sotcher Lake, these occupied areas are not in forested or heavily vegetated areas. Sotcher Lake is within the Mammoth Lakes Destination Recreation Area where a high level of recreation use occurs and the overarching management desired condition is to provide for higher levels of development within a "…*natural appearing landscape*" (MA-DRA-DC-02). It is not expected that vegetation management would be planned within this area during the life of the forest plan, however, fuels management could occur and is discussed below.

Because of the existing sparse vegetation conditions around Little Hot Creek, no fuels management is likely to be needed or occur during the life of the forest plan. In order to reduce the risk of negative wildfire impacts, projects could be proposed around Sotcher Lake to meet a forest plan goal for the Community Wildfire Protection Zone (MA-CWPZ-GOAL-02) to "*[r]educe the impacts of wildfire by creating fire-adapted communities through fuel reduction treatments, prescribed fire, and managing wildfires that can benefit natural resources while reducing risk.*" If fuels management projects are proposed, they would be guided by direction for Riparian Conservation Areas to "have the ecological conditions that contribute to the recovery of threatened and endangered species" (MA-RCA-DC-02). Fuels management activities would typically occur in the upland areas and not immediately affect the lakeshore or riparian habitats that might provide direct habitat for the Owens tui chub. These projects would also be guided by a standard for Watersheds to use "best management practices" to "mitigate adverse impacts to soil and water resources" (WTR-FW-STD-01).

Recreation Management

For the Owens tui chub, the entire segment of Little Hot Creek (Stream ID 1.084) was evaluated and found to meet the eligibility requirements to be considered for inclusion in the National Wild and Scenic Rivers System (see Figure 22 above). The assigned preliminary classification is

"recreational river". Classification is based on the level of human development of the shoreline, watercourse and access at the time a river is found eligible. A "recreational river" is defined as rivers, or sections of rivers, that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Eligible wild and scenic rivers are managed to "*…retain their free-flowing condition, water quality, and specific outstandingly remarkable values*" "*until further study is conducted or until designation by Congress*" (MA-EWSR-DC-01). Any future proposed projects would be guided by standard (MA-EWSR-STD-01) that applies interim protection measures identified in the Forest Service Handbook. That direction specifies that Forest Service-identified eligible and suitable rivers are protected sufficiently to maintain free flow and outstandingly remarkable values unless a determination of ineligibility or non-suitability is made. Future in-stream habitat restoration projects, such as, construction of structures and vegetation management to protect and enhance wildlife and fish habitat, can occur within recreational rivers as long as they fully protect identified river values and do not affect the river's free-flowing character. Additional information about these river segments can be found in Appendix C in Volume 2 of the FEIS.

The area surrounding Little Hot Creek Pond was fenced as described above. The fence serves as a passive deterrent to public uses around the pond but if habitat disturbance were to occur, the forest could evaluate taking additional actions to move towards the desired condition SPEC-FW-DC-02 to manage habitats for listed species.

Sotcher Lake is within the Mammoth Lakes Destination Recreation Area. This lake is a popular location for fishing and there is a designated picnic area that receives heavy use. Given that information about the specific habitats and areas of occupancy in Sotcher Lake is not known, it is difficult to assess the potential for impacts from recreation uses. If specific activities are identified that are adversely affecting Owens tui chub, projects could be developed to meet the desired condition for Animal and Plant Species (SPEC-FW-DC-02) that "*[e]cological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the Endangered Species Act*".

Restoration Activities

The area around Little Hot Creek Pond was evaluated along with the CDFW for management options for the emergent vegetation growing within the pond. While there is some vegetation encroachment, the population of Owens tui chub appears to be stable. The forest would continue to coordinate with the USFWS and CDFW to evaluate habitat conditions at Little Hot Creek Pond to further goal SPEC-FW-GOAL-03. If it's determined that vegetation control is needed and the specific equipment needed is available, the forest would develop a site-specific project with sufficient design features and mitigations to contribute to recovery of the species (SPEC-FW-STD-01). Projects would incorporate appropriate habitat management actions for vegetation control as determined necessary to contribute to species recovery (SPEC-FW-GDL-03).

As described above, the Little Hot Creek Pond is currently isolated from non-native aquatic predators like largemouth bass and brown trout by downstream diversions that prevent connection with the Owens River. It is not anticipated that these predatory fish will become introduced or established in the Little Hot Creek Pond because it does not provide suitable habitat and is small in size. The forest plan recognizes that some "*…barriers are maintained in good condition to protect native aquatic species*" in the desired condition for Rivers and Streams (RCA-RIV-DC-02). If a change were to occur to these barriers to threaten their effectiveness, projects would be considered to meet the desired condition (SPEC-FW-DC-02) to manage for ecological conditions

that "…*provide habitat conditions that contribute to the survival, recovery, and delisting of species under the Endangered Species Act*" and the goal to coordinate with the USFWS and with CDFW to "*restore and maintain essential habitat*" for listed species (SPEC-FW-GOAL-03). This would contribute to **Recovery Plan Task 2.2.1** to use barriers to separate occupied habitat from deleterious non-native species.

Although mosquitofish are abundant at Little Hot Creek Pond, the tui chub population at Little Hot Creek Pond appears to continue to reproduce and thrive in the presence of mosquitofish in this location (L. Simms pers comm). At this time, control of mosquitofish is not planned, but the forest would consider action, if feasible, if recommended by the USFWS or CDFW in order to contribute to the recovery of the Owens tui chub (SPEC-FW-DC-02, SPEC-FW-GOAL-03, and SPEC-FW-GDL-03).

Hybridization with Lahontan tui chub is a threat. As shown in Figure 22, the Little Hot Creek Pond is close to the forest boundary and water withdrawals downstream and outside of the national forest are responsible for maintaining the barrier on Little Hot Creek. If downstream water withdrawals were to be reduced, there is a possibility that Little Hot Creek could reconnect with the Owens River creating the potential for contact with Lahontan tui chub. Since it is outside the authority of the Forest Service to regulate water rights or water uses outside of National Forest System lands, if that were to occur and it was feasible to construct a barrier on National Forest System lands, it could be considered to meet the desired conditions SPEC-FW-DC-02 and the goal to coordinate with the USFWS and with CDFW to restore and maintain essential habitat for listed species (SPEC-FW-GOAL-03).

As described above for Recreation Management, there is no information known about habitat restoration needs for Sotcher Lake. Recreation impacts to the shoreline would be managed as needed to meet MA-RCA-STD-07 to design and manage activities to have less than 20% of the shoreline impacted but recognizing that in Destination Recreation Areas this may not be achievable but activities would be designed "*to reduce the percent of impact to the extent feasible*."

The threat of competition from rainbow trout or mosquitofish has been identified due to interactions with similar species. The forest plan provides broad guidance to address these threats through consideration of site-specific project proposals if warranted from SPEC-FW-DC-02, SPEC-FW-GOAL-03, and SPEC-FW-GDL-03.

Cumulative Effects

The cumulative effects analysis area for the Owens tui chub includes portion of the Inyo NF plan area that affects Little Hot Creek Pond and Sotcher Lake. This an appropriate scale for determining cumulative effects since this area includes all habitat potentially affected by implementation of the forest plan described by the Proposed Action. The cumulative effects time frame is 15 years into the future, which is the expected timeframe when the forest plan would be revised. The cumulative effects of all past non-federal actions are incorporated into the existing condition.

The private land parcel upstream of the Little Hot Creek Pond is known as the Hot Creek Pit and is a former clay (kaolin) mine (https://mrdata.usgs.gov/mrds/show-mrds.php?dep_id=10237221). It is unknown if any future activities are planned. There are additional private land parcels downstream towards the Owens River. Agricultural and other land uses on the downstream

parcels are expected to continue, including downstream water diversions that provide a barrier between Little Hot Creek and the Owens River.

Sotcher Lake has no non-federal lands nearby and the only currently known non-federal actions planned around Sotcher Lake is the continued stocking of non-native trout by the California Department of Fish and Wildlife to support recreational sportfishing.

Given these and other potential nonfederal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to threatened and endangered species. All future project level activities that may affect these species will require project-specific assessments and consultation under Section 7 of the Endangered Species Act.

- Restoration activities to manage emergent vegetation within the Little Hot Creek Pond to improve habitat conditions has been considered by the CDFW and Inyo NF but not implemented because of a lack of equipment. Such restoration activity to improve habitat conditions could occur based upon a site-specific analysis and would be encouraged by the Proposed Action.

Based on our analysis, we determined that because some actions and activities may disturb and displace individuals and habitat could be affected by restoration activities, adoption of the Proposed Action ***may affect, and is likely to adversely affect*** the Owens tui chub.

Whitebark Pine (Candidate Species)

The 12-Month finding for whitebark pine (United States Department of the Interior 2011b) and Species Assessment and Listing Priority Assessment Form (United States Department of the Interior 2016c) describes key habitat, life history requirements, distribution and threats compiled from a variety of best available science sources. The relevant information is summarized here, generally without the specific source attributions, except where other sources are used or where it may aid in identifying which document contains additional detail.

Classification, Critical Habitat and Recovery Plan

The whitebark pine was added to the candidate species list in 2011 (United States Department of the Interior 2011b) after a 12-month finding on a petition to list the species was found to be warranted but precluded by higher priority actions. Whitebark pine currently has a Listing Priority 2 because threats to the species are estimated to be of high magnitude and imminent immediacy.

Since becoming a candidate species, the status of whitebark pine has been reviewed in an annual description of progress on listing actions, the most recent in December 2016 (United States Department of the Interior 2016b). In addition, a Species Assessment and Listing Priority Assignment Form was prepared (United States Department of the Interior 2016c) and considered in preparing this biological assessment. The Species Assessment identifies the following threats relevant to the Inyo NF plan area:

1. Fire and fire suppression
2. Climate change
3. Disease – white pine blister rust
4. Predation – mountain pine beetle
5. Inadequate existing regulatory mechanisms

Habitat and Life History

Whitebark pine is considered a hardy conifer that can tolerate poor soils, steep slopes and harsh environments in alpine and subalpine locations. They are a slow-growing tree given the harsh environments they occur in and are long lived. While they can produce cone crops at 20-30 years of age, they do not produce large cone crops until age 60-80 years. Seed production can vary between years but is synchronized between populations and high seed production occurs typically every 3 to 5 years. This is an important life history trait since seeds are heavily used for food by many species, especially Clark's nutcrackers, and synchronous high seed production ensures some seed escapes predation for regeneration. Dispersal, and subsequent regeneration, is primarily a result of seed caching by Clark's nutcrackers and this is an important ecological process for recolonizing areas such as burned areas.

Historic and Current Distribution

Whitebark pine grows in the highest elevation forest and at timberline. Its distribution is essentially split into two broad sections, one following the British Columbia Coast Ranges, the Cascade Range, and the Sierra Nevada, and the other covering the Rocky Mountains from Wyoming to Alberta.

In California, whitebark pine has been recorded on National Forest System lands in the Six Rivers, Klamath, Modoc, Shasta-Trinity, Lassen, Tahoe, Eldorado, Lake Tahoe Basin

Management Unit, Stanislaus, Sierra, Inyo, and Sequoia National Forests. Moderate amounts of whitebark pine also occurs in Yosemite and Sequoia and Kings Canyon National Parks with minor amounts in Lassen Volcanic National Park and on lands managed by the Bureau of Land Management. While the species has a broad geographic range, many stands are geographically isolated (Keane et al. 2012) and precise information regarding the abundance and distribution of stands is limited, especially where it occurs in mixed stands with other species. The Forest Service has created a spatial dataset that provides a reasonable estimate of the known distribution of whitebark pine in California by examining multiple relevant vegetation mapping datasets (Slaton, Gross, and Meyer 2014). This dataset shows that almost all of the known distribution is on National Forest System lands and National Park Service lands, and the vast majority is within designated wilderness areas.

In the Sierra Nevada and Cascade Ranges of California, whitebark pine often occur as pure or nearly pure stands in the subalpine zone, where it regularly defines the upper tree line and often forms krummholz cushions. This species generally occurs on cryochrept soils—cold-climate soils lacking development—that are moderately to poorly draining, nutrient poor and from granitic or basaltic origins (Hall, Crown, and Titus 1984).

A spatial analysis shows that approximately 37 percent of the extent of whitebark pine in California occurs on the Inyo NF (Slaton, Gross, and Meyer 2014). An analysis of that data shows that approximately 86 percent of the whitebark pine on the forest occurs within designated wilderness areas (Table 20) as shown in Figure 24 for the northern portion of the forest and Figure 25 for the southern portion of the forest. Of the remaining 14 percent not in designated wilderness areas, a large amount occurs in the Glass Mountain inventoried roadless area. Smaller amounts also occur within ski areas, near high elevation reservoirs where day use activities are popular (Lake Sabrina, Saddlebag Lake, South Lake), or at the lower elevations of the whitebark pine zone, where campgrounds and trailheads are often found (such as Onion Valley, Bishop Creek, and Rock Creek developed recreation sites).

