Environmental Assessment

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Pacific Southwest Region

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Walker Fire Recovery Project

Plumas National Forest
Beckwourth and Mount Hough
Ranger Districts

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CHAPTER 1: Purpose, Need and Proposed Action

Introduction

Walker Fire began on Wednesday, September 4, 2019 burning quickly across steep slopes and valley bottoms within four watersheds (Upper and Lower Indian Creek, Last Chance Creek and Red Clover Creek) approximately 11 miles east of Taylorsville, Plumas County, California. Difficult terrain, heavy fuel accumulations and high winds caused rapid fire growth that repeatedly jumped containment lines.

After coordinated firefighting techniques and fall/winter precipitation, the Walker Fire was contained on September 25, 2019, controlled on October 22, 2019 and declared out on January 15, 2020. Approximately 58,787 acres were burned, including private lands (1,404 acres) and National Forest System lands (57,380 acres) on the Mt. Hough and Beckwourth Ranger Districts of the Plumas National Forest.

The Forest Service is proposing to take management action to respond to conditions created by the Walker Fire. This Environmental Assessment summarizes the environmental effects of the Proposed Action and No Action Alternatives.

Background

The Walker Fire resulted in a mosaic of vegetation burn severity effects (based on basal area tree mortality) (Figure 1). There are areas where tree mortality is 100 percent while other areas still support a green tree component. Based on the fire severity assessment methods and vegetation burn severity maps, about 50 percent (29,440 acres) burned at high severity (75 to 100 percent basal area tree mortality) and 13 percent (7,904 acres) burned at moderate severity (50-75 percent basal area tree mortality of the trees) vegetation burn severities (Figure 1, red and orange colors, respectively).

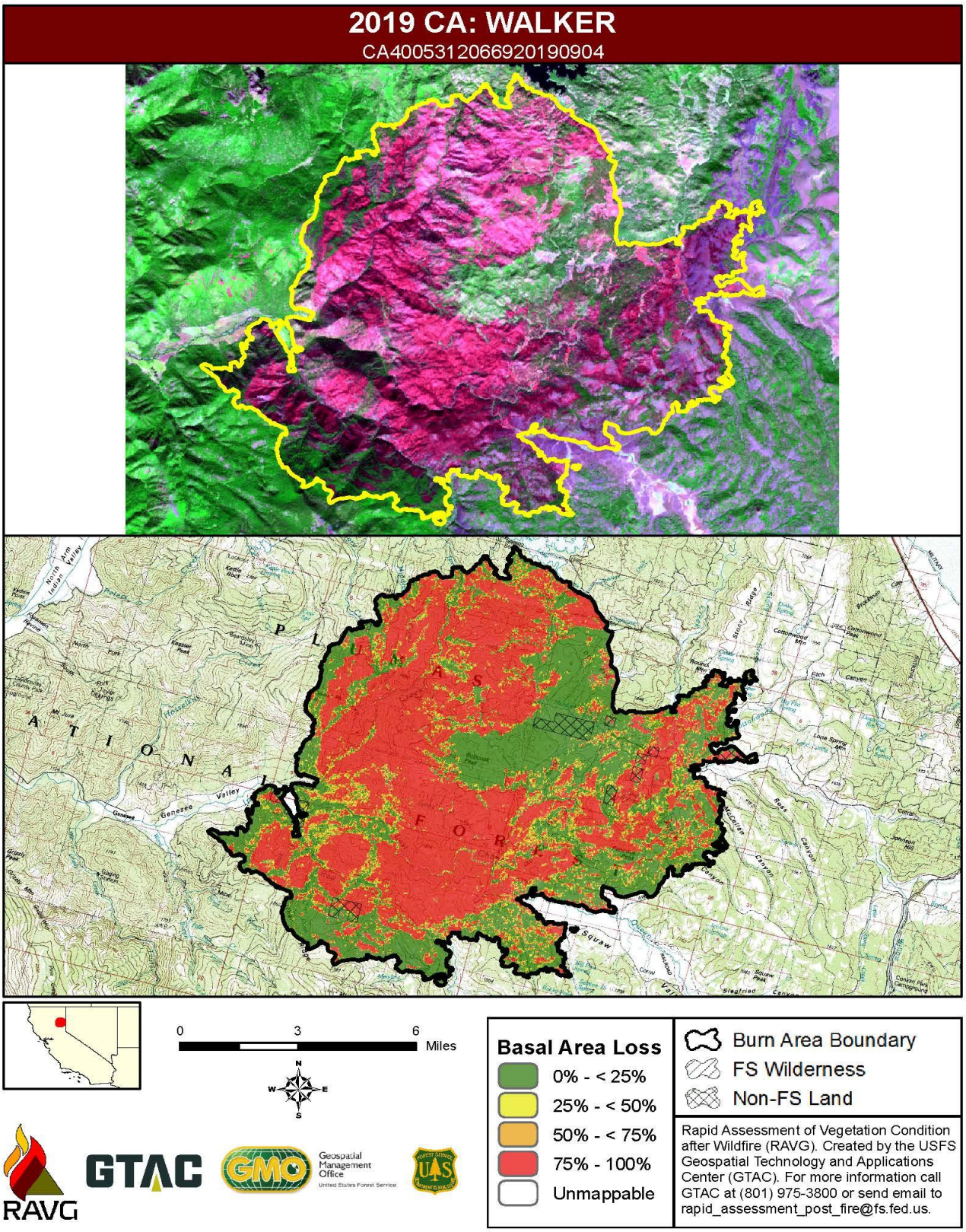

Figure 1. Walker Fire Vegetation Burn Severity Map

The Walker Fire Recovery Project area is located approximately 30 miles northeast of Quincy, California, on the Mt. Hough and Beckwourth Ranger Districts of the Plumas National Forest (Figure 1). Figure 2 shows the general location of the Walker Fire Recovery Project area relative to the Plumas National Forest boundaries and nearby communities. The legal land description for the project is: Township (T) 25 North (N), Range(R) 11 East (E), Sections 1, 11-13; T25N R12E Sections 1-18, 20-24; T25N R13E Sections 3-10, 15-18; T26N R11E Section 36; T26N R12E Sections 1-5, 7-36; T26N R13E Sections 1-3, 5-35; T27N R12E Sections 23, 25-28, 32-36; and T27N R13E Sections 30-32, 34-36; Plumas County, California, Mount Diablo Base Meridian (MDBM).

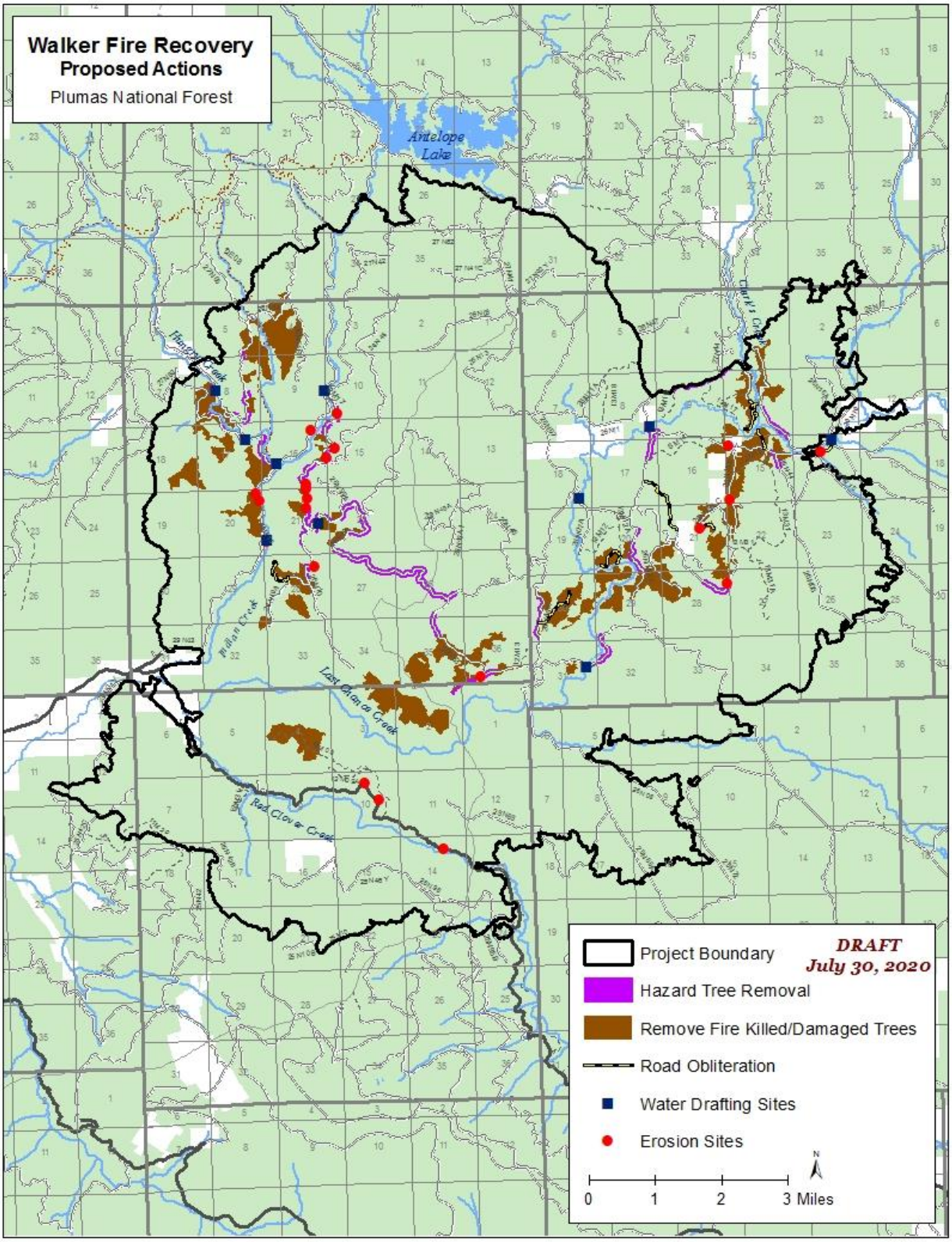

Figure 2. **Walker Fire Recovery Project Location and Proposed Activities Map**

An interdisciplinary team assessed the effects of the fire and worked with the Responsible Official to develop a proposal for post-fire treatment activities based on management objectives, science, and experience in October 2019. Post-fire timber salvage opportunities were focused in areas with commercial timber value and other considerations including:

- Areas that burned at moderate to high severity that overlapped with previously forested vegetation types with larger trees (≥ 11 inches DBH) and dense canopies (≥ 40 percent canopy cover);
- Could be implemented using ground-based logging systems (based on market evaluations) and further refined based on haul costs, road maintenance, distance from other units, etc.;
- Removed areas of tribal and cultural importance, eligible Wild and Scenic Rivers, California spotted owl and northern goshawk Protected Activity Centers (PACs), and other wildlife habitat values.

Of the nearly 25,800 acres of forested vegetation that burned at moderate to high severity, approximately 11,600 acres were originally proposed for treatment. The proposed treatment units were further refined through evaluation of cultural and natural resources, logging systems and economic efficiency, and on-the-ground field assessments, resulting in approximately 3,742 acres proposed for timber harvest treatments. Table 1 describes the key considerations in the development of the final proposed action.

Table 1. Key considerations and progression of the final proposed action

Considerations during proposed action development	Acres of proposed treatment[1]
Walker Fire Area (NFS lands)	57,400 acres
Acres of moderate and high severity burn	36,900 acres
Forested vegetation that burned at moderate to high severity; removed non-forest vegetation (e.g. shrubs, chaparral)	25,800 acres
Forested vegetation with larger trees (trees ≥ 11 inches DBH; canopy cover ≥ 40 percent)	11,600 acres
Removed acres of tribal cultural importance, eligible wild and scenic rivers, and high value wildlife habitat (recommendation by Point Blue Conservation)	9,500 acres
Further refined salvage locations based on cost of logging systems and economic efficiency (i.e. haul costs, road maintenance costs, distance from other units, etc.). Due to market research, focused on ground-based logging systems.	8,400 acres
Field verification refinement including on-the-ground assessments of slope, access, conflicts/impacts to natural resources, focusing on the east side units. *East side units are more easily accessible.	5,200 acres
Excluded revised California spotted owl and northern goshawk PACs	4,700 acres
Final revisions to treatment units in preparation of timber sale contracts, with the main focus on the west side units. * West side units more difficult to access due to steep terrain and remote location.	3,742 acres

[1] Rounded to nearest hundredth

No project activities are proposed within the boundaries of eligible Wild and Scenic River designations or in any protected activity center. Large and medium patches of existing burned forest habitat interspersed throughout the burned area would be left untreated under the proposed action.

Land designations within the Plumas National Forest and the Walker Fire perimeter specific to the 2004 SNFPA include: wildland urban interface (urban core, defense zone, and threat zone); Sierra Nevada yellow-legged frog suitable habitat; Northern goshawk Protected Activity Center (PAC), California spotted owl PAC, and Old Forest Emphasis (OFE) area. Land designations within the Plumas National Forest and the Walker Fire perimeter specific to the 1988 PNF LRMP include: visual quality objectives for maximum modification, modification, partial retention, and retention; recreation opportunity spectrum classes roaded modified and roaded natural; LRMP management areas-Antelope (#29), Ward (#30), Mt. Ingalls (#31), Dotta (#36), and Last Chance (#40); LRMP prescriptions-Recreation Area Prescription (Rx-5), Minimal Management Prescription (Rx-7), Visual Retention Prescription (Rx-10), Bald Eagle Habitat Prescription (Rx-11), Visual Partial

Retention Prescription (Rx-14), and Timber Emphasis Prescription (Rx-15); and eligible Wild and Scenic River.

Purpose and Need for Action

The Walker Fire Recovery Project is being proposed as a management response to the Walker Fire. In compliance with the Code of Federal Regulations [36 CFR 220.7(b)(1) and 40 CFR 1508.9(b)], this section describes the need for the project. The needs for this project are:

1. **To recover the economic value of fire-killed and fire-injured trees.** The *Sierra Nevada Forest Plan Amendment Record of Decision* (SNFPA ROD) provides direction for salvage logging following large, catastrophic wildfires to recover the economic value of dead and dying trees and support objectives for reducing hazardous fuels (described below) (SNFPA ROD, p. 6 and p. 52, Standard and Guideline #13). Local timber industry representatives have expressed interest in harvesting the salvageable material. As explained in the SNFPA ROD, the Forest Service has a role to play in providing a wood supply for local manufacturers and sustaining a part of the employment base in rural communities (SNFPA ROD, p. 4).
2. **To reduce the danger and difficulty of suppressing future wildfires.** Significant reduction to near total elimination of surface and small understory (ladder) fuels is a persistent characteristic of the areas that burned with moderately high and very high vegetation burn severity effects within the project area. This change in fuel loading and composition is expected to reduce wildfire intensities and rates of spread for several years. However, high snag densities and a complex arrangement of fallen trees, broken tops and branches intermixed and suspended within an increasingly heavy shrub component create a hazardous fuels condition and would eventually limit the ability of firefighters to safely and effectively control future wildfires, particularly in strategic locations that could be used for future fire suppression actions.
3. **To promote scientific research regarding the effects of large fires on the environment.** Research opportunities to study the effects of large, high-intensity fires and restoration treatments on wildlife, conifer seed dispersal, tree recruitment, soil erosion, aquatic resources, and fuel accumulation are abundant within the Walker Fire perimeter. The PNF is working with scientists from the Pacific Northwest Research Station and University of Washington to take advantage of the opportunity that a fire of this scale and intensity provides. This research would add to a better understanding of the potential effects of management of burned forests to achieve long-term resilience and the conservation of native plants and animal species associated with these habitats.

Management Direction

Management proposals by the PNF are guided by direction contained in the *Plumas National Forest Land and Resource Management Plan* (PNF LRMP) (1988) as amended by the SNFPA ROD (USDA 2004). These documents are herein referred to as the "Forest Plan." The Walker Fire Recovery Project is designed in a manner that is consistent with Forest Plan direction, as described in this section.

The Forest Plan provides for ecosystem restoration following large, catastrophic disturbance events. Restoration activities may be conducted in all land allocations and include objectives for managing disturbed areas for long-term fuel profiles, restoring habitat, and recovering the economic value of some dead and dying trees. Restoration projects can include salvage of dead and dying trees for economic value as well as for fuels reduction (SNFPA ROD, p. 6).

The Forest Plan has standards and guidelines pertaining to salvage activities following large disturbance events, such as the Walker Fire (SNFPA ROD, pp. 52 and 53). Salvage harvest of dead and dying trees may be conducted to recover the economic value of this material and support objectives for reducing hazardous fuels, improving forest health, re-introducing fire, and/or re-establishing forested conditions (SNFPA ROD, p. 52). Standards and guidelines direct managers to design post-disturbance restoration projects to: (1) reduce potential soil erosion and the loss of soil productivity caused by loss of vegetation and ground cover; (2) protect and maintain critical wildlife habitat; (3) manage development of fuel profiles over time; and (4) recover the value of timber killed or severely injured by the disturbance (SNFPA ROD, p. 52).

Use the best available [scientific] information for identifying dead and dying trees as developed by the Pacific Southwest Region Forest Health Protection Staff (SNFPA ROD, p. 52). An evaluation of the Walker Fire was conducted by Danny Cluck, Forest Health Protection Entomologist, on November 7, 2019. The objective of the evaluation was to identify levels of fire injury to conifers, note any insect activity, and discuss variables that should be considered when developing fire-injured tree marking guidelines. Marking Guidelines for Fire-Injured Trees in California (Smith and Cluck 2011) would be used. Fire-killed and fire injured trees with a 70 percent probability of mortality would be designated for removal for this project.

Outside of the Wildland Urban Interface (WUI) defense zones, removing dead and dying trees is prohibited in PACs and known den sites, unless a biological evaluation determines that the areas proposed for harvest are rendered unsuitable for the purpose they were intended by a catastrophic stand-replacing event (USDA 2004b, p. 53). According to the SNFPA ROD (USDA 2004b, p. 37) the Forest Service is to evaluate habitat conditions after a stand-replacing event within a 1.5-mile radius around the activity center to identify opportunities for re-mapping the PAC. If there is insufficient suitable habitat for designating a PAC within the 1.5-mile radius, the PAC may be removed from the network.

Additionally, under the Multiple-Use Sustained-Yield Act of 1960, as amended (74 Stat. 215; 16 USC 528-531) and the Forest and Rangeland Renewable Resource Planning Act of 1974, as amended [88 Stat. 476; as amended by the National Forest Management Act of 1976 (16 USC 1600-1614)], the Forest Service is authorized to sell timber and reforest NFS lands.

Summary of Proposed Action (Alternative 1)

To respond to the purpose and need, the Plumas National Forest is proposing to salvage harvest approximately 3,742 acres of fire-killed and fire-injured (dead/dying) trees on the Mt. Hough and Beckwourth Ranger Districts. In order to implement the proposed action, approximately 76 miles of existing National Forest Transportation System (NFTS) roads would be repaired and maintained as necessary. Commercial hazard tree abatement and removal is proposed along 40 miles of these roads to provide safe access and operations, and benefit public safety.

Approximately 11 miles of temporary roads would be constructed (2.8 miles) or reconstructed (8.2 miles) to implement the logging operations, and then actively obliterated after project activities are complete. Existing infrastructure would be used whenever possible as long as it does not cause further resource damage and is properly located on the landscape. Constructing or repairing water drafting locations for dust abatement and constructing temporary roads, landings, and skid trails are also proposed. Approximately twenty-three existing or potential erosion sites and ten water sources were identified by the Central Valley Regional Water Quality Control Board, are included in this proposal for improvement, and occur along haul routes. The Plumas National Forest is requesting an emergency situation determination for the actions proposed for the Walker Fire Recovery Project. Chapter 2 provides a detailed description of the proposed action (Alternative 1). All proposed activities are consistent with the Forest Plan.

Decision Framework

The Plumas National Forest Supervisor is the Responsible Official for this project proposal. The Forest Supervisor will decide whether to approve the proposed action, approve a modification to the proposed action, or take no action related to this proposal.

Tribal Consultation

Tribal consultation occurred during and following the Walker Fire. The Walker Fire area is within the homeland of the Mountain Maidu people with significant interest also held by the Washoe Tribe of Nevada and California. Consultation efforts for the Walker Fire Recovery Project included the Greenville Rancheria, the Susanville Indian Rancheria and the Washoe Tribe of Nevada and California – all federally recognized Indian tribes. Consultation also took place with the Maidu Summit Consortium and the Ya-Mani Maidu Cultural Association whose organizations include members having direct associations with the Walker Fire area. Outreach also involved collaboration with Ms. Trina Cunningham, Mountain Maidu Ecologist and Cultural Representative, who has traditional family ties to the affected area. Initial planning for Walker Fire Recovery was underway by November

of 2020. A meeting with Ms. Cunningham resulted in the elimination of several areas from consideration for future treatments due to cultural resource sensitivity. The potential for a Maidu trail within another planned unit was highlighted for field verification as well. On April 3, 2020 formal tribal consultation letters were mailed to the Greenville Rancheria, the Susanville Indian Rancheria, the Washoe Tribe of Nevada and California as well the Maidu Summit Consortium and the Ya-Mani Maidu Cultural Association. Consultation and collaboration with Indian tribes, organizations and individual tribal interests regarding recovery activities within the Walker Fire area are ongoing.

On June 10, 2020 formal tribal consultation letters were mailed to Greenville Rancheria, the Susanville Indian Rancheria, the Washoe Tribe of Nevada and California as well the Maidu Summit Consortium and the Ya-Mani Maidu Cultural Association providing information about the 30-day comment period, project, project specific website, and Forest contacts.

Public Involvement

Initial public involvement efforts were used to help in developing the proposed action for the Walker Fire Recovery Project (initially as part of the Walker Fire Rehabilitation Project). Two meetings were held with industry contacts, along with several separate conversations; conversations and field visits were held with Central Valley Regional Water Quality Control Board; Plumas County Public Works; Plumas County Fire Safe Council; and range permit holders. This also included scoping materials of a cover letter, proposed action, and two maps sent to private land owners, mining claimants, range permittees, local community members, local government, industry representatives, and environmental organizations.

Initial Public Involvement

The Walker Fire Recovery project including scope and overview was presented on two separate occasions on February 25, 2020 and May 28, 2020. Attendees of these meetings included industry representatives from California Forestry Association, Bordges Timber, J&C Enterprises, Poston Logging LLC., Markit Forestry, Wheelabrator, Honey Lake Power, DL Stoy Logging, Collins Pine Co., Association of California Loggers, Sierra Pacific Industries, Trinity River Lumber, and J.W. Bamford Inc.. Also in attendance was Mule Deer Foundation and University of California Cooperative Extension. The Walker Fire Recovery Project proposed project boundary was shared and on May 28, 2020 and it was communicated that the planning instrument (categorical exclusion to environmental assessment) has changed.

Several conversations were held with industry representatives from Sierra Pacific Industries regarding implementation-access to treatment units (due to Walker Fire temporary Forest closure); volume per species; acres; haul routes; road work requirements; proposed logging systems (ground based versus skyline); timber sale packaging; and sale appraisals. Planning related discussions involved planning timelines; expected decision date; limited operating periods; and other project specific mitigations.

Conversations regarding the proposed action and compliance with the California Water Code, submitting a Report of Water Discharge, and compliance with the General Order were held with Central Valley Water Quality Control Board. On January 6, 2020 Central Valley Water Board staff conducted a joint inspection of portions of the project area with Plumas National Forest staff. The inspection primarily focused on potential haul routes to identify significant existing potential erosion sites (SEPES). During the inspection it was noted that some of the haul routes may include Plumas County roads that SEPES which will need to be identified before a project Notice of Intent will be accepted. Central Valley Water Board staff requested the Forest provide a full disclosure of SEPES identified in the project area, including County roads, with proposed treatments and a schedule for those sites to improve or protect water quality. The SEPES disclosure is required to be submitted to and approved by Central Valley Water Quality staff before a notice of applicability will be issued for General Order coverage. A second joint inspection was completed June 18-19, 2020 focusing on refining and finalizing SEPES for General Order compliance.

Communications occurred between Plumas County Public Works and the Forest to discuss road drainage concerns within the project area. Information about the size and scope of project and categorical exclusion was presented at a Fire Safe Council meeting on March 12, 2020. No addition conversations were held with Plumas County Public

Works or the Plumas County Fire Safe Council regarding this project since converting the project to an EA.

Range permittees were contacted to inform them of project progress, when implementation is expected to begin, and that notifications will be provided in the future as the implementation phase approaches.

Scoping

Formal public scoping for Walker Fire Rehabilitation Project was initiated on April 3, 2020. Letters were sent to approximately 100 interested and affected individuals and organizations (see Chapter 4, External and Internal Scoping Lists). The following six groups/individuals responded to the Forest Service's scoping efforts: Steve Brink for the California Forestry Association; Jake Blaufuss for Sierra Pacific Industries; Justin Augustine and Chad Hanson for the Center for Biological Diversity and the John Muir Project; Sue Britting and Jamie Ervin, Patricia Puterbaugh, and Darrel Jury for Sierra Forest Legacy, Lassen Forest Preservation Group, and Friends of Plumas Wilderness; Scott Stawiarski for American Forest Resource Council; and Griffin Perea for the Central Valley Regional Water Quality Control Board. Two of the respondents supported the Walker Fire Recovery Project proposal while four were opposed to salvage logging and artificial regeneration, preferring that the area remain as burned forest habitat and that natural regeneration processes occur throughout the Walker Fire area. These comments were used to identify a change in environmental documentation and issues.

The proposed action scoped with interested and affected parties utilized a category listed Forest Service Interim Directive, FSH 1909.15, Chapter 30, Categorical Exclusion from Documentation, 32.2, Category 11, "Post-fire rehabilitation activities, not to exceed 4,200 acres (such as tree planting, fence replacement, habitat restoration, heritage site restoration, repair of roads and trails, and repair of damage to minor facilities such as campgrounds), to repair or improve lands unlikely to recover to a management approved condition from wildland fire damage, or to repair or replace minor facilities damaged by fire. Such activities:

- Shall be conducted consistent with Agency and Departmental procedures and applicable land and resource management plans;
- Shall not include the use of herbicides or pesticides or the construction of new permanent roads or other new permanent infrastructure; and
- Shall be completed within 3 years following a wildland fire." [36 CFR 220.6(e)(11), p. 12]

Scoping comments received contended that timber harvest activities described in the proposed action were not covered by category 11. As a result of the scoping comments received, the Responsible Official decided to remove timber harvest activities from the Walker Fire Rehabilitation Project. Timber harvest activities were incorporated into this Environmental Assessment, the project was named the Walker Fire Recovery Project, and an Emergency Situation Determination is being pursued.

The Walker Fire Recovery Project has been included in the quarterly Plumas National Forest Schedule of Proposed Actions (SOPA) since April 7, 2020.

30-day Comment Period

Legal notification for the 30-day opportunity to comment on the preliminary Walker Fire Recovery Project EA was published in *Oroville Mercury Register* and *Chico Mercury Register* newspapers on June 12, 2020. Due to COVID-19 the Feather River Publishing Company ceased newspaper publications including legal notices. *Feather River Bulletin* is the newspaper of record for the Plumas National Forest Supervisor. Letters were sent to scoping contacts informing them that the legal notice would publish in the *Oroville Mercury Register*. The change in publication was also published on the project specific website: https://www.fs.usda.gov/project/?project=58204.

The following five groups/individuals submitted comments: Center for Biological Diversity and the John Muir Project; Sierra Pacific Industries; American Forest Resource Council; and Central Valley Regional Water Quality Control Board. Two of the respondents supported the Walker Fire Recovery Project proposal and provided requests for materials and information, and submitted specific questions; while two were opposed to salvage logging and have concerns over negative effects to wildlife species and their habitat and the use of best

available science. The Central Valley Regional Water Quality Control Board submitted a transmittal of inspection report which documents observed site conditions and identifies any necessary follow-up actions.

Issues

Issues have a cause-effect relationship to the actions under consideration. An issue statement describes a specific action and the environmental effect(s) expected to result from that action. Cause-effect statements provide a way to understand and focus on the issues relevant to a particular decision. Issues serve to highlight effects or unintended consequences that may occur from the proposed action and alternatives, giving opportunities during the analysis to reduce adverse effects and compare trade-offs for the decision maker and public to understand. Issues are identified during scoping early in the process to help set the scope of the actions, alternatives, and effects to consider.

The interdisciplinary team reviewed comments received from seven individuals or groups, both orally and in writing. Much of the input received consisted of either "non-issues"[1] or questions and general comments; however, several important issues have been identified by the Responsible Official. The following is a summary of identified issues and a brief synopsis of how they are addressed in project design/mitigation measures, alternative development, and/or the environmental effects analyses presented in Chapter 3 (and summarized at the end of Chapter 2). Important issues have been organized and grouped by common resource, cause-effect relationships, same or common geographical area, or those linked to the same action.

[1] Comments are considered "non-issues" if the issue is: 1) outside the scope of the proposed action; 2) already decided by law, regulation, or policy; 3) irrelevant to the decision being made; or 4) conjectural and not supported by scientific evidence.