Table 20. Distribution of whitebark pine on the Inyo National Forest and in California

Region	Acres
Inyo National Forest	139,922
In Wilderness on Inyo National Forest	120,137
Other National Forests in California	123,089
National Parks in California	107,438
Total in California	372,035

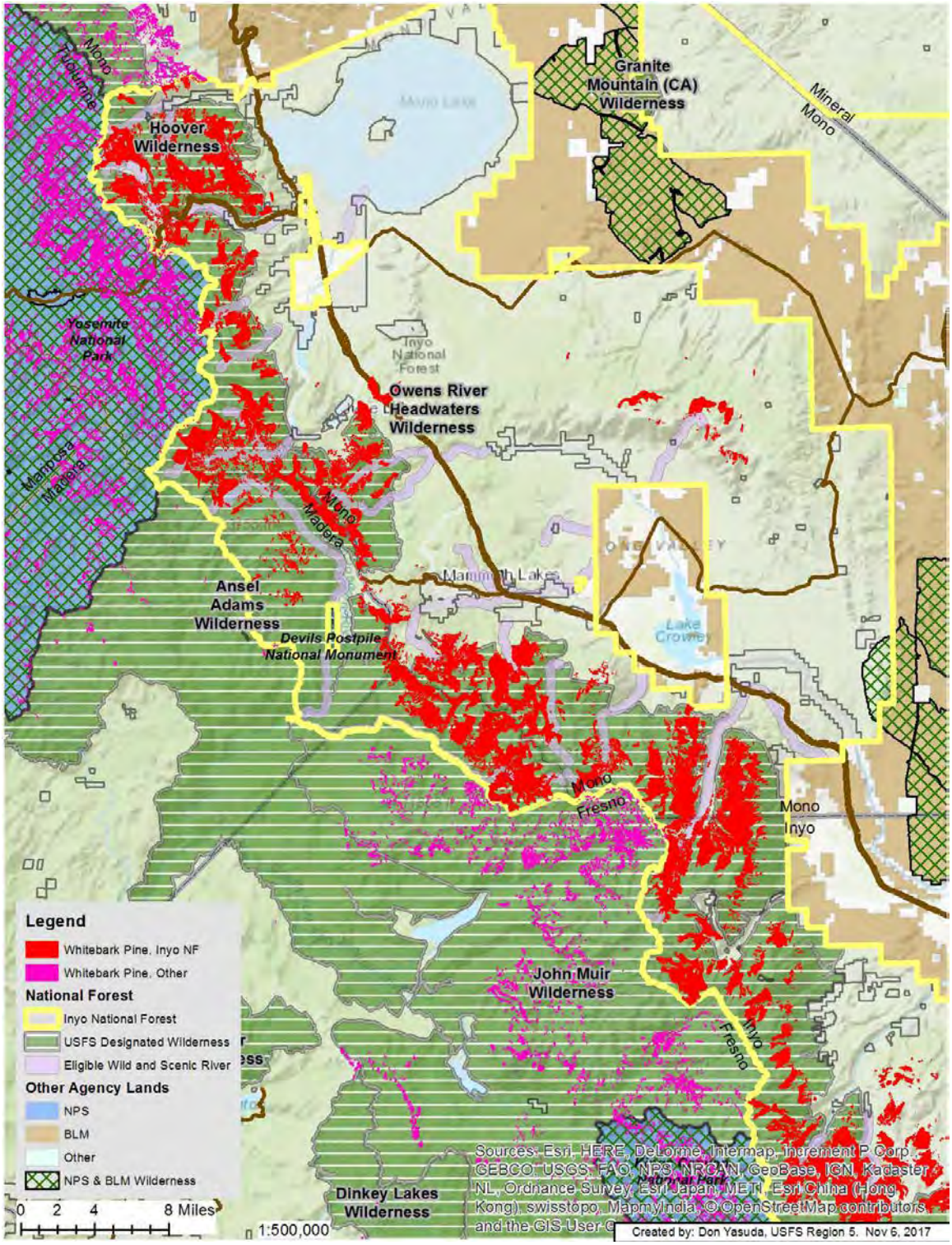

Figure 24. Whitebark pine distribution on northern portion of Inyo National Forest

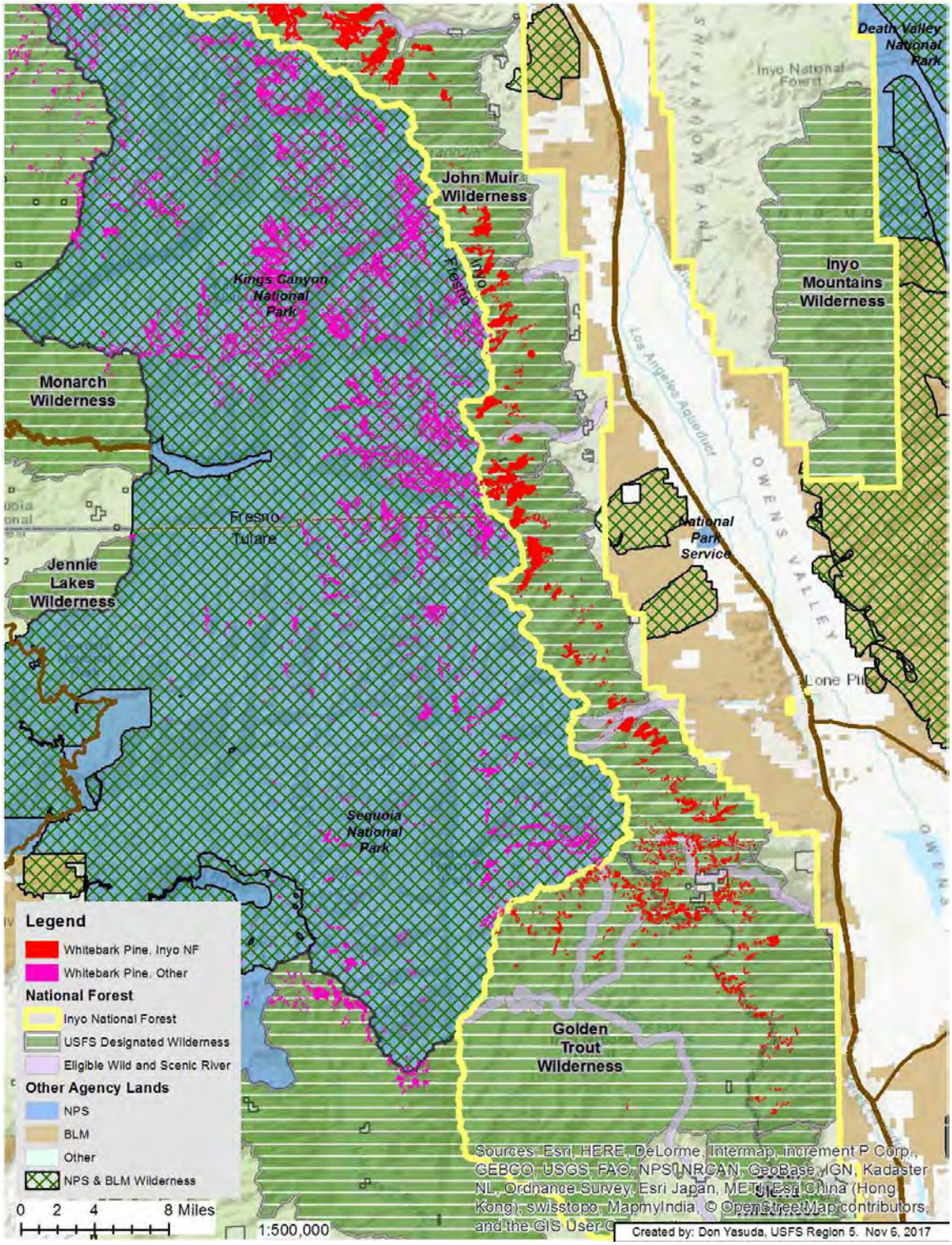

Figure 25. Whitebark pine distribution on northern portion of Inyo National Forest

Population and Habitat Status and Trend

Information on current whitebark pine population does not exist for the Inyo NF. However, newer data and mapping technologies are allowing better mapping of the extent of whitebark pine in the Sierra Nevada range (Slaton, Gross, and Meyer 2014). This coupled with developing remote

sensing technologies will allow better analysis of changes in the extent of occupied areas from disturbances and mortality over time. Mortality of mature trees has occurred during recent droughts from mountain pine beetle attacks as discussed in the Threats section below but specific trend data does not exist.

Threats

The threats identified in the 12-month finding (United States Department of the Interior 2011a) and species assessment (United States Department of the Interior 2016c) were reviewed to determine which may be relevant to the plan area.

Fire and fire suppression

The policy and practice of fire suppression has resulted in some change in the structure and composition of vegetation and the fuels that influence the behavior of fire. This has resulted in some forests that are denser and some areas where fuels have increased over time due to the suppression of wildfires. However an evaluation of the natural range of variation found that subalpine forest stands in the Sierra Nevada are still largely within the natural range of variation with respect to the composition, structure, and function (Meyer 2013b). On the Inyo NF, the majority of whitebark pine occurs in wilderness where restoring fire as an ecological process is a priority. Although many wildfires continue to be suppressed, some are closely monitored and allowed to burn with limited or no active suppression actions after considering public safety, risks to communities, and fire effects to natural resources.

Climate change

The species assessment (United States Department of the Interior 2016c) identified three aspects of climate change that could potentially directly affect whitebark pine: 1) increasing temperatures exceed the species biological tolerance; 2) increasing competition from other conifers that migrate upward as the cold zone warms; and 3) increases in frequency and intensity of disturbance from fire and disease. The subalpine forests natural range of variation report supports this by concluding that climate envelope models project substantial future loss and high climate vulnerability of subalpine forests by the end of the century (Meyer 2013b).

Disease – white pine blister rust

The species assessment (United States Department of the Interior 2016c) determined that rangewide, white pine blister rust infection has spread and intensified over time and presents a threat by reducing seed production and killing trees. The incidence of blister rust in whitebark pine is higher in the northern Sierra Nevada just north and west of the Inyo NF (Lake Tahoe south to Stanislaus NF) with fewer incidences in the Great Basin ecoregion, which includes portions of the Inyo NF. To date, whitebark pine in the southern Sierra Nevada has been relatively resistant to invasion by white pine blister rust, especially on the east side of the Sierra Nevada crest (Maloney 2011, Meyer et al. 2013).

Predation – mountain pine beetle

The species assessment (United States Department of the Interior 2016c) identified a rangewide concern for attack and mortality from mountain pine beetle across the species range, with extensive bark beetle activity in the Rocky Mountains that peaked in 2008 but has since subsided. The evaluation of subalpine forests in the Sierra Nevada (Meyer 2013b) found levels of mountain pine beetle outbreaks were likely within the historic range of variation prior to 2006 but increased outbreaks on the Inyo NF and Modoc NF (northeastern California) since 2006 coupled with

projections of increased outbreaks from climate change suggest that outbreaks will likely exceed the natural range of variation by early to mid-century. The threat from mountain pine beetle attacks is expected to be compounded by synergistic effects from white pine blister rust and drier and warmer temperatures that are expected to result from climate change. Observations in the June Mountain area in 2013 by forest pathologist, Martin Mackenzie, documented mortality in overstory whitebark pine but also regeneration and release of seedlings and saplings in the understory (MacKenzie 2014).

Inadequate existing regulatory mechanisms

The species assessment (United States Department of the Interior 2016c) identified limitations in existing regulatory mechanisms. The primary ones relevant to the Inyo NF is the Wilderness Act that limits most active restoration opportunities; the National Forest Management Act which encourages restoration but is limited in the amount of direct improvements; and federal wildland fire management polies, plans and guides which may be beneficial but are not specific enough to ensure threats to whitebark pine are adequately addressed.

Analysis of Effects

The current forest plan does not include specific plan direction that applies to whitebark pine. The Proposed Action recognizes whitebark pine in vegetation desired conditions and formalizes a goal to develop a whitebark pine conservation and restoration strategy. Management of the effects to whitebark pine presents distinctive challenges compared to other analyzed species because they are fairly widely distributed in multi-acre stands. As such, maintenance of the viability of these types of populations cannot be effectively managed through avoidance of occurrences during management activities using tactics such as control area and "flag-and-avoid" guidance, especially those associated with high elevation portions of ski areas and recreation sites. The long life span of whitebark pine presents additional challenges for management. Cones are first produced at 20-30 years of age on good sites, but on most sites, trees do not reach full cone production until 60 to 100 years of age (Handcock and Csillag 2002). The forest plan includes a goal (SPEC-FW-GOAL-05) to *"[d]evelop a regional whitebark pine conservation and restoration strategy in collaboration with other Federal agencies, research organizations, and other partners."* This is envisioned to compliment the range-wide restoration strategy developed in 2012 (Keane et al. 2012) by providing a strategy applicable to the national forests in the Sierra Nevada and Cascades Range. To the extent that applicable habitat management objectives or goals are developed, they would be incorporated into future projects as directed by guideline, SPEC-FW-GDL-04.

Indirect Effects

Whitebark pine occurs within the subalpine and alpine ecological zone and is incorporated specifically into two desired conditions for that zone. TERR-ALPN-DC-03 describes the condition where "*[s]ubalpine woodlands are resilient to insects, diseases, fire, wind, and climate change. High-elevation white pines (whitebark pine, Great Basin bristlecone pine, limber pine, and foxtail pine) are healthy and vigorous, with a low incidence of white pine blister rust, and resilient to moisture stress and drought. White pine blister rust-resistant trees are regenerating and populations of high elevation white pines have the potential to expand above the tree line.*" TERR-ALPN-DC-04 is developed specifically to recognize the importance of mature, seed bearing trees by desiring that "*[m]ature cone-bearing whitebark pine trees are spatially well distributed to produce and protect natural regeneration and conserve genetic diversity.*"

The forest plan recognizes the need to consider the impacts of climate change in the desired conditions that emphasize resilience and stressors. Within wilderness, management of fire will be the primary management activity due to constraints on other active management and is discussed above. Outside of wilderness, projects or activities that do occur would be guided by two desired conditions (TERR-MONT-DC-03 and TERR-ALPN-DC-03) that focus on maintaining healthy and vigorous tress that are resilient to stressors and climate change. An additional desired condition (TERR-ALPN-DC-04) describes the important characteristic of having well-distributed mature cone-bearing whitebark pine trees. When projects are designed in the alpine and subalpine ecological zone, this desired condition will function to guide them to consider the seral stages of whitebark pine and ensure that regeneration is likely to continue to occur which will increase the likelihood of climate adaptation (Brautigam et al. 2013). The forest plan also includes plan direction to address the potential climate change influence on the forest disease, white pine blister rust, and the climate risk of increases in insect attack from mountain pine beetles which is discussed above for Vegetation Management. One additional threat is impacts to individuals from snow avalanches which will be influenced by climate change to the extent that patterns of snowfall and conditions that trigger avalanches change over time.