Table 2. Important issues identified during the NEPA process

Issue	Discussion
Salvage logging would have significant adverse effects on Black-backed woodpecker habitat (snags in burned forest habitat) and populations.	During project design, careful consideration was given to maintaining areas of untreated burned forest habitat and retaining snags within the Walker Fire area while meeting the project's objectives. In addition, management requirements that are part of the proposed action call for retaining the largest snags in the treated areas as well as cull logs. (Refer to the management requirements for wildlife under the proposed action in Chapter 2 of this EA.) Effects analyses presented in Chapter 3 of this EA evaluate the direct, indirect, and cumulative effects of snag removal via salvage harvesting on habitats for a wide variety of species that depend, either wholly or in part, on burned habitat conditions as well as snags.
Salvage logging would have significant adverse effects on California spotted owl habitat and populations, northern goshawk habitat and pallid bat habitat.	Management requirements (mitigation measures) were developed for the proposed action to minimize adverse effects on these species and their habitats. The proposed action includes management requirements for retaining large snags and large woody debris, implementing limited operating periods, and coordinating any project activities located within 500 feet of mine openings with a wildlife biologist. (Refer to the management requirements for wildlife under the proposed action in Chapter 2 of this EA.) Direct, indirect, and cumulative effects of the proposed action on Region 5 Forest Service sensitive species, including the California spotted owl, northern goshawk and pallid bat, are disclosed in Chapter 3 of the EA and in the project Biological Evaluation.
Salvage logging and subsequent tree planting would have significant adverse effects on shrub dependent species.	Prior to the Walker Fire, there were approximately 15,310 acres of shrubland habitat within the fire perimeter. The Walker Fire resulted in an estimated increase of 27,392 acres of shrubland habitat as previously forested areas that experienced moderately to high vegetation burn severity will rapidly convert to shrub types. Plant successional processes are restarting in the burned areas, with shrub species expected to vigorously re-sprout as well as regenerate from seeds stored in the soil and stimulated by the fire's heat. Direct, indirect, and cumulative impacts of the proposed action on the post-fire landscape's shrub habitats are analyzed and disclosed in Chapter 3 of this EA under Management Indicator Species: Shrubland (West-Slope Chapparal) Habitat (Fox Sparrow).

Issue	Discussion
Salvage logging would have significant adverse effects to soil productivity.	Potential adverse effects on soil productivity were carefully considered in the design of the project to ensure consistency with Forest Plan standards and guidelines for maintaining soil productivity. Management requirements (mitigation measures) were developed for the proposed action to minimize potential adverse impacts of the project activities on soil productivity. These include requirements for maintaining effective ground cover in specific areas focusing on steeper skid trails; limiting tractor skidding to slopes less than 35 percent; using existing skid trails and landings; allowing mechanical operations under specific soil moisture conditions; ripping of temporary roads and landings on appropriate soil types and getting ground cover on the steeper skid trails. (Refer to the management requirements for watershed, soils, and aquatic resources presented under the description of the proposed action in Chapter 2 of this EA.) The soils effects analysis presented in Chapter 3 of this EA analyzes the potential effects of the proposed action and no action alternatives on soil productivity.
Salvage logging would increase future fire intensity.	Managing future fuel profiles to enhance the ability of firefighters to safely and effectively control future wildfires is one of the needs for the proposed action. Both taking action and not taking action have consequences for fire and fuels management. The fire and fuels effects analysis presented in Chapter 3 of this EA discloses potential effects of the proposed action and no action alternatives on future fuel loading and potential fire intensity.
Delaying salvage logging would adversely affect economic recovery of fire killed trees.	Delaying salvage harvest would limit the Forest Service's ability to recover the economic value of fire-killed and severely injured trees sufficient to jeopardize the Agency's ability to accomplish the proposed action's objectives directly related to resource protection and restoration. For this and other reasons, the Plumas National Forest is pursuing an Emergency Situation Determination (ESD) for this project proposal, which, if granted, would speed up recovery of the value associated with fire-killed and severely injured trees. A draft ESD document describing the Forest's rationale for requesting an ESD has been prepared. The draft ESD details the economic and environmental impacts associated with delaying implementation of salvage harvest.

CHAPTER 2: Alternatives

This chapter describes and compares Alternative 1 (Proposed Action), which has been designed to meet the purpose and need for action described in Chapter 1, and Alternative 2 (No Action). This chapter also details the proposed action's design features and management requirements. The intent of these features and requirements is to minimize adverse environmental impacts and ensure that the proposed action is consistent with the Forest Plan standards and guidelines. Finally, this Chapter displays the alternatives in comparative form, defining the differences between them and providing a basis for a choice among the options by the Responsible Official.

Alternatives Considered in Detail

Alternative 1 (Proposed Action) and Alternative 2 (No Action) are described in detail in the following sections.

Changes based on comments from the public:

Commercial hazard tree removal (1,053 acres) from the 2020 PNF Road and Trail Maintenance Project was incorporated into Alternative 1 of the Environmental Assessment because it contributes to the recovery of economic value of fire-killed and fire-injured trees; safe access and operations, and public safety. Removal of hazard trees also reduces fuel loading in the short and long term by removing standing dead trees that would later fall, mix with live vegetation, and increase the danger and difficulty of suppressing future wildfires. By incorporating commercial hazard tree removal into Alternative 1, we are also responding to public comments requesting these actions be analyzed in a single planning document to account for cumulative effects.

The application of Probability of Mortality (Pm) were modified for consistency. To account for hazard trees that impact the roadways, treatment units within 200 feet of road prisms were assigned a Pm of 0.5, to ensure that as many potentially hazardous trees are removed as efficiently and expeditiously as possible, providing for both short- and long-term benefits to public safety along roadways. Treatment units located beyond 200 feet from a road prism were assigned a Pm of 0.7 to account for dead and dying trees associated with salvage. The application of Pm for hazard trees and salvage were recommended by Danny Cluck, Forest Entomologist, Northeastern California Shared Service Area, in his Forest Health Protection evaluation completed in November 2019 (Cluck 2019, page 6). The Pm for hazard trees was recommended to reduce the number of additional hazard trees that will need to be abated as a result of delayed mortality and to meet post-fire objectives within salvage units (page 6).

Alternative 1, Proposed Action

To meet the purpose and need of the project, the following activities are proposed (displayed on maps in Appendix A):

1. Salvage Fire-Killed Trees with Ground Based Equipment (approximately 2,690 acres): The proposed action maps show the locations of the treatment areas proposed for salvage harvest of fire-killed trees using ground-based equipment. Chainsaws and/or mechanical harvesters (tracked and/or rubber- tired equipment) would be used to fall commercial-sized fire-killed trees on slopes generally up to 35 percent. In general, trees would be limbed and bucked into log segments prior to being yarded to the landing. Whole tree yarding would not be used unless at least 50 percent effective soil cover can be achieved post-harvest.

Small diameter trees (3-11.9 inches DBH) are proposed for mechanical felling; tops and limbs may be lopped and scattered or chipped to a height of 18 inches or less, piled and burned, or removed as biomass; and very small material (less than 3 inches DBH) may be piled or run over with machinery. Activity generated fuels would be lopped and scattered within the treatment areas, or in the case of whole tree yarding, burned at landings.

Fire-killed trees are burned trees that either (**1**) have no green needles **or** (**2**) meet the criteria of a 0.7 Probability of Mortality (Pm) in the *Marking Guidelines for Fire-Injured Trees in California*, Report # RO-11-

01 (Smith and Cluck 2011). Commercial-sized trees being considered for this project are a minimum of 12 inches diameter at breast height (dbh); however, the minimum diameter could increase during project implementation to ensure harvest of sound, utilizable timber. Where economically feasible, non-commercial fire-killed trees may be felled and left on site where needed to provide slope stability and to reduce overhead hazard to future reforestation efforts.

Monitoring is planned to occur within one of the treatment units post-treatment for the purpose of quantifying effects of variable density retention salvage logging on forest structure, fuel succession, and wildfire behavior. Permanent plots are established and include approximately 49 acres. Treatments within these plots include salvage treatments as described above (0.7 Pm), hazard tree abatement and removal treatments as described below (0.5 Pm), and no treatment (control).

2. Maintain the Necessary Road System to Manage the Project Area: In order to implement the proposed action, approximately 76 miles of existing National Forest Transportation System (NFTS) roads would be repaired and maintained as necessary. Activities may include grading, improving or installing new drainage features, installing armored dips, laying gravel, replacing culverts, etc. Approximately 11 miles of temporary roads would be constructed (2.8 miles) or reconstructed (8.2 miles) to implement the salvage logging operations, and then obliterated after project activities are complete. There would be no changes to the Motor Vehicle Use Map (MVUM).

Hazard tree abatement and removal is proposed along 40 miles of NFS roads to provide safe access and operations (1,052 acres). Hazard trees are fire-killed and fire-injured trees that meet (**1**) the definition of a hazard[2] in *Hazard Tree Guidelines for Forest Service Facilities and Roads in the Pacific Southwest Region* (Angwin, Cluck, Zambino, Oblinger, and Woodruff, 2012) **or** (**2**) the criteria of a 0.5 Probability of Mortality (Pm) in the *Marking Guidelines for Fire-Injured Trees in California*, Report # RO-11-01 (Smith and Cluck 2011) and have the potential to strike the roadway if they fall.

Approximately twenty-three existing or potential erosion sites and ten water sources were identified by the Central Valley Regional Water Quality Control Board and included in this proposal for improvement. Existing or potential erosion sites are identified along haul routes and include cleaning or replacing drains, culverts, and ditches; installing water bars; installing armored plates; reconstruction of low water crossings; etc.

Project implementation is expected to occur as soon as August 2020 and continue up to 1 year after the Decision Notice is signed. Proposed activities could be accomplished through commercial timber sale contracts, stewardship contracts, service contracts, and/or force account labor forces.

Alternative 2, No Action

Under the No Action alternative, none of the activities proposed under Alternative 1 would be implemented. The No Action alternative would not preclude activities that have already been approved in this area or those being planned as separate projects.

[2] Hazard trees include dead or dying trees, dead parts of live trees, or unstable live trees (due to structural defects or other factors) that are within striking distance of people or property (a target). Hazard trees have the potential to cause property damage, personal injury or fatality in the event of a failure.

Management Requirements

The following management requirements (Table 3) are designed to reduce or prevent adverse effects by Proposed Action and Table 4 includes management requirements for Riparian Conversation Areas (RCA).

Table 3. Management requirements designed to reduce or prevent adverse effects by Walker Fire Recovery Project activities for Alternative 1

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
Cultural Resources	Cultural Resources will be designated on the ground prior to implementation of all project activities. Protect Cultural Resources that have been identified on the ground using standard protection measures as well as being identified on project maps provided by the District Archaeologist.	District Archaeologist, Layout/Contract Specialist, and Sale Administrator
Cultural Resources	Management of Cultural Resources: Protect all Cultural Resources with flagged control areas. Utilize directional felling methods as appropriate to protect Cultural Resources. Buffer zones may be designated to ensure added protection. Sale Administrator, Contract Inspector, and/or Archaeologist will walk all sites with purchaser, contractor, or force account staff prior to start of project activities.	District Archaeologist, Layout/Contract Specialist, and Sale Administrator
Cultural Resources	Management of Linear Cultural Resources: Directionally fell trees parallel to or away from linear Heritage Resources (trails, ditches, roads etc.); existing breaches will be used whenever possible. Any new breaches will be approved by designated by the District Archaeologist prior to project implementation. Isolated trees inside of linear Cultural Resource features may be felled on a case-by-case basis and with on-the-ground approval of the District Archaeologist.	District Archaeologist, Layout/Contract Specialist, and Sale Administrator
Cultural Resources	Removal of trees from within Cultural Resource boundaries will follow the guidelines established in Appendix E of the 2018 Amended Regional Programmatic Agreement Regarding Compliance with Section 106 of the National Historic Preservation Act, as well as Forest guidelines in regards to the felling and removal of salvage trees within historic properties: Trees may be limbed or topped to prevent soil gouging during felling. Written approval must be obtained from the Forest Heritage Program Manager (HPM) or delegated District Archaeologist prior to any activities within Cultural Resource boundaries. An Archaeologist must be present during felling and removal of trees. Trees will be fully suspended while being removed from the site. Removal of trees inside of Cultural Resources is limited to hand bucking and carrying, rubber tired loader, use of crane/self-loader, and helicopter, or other non-disturbing methods as approved by the HPM/District Archaeologist. Equipment operators will be briefed on the need to reduce ground disturbance.	District Archaeologist, layout/Contract Specialist, and Sale Administrator
Lands	Protect land survey signs and monuments, even if burned, or laying on the ground.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Public Service Officer
Lands	Notify private property owners within the Walker Fire area of initial logging schedule.	Layout/Contract Specialist, Fuels Specialist, Sale

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
		Administrator, and Public Service Officer
Minerals	Notify mining claimants within the Walker Fire Area of impending harvest schedule once it is known.	Minerals Officer and Sale Administrator
Range	Notify ranger permit holders within the Walker Fire area of impending harvest schedule once it is known.	Range Management Staff and Sale Administrator
Nonnative Plants - Prevention	Clean all equipment that operates off roads before it enters the project area if it is coming from areas infested with nonnative invasive plants (NNIPs) (reference standard provision B6.35 Equipment Cleaning).	District NNIP Coordinator, Contract Specialist, and Implementation Team
Nonnative Plants - Prevention	Clean equipment that is operating off roads before it moves from an infested area within the project to another area (within or outside the project area).	District NNIP Coordinator, Contract Specialist, and Implementation Team
Nonnative Plants - Prevention	Ensure that all plant material used for erosion control and/or road maintenance is NNIP free (including straw and mulches as well as propagative parts such as seed).	District NNIP Coordinator, Contract Specialist, and Implementation Team
Nonnative Plants - Prevention	Survey all units prior to project operations. If NNIP infestations are found, avoid soil disturbance in infested areas by buffering them by 50 feet until a determination has been made that the infestation is eradicated.	District NNIP Coordinator, Contract Specialist, and Implementation Team
Rare Plants - Conservation	Survey all units prior to project operations. If rare plants (TEP, sensitive, or watchlist) are discovered, buffer them from disturbance by 50 feet or by the recommended distance that was determined on-the-ground based on site conditions.	Botanist, Contract Specialist, and Implementation Team
Rare Plants - Conservation	Leave all trees in place when they must be felled into peatlands/fens.	Botanist, Contract Specialist, and Implementation Team
Rare Plants - Conservation	Avoid disturbance to known sensitive plant occurrences within the project/analysis areas by buffering them by 50 feet.	Botanist, Contract Specialist, and Implementation Team
Recreation and Public Use	Provide for public safety and education by posting signs to inform public of project activities. Whenever possible, post notices on PNF website prior to treatments. Keep information current.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Specialist
Recreation and Public Use	Protect all trail improvements, directional and informational signs, barriers, etc. If any barriers (including boulders) or improvements are damaged or removed to during activities, they must be replaced and re-installed in the same location and manner immediately following vegetation management operations.	Layout/Contract Specialist, Fuels Specialist and Recreation Specialist
Recreation and Public Use	Recreation areas (designated roads, trails, trailheads, and dispersed camp sites) within the Walker Fire closure area will be temporarily closed to provide for public safety during active tree removal operations.	Layout/Contract Specialist, Fuels Specialist and Recreation Officer or Trails Manager
Recreation and Public Use	Skid trails in the vicinity of motorized routes or non- motorized trails shall be treated to prevent post-harvest use by any motorized vehicle. This may be by slash scatter, water barring, or other method agreed to by the Trails Manager. The access point shall be closed in a manner that is effective to keep	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Officer or

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
	motorized use from occurring.	Trails Manager
Recreation and Public Use	When recreation sites, including access roads, trails, parking areas, dispersed camping areas, staging areas, or areas associated with special use permits are proposed for landings or slash disposal sites, specific mitigation measures shall be developed by the Public Services Officer, Recreation Officer, or Trails Manager in advance of use.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Officer or Trails Manager, Public Services Officer
Recreation and Public Use	When using designated dispersed camp areas as a landing, protect all live trees and vegetation.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Officer or Trails Manager
Recreation and Public Use	Trails: Effectively repair/restore designated trails prior to equipment leaving the unit. Effectively close trail crossings and skid trails or temporary roads prior to equipment leaving the unit.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Officer or Trails Manager
Recreation and Public Use	Trails: Do not operate machinery on, or widen, the Middle Creek trail. This trail shall not be used for log removal activity or landing sites.	Layout/Contract Specialist, Fuels Specialist, Sale Administrator, and Recreation Officer or Trails Manager
Scenery Resources	Along the Middle Creek Trail, maximize protection of non-affected timber and ground vegetation during tree removal operations and slash treatment.	Layout/Contract Specialist and Sale Administrator
Scenery Resources	If leave-tree mark is utilized, place mark away from trail viewer within 150 feet of the Middle Creek Trail.	Timber Marking Crew
Silviculture	Utilize directional felling techniques to minimize damage to residual standing trees, protected features, and infrastructure. Cut trees should have no more than a 6” stump on the high side, with a 12” exception for safety if hand falling. Retained logs should be oriented perpendicular to the slope to reduce erosion, when feasible.	
Silviculture	Borax: Borax will be applied to all cut conifer stumps greater than 14” in diameter, except incense cedar. Borate compound should be applied with a thin layer to the entire stump surface and areas of the stump where bark is gone. Apply borate compound within 4-24 hours after tree is felled.	Contract Specialist and Sale Administrator
Silviculture	Borax: The application would comply with all applicable state and federal regulations for the safe use of pesticides, including the Sporax label requirements, e.g., applicators will be adequately trained, medical aid will be available, wash water and eye wash water will be on site or nearby, and personal protective equipment will be used (eye protection, gloves, long-sleeved shirt, and long pants).	Contract Specialist and Sale Administrator
Silviculture	Borax: Implement Best Management Practices (BMPs) for pesticide application, including a spill contingency plan.	Contract Specialist and Sale Administrator
Silviculture	Borax: Insure for direct application to stumps within 300 feet of perennial or intermittent streams, meadows, and special aquatic features.	Contract Specialist and Sale Administrator

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
Silviculture	Borax: Do not apply a borate compound during a sustained rainfall.	Contract Specialist and Sale Administrator
Transportation System, Road Maintenance and Safety	Coordinate use (e.g., skidding on the roads) and any repairs or maintenance with the County Roads Department Office.	Maintenance Engineer, Contract Specialist, Sale Administrator
Transportation System, Road Maintenance and Safety	Protect all improvements along roadways including road surface, signs, ditches, and drainage structures.	Maintenance Engineer, Contract Specialist, Sale Administrator
Transportation System, Road Maintenance and Safety	Maintain haul roads before, during, and after use. Place emphasis on post haul maintenance of road surface, and the surface drainage crossings to reduce erosion potential. Clean all activity debris from ditches and culvert inlets. Use Timber Sale contract road maintenance specifications T-802 Ditch Cleaning, T-803 Surface Blading, T-805 Drainage Structures, and T-809 Waterbars (or something comparable for service or stewardship contracts).	Maintenance Engineer, Contract Specialist, Sale Administrator and Fuels Implementation Team
Watershed, Soils, and Aquatic Resources	Establish Riparian Conservation Areas (RCAs) for all aquatic features, as specified below. Ensure Riparian Conservation Objectives (RCOs) are met within RCAs by adhering to these manage requirements.	Planning Forester, Prep Forester, Sale Administrator, and Soil Scientist or Hydrologist
Watershed, Soils, and Aquatic Resources	For logging in RCAs with slopes over 15%. Skid Trails receiving 3 or more passes and reopened landing / temp roads need 60% ground cover (mulch, slash in contact with ground). Preferable to have equipment drive over slash to press into ground. Predetermine water-bar location and place slash at outlet. Vary routes and minimize turning. Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of weed free straw, wood chips, or mulch may be used where on-site material is insufficient. Also lop and scatter of sub merchantable trees may be used.	Planning Forester, Prep Forester, Sale Administrator, and Soil Scientist or Hydrologist
Watershed, Soils, and Aquatic Resources	No new landings or roads will be located within RCAs. Consult with a soil Scientist or hydrologist before using an existing skid trail, landing, or road located within an RCA.	Planning Forester, Prep Forester, Sale Administrator, and Soil Scientist or Hydrologist
Watershed, Soils, and Aquatic Resources	Designated skid trails or temp roads crossing ephemeral or intermittent stream channels may be approved for access to otherwise inaccessible areas, but only upon consultation with a soil scientist or hydrologist, and wildlife biologist as well for the intermittent. Crossings may require rock or log armoring, or culvert. Remove all fill from channel at end of season and mulch with slash etc. to 90% ground cover for at least first 25 feet of the approaches and/or waterbars to dissipate water where identified by road engineer and soil scientist, and/or hydrologist.	Planning Forester, Prep Forester, Sale Administrator, and Soil Scientist or Hydrologist, and Wildlife Biologist
Watershed, Soils, and Aquatic Resources	Salvage trees within the equipment exclusion zone can be felled. Fell them away from the channel and other aquatic features to minimize disturbance of riparian vegetation. If feasible try to fell trees at a slight angle and not perpendicular to the stream. Felled trees within the RCA may be removed by end-lining. End-lining is not permitted through riparian vegetation. Grooves and bare soil created by end-lining will be mitigated with hand-built water bars and/or slash placement. Removal of trees across a perennial, intermittent or ephemeral stream will require full suspension across the entire channel. If	Planning Forester, Prep Forester, Sale Administrator, and Soil Scientist or Hydrologist, and Wildlife Biologist

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
	full suspension cannot be obtained then the portion of the log that cannot be suspended will be left in the equipment exclusion zone	
Watershed, Soils, and Aquatic Resources	Water Source Use: Water sources shall be approved by wildlife biologist and hydrologist. May require improvement to meet wildlife and water quality requirements including rocking approaches, bump logs, etc.	Planning Forester, Prep Forester, Sale Administrator, Road Maintenance Engineer, Hydrologist, and Wildlife Biologist
Watershed, Soils, and Aquatic Resources	Water Source Use: Where overflow runoff from water trucks or storage tanks may enter the stream, effective erosion control devices shall be installed.	Planning Forester, Prep Forester, Sale Administrator, and Hydrologist
Watershed, Soils, and Aquatic Resources	Water Source Use: All water-drafting vehicles shall be checked routinely and shall be repaired as necessary to prevent leaks of petroleum products from entering RCAs.	Planning Forester, Prep Forester, Sale Administrator, and Hydrologist
Watershed, Soils, and Aquatic Resources	Water Source Use: Water-drafting vehicles shall contain petroleum spill kits. Dispose of absorbent pads according to the Hazardous Response Plan.	Planning Forester, Prep Forester, Sale Administrator, and Hydrologist.
Watershed, Soils, and Aquatic Resources	Water Source Use: Survey all proposed drafting locations for sensitive and listed amphibians and receive approval from a biologist prior to use. Use drafting devices with 2- mm or less screening and place hose intake into bucket in the deepest part of the pool. Use a low velocity water pump and do not pump ponds to low levels beyond which they cannot recover quickly (approximately one hour).	Planning Forester, Prep Forester, Sale Administrator, Aquatic Biologist and Hydrologist
Watershed, Soils, and Aquatic Resources	If a sensitive or listed amphibian is sighted within the project area, cease operations in the sighting area, and inform a Forest Service aquatic biologist of the sighting immediately.	Planning Forester, Prep Forester, Sale Administrator, Aquatic Biologist and Hydrologist
Watershed, Soils, and Aquatic Resources	Limit tractor skidding to less than 35 percent slopes unless a watershed specialist evaluates operations on the steeper slopes. Tractor skidding may occur on slops greater than 35 percent only in short pitches less than 100 feet in distance. Where skidding occurs on slopes greater than 15 percent and effective soil cover off of skid trails is less than 50 percent, scatter slash on skid trails to achieve at least 50 percent effective soil cover. Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of weed free straw, wood chips, or mulch may be used where on-site material is insufficient. Also lop and scatter of sub merchantable trees may be used.	Planning Forester, Prep Forester, Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	When possible, use existing skid trails and landings except where this could cause unacceptable resource damage. Limit new and existing skid trails, temp roads, and landings to less than 15 percent of the unit area. Space skid trails at least 75 feet apart.	Planning Forester, Prep Forester, Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	Where end-lining has gouged out soil forming a path for concentrating runoff, use hand tools to install cross drains or rake berm over gouged out area. Use cross drain spacing guidelines listed below. Pull berms back on skid trails where ground conditions are appropriate.	Sale Administrator, Soil Scientist, Hydrologist,
Watershed, Soils,	Allow mechanical operations only when soil moisture conditions	Sale Administrator,

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
and Aquatic Resources	are such that compaction, gullying, and/or rutting will be minimal. Conduct ground based harvest operations when soil is dry; that is, in the spring when soil moisture in the upper 8 inches is not sufficient to allow a soil sample to be squeezed and hold its shape, or will crumble when the hand is tapped. In the summer and early fall after storm event(s) when soil moisture between 2-8 inches in depth is not sufficient to allow a soil sample to be squeezed and hold its shape, or will crumble when the hand is tapped. Off of designated skid trails, limit all equipment passes over the same piece of ground to reduce the potential for adverse soil compaction.	COR, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	Temporary roads and Landings: Following temporary road use, remove culverts, eliminate ditches, out-slope roadbed, remove ruts and berms, effectively block the road to normal vehicular traffic where feasible under existing terrain conditions, and build cross ditches and water bars. Subsoil or rip temporary roads and landings only where called for by hydrologist or soil scientist. If lacking, add 60% effective soil cover to bare soil. Effective soil cover could include plant litter, woody material in contact with the soil, living vegetation, and rock fragments with a diameter of ½ to 3 inches. Use of weed free straw, wood chips, or mulch may be used where on-site material is insufficient. Also lop and scatter of sub merchantable trees may be used.	Planning Forester, Prep Forester, Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	Log Landings: re-use log landings to the extent feasible. Limit new landings to ¼ to ½ acre in size.	Planning Forester, Prep Forester, Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	Cable corridors: hand waterbar and scatter slash to achieve at least 60 percent effective soil cover. On slopes 35 to 50 percent apply at least 75 percent effective soil cover.	Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, and Aquatic Resources	Recommended spacing for cross drainage spacing on skid trail and temporary roads: Slope Gradient Cross Drain Spacing 1-6% 250 feet 7-9% 150 feet 10-14% 125 feet 15-20% 60 feet 21-40% 30 feet	Sale Administrator, Soil Scientist, Hydrologist,
Watershed, Soils, and Aquatic Resources	To reduce the potential for adverse cumulative watershed effects, implement state certified Best Management Practices (BMPs). Site specific BMPs applicable to this project (located in project record file) include BMP 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15, 1.16, 1.17, 1.19, 1.20, 1.21, 2.2, 2.3, 2.4, 2.5, 2.8, 2.11, 2.13, 5.1, 5.2, 5.5, and 5.6.	Planning Forester, Prep Forester, Sale Administrator, Soil Scientist, and Hydrologist
Watershed, Soils, Aquatic Resources	Where feasible, all treatments should maintain the minimum requirement for CWD (5 logs per acre measuring 20” in diameter and 10’ long) or 10-15tons per acre. If the minimum CWD requirement has not been achieved post-harvest, distribute non-merchantable logs greater than 12” in diameter from landing pile to meet the standard.	Planning Forester, Prep Forester, Sale Administrator, and Soils Scientist
Wildlife	A minimum of 4 snags per acre in the largest diameter size class generally representative of the unit would be retained within treatment units, averaged across ten acres. Large snags retained within RCAs and inoperable areas would be	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
	incorporated into the average. Where necessary to meet the average, select snag retention clumps generally ranging from 0.25 to 2 acres in size to include snags representative of the largest diameter snag classes in the unit. Select snag retention clumps preferentially adjacent to spotted owl and northern goshawk PACs and HRCAs, around suspected or known wildlife-inhabited trees (e.g. nest trees, roosts), and around existing green forest patches. Site-preparation (e.g. mastication, piling) would not occur within snag retention clumps.	Fuels Implementation Team
Wildlife	During marking, retain suspected or known wildlife- inhabited trees (e.g. nest trees, roosts, etc.), unless they pose an imminent safety hazard that cannot be mitigated through other means; if removal is necessary coordinate with the wildlife biologist. Any wildlife-inhabited trees retained during marking should be incorporated into snag retention clumps where necessary to meet the general average snag retention guideline.	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	Retain the largest size classes of existing large woody debris to a rate of approximately 15 tons/acre in treatment units. Logs greater than 12" diameter at the mid-point and at least 20 feet long will be used to meet the criteria. Where existing conditions do not meet or exceed these levels, the requirement is to retain as close to these levels as feasible. Avoid disturbance of existing large logs during treatments to the extent practicable, and avoid piling logs used to meet the standard during site preparation in tree planting areas. In areas deficient in large woody material, cull logs would be left at the stump where possible.	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	Where activity generated vegetation is piled, retain an average of 1 pile per acre; preferentially retain piles that are in close proximity to the following: large live trees (>24"), patches of live trees, large oaks (>24"), large snags (>24"), snag patches, and RCAs.	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	For California spotted owl PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the activity center during the breeding season (March 1 through August 15), unless surveys confirm that California spotted owls are not nesting. Prior to implementing activities within or adjacent to a California spotted owl PAC, conduct surveys to establish or confirm the location of the nest or activity center.	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	For northern goshawk PACs: Maintain a limited operating period (LOP), prohibiting vegetation treatments within approximately ¼ mile of the nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the nest stand within a protected activity center (PAC) is unknown, either apply the LOP to a ¼-mile area surrounding the PAC, or survey to determine the nest stand location.	Wildlife Biologist, Layout/Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	Retain buffers around existing hardwood trees by not planting conifers or piling vegetation within 20 feet of the edge of hardwood crowns.	Wildlife Biologist, Contract Specialist, Sale Administrator, and Fuels Implementation Team
Wildlife	Report all mine openings to the wildlife biologist that are identified during project layout. Coordinate any marking of trees and all activities within 500 feet of mine openings.	Wildlife Biologist, Contract Specialist, Sale Administrator, and

Potential Resource(s) Affected	Management Requirements Designed to Reduce or Prevent Adverse Effects	Responsible Person(s)
		Fuels Implementation Team
Wildlife	Incidental detections of federally-listed and sensitive species prior to or during project implementation will be reported to the District Wildlife Biologist for protection in accordance with management direction for the Plumas National Forest.	Wildlife Biologist, Contract Specialist, Sale Administrator, and Fuels Implementation Team

Table 4. Management requirements for Riparian Conservation Areas by stream type, with buffer widths, distance to burn piles, and equipment exclusion zones based on slope restrictions.

Stream Type	Riparian Conservation Area (RCA) widths	Minimum distance to burn pile	Equipment Exclusion Zone		
			Slope <35%	Slope <15%	Slope >35%
Perennial streams*	300 feet	82 feet	100 feet	82 feet	Excluded
Intermittent stream*	150 feet	82 feet	100 feet	82 feet	Excluded
Ephemeral stream	150 feet	15 feet	50 feet	25 feet	Excluded
Special Aquatic* Features (Reservoirs, wetlands, fens, and springs)	300 feet	82 feet	100 feet	82 feet	Excluded
Riparian features, dry meadows,	150 feet	25 feet	25 feet	25 feet	Excluded

*Considered Sierra Nevada Frog Suitable Habitat.

Alternatives Considered but Eliminated from Detailed Study

Comments received from Center for Biological Diversity and John Muir Project requested that treatment units adjacent to California spotted owl PAC PLU0072 (units 133, 134, 144, 146, and 152) be removed from the project and for a 'limited operating period' to be applied to breeding and nesting birds to reduce direct mortality (CBD/JMP Comment Letter, p. 1). The treatment units listed above overlap with high quality black-backed woodpecker habitat predicted by Campos et al. 2020 modeling techniques.

This alternative was eliminated from detailed study because it does not fully meet the purpose and need of recovering economic value of fire-killed and fire-injured trees and reducing the difficulty and danger of future wildfire suppression. Treatment units 133, 134, 144, 146, and 152 were reduced by 53 percent (615 acres reduced to 291 acres) during the comment period based on field reconnaissance. The remaining 291 acres of salvage harvest near PAC PLU0072 would contribute approximately 2 million board feet (mmbf) toward the economic recovery (about 6 percent of the project's total volume). The limited operating period proposed would restrict salvage harvest from August to March meaning harvest activities could not start until Spring of 2021. Delaying salvage harvest activities until Spring 2021 would lead to a reduction in volume of approximately 12.8 mmbf based on deterioration rates. Removal of the listed units and the incorporation of the limited operating period would reduce the projects total volume by almost 15 mmbf compromising the economic recovery of the project. Additionally, it is likely the project would not receive bids from potential contractors if the limited operating is included because the value of the timber would be diminished.

Removing the units would compromise meeting the purpose and need of reducing the difficulty and danger of future wildfire suppression. The dead trees and vegetation left behind will fall into the new growth creating a situation where wildfires could grow in intensity and size. As wildfire intensities or a high volume of standing dead trees preclude direct suppression with ground forces because its unsafe, indirect tactics, heavy equipment and aircraft would be heavily utilized. Ultimately, future fire size, and suppression and emergency rehabilitation costs would increase.

The proposed action was designed to account for the commenter's concerns regarding California spotted owls and black-backed woodpeckers. Initial salvage logging units were modified to exclude California spotted owl Protected Activity Centers (PACs) and/or replacement PACs. Additionally, treatment units 133, 134, 144, 146, and 152 were reduced by 53 percent (615 acres reduced to 291 acres) during the comment period based on field reconnaissance. The proposed action was modified, in part, to be consistent with this proposed alternative. Salvage logging would impact 2 percent of the suitable spotted owl habitat in the analysis area. A limited operating period would be instituted surrounding spotted owl nests or activity centers; specifically the Hungry owl pair (PLU0072) is within ¼ mile of proposed activities and would be conducted outside of the nesting period. Therefore, short-term adverse effects would be minimized.

Authors of two black-backed woodpecker scientific papers were recruited to analyze two different habitat models within the wildlife analysis area. The Campos et al. 2020 model incorporates density and size of trees, high severity fire at local scale, lower burn severity at the 1 km scale, and elevation as important model variables. Using modeling from Campos et al. (2020), initial planning efforts in the Walker Fire excluded large areas of the wildlife analysis area to protect some of the highest quality black-backed woodpecker habitat available. Specifically, most of the southern portion of the Walker Fire area, where there is high quality habitat, was almost completely excluded from proposed harvest.

The Campos et al. 2020 model predicted 2,923 acres of high quality black-backed woodpecker habitat was created during the fire, and 303 acres overlap with treatment units. This equates to 10 percent of high quality habitat overlapping with treatment units that will not be suitable for woodpeckers post implementation. Overall, the Walker Fire created 58,664 acres of high, moderate and low black-backed woodpecker habitat and 89 percent of all habitat qualities would not be treated.

There is no management direction for a limited operating period or activity restrictions for general nesting and breeding birds. Black-backed woodpeckers generally begin breeding activity on May 1 and young fledge the nest around July 31. Implementation is expected to begin in August 2020 and is outside of the black-backed

woodpecker breeding and nesting season. There is tremendous incentive to remove as much material from the landscape as possible during this field operating season for a variety of reasons (i.e. timber value and deterioration; effects to natural resources; etc.). Approximately 60 percent of the total volume is anticipated for removal prior to onset of winter. The remaining harvest would be completed the following field season.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. The alternatives can be compared in terms of (a) how well they respond to the purpose and need for action and (b) their environmental effects, specifically in terms of the issues identified for this proposal. Table 5 and Table 6 below provide a comparison of the alternatives in these two regards. Information in the tables is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively between the alternatives. Detailed analyses for the environmental effects summarized in Table 6 are provided in Chapter 3 of this EA.

Table 5. Comparison of Walker Fire Recovery Project Alternatives In Terms of Meeting the Purpose of and Need For Action

Need for and Purposes of the Project	Alternative 1 (Proposed Action)	Alternative 2 (No Action)
Recover the economic value of fire-killed trees	Approximately 32 million board feet (mmbf) salvaged Net timber sale revenue is estimated at approximately $3 million.	Zero mmbf harvested and no timber sale revenue generated
Reduce the danger and difficulty of suppressing future wildfires	Approximately 3,742 acres of treatments would reduce the danger and difficulty of future fire management efforts.	Zero acres would be treated and future fire management efforts would remain difficult

Table 6. Comparison of Walker Fire Recovery Project Alternatives in Terms of Important Issues

Issue	Alternative 1 (Proposed Action)	Alternative 2 (No Action)
Expected black-backed woodpecker pairs	Sufficient habitat would be retained to support 125 pairs of black-backed woodpeckers predicted to occupy NFS lands in the Walker Fire area.	Sufficient habitat would be retained to support 140 pairs of black-backed woodpeckers predicted to occupy NFS lands in the Walker Fire area.
Snags in burned forest habitat	Of the 9,685 acres of newly created, high quality burned forest habitat on NFS lands, approximately 1,054 acres (11%) of snags in burned forest habitat would be removed. Approximately 89% of burned habitat would remain.	Zero acres of snags in burned forest habitat would be affected
California spotted owl habitat	Approximately 164 acres of suitable habitat (2% of the 6,701 acres of suitable California spotted owl habitat in the analysis area) would be treated.	Zero acres of suitable habitat would be treated. Alternative 2 would not change the acreage of suitable habitat, nor would it reduce habitat elements (snags and large woody debris) within areas of existing suitable California spotted owl habitat.
Northern Goshawk habitat	Approximately 316 acres of suitable habitat (6% of the 10,688 acres of suitable northern goshawk habitat in the analysis area) would be treated.	Zero acres of suitable habitat would be treated. Alternative 2 would not change the acreage of suitable habitat, nor would it reduce habitat elements (snags and large woody debris) within areas of existing suitable northern goshawk habitat.
Bat habitat	Large snags would be removed from approximately 3,901 acres within the analysis area that provide potential roosting sites (approximately 17% of the 22,783 acres of suitable roosting habitat in the analysis area). Snag retention requirements, combined with retention of large live trees, would retain potential roost sites within treatment areas; however, the quantity of potential roost sites would be reduced.	Large snags resulting from the effects of the Walker Fire would persist within the existing 22,783 acres of bat roosting habitat in the analysis area, providing potential roost sites until they decayed and fell.

Issue	Alternative 1 (Proposed Action)	Alternative 2 (No Action)
Shrub dependent species	No acres of scrub dominated land are proposed for salvage logging. Current conditions show an increase in shrubland habitat of approximately 27,392 acres (50%) that burned at high vegetation burn severity that will grow into shrubland habitat and likely be suitable for fox sparrow in 2-5 years.	The existing shrubland habitat on NFS lands would be retained. Current conditions show an increase in shrubland habitat of approximately 27,392 acres (50%) that burned at high vegetation burn severity that will grow into shrubland habitat and likely be suitable for fox sparrow in 2-5 years.
Soil productivity	Proposed treatments that result in ground disturbance using ground-based equipment and mechanical site preparation activities, have the greatest potential to result in adverse effects on soil productivity. Mitigation measures included in Alternative 1 would ensure that the proposed activities would meet Forest Plan standards and guidelines for maintaining soil productivity.	Zero acres would receive treatments that have effects on soil productivity
Future fire intensity	In areas proposed for salvage harvest under Alternative 1, modeling shows that treatment would reduce mean surface fuel loads by over 60 percent.	In areas of high vegetation burn severity, as fire-killed vegetation falls into a growing volume of live vegetation, wildfires may be expected to grow in intensity, size and suppression difficulty, and trend in increasing high severity wildfire.
Economic recovery of fire killed trees	Approximately 32 million board feet (mmbf) salvaged. Net timber sale revenue is estimated at approximately $3 million.	Zero mmbf harvested and no timber sale revenue generated

Modifications to the Environmental Assessment

1. Minor edits occurred throughout this document to remove duplicate words; misspelled words; grammar and punctuation mistakes; miss referenced tables and figures; and general errors. Acres were also updated throughout this document to reflect incremental changes (#3 below) and the additional action of hazard tree abatement and removal (#4 below).
2. Figure 2, Walker Fire Recovery Project Location and Proposed Activities Map was updated to illustrate current treatment units, including hazard trees (EA, page 4).
3. Incremental changes to treatment units from October 2019 through June 2020 are generally described through key considerations in Table 1 above (EA, page 5).
4. Hazard tree abatement and removal along 40 miles of NFS roads (1,053 acres) was added to the proposed action (Alternative 1) after receiving public comments on the preliminary EA (July 2020) (EA, pages 7, 13, and 14).

5. The Public Involvement section was updated for flow and clarity and to reflect comments received during the 30-day comment period from June 12-July 13, 2020 (EA, page 8-10).
6. The application of Probability of Mortality were modified for consistency. To account for hazard trees that impact the roadways, treatment units within 200 feet of road prisms were assigned a Pm of 0.5. Treatment units located beyond 200 feet from a road prism were assigned a Pm of 0.7 (EA, page 13).
7. The detail description of Alternative 1, Proposed Action, was updated to include all activities considered and analyzed. This includes a description of small diameter tree treatments; monitoring related activities; and hazard tree activities, hazard tree guidelines, and marking tree guidelines (EA, pages 13-14).
8. The Alternatives Considered but Eliminated from Detailed Study section was updated to consider specific requests received from public comments (EA, pages 23-24).
9. Table 5 and Table 6 were updated to reflect current and accurate acres, miles, and percentages in terms of meeting the purpose and need and important issues (EA, pages 25-27).
10. A summary of context regarding the proposed action, cumulative effects, documents incorporated by reference, cumulative effects boundaries, and an ongoing and future project table were adding to the beginning of chapter 3 (EA, pages 29-31).
11. A safety section was added to chapter 3 to address hazard tree abatement and to disclose safety related direct, indirect, and cumulative effects (EA, pages 37-40).
12. The forest vegetation section and associated appendices to the EA were updated to include clarification regarding the prescribed Probability of Mortality and tree height (EA, pages 52-54).
13. The wildlife section was updated to consider public comments received during the 30-day comment period, specific to consultation with the U.S. Fish and Wildlife Service, California spotted owl, and black-backed wood pecker (EA, pages 66-67, 90-97, and 120-123).
14. A cultural resources section was added to clarify a no effect finding and clarify consultation with the State Historic Preservation Office (EA, pages 138-140).

CHAPTER 3: Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for the comparison of alternatives presented in Chapter 2.

In 1978, the Council on Environmental Quality promulgated regulations for implementing the National Environmental Policy Act (NEPA). These regulations (40 CFR Parts 1500 through 1508) include the definition of "significantly" as used in assessing a proposal's effects on the human environment under NEPA (40 CFR 1508.27). The 11 elements of this definition are critical to reducing paperwork through use of a "finding of no significant impact" when an action would not have significant effects on the human environment and would therefore be exempt from the requirement to prepare an environmental impact statement. Assessing the potential for significant effects under NEPA requires considerations of both the context and intensity of the effects of a proposed action.

The local context of the proposed action is limited to the northern and middle portion of the Plumas National Forest, in the locations displayed on the attached maps (Appendix A). The Plumas National Forest is comprised of approximately 1.2 million acres of national forest lands. The acreage proposed for treatment under the Walker Fire Recovery Project represent a fraction of one percent (approximately 3,742 acres in Alternative 1) of acreage of national forest lands on the Forest; the entire project area (which encompasses the area that burned in the Walker Fire) represents less than one percent (57,380 NFS acres) of the Forest's total acreage. Project activities would be conducted over a relatively short time period; salvage operations and road work would be conducted within the next year. Thus, in terms of the affected area, the proposed action would affect a small portion of the Plumas National Forest land-base over a relatively short timeframe.

Within this context of seasonality and duration of proposed activities, the environmental analyses prepared in support of this EA (Wildlife and Plant Biological Evaluations, Animal Biological Assessment, Management Indicator Species Report, Migratory Landbird Conservation Report, Noxious Weed Risk Assessment, Borax Evaluation, Cumulative Watershed Effects Analysis, Riparian Conservation Objectives, Archaeological Reconnaissance Report and environmental analyses of economics, forest vegetation, fire, fuels, and air quality, soils and hydrology, and recreation, which are hereby incorporated by reference and are available upon request or published on the project specific website (with the exception of the confidential Archaeological Reconnaissance Report). These analyses indicate that the proposed action would not pose significant short- or long-term effects on the environment. The context of the proposed action is limited to minor, local, short-term effects within the Walker Fire Recovery Project area. No significant effects, either long or short term, regional or societal, are anticipated.

The following parts present the analysis of effects in light of the ten factors that are used in evaluating the intensity of impacts on individual resources (i.e., forest vegetation, fuels and fire, soil productivity, hydrology and water quality, wildlife species, plant species, cultural resources, among others)[3].

Cumulative Effects

In order to understand the contribution of past actions to the cumulative effects of the proposed action, the analysis of cumulative effects herein relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach. First, a catalog

[3] Some minor differences in acreages and timber volumes may exist between sections of this document, other project documents, appendices, or reference documents. These minor differences are the result of rounding and/or differences in the resource analysis and methodologies employed by specialists in assessing impacts to various resource areas. Such minor differences do not in any way invalidate the analysis or conclusions.

and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), and trying to isolate the individual actions that continue to have residual impacts would be nearly impossible. Second, providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions. Additionally, focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed those effects. Third, public scoping for this project did not identify any public interest of need for detailed information on individual past actions. Finally, the Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions."

The cumulative effects analysis in this EA is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part: "CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives would add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloguing past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision-making (40 CFR1508.7)." Table 7 lists ongoing and reasonably foreseeable projects for the cumulative effects analysis.

For these reasons, effects analyses of past actions in this part are based on existing environmental conditions. With the exception of the analyses below, the cumulative effects boundary for each resource was the Walker Fire Recovery Project area. Explanation and maps of cumulative effects analysis areas can be found in the project record.

- The cumulative effects analysis area for economics is Plumas County.
- The cumulative effects analysis area for forest vegetation is the Walker Fire Recovery Project treatment units.
- The cumulative effects analysis area for the Forest Service Region 5 Sensitive, TES (threated, endangered, proposed, and candidate), and Management Indicator Species (MIS) wildlife species Western bumble bee, Sierra Nevada yellow-legged frog, foothill yellow-legged frog, California spotted owl, Northern goshawk, gray wolf, bats species (Townsend's big-eared bat, pallid bat, and fringed myotis), shrubland (West-slope chaparral) habitat (fox sparrow), and snags in burned forest ecosystem component (black-backed woodpecker) includes the entire Walker Fire footprint to consider other activities on USFS lands as well as those on private lands burned by the Walker Fire.
- The cumulative watershed effects (CWE) analysis area is bounded by nine 14 digit hydrologic unit (HU) drainages that have the potential to be impacted directly or indirectly (as well as cumulatively as discussed later in this chapter) by the proposed activity.
- The cumulative effects analysis area for soils is bounded by the treatment units where ground disturbing activities are proposed.

- The cumulative effects analysis area for cultural resources is all proposed treatment units and transportation systems that will be used in connection with the project.

Table 7. List of ongoing and future foreseeable projects within the Walker Fire perimeter

Ongoing	
Big Bar Salvage Timber Sale	Economics cumulative effects analysis only
Cradle Valley Service Contract	Economics cumulative effects analysis only
Antelope Roadside Decks	Economics cumulative effects analysis only
2020 Mt. Hough Ranger District Moonlight Fire Trail Maintenance	Trail maintenance (logout, brushing, tread work, bridge construction, signage) along the Antelope – Taylor Trail, Cold Stream Trail and Middle Creek Trail (non-motorized)
2021-2024 Sierra Buttes Trail Stewardship Trail Maintenance Agreement	Trail maintenance (logout, brushing, tread work) along the Antelope – Taylor Trail, Cold Stream Trail and Middle Creek Trail (non-motorized)
Range and Wildlife Habitat Improvement Project	Replace 26 miles of range allotment fencing, four water developments, and 3 cattle guard wings. Replace wildlife 11 wildlife guzzlers. All replacements will be within the same footprint.
Burned Area Emergency Response	Activities to mitigate effects of the Walker Fire that could cause imminent danger to life, property, or natural resources.
Plumas National Forest Firewood Program	Purchased firewood permit allows cutting and removing wood for fuel. Wood collected consists of fallen trees, non-merchantable material from previous operations, and dead trees along roads.
Plumas National Forest Christmas Tree Program	Purchased Christmas tree permit allows cutting and removing conifers 6 inch diameter at breast height.
Reasonably Foreseeable Future Actions	
2020 PNF Road and Trail Maintenance Project	Road and trail maintenance; hazard tree abatement; and fuels reduction on 3,193 acres.
Walker Reforestation Project	Site preparation; plant native conifer seedlings; and release with the potential use of herbicides. Unknown acres.

Economics

The purpose of this section is to summarize the economics analysis and compare the economic impacts of the alternatives (Proposed Action and No Action) identified in this Environmental Analysis. The methodology used and the assumptions made to evaluate the economic effects of each alternative is summarized below.

Background

The Walker Fire Recovery Project area is located on the Plumas National Forest (PNF) within both the Mt. Hough and Beckwourth Ranger Districts. Both Districts are primarily located within Plumas County. Plumas County has a population of just under 22,000 and contains a variety of employment sectors (Table 8). Quincy (the county seat) has an area population of about 7,000 people with only one incorporated town, Portola, located on eastern side of the county with population of about 2,000. The population of the county has grown quite slowly over time and contains U.S. National Forests covering over 70 percent of its area.

Activities on the Mt. Hough and Beckwourth Ranger District that contribute to economic security include grazing, logging, contracts, agreements, recreational concessions, special uses and other recreational opportunities. In addition, the PNF supports local communities through permits and easements. Management decisions emphasize environmental quality and the health and safety of Forest users. Residents within and adjacent to the National Forest System lands look to the Forest Service for protection from the effects of wildfires and other adverse

impacts to resources, such as air quality and water quality.

Plumas County Industry Composition

The major employment sectors in the industry sector in Plumas County are government, health care, and retail trade. These sectors have grown slightly between 2010 and 2015. Construction, Food services and manufacturing are also significant employment sectors. The largest manufacturing industry in Plumas County is sawmills and wood preservation and within the manufacturing sector, had the most growth between 2010 and 2015.

As shown in Table 8 below, between 2010 and 2008, the Plumas County mining and logging industry sector has maintained steady levels. Variability from year to year is the result of the cyclical nature of the industry. Employment generated by the timber industry in other sectors includes employment in logging services suppliers, mechanics, truckers, and consulting foresters.

Table 8. Plumas County Industry Employment Sectors by Number of Jobs Per Year[4]

Industry Sector	2010 jobs	2015 jobs	Change in jobs 2010-2015		Change in jobs 2015-2020	
Government	2,461	2,483	22	1%	(8)	(0%)
Health Care	563	660	97	17%	146	22%
Retail Trade	678	617	(61)	(9%)	(23)	(4%)
Construction	595	580	(15)	(3%)	(75)	(13%)
Accommodation and Food Services	582	569	(13)	(2%)	(38)	(7%)
Manufacturing	485	554	69	14%	(82)	(15%)
Arts, Entertainment, and Recreation	283	281	(2)	(1%)	6	2%
Other Services (except Public Administration)	450	280	(170)	(38%)	(6)	(2%)
Professional, Scientific, and Technical Services	235	232	(3)	(1%)	10	4%
Administrative and Support Services	205	202	(3)	(1%)	13	6%
Transportation and Warehousing	158	175	17	11%	28	16%
Utilities	146	150	4	3%	34	23%
Finance and Insurance	172	130	(42)	(24%)	(12)	(9%)
Real Estate and Rental and Leasing	99	95	(4)	(4%)	2	2%
Educational Services	57	93	36	63%	29	31%
Crop and Animal Production (Agriculture)	109	81	(28)	(26%)	(32)	(40%)
Wholesale Trade	59	69	10	17%	19	28%
Information	75	62	(13)	(17%)	1	2%
Management of Companies and Enterprises	16	26	10	63%	(4)	(15%)
Mining, Quarrying, and Oil and Gas Extraction	16	13	-3	-19%	6	46%

The Role of the Forest Service

The Plumas National Forest has, and will continue to, plan and implement vegetation management projects into the future. Harvest volumes on the Plumas National Forest between 2009 and 2019 have ranged from 30 to 90 million board feet (mmbf), with a 10-year average of approximately 50 mmbf per year. Maintaining the infrastructure for

[4]Source: Plumas County Labor Market Profile and Industry/Sector Analysis- Nov 2016.

logging and wood product processing is essential in allowing the Forest Service to meet multiple forest resource management objectives as well as providing economic security to Plumas County residents.

In recent years, the Agency's ability to offer economically viable timber sales on a consistent basis has been a concern. The current national and local economy has great influence on the ability of the Forest Service to award contracts for salvage harvest operations. Market conditions have been stressed, project implementation costs are rising, and although the value of sawlogs has been improving slightly or remaining steady for years, the more recent Covid-19 economic impacts has shown to decrease log value prices. Recovery and risk of investment is still a concern with salvage harvesting and hazard tree removal due to rapid deterioration of the fire killed trees. Other concerns in the industry include the availability of skilled woods workers, logging equipment, and trucks, and capacity at lumber mills and biomass facilities.

Timber sales that receive no bids incur large preparation costs with no implementation and resulting benefits to the resources involved. In order to plan and prepare a fire salvage project at the scale and within the timeframes of the Walker Fire Recovery Project, the Forest Service needs a large team of survey and inventory crews, resource specialists, field layout and contract preparation foresters, and marking crews. In such cases, this workforce begins work immediately after the fire due to the extremely tight timeline that is dictated by the deterioration of the fire killed trees. These employees are funded through annual appropriations allocated to the Forest. This funding is competitive between Regions and Forests. (Note that administrative costs, such as those described in this paragraph, are not included in the effects analysis.) Therefore, these offerings need to be attractive economically both from a Forest Service and timber industry standpoint in order to be successful and stimulate competition.

Additionally, most of the vegetation management projects (including implementation of any subsequent Walker related timber sales) prepared by the Forest Service are not suited for year around employment. Access to project areas is generally weather and/or resource (habitat dependent; some locations are only accessible for a short period of time, typically 5 to 6 months. Employees of the logging industry typically rely on other employment to supplement individual needs.

Methodology

The methodology used and the assumptions made to evaluate economic effects under each alternative are summarized herein. The cumulative effects analysis boundary is Plumas County. Lidar data or where available, site-specific tree measurement data provide the basis for harvest volume estimates for salvage tree removal treatments. For the purposes of this analysis, harvest volume estimates are based on average volume per acre of merchantable trees to be removed, i.e., trees greater than 12 inches diameter at breast height (dbh) weighted by treatment method and forest type using the Forest Service Pacific Southwest Region Timber Cruising Handbook (Forest Service Handbook 2409.12). All acreage and harvest volume figures in this analysis are approximate.

This analysis utilizes the most recent Region 5 Transaction Evidence Appraisal (TEA) to estimate the average sawlog value of proposed treatments under the proposed action (Alternative 1) for a portion of the treatment units. The remaining units have been extrapolated using factors from the TEA volumes, sawlog values, and haul costs, and applied to lidar derived volumes. Alternative 2 does not include commercial timber harvest. The estimated sawlog value is based on Base Period Weighted Average Quality Values, which provide the weighted average value over a mix of log sizes and species from sales offered statewide during the third quarter base period of 2020.

Assumptions Made

Project economic feasibility must consider individual components of the timber sale as well as the sale as a whole. Items such as volume per acre, volume by species, and total sale volume all impact a timber sale offering's marketability. Operational costs, including falling, bucking, skidding, loading, hauling, scaling, road work, slash treatment, and erosion control work, are measured against value at the mill to determine the net value and thereby the economic viability of the potential harvesting.

Sawlog Volume (CCF and mbf) and Species Composition. Volume estimates under Alternative 1 are based on measurements of trees in portions of the Walker Fire Recovery Project area. Volumes per acre and species from these measurements have been extrapolated to reflect the averages across the proposed project as a whole and documented in the Walker Fire Recovery Project record. No commercial harvest would occur under Alternative 2.

Harvest volumes used in this analysis are approximate.

Total Timber Net Value. Forest Service Pacific Southwest Region Transaction Evidence Appraisal (TEA) and Third quarter of 2020 Base Period data provide the basis for estimating the harvest costs and value of sawlogs to determine the net value of the harvesting operation as a whole. Measurements from trees in the Walker Fire and Lidar derived volumes were used in the estimates of volume and species composition.

Logging Costs. Approximate harvest costs are based on TEA Base Period average costs, including stump- to-truck, haul and scale, and erosion control. Road surface replacement and maintenance and brush disposal deposits are incorporated in the net value obtained from this appraisal process.

Direct Employment. The Walker Fire Recovery Project economic analysis assumes that approximately eight jobs are directly created in the lumber and wood products sectors for every million board feet of timber harvested under timber sale contracts (Johnson et al. 2007; Zhou 2015; Crone and Haynes 2001).

Employment "Multiplier" Effects. The 2001 *Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement* (SNFPA FEIS), Volume 2, Chapter 3, Part 6, (page 543) states: "An industry sector produces goods and services for consumers. As the economy produces goods and services, this production generates demand for other goods and services as inputs to production. Wages paid to workers in the sector also provide incomes for households; this allows workers to consume goods unrelated to their jobs. Multipliers describe the changes in demand for other products in response to increased demand for products or goods in one sector. Type II industry multipliers account for the additional employment generated by one job. Additional jobs come from the materials and services created to support that one job and from the personal consumption (spending) of the jobholder out of his or her salary."

Table 6.2b of the 2001 SNFPA FEIS (page 544) displays selected Type II industry multipliers from natural resource products by county and region. The Type II multiplier for Plumas County's logging and sawmill industries is 1.63. This number (1.63) was used to discuss the indirect employment effects of the alternatives.

Direct and Indirect Effects

The economic analysis for Alternative 1 is discussed with five measurements: 1) volume by species; 2) sale viability; 4) direct employment; and 5) indirect employment through the multiplier effect.

In order to meet the purpose and need of this project, the following activities are proposed:

- Salvage fire-killed trees on approximately 2,690 acres with ground-based equipment
- Abate and remove hazard trees on approximately 1,053 acres with ground-based equipment

Volume by Species

Table 9 shows the breakdown of volume proposed for salvage harvest and hazard tree removal in both thousand board feet (MBF) and hundred cubic feet (CCF) units of measure by species. The species composition is typical of mixed conifer forests in this area. The total volume estimate represents the amount of lumber needed to build as many as 1,690 homes that are 2,600 square feet in size (average size home built in 2013- Census Bureau) and assumes 6.3 board feet are required for every square foot of house.