The forest plan includes a goal (SPEC-FW-GOAL-05) to collaboratively develop a regional whitebark pine conservation and restoration strategy. This strategy is envisioned as a regional approach to the range-wide restoration strategy developed in 2012 (Keane et al. 2012) and would cover whitebark pine across its range in California. It would likely identify habitat management objectives or habitat goals and tactical practices that could be implemented to conserve whitebark pine. Under guideline SPEC-FW-GDL-04, if such habitat management objectives or habitat goals were developed, they would be considered in the design of projects as appropriate. Any tactical practices could be considered and implemented in future projects unless they are inconsistent with an existing standard or guideline, in which case an amendment to the forest plan may be considered.

The forest plan monitoring program has a monitoring question and indicator that addresses if high elevation white pines are being sustained or increasing across the landscape (Monitoring Program, CC01). There is also a Proposed and Possible Action (Terrestrial Ecosystems, Sierra Nevada Montane Zone) that indicates an intent of the forest to continue to "*[c]ooperate with the Pacific Southwest Region Ecology Program to monitor health of whitebark pine stands.*"

Since most of the occurrences of whitebark pine are located within designated wilderness areas, the Wilderness Act and the forest plan desired conditions limits the extent of active management that can occur to benefit whitebark pine (DA-WILD-DC-01). However, given the remote nature of most occurrences, there is limited opportunity for active management anyway.

When projects are planned, the overarching Animal and Plant Species standard SPEC-FW-STD-01 ensures that projects consider species and habitat needs for whitebark pine during the project-level environmental planning process. Projects or activities that do occur would be guided by two desired conditions (TERR-MONT-DC-03 and TERR-ALPN-DC-03) that focus on maintaining healthy and vigorous tress with low incidence of white pine blister rust that are resilient to stressors and climate change. An additional desired condition (TERR-ALPN-DC-04) describes the important characteristic of having well-distributed mature cone-bearing whitebark pine trees. This is important to ensure sufficient seeds for caching by Clarks nutcrackers to aid in natural regeneration and to maintain genetic diversity. These desired conditions would function to ensure that projects that affect vegetation would be designed to protect mature whiteback pine and are designed to improve conditions that lessen stressors and risks to whitebark pine.

The following program areas include actions guided by the forest plan that could potentially affect whitebark pine: Fire Management, Vegetation and Fuels Management, Recreation Management, Restoration Activities, and Roads and Other Infrastructure.

The Range Management program areas is not expected to affect this species because livestock grazing has not been identified as a threat to the species or its habitat.

Fire Management

Since the majority of whitebark pine on the Inyo NF occurs in wilderness, it would be beneficially affected by the increased emphasis on restoring fire as an ecological process (FIRE-FW-DC-01 and DA-WILD-DC-03).

A desired condition in Subalpine and Alpine Zones (TERR-ALPN-DC-05) states that "*[a]lpine ecosystems are resilient to climate change, and fires are small and occur infrequently*." A potential management approach for Fire recognizes the need to limit impacts to sensitive habitats for at-risk species like the whitebark pine when it can be done safely. The majority of the wilderness areas where whitebark pine occurs are in the Wildfire Maintenance Zone and the Wildfire Restoration Zone (see Figure 3). In these Strategic Wildfire Management Zones the desired conditions are to manage conditions such that wildland fire predominately have a positive benefit to ecosystems and resources (MA-WRZ-DC-01 and MA-WMZ-DC-01). Using the full range of wildfire management strategies and tactics encouraged by the desired conditions, it is expected that more wildfires will be managed within wilderness to meet resource objectives than is currently occurring (MA-WRZ-DC-02, MA-WRZ-GOAL-01, MA-WMZ-GOAL-01, and MA-WMZ-STD-01). Within both zones, when wildfires do occur, natural barriers and features will be used where safe and practical as control lines and to moderate fire behavior (MA-WRZ-STD-01 and MA-WMZ-STD-02).

Guideline (FIRE-FW-GDL-02) directs most wildfires and prescribed fires will be managed using a variety of fire management options and activities such as hand and aerial ignitions to achieve a mix of fire effects and to limit extensive continuous areas of high severity fire effects. The desired conditions support developing resource objectives that will identify the risks and benefits to whitebark pine from wildfire which will allow more adaptive and responsive wildfire management decisions, including when managing wildfires can restore ecological conditions favorable to whitebark pines. A potential management approach for Fire describes our intent for making fire management decisions as: "*[w]hen determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season.*" As more wildfires are managed and more areas have burned, future fires are expected to burn more similar to the natural range of variation, with a more varied mix of fire severities more responsive to the scattered and more heterogeneous upper elevation forest conditions. This should lessen the risks of large high severity wildfires that could affect large areas of whitebark pine to a greater extent than would occur under the current forest plan.

Vegetation and Fuels Management

In general, limited vegetation management to reduce stand densities is expected to occur in stands with whitebark pine. This type of active management is generally limited on the Inyo NF because of limited access by equipment and the higher costs of vegetation management due to limited vegetation management infrastructure. The Inyo NF has developed an analysis procedure to

evaluate impacts to whitebark pine that is being applied for the Mammoth Lakes Basin Hazardous Fuels Reduction Project environmental analysis that is in progress. It evaluates the extent and magnitude of effects to whitebark pine trees and the forest intends to apply it to future projects. This procedure is aligned with the direction in the Proposed Action relevant to whitebark pine by avoiding removal of whitebark pine to the extent possible, which typically would involve flag and avoid of individual whitebark pine trees.

Disease – white pine blister rust

The Proposed Action recognizes the risk of white pine blister rust in two desired conditions. TERR-MONT-DC-03 and TERR-ALPN-DC-03. Both emphasize the desired condition that there is low incidence of white pine blister rust and that white pine blister rust resistant trees are regenerating, sustained, and have the potential to expand. This compliments the current regional program for managing white pine blister rust by conducting surveillance and monitoring, identifying, protecting, and collecting seed and growing progeny from rust-resistant trees, and conducting research on blister rust (https://www.fs.usda.gov/detail/r5/forest-grasslandhealth/insects-diseases/?cid=stelprdb5334111). While the white pine blister rust program is primarily focused on blister rust in sugar pine and western white pine, it also monitors and evaluates whitebark pine. Even though the incidence of white pine blister rust is currently very low on the Inyo NF, the Proposed Action includes a monitoring question to evaluate if high elevation white pines, which includes whitebark pine, are being sustained or increasing across the landscape with climate change (Monitoring Program, CC01). This monitoring question will examine indicators of the extent of these forest types and the trends in tree mortality and regeneration. Actions to evaluate blister rust will continue and if the incidence in whitebark pine increases, actions to manage blister rust may be necessary to consider in the future.

Predation – mountain pine beetle

The same plan component described above for Disease also apply for addressing the threat from mountain pine beetle. The desired conditions TERR-MONT-DC-03 and TERR-ALPN-DC-03 address the condition of resilience of whitebark pine to insects and being resilient to moisture stress and drought, conditions that may facilitate mountain pine beetle outbreaks. Since most of the whitebark pine occurs within wilderness, no direct active management other than restoring fire as an ecosystem process will likely occur to move towards these desired conditions. Outside of wilderness, vegetation projects could be designed to reduce stand density of trees to lessen competition and increase the resilience of whitebark pine. Since most tree mortality by mountain pine beetle is in mature trees, there has been some evidence that mortality of mature trees may release understory whitebark pine saplings. This has been observed in the June Mountain area (MacKenzie 2014) where mountain pine beetle mortality of stands of whitebark pine functioned to release saplings that were seed cached by Clarks nutcrackers. Many of these saplings were many decades old and suppressed in growth by the overstory trees and some showed signs of increased growth following release (MacKenzie 2014). Given that whitebark pine must mature to produce large seed crops, it will be important to consider age class diversity when managing stands of whitebark pine (TERR-ALPN-DC-04).

Fuels Management

Whitebark pine of all age classes are adversely affected by high intensity fire, but burned areas provide a seedbed and are used by Clark's nutcrackers as seed cache sites and can serve as regeneration sites. While no priorities for prescribed burning are set specifically for whitebark pine currently, the reduction of fuels that threaten nearby infrastructure would also reduce the threat of high intensity fire that would adversely affect existing whitebark pine. When fuels

reduction or prescribed burn projects are designed, standard SPEC-FW-STD-01 would require them to include "…*design features, mitigation, and project timing considerations…*" to avoid, minimize, or mitigate adverse effects to whitebark pine. This would typically include designs to avoid or minimize impacts to seed-bearing mature trees (TERR-ALPN-DC-04), manage impacts to understory vegetation and whitebark pine saplings in order to increase opportunities for release and regeneration of whitebark pine.

Recreation Management

Recreation activities in the areas where whitebark pine occurs outside of wilderness include some developed and dispersed recreation sites, activities and management in the vicinity of ski areas and trail construction and maintenance. The extent of impacts of recreation management on whitebark pine on the Inyo NF are not known but they occur within and near several popular campgrounds and recreation sites as described above. In general, whitebark pine can be affected by collection and use of whitebark pine branches and downed wood for campfires by recreationists. However, since 2002, the Inyo NF has implemented elevation-based campfire restrictions in wilderness areas in part to reduce the impacts of depletion of downed wood and ground litter in the elevations where whitebark pine occurs. Whitebark pine trees may also be affected by incidental damage by recreationists within campgrounds and during campground maintenance, including pruning or removal when they create safety hazards. Outside of developed campgrounds, the Inyo NF has maintained

The June Lake Ski Area is managed under a special use permit from the Inyo NF. In 2012, in response to increased tree mortality, a site-specific vegetation management planning project was approved that included 503 acres of whitebark pine restoration treatments (June Mountain Ski Area Vegetation Management Planning Project, (United States Department of Agriculture 2012)). The methods used included thinning stands to reduce susceptibility to mountain pine beetle attack, removing trees infested with mountain pine beetles, creating small opening to enhance Clarks Nutcracker seed caching, and managing the fuel bed to aid in prescribed burning. In the 480 acres of more general thinning, silvicultural prescriptions emphasized retention of smaller whitebark pine. To date, there has been less tree mortality near the Mammoth Mountain Ski Area and a similar proposed project has not been initiated.

Restoration Activities

Restoration activities, such as those designed for the June Mountain area could occur where risks of mountain pine beetle mortality are high or where restoration of fire is determined to be necessary to benefit whitebark pine. While some individual whitebark pine trees could be affected, overall project designs would to increase the health and vigor of whitebark pine stands (TERR-ALPN-DC-03) and ensure an age-class distribution that includes mature cone-bearing trees are spatially well distributed across the range of the species on the forest (TERR-ALPN-DC-04).

Roads and Other Infrastructure

Where whitebark pine occurs along roads, trails, within utility corridors, and near facilities, they may be pruned or removed where they contribute to safety hazards and cannot be avoided. The desired condition for mature cone-bearing trees (TERR-ALPN-DC-04) would guide projects to consider project design features that protect mature trees where possible.

Cumulative Effects

Since most of the whitebark pine occurs on federal lands, the only non-federal actions that are likely to occur and affect whitebark pine is fire management, recreation management, road management including hazard tree removal by the State and County and routine maintenance on private lands.

Fire suppression will continue to occur on state, county, and private lands. During fire suppression activities, individual whitebark pine trees could be cut down or damaged; however, the extent of effect is likely to be limited to individuals within stands of trees. Where whitebark pine occur within areas managed for recreation by non-federal entities and along roads open to the public and near facilities, periodic falling of hazard trees would be expected to continue to occur. Management of forested portions of individual private land parcels, may affect individual whitebark pine trees in the course of routine management. However, given the small extent of non-federal lands with whitebark pine, there are no known substantial cumulative effects.

Given these and other potential nonfederal future actions, we do not anticipate a significant increase in the level of impacts to these species' population in the plan area beyond what has already been noted in the analysis of effects resulting from implementing the Proposed Action.

Determination

Key conclusions:

- The forest plan provides a programmatic framework for future site-specific projects and actions but does not prescribe specific projects or assign project locations. Plan components exist to ensure proposed actions avoid, mitigate or minimize impacts to candidate species. All future project level activities that may affect this species will require project-specific assessments to evaluate the extent that projects may accelerate the trend toward federal listing and projects may seek technical assistance from the USFWS to consider or incorporate additional conservation recommendations to avoid, minimize, or mitigate potential effects.

- Whitebark pine will be affected by wildfires that continue to burn on the Inyo NF. Forest plan direction works to minimize effects during wildfire emergency response when safe, feasible and practical by identifying areas with whitebark pine during fire management planning. Some harm to individual seedlings, saplings, and mature trees will likely occur where prescribed burning occurs because complete avoidance is infeasible when planning prescribed burns of sufficient size to influence ecological conditions. Efforts to protect mature, cone bearing trees would occur when planning projects.

- Whitebark pine will continue to be affected by mountain pine beetles, especially in periods associated with prolonged drought. Forest plan direction provides for managing vegetation conditions to be restored towards the natural range of variation, but opportunities for active management is limited in most of the range of whitebark pine because it occurs within designated wilderness. Some restoration projects may occur outside of wilderness and may affect individual whitebark pine trees but would be designed to provide for the persistence of the species.