Table 9. Walker Fire Recovery Project species composition and volume in MBF and CCF

Species	Percent of Species Composition	Volume MBF by Species	Volume CCF by Species
Douglas Fir	17	5,517	7,999
Incense Cedar	6	1,821	2,641
Sugar Pine/Western White Pine	2	481	697
White Fir/Red Fir	14	4,508	6,537
Ponderosa Pine/Jeffery Pine	59	18,851	27,333
Lodgepole pine	3	871	1,263
Totals		32,045	46,471

Implementation Costs

There are a number of implementation costs associated with the activities proposed under Alternative 1. The logging costs shown in Table 10 below incorporate all of the activities necessary to implement a timber sale contract. They include cutting and limbing trees, skidding them to a landing, branding logs, loading on trucks, and hauling them to a mill. Logging costs also include all erosion work, including scattering straw on skid trails and constructing water bars, ripping landings and high use skid trails, disposing landing slash, maintaining existing roads, constructing temporary roads, providing surface replacement deposits, and the profit and risk estimated to be in the bid for the timber.

Net value after harvesting is also displayed in Table 10 on a per CCF basis. Logging costs represent all of the activities described in the preceding paragraph associated with harvesting the 32 mmbf or 46,471 CCF of timber. These costs are estimated to be $155.79 per CCF. The value of the logs after all operations are completed is estimated to be $1 million and is based on the TEA appraisal system as previously described.

Table 10. Summary of Alternative 1 harvesting estimates for volume, cost, and net value[5]

Activity	Volume MBF	Volume CCF	Average Logging Cost* per CCF	Net Value after Harvesting
Harvesting	32,049	46,471	$154.65	$1,009,210

*Includes Stump to truck, hauling, slash work, erosion control, road maintenance, surface replacement deposit, temporary road cost, brush disposal.

Project Viability

Based on volume estimates, logging systems, log values, logging costs, sale size, timber quality, and operating restrictions, the proposed project should receive a valid bid as long as the deterioration has not progressed to the point of decreasing the value enough to cause a deficit condition by the time it is offered. At the expected bid rate, the gross timber sale revenue is estimated at approximately $8.1 million with approximately $1,009,210 of net revenue going directly to the USDA. Net revenue is the total value of the commercial timber harvested minus the logging costs (as described above) associated with removing commercial sized timber. Revenue generated by commercial timber harvest could be used to pay for any associated Knutson-Vandenberg (K-V) identified work to improve watershed condition within any subsequent sale area boundaries.

[5] Walker Fire Recovery Project Volume and Value estimate William Brendecke, Forest Silviculturist, June, 2020.

Employment

Under Alternative 1, it is estimated that about 256 jobs would be created in the lumber and wood products sector during implementation of the timber sale.

An additional 417 jobs (216 x 1.63) would be created through the multiplier effect. Not only would a continued supply of forest products be made available, Alternative 1 would promote an economic base for employment opportunities. Workers would need supplies, equipment, fuel, and repair shops, which would indirectly benefit the local community.

Alternative 2 (No Action)

Under Alternative 2, none of the activities proposed under Alternative 1 would be implemented. The No Action Alternative would not harvest any trees so gross timber sale revenue of approximately $8 million would not be realized. Approximately $1 million of net revenue at minimum bid rate would not be realized from a timber sale. No new jobs would be created as a result of Alternative 2. Alternative 2 would not create opportunities for dollars to be channeled through the economy. Lumber and wood products workers would not buy and shop for services locally. Additionally, seasonal employees and heavy equipment operators would likely seek employment, possibly away from the local area, further reducing the skilled labor force for forestry work.

Summary and Comparison of Effects

This analysis compares the timber sale and community stability values, as reflected in revenue to local industry and contributions to the employment base of local communities between Alternatives 1 and 2.

Alternative 1 would contribute toward community stability by providing the employment opportunities for woods and mill workers and revenue for local businesses.

The economic benefits, as indicated by community stability, revenue, and employment opportunities, are not the only values that Alternative 1 would benefit. The proposed action would also provide non- monetary benefits by providing the opportunities to recover the economic value of fire-killed trees and reduce the danger and difficulty of suppressing future wildfires by removal or rearrangement of high future fuel loading.

Under Alternative 1, approximately 32 million board feet of timber volume would produce approximately $1 million net revenue. It is anticipated that some of this revenue would be used to contribute back into the project under Knutson-Vandenberg (K-V) funded work. Implementation of Alternative 1 would directly and indirectly increase new employment opportunities and would provide as many as direct and indirect 417 jobs over time as harvest operations, milling activities were conducted.

Although Alternative 2 has no project costs, this alternative would provide no opportunities to meet the Purpose and Need for the Walker Fire Recovery Project. Alternative 2 would also provide no jobs or wages.

Under Alternative 2, no timber volume would be produced, no revenue would be generated, and no new jobs would be created.

Cumulative Effects

Past, present, and reasonably foreseeable future actions on the Plumas National Forest cumulatively contribute to the economic effects analysis. Factors considered in the cumulative effects analysis include annual Forest volume estimates, gross timber value, and direct and indirect employment. From fiscal year 2012 through 2016, approximately 64.4 million board feet (mmbf) of timber per year was sold on Plumas National Forest; approximately $4 million per year was collected from harvesting. From years 2017-2019 the annual board feet average has dropped slightly to 53 mmbf. The volume harvested and revenue generated has directly contributed back to service work and partnerships on the Plumas to provide inputs to the local economy.

Present or ongoing actions (e.g. Big Bar Salvage, Cradle Valley Service Contract, Antelope Lake Roadside Decks and others) are contributing to the annual Forest average. The proposed action (Alternative 1) would allow the Plumas to return to the annual average timber volume production of 2012-2016 and thereby increase employment opportunities associated with removal of forest products and implementation of service work.

Alternative 1 would positively contribute to beneficial impacts associated with other nearby projects (specifically the Big Bar Salvage, Cradle Valley and Antelope Lake Roadside Deck sales along with others) in maintaining infrastructure for logging and wood product processing and supporting contractors.

Under Alternative 2, no timber volume would be cut or sold. There would be no direct or indirect economic effects associated with salvage harvest, under Alternative 2, and therefore no cumulative effects.

Safety

Introduction

This section addresses hazard tree abatement within the Walker Fire Recovery Project by disclosing direct, indirect, and cumulative effects of two alternatives. This section includes topics like annual fall rates, deterioration and risks to people in the project area.

Background

There are approximately 150 miles of roads in the Walker Fire perimeter accessible to the public and forest workers (Table 11). These individuals are at risk from dead and dying trees located along roads, as the trees deteriorate, become unstable, and eventually fall (Angwin et al. 2012). Falling trees may strike individuals, or their vehicles or may block road access, trapping people in the area. The influence of fire has increased the annual snag fall rate from 8 percent in unburned conditions to an annual rate of 20 percent in burned conditions in Eastside Pine Forests (Landram et al. 2002). Annual fall rates vary by species and diameter. Fall rates are greater for smaller diameter classes. It takes just 6 years for 50 percent of fire-killed Jeffrey pine and ponderosa pine to fall. It takes 8 years for 50 percent of the fire-killed white fir to fall. The fall rates appear to be slow at first, then increase as time goes by, and then decrease again. Fire killed trees may also have structural damage from fire scarring of the bole and burned roots, accelerating their eventual fall. In addition to roadside hazards, dead trees pose hazards to firefighters suppressing future wildfires, hikers, loggers, slash crews, tree planters, and workers conducting future prescribed burns or other resource management projects on both National Forest System and private lands.

Table 11. Miles of roads in the Walker Fire perimeter.

Road Ownership	Miles
COUNTY, PARISH, BOROUGH	6.8
NATIONAL FOREST SYSTEM ROAD	134.84
CLOSED	8.15
PRIVATE	0.01
STATE HIGHWAY	0.0
Grand Total	149.94

Effects Analysis Methodology

Geographic Spatial and Temporal Boundaries

The cumulative effects analysis boundary for safety is the Walker Fire perimeter. Short-term duration for effects is 2 years to account for implementation of proposed activities. Long-term duration for effects is 5 years to account for ongoing and future foreseeable actions or projects.

Alternative 1 (Proposed Action) – Direct and Indirect Effects

Alternative 1 abates and removes roadside hazards from 40 miles of roads in the Walker Fire Recovery Project area (1,053 acres). Alternative 1 proposes to abate and remove hazard trees on almost 2 percent of public lands in the Walker Fire perimeter. Along roadsides the vast majority of trees with structural defects, likely to cause failure in all or part of the tree that may fall and hit the road prism would be removed. Danger to the public from falling snags would be reduced along roads. Removing hazard trees along roads also reduces immediate and long-term exposure to potential injuries that could result from having to buck downed logs out of the roadway. These

activities are localized and/or restricted to roadsides causing short-term effects and benefits to public safety to occur only in these areas. Based on past roadside hazard projects on the Plumas National Forest, the roadside hazard portion of the project directly reduces the short and long-term risk of injury or death to the public, Forest Service employees and contractors and reduces damage to roads or property along traveled routes within the project area. Removal of hazard trees and the subsequent treatment of activity slash effectively meet the desired conditions within the project by mitigating hazards and providing for public safety along roads and facilities. Effective ground cover would be provided to stabilize soils and reduce erosion potential while not exceeding fuel arrangement leading to hazardous fuel conditions. The ability for fire suppression resources to access the areas within the Walker Fire perimeter and prevent further loss of forested/ vegetation cover in an event of a wildfire is greatly increased.

In the salvage recovery units, dead and dying trees are retained in the snag retention areas, RCAs, and in resource protection areas, posing a risk to workers and the public in these areas which would not be abated by the project. Risks from falling snags would also remain along some streams and where dispersed recreation occurs.

One short-term effect of the project is an increased risk to loggers and crews implementing the project from dead trees that are currently unstable, and smaller snags that deteriorate quickly.

If future actions or projects were undertaken, contractors, crews, and personnel would be at reduced risk of injury or death from falling snags along roadways and salvage treatment units.

There is a short-term increased risk of vehicle accidents under the action alternative due to the increased traffic from logging. The number of log trucks, crew vehicles, and individual cars and trucks would increase substantially during the next 1 to 2 years to accomplish the work required under the alternatives. This increase would affect safety on the NFS roads within the fire area as well as California State Highway 70/89. Upwards of 50 log truck loads per day would be hauling from the Walker Fire area from National Forest System lands during the late summer and fall of 2020 and possibly 2021. The risk of a collision is greatest where trucks are entering or exiting the highway. The Forest Service requires safety signing as part of the administration of timber sale contracts, which alerts the public to traffic hazards.

The Walker Fire Recovery Project as proposed creates a safer environment by reducing the danger and difficulty of suppressing future wildfires and for scientific research to be conducted in treatment units. In addition, the abatement and removal of these hazard trees contributes to the project's purpose of economic recovery of fire-killed and fire-injured trees.

Alternative 1 (Proposed Action) - Cumulative Effects

Under the proposed action alternative specific roads that are currently closed would be able to reopen, allowing wood cutting, recreation, road maintenance, and implementation of the Walker Fire Recovery Project, including research to study the effects of large, high-intensity fires. Reopening of these roads would also allow the 2020 Plumas National Forest Road and Trail Maintenance Project and future reforestation work to proceed. Wood cutting by locals provides needed firewood to supplement the use of gas, and electricity to heat homes during the winter. On-going recreation includes fishing and dispersed camping.

The purpose and need of the 2020 Plumas National Forest Road and Trail Maintenance Project is to provide for safe travel along 182 miles of NFS roads, and on motorized and non-motorized trails within the fire area that are not included in the Walker Fire Recovery Project. Capturing additional, incidental hazards through the 2020 PNF Road and Trail Maintenance Project would therefore further reduce hazards in the Walker Fire perimeter. Under the road and trail maintenance project, approximately 2,172 acres are being considered for removal of incidental fire-killed and fire-injured trees that meet hazard tree guidelines; these hazards would be abated by hand or with mechanical equipment that does not leave the road prism, and would result in a reduction of standing snags near the roadway and trails. Since roadside hazard and danger tree abatement and/or removal activities are limited to 150 to 200 feet on either side of the road, these effects are localized and restricted to roadsides and trails.

There are approximately 57,380 acres of NFS lands within the Walker Fire perimeter. Approximately 3,225 acres of roadside hazard or danger tree removal is proposed or will be implemented within the Walker Fire perimeter, including both the Walker Fire Recovery Project and the 2020 Plumas National Forest Road and Trail

Maintenance Project. This amounts to approximately 5.6 percent of public lands within the analysis area that will have improved safety for road and trail users on the Forest.

Some hazard tree abatement, conducted as part of the an emergency response during fire suppression, already occurred along approximately 11 miles (250 acres) of NFS roads (Antelope Lake and Beckwourth-Genesee roads) or an additional 0.5 percent of the analysis area. Cumulatively, hazard tree abatement will occur on approximately 3,475 acres of NFS roads, for a total of 6.1 percent of the total acres treated within the Walker Fire perimeter. Since the removal of hazardous, fire-killed and fire-injured trees would only occur along roadsides and in moderate and high vegetation burn severity areas, the effects would be limited to these areas, and subsequently, dispersed across the 58,787 acre analysis area resulting in a minimal scale of effects.

Cumulatively, these projects as proposed create a safer environment by reducing the danger and difficulty of suppressing future wildfires and for scientific research to be conducted in treatment units. In summary, the Alternative 1 would have a positive cumulative effect on public and forest worker safety and the ability to maintain roads in the Walker Fire area.

Alternative 2 (No Action) – Direct and Indirect Effects

Under alternative 2, all dead and dying trees proposed for removal under the Walker Fire Recovery Project would be retained, posing a very high risk to the public and forest workers along those roads and areas as time goes on. The public would be at risk from snags falling into roads as they drive by. Activities such as driving and hiking would be dangerous where snags are numerous.

As standing dead hazard trees begin to fall and intermix with smaller surface and ladder fuels, and newly established brush, and standing snags continue to deteriorate and become more unstable, suppression of future wildfires becomes extremely difficult and increasingly unsafe.

If future actions or projects were undertaken, contractors, crews, and personnel would be at great risk of injury or death from falling snags along roadways. Small snags would pose a risk in approximately one to three years. Larger snags may become a high risk after two or more years, by six years over half of the snags may have fallen (Landram et al. 2002). Without hazard tree removal, future seedling tending, thinning, and prescribed burning in the proposed roadside areas would be high-risk endeavors, and may be precluded due to the risk to workers; this work would likely not continue because access would be compromised by hazard trees in some areas.

On the Storrie Fire of August, 2000 on the Lassen National Forest, the deteriorated timber resulting from delay created such extreme safety risks that a timber sale contract was cancelled after it was awarded (Franco, personal communication, 2009). The Romeo #2 Fire Salvage Sale was one of three fire salvage sales awarded from the Storrie Fire (Franco, personal communication, 2005). Logging on the sale started 3 years after the fire. After three days of cutting trees using feller bunchers (machines that cut trees and lay them on the ground), the timber sale purchaser shut down his operations because crumbling portions of trees were hitting the feller buncher, threatening the safety of the operator. Eighty to ninety percent of the trees being cut were breaking off, leaving only 8 to 12 feet of the lower portion of the tree intact. Some trees were as large as 30 inches diameter. The agreement to cancel the contract noted that “field operations indicated that the included trees are too unstable to safely harvest with mechanical harvesters” and “due to the recurring problem of trees falling on top of the harvesters while the tree is being cut and placed on the ground, there is a danger that one of the trees will come through the roof of the harvester”.

This example illustrates the safety risk posed to workers, including firefighters, working in the vicinity of high levels of snags. Fire fighters typically need to fell snags near firelines. This activity would be unacceptably dangerous, resulting in the fire fighters needing to retreat to areas of low to no snags for effective and safe firefighting.

The safety risks posed by breaking and falling snags would ultimately preclude safe firefighting, tree planting, fuel treatment and other uses by humans of the fire area. Log truck traffic would not increase under this alternative, and this alternative would not contribute to cumulative effects on safety from traffic accidents.

There would be no additional vehicle traffic due to the operations. Due to unabated safety concerns, the Forest may

maintain road closures currently in place until enough appropriated dollars would be obtained to treat the roadside hazards internally or under service contracts, and a new environmental analysis may then need to be prepared. With no action, the purpose and need for recovering the economic value of trees killed by the Walker Fire would not be fulfilled. Nor would the purpose and need to reduce the danger and difficulty of suppressing future wildfires.

Alternative 2 (No Action) - Cumulative Effects

Under alternative 2 the Forest may extend the current closure order for NFS roads and trails once trees began to fall at such a rate that they cannot safely be treated by a road or trail crew. The Forest would likely invest resources in terms of fire crews and other personnel to address falling hazards and remove them for roadways to provide access. The 2020 PNF Road and Trail Maintenance Project would still abate incidental hazards on an additional 2,172 acres within the Walker Fire perimeter. Implementation of this project, without the implementation of the Walker Fire Recovery Project, would prove to be very complicated, time consuming, and expensive on at least 40 miles of NFS roads (1,053 acres).

Cumulatively, incidental hazards along NFS roads and trails on 2,172 acres would still be treated and hazards abated during the emergency response on 250 acres totals 2,422 acres. Therefore, approximately four percent of the NFS lands within the Walker Fire perimeter would be treated to abate and remove hazards.

Potential future actions or projects within the Walker Fire perimeter that overlap with the Walker Fire Recovery Project treatments would likely not occur due to safety reasons. Reforestation activities would not be allowed to occur in the treatment units for safety reasons after one year. No seedling release would occur unless it happened in the next year. Mining operations, wood cutting, recreation, road maintenance, and reforestation work would be limited or not occur at all. Miners and recreation users would have to find alternative ways to enter the project area either through alternative routes or by hiking into the Walker Fire area.

It has been the Plumas National Forest's experience that trees begin to fall in concentrations approximately one year after the fire (Lazzarino, personal communication, 2008). After that time much of the road maintenance would not be able to proceed, which could have very serious watershed effects. Corky Lazzarino, former Resource Maintenance Team Leader for the Forest, testified in a declaration during the Moonlight Roadside Safety and Hazard Tree Removal Project litigation that after a fire burns through an area the interval of road maintenance in the fire perimeter changes to an annual cycle because culverts plug quickly. This yearly maintenance schedule typically occurs for several years (Lazzarino, personal communication, 2008). If the road maintenance were not to occur due to road closure for safety reasons then "there could be increased soil movement in the high severity areas, some rockfall would occur, and trees and debris would fall into the drainages and culvert pipe inlets. There would also be increased flashy runoff from the high severity burn areas. It is predictable that the majority of the culverts would clog in the first year or two, and the roads would wash out as the culverts failed. The resulting damage would create a severe impact to the watershed and wildlife, as well as to downstream residences."

There are special use permits within the Walker Fire perimeter as well as a lot of public enthusiasm around Antelope Lake. The Antelope Recreation Area includes campgrounds, NFS roads and trails, a boat ramp, and other recreation opportunities. Antelope Lake is moderately used destination because of its more remote location, located in the northeastern part of the Mt. Hough Ranger District, with 15 miles of shoreline, and protected covers that attract several species of migratory birds and nesting bald eagles. Antelope Lake is conveniently located at near the administrative boundary shared with the Lassen National Forest. The NFS transportation network allows Forest visitors to access Antelope Lake from Janesville, California, Lassen County and Beckwourth, California, Plumas County. Forest visitors from Susanville, California and the north, and Reno, Nevada and the east generally access Antelope Lake from these essential Forest highways.

In summary, alternative 2 would have a detrimental effect to public and forest worker safety and the ability to maintain roads in the Walker Fire perimeter, causing unnecessary damage to resources and potential requiring continued closures of the area to mining, recreation use and future project work including reforestation, fuels reduction, and roadside hazard work. The purposes of recovering the economic value of fire-killed and fire-injured trees; reducing danger and difficulty of future wildfire suppression, and scientific research would not be realized.

Forest Vegetation

Introduction

The information presented in the Forest Vegetation section includes a background of pre-fire conditions, fire effects, silvicultural analysis, and foreseeable cumulative impacts to existing forested vegetation relative to the proposed actions.

The proposed action treatments of salvage and hazard tree abatement and removal across 3,742 acres for the Walker Fire Recovery Project within the Walker Fire perimeter were originally recommended by silvicultural resource personnel.

Background

Pre-fire Stand Conditions

The elevation of the Walker Fire Recovery Project treatment units generally ranges from 4,500 feet to 6,500 feet. The project area spans the central and east side of the northern Sierra Nevada mountain range. Treatment units are located within two ranger districts of the Plumas National Forest, the Beckwourth Ranger District on the east side, and the Mount Hough Ranger District on the west side. Stands on the east side of the project area are primarily composed of eastside pine vegetation type, which is dominated by Jeffrey pine and ponderosa pine, with some white fir component. Stands in the middle and western part of the project area are dominated by Sierran Mixed Conifer which includes ponderosa pine, Jeffrey pine, incense cedar, Douglas-fir, sugar pine, white fir, and scattered hardwoods (black oak). Lodgepole pine exists within meadows and meadow edges, more frequently on the east side of the project area. South-facing slopes are more pine-dominant and tend to have a more open canopy, and north-facing slopes have more fir component and have denser canopy cover. See Table 13for acres of each vegetation type within the treatment units.

On public and private lands, past harvest activities focused on removal of dominant and co-dominant trees, sanitation cuts, and even-aged management. In the 1940s through the 1960s, some units included in the Walker Fire Recovery Project were harvested to remove the large timber and left non-commercial timber, leaving few large trees and many small understory trees. Other units were harvested during the 1970s to 1990s which focused on even-aged management and sanitation cuts, which removed live dominant and co-dominant trees, removed dead and dying trees, and established conifer plantations. These practices, combined with untreated areas, may have contributed to high severity burned patches in the Walker Fire.

More recently, management of National Forest System lands has been restoration-based and focused on hazardous fuel reduction. However, the units treated within this project have not had the opportunity to receive these restoration and fuels-reduction based treatments because the value of the timber within the units did not support building and maintaining roads to access the units. Many of these units were initially harvested when there were fewer mitigations to implementation and there was volume in the units to support timber removal. Ideally these units would have received restoration based treatment; some were evaluated during the Plumas Audubon Genesee Valley Wildfire Restoration Plan on the Mount Hough Ranger District, and some units were being evaluated to be part of a planning project on the Beckwourth Ranger District. The Beckwourth Ranger District units were burned before a planning decision was signed, and the Mount Hough Ranger District proceeded with a few smaller projects that did not include large scale mechanical thinning.

The California Wildlife Habitat Relationships System (Mayer and Laudenslayer 1988) was used for vegetation typing. California Wildlife Habitat Relationships (CWHR) vegetation typing (Mayer and Laudenslayer 1988) and fire severity (Miller and Thode 2007) are used to measure cumulative effects of alternatives on landscape structure and diversity (Table 12). CWHR vegetation type, size class and density is an effective proxy for seral stages and may be used to display the relative distribution of seral stages because it describes vegetation type, average tree size and canopy cover. In addition, this allows for a congruent analysis of effects on forest vegetation and wildlife habitat. Size classes 0-3 are usually indicative of young seral stages best described as dominated by seedlings, saplings and pole-sized stands with small trees. Larger size classes are often interpreted as mid to later seral stages. Density of forest cover is often expressed in terms of canopy cover. Stands consisting of size class 5 over a distinct

layer of size class 4 or 3 trees with a minimum of 60 percent canopy cover are classified as CWHR 6D. All vegetation information is displayed using CWHR vegetation typing and serves as the baseline acres for analysis. See Appendix C of the Forest Vegetation documentation for tables defining CWHR diameter size class and density canopy cover.

Changes to Vegetation/ Forest Types[6] due to the 2019 Walker Fire

The 2019 Walker fire caused dramatic changes to forested and non-forested CWHR vegetation types. Table 12 presents the categorical breakdown of CWHR forest/ non-forested cover types cross-referenced by four categories of burn severities. This table uses the assumption that at minimum the high severity fire burn category has caused loss of forested or non-forested cover (deforested) within those coordinating acres.

The Walker Fire burned with a range of fire burn severities in a variety of previously forested and non-forested CWHR types, sizes classes and percent canopy covers. In addition, the Walker Fire encountered various stand structures and seral stage due to the interactions of previous wildfire burn areas and previous management activities from the past decades. As a result, the Walker Fire high burn severities has shifted much of the landscape (about 50 % of the entire burn area) to the stand initiation phase of forest development (Oliver and Larson 1996). For example, where the Walker fire overlapped with previous burned areas (i.e. Antelope Complex and Moonlight Fires), the Walker Fire re-burned in about 11,000 acres of chaparral vegetation cover (non-forested type). Here, this chaparral cover represents the result of vegetation cover type conversion (forested to non-forested) from these previous high severity fire burn areas. As a result of the 2019 Walker Fire, at least 7,000 acres of these 11,000 acres re-burned at high severity reintroducing (i.e. starting over) the stand initiation phase of forest development (Oliver and Larson 1996). Where high severity fire overlapped with forested cover, the result or stand initiation phase of forest development has also occurred. Overall and when accounting for areas capable of supporting forested cover (i.e. at least 10 % canopy cover) and extensive high severity effects, about 28,000 acres are considered in the stand initiation phase or forest development or currently deforested.

Table 12. California Wildlife Habitat Relationship vegetation/forest types, size classes, density classes by 2019 Walker Fire severities (pre-fire).

California Wildlife Habitat Relationship			**Acres**				
Forest/Vegetation Type	**Size Class (inches)**	**Canopy Cover (percent)**	**Unburned**	**Low severity**	**Moderate severity**	**High severity**	**Grand Total**
Annual Grassland	<Null>	Not Determined / Not Applicable	141	91	66	159	456
	<Null> Total		**141**	**91**	**66**	**159**	**456**
Annual Grassland Total			**141**	**91**	**66**	**159**	**456**
Aspen	1.0" - 5.9" DBH	10.0 - 24.9%				1	1
		40.0 - 59.9%	1	1	1	0	3
	1.0" - 5.9" DBH Total		**1**	**1**	**1**	**2**	**5**
	11.0 - 23.9" DBH	10.0 - 24.9%	2	2	2	2	8
		60.0% and up	0	0	0		1
	11.0 - 23.9" DBH Total		**2**	**2**	**2**	**2**	**8**

[6] Classification of "Forest or Forest Types" implies at least 10% canopy cover exists by tree species within these acres. Non-forested types are a group lumping of Non-forest types (i.e. <10% canopy cover of tree species) and includes Annual Grassland, Barren, Mixed Chaparral, Montane Chaparral, Montane Riparian, Perennial Grassland, Sagebrush, Wet Meadow

Aspen Total			**3**	**3**	**2**	**4**	**13**
Barren	<Null>	Not Determined / Not Applicable	30	43	41	44	157
	<Null> Total		**30**	**43**	**41**	**44**	**157**
	Not Determined / Not Applicable	Not Determined / Not Applicable	3	1	1	1	6
	Not Determined / Not Applicable Total		**3**	**1**	**1**	**1**	**6**
Barren Total			**33**	**43**	**41**	**44**	**163**
Eastside Pine	1.0" - 5.9" DBH	10.0 - 24.9%	12	29	26	120	188
		25.0 - 39.9%	0	1	0	0	2
		40.0 - 59.9%	0				0
	1.0" - 5.9" DBH Total		**13**	**30**	**26**	**120**	**190**
	6.0" - 10.9" DBH	10.0 - 24.9%	473	219	213	359	1,263
		25.0 - 39.9%	65	113	80	210	469
		40.0 - 59.9%	25	36	10	1	72
		60.0% and up	9	1	1	0	10
	6.0" - 10.9" DBH Total		**571**	**369**	**304**	**569**	**1,814**
	11.0 - 23.9" DBH	10.0 - 24.9%	271	476	375	587	1,709
		25.0 - 39.9%	967	1,281	781	1,269	4,298
		40.0 - 59.9%	679	773	409	915	2,777
		60.0% and up	166	81	27	43	317
	11.0 - 23.9" DBH Total		**2,083**	**2,611**	**1,593**	**2,814**	**9,101**
	24.0" and up	10.0 - 24.9%	10	21	20	19	70
		25.0 - 39.9%	23	43	31	66	163
		40.0 - 59.9%	109	100	38	94	342
		60.0% and up	11	17	9	28	65
	24.0" and up Total		**153**	**182**	**99**	**207**	**640**
Eastside Pine Total			**2,819**	**3,193**	**2,022**	**3,711**	**11,745**
Jeffrey Pine	6.0" - 10.9" DBH	10.0 - 24.9%	2	5	9	178	193
		25.0 - 39.9%	13	4	4	190	211
	6.0" - 10.9" DBH Total		**15**	**9**	**12**	**368**	**404**
	11.0 - 23.9" DBH	10.0 - 24.9%	63	51	36	29	180

		25.0 - 39.9%	6	19	21	71	117
		40.0 - 59.9%	9	11	6	15	41
	11.0 - 23.9" DBH Total		**78**	**82**	**63**	**115**	**338**
	24.0" and up	10.0 - 24.9%	1	4	14	20	38
		40.0 - 59.9%	1	2	1	0	4
	24.0" and up Total		**2**	**6**	**14**	**20**	**42**
Jeffrey Pine Total			**94**	**97**	**89**	**503**	**783**
Lacustrine	<Null>	Not Determined / Not Applicable	2	1	1	1	4
	<Null> Total		**2**	**1**	**1**	**1**	**4**
Lacustrine Total			**2**	**1**	**1**	**1**	**4**
Low Sage	<Null>	Not Determined / Not Applicable	17	4	1	1	23
	<Null> Total		**17**	**4**	**1**	**1**	**23**
Low Sage Total			**17**	**4**	**1**	**1**	**23**
Mixed Chaparral	<Null>	Not Determined / Not Applicable	143	104	105	157	509
	<Null> Total		**143**	**104**	**105**	**157**	**509**
Mixed Chaparral Total			**143**	**104**	**105**	**157**	**509**
Montane Chaparral	< 1.0" DBH	Not Determined / Not Applicable	496	152	295	2,456	3,399
	< 1.0" DBH Total		**496**	**152**	**295**	**2,456**	**3,399**
	<Null>	Not Determined / Not Applicable	262	128	84	612	1,086
	<Null> Total		**262**	**128**	**84**	**612**	**1,086**
	Not Determined / Not Applicable	Not Determined / Not Applicable	1,061	524	645	4,112	6,342
	Not Determined / Not Applicable Total		**1,061**	**524**	**645**	**4,112**	**6,342**
Montane Chaparral Total			**1,819**	**803**	**1,024**	**7,180**	**10,827**
Montane Hardwood	1.0" - 5.9" DBH	25.0 - 39.9%	3	15	15	11	44
	1.0" - 5.9" DBH Total		**3**	**15**	**15**	**11**	**44**
	6.0" - 10.9" DBH	25.0 - 39.9%	31	51	17	57	156
	6.0" - 10.9"		**31**	**51**	**17**	**57**	**156**

	DBH Total						
Montane Hardwood Total			**33**	**66**	**32**	**68**	**201**
Montane Hardwood-Conifer	6.0" - 10.9" DBH	40.0 - 59.9%	0	7	5	10	23
	6.0" - 10.9" DBH Total		**0**	**7**	**5**	**10**	**23**
	11.0 - 23.9" DBH	25.0 - 39.9%	41	139	173	373	726
		60.0% and up	10	13	5	0	28
	11.0 - 23.9" DBH Total		**51**	**152**	**179**	**373**	**755**
	24.0" and up	25.0 - 39.9%	1	0	0		1
		60.0% and up	1	4	4	0	9
	24.0" and up Total		**1**	**4**	**4**	**0**	**10**
Montane Hardwood-Conifer Total			**52**	**163**	**188**	**384**	**787**
Montane Riparian	<Null>	Not Determined / Not Applicable	109	87	57	96	349
	<Null> Total		**109**	**87**	**57**	**96**	**349**
	1.0" - 5.9" DBH	10.0 - 24.9%	21	23	17	12	74
		25.0 - 39.9%	9	11	7	16	42
		40.0 - 59.9%	2	3	2	1	7
		60.0% and up	5	3	1	0	9
	1.0" - 5.9" DBH Total		**37**	**39**	**26**	**29**	**131**
	6.0" - 10.9" DBH	25.0 - 39.9%	19	1			20
	6.0" - 10.9" DBH Total		**19**	**1**			**20**
	11.0 - 23.9" DBH	10.0 - 24.9%	5	1	1	1	8
		25.0 - 39.9%	5	4	1	1	11
		60.0% and up	1	0			11
	11.0 - 23.9" DBH Total		**11**	**6**	**2**	**2**	**20**
Montane Riparian Total			**175**	**133**	**85**	**127**	**520**
Perennial Grassland	< 1.0" DBH	Not Determined / Not Applicable	33	1	7	10	51
	< 1.0" DBH Total		**33**	**1**	**7**	**10**	**51**
	<Null>	Not Determined / Not Applicable	386	187	169	374	1,116
	<Null>		**386**	**187**	**169**	**374**	**1,116**

	Total						
	Not Determined / Not Applicable	Not Determined / Not Applicable	11	10	8	8	37
	Not Determined / Not Applicable Total		**11**	**10**	**8**	**8**	**37**
Perennial Grassland Total			**430**	**198**	**184**	**392**	**1,204**
Ponderosa Pine	1.0" - 5.9" DBH	10.0 - 24.9%	5	10	1		15
	1.0" - 5.9" DBH Total		**5**	**10**	**1**		**15**
	6.0" - 10.9" DBH	10.0 - 24.9%	1	8	8	42	59
		25.0 - 39.9%	0	15	44	252	311
		40.0 - 59.9%	14	41	10	0	65
	6.0" - 10.9" DBH Total		**16**	**64**	**62**	**294**	**436**
	11.0 - 23.9" DBH	10.0 - 24.9%	9	10	11	42	72
		25.0 - 39.9%	20	35	46	170	271
		40.0 - 59.9%	10	41	50	144	246
		60.0% and up	0	0	0		1
	11.0 - 23.9" DBH Total		**40**	**86**	**107**	**356**	**590**
	24.0" and up	25.0 - 39.9%	2	5	1	8	16
		40.0 - 59.9%	1	13	27	54	95
		60.0% and up			1	67	68
	24.0" and up Total		**3**	**18**	**29**	**129**	**179**
Ponderosa Pine Total			**63**	**178**	**199**	**780**	**1,220**
Red fir	11.0 - 23.9" DBH	25.0 - 39.9%	0	2	0		3
	11.0 - 23.9" DBH Total		**0**	**2**	**0**		**3**
Red fir Total			**0**	**2**	**0**		**3**
Sagebrush	< 1.0" DBH	Not Determined / Not Applicable	28	2	0	0	30
	< 1.0" DBH Total		**28**	**2**	**0**	**0**	**30**
	<Null>	Not Determined / Not Applicable	1,152	717	602	807	3,277
	<Null> Total		**1,152**	**717**	**602**	**807**	**3,277**
	Not Determined	Not Determined /	49	18	23	27	117

	/ Not Applicable	Not Applicable					
	Not Determined / Not Applicable Total		**49**	**18**	**23**	**27**	**117**
Sagebrush Total			**1,228**	**737**	**625**	**834**	**3,424**
Sierran Mixed Conifer	1.0" - 5.9" DBH	10.0 - 24.9%	5	6	2	2	15
		25.0 - 39.9%	0	0	1	10	11
		40.0 - 59.9%	2	1	2	23	28
	1.0" - 5.9" DBH Total		**6**	**8**	**4**	**35**	**53**
	6.0" - 10.9" DBH	10.0 - 24.9%	3	15	26	196	239
		25.0 - 39.9%	21	26	23	477	547
		40.0 - 59.9%	15	4	7	39	65
		60.0% and up	14	17	9	37	77
	6.0" - 10.9" DBH Total		**53**	**62**	**65**	**749**	**929**
	11.0 - 23.9" DBH	10.0 - 24.9%	368	342	331	881	1,922
		25.0 - 39.9%	544	785	672	1,940	3,942
		40.0 - 59.9%	1,164	1,301	1,045	5,854	9,364
		60.0% and up	877	529	287	1,529	3,221
	11.0 - 23.9" DBH Total		**2,953**	**2,957**	**2,335**	**10,204**	**18,448**
	24.0" and up	10.0 - 24.9%	11	34	70	155	271
		25.0 - 39.9%	88	142	121	174	524
		40.0 - 59.9%	329	321	257	1,391	2,299
		60.0% and up	337	363	306	2,207	3,214
	24.0" and up Total		**766**	**860**	**754**	**3,927**	**6,308**
Sierran Mixed Conifer Total			**3,778**	**3,887**	**3,158**	**14,915**	**25,738**
Wet Meadow	<Null>	Not Determined / Not Applicable	6	8	7	15	37
	<Null> Total		**6**	**8**	**7**	**15**	**37**
Wet Meadow Total			**6**	**8**	**7**	**15**	**37**
White fir	1.0" - 5.9" DBH	10.0 - 24.9%	6	0			6
	1.0" - 5.9" DBH Total		**6**	**0**			**6**
	6.0" - 10.9" DBH	10.0 - 24.9%	1	0			1
		25.0 - 39.9%	6	1	0	0	8

		40.0 - 59.9%	6	1	1		9
		60.0% and up	205	66	30	81	382
	6.0" - 10.9" DBH Total		**218**	**68**	**32**	**81**	**399**
	11.0 - 23.9" DBH	10.0 - 24.9%	4			5	10
		25.0 - 39.9%	6	3	5	10	24
		40.0 - 59.9%	276	64	21	29	391
		60.0% and up	159	27	11	27	225
	11.0 - 23.9" DBH Total		**446**	**94**	**37**	**72**	**649**
	24.0" and up	25.0 - 39.9%				2	2
		40.0 - 59.9%	36	17	5	11	69
	24.0" and up Total		**36**	**17**	**5**	**13**	**71**
White fir Total			**705**	**180**	**74**	**166**	**1,125**
Grand Total			**11,544**	**9,892**	**7,904**	**29,441**	**58,781**

Acres are approximate.

The majority of vegetation size classes within treatment units are California Wildlife Habitat Relationship (CWHR) 4, which range from 11.0-24.0 inches diameter at breast height (DBH). There are lesser amounts of size class CWHR 5 (>24.0 inches DBH) and a minor component of size class 3-X (<11.0 inches DBH) in the treatment units. See Table 13 for details of acres of CWHR size class and pre-fire canopy cover density within the treatment units.

Table 13. California Wildlife Habitat Relationship (CWHR) vegetation stand types within Walker Fire Recovery Project treatment units (pre-fire)

CWHR Stand Type	Acres within Treatment Units	Percent of total treatment vegetation
Sierran Mixed Conifer (SMC)	2,447 acres	65% of treatment units
Eastside Pine (EPN)	1,021 acres	27% of treatment units
Ponderosa Pine (PPN)	44 acres	1% of treatment units
Minor Stand Types: Jeffrey Pine (JPN), White Fir (WFR)	23 acres	<1% of treatment units
Non-forest Types*	207 acres	6% of treatment units
Total	3,742 acres	100% of treatment units

* Non-forest types includes Annual Grassland (AGS), Barren (BAR), Mixed Chaparral (MCH), Montane Chaparral (MCP), Montane Riparian (MRI), Perennial Grassland (PGS), Sagebrush (SGB), Wet Meadow (WTM)

Table 14. Pre-fire California Wildlife Habitat Relationship (CWHR) vegetation size classes and density of canopy cover within Walker Fire Recovery Project treatment units

California Wildlife Habitat Relationship (CWHR) Vegetation Size Classes and Canopy Cover Density within Treatment units (Pre-fire)							
	CWHR Canopy Cover Density (Acres)					**Total Acres Per Size Class**	**Percent of Treatment Units**
CWHR size class	**Dense (D) (60-100%)**	**Moderate (M)**	**Open (P)**	**Sparse (S)**	**X**		

CWHR5 (>24"DBH)	197	342	43	19		600	16% of units
CWHR4 (11.0"-24.0" DBH)	216	1576	756	236		2783	74% of units
CWHR3 (6.0"-11.0" DBH)	-	7	75	71		154	4% of units
CWHRX-2 (<6.0"DBH; nonforest)				<1	205	205	6% of units
						3,742	100% of units

Walker Fire Effects to Vegetation

The Walker Fire began on Wednesday, September 4, 2019, and burned approximately 58,787 acres on the Mt. Hough and Beckwourth Ranger Districts of the Plumas National Forest (PNF) and on non-Forest System (FS) lands. Total NFS lands that burned is 57,380 acres. The Forest Service will not be treating non-FS lands, however to explain the Walker Fire background and fire effects in context, the total fire acreage 58,787 will be used for analysis.

Fire severity was mapped utilizing Landsat Thematic Mapper (TM) satellite imagery and Relative Differenced Normalized Burn Ratio (RdNBR) classification, and is commonly used to describe the effects of the wildfire on forest vegetation (Miller et al. 2009, Miller and Thode 2007, Safford et al. 2008). Fire severity affects vegetation type, size class, and density. Post-fire vegetation condition is assessed using Rapid Assessment of Vegetation Condition after Wildfire (RAVG) data.

The RAVG data predicts basal area loss[7] through a change detection process using two TM images captured before and after a wildfire. Basal area loss does not describe a permanent loss of basal area within a forest, but simply describes the amount of change in the live tree cover immediately (30-45 days after wildfire containment) after a wildfire undergoes RAVG analysis. The algorithm used is the RdNBR, which is sensitive to vegetation mortality resulting from the wildfire event. This data classifies vegetation in four grid codes which correspond with classes representing percent basal area mortality. This was grouped into four categories classified in Table 16 below. Additionally this vegetation burn severity data is depicted visually to demonstrate distribution across treatment units in Figure 3.

The Walker Fire burned with mixed severity- unburned, low, moderate, and high vegetation burn severity. A distribution of vegetation burn severities for the total fire area is listed in Table 15 classified into four categories.

Table 15. Walker Fire Vegetation Burn Severity categorized by basal area mortality in acres

RAVG Vegetation Burn Severity Description	Basal Area Mortality	Acres	Percentage of total fire area
High Severity	75% -100%	29,440	50%
Moderate Severity	50% - < 75%	7,904	13%
Low Fire Severity	25% - < 50%	9,894	17%
Unchanged or Underburned	0% - <25%	11,545	20%
Total		58,783*	100%

* ~Four acres were considered unclassified

The Walker Fire was fueled by appreciable wind events and receptive fuels, which combined with difficult to access terrain, resulted in large patches of contiguous forested terrain that experienced high vegetation burn severity. A patch analysis has been completed (Appendix C) to quantify high severity fire effects to vegetation.

[7] Basal area loss is defined as the proportion of basal area loss from pre-fire to post-fire conditions

The Walker Fire Recovery Project is focused on treatment of primarily CWHR size class 4 and 5 stands that burned at high severity (75-100 percent mortality). Both moderate and high severity stands are evaluated because there is the possibility of further mortality extending into stands with moderate and lower burn severities due to fire injuries to tree crowns and cambium, and increased stresses such as drought or insect attack. Due to the mosaic nature of fire, there are also areas of low and unchanged severity which are included in the treatment units. For example, small inclusions within higher severity areas, areas of predicted delayed conifer mortality, access for logging systems, and patchy mortality along forest system roads. Field recon in February 2020, found that units that include mixed severity have had consequential delayed mortality months after fire containment, and therefore were included in the project. See Figure 4 for a graph that displays the RAVG burn severity per CWHR vegetation size class and density.

Table 16. RAVG burn severity within Walker Fire Recovery Project treatment units

RAVG Vegetation Burn Severity	Acres	Percent of Treatment Units
High Severity (>75-100%)	3,105	83%
Moderate-high Severity (50-75%)	445	12%
Moderate-low Severity (25-50%)	168	4%
Low-unchanged (0-25%)	24	<1%
Total	3,742	100%

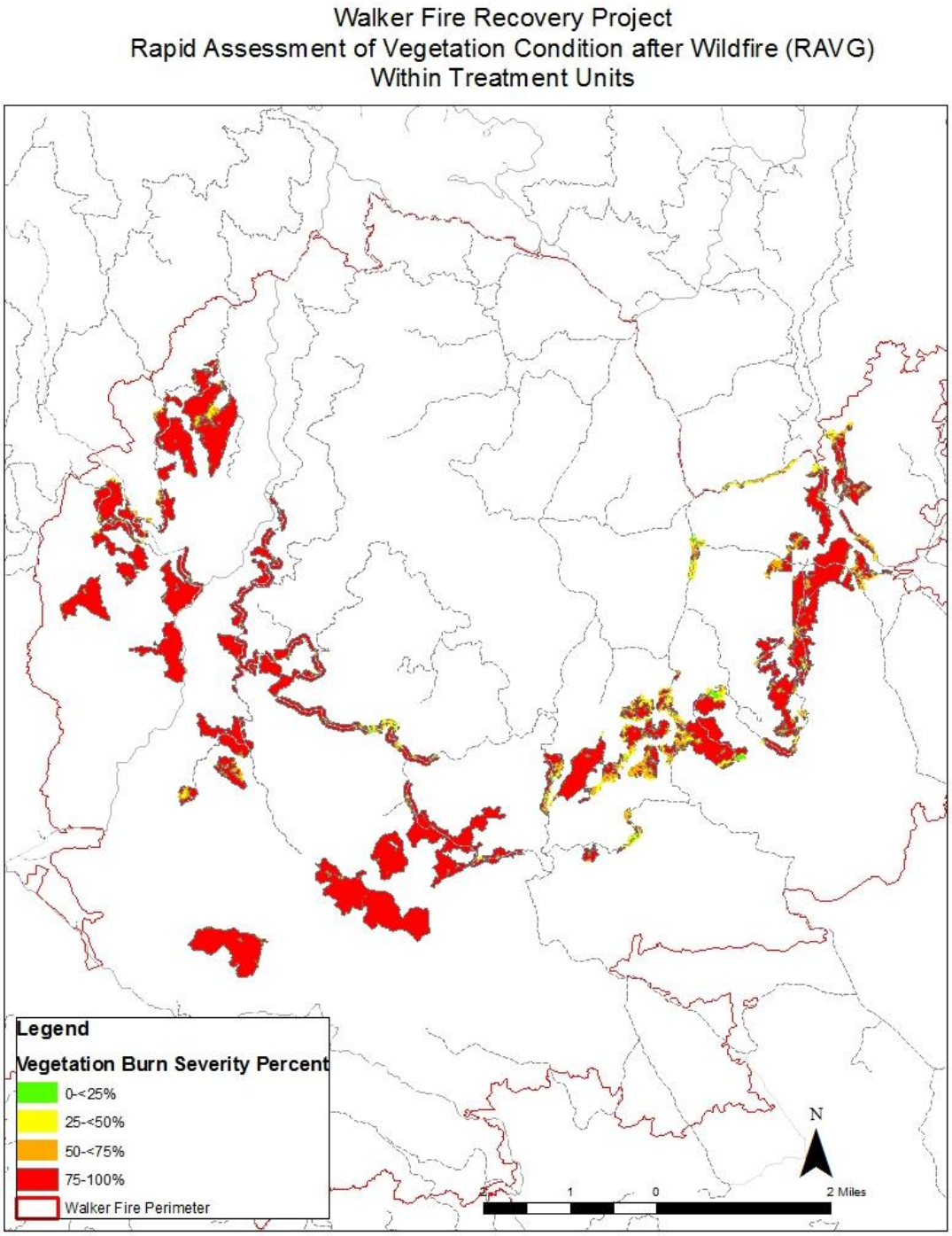

Figure 3. RAVG vegetation burn severity within Walker Fire Recovery Project treatment units

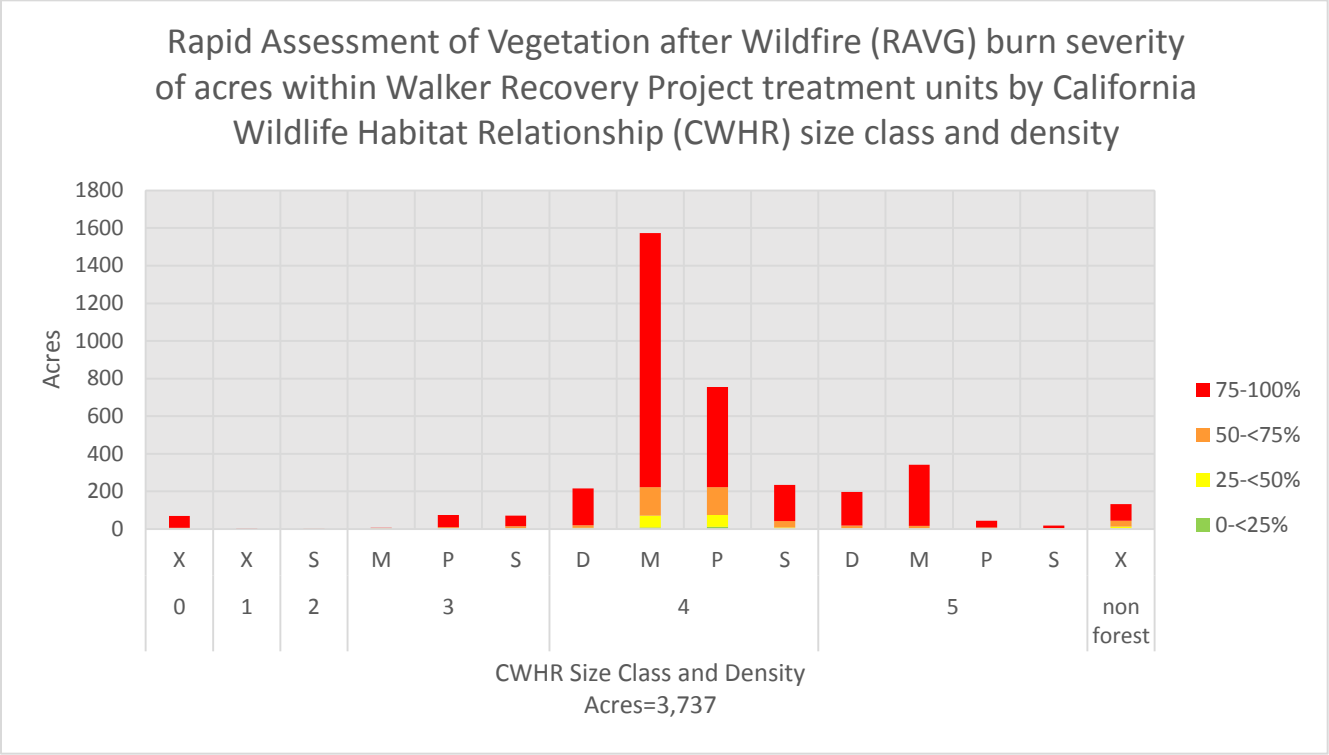

Figure 4. Rapid Assessment of Vegetation after Wildfire (RAVG) vegetation burn severity within Walker Fire Recovery Project treatment units by California Wildlife Habitat Relationship (CWHR) size class and canopy cover density

The Walker Fire created changed conditions on the landscape. For example, timber that had been planned for sustainable yield over time was burned by the Walker Fire. Also the large amount of snags and future dead and down fuels created by the Walker Fire will inhibit the safety of firefighters to suppress future fires. Finally, many snags were created by the fire, and more research is needed about the role of snag retention in large post-fire environments. Treatments identified in this report directly address and respond to the needs created by the Walker Fire.

Treatments described in the proposed action including removal of large and small diameter timber and fuels and are designed to provide remediation for loss of economic potential and reduction of fuels within project treatment units. The proposed action will also incorporate a research project using the Walker Fire and the proposed action as a sample group in a larger research project by Morris Johnson, Research Fire Ecologist, Pacific Northwest Research Station, Seattle, WA.

Evaluation of Dead, Dying (Probability of Mortality (Pm)) and Hazard Trees-

The Walker Fire was evaluated by USFS Region 5 Forest Health Protection (FHP) Entomologist Danny Cluck on November 7, 2019. The objective of this visit was to evaluate the levels of fire injury to conifers, note any insect activity and discuss variables that should be considered when developing fire-injured tree and hazard tree marking guidelines. Recommendations provided in this report assisted in the formulation of silvicultural prescriptions aimed at removing a portion of the fire-injured trees including the abatement of roadside hazard trees.

The guidelines developed by Region 5 FHP, *Marking guidelines for fire-injured trees in California* (Smith and Cluck 2011) were recommended for use to identify dead and dying trees in the Walker Fire area. Region 5 FHP hazard tree guidelines define failure and target potential and were provided for use to identify trees to be removed along roadsides (Angwin et al. 2012). Both guidelines can be used in combination along roadsides to identify whether fire injured tree will be considered dead and then identify their hazard level due to death, defect, form, decay, lean, etc. in order to mitigate trees that are likely to die from fire injuries and pose a hazard in the near

future.

Dead and dying trees are identified and selected for removal using model-based metrics that predict Probability of mortality (Pm). Trees are evaluated by diameter and species on crown length scorched (for yellow pine), crown volume killed (for Douglas-Fir and lodgepole pine) and crown length killed (all other species to be evaluated in this project). The model calculates a Probability of mortality (Pm) per species based upon the above metrics. The Probability of mortality (Pm) levels incorporated into the guidelines are thresholds where all trees meeting or exceeding a selected Pm level are marked for removal.

Three silvicultural prescriptions written for the Walker Fire Recovery Project were reviewed by Danny Cluck on April 27, 2020 and found to be consistent with regional guidelines (Appendix B). These prescriptions are based on the fire injured tree marking guidelines (Report #RO-11-01, Smith and Cluck, May 2011) and/ or hazard tree marking guidelines (Report #RO-12-01, Angwin et al., April 2012) developed by Region 5 Forest Health Protection as well as Standard and Guidelines from the 2004 SNFPA. The guideline criteria for delayed conifer tree mortality are based on the post bud- break model or percent crown volume killed at probability of mortality level of 0.7 (Pm=0.7). However to account for roadway safety, delayed mortality and deferred roadway maintenance, trees that are at least 1.5 times their height distance from system roads have a lower probability of mortality assessment level (Pm=0.5)[8] (Figure 5). One- and one-half tree height distance from the roadway is the currently recommended distance for hazard tree mitigation and represents the potential zone of impact for whole trees and tree parts after impact with other trees and the ground surface (Angwin et al. 2012, Filip et al. 2016). The premise here is that trees have and do roll, slide and have tremendous inertia and momentum before coming to rest. For this project, a general 200 foot distance from roads was used to recognize: (1) the area of potential ground disturbing effects, (2) extensive dead/ dying trees at or greater than 133 feet tall[9], (3) slope distances from roads (i.e. influencing failure zone due to rolling/ movement of trees or tree parts), (4) harvest operation safety and (5) innate individual tree factors including lean, defect, brittleness of dead and dying timber (i.e. potential hazard trees or tree parts).

[8] Due to extensive fire severities and subsequent fire effects (i.e. extensive fire killed trees) within the Walker Recovery EA units, the roadside to non-roadside change from Pm 0.7 to 0.5 (or vice versa) causes only minor difference in mortality determinations and potential tree retention.

[9] Based on field measured observations of the height of trees and roadside slopes, a 200 foot distance was used for effects analysis purposes and to capture the general area used to capture the average 1.5 tree height distance from roads. On flat ground, 200 feet is the outcome of applying 1.5 height distance of a 133 foot tall tree. Trees of this height on greater than zero percent slope are common (i.e. influences failure zone- figure 5) along roadsides in the Walker Fire Recovery EA. Within the 1,053 acres (the area within 200 feet of roadsides) the average slope is 23 percent.

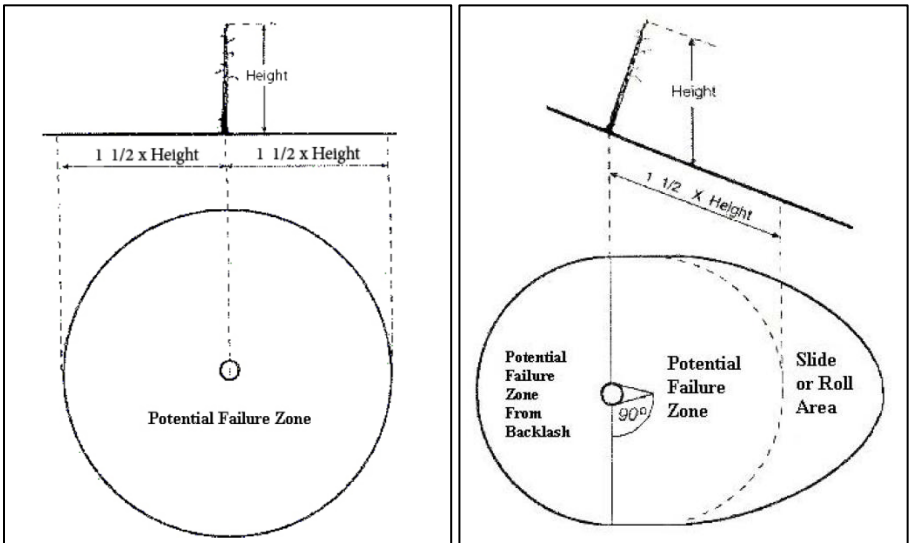

Figure 5. Potential failure zone associated with total tree failure without slope or lean considerations (left figure) and with slope and lean considerations (right figure) from Angwin et al. 2012 and Filip et al. 2016.

For this project, a 0.7 Pm was selected for trees that would not strike a road or target. The 0.7 percent Pm was selected for the interior areas to prevent taking trees that may live, that may provide wildlife habitat, and natural regeneration. Also snag recruitment will likely occur with a conservative 70 percent Pm because some of the retained trees will likely die. Approximately 2,689 acres represent those areas where the 0.7 probability of mortality would apply and the 0.5 probability of mortality is located within 200 feet of Forest system roads and trails and covers 1,053 acres, for a treatment unit total of 3,742 acres.

Hazard trees that do not meet the 0.5 or 0.7 Pm (not fire killed or injured) but may strike a road or target are additionally evaluated using the Region 5 FHP hazard tree guidelines (Angwin et al. 2012). Defective trees with a high failure potential or high failure potential trees with multiple, interacting defects are also marked for removal if they may strike a road or target to remove the hazard to the roadway.