- Management actions will contribute to maintaining or restoring ecological conditions in the alpine and subalpine areas where the majority of whitebark pine occurs by emphasizing the restoration of fire as an ecological process and requiring the protection

> of whitebark pine during project planning to the extent capable within the plan area. Importantly, the importance of mature cone bearing trees is emphasized by desired conditions to better protect natural regeneration opportunities and the genetic diversity of this long-lived species. Nonetheless, individual whitebark pine trees, including mature trees, seedlings and saplings, may be harmed during implementation of management activities intended to reduce risks to subalpine and alpine ecosystems, benefit whitebark pine stands, manage recreation facilities, and provide for public safety. Because of the nature of this species and the extent of its occurrence, avoidance will not always be possible. Overall, restoring fire as an ecosystem process will provide the greatest long-term benefit to this species.

Based on our analysis, we determined that although some actions and activities may disturb or remove individuals and habitat could be affected by restoration activities, because adequate direction exists to protect whitebark pine stands and provide for reproduction, adoption of the Proposed Action ***may affect individuals, but is not likely to jeopardize the continued existence*** of the whitebark pine.

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Appendix A - Species Not Considered

The following species were identified in official species lists received for this project but are not known to occur within the action area. With the agreement of the USFWS received in an April 28, 2017 communication, it was agreed that these species will not be affected by the Proposed Action and need not be included in the biological assessment.

North American wolverine

There are no contemporary verified or documented occurrences of the North American wolverine in the southern Sierra Nevada mountain range (Aubry, McKelvey, and Copeland 2007, United States Department of the Interior 2010). In 2008, a male wolverine was photographed at a camera station on the Tahoe NF, approximately 240 miles north of the Inyo NF (Moriarty et al. 2009, CNDDB 2017). Genetic analysis of hair and scat revealed this animal was a male with genetic origin from the western edge of the Rocky Mountain region (Moriarty et al. 2009). This represented the most recent verified detection in California since the last documented occurrence in the 1950's and the prior verified occurrence in 1922 (Aubry, McKelvey, and Copeland 2007). In February and May of 2016, a wolverine was again photographed on the Tahoe NF. This individual is believed to be the same one as photographed in 2008 but genetic results from this new detection have not been reported. The 2007 Aubrey et al. analysis examined records through 2005 and since that time, there are 2 other records of wolverine in the California Natural Diversity Database within the Inyo NF and one record reported within 50 miles of the Inyo NF (CNDDB 2017). None of these records are considered verified or documented occurrences by definitive evidence such as specimens, photographs, hair or other physical evidence using definitions consistent with Aubry et al. (2007).

California condor

There are no contemporary documented occurrences of the California condor on the Inyo NF (CNDDB 2017). The Blue Ridge National Wildlife Refuge, located in the San Joaquin Valley foothills west of the Sequoia NF, is the closest area specifically managed for California condor recovery (United States Department of the Interior 2013a), approximately 20 miles to the west of the southern portion of the Inyo NF. Currently, there is infrequent condor use of the Blue Ridge Refuge, estimated at one to two days a year, if any at all, but the general trend is one of increasing activity and it's expected that use will increase over time as condor populations recover (United States Department of the Interior 2013a). Condor use of the Inyo NF is not expected to occur until more regular use of the Blue Ridge National Wildlife Refuge area occurs in the future. Since the revision of a forest plan is a framework programmatic action, any specific project that could affect California condor, such as wind energy proposals, will require site-specific evaluation and consultation with the USFWS as necessary. There are no foreseeable wind energy proposals on the Inyo NF.

Least Bell's vireo

The least Bell's vireo was formerly widespread and abundant throughout the Central Valley of California and other low-elevation riverine valleys; it also occurred in the Sierra Nevada foothills and the Coast Ranges; the range extended from Red Bluff (Tehama County) to northwestern Baja California, including populations in the Owens Valley, Death Valley, and the Mohave Desert (United States Department of the Interior 1986, 2006b). Now it is essentially extirpated from the Central Valley, although some re-colonization of the San Joaquin Valley may be occurring and there are some territories in the Owens Valley, outside of the Inyo NF (United States Department

of the Interior 2006b). The number of territories has increased to 11 territorial locations, but there is some uncertainty whether these individuals are least Bell's vireo or the more common Arizona Bell's vireo (M., McCaskie, and Unitt 2003). These locations are well outside of the Inyo NF and would not be affected by management within the action area.

Yellow-billed cuckoo, western U.S. DPS

The western U.S. Distinct Population Segment of yellow-billed cuckoo occurs along the Owens River in the vicinity of the Inyo NF (United States Department of the Interior 2014a). No yellow-billed cuckoos are known to occur within the Inyo NF (CNDDB 2017). Proposed critical habitat (Owens River; CA Unit 5) is identified along the Owens River that is owned and managed by the Los Angeles Department of Water and Power and would not be affected by management in the action area (United States Department of the Interior 2014a).

Western snowy plover, Pacific Coast population DPS

The Pacific Coast Distinct Population Segment of western snowy plover (*Charadrius nivosus nivosus*) is defined as "those individuals that nest adjacent to or near tidal waters, and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries" (United States Department of the Interior 1993b). Generally it is considered as the populations within 50 miles of the Pacific Coast. critical habitat has been designated and exists entirely along the Pacific Coast and does not exist within or near the action area (United States Department of the Interior 2012). Four records of snowy plovers are documented between 1978 and 2004 in the California Natural Diversity Database in the vicinity of the Inyo NF, primarily in the Owens Valley (CNDDB 2017). These occurrences are not referenced as part of the Pacific Coast DPS (United States Department of the Interior 1993b) and may be part of the larger inland population of snowy plover (United States Department of the Interior 2012).

Delta smelt and northern California DPS of steelhead

The Delta smelt (*Hypomesus transpacificus*) is associated with waters in the Sacramento-San Joaquin Delta (United States Department of the Interior 1993a) and the northern California Distinct Population Segment of steelhead (*Oncorhynchus mykiss*) is associated with rivers and waters of the Pacific Coast in northern California (United States Department of the Interior 2006a). Other Distinct Population Segments of steelhead occur within the California Central Valley that were not included on the official species list. Neither of these species occur on the Inyo NF which is almost entirely located on the east side of the Sierra Nevada mountain range.

Little Kern golden trout

The Little Kern golden trout occurs within the Little Kern River drainage that is located primarily within the Golden Trout Wilderness on the Sequoia NF, with additional smaller drainage areas on the Sequoia National Park and Sequoia NF (United States Department of the Interior 2011c). This watershed is located just west of the Inyo NF and management within the action area would not affect this watershed.

Owens pupfish

The Owens pupfish occurs in the Owens Valley outside of the Inyo NF. The species is addressed in the Owens Basin Wetland and Aquatic Species Recovery Plan for Inyo and Mono Counties, California (United States Department of the Interior 1998). The recovery plan identifies several conservation areas for the recovery of the Owens pupfish, none of which are on National Forest

System lands. The 5-Year Review for Owens Pupfish (United States Department of the Interior 2009b) does not identify recovery opportunities or threats relevant to the Inyo NF. This species will not be affected by the Inyo NF plan revision preferred alternative.

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Appendix B – Plan Components for At-risk Species

Summary Crosswalk of selected plan components in the existing forest plan to the Proposed Action forest plan. This only includes direction specifically referencing or directly related to federally listed species or at-risk species. Other plan components that would indirectly guide projects and are not focused on federally listed species are not included here. Note that some direction relevant to federally listed species is also found in Appendix C for Aquatic and Riparian Ecosystems.

Forestwide Direction Specific for Federally Listed Species

Existing Forest Plan	Revised Forest Plan	Notes
Inyo, Diversity Goal: The Forest has achieved diversity of plant and animal communities by providing a threshold level of vegetation types and seral stages. **Inyo Wildlife: Threatened, Endangered, and Sensitive Animal Species:** Consider threatened and endangered species as below viability until recovery is achieved. Emphasize the protection and improvement of habitat for threatened or endangered wildlife. Manage for the protection and enhancement of all historically and potentially threatened or endangered species habitat as necessary to meet recovery levels. **Inyo Fish: Threatened and Endangered Fish S&G:** Provide high quality habitat far threatened and endangered fish species based on the results of habitat capability modal analyses.	**SPEC-FW-DC-02:** Habitats for at-risk species support self-sustaining populations within the inherent capabilities of the plan area. Ecological conditions provide habitat conditions that contribute to the survival, recovery, and delisting of species under the Endangered Species Act; preclude the need for listing new species; improve conditions for species of conservation concern including addressing threats (e.g. minimal impacts from disease); and sustain both common and uncommon native species. **SPEC-FW-DC-03:** Land management activities are designed to maintain or enhance self-sustaining populations of at-risk species within the inherent capabilities of the plan area by considering the relationship of threats (including site-specific threats) and activities to species survival and reproduction.	Similar direction. Recognizes the need to contribute to the survival, recovery, and delisting of federally listed species.
Inyo, Threatened, Endangered, or Sensitive Species Goal: The habitats of threatened or endangered animals are protected or improved to assist the recovery of the species in cooperation with state and other federal agencies.	**SPEC-FW-GOAL-03:** Work with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and	Similar direction. Goal 04 expands guidance to communicate and collaborate with others to increase the opportunities to improve conditions. Guideline 03 requires considering habitat

Existing Forest Plan	Revised Forest Plan	Notes
Inyo Wildlife: Threatened, Endangered, and Sensitive Animal Species: Cooperate with the Fish and Wildlife Service and California Department of Fish and Game in the management of threatened and endangered species and the restoration of habitat. Submit proposals for actions that might affect the continued existence of a threatened or endue species to the U.S. Fish and Wildlife Service for formal consultation. **Inyo Fish: Threatened and Endangered Fish S&G:** Rehabilitate and maintain essential habitat for these species according to species' recovery plans and Memoranda of Understanding with the California Department of Fish and Game and the U.S. Fish and Wildlife Service.	implement other recovery actions according to species recovery plans. **SPEC-FW-GOAL-04:** Communicate and collaborate with other agencies, Tribes, landowners, and partners to maximize opportunities to improve conditions in the plan area for at-risk species and the habitats and ecological processes on which they depend for survival. **SPEC-FW-GDL-03:** Habitat management objectives and nonhabitat recovery actions from approved recovery plans should be incorporated, if appropriate, in the design of projects that will occur within federally listed species habitat to contribute to recovery of the species. **SPEC-FW-GDL-04:** Habitat management objectives or goals from approved conservation strategies or agreements should be incorporated, if appropriate, in the design of projects that will occur within at-risk species habitat.	management objectives from approved recovery plans when designing projects. Strengthened to recognize some recovery plan actions will guide activity decisions. Guideline 04 recognizes that some species may have approved conservation strategies or conservation agreements before a recovery plan is approved or that provides more local guidance to implement an approved recovery plan.
Inyo, Threatened, Endangered, or Sensitive Species Goal: The habitats of threatened or endangered animals are protected or improved to assist the recovery of the species in cooperation with state and other federal agencies.	**SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.	Standard 01 requires projects to be designed to avoid, mitigate, or minimize effects to at-risk species and habitat.
Inyo, Protection, Standard and Guideline: Consider both existing conditions and the effect of future management activities in the area surrounding the project area when developing treatment standards for fuels. **Inyo, Protection, Standard and Guideline:** The Forest Service mission in fire management is to use fire as a resource management tool.	**FIRE-FW-DC-01:** Wildland fires burn with a range of intensity, severity and frequency that allow ecosystems to function in a healthy and sustainable manner. Wildland fire is a necessary process, integral to the sustainability of fire-adapted ecosystems (see TERR-FW-DC related to fire). **FIRE-FW-GOAL-01:** Reduce fuel accumulations, help maintain and protect habitat for a variety of species, reduce smoke from larger fires, provide added protection for communities, and restore fire on the	Similar direction. Recognizes the role of fuel reduction in managing fire and the use of fire as a management tool.

Existing Forest Plan	Revised Forest Plan	Notes
	landscape. These actions are also an integral part of achieving sustainable recreation, particularly by maintaining scenic attractiveness, integrity, and character.	
Inyo, Protection, Standard and Guideline: Use Prescriptions and Management Area Direction and fire management action plans when determining the appropriate wildfire suppression strategy.	**PMA for Forestwide Fire:** When determining the appropriate wildfire management strategy, use spatial support tools such as wildfire risk assessments, fire management operating plans, and the current Forest Service decision support system for wildfire management. Locations of special habitats and key habitat areas for at-risk species should be readily available in the current Forest Service decision support system for wildfire management ahead of fire season.	Similar direction. Agency policy is to use a Wildland Fire Decision Support System to evaluate and document management responses to wildfires that escape initial suppression actions. The intent is to include relevant maps of special habitats and key habitat areas so they can be fully considered when evaluating wildfire management response options.

Sierra Nevada Bighorn Sheep

Note: In the existing forest plan mountain sheep refers to all bighorn sheep. In the revised forest plan, the term bighorn sheep is used and also applies to desert bighorn sheep except for SPEC-SHP-STD-02, which is specific to Sierra Nevada bighorn sheep.

Table 21. Crosswalk of Plan Direction - Sierra Nevada bighorn sheep

Existing Forest Plan	Revised Forest Plan	Notes
Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 1: Maintain existing mountain sheep habitat. Where feasible, expand their ranges by transplanting animals to suitable unoccupied habitats as per the criteria stated in the Sierra Nevada Mountain Sheep Recovery Plan. **Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 5:** If reintroduced mountain sheep establish themselves in drainages outside the reintroduction sites, take	**SPEC-SHP-DC-01:** An adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range of mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches. **SPEC-SHP-STD-02:** Manage recreation, or other disturbances, where research has found it to cause	As of 2015, 14 herd units were occupied, meeting the Recovery Plan distribution requirements. The CDFW evaluates and conducts translocations in coordination with the Inyo NF and the USFWS. Desired condition expanded to cover seasonal habitat and life history needs. Standard developed to support recovery action to manage recreation where conflicts are documented to exist for Sierra Nevada bighorn sheep.

Existing Forest Plan	Revised Forest Plan	Notes
advantage of opportunities to extend mountain sheep range, consistent with other resource activities. **Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 7:** Provide for the long-term viability of Sierra Nevada and Nelson mountain sheep populations by promoting reestablishment of these species into suitable habitat within historic range, giving preference to areas with no current livestock use and consistent with other resource activities. **Mountain Sheep Habitat Management Prescription (#3) – Wildlife:** Evaluate potential transplant sites, giving preference to sites that have no current livestock grazing.	Sierra Nevada bighorn sheep to avoid important habitat as described in the Sierra Nevada Bighorn Sheep Recovery Plan or other guidance from the U.S. Fish and Wildlife Service. **SPEC-FW-GOAL-04:** Communicate and collaborate with other agencies, Tribes, landowners, and partners to maximize opportunities to improve conditions in the plan area for at-risk species and the habitats and ecological processes on which they depend for survival. **PMA for Bighorn Sheep:** If reintroduced bighorn sheep establish themselves in drainages outside the reintroduction sites, take advantage of opportunities to extend bighorn sheep range, consistent with other resource activities.	Goal developed to encourage continued collaboration with others to manage species and habitats on the forest. Potential management approach expresses the intent to continue to coordinate with the Service and California Department of Fish and Wildlife to evaluate opportunities to manage populations as they expand or move, including evaluating the risk of disease spread and mitigating risks where feasible.
Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 2: Permit no increase in existing livestock use if the increase is shown to be deleterious to mountain sheep populations as defined in the Recovery Plan. **Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 3:** Maintain the health of established mountain sheep populations. If disease transmission from domestic livestock is shown to be deleterious to mountain sheep populations, find ways to alleviate this problem. **Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 4:** Prohibit the conversion of livestock type from cattle to	**SPEC-SHP-DC-02:** The risk of disease transmission from domestic sheep and goats to bighorn sheep (based upon the best available risk assessment model) is reduced to the maximum extent practicable. **SPEC-SHP-STD-01:** Do not allow domestic sheep or goat grazing or pack goat use adjacent to bighorn sheep populations where relevant bighorn sheep risk assessment models show there is a high risk of contact and spread of disease, unless risks can be adequately mitigated. **SPEC-SHP-GOAL-01:** Coordinate with the California Department of Fish and Wildlife and the U.S. Fish and Wildlife Service to conduct a risk assessment of pack goat use on the Inyo National Forest and develop mitigations strategies to manage the risk of disease transmission, if needed.	Strengthened to require mitigation of high risk of contact using science-based risk assessment models. Goal expresses the intent to coordinate with the State to evaluate the risk of disease contact from recreational pack goat use using a science-based risk assessment and develop mitigation strategies to address any high risks of contact.

Existing Forest Plan	Revised Forest Plan	Notes
sheep on or adjacent to existing or approved reintroduction sites for mountain sheep. **Mountain Sheep Habitat Management Prescription (#3) – Range:** Permit no increase in livestock use if the increase is shown to be deleterious to maintain sheep populations.		
Sierra Nevada mountain sheep and Nelson mountain sheep Standard and Guideline 6: Develop and implement a recovery and conservation plan for Nelson sheep similar to the one devised for Sierra Nevada sheep. Update the Sierra Nevada Mountain Sheep Plan.	**SPEC-FW-GOAL-03:** Work with the California Department of Fish and Wildlife (following the memoranda of understanding), Nevada Department of Wildlife, and U.S. Fish and Wildlife Service to restore and maintain essential habitat for at-risk species and implement other recovery actions according to species recovery plans. **SPEC-FW-GOAL-04:** Communicate and collaborate with other agencies, Tribes, landowners, and partners to maximize opportunities to improve conditions in the plan area for at-risk species and the habitats and ecological processes on which they depend for survival.	The development of a recovery and implementation plan for the Nelson's desert bighorn sheep is dependent upon coordination and collaboration with the California Department of Fish and Wildlife, other agencies, non-governmental organizations, and the public and is covered by two plan goals. The goals are not species-specific to allow them to apply to other at-risk species as they are identified in the future.
Designated Wilderness (#1, #2), Wildlife: Manage mountain sheep habitat to maintain and/or enhance carrying capacity. Relocate existing or construct new recreation trails only in areas where the trails will rot cause significant adverse effects upon the use by mountain sheep of their habitat. Identify and provide for this sensitivity in the appropriate wilderness management plan. **Mountain Sheep Habitat Management Prescription (#3) - Facilities:** Locate trails and manage their use so they do not	**DA-WILD-DC-08:** Forest system trails that access wilderness are part of a high-quality wilderness experience for visitors. Forest system trails meet national quality standards, with minimal deferred maintenance and adhere to the national trail classification system. Trails in wilderness are located in resilient areas, and do not cause adverse impacts to at-risk species, water quality, soils, hydrologic connectivity, or cultural resources. **DA-WILD-DC-10:** Resource impacts of user-created trails are reduced. **SPEC-SHP-STD-02:** Manage recreation, or other disturbances, where research has found it to cause	Maintain direction to mitigate or avoid recreation impacts. Standard expanded beyond just recreation and made specific to Sierra Nevada bighorn sheep. Uses the disturbance study approach identified in the Recovery Plan to determine the extent of disturbance and inform mitigations that would be implemented site-specifically.

Existing Forest Plan	Revised Forest Plan	Notes
conflict with maintain sheep habitat. Establish no roads or heliports where they would conflict with mountain sheep. **Mountain Sheep Habitat Management Prescription (#3) – Recreation:** Resolve conflicts between mountain sheep and hang gliding in favor of mountain sheep. **Designated Wilderness (#1), Wilderness:** Redirect or restrict use where necessary to restore impaired wilderness resources.	Sierra Nevada bighorn sheep to avoid important habitat as described in the Sierra Nevada Bighorn Sheep Recovery Plan or other guidance from the U.S. Fish and Wildlife Service.	
Mountain Sheep Habitat Management Prescription (#3) – Minerals: Commensurate with the sensitivity of Mountain sheep on their wintering grounds, work with claimants and mineral operators to limit mineral exploration and development activities- within mountain sheep winter range during the period when the animals are using the winter range.	**SPEC-SHP-DC-01:** An adequate amount of suitable habitat supports persistent populations of bighorn sheep. These habitat patches include unforested openings supporting productive plant communities with a variety of forage species in and near adequate steep rocky escape terrain throughout the elevational range of mountain ranges. These areas meet different seasonal needs for each sex for feeding, night beds, birthing sites, lamb rearing, and migration routes between suitable habitat patches. **SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species. **GEO-FW-DC-01:** Mineral resources on National Forest System lands provide for public benefit, while minimizing adverse environmental effects on other national forest resources from mineral exploration, development, and extraction.	Addressed by Geology and Minerals desired condition. Would be site-specifically evaluated to determine if adverse effects may occur from site-specific proposed actions. Measure of effect would be compared to the bighorn sheep desired condition.

Lahontan Cutthroat Trout

Existing Forest Plan	Revised Forest Plan	Notes
Fish – Threatened and Endangered Fish 3: Manage all stream reaches of essential habitat as depicted in the Recovery Plan to the following guidelines in consultation with the U.S. Fish and Wildlife Service. 1. Do not allow any activity that results in more than 10 percent degradation of the habitat within any given stream reach; this conclusion must be supported by data that results from the use of a quantitative methodology survey such as GAWS, COWFISH, etc. 2. Restore unstable or eroding streambanks to attain a streambank system that is no more than 10 percent unstable at any given time. 3. Retain vegetation adjacent to perennial streams that affords stream shading and streambank stability.	**SPEC-LCT-STD-01:** In stream reaches occupied by or identified as essential habitat in the recovery plan for the Lahontan cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or essential habitat stream reach. Take corrective action where streambank disturbance limits have been exceeded. **MA-RCA-GDL-06:** Unstable or eroding streambanks should be restored to attain a streambank system that is no more than 10 percent unstable of the reach's current potential. **MA-RCA-DC-04:** Native fish, amphibians, and other native aquatic species are present within their historic distribution and have adjusted for climate change. Habitat conditions support self-sustaining populations, except where distributions are altered by areas managed for desirable nonnative fish species. Streams and rivers provide a variety of habitats for aquatic species, including deep pools and overhanging banks, structure provided by large wood, off-channel areas and cover within their natural range of variation. Woody and herbaceous overstory and understory regulate stream temperatures. Aquatic and upland components are linked, providing access to food, water, cover, nesting areas, and protected pathways for aquatic, riparian, and upland species. **SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.	Similar Direction.
Fish – Threatened and Endangered Fish 4: Prohibit stream-modifying construction activities within or immediately adjacent to the aquatic zone during the following spawning seasons:	**MA-RCA-GDL-07:** To prevent impacts to spawning habitat, stream-modifying construction activities within or immediately adjacent to the aquatic zone should be	No Change

Existing Forest Plan	Revised Forest Plan	Notes
1. in streams with spring spawning species (rainbow, cutthroat, and golden trout), February 15-August 20; 2. in streams with fall spawning species (brown and brook trout), October 1-April 15. Exceptions to (1) and (2) above must be approved by the Forest Supervisor.	prohibited during the following spawning seasons: a. In streams with spring spawning species (rainbow, cutthroat, and golden trout), February 15 to August 20. b. In streams with fall spawning species (brown and brook trout), October 1 to April 15. The Forest Supervisor has the authority to make exceptions to these seasons.	

Paiute Cutthroat Trout

Existing Forest Plan	Revised Forest Plan	Notes
Fish – Threatened and Endangered Fish 3: Manage all stream reaches of essential habitat as depicted in the Recovery Plan to the following guidelines in consultation with the U.S. Fish and Wildlife Service. 1. Do not allow any activity that results in more than 10 percent degradation of the habitat within any given stream reach; this conclusion must be sued by data that results from the use of a quantitative methodology survey such as GANS, COWFISH, etc. 2. Restore unstable or eroding streambanks to attain a streambank system that is no more than 10 percent unstable at any given time. 3. Retain vegetation adjacent to perennial streams that affords stream shading and streambank stability.	**SPEC-PCTR-STD-01:** In stream reaches occupied by or identified as essential habitat in the recovery plan for the Paiute cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or "essential habitat" stream reach. Take corrective action where streambank disturbance limits have been exceeded. **MA-RCA-GDL-06:** Unstable or eroding streambanks should be restored to attain a streambank system that is no more than 10 percent unstable of the reach's current potential. **MA-RCA-DC-04:** Native fish, amphibians, and other native aquatic species are present within their historic distribution and have adjusted for climate change. Habitat conditions support self-sustaining populations, except where distributions are altered by areas managed for desirable nonnative fish species. Streams and rivers provide a variety of habitats for aquatic species, including deep pools and overhanging banks, structure provided by large wood, off-channel areas and cover within their natural range of variation. Woody and herbaceous overstory and understory regulate stream temperatures. Aquatic and upland	Similar Direction

Existing Forest Plan	Revised Forest Plan	Notes
	components are linked, providing access to food, water, cover, nesting areas, and protected pathways for aquatic, riparian, and upland species. **SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species.	
Fish – Threatened and Endangered Fish 4: Prohibit stream-modifying construction activities within or immediately adjacent to the aquatic zone during the following spawning seasons: 1. in streams with spring spawning species (rainbow, cutthroat, and golden trout), February 15-August 20; 2. in streams with fall spawning species (brown and brook trout), October 1-April 15. Exceptions to (1) and (2) above must be approved by the Forest Supervisor.	**MA-RCA-GDL-07:** To prevent impacts to spawning habitat, stream-modifying construction activities within or immediately adjacent to the aquatic zone should be prohibited during the following spawning seasons: c. In streams with spring spawning species (rainbow, cutthroat, and golden trout), February 15 to August 20. d. In streams with fall spawning species (brown and brook trout), October 1 to April 15. The Forest Supervisor has the authority to make exceptions to these seasons.	No Change

Yosemite Toad and Mountain Yellow-legged Frogs

Existing Forest Plan	Revised Forest Plan	Notes
SNFPA-98: Within 500 feet of known occupied sites for the California red-legged frog, Cascades frog, Yosemite toad, foothill yellow-legged frog, mountain yellow-legged frog, and northern leopard frog, design pesticide applications to avoid adverse effects to individuals and their habitats.	**SPEC-AMPH-STD-01:** Where pesticide applications are proposed within 500 feet of known occupied sites for Yosemite toad, Sierra Nevada yellow-legged frog, and Mountain yellow-legged frog, design applications to avoid adverse effects to individuals and their habitats.	Similar, removes species that do not occur on the Inyo NF from the list.

Whitebark Pine

Existing Forest Plan	Revised Forest Plan	Notes
NONE	**SPEC-FW-GOAL-05:** Develop a regional whitebark pine conservation	Intent to develop a collaborative strategy which

Existing Forest Plan	Revised Forest Plan	Notes
	and restoration strategy in collaboration with other Federal agencies, research organizations, and other partners. **SPEC-FW-GDL-04:** Habitat management objectives or goals from approved conservation strategies or agreements should be incorporated, if appropriate, in the design of projects that will occur within at-risk species habitat.	can then be integrated into project design.

Appendix C – Plan Components for Aquatic and Riparian Ecosystems

Aquatic and Riparian Ecosystems

SPEC-FW-GDL-07: Water developments (such as a diversion or well) should be avoided near streams or seeps and springs where there is high risk of dewatering aquatic and riparian habitats where at-risk species occur.

WTR-FW-GDL-02: Minimize the effects of stream diversions or other flow modifications on at-risk species as well as other beneficial uses during relicensing; planning for state and other authorized water use; and water rights. Determine and recommend in-stream flow requirements and habitat conditions that maintain, enhance, or restore all life stages of native aquatic species and that maintain or restore riparian resources, channel integrity and aquatic passage.

RCA-MEAD-OBJ-01: Maintain, enhance, or improve conditions on 5 to 10 meadows of any size, within 10 years following plan approval.