Additionally, trees are selected for removal that meet the following:

- Any tree with no green needles.
- For all species, trees should be marked for removal if any combination of boring dust or frass (in bark crevices, webbing along the bole, or that accumulates at the base of the trees), pitch tubes with pink or reddish boring dust associated with them, pouch fungus conks and/or current woodpecker activity (holes into the sapwood and/or bark flaking, specifically excludes injury caused by sapsucker feeding) is present over at least 1/3 of the bole circumference. This specifically excludes basal attacks by the red turpentine beetle on pines (large pitch tubes associated with coarse boring dust generally restricted to the lower 2 to 3 feet of the bole or woodpecker activity restricted to this area) and when the above indicators are only associated with wounds, old fire scars, etc.

Table 17. Number of acres from the Walker Fire Recovery EA Project that are either >200ft or ≤200ft from a specific road.

	Acres	Percentage of treatment unit area	Employed probability of mortality (from Smith and Cluck 2011)
Portions of units ≤ 200ft distance from a road	1,053	28%	0.5
Portions of units > 200ft distance from a road	2,689	72%	0.7
Total	3,742	100%	

Mitigations and proposed actions for Walker Fire Recovery Project

Based on known information, mitigation measures will need to be incorporated into the project to reduce impacts to residual standing trees and surrounding forest land, and to help maintain forest health.

These include directional falling to reduce damage to existing vegetation, and treatment of cut stumps with borate compound to prevent Heterobasidion root disease. These mitigations are listed in Table 3 under the Silviculture heading and detailed in the Walker Recovery Project Silviculture Report (Winford, 2020). By incorporating these mitigations, it will reduce or eliminate damage to existing vegetation that may be caused by the proposed actions.

Proposed activities include: salvage fire injured and dead trees and remove hazardous trees that meet prescription guidelines in Appendix B, fuels reduction to remove small diameter trees that may not have commercial value in order to meet desired conditions in purpose and need, and research and monitoring. These activities are described in chapter 1 of the EA and are also detailed in the Walker Recovery Project Silviculture Report (Winford, 2020).

Alternative 1 (Proposed Action) Direct and Indirect Effects

The analysis area is the extent of the 3,742 acres within Walker Fire Recovery Project treatment units. The Walker Fire burned 3,103 of these acres at high severity. Landscapes experiencing high severity (75-100 percent) basal area mortality result in dramatic changes to their vegetation type post-fire. Vegetation typing is largely converted to early seral stage or non-forest vegetation types post-fire. Many trees that are not killed by the fire initially will succumb to drought, insect activity, and cambium damage.

Areas experiencing low to moderate severity basal mortality tend to present little salvage opportunity due to lower immediate mortality and generally less intense fire behavior. Low and moderate severity stands have the potential for a fuel pulse as the understory may have been burned and killed, but not consumed, leaving behind a fuel bed primed for intense fire activity as brush and fine fuels return. Due to the mosaic nature of fire, there are areas of low and moderate severity which are included in units for treatment. These include small inclusions within higher severity areas, areas of predicted delayed conifer mortality, and access for logging systems.

Table 18 and Figure 6 displays the CWHR size classes 1-5 before and after the Walker Fire. Most dramatic changes were in the CWHR size class 4 which had represented 74 percent of the area changed to 4 percent of the area, a 70 percent stand composition change. CWHR size class 5 changed from 16 percent of the area to less than 1 percent, a 16 percent stand composition change. If these were reclassified, they would be changed to CWHR size class 1. The combined 90 percent reduction of the CWHR 4 and 5 is substantial because CWHR 4 and 5 are the predominant mid to late seral conditions found in the Plumas National Forest. This signifies a 90 percent habitat reduction for late seral obligate wildlife species within the Walker Fire footprint.

Table 18. California Wildlife Habitat Relationship (CWHR) size class percent and acres change before and after Walker Fire

Walker Fire	CWHR Size Class						Total
	Non-Forested	CWHR 1	CWHR 2	CWHR 3	CWHR 4	CWHR 5	
Pre Fire Acres	201	4	1	154	2,783	600	3,742
Pre-Fire Percent	4%	<1%	<1%	4%	74%	16%	100%
Post Fire Acres	201	3,359	0	11	163	8	3,742
Post-Fire percent	4%	90%	0%	<1%	4%	<1%	100%
Change in Acres	0	+3,355	-1	-143	-2,620	-592	
Percent Change	0%	+90%	-<1%	-4%	-70%	-16%	

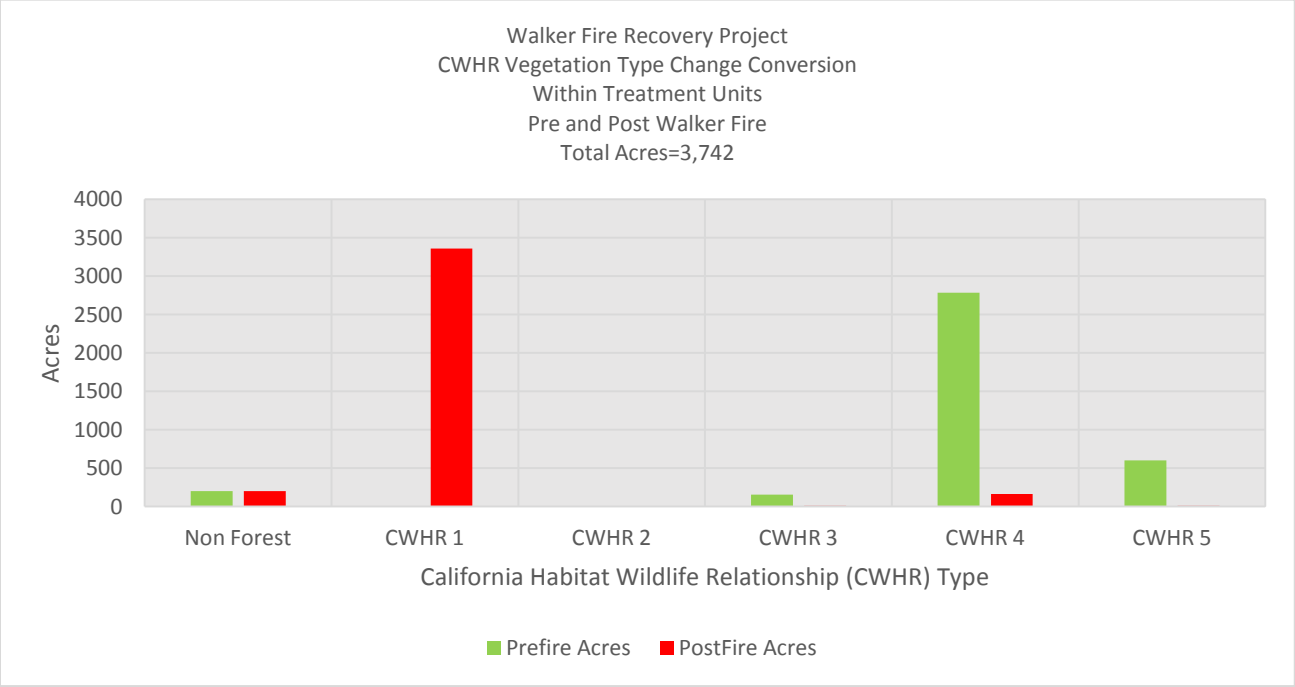

Figure 6. California Wildlife Habitat Relationship (CWHR) size class change before and after the Walker Fire. Note the increase in CWHR class 1 from less than 1 to 90 percent of the acres within the Walker Fire Recovery Project treatment units. This represents a deforested condition.

The proposed action would remove almost all available timber that meets 0.7 Probability of Mortality Guidelines from the interior units, and that which meets 0.5 Probability of Mortality within 200 feet of Forest System roads. There would be economic benefit to timber companies and the local community

from this timber harvest. Fuels including smaller diameter trees would be removed or rearranged from these acres with the timber sale or a service contract. Units that experience timber harvest and fuels removal or rearrangement will not change in their trajectory to early seral vegetation regardless of timber harvest. Removing timber and fuels from these units is important for future recovery actions.

Research and monitoring is an important component of this salvage project. The proposed action will support the Forest Service in developing best available scientific information to support future management actions.

Alternative 1 (Proposed Action) Cumulative Effects

Cumulative effects of past, present and reasonably foreseeable future actions on forest vegetation are summarized in this section.

The temporal bounds include a 30-year horizon for future effects because modeling indicates that within 30 years the treated stands would approach stocking levels corresponding with forest development.

This cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. Rather, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

An extended suppression repair and hazard mitigation effort for the Walker Fire included felling imminent hazard trees along approximately 11 miles of Antelope Lake and Beckwourth Genesee roads. Under this project, fire-killed and fire-injured trees expected to die were removed resulting in a reduction of standing snags near the roadway. These two motorways provide access to large portions of the Districts and are heavily used by the public. Since the removal of hazardous, fire-killed and fire-injured trees would only occurred within striking distance of roads under this projects, the effects are limited to these areas. Due to the limited and dispersed nature of these effects, these activities would not substantially affect forest vegetation at the stand or landscape level.

The area for analyzing cumulative effects to vegetation is limited to the Walker Fire Recovery Project units. The activities proposed in the Walker Fire Recovery Project are not the only the activities proposed within the extent of these units. In addition to the Walker Fire Recovery Project, there are three other Walker Fire related projects being developed to meet different purposes and needs in the vicinity. Objectives of these projects include road and motorized and non-motorized trail maintenance, reforestation including site preparation, planting native conifers, and release, wildlife habitat improvements, and range allotment improvements.

Walker Reforestation

The Walker Reforestation project is focused on reestablishing native conifer vegetation on lands that burned at high severity during the Walker Fire. This reforestation project is in the reconnaissance and polygon development phase. It will focus on areas that were salvaged in the Walker Fire Recovery Project, and will also include young plantations that demonstrated good growth and survival prior to experiencing stand-replacing fire that were not included in the Walker Fire Recovery Project. Proposed Actions may include:

- Site preparation for planting including pull brush, remove fuels including standing and down woody debris.
- Piling and burning fuels and down woody debris.
- Planting native conifers depending on site-specific stocking objectives using hand-planting methods and tools.

- Releasing trees for survival and growth using mechanical or chemical treatments.
- Complete stocking surveys to assess survival and growth, recommend course of action that may include replanting, release, or certification of planted stand.

This proposed reforestation project is being planned to promote establishment, survival, growth, and development of conifer forest types. These planting locations are predominantly in high-severity burned areas with little to no surviving parent trees; consequently, there will be little to no additive impact to remaining conifer trees nor seedlings because few to none are present. The reforestation project may impact non-forest competing vegetation by removing or chemically treating shrub and brush types to promote seedling survival. Shrub and brush types currently are minimal in this reforestation footprint, however because many resprout from their roots and/or root collars they are anticipated to have significant growth and development prior to site prep and planting. Fuels are planned to be piled and burned to reduce fuel loading in newly established plantations. Stocking surveys will evaluate growth and survival of seedlings. This site prep and planting, release, fuels treatment, and stocking surveys, is proposed to promote a more rapid return to conifer forested vegetation than could be expected without these actions. No foreseeable additive impacts to forested vegetation in the Walker Fire Recovery Project are expected.

Range and Wildlife Habitat Improvements

Range allotment improvements proposed include replacing 26 miles of fencing that burned in the Walker Fire. New fencing will be replaced in-kind in close proximity to original fencing location. Four water developments for range that were incinerated in the Walker Fire are also proposed to be replaced in-kind, in the same location. Wildlife habitat improvements are replacing ten “guzzler” water catchment systems that burned in the Walker Fire. These guzzlers will be replaced in-kind in the same location. These features were preexisting prior to the Walker Fire. Replacing these wildlife and range features have no foreseeable additive impact on forested vegetation.

2020 PNF Road and Trail Maintenance

A road and trail maintenance project is being planned within the Walker Fire footprint and on nearby roads. The road and trail maintenance project has proposed actions that include road and trail maintenance, hazard tree abatement, and fuels reduction.

The road and trail maintenance project will have little to no effect to vegetation in the surface replacement and road improvements actions. Most if not all of this work will take place on the existing road prism and will have no effect to existing vegetation.

Conifer vegetation may be removed with this action; Region 5 FHP hazard tree guidelines (Angwin et al. 2012) and probability of mortality guidelines in *Marking guidelines for fire-injured trees in California* (Smith and Cluck 2011) will be used to identify hazards to the public and infrastructure. Trees meeting these criteria pose a hazard to the infrastructure and/or the public. Trees meeting these criteria also have structural or fire-caused defects or damage that compete with public safety and infrastructure maintenance objectives.

Table 19. 2020 PNF Road and Trail Maintenance Project treatments, acres, and cumulative effects to vegetation

Treatment	Acres	Cumulative Effects to vegetation
Mechanical- reach from road and road maintenance	79	Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be felled and may be removed with mechanical equipment if it can be reached from the road. The possibility exists of damaging existing vegetation by felling and removing these hazard trees, and *Heterobasidion* root disease spread from cut stumps. Mitigations will include directional felling and borate compound application to minimize damage to exiting vegetation. These mitigations are designed to minimize any additive cumulative effects to existing vegetation.
Mechanical- reach from road	278	Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be felled and may be removed with mechanical equipment if it can be reached from the road. The possibility exists of damaging existing vegetation by felling and removing these hazard trees, and *Heterobasidion* root disease spread from cut stumps. Mitigations will include directional felling and borate compound application to minimize damage to exiting vegetation. These mitigations are designed to minimize any additive cumulative effects to existing vegetation.
Mastication- reach from road	472	Mastication is planned to remove hazardous fuels and small diameter hazard trees within 25' of road prism. Mastication will occur with equipment stationed on the road prism. Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be masticated. No foreseeable additive cumulative effects to existing vegetation are expected from this action.
Road Maintenance	193	Actions take place within existing road prism. No additive effect to vegetation.
Hazard tree abatement- Hand	1917	Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be hand felled. The possibility exists of damaging existing vegetation by felling these hazard trees, and *Heterobasidion* root disease spread from cut stumps Mitigations will include directional felling and borate compound application to minimize damage to exiting vegetation. These mitigations are designed to minimize any additive cumulative effects to existing vegetation.
Hazard Tree Abatement and Trail Maintenance	246	Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be hand felled. The possibility exists of damaging existing vegetation by felling these hazard trees, and *Heterobasidion* root disease spread from cut stumps Mitigations will include directional felling and borate compound application to minimize damage to exiting vegetation. These mitigations are designed to minimize any additive cumulative effects to existing vegetation.
Hazard Tree Abatement along Motorized Trail	9	Trees meeting R5 hazard tree guidelines and/or probability of mortality guidelines will be hand felled. The possibility exists of damaging existing vegetation by felling these hazard trees, and *Heterobasidion* root disease spread from cut stumps Mitigations will include directional felling and borate compound application to minimize damage to exiting vegetation. These mitigations are designed to minimize any additive cumulative effects to existing vegetation.
Total	3193	Adverse effects to existing vegetation from 2020 PNF Road Trail Maintenance project can be mitigated thru directional felling techniques and application of borate compound. Overall

		cumulative impacts to forested vegetation from this project are minimal.

Alterative 2 (No Action Alternative) Direct and Indirect Effects

Under the No Action Alternative, none of the activities proposed under Alternative 1 would be implemented. The economic value of fire-killed timber would not be recovered by local communities. Thousands of acres of dead trees and those likely to die would remain on the landscape. These snags would fall and create a hazardous fuels condition, thereby inhibiting efficient and safe firefighting action on future fires.

Research on the Plumas National Forest has demonstrated that initial high severity burns led to an increase in standing snags and shrub vegetation, which in combination with severe fire weather promoted high severity fire in the subsequent reburn. Management activities identified in the research including thinning are recommended for consideration as tools for moderating fire behavior before subsequent reburns (Coppoletta, Merriam, and Collins, 2016). If the no action alternative is selected, there will be no moderation to fire behavior by thinning (salvage in this case). There will be persistence of the snag and shrub vegetation condition; thereby maintaining the trajectory of high severity reburn. It will be difficult for new forested vegetation to establish naturally with the high severity reburn feedback loop. The no action alternative will maintain a shrub-type condition for the foreseeable future.

The No Action alternative would not preclude activities that have already been approved in this area or those being planned as separate projects. Projects and activities planned within this area would be negatively impacted if the No Action Alternative was selected.

Walker Reforestation Project

The Walker Reforestation project would need to have these trees removed at high cost to the government prior to planting. Any economic value that currently exists in these wood products would be lost to deterioration, so the government would have to incur high costs (>$500/acre) just to cut and grapple pile the materials to the landing and burn them at the landing. The risk of losing a plantation to fire is extremely high if standing fuels are retained within the plantation; also there is a large risk to planting crews of injury and death from a falling snag. These snags would need to be removed to plant trees for the Walker Reforestation project. If these were not removed, the Walker Reforestation project would likely not be implemented due to safety concerns and fire risk to plantation.

Range and Wildlife Habitat Improvements

The Range and Wildlife Habitat Improvements would be able to implement the miles of fencing and the guzzler installation if the no action alternative is selected. However, both the fencing and the guzzlers would be at risk of being hit by falling snags. The Range Fencing, being a linear feature is most at risk of falling snags along its length of 26 miles. The guzzlers are a smaller target that may be able to be mitigated with some hand-felling prior to installation.

With the increase fuel loading from future dead and down snags the range fencing and wildlife guzzlers will be at risk of burning again in a future fire if the no action alternative is selected.

2020 PNF Road and Trail Maintenance Project

The 2020 PNF Road and Trail Maintenance project will be able to move forward for implementation if the no action alternative is selected. The largest trees in the largest patches of the highest severities along the roadsides will not be removed. The 2020 PNF Road and Trail Maintenance project will have significant expense to implement large numbers of acres. Likely much of the vegetation hazard abatement will be completed by Forest Service hand-falling fire crews, piecemeal over time. Roads are likely to be closed by fallen large diameter timber if the no action alternative is selected, leaving the 2020 PNF Road and Trail Maintenance project as a second priority to opening the roads from the continuous road hazard

mitigation operations

Alternative 2 (No Action Alternative) Cumulative Effects

Post fire conifer natural regeneration potential was evaluated for the Walker Fire area by Michelle Coppoletta in 2019. The research found that 51 percent of the Walker fire area would have little to no regenerating conifers in the short term (Coppoletta 2019). Walker Fire Recovery project units that burned at high severity correspond with those that have low natural regeneration potential. The No Action Alternative will result in little to no regenerating conifers in the short term. In the long term, there will be no sustainable yield of timber nor timber economic opportunity from these acres for many decades. There will be a persistence in shrub-type and those species that depend on forested conditions will not have suitable habitat until the forest regenerates.

Finding of No Significant Impact

There is a beneficial impact to public health and safety in this project.

This project includes 1053 acres that are within 200 feet of the road which will have hazards to the road removed with the proposed action. The Walker Fire Recovery Project removes snags that were created by the Walker Fire, and those trees that are likely to become snags based upon Probability of Mortality Guidelines (Smith and Cluck 2011). There has been research on the longevity of fire-killed snags in California. It was determined after sampling 1140 snags of all species that 95 percent of those that were yellow pine fell within 10 years. Forty-six percent of white fir, 42 percent sugar pine, and 13 percent incense cedar had also fallen within 10 years (Grayson et al. 2019). Applied to the Walker Fire, considering 28 percent of stands are a predominantly pine vegetation type (east side pine/ponderosa pine) and 65 percent of stands have a mixed pine component in Sierran Mixed Conifer vegetation type (Table 13), it is reasonable to assume similar lack of snag longevity in the Walker Fire. Removing fire killed and fire damaged snags along 1053 acres of roadway will remove many snags that are likely to fall within 10 years. These snags create hazards to public health and safety by putting people at direct risk of injury or death by being hit by snags along National Forest System roads.

The proposed action will not result in significant adverse short or long term effects to existing vegetation.

Management direction, including desired conditions and allowable activities within land allocations, are set forth in the Plumas National Forest Land and Resource Management Plan (USDA 1988) as amended by the 2004 Sierra Nevada Framework Plan Amendment (SNFPA). Management prescriptions from the LRMP amended by the SNFPA have been evaluated for consistency with the proposed actions. A detailed description of how the proposed actions meet the LRMP and SNFPA can be found in the Walker Fire Recovery Project Silviculture Report (Winford 2020). Because the proposed actions are consistent with the LRMP and SNFPA, there should be no significant adverse impact as a result of these actions.

Although the proposed action is designed to take overt action to address the need created by the Walker Fire, looking at management direction in context with proposed actions demonstrates a hard look taken to ensure the beneficial effects of the proposal have not overshadowed the hard look for potential significant adverse effects.

National Forest Management Act of 1976

The Walker Fire Recovery Project meets the National Forest Management Act (NFMA) of 1976, including its amendments to the Forest and Rangeland Renewable Resources Planning Act of 1974 which state that it is the policy of the Congress that all forested lands in the National Forest System be maintained in appropriate forest cover with species of trees, degree of stocking, rate of growth and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans.

The Congress in its findings notes that the management of the Nation's renewable resources is highly

complex and the uses, demand for, and supply of the various resources are subject to change over time; and allows the sale of trees and other forest products located on National Forest System lands. In NFMA, it is legislated to consider the economic stability of communities whose economies are dependent on such national forest materials.

NFMA and the Forest and Rangeland Renewable Resources Planning Act specifically address that these laws do not prohibit salvage harvesting of timber stands which are substantially damaged by fire, windthrow, or other catastrophe, or which are in imminent danger from insect or disease attack (NFMA of 1976; Forest and Rangeland Renewable Resources Planning Act of 1974).

The Walker Fire Recovery Project meets this direction by removing of dead and dying trees, removing fuels, and considering the economic stability of local communities as prescribed in the National Forest Management Act.

Conclusion

In conclusion, forest vegetation has been highly altered by the Walker Fire. The Walker Fire Recovery project has been proposed to remediate some of the effects created by the fire. Proposed actions are consistent with law, regulation, and policy. Mitigations can be implemented to reduce impacts to remaining existing forested vegetation that may be caused by the proposed action. The benefits of the proposed action far outweigh any foreseeable impacts to forested vegetation. The Walker Fire Recovery project would benefit both the current and future of the Plumas National Forest by addressing these needs on the landscape.

Fire and Fuels

The fire and fuels analysis compares predicted current and future wildfire characteristics resulting from implementation of the two alternatives (proposed action and no action alternative) described in Chapter 2.

Background

Prior to the 2019 Walker Fire, the landscape had been heavily influenced by grazing, logging, reforestation, and fire suppression activities. There were a handful of significant wildfires in the area north of Last Chance Creek, which represents roughly the northern two-thirds of the Walker Fire area (Figure 7), while areas south of Last Chance Creek had no noteworthy fire history in the record dating back to 1908. The combination of these activities and wildfire events created a landscape dominated by past high severity wildfire to the north, and fire-deficit forest conditions that lacked any of their historic fire resiliency to the south. Both areas had significant fuel loading.

For the northern portion of the project area we have accurate burn severity data for the two most recent significant fires, the 2007 Wheeler Fire and the 2001 Stream Fire. The 2019 Walker Fire overlapped portions of both of these fires, with re-burned areas largely matching the burn severity of previous fires. The 2007 Wheeler Fire, which burned 22,900 acres, overlaps with approximately 16,000 acres of the Walker Fire. Approximately 60 percent of the portion of the Wheeler Fire that overlaps with the Walker Fire was burned at high severity in the Wheeler Fire. Roughly 1,700 acres of that area were salvage harvested. All of these acres subsequently burned at high severity in the Walker Fire with no discernible difference between salvage harvested and unharvested areas. A smaller portion (roughly 450 acres) of the 2001 Stream Fire overlaps with the northern most edge of the Walker Fire area. All of this area burned at high severity in the Stream fire and most of the area was salvage harvested and re-planted. All of these acres subsequently reburned at high severity in the 2007 Wheeler Fire.

Areas that burned at primarily low severity in the 2007 Wheeler Fire also burned with matching low severity during the 2019 Walker Fire. A portion of these areas were treated under the Antelope Border project between 1997 and 2005. Treatments were designed to create a network of Defensible Fuels Profile Zones (DFPZs) using the standards and guidelines from the Herger-Feinstein Quincy Library Group Act (HFQLG) which employed thinning from below followed by prescribed fire treatments. Roughly 925

acres of the Antelope Border DFPZ were burned in the 2007 Wheeler Fire, and while the DFPZ was not successful at stopping the fire, the treatment units were some of the only forested stands to survive the fire. The same portion of the DFPZ was again burned in the 2019 Walker Fire with nearly identical results. While both fires burned through or spotted over the DFPZ, the treatments, which were designed to restore forest structure to that seen before European influence, resulted in a fire resilient condition that allowed the conifer forest to survive.

Areas that burned in the 1977 Babcock Fire and the 1981 Elephant Fire had less discernible effects on the outcome of the Walker Fire. Many of the areas that burned at high severity in the Babcock and Elephant fires were subsequently salvage logged and reforested, and many of these areas burned at high severity in the Walker Fire. However, many of the areas that burned at lower severity in the Babcock and Elephant Fires also burned at high severity in the Walker Fire due to 30+ years of fuels accumulation and lack of natural fire return.

In the areas south of Last Chance Creek, where there was no record of noteworthy wildfire in the historic recorded dating back to 1908, there were also no records of recent fuels reduction treatments. Logging and thinning projects in the area occurred before tracking of fuels reduction objectives began, and most were old enough that surface fuels had accumulated to levels that resulted in high burn severity. Exceptions to this occurred in areas where fuels were burned out ahead of the main Walker Fire to secure indirect containment lines, resulting in lower burn severity areas along final containment lines.

Overall, the majority of the Walker Fire landscape was highly departed from the fire resilient forest structure that would have historically favored the persistence of conifer forests. Prior to European settlement, the average natural fire return interval for the Walker Fire area ranged from 10 to 15 years with more than 90 percent of the landscape burning less than every 16 years (Safford et. al. 2011). Decades of the combined effects of fire suppression, logging, reforestation, and grazing activities resulted in a landscape dominated by past high severity wildfire to the north, and fire-deficit forest conditions that lacked any of their historic fire resiliency to the south. Both areas had significant fuel loading. In the north, this included standing and fallen fire killed trees, and live montane brush. In the south, surface fuels consisted of over 100 years of accumulated forest litter and fallen trees from at least two drought related insect mortality events, and abundant ladder fuels in the form of conifer saplings and brush. Past fire salvage efforts appear to have had little to no effect on reducing subsequent fire severity. However, removal of fire-killed hazard trees along transportation routes after past wildfires did greatly increase firefighter safety during the Walker Fire. While extreme fire behavior overran many of the roads where roadside hazard tree removal projects had been completed, firefighters were ultimately able to contain the northeast portion of the Walker Fire utilizing several miles of the road system where fire-killed trees had been removed as indirect fireline and safe access to conduct interior burn out operations of fuels between the main fire and the control line.

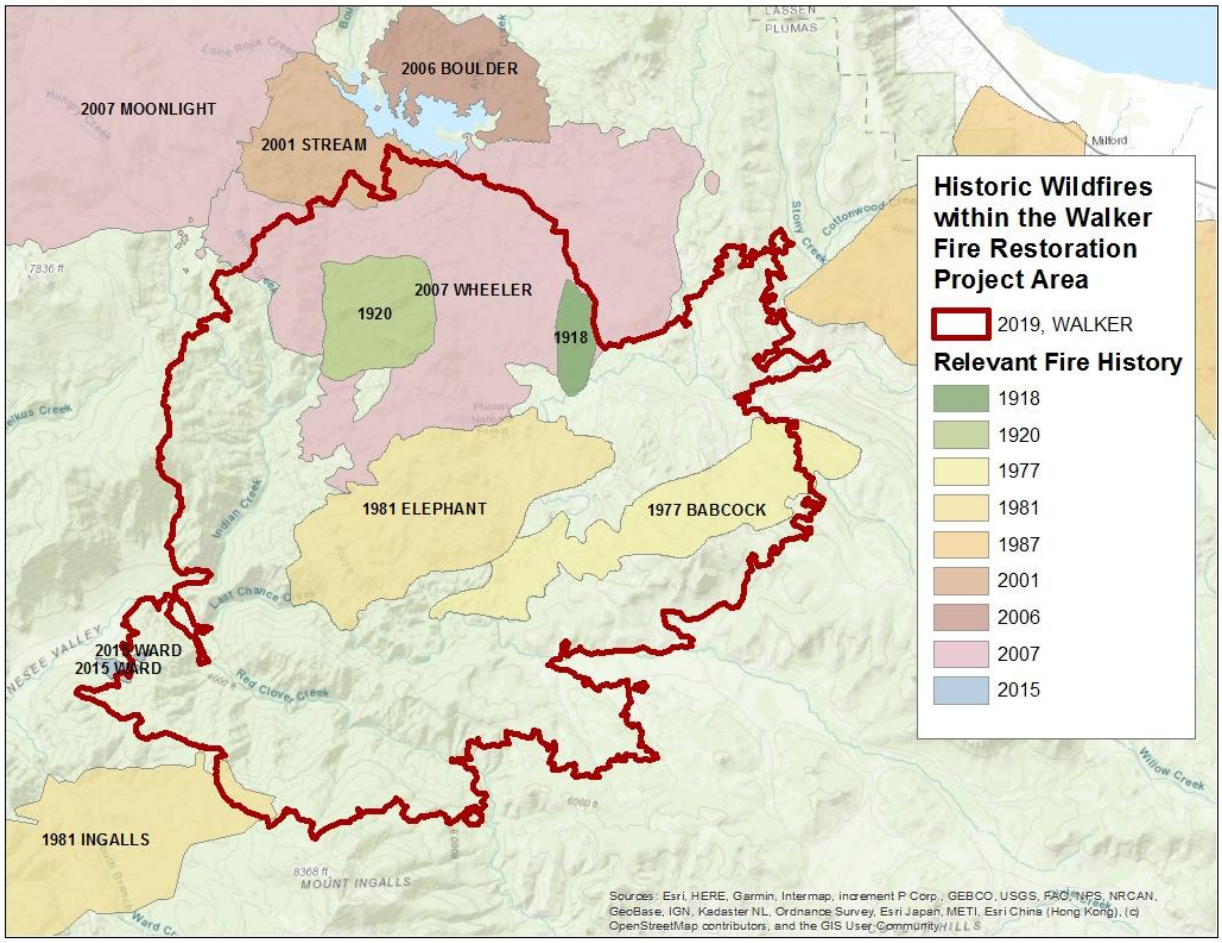

Figure 7. Fire history of the Walker Fire Restoration Project area.