RCA-RIV-OBJ-01: Maintain or restore structure, composition, or function of habitat for fisheries and other aquatic species along 10 to 20 stream miles over a 10 year period.

RCA-RIV-OBJ-02: Eliminate or mitigate one priority barrier to aquatic organism passage or ecological connectivity within ten years following plan approval.

Existing Forest Plan	Revised Forest Plan	Notes
SNFPA CAR Designation: Critical aquatic refuges (CARs) are subwatersheds, generally ranging between 10,000 to 40,000 acres, with some as small 500 acres and some as large as 100,000 acres, that contain either: • known locations of threatened, endangered, or sensitive species, • highly vulnerable populations of native plant or animal species, or • localized populations of rare native aquatic- or riparian-dependent plant or animal species. Critical aquatic refuges are shown on maps in Volume 4, Appendix I of the SNFPA FEIS (January 2001), beginning on page I-53. The boundaries of CARs may be refined during landscape analysis based on the findings from conservation	**NONE**	Critical Aquatic Refuges are not continued. Conservation Watersheds are similar but are not a direct replacement.

Existing Forest Plan	Revised Forest Plan	Notes
assessments or verification of the presence and condition of habitat for threatened, endangered, and sensitive species. Additional CARs may be added by individual national forests. **SNFPA CAR DC:** Critical aquatic refuges provide habitat for native fish, amphibian and aquatic invertebrate populations. Remnant plant and animal populations in aquatic communities are maintained and restored. **SNFPA CAR DC:** Streams in meadows, lower elevation grasslands, and hardwood ecosystems have vegetation and channel bank conditions that approach historic potential. **SNFPA CAR DC:** Water quality meets State stream standards		
NONE	**MA-CW-DC-01:** Conservation watersheds provide high-quality habitat and functionally intact ecosystems that contribute to the persistence of species of conservation concern and the recovery of threatened, endangered, proposed, or candidate species. **MA-CW-DC-02:** Conservation watersheds exhibit long-term (multiple planning cycles) high watershed integrity and have aquatic, riparian, and terrestrial ecosystems resilient to stochastic disturbance events such as wildfires, floods, and landslides. **MA-CW-DC-03:** The drainage connections between floodplains, wetlands, upland slopes, headwaters, and tributaries are intact and provide for breeding, dispersal, overwintering, and feeding habitats for at-risk species. These areas provide refugia if other areas of the watershed are disturbed by events such as floods, landslides, and fires.	Conservation Watersheds are designed to identify a set of watersheds that: 1) provide high quality water and beneficial uses; 2) have a high diversity of species and habitats; 3) are adjacent to other protected areas; and 4) is large (at least HUC 12 or larger). Local knowledge of areas by the public and Forest Service staff refined the final boundaries. Four Conservation Watersheds are identified: 1) Mono Lake Headwaters; 2) Middle Fork San Joaquin Headwaters; 3) Cottonwood-Crooked Creek Headwaters; 4) South Fork Kern River Headwaters
NONE	**MA-CW-STD-01:** Site-specific activities occurring in the Destination or General Recreation Areas will promote the maintenance or	Direction recognizes that some site-specific activities may have localized effects to Watershed Condition

Existing Forest Plan	Revised Forest Plan	Notes
	restoration of Watershed Condition Framework indicators, which are attained at the watershed scale. **MA-CW-GDL-01:** Accept adverse effects from project activities when they are short-term, site-specific, and support the long-term functionality of aquatic, riparian, and terrestrial systems. **MA-CW-GDL-02:** Design project activities in conservation watersheds to attain functional Watershed Condition Framework indicators.	Framework indicators but must still maintain or restore indicators at the watershed scale.
NONE	**MA-CW-GDL-03:** When building new roads within conservation watersheds, avoid or minimize increases in sediment production; increases in water capture; and loss of stream connectivity unless these actions increase the benefit of ecological function in aquatic ecosystems.	Provides specific direction for new road construction within Conservation Watersheds.
NONE	**MA-CW-PMA:** Within conservation watersheds, restoration projects and actions are given a high priority for implementation and monitoring. **MA-CW-PMA:** Consider Watershed Condition Framework indicators when developing restoration activities within conservation watersheds.	Direction provides priority and focus for restoration projects and actions within Conservation Watersheds.
SNFPA RCA Designation: Riparian conservation area (RCA) widths are described below. RCA widths shown below may be adjusted at the project level if a landscape analysis has been completed and a site-specific RCO analysis demonstrates a need for different widths. • Perennial Streams: 300 feet on each side of the stream, measured from the bank full edge of the stream • Seasonally Flowing Streams (includes intermittent and ephemeral streams): 150 feet on each side of the stream, measured from the bank full edge of the stream • Streams in Inner Gorge[1]: top of inner gorge	**MA-RCA:** Riparian conservation area widths are defined by type: • perennial streams, 300 feet on each side of the stream, measured from the bankfull edge of the stream; • seasonally flowing streams (includes intermittent and ephemeral streams), 150 feet on each side of the stream, measured from the bankfull edge of the stream; • streams in inner gorge (defined by stream adjacent slopes greater than 70 percent gradient), top of inner gorge; • special aquatic features (including lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs) or perennial streams with riparian conditions	Essentially SAME, replace RCO analysis with interdisciplinary analysis.

Existing Forest Plan	Revised Forest Plan	Notes
• Special Aquatic Features[2] or Perennial Streams with Riparian Conditions extending more than 150 feet from edge of streambank or Seasonally Flowing streams with riparian conditions extending more than 50 feet from edge of streambank: 300 feet from edge of feature or riparian vegetation, whichever width is greater • Other hydrological or topographic depressions without a defined channel: RCA width and protection measures determined through project level analysis. [1]. Inner gorge is defined by stream adjacent slopes greater than 70 percent gradient [2]. Special Aquatic Features include: lakes, wet meadows, bogs, fens, wetlands, vernal pools, and springs **SNFPA 91:** Designate riparian conservation area (RCA) widths as described in Part B of this appendix. The RCA widths displayed in Part B may be adjusted at the project level if a landscape analysis has been completed and a site-specific RCO analysis demonstrates a need for different widths.	extending more than 150 feet from edge of streambank or seasonally flowing streams with riparian conditions extending more than 50 feet from edge of streambank, 300 feet from edge of feature or riparian vegetation, whichever width is greater; and • other hydrological or topographic depressions without a defined channel, riparian conservation area width, and protection measures determined through project-level analysis. Riparian conservation area widths may be adjusted at the project level if interdisciplinary analysis demonstrates a need for different widths to meet or improve riparian conservation area desired conditions.	
SNFPA RCA DC (1): Water quality meets the goals of the Clean Water Act and Safe Drinking Water Act; it is fishable, swimmable, and suitable for drinking after normal treatment.	**WTR-FW-DC-02:** Water quality supports State-designated beneficial uses of water. Water quality is sustained at a level that retains the biological, physical, and chemical integrity of aquatic systems and benefits the survival, growth, reproduction and migration of native aquatic and riparian species.	Essentially SAME
SNFPA RCA DC (2): Habitat supports viable populations of native and desired non-native plant, invertebrate, and vertebrate riparian and aquatic-dependent species. New introductions of invasive species	**MA-RCA-DC-02:** Riparian conservation areas have ecological conditions that contribute to the recovery of threatened and endangered species and support persistence of species of conservation concern as well as native and desired	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
are prevented. Where invasive species are adversely affecting the viability of native species, the appropriate State and Federal wildlife agencies have reduced impacts to native populations.	nonnative aquatic and riparian-dependent plant and animal species. **MA-RCA-DC-04:** Native fish, amphibians, and other native aquatic species are present within their historic distribution and have adjusted for climate change. Habitat conditions support self-sustaining populations, except where distributions are altered by areas managed for desirable nonnative fish species. Streams and rivers provide a variety of habitats for aquatic species, including deep pools and overhanging banks, structure provided by large wood, off-channel areas and cover within their natural range of variation. Woody and herbaceous overstory and understory regulate stream temperatures. Aquatic and upland components are linked, providing access to food, water, cover, nesting areas, and protected pathways for aquatic, riparian, and upland species. **RCA-LPP-DC-01:** Lakes and ponds retain necessary attributes, such as adequate vegetation and large woody debris to function properly and support native biotic communities. Attributes include floodwater retention and groundwater recharge, stabilized islands and shoreline features, and diverse characteristics to provide for amphibian production, waterfowl breeding, and biodiversity. **MA-RCA-GOAL-02:** Where invasive species are adversely affecting the persistence of native species, work with the appropriate State and Federal wildlife agencies work to reduce impacts of invasive species to native populations. **INV-FW-DC-01:** Terrestrial and aquatic invasive species are controlled or eradicated when possible, and establishment of new populations is prevented. **INV-FW-DC-02:** The area affected by invasive species and introduction of new invasive species is minimized.	
SNFPA RCA DC (3): Species composition and structural diversity of plant and animal	**MA-RCA-DC-05:** Riparian areas provide a range of substrates to sustain habitat for a variety of aquatic	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
communities in riparian areas, wetlands, and meadows provide desired habitat conditions and ecological functions.	and terrestrial fauna within their natural capacity of the system. **MA-RCA-DC-08:** The condition of riparian vegetation, including riparian species composition, stand density, and fuel loading, is consistent with healthy riparian systems and reduces risks from high-intensity wildfire in the watershed. **RCA-MEAD-DC-02:** Wetlands and groundwater-dependent ecosystems (including springs, seeps, fens, wet meadows, and associated wetlands or riparian systems) support stable herbaceous and woody vegetation communities that are resilient to drought, climate change, and other stressors. Root masses stabilize stream channels, shorelines, and soil surfaces. The natural hydrologic, hydraulic, and geomorphic processes in these ecosystems sustain their unique functions and biological diversity.	
SNFPA RCA DC (4): The distribution and health of biotic communities in special aquatic habitats (such as springs, seeps, vernal pools, fens, bogs, and marshes) perpetuates their unique functions and biological diversity.	**MA-RCA-DC-03:** The distribution and health of biotic communities in special aquatic habitats perpetuates their unique functions and biological diversity. **MA-RCA-DC-07:** Key riparian processes and conditions (including slope stability and associated vegetation root strength, wood delivery to streams and floodplains, input of leaf and organic matter to aquatic and terrestrial systems, solar shading, microclimate, and water quality) operate consistently with local disturbance regimes. **MA-RCA-DC-09:** Riparian areas in frequent fire landscapes (such as montane areas) have low- to moderate-severity fire restored as an ecological process. Fire effects occur in a mosaic and support restoration and ecological integrity and function of composition, structure, and ecological resilience. **RCA-MEAD-DC-08:** Fen condition is within the natural range of variation. Fens are resilient with continual peat accumulation and carbon sequestration. The hydrologic regime, and vegetation, soil, and	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
	water characteristics sustain the fen's ability to support unique physical and biological attributes. **RCA-SPR-DC-01:** Springs provide sufficient water to maintain healthy habitats for native riparian and aquatic species. **RCA-SPR-DC-02:** Springs are resilient to natural disturbances, groundwater diversions, and changing climate conditions. Springs function across the landscape within their type and water availability. **RCA-SPR-DC-03:** Springs and associated streams and wetlands have the necessary soil, water, and vegetation attributes to be healthy and functioning at or near potential. Water flow is similar to historic levels and persists over time, within constraints of climate change.	
SNFPA RCA DC (5): Spatial and temporal connectivity for riparian and aquatic-dependent species within and between watersheds provides physically, chemically and biologically unobstructed movement for their survival, migration and reproduction.	**RCA-RIV-DC-02:** Stream ecosystems, including ephemeral watercourses, exhibit full connectivity where feasible to maintain aquatic species diversity, except where barriers are maintained in good condition to protect native aquatic species. Ephemeral watercourses provide for dispersal, access to new habitats, perpetuation of genetic diversity, and nesting and foraging habitat for riparian and aquatic species. **RCA-MEAD-DC-03:** Meadows are resilient and recover rapidly from natural and human disturbances. They exhibit a high degree of hydrologic connectivity laterally across the floodplain and vertically between surface and subsurface flows. They provide important ecosystem services such as high-quality water, recharge of streams and aquifers, and moderation of climate variability and change. **MA-RCA-GDL-01:** 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	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
	where necessary to restore connectivity.	
SNFPA RCA DC (6): The connections of floodplains, channels, and water tables distribute flood flows and sustain diverse habitats.	**MA-RCA-DC-01:** The connections of floodplains, channels, and water tables distribute flood flows and sustain diverse habitats. **RCA-RIV-DC-04:** Streams and rivers maintain seasonal water flow over time, including periodic flooding, which promotes natural movement of water, sediment, nutrients, and woody debris. Flooding creates a mix of stream substrates for fish habitat, including clean gravels for fish spawning, large wood structures, and sites for riparian vegetation to germinate and establish.	Essentially SAME
SNFPA RCA DC (7): Soils with favorable infiltration characteristics and diverse vegetative cover absorb and filter precipitation and sustain favorable conditions of stream flows.	**MA-RCA-DC-06:** Soil structure and function is sustained to infiltrate and disperse water properly, withstand erosive forces, sustain favorable conditions of stream flow, and cycle nutrients. Associated water tables support riparian vegetation and restrict nonriparian vegetation. **RCA-MEAD-DC-04:** Soils in wet and headwater meadows are influenced by a shallow water table and function to filter water. These soils also store and release water over an extended period of time, which helps to maintain streamflow during dry summer months.	Essentially SAME
SNFPA RCA DC (8): In-stream flows are sufficient to sustain desired conditions of riparian, aquatic, wetland, and meadow habitats and keep sediment regimes as close as possible to those with which aquatic and riparian biota evolved. The physical structure and condition of stream banks and shorelines minimizes erosion and sustains desired habitat diversity.	**SPEC-FW-GDL-05:** Water developments (such as a diversion or well) should be avoided near streams, seeps, and springs where there is high risk of dewatering aquatic and riparian habitats where at-risk species occur. **RCA-RIV-DC-03:** Instream flows are sufficient to sustain desired conditions of riparian, aquatic, wetland, and meadow habitats and retain patterns of sediment, nutrients, and wood routing as close as possible to those with which aquatic and riparian biota evolved. The physical structure and condition of streambanks and shorelines minimize erosion and sustain desired habitat diversity. **RCA-RIV-DC-05:** Stream channel conditions exhibit a sediment regime	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
	under which aquatic and riparian ecosystems evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport. The sediment regime should be similar to the natural distribution of reference conditions. **WTR-FW-DC-01:** Adequate quantity and timing of water flows support ecological structure and functions, including aquatic species diversity and riparian vegetation. Watersheds are resilient to changes in air temperatures, snowpack, timing of runoff, and other effects of climate change.	
SNFPA RCA DC (9): The ecological status of meadow vegetation is late seral (50 percent or more of the relative cover of the herbaceous layer is late seral with high similarity to the potential natural community). A diversity of age classes of hardwood shrubs is present and regeneration is occurring.	**RCA-MEAD-DC-05:** Meadows have substantive ground cover and a rich and diverse species composition, especially of grasses and forbs. Meadows have high plant functional diversity with multiple successional functional types represented. Perennial streams in meadows contain a diversity of age classes of shrubs along the streambank, where the potential exists for these plants. **RCA-MEAD-DC-06:** A complexity of meadow habitat types and successional patterns support native plant and animal communities. Meadow species composition is predominantly native, where graminoid (grass-like) species are well represented and vigorous, and regeneration occurs naturally. Healthy stands of willow, alder, and aspen are present within and adjacent to meadows with suitable physical conditions for these species. Natural disturbances and management activities are sufficient to maintain desired vegetation structure, species diversity, and nutrient cycling.	Functionally similar. Specific percentage of late seral condition removed to recognize variability of meadow vegetation and inherent capabilities of different meadows. Utilization standards set based upon vegetation types and similarity to desired vegetation conditions, adjusted for trend and hydrologic function.
SNFPA RCA DC (10): Meadows are hydrologically functional. Sites of accelerated erosion, such as gullies and headcuts are stabilized or recovering. Vegetation roots occur throughout the available soil profile. Meadows with perennial and intermittent	**RCA-MEAD-DC-01:** Meadows are hydrologically functional. Sites of accelerated erosion, such as gullies and headcuts are stabilized, recovering, or within the natural range of variation. Vegetation roots occur throughout the available soil profile. Meadows with perennial and intermittent streams have the	SAME