Intensity Criteria Pertaining to Resource

The effects of treatment on fuels and potential fire behavior are evaluated using surface fuel load and flame length as measurement indicators.

Surface Fuel Load: The volume and condition of surface fuels is critical in determining fire potential. Fine dead surface fuels (less than three inches in diameter) respond to ambient environmental conditions and determine the rate of spread and intensity at the fire front. Larger dead surface fuels respond more slowly to environmental conditions, but may extend fire residence times and be more difficult to extinguish. Live surface fuels typically become more susceptible to ignition as the dry season progresses. In the post-fire environment, standing dead trees greater than three inches dbh present considerable challenges to fire management resources. These snags are not only susceptible to ignition from wildfires, but create a very high fuel load, predisposed to high burn severity in subsequent wildfires, and present a significant safety hazard to fire management resources.

Reduced surface fuel volumes and lower volumes of standing dead snags greater than three inches dbh under the proposed action represent desired conditions for fire and fuels management.

Flame Length: Flame length (measured in feet) is influenced by fuel type, fuel arrangement, fuel moisture, and weather conditions. Fuel type and fire intensity in turn influence fire line production rates by different suppression resources. Increased flame lengths indicate an increase in fire intensity and the likelihood of high mortality in naturally regenerated, newly planted and fire-survived stands. Predicted

flame lengths that do not significantly increase under the proposed action represent acceptable conditions for fire and fuels management.

Tools Used to Predict Impacts

Post-fire conditions were assessed through remote sensing and field observations. The burn severity of the fire was mapped utilizing the Rapid Assessment of Vegetation Condition after Wildfire (RAVG) process. The RAVG products are based on a seven-class or four-class basal area loss layer modeled from the relative differenced Normalized Burn Ratio (RdNBR, Miller and Thode 2007). In the context of RAVG analysis, basal area loss measures the percent change in basal area or tree cover (relative number of live trees on the site) from the pre-fire condition.

Effects of the proposed action on fuels and future wildfire characteristics are compared to the no-action alternative. The Fire and Fuels Extension to the Forest Vegetation Simulator (FFE/FVS) was used to predict surface fuel loading, and flame lengths before and after the proposed treatments. Forest stand data collected from the overlapping 2008 Moonlight and Wheeler Fires Recovery and Restoration Project was used for the model. These outputs were then compared to post-fire field observations for representative accuracy once they became available. The model was used to quantify existing conditions and to predict the effects of treatments on fuel loads and high intensity fire potential. Modeled results are used to highlight the relative differences resultant of the proposed action against the no action alternative

Assumptions Made:

- Baseline stand data is representative of conditions in the Walker Fire Recovery Project area.
- Model outputs predict existing and future potential wildfire effects under severe fire weather and fuel moisture conditions within the treatment areas. While rare, severe weather conditions occur annually during the summer fire season. Historically, ignitions occurring under severe weather and fuel moisture conditions exceed initial attack suppression capabilities and become large, high severity wildfires.

Effects Analysis Methodologies

The cumulative effects analysis begins with taking into consideration the direct and indirect effects of the alternatives on fuels and fire behavior, and is extended to a landscape level by taking into consideration other vegetation and fuels management projects, as well as past wildfires that have occurred within and around the Walker Fire Recovery Project area.

Effects Analysis Spatial and Temporal Boundary

In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

Direct and Indirect Effects of Alternative 1

Significant reduction of surface and small understory (ladder) fuels lead to a reduction of mean surface fuel loads by 60 percent, (even in low severity burn areas) throughout the project area. This initiated the development of new fuels profiles a few weeks post-fire as fire adapted plants begin re-sprouting and re-colonizing. Activities associated with the proposed action can have an additive or reductive effect on the development of this fuels profile by felling standing fuels and leaving them in place, removing a portion of them, or removing them entirely. Alternative 1 proposes activities that do all three of these potential actions including lop and scatter which would add to surface fuel profiles, and whole tree yarding to landings and pile and burn treatments that would have a reductive effect on future surface fuel profiles. As fuels profiles continue to develop the effectiveness of treatments become less noticeable against the

background of the untreated portions of the landscape. Surface fire spread models struggle to differentiate between treated and untreated burned landscapes beyond 10-20 years because in the modeling framework they convert to brush fuel models as the main driver of fire spread. Research indicates that post fire salvage treatments have only modest effects on future wildfire behavior beyond the short term (5-10 years). However, salvage logging has been shown to reduce surface fuel loading which can reduce adverse effects of soil heating in subsequent fires (Monsanto and Agee 2008), which may help to prevent the transition of conifer forest to shrubland (Passovoy and Fulé 2006). The most significant effect of post fire salvage on future wildfire is the mitigation of hazard trees along roads that provide fire management personnel with safe ingress/egress to fires and containment lines.

Salvage logging in moderate and high severity fire areas would generate an increase in surface fuel. In treatment units that undergo piling and burning or whole tree yarding of all cut material, the accumulation of surface fuels would not result in a significant elevation of fire behavior or high severity fire potential within the first 5-10 years after treatment. In treatments where cut material less than 12 inches in diameter remain in the treatment unit (lopped and scattered) the accumulation in surface fuels would increase potential fire behavior above pre-treatment levels. Within the short-term (0-5 years) this would not cause a significant increase in fire risk at the landscape level because treatment units would be relatively isolated within a larger matrix of burn areas with very little surface fuel. However, within 10 years as many of the fire killed trees begin to fall in areas outside of salvage units and brush species become established across the landscape, potential fire behavior and overall fire risk would increase significantly (Table 20). Course woody debris (surface fuels greater than 3 inches diameter) within treatment units would remain within the optimum range of 5-20 tons per acre thought to provide a tradeoff of acceptable fire risk and beneficial quantities for wildlife, soil protection, and soil productivity (Brown et al. 2003). But, while much of the hazard to firefighters from burning snags would be mitigated, the large amounts of downed trees and limbs would reduce the effectiveness and efficiency of fire control efforts. Twenty years post treatment, the effects on fire behavior would be largely indiscernible with estimated flame lengths well beyond the threshold for effective initial attack under severe fire weather conditions. Mitigation of hazard trees along roadsides and in some strategic landscape positions will likely offer fire management personnel a safe location to employ an indirect containment strategy.

Table 20. Treatment comparison by alternative of the predicted average fuel loading (Tons per acre) and resulting average flame length (feet) over time (years).

Treatment	Year				
	2020	2022	2030	2040	2050
Proposed Action					
Average Tons/Ac of surface fuel less than 12" diameter if Piled and Burned	6.8	6.8	8.3	8.6	12.2
Average Tons/Ac of surface fuel less than 12" diameter if Lopped and Scattered	6.8	13	21.3	21.7	25.3
Average Tons/Ac of surface fuel less than 12" diameter if Whole tree yard to landing	6.8	9.1	17.4	17.8	21.4
Average Tons/Ac of surface fuel greater than 12" diameter	1.7	2.1	2.8	3.1	3.6
Average Total Flame Length (feet) Pile and Burn	0.9	0.9	4	12	15
Average Total Flame Length (feet) Lop and Scatter	0.9	6.3	10	15	20
Average Total Flame Length (feet) Whole tree yard to landing	0.9	4	8	12	15
No Action					
Average Tons/Ac of surface fuel less than 12" diameter	6.8		23.2	42.2	44
Average Tons/Ac of surface fuel greater than 12" diameter	1.7		7.8	15.3	19.1
Average Total Flame Length (Feet)	0.9		10.3	18.1	23

Summary of Direct and Indirect Effects for Alternative 2

Under this alternative, no treatments would occur. Initially, lack of fuels in the burned area generally would not support large high intensity wildfires. As fire killed vegetation falls into a growing volume of live vegetation, wildfires may be expected to grow in intensity and size. Suppression difficulty will increase as the wildfires severity increases, but the associated ecosystem impacts, will not change (Miller et al. 2008). This has been observed on portions of the Plumas National Forest that burned in the 2001 Storrie Fire and subsequently re-burned in the 2012 Chips Fire. Fuel loading and arrangement in previously forested portions of the landscape that burned at high severity in the 2001 Storrie Fire significantly increased the intensity, suppression difficulty, and ultimately the size of the 2012 Chips Fire. Direct attack efforts were ineffective even with the support of heavy aerial retardant application because of the fire intensity and continuous, heavy fuels. The combination of heavy surface fuels and high snag densities resulted in spotting over 2 miles ahead of the main fire, which compromised indirect attack efforts as well. Similar significant impacts can be expected in the Walker Fire burn area if the same conditions are allowed to develop. Table 20 displays the predicted fuel loading and flame length conditions expected throughout the previously forested portions of the Walker Fire area that burned at

high severity.

The Plumas National Forest strives to utilize a confine and contain strategy when appropriate to allow low and moderate severity wildfires to accomplish resource objectives, however, successful implementation of this strategy relies upon the presence of strategic containment options across the landscape. Under this alternative, options for containment of naturally ignited wildfires would be few, decreasing the likelihood that wildfires would be allowed to accomplish resource objectives. Full suppression of all wildfires would be the likely response. As wildfire intensities or a high volume of standing dead trees preclude direct suppression with ground forces, indirect tactics, heavy equipment and aircraft would be more heavily utilized. Ultimately, future fire size, and suppression and emergency rehabilitation costs would increase and the cycle of repeated high severity wildfires would continue under Alternative 2.

Cumulative Effects for Alternative 1

Treatments implemented under the proposed action would have a short-term beneficial effect on fuel loading and fire behavior. During this period (up to 10 years post treatment) these treatments stands would contribute to the larger network of fuels reduction treatments on the adjacent landscape, potentially reducing the size and severity of future wildfires. This network of treatments includes the Antelope Border Project which performed with some success during the Walker and Wheeler fires, as well as numerous other projects that include the Eastside Underburn Project to the east of the project area, the Wildcat and North Antelope Projects to the north, the Mud Lake RNA Baker Cypress Project, Moonlight Restoration Project, and Franks Valley Project to the west, and the Ingalls project to the south of the project area.

In the longer term, the effectiveness of salvage harvest treatments implemented under this project on fire behavior would decline fairly rapidly due to the overwhelming influence of fuel conditions on the surrounding untreated landscape. If future wildfires occur in the untreated high burn severity landscape during critical fire weather events, resultant fire behavior is likely to compromise the effectiveness of portions of the larger landscape fuels treatment network due to long range spotting similar to what occurred during the Walker Fire when it encountered the Antelope Border DFPZ (described above in “Background” section). Under more moderate fire weather conditions, while the larger landscape fuels treatment network would remain effective, any contribution from salvage harvest treatments to the larger network will diminish unless follow-up treatments occur to control the development of brush.

Future reforestation efforts may have additional short-term beneficial effects on fuel loading and fire behavior within the Walker Fire area and as part of the larger fuels treatment network. These benefits are also likely to be short-lived as shown by the low survival rate of post-fire salvage plantations from the Stream and Wheeler fires that were burned in the Walker Fire. Burned Area Emergency Response (BAER) activities were taken to mitigate effects of the Walker Fire that could cause imminent danger to life, property, or natural resources. Response efforts included restoration and improvement of drainage functions as well as mastication of dead vegetative material to reestablish soil cover in high severity burn areas in order to reduce erosion. Actions taken for BAER did not have measurable effects relative to fuels or fire behavior.

The Plumas National Forest personal use firewood program allows the purchase of a permit to cut and remove wood for fuel from National Forest lands. Most of this material consists of fallen trees found along forest roads, and non-merchantable logs from past logging operations. Unused material left behind by firewood gathering does not contribute significantly to the surface fuel loading due to the dispersed nature of these activities. Areas of the Walker Fire Recovery Project analysis area not hosting salvage removal operations will be open to seasonal firewood cutting. Firewood would continue to be removed near forest system roads, resulting in a cumulative but insignificant reduction of large fuels within the analysis area.

The 2019 Walker Fire dramatically reduced surface fine fuel loads, old deep duff and litter layers, and

ladder fuel continuity across a wide area. The Walker Fire Recovery Project, combined with past, present and reasonably foreseeable future actions described above, would have minor beneficial effects on existing and future wildfire characteristics and potentially significant positive cumulative effects on wildfire control operations within the Walker Fire Recovery analysis area.

Cumulative Effects of Alternative 2

Nowhere else on the Plumas National Forest is the result of climate change on the frequency, size and severity of wildfires more evident. The Walker Fire joins the 2001 Stream, 2006 Boulder, 2007 Wheeler, and 2007 Moonlight fires to form a contiguous patch of over 136,000 acres (over 213 square miles) of National Forest land that has burned with mostly high severity effects (Figure 7). A majority of this landscape is likely to experience a cycle of repeated high severity wildfires (Thompson et al. 2007) over the next 30 years (the temporal extent of this analysis) and beyond.

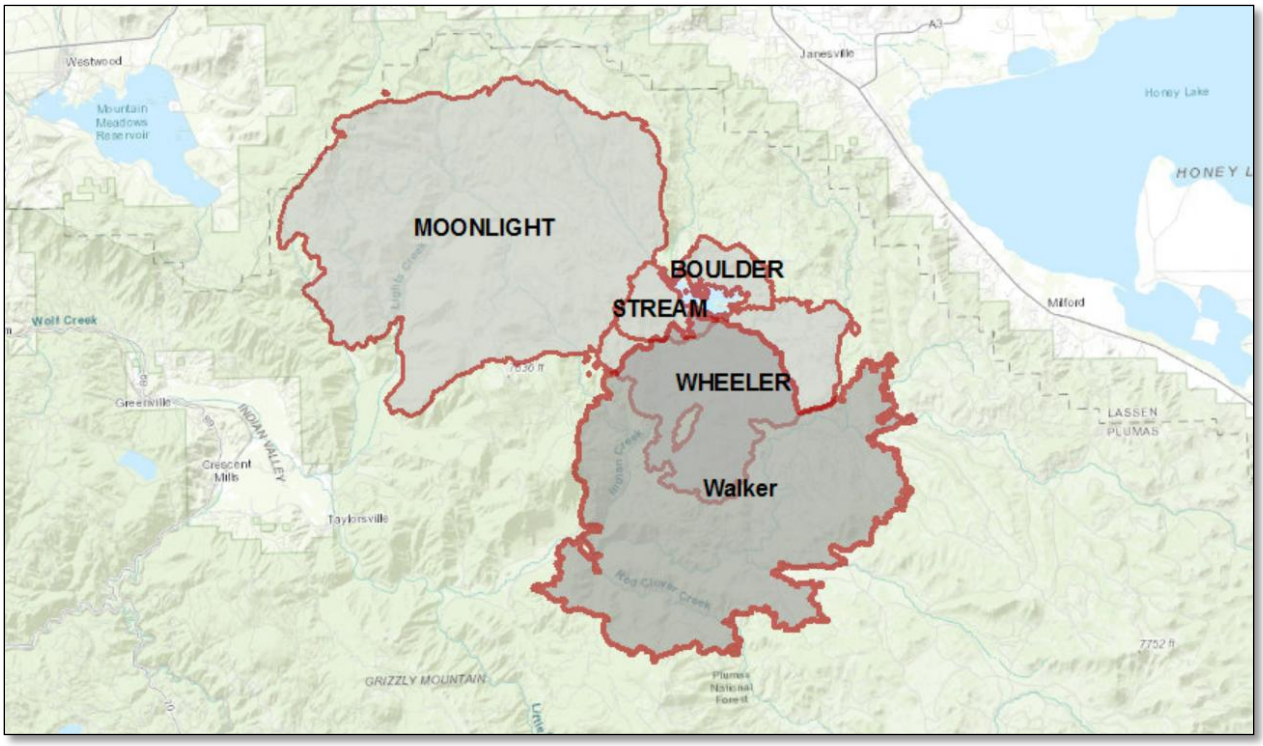

Figure 8. Cumulative large fires from 2001 to present in northeastern Plumas National Forest.

The proposed action's objectives of managing fuel profiles to reduce the danger and difficulty of managing future wildfires and reducing snag hazards would not be met. As hazardous fuels accumulations of snags, mature brush, and heavy surface fuels develop across an even greater area, the risk to down-wind communities that a fire will escape initial attack and develop a head of steam to carry it into a community during a critical fire weather event increases. While the beneficial impacts of other past, present, and reasonably foreseeable future actions on fire and fuels management would be realized under the no action alternative, long-term beneficial effects under the proposed action, particularly those related to opportunities for safe and efficient future fire suppression tactics would not be realized. The cumulative effect of the no action alternative would be a landscape that would be more at risk of wildfires that would be difficult to control due to the high levels of standing and fallen snags and a complex arrangement of fuels.

Air Quality

Air quality is managed through federal, state, and local laws and regulations. The Environmental Protection Agency (EPA) has the primary federal role of ensuring compliance with the requirements of the Clean Air Act (CAA). The EPA issues national air quality regulations, approves and oversees State Implementation Plans (SIPs), and conducts major enforcement actions. States and local Air Pollution Control Districts (APCDs) and Air Quality Management Districts (AQMDs) have the primary responsibility of carrying out the development and execution of SIPs, which must provide for the attainment and maintenance of air quality standards.

The state of California also sets Ambient Air Quality Standards which must be equal to or higher than the national standards. Since the state of California has an approved SIP, the enforcement of the CAA is primarily carried out by the California Air Resources Board (CARB), with assistance from the EPA in the areas of scientific research, expert studies, engineering designs and money to support clean air programs.

The CAA requires federal agencies to meet State and local air quality regulations. Any federal activity that may impact air quality must conform to SIPs. The Forest Service is required to analyze air quality emissions to ensure that proposed actions reduce or mitigate air quality impacts and meet the State SIP. Federal projects cannot proceed unless they conform to the applicable SIP.

The original Air Quality Act was passed in 1963. This act was followed by the Clean Air Act Amendments in 1970, 1977, and 1990. The Clean Air Act Amendments of 1970, Section 109, requires the EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. These pollutants include carbon monoxide (CO), lead, nitrogen dioxide (NO_2), particulate matter less than 10 microns in diameter (PM_{10}), particulate matter less than 2.5 microns in diameter ($PM_{2.5}$), ozone, and sulfur dioxide. These are called criteria air pollutants because the agency has regulated them by first developing health-based criteria (science-based guidelines) as the basis for setting permissible levels. One set of limits (primary standard) protects health; another set of limits (secondary standard) is intended to prevent environmental and property damage. A geologic area that meets or surpasses the primary standard is called an attainment area; areas that don't meet the primary standard are called nonattainment areas.

Table 21. Attainment status for Plumas County, California for three criteria pollutants of greatest concern, Ozone (O_3), Particulate Matter less than 10 microns in diameter (PM_{10}), Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$), and Carbon Monoxide (CO) under State and Federal air quality standards.

Attainment Status of State and Federal Air Quality Standards for Plumas County, California Within the Northern Sierra Air Quality Management District		
Pollutant	**State Designation**	**Federal Designation**
O_3	Unclassified	2015 O_3 Standard (70 ppb) Unclassifiable.
PM_{10}	Non-attainment	Unclassified
$PM_{2.5}$	Portola area in Plumas County: Non-attainment Remainder of Plumas County: Unclassified	2012 Annual Standard (12µg/m^3) Portola area in Plumas County: Non-attainment. Remainder of Plumas County: Unclassifiable/Attainment
		2012 24-hour Standard (35µg/m^3) Unclassifiable/Attainment

In addition, Plumas County is either Attainment or Unclassified for all State and federal carbon monoxide

(CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb) standards.

Currently, Plumas County is not within California state attainment standards for PM_{10} and is not within California state or Federal attainment standards for $PM_{2.5}$ in the Portola area (Figure 9). Particulate matter (PM) consists of particles small enough to remain suspended in the air for long periods (mostly smoke and dust). PM_{10} and especially $PM_{2.5}$ (10 and 2.5 refer to aerodynamic particle size in microns) are small enough to lodge in the deepest recesses of the lungs and cause serious respiratory problems. A battery of recent scientific studies have linked particulate matter, especially fine particles with a series of significant health problems, including premature death, respiratory related hospital admissions and emergency room visits, aggravated asthma, respiratory symptoms such as severe chest pain, aggravated coughing, chronic bronchitis, decreased lung function and shortness of breath. The most sensitive populations are children, elderly people and individuals with various health conditions such as heart and lung diseases.

Federal and California state air quality standards exist for PM_{10} (mostly dust) and $PM_{2.5}$ (mostly smoke and fine aerosols, which are combustion byproducts), although more emphasis has recently been placed on $PM_{2.5}$. Major contributors to particulate matter in the District are woodstoves and fireplaces, residential open burning, dust emissions from construction and earth-moving equipment, forestry management burns, transport from agricultural burns, vehicle traffic and windblown dust. Particulate matter concentrations in the ambient air can be relieved or exacerbated by meteorology.

The Portola area (including Johnsville, Mohawk, Graeagle, Blairsden, Clio and Portola) is a State- and federally-designated $PM_{2.5}$ non-attainment area, and has historically had the highest recorded $PM_{2.5}$ concentrations in the District. The Quincy area has also had some high monitor values.

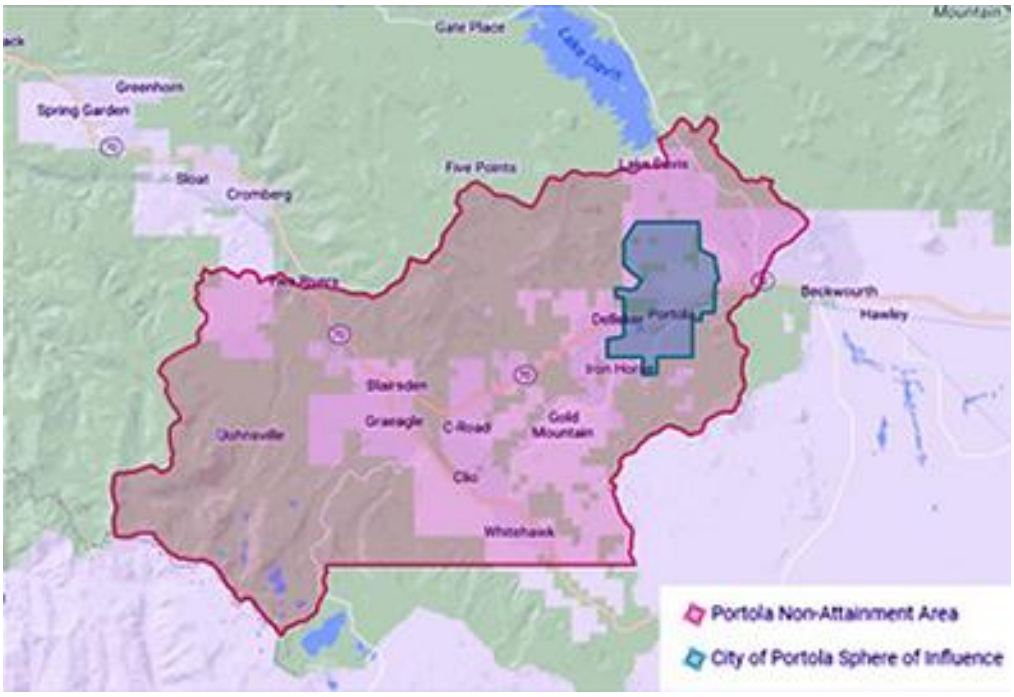

Figure 9. Portola, California non-attainment area for California state and federal air quality standards for the criteria pollutant Particulate Matter less than 2.5 microns in diameter ($PM_{2.5}$).

Data from the EPA Compilation of Air Pollutant Emission Factors (EPA 1995) and the NEPA Air Quality Analysis Desk Reference (USFS 1995) were used to predict the air quality effects from the Walker Fire Recovery proposed action, including burning piles and equipment emissions. Inputs are based on stand data, fuel characteristics, probable burning conditions and the volume of material estimated to be removed or burned after treatments have been completed. The analysis assumes a worst

case scenario in which all material less than 12 inches diameter is burned, either as piles within treatment units or at landings, however, it is possible that some material may be chipped and removed from the project area as biomass. Emissions estimates of PM_{Total}, PM_{10}, $PM_{2.5}$, CO, CO_2, Methane (CH_4), Non-Methane Hydrocarbons (NMHC), and Total Greenhouse Gasses (GHGs) are summarized below (Table 22). Equipment hours are based on average production rates for similar projects. These outputs are used as the principle indicator of air quality impact. Since the alternative based emissions will be spread over several years, implementation of any alternative is not expected to exceed deminimus thresholds for these criteria pollutants.

Table 22. Emission Estimates for Alternative 1

Emissions Results					
CO	2712.24	tons	PM	963.90	tons
CO_2	118789.32	tons	$PM_{2.5}$	606.90	tons
CH_4	200.10	tons	PM_{10}	714.00	tons
GHGs	126504.021	tons CO_2e	NMHC	161.58	tons

Class 1 Prevention of Significant Deterioration (PSD) Areas

Class 1 areas include all international areas and National Parks greater than 6000 acres, national wilderness areas greater than 5000 acres that existed on August 7, 1977. This class provides the most protection to pristine lands by severely limiting the amount of additional man-made air pollution, which can be added to these areas. The closest Class 1 PSD area to the Walker Fire Recovery Project site is Lassen Volcanic National Park which is about 35 miles northwest of the project area. Prevailing winds, local topography, the limited volume of potential pollution outputs from dust and prescribed fire smoke from the Walker Fire Recovery Project, and the distance from the project area would make any impact to this Class 1 area unlikely.

Prescribed Burning (Pile Burning)

Required air quality coordination would take place between the Forest Service and the Northern Sierra Air Quality Management District (NSAQMD). This air quality coordination would follow the Smoke Management Guidelines for Agricultural and Prescribed Burning contained in Title 17 of the California Code of Regulations. These Guidelines are intended to provide for the continuation of agricultural burning, including pile burning, as a resource management tool, and provide increased opportunities for pile burning and agricultural burning, while minimizing smoke impacts on the public. The regulatory actions called for are intended to assure that each air district has a program that meets air district and regional needs.

Proper mitigation measures to meet air quality requirements would be implemented under the Walker Fire Recovery Project. A prescribed fire planner would coordinate with the NSAQMD to mitigate emissions from fuel reduction burning. Burning permits would be acquired from the NSAQMD. The NSAQMD would determine permissive burn days, based on CARBs daily information on “burn” or “no burn” conditions. Burn plans would be designed and all fuel reduction burning would be implemented in a way to minimize particulate emissions. Prescribed fire implementation would coordinate daily and seasonally with other burning permittees both inside and outside the forest boundary, through the North East Air Alliance (NEAA) to help meet air quality standards. Because of the mitigation measures applied and coordination with regulatory agencies and other prescribed burners any impacts are expected to be minimal.

The Smoke Management Guidelines include a daily burn authorization system that would regulate prescribed burning implemented under Walker Fire Recovery Project action alternative. This

authorization system is designed to minimize smoke impacts on smoke sensitive areas, avoid cumulative smoke impacts, and prevent public nuisance. The burn authorization system would not allow more burning on a daily basis than is appropriate for the meteorological or air quality conditions. The system specifies the amount, timing and location of each burn event.

Control of Dust

Fugitive dust could be caused by the construction and reconstruction of roads, skidding of logs, and biomass material, hauling operations on native or aggregate surfaced roads, and road maintenance and repair activities. Dust abatement techniques would be applied as necessary to all these activities to minimize unsafe conditions and meet air quality requirements. The primary techniques used for dust abatement is the application of water during operations or application of dust palliatives such as magnesium or calcium chloride to roads to reduce dust as necessary.

Because of the size of the Walker Fire Recovery Project area, the small amount and dispersed nature of dust producing activities, and the favorable weather conditions within the normal operating season, in combination with the dust abatement techniques used, any adverse effects from dust are expected to be minimal.