Existing Forest Plan	Revised Forest Plan	Notes
streams have the following characteristics: (1) stream energy from high flows is dissipated, reducing erosion and improving water quality, (2) streams filter sediment and capture bedload, aiding floodplain development, (3) meadow conditions enhance floodwater retention and groundwater recharge, and (4) root masses stabilize stream banks against cutting action.	following characteristics: (1) stream energy from high flows is dissipated, reducing erosion and improving water quality; (2) streams filter sediment and capture bedload, aiding floodplain development; (3) meadow conditions enhance floodwater retention and groundwater recharge; and (4) root masses stabilize streambanks against cutting action.	
SNFPA 92: Evaluate new proposed management activities within CARs and RCAs during environmental analysis to determine consistency with the riparian conservation objectives at the project level and the AMS goals for the landscape. Ensure that appropriate mitigation measures are enacted to (1) minimize the risk of activity-related sediment entering aquatic systems and (2) minimize impacts to habitat for aquatic- or riparian-dependent plant and animal species.	**WTR-FW-STD-01:** Use best management practices as described in agency technical guides and handbooks to mitigate adverse impacts to soil and water resources during the planning and implementation of forest management activities. **MA-RCA-STD-15:** Designate equipment exclusion zones within riparian conservation areas when designing projects. The default is half of the riparian conservation area width (150 feet for perennial streams, 75 feet for intermittent streams): a. These widths may be adjusted on a project-by-project basis based on geomorphology, slope, or soil conditions, as long as best management practices and other plan direction are met. Adjustments may be made only after consultation with experts in aquatic ecology, soils, and/or hydrology. b. If further mechanical incursion is warranted, use methods that limit soil disturbance within the riparian conservation area, such as low ground pressure equipment, helicopters, over-the-snow logging, extra ground cover requirements, or other soil protective actions to achieve desired conditions consistent with best management practices and other plan direction. c. When vegetation is treated in the near stream area, meet the needs for coarse wood in stream channels where possible.	Essentially SAME

Existing Forest Plan	Revised Forest Plan	Notes
SNFPA 93: Identify existing uses and activities in CARs and RCAs during landscape analysis. At the time of permit reissuance, evaluate and consider actions needed for consistency with RCOs.	**NONE**	Projects must be evaluated to determine if they are consistent with the forest plan, including direction for watersheds, riparian conservation areas, conservation watersheds, and other areas.
SNFPA 94: As part of project-level analysis, conduct peer reviews for projects that propose ground-disturbing activities in more than 25 percent of the RCA or more than 15 percent of a CAR.	**WTR-FW-STD-02:** Restoration projects will not result in long-term degradation of aquatic and riparian conditions, including connectivity, at the watershed or subwatershed scale. Adverse effects from project activities are acceptable when they are short-term, site-scale, and support or do not diminish long-term recovery of aquatic and riparian resources.	Removes direction for peer review and replaces with direction to avoid long-term degradation while accepting some short-term adverse effects.
SNFPA 95: For waters designated as "Water Quality Limited" (Clean Water Act Section 303(d)), participate in the development of Total Maximum Daily Loads (TMDLs) and TMDL Implementation Plans. Execute applicable elements of completed TMDL Implementation Plans.	**NONE**	Removed because addressed by agency policy.
SNFPA 96: Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.	**MA-RCA-STD-01:** Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.	SAME
SNFPA 97: Limit pesticide applications to cases where project level analysis indicates that pesticide applications are consistent with riparian conservation objectives.	**MA-RCA-STD-02:** Limit pesticide applications to cases where project-level analysis indicates that pesticide applications are consistent with riparian conservation area desired conditions.	SAME
SNFPA-98: Within 500 feet of known occupied sites for the California red-legged frog, Cascades frog, Yosemite toad, foothill yellow-legged frog, mountain yellow-legged frog, and northern leopard frog, design pesticide applications to avoid adverse effects to individuals and their habitats.	**SPEC-AMPH-STD-01:** Where pesticide applications are proposed within 500 feet of known occupied sites for Yosemite toad, Sierra Nevada yellow-legged frog, and Mountain yellow-legged frog, design applications to avoid adverse effects to individuals and their habitats.	Only includes species that are known to occur on the Inyo NF.
SNFPA 99: Prohibit storage of fuels and other toxic materials	**MA-RCA-STD-03:** Prohibit storage of fuels and other toxic materials	Remove reference to CARs. Requirement for spill plans

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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 are no other alternatives. Ensure that spill plans are reviewed and up-to-date.	except at designated administrative sites and sites covered by special use authorization. Prohibit refueling within riparian conservation areas except when there are no other alternatives.	addressed by agency policy and Best Management Practices
SNFPA 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.	**MA-RCA-GDL-01:** 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.	SAME
SNFPA 101: 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 to in 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.	**MA-RCA-STD-04:** Ensure that culverts or other stream crossings do not create barriers to upstream or downstream passage for aquatic-dependent species, except where desired to protect native species. **MA-RCA-STD-05:** All new or replaced permanent stream crossings shall accommodate at least the 100-year flood, its bedload, and debris. Estimates for 100-year flood potential will reflect the best available science regarding potential effects of climate change. **MA-RCA-STD-06:** Locate water drafting sites to minimize adverse effects to instream flows and depletion of pool habitat.	Essentially SAME. Specifies that stream crossings should consider at least the 100-year flood potential.
SNFPA 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 long-term restoration actions and implement them	**WTR-FW-STD-02:** Restoration projects will not result in long-term degradation of aquatic and riparian conditions, including connectivity, at the watershed or subwatershed scale. Adverse effects from project activities are acceptable when they are short-term, site-scale, and support or do not diminish long-term recovery of aquatic and riparian resources. **Potential Management Approach for RCAs:** When conducting proper functioning condition assessments, if information is available to show the	Functionally Similar. Projects must be designed to move towards and not preclude attaining relevant Forest Plan desired conditions.

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according to their status among other restoration needs.	historic potential of an area and the current potential is different from that historical potential, consider restoration measures that would be necessary to attain the historical potential. **Potential Management Approach for RCAs:** Determine if stream characteristics are within the range of natural variation; if characteristics are outside the range of natural variation, restoration should be considered.	
SNFPA 103: Prevent disturbance to streambanks and natural lake and pond shorelines caused by resource activities (for example, livestock, off-highway vehicles, and dispersed recreation) from exceeding 20 percent of 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 and designated off-highway vehicle routes.	**MA-RCA-STD-07:** Prevent disturbance to streambanks and shorelines of lakes and ponds (caused by resource management activities, or factors such as off-highway vehicles or dispersed recreation) from exceeding 20 percent of 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 may not be met within Destination Recreation Management Areas, sites authorized under special use permits, and designated off-highway vehicle routes, but activities will be designed and managed to reduce the percent of impact to the extent feasible. **RANG-FW-STD-07:** Within riparian conservation areas that are properly functioning or functional at risk with an upward trend, limit annual livestock disturbance to streambanks and shorelines of natural lakes and ponds (caused by trampling and trailing) from exceeding 20 percent of the stream reach, or natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. Allow no more than 15 to 20 percent disturbance if the riparian conservation area is functional at risk with a downward trend, as defined in the appropriate technical reports.	Essentially SAME
SNFPA 104: In stream reaches occupied by, or identified as "essential habitat" in the conservation assessment for, the Lahonton and Paiute cutthroat	**SPEC-LCT-STD-01:** In stream reaches occupied by or identified as essential habitat in the recovery plan for the Lahontan cutthroat trout, limit streambank disturbance from	Essentially SAME

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trout and 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 record of decision.) 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.	livestock to 10 percent of the occupied or essential habitat stream reach. Take corrective action where streambank disturbance limits have been exceeded. **SPEC-PCTR-STD-01:** In stream reaches occupied by or identified as essential habitat in the recovery plan for the Paiute cutthroat trout, limit streambank disturbance from livestock to 10 percent of the occupied or "essential habitat" stream reach. Take corrective action where streambank disturbance limits have been exceeded. **MA-RCA-GOAL-01:** Coordinate and collaborate with the State fish and wildlife agencies to address native aquatic species issues, including evaluating management and monitoring needs to address aquatic species requirements across ownership boundaries.	
SNFPA 105: 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.	**MA-RCA-DC-04:** Native fish, amphibians, and other native aquatic species are present within their historic distribution and have adjusted for climate change. Habitat conditions support self-sustaining populations, except where distributions are altered by areas managed for desirable nonnative fish species. Streams and rivers provide a variety of habitats for aquatic species, including deep pools and overhanging banks, structure provided by large wood, off-channel areas and cover within their natural range of variation. Woody and herbaceous overstory and understory regulate stream temperatures. Aquatic and upland components are linked, providing access to food, water, cover, nesting areas, and protected pathways for aquatic, riparian, and upland species. **RCA-RIV-DC-01:** Stream ecosystems, riparian corridors, and associated stream courses sustain ecosystem structure; are resilient to natural disturbances (such as flooding) and climate change; promote the natural movement of water, sediment and woody debris;	The need for riparian vegetation restoration projects will be informed by Priority Watersheds, Conservation Watersheds, and during site-specific project planning. Projects would be considered to move towards Forest Plan desired conditions.

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	and provide habitat for native aquatic species or desirable nonnative species.	
SNFPA 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.	**WTR-FW-GOAL-01:** Collaborate with Tribes; local, State, and Federal agencies; adjacent landowners; and other interested parties on watershed restoration across ownership boundaries. **MA-RCA-GOAL-01:** Coordinate and collaborate with the State fish and wildlife agencies to address native aquatic species issues, including evaluating management and monitoring needs to address aquatic species requirements across ownership boundaries. **WTR-FW-STD-03:** For exempt hydroelectric facilities on National Forest System 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.	Functionally SAME. The Forest Service has authority to recommend instream flows for hydroelectric projects during the licensing process.
SNFPA 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.	**WTR-FW-STD-03:** For exempt hydroelectric facilities on National Forest System 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.	SAME
SNFPA 108: Determine if the level of coarse large woody debris (CWD) 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 proposed management activities move conditions toward the range of natural variability.	**RCA-RIV-DC-06:** Within rivers and streams, the level of coarse large woody debris is within the natural range of variation.	Essentially SAME. By definition, projects should be designed to move towards or not preclude attainment of relevant Forest Plan desired conditions.
SNFPA 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	**FIRE-FW-GDL-04:** When managing wildland fire, allow fire to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function.	Although Critical Aquatic Refuges are not managed in the Proposed Action, similar direction applies for the use of prescribed burning in essential habitats.

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extent of prescribed fire. Avoid direct lighting within riparian vegetation; prescribed fires may back into riparian vegetation areas. Develop mitigation measures to avoid impacts to these species whenever ground-disturbing equipment is used.	**SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species. **FIRE-FW-GDL-08:** During wildfires, avoid fire management activities in special habitats (see Terrestrial section, chapter 2) except when necessary to protect life and property. This includes activities such as line construction, staging areas, safety zones, water drafting, and camps. When conducting fire management activities near special habitats, take extra measures to avoid spread of invasive plants.	Direction to avoid direct lighting within riparian vegetation is replaced with Standard 01 to determine appropriate mitigations, including limiting prescribed burn tactics at the site-specific project level.
SNFPA 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, from aquatic habitats.	**MA-RCA-STD-09:** 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 from aquatic habitats, including juvenile fish, amphibian egg masses and tadpoles.	SAME
SNFPA 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 which mitigation measures to adopt, weigh the potential harm of mitigation measures, for example fire lines, 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 where fire suppression or fuel management actions could be damaging to habitat or long-term function of the riparian community.	**FIRE-FW-GDL-04:** When managing wildland fire, allow fire to burn in riparian ecosystems when fire effects are expected to be within the natural range for the ecosystem to improve riparian ecosystem function. **SPEC-FW-STD-01:** Design features, mitigation, and project timing considerations are incorporated into projects that may affect occupied habitat for at-risk species. **FIRE-FW-GDL-06:** During wildfires, avoid fire management activities in special habitats (see Terrestrial section, chapter 2) except when necessary to protect life and property. This includes activities such as line construction, staging areas, safety zones, water drafting, and camps. When conducting fire management activities near special habitats, take extra measures to avoid spread of invasive plants. **FIRE-FW-GDL-01:** Use naturally ignited and prescribed wildland fires to meet multiple resource management objectives where and	Functionally similar. Recognizes the ecological value of restoring fire to riparian ecosystems.

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	when conditions permit and risk is within acceptable limits. **FIRE-FW-GDL-02:** When managing wildland fire (wildfire and prescribed fire), use a variety of fire management options, including hand and aerial ignitions, to achieve a mix of fire effects. When safe and feasible, limit extensive continuous areas of high-severity fire effects in old forest habitat. **RCA-MEAD-DC-07:** Meadows in montane and upper montane areas have low- to moderate-severity fire restored as an ecological process, especially on meadow edges, limiting conifer encroachment and enhancing native understory plant composition and cover.	
SNFPA 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.	**MA-RCA-STD-19:** Ensure that post-wildfire management activities enhance native vegetation cover, stabilize channels, and minimize adverse effects from the existing road network to protect the riparian systems.	Essentially SAME
SNFPA 113: Allow hazard tree removal within RCAs or CARs. Allow mechanical ground disturbing fuels treatments, salvage harvest, or commercial fuelwood cutting within RCAs or CARs when the activity is consistent with RCOs. Utilize low ground pressure equipment, helicopters, over the snow logging, or other non-ground disturbing actions to operate off of existing roads when needed to achieve RCOs. Ensure that existing roads, landings, and skid trails meet Best Management Practices. Minimize the construction of new skid trails or roads for access into RCAs for fuel treatments, salvage harvest,	**MA-RCA-DC-10:** Riparian areas protect or improve riparian area-dependent resources while allowing for management of other compatible uses like recreation, vegetation management, or livestock grazing. **MA-RCA-STD-18:** Avoid construction of new skid trails or temporary roads for access into riparian conservation areas, unless it is the only feasible option to conduct restoration activities for protection and improvement of riparian conservation areas. **WTR-FW-STD-01:** Use best management practices as described in agency technical guides and handbooks to mitigate adverse impacts to soil and water resources during the planning and implementation of forest management activities.	Essentially SAME

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commercial fuelwood cutting, or hazard tree removal.		
SNFPA 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 frog, Cascades frog, Yosemite toad, foothill and mountain yellow-legged frogs, and northern leopard frog.		Plan components should not specify a specific analysis to be responsive to changes in the best available scientific information.
SNFPA 115: During fire suppression activities, consider impacts 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, determine guidelines for suppression activities, including avoidance of potential adverse effects to aquatic- and riparian-dependent species as a goal.	**MA-RCA-GDL-04:** Avoid wildfire control methods and activities that would impact the riparian conservation area, including dozer-built lines, unless alternative control methods are not safe or practical. **FIRE-FW-GDL-06:** Avoid wildfire control methods and activities that would impact the riparian conservation area, including dozer-built lines, unless alternative control methods are not safe or practical. **FIRE-FW-PMA:** Prior to and during the fire season, assess conditional thresholds under which desired conditions can be met for the strategic fire management zones (see "Management Areas" section in this chapter). Work with Tribes and adjacent landowners to identify areas and resources of value.	Essentially SAME
SNFPA 116: Identify roads, trails, OHV trails and staging areas, developed recreation sites, dispersed campgrounds, special use permits, 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 or desired conditions.	**MA-RCA-GDL-02:** Minimize impacts from roads, trails, off-highway-vehicle trails, staging areas, developed recreation sites, dispersed campgrounds, special use permits, grazing permits, and day use sites that have been identified as contributing to degradation of water quality or habitat for aquatic and riparian-dependent species.	Essentially SAME
SNFPA 117: Assess the hydrologic function of meadow habitats and other special aquatic features during range management analysis. Ensure	**RANG-FW-STD-02:** Forage utilization standard determinations must include an evaluation of hydrologic function during rangeland condition evaluations following the	Essentially SAME

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that characteristics of special features are, at a minimum, at Proper Functioning Condition, as defined in the appropriate Technical Reports (or their successor publications): (1) "Process for Assessing PFC" TR 1737-9 (1993), "PFC for Lotic Areas" USDI TR 1737-15 (1998) or (2) "PFC for Lentic Riparian-Wetland Areas" USDI TR 1737-11 (1994).	Inyo National Forest Supplement to the Pacific Southwest Region's "Rangeland Analysis and Planning Guide" (R5-EM-TP-004).	
SNFPA 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 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, presence of: (1) sphagnum moss (Spagnum spp.), (2) mosses belonging to the genus Meessia, and (3) sundew (Drosera spp.) Complete initial plant inventories of bogs and fens within active grazing allotments prior to re-issuing permits.	**MA-RCA-STD-10:** Prohibit or mitigate ground-disturbing activities that adversely affect hydrologic processes that maintain water flow, water quality, or water temperature critical to sustaining fen ecosystems and the plant species that depend on these ecosystems. **MA-RCA-STD-11:** Prevent activities from causing significant degradation of fens from trampling, such as by livestock, pack stock, wheeled vehicles, and people. **MA-RCA-STD-14:** Complete initial inventories of fens within active grazing allotments prior to completing the allotment environmental analysis. If more than 10 fens occur on an allotment, ensure at least 25 percent of all fens are inventoried initially. Establish a 5-year schedule to complete inventory. **MA-RCA-STD-08:** In fen ecosystems, limit disturbance from livestock and pack stock to no more than 15 to 20 percent annually. Reduce disturbance further if a fen is nonfunctional or functional at risk with a downward trend.	Essentially SAME
SNFPA 119: Locate new facilities for gathering livestock and pack stock outside of meadows and riparian conservation areas. 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 riparian	**MA-RCA-STD-17:** Locate new livestock handling facilities and stock driveways, salting, and supplemental feeding outside of meadows and riparian areas except where there are no other feasible alternatives and where placement is consistent with meeting watershed or water quality best management practices if located in riparian conservation areas. **MA-RCA-GDL-03:** When reissuing permits for livestock, evaluate impacts of facilities on the riparian	Essentially SAME

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conservation areas with riparian conservation objectives.	conservation areas and consider relocating existing livestock facilities outside of meadows and riparian areas.	
SNFPA 120: Under season-long grazing: • For meadows in early seral status: limit livestock utilization of grass and grass-like plants to 30 percent (or minimum 6-inch stubble height). • For meadows in late seral status: limit livestock utilization of grass and grass-like plants to a maximum of 40 percent (or minimum 4-inch stubble height). Determine ecological status on all key areas monitored for grazing utilization prior to establishing utilization levels. Use Regional ecological scorecards 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 Geographical Information System database. 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 impacted. 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	Base Utilization set by Rangeland Vegetation Type. **MA-RCA-STD-12:** Manage livestock grazing to attain desired conditions in riparian conservation areas. Where livestock grazing is found to be contributing to a decline in the function of riparian systems, modify grazing practices as prescribed in the Inyo Forest Supplement to the R5 Rangeland Analysis and Planning Guide. If adjusting practices is not effective, remove livestock from that area using appropriate administrative authorities and procedures. **MA-RCA-STD-11:** Assess the hydrologic function of riparian areas, meadows, fens, and other special aquatic features during rangeland management analysis. Ensure that characteristics of special features are, at a minimum, at proper functioning condition or functioning at risk and trending toward proper functioning condition, as defined in appropriate technical reports.	Utilization standards set based upon vegetation types and similarity to desired vegetation conditions, adjusted for trend and hydrologic function. Base utilization standards vary based upon grazing system.

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recovered and have moved to mid- or late seral status.		
SNFPA 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 grazing herbaceous vegetation to browsing woody riparian vegetation.	Set by each Rangeland Vegetation Types. For the Willow type, the base utilization standard ranges from 0-5% for sites with severe hedging or a downward trend in regeneration to 11-20% for sites with little or no hedging and upward or static trend in regeneration. For the Aspen type, the base utilization standard ranges from no use to 20%.	Functionally the SAME.
SNFPA 122: Recommend restoration practices in: (1) areas with compaction in excess of soil quality standards, (2) areas with lowered 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.	**MA-RCA-OBJ-01:** Restore the structure and composition of at least 400 acres in riparian areas within 10 years following plan approval, emphasizing riparian areas that face the most risk from large-scale high-intensity fire, past fire exclusion, or accelerated flooding events associated with climate change. **MA-RCA-PMA:** When conducting proper functioning condition assessments, if information is available to show the historic potential of an area and the current potential is different from that historical potential, consider restoration measures that would be necessary to attain the historical potential.	Priorities for restoration will consider the restoration needs within Priority Watersheds, Critical Watersheds, and in site-specific projects proposed for other purposes.
SNFPA 123: Determine which critical aquatic refuges or areas within critical aquatic refuges are suitable for mineral withdrawal. Propose these areas for withdrawal from location and entry under U.S. mining laws, subject to valid existing rights, for a term of 20 years.	**NONE**	Critical Aquatic Refuges are not continued. Determinations of suitability for mineral withdrawal is guided by agency policy
SNFPA 124: [*Within CARs*] Approve mining-related plans of operation if measures are implemented that contribute toward the attainment or maintenance of aquatic management strategy goals.	**GEO-FW-DC-01:** Mineral resources on National Forest System lands provide for public benefit, while minimizing adverse environmental effects on other national forest resources from mineral exploration, development, and extraction. **MA-RCA-DC-10:** Riparian areas protect or improve riparian area-dependent resources while allowing for management of other compatible	Critical Aquatic Refuges are not continued. Direction for other activities that occur within RCAs would still seek to protect or improve riparian area dependent resources.

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	uses like recreation, vegetation management, or livestock grazing.	
Inyo Fish: Fisheries S&G: Manage all stream reaches of all state designated wild trout waters according to the following: 1. Any activity that results in trampling and chiseling should not exceed 10 percent of any given stream reach. A reach is defined as a continuous portion of a stream with homogeneous physical characteristics. Use the current situation as documented in the Final Environmental Impact Statement (EIS) as a reference point. 2. Restore unstable or eroding streambanks to attain a streambank system that is no more than 10 percent unstable at any given time. 3. Streamside vegetation should provide a minimum of 90 percent of the habitat's capability to provide stream shading and fish cover.	**MA-RCA-DC-11:** Along all State-designated wild trout waters (designated as of February 2001), streamside vegetation provides a minimum of 90 percent stream shading and fish cover, based on capability of the site. **MA-RCA-GDL-05:** Stream reaches of all State-designated wild trout waters (designated as of February 2001) should be managed according to the following: Any activity that results in trampling and chiseling should not exceed 10 percent of any given stream reach in order to reduce sedimentation into wild trout waters. A reach is defined as a continuous portion of a stream with homogeneous physical characteristics. **MA-RCA-GDL-06:** Unstable or eroding streambanks should be restored to attain a streambank system that is no more than 10 percent unstable of the reach's current potential. **MA-RCA-STD-01:** Ensure that management activities do not adversely affect water temperatures necessary for local aquatic- and riparian-dependent species assemblages.	Essentially SAME

Appendix D – List of existing resource plans from the Forest Plan

NOTE: this is a copy of "Appendix F: Existing Resource Plans" in the Land Management Plan for the Inyo National Forest (United States Department of Agriculture 2017 (*in prep.*)-b)

The following is a list of existing resource plans and agreements that also guide management of the Inyo National Forest along with the land management plan. This list is not comprehensive, and there may be other resource plans that are being implemented by the Inyo National Forest.

- Individual research natural area management (RNA) plans for established research natural areas:
    - Indiana Summit RNA, established 1932
    - Harvey Monroe Hall RNA, established 1933
    - White Mountain RNA, established 1953
    - Last Chance Meadow RNA, established 1982
    - Sentinel Meadow RNA, established 1983
- Mono Basin Scenic Area Comprehensive Management Plan (1989)
- North and South Forks of the Kern Wild and Scenic River Plan (1994)
- Hoover Wilderness Plan (1977)
- Golden Trout Wilderness Plan (1982)
- South Sierra Wilderness Plan (1991)
- John Muir, Ansel Adam and Dinkey Lakes Wilderness Plan (2001)
- Motorized Travel Management Plan (2009)
- Lahontan Cutthroat Trout (*Oncorhynchus clarki hensawi*) Recovery Plan (1995)
- Revised Recovery Plan for the Paiute Cutthroat Trout (*Oncorhynchus clarkia seleniris*) (2004)
- Owen Basin Wetland and Aquatic Species Recovery Plan Inyo and Mono Counties, California (1998)
- Wild Horse Management Plan for White Mountain and Inyo Mountain Herds (1976)
- Saline Valley and Lee Flat Burro Herd Management Plan (1985)
- Montgomery Pass Wild Horse Management Territory Coordinated Resource Plan (1988)
- Sierra Nevada Bighorn Sheep (*Ovis candensis sierrae*) Recovery Plan (2007)
- Bi-State Action Plan: Conservation of the Greater Sage-Grouse Bi-State Distinct Population Segment (2012)
- Conservation Agreement for *Abronia alpina* (Ramshaw Meadows abronia) (2015)