Diesel Engine and other Motor Vehicle Emissions

The potential for adverse effects from emissions from diesel engines and other motor vehicle is very low because of the relatively small number of vehicles from all forms of activities in the project area. The project area is a very rural environment with a minimal amount of commercial or residential development. It has a high level of air quality year-around. Recreational activity and forest management activities such as timber harvests are widely dispersed temporally and spatially on both National Forest and private land. In addition, the Federal and State requirements designed to protect and maintain air quality for diesel and other motor vehicle engines are applicable to all the equipment and recreational vehicles that operate within the project area. For these reasons, any adverse effects from the exhaust associated with diesel and other motor vehicles are expected to be minimal to the point of non-significance.

Alternative 1 - Direct and Indirect Effects

The Walker Fire Recovery Project is dispersed through a large rural mountainous area with a low population density. Air quality is good throughout the year. The primary human activities that might affect air quality are logging and other construction activities that produce dust or the use of prescribed fire. Because this project area is large and the expected activities would be widely dispersed over space and time, and mitigations measures would be applied, both activity generated dust and smoke from prescribed fire that would result from cumulative past, present and future foreseeable actions are expected to remain at levels that meet both state and federal air quality standards for this area.

Because of the distances from the proposed project area, the nature of prevailing winds and the amount and timing of occurrences of dust and smoke, no communities are expected to experience adverse air quality effects from actions proposed by the Walker Fire Recovery Project. Any adverse effects from prescribed burning would be minimized by the implementation of air quality regulation requirements and the standard mitigation measures applied to the application of prescribed fire on the Mount Hough and Beckwourth Ranger Districts and adjacent Lassen National Forest, public and private lands.

Alternative 1 - Cumulative Effects

Because of the distances from other potential sources of smoke, and the nature of the prevailing winds, cumulative smoke effects from these other sources in combination with the potential effects from the Walker Fire Recovery Project are very unlikely.

Since the proposed action would follow the Smoke Management Guidelines for Agricultural and Prescribed Burning contained in Title 17 of the California Code of Regulations it is expected that the

current high level of air quality in the Walker Fire Recovery Project Area and the Mount Hough and Beckwourth Ranger Districts would be maintained. Overall smoke emissions from prescribed fire on the Ranger Districts are expected to remain within a range similar to the current level. The actual amount of emissions would vary from year to year based on weather and fuel conditions, and on the requirements for smoke management that result from coordination with the California Air Resources Board (CARB) within the Northern Sierra Air Quality Management District.

Wildlife

Introduction

The purpose of this analysis is to determine whether the Walker Fire Recovery Project would result in a trend toward listing or loss of viability for USDA Region 5 Forest Service sensitive species. The Biological Assessment (BA) was prepared in accordance with legal requirements set forth under Section 7 of the Endangered Species Act [19 U.S.C. 1536 (c), 50 CFR 402] and standards established in Forest Service Manual direction (FSM 2672.42) and was sent to United States Fish and Wildlife Service for consultation. Potential project effects on Region 5 Forest Service Management Indicator Species (MIS), and migratory bird species were analyzed in separate documents (refer to the Walker Recovery Project MIS Report and Walker Recovery Project Migratory Birds Report).

Forest Service sensitive species are designated by the Regional Forester and are species that have known or suspected viability problems due to (1) significant current or predicted downward trends in population numbers or density, and/or (2) significant current or predicted downward trends in habitat quantity or quality for these species. The Forest Service considers the long-term conservation needs of sensitive species in order to avoid future population declines and the need for federal listing. The Biological Evaluation for Region 5 Sensitive Species list was updated in 2018.

Five categories of species are considered in the Biological Evaluation (BE) (hereafter TES species); threatened, endangered, proposed, candidate and Forest Service sensitive species. Species federally listed as endangered by the US Fish and Wildlife Service (USFWS) are species currently in danger of extinction throughout all or a significant portion of their range. Species listed as threatened are likely to become endangered within the foreseeable future throughout all or a significant portion of their range. A proposed species is any species that is proposed in the Federal Register to be listed as a threatened or endangered species under the Endangered Species Act (ESA) (50 CFR 402.03). A candidate species is a species for which the USFWS has on file enough information to warrant or propose listing as endangered or threatened. These species have been addressed in the Biological Assessment (BA) document that has been sent to USFWS. Two species are discussed in this Environmental Assessment: Sierra Nevada yellow-legged frog and gray wolf.

Table 23. Threatened, Endangered, Proposed, Candidate and Sensitive Animal Species that potentially occur on the Plumas National Forest by species status, habitat and category for project analysis.

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Habitat or Ecosystem Component	Category for Project Analysis**
Invertebrates			
Valley elderberry longhorn beetle (Desmocerus californicus dimorphus)	FT	Elderberry trees (Sambucus spp.)	1
Western Bumblebee (Bombus occidentalis)	USFS : S	Access to Flowing Plants and Abandoned Rodent Burrows	3

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Habitat or Ecosystem Component	Category for Project Analysis**
Carson wandering skipper (Pseudocopaeodes eunus obscurus)	FE	Alkaline Soils	1
Fish			
Hardhead minnow (Mylopharodon conocephalus)	USFS : S DFW :SSC	Riverine and Lacustrine	2
Delta smelt (Hypomesus transpacificus)	FT	Riverine and Lacustrine	1
Amphibians			
California red-legged frog (Rana aurora draytonii)	FT	Riverine and Lacustrine	1
Foothill yellow-legged frog (Rana boylii)	USFS : S, CDFW T	Riverine and Lacustrine	3
Sierra (Mountain) yellow-legged frog (Rana sierrae)	FC, USFS : S, CDFW : SSC	Riverine and Lacustrine	3
Northern leopard frog (Rana pipiens)	USFS : S, CDFW : SSC	Riverine and Lacustrine	1
Reptiles			
Northwestern pond turtle (Clemmys marmorata marmorata)	USFS : S, CDFW : SSC	Riverine and Lacustrine	2
Birds			
Bald eagle (Haliaeetus leucocephalus)	USFS : S, SE, USFWS : BCC	Large trees adjacent to riverine and lacustrine	2
California spotted owl (Strix occidentalis occidentalis)	USFS : S, USFS : MIS, DFG : SSC, USFWS : BCC	Late Seral Closed Canopy Coniferous Forest	3
Greater sandhill crane (Grus canadensis tabida)	USFS : S, ST	Prefers open habitats (grasslands and croplands) with shallow lakes and fresh emergent wetlands	1
Great gray owl (Strix nebulosa)	USFS : S, SE	Late Seral Closed Canopy Coniferous Forest adjacent to wet meadows	1
Northern goshawk (Accipiter gentilis)	USFS : S, DFG : SSC	Late Seral Closed Canopy Coniferous Forest	3

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Habitat or Ecosystem Component	Category for Project Analysis**
Swainson's hawk (Buteo swainsoni)	USFS : S, DFG : SSC	Open desert, grassland or cropland containing scattered, large trees or small groves	1
Willow flycatcher (Empidonax trailii brewsteri)	USFS : S, SE, USFWS : BCC	Riparian with dense willows	2
Mammals			
Gray Wolf (Canis lupus)	USFWS: FE	General Forest	3
American marten (Martes americana)	USFS : S	Late Seral Closed Canopy Coniferous Forest	1
California wolverine (Gulo luteus)	USFS : S, ST	Late Seral Closed Canopy Coniferous Forest	1
Pacific fisher (Martes pennanti pacifica)	FC, USFS : S, DFG : SSC	Late Seral Closed Canopy Coniferous Forest	1
Sierra Nevada red fox (Vulpes vulpes necator)	USFS : S, ST	Late Seral Closed Canopy Coniferous Forest	1
Pallid bat (Antrozous pallidus)	USFS : S, DFG : SSC	Most common in open, dry habitats with rocky areas (rocky outcrops, cliffs and crevices)	3
Townsend's big-eared bat (Corynorhinus townsendii)	USFS : S, DFG : SSC	Mesic Habitats	3
Fringed myotis (Myotis thysanodes)	USFS : S DFW : SSC	Hardwood-conifer Open Canopy Forests	3

*__Species Status: FE__ = Federal Endangered, **FT** = Federal Threatened, **FP** = Federal Proposed, **FC** = Federal Candidate,
USFS : S = U.S. Forest Service - Sensitive, **USFS : MIS** = U.S. Forest Service – Management Indicator Species, **SE** = State Endangered,
ST = State Threatened, **DFG : FP** = State Fully Protected, **DFG : SSC** = State Species of Special Concern,
USFWS : BCC = U. S. Fish and Wildlife Service Birds of Conservation Concern, **SOI** = Species of Interest.
** **Category 1:** Species whose habitat is not in or adjacent to the wildlife analysis area and would not be affected by the project.
Category 2: Species whose habitat is in or adjacent to the wildlife analysis area, but would not be either directly or indirectly affected by the project.
Category 3: Species whose habitat would be either directly or indirectly affected by the project.

Some TES species identified in Table 23 have been eliminated from further analysis based on past analysis and concurrence from the USFWS (Rotta 1999, USFWS letter 1-1-99-I-1804 dated August 17, 1999) or due to lack of species distribution and/or lack of designated critical habitat. These species are listed below:

- Delta smelt (Hypomesus transpacificus)
- California red-legged frog (*Rana aurora draytonii*) and Critical Habitat for CRLF.
- Critical Habitat for Sierra Nevada Yellow-legged Frog (*Rana sierrae*): No Designated Critical Habitat exists in the action area or the analysis area. There would be no effect to Critical Habitat. This is further explained in the Biological Assessment.

In addition, the valley elderberry longhorn beetle, Northern leopard frog, yellow-billed cuckoo, Greater

sandhill crane, great gray owl, Swainson's hawk, American marten, Pacific fisher, Sierra Nevada red fox and wolverine were classified as Category 1 above. These species will not be discussed further because habitats that support these species do not occur in the wildlife analysis Area, so the project would not directly or indirectly affect these species or their habitats.

Hardhead minnow, Western pond turtle, willow flycatcher and bald eagle were identified as Category 2 above. Habitat for these species occurs within the analysis area, but the habitat factors for these species would not be directly or indirectly affected by the project; therefore, the project would not affect these species or their habitat. Species with habitat that would be either directly or indirectly affected by the Walker Fire Recovery Project (Category 3, Table 23) are carried forward in the BE. The BE report will evaluate the direct, indirect, and cumulative effects of the alternatives on these species and their habitats. Category 3 species known to be present and have habitat that may be affected are considered key species and are carried forward into this BE.

Consultation to Date

Consultation with the USFWS is required. The Biological Assessment was sent to USFWS on April 10, 2020 and a biological opinion through USFWS consultation was completed, received on May 13, 2020, and is available in the project record. Consultation was completed for gray wolf and Sierra Nevada yellow-legged frog. The gray wolf had a new litter in the summer of 2020 after consultation was complete. This den and rendezvous sites were greater than 1 mile from the Walker Fire perimeter (personal communication between CDFW wolf biologist Kent Laudon and Colin Dillingham 31 July 2020), and the Forest Service, CDFW and USFWS are coordinating project implementation as outlined in USFWS's concurrence (08ESMF00- 2020-F-1784-1) with the determination of may affect, not likely to adversely affect.

Effects Analysis Methodology

Geographic Analysis Areas

The action area, or project area, is defined as the units to be treated, is 3,742 acres. The wildlife analysis area for terrestrial species is 58,787 acres including federal and non-federal lands (Figure 10). The acres delineated for analysis encompass areas where actions are proposed and/or cumulative effects with the proposed action are potentially significant.

The direct and indirect effects of the proposed project activities, together with the additive or cumulative effects, have been considered in evaluating impacts to TES species and habitat. This threshold of tolerance will be assessed through determination of whether the effects to the species may lead to a trend toward listing under the federal Endangered Species Act. The threshold of tolerance for federally endangered species will be whether the effects of the project are likely to adversely affect individuals.

See Figure 10 for the spatial boundary of the wildlife cumulative effects analysis area, which includes the entire Walker Fire perimeter. There are two actions planned in the analysis area that are likely to occur in the next 1-5 years. The 2020 PNF Road and Trail Maintenance Project which would complete road and trail maintenance, hazard tree abatement and fuel reduction along existing roads. The Walker Reforestation Project would include site preparation, plant native conifer seedlings and release with the potential use of herbicides in the analysis area.

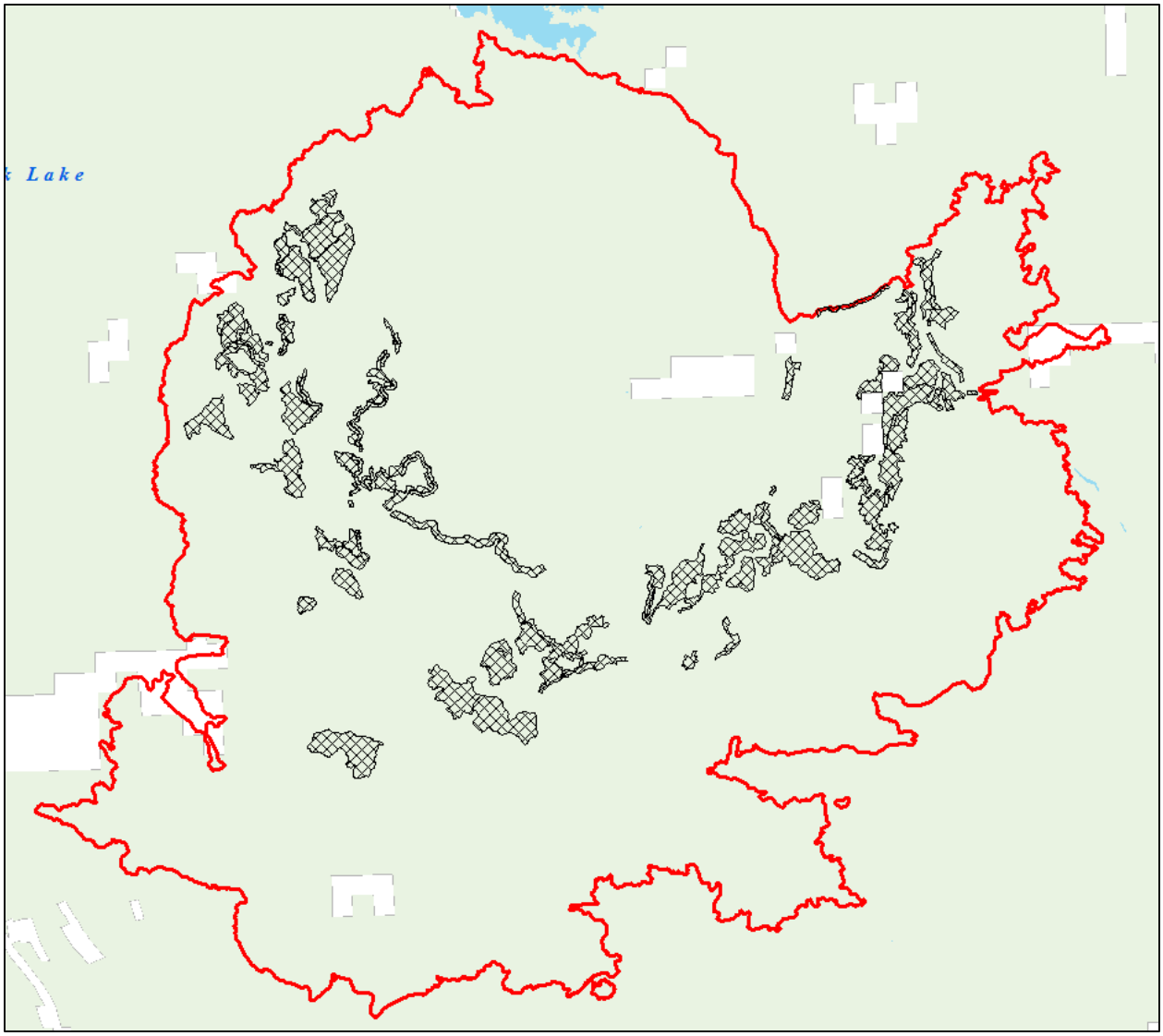

Figure 10. Walker Recovery Project Wildlife Analysis area, Plumas National Forest. Red outline is analysis area boundary, hatched polygons are proposed treatment polygons. White background are private lands and green is National Forest lands.

Duration of Impacts and Cumulative Effects Boundaries

The direct effects would likely be limited to the project implementation phase (1 year). Indirect effects would last beyond the implementation period and occur within the temporal bound of the cumulative effects analysis. Cumulative effects are based on past actions that have occurred in the Walker Fire Recovery Project area in the past 30 years. For the purpose of the wildlife analysis, the temporal bounds include a 30-year horizon for future effects because modeling indicates that, within that timeframe, the treated stands would approach stocking levels corresponding with forest development (i.e. young forested stands could develop within this timeframe).

Specific Assumptions

The following assumptions apply specifically to the wildlife analysis:

- **Assumption 1:** All standards and guidelines, standard operating procedures (SOPs), project

specific design features and mitigations would be fully adhered to and implemented, including the use of the appropriate Limited Operating Periods (LOPs).

- **Assumption 2:** All activities proposed would be completed within approximately one to two years.
- **Assumption 3**: All trees known to be inhabited by wildlife (nest trees, roosts, etc.) would be retained unless they pose a safety hazard.
- **Assumption 4**: Analysis assumes occupancy unless project area has been surveyed to protocol and found to be absent of the species.
- **Assumption 5**: Proposed activities have the potential to affect TES species, either directly by the modification or loss of habitat or habitat components, and rarely from direct mortality if nest trees are felled, or indirectly through habitat modification (e.g., changes to canopy cover, age class structure and species composition).
- **Assumption 6**: Aquatic species spend all or significant portions of their life cycles either in water and/or moving through nearby terrestrial/riparian habitats, such as Riparian Conservation Areas (RCAs).
- **Assumption 7**: Aquatic habitats and associated stream systems can tolerate certain levels of land disturbance. However, widespread or intense land disturbances applied in sensitive areas such as RCAs can substantially impact the immediate area or downstream channel stability and water quality.

Effects Analysis

The EA includes all species that were identified in the Biological Evaluation, Biological Assessment, Management Indicator Species Report and public comments that may be impacted by the Walker Fire Recovery Project. Many other species were not included in the EA, but analysis was completed and is included the above mentioned reports. To reduce the length of the final EA, the following analyses were removed from the draft EA and retained in the Biological Evaluation: Willow Flycatcher, Hardhead Minnow, Western Pond Turtle, Bald Eagle, Great Gray Owl and Mesocarnivores. These sections were removed because the analysis showed that these species would not be impacted by the Walker Fire Recovery Project.

The Walker Fire Recovery Project was reviewed on the ground as well as using satellite imagery (NAIP), vegetation layer spatial datasets, species specific spatial datasets and known information to help determine suitable habitat for species. In the field, areas identified as suitable habitat in the analysis area were surveyed. Species nest sites and locations were recorded using Global Positioning System (GPS) and incorporated into spatial datasets. For the analysis of effects, changes to suitable habitat and impacts to management units (i.e., protected activity centers, PACs; nesting territories, etc.) were determined using a spatial dataset of the vegetation layer combined with type of treatments (e.g. mechanical thinning, hand thinning, prescribed fire).

All vegetation information is displayed using the California Wildlife Habitat Relationships (CWHR) vegetation codes and serves as the baseline acres for analyses (Appendix C of USDA 2004). Forest-wide vegetation typing is updated after fires and forest activities to most accurately represent available habitat types.

GIS analysis using California Wildlife Habitat Relationships modeling was used. When making determinations for post fire Wildlife Habitat, it was assumed that if fire severity was greater than 50 percent vegetation burn severity, then forested environments would no longer provide sufficient canopy cover to qualify as moderate or dense canopy cover. Therefore, habitats burned at greater than 50 percent burn severity are no longer considered suitable owl or goshawk nesting or roosting habitat. PACs and

HRCAs were redrawn in several areas and effects used redrawn habitat designations for analysis purposes. See the spotted owl and goshawk sections below for more details.

Other data sources used include:

- GIS layers containing the following information: vegetation layer, ownership, aquatic features (streams, springs and lakes, etc.), riparian/aquatic management areas (Riparian Conservation Areas (RCAs), Critical Aquatic Refuges (CARs)), and species management layers (e.g., Protected Activity Centers (PACs), Home Range Core Areas, (HRCAs)), CWHR, slope, elevation, gradient, aquatic features
- Incidental detection records located in the Natural Resources Inventory System (NRIS) database
- Project survey reports
- Scientific literature

General Affected Environment

Wildlife habitat in the Walker Fire wildlife analysis area consists of variously forested areas which were burned in the September – October 2019 Walker Fire. The analysis area also includes brushy habitats, meadows, riparian habitat, hardwoods and many perennial and intermittent streams. Fire suppression led to unnaturally high fuel loading, which contributed to the high wildfire severity of the Walker Fire.

The analysis of project activities considers the attributes of structure and heterogeneity values for suitable habitat. Although these characteristics are evaluated, there is no standard for measurement. Therefore, this analysis uses the California Wildlife Habitat Relationships (CWHR) system to evaluate forest conditions and the suitability of wildlife habitat. The CWHR system continues to be used for terrestrial wildlife habitat analysis for projects under the 2004 SNFPA FSEIS as it maintains consistency for monitoring changes in species habitat. This analysis uses CWHR size class 5 to differentiate late seral forest, CWHR size class 4 is considered mid-seral. The predominant pre-Walker Fire CWHR size class of forest stands in the project area is 4, which accounts for 28 percent of the wildlife analysis area. CWHR size class 5 constitutes approximately 10 percent of the wildlife analysis area. Largely due to past wildfires (Moonlight Fire 2007, Antelope Wheeler Complex 2007, and Stream Fire 2001), there were 15,310 acres of shrub dominated habitats in the analysis area prior to the Walker Fire. Table 24 summarizes the amount of CWHR types within the terrestrial wildlife analysis area.

It is acknowledged that there are some disparities in habitat typing between CWHR and actual stand data and that the acres of 4M, 4D, 5M and 5D could be inexact estimates of habitat availability, and that CWHR types are only looking at three key habitat attributes, canopy cover, size class and species composition. However, this data is the best information available for evaluating landscape-level changes in habitat types. Table 25 shows the approximate number of down logs by average DBH needed to meet 10-15 tons/acre referred to in the 2004 SNFPA FSEIS ROD. These retention standards were designed to meet the needs of wildlife.

Table 24. Summary of California Wildlife Habitat Relationships (CWHR) types within the Walker Recovery Project wildlife analysis area. (All acres are approximate. Analysis Area includes Private Lands and USFS lands; Project Area only contains USFS lands as project work will not occur on private lands.).

Seral Stage	CWHR Size-Density	Acres of Pre-Walker Fire condition in analysis area	Acres of analysis area less than 50% vegetation burn severity	Acres less than 50% vegetation burn severity in treatment units
Conifer Forest - Multi-Layered, Dense Canopy	6	0	0	0
Conifer Forest - Late Seral Dense Canopy	5D	3348	639	18
Conifer Forest - Late Seral Moderate Canopy	5M	2810	804	69
Conifer Forest - Late Seral Open Canopy	5P	706	267	64
Conifer Forest - Late Seral Sparse Canopy	5S	379	99	1
Conifer Forest - Mid Seral, Dense Canopy	4D	3,765	1,592	111
Conifer Forest - Mid Seral, Moderate Canopy	4M	12,823	3,666	1136
Conifer Forest - Mid Seral, Open Canopy	4P	8,658	3,307	7138
Conifer Forest - Mid Seral, Sparse Canopy	4S	3,893	1446	20
Conifer Forest - Early Seral, Dense Canopy	3D	469	279	0
Conifer Forest - Early Seral, Moderate Canopy	3M	211	114	05
Conifer Forest - Early Seral	Size Class 1,2 3P, 3S	3,567	1004	012
Hardwood Forest		1,001	178	61
Shrub Dominated		15,310	4,741	016
Grassland		1,698	822	011
Non-Vegetated		150	75	0
Total		58,787	19,022	3378

* Conifer forest includes EPN, JPN, PPN, SMC and WFR; Hardwood Forest includes ASP and MHC; Grassland includes AGS, PGS and WTM; Shrub Dominated includes MCH, MRI, MCP, RIV, and SGB; Non-Vegetated includes BAR, LAC, URB, and WAT.
Size Class: 1 = Seedling Tree <1" DBH; 2 = Sapling Tree 1 - 6" DBH; 3 = Pole Tree 6 - 11" DBH, 4 = Small Tree 11 - 24"DBH; 5 = Medium/Large Tree >24"DBH; 6 = Multi-layered Tree.
Canopy Cover: D = Dense Canopy Cover (> 60%); M = Moderate Canopy Cover (40 - 59%); P = Open Canopy Cover804 (25 – 39%); S = Sparse Canopy Cover (10 – 24%).
Vegetation Types: AGS = Annual Grassland; ASP = Aspen, BAR = Barren; EPN = Eastside Pine; PPN = Ponderosa Pine; JPN = Jeffrey Pine; LAC = Lacustrine; LPN = Lodgepole Pine; MCH = Mixed Chaparral; MCP = Montane Chaparral; MHC = Montane Hardwood-Conifer; MHW = Montane Hardwood; MRI = Montane Riparian, PGS = Perennial Grassland; PPN = Ponderosa Pine; RIV = Riverine; SGB = Sagebrush; SMC = Sierra Mixed Conifer; URB = Urban; WFR = White Fir; WTM = Wet Meadow (Mayer and Laudenslayer 1988).

Table 25. Approximate Number of down Logs by Average DBH needed to meet 10-15 tons/acre

Average DBH (inches)	Number of down logs
12	24 to 30
14	18 to 24
16	14 to 20
18	10 to 14
20	8 to 12
22	6 to 8
24	4 to 6
26	4 to 6
28	4 to 6
30	4 to 6
>30	2 to 4

Environmental Consequences Common to Sensitive Wildlife Species

The following generalized effects analyses for the Proposed Action apply to all species considered in the Biological Evaluation, Biological Assessment (USDA 2020, BA), Management Indicator Species Report (USDA 2020, MIS) and Migratory Bird Report (USDA 2020, MBR). Additional analysis is provided for specific species in subsequent sections. Refer to Walker Recovery Project Biological Assessment for analysis for Sierra Nevada Yellow-legged frog and Gray Wolf.

Direct effects include immediate changes in habitat conditions and disturbance/harassment to individuals, including direct mortality, during project activities. It is assumed in this analysis that project activities would be implemented as stated, in compliance with all rules and regulations governing land management activities, including the use of the appropriate Limited Operating Periods (LOPs) identified in Table 26. LOPs can be lifted by the District Wildlife Biologist if birds are absent or not nesting. Direct disturbance, including mortality to individual animals addressed in this analysis is unlikely, due to survey efforts for selected species, incorporation of LOPs where appropriate, and implementation of Forest standards and guidelines. If presently unknown wildlife is discovered prior to or during implementation, and the species identified warrants a LOP, protections would be implemented. Indirect effects include effects that occur later in time or beyond the treatment area of the project. Indirect effects also may include effects to a species prey base.

Table 26. Limited Operating Periods (LOPs) for the Plumas National Forest.

Species	Location	Limited Operating Period	Reference Pages
Yellow-legged Frogs	Instream work	Dry Stream Channel or pre-project survey	Biological Opinion
	Upland work and burning	October 01 – April 15	Biological Opinion
Bald Eagle	Within designated territories (1/2 mile around nest)	November 1 - August 31	2 - 8*
	Winter roosts	November 1 - March 1	
California Spotted Owl	Within 1/4 mile of nests or within protected activity center boundary	March 1 - August 15	2 - 8* Modified by October 2006 RO Letter
Great Gray Owl	Within 1/2 mile of nesting sites	March 1 - August 31	2 - 8*
Goshawk	Within 1/4 mile of nests or within protected activity center boundary	February 15 - September 15	A - 60**
American marten	100 acre den site buffer	May 1 - July 31	A - 62**
Pacific Fisher	700 acre den site buffer	March 1 - June 30	A - 61**
Pallid Bat and Townsend's Big-eared Bat	W/in 1/4 mile of maternity and other roosts	May 1 – August 15	Professional Judgment

*Herger-Feinstein Quincy Library Group Forest Recovery Act – Final Environmental Impact Statement (HFQLGFRA-FEIS) (1999), Page 2-8, Table 2.3.
**Sierra Nevada Forest Plan Amendment – Final Supplemental Environmental Impact Statement (SNFPA FSEIS) – Record of Decision (ROD) (2004), page A-54, A-58, A-60, A-61 and A-62.

Table 27. Riparian Conservation Area Treatment Design Criteria by RCA Type.

Stream Type	Riparian Conservation Area (RCA) widths	Minimum distance to burn pile	Equipment Exclusion Zone	
			Slope <35%	Slope >35%
Perennial streams*	300 feet	82 feet	100 feet	Excluded
Intermittent stream*	150 feet	82 feet	82 feet	Excluded
Ephemeral stream	150 feet	15 feet	25 feet	Excluded
Special Aquatic* Features (Reservoirs, wetlands, fens, and springs)	300 feet	50 feet	100 feet	Excluded
Riparian features, dry meadows, seasonal wetlands	150 feet	25 feet	50 feet	Excluded

*Considered Sierra Nevada Frog Suitable Habitat.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects

Direct and Indirect Effects of Implementing Salvage Logging

Approximately 3,742 acres are proposed for mechanical salvage logging treatment. Direct effects from

mechanical treatments occur with trampling, or disturbance to nesting or denning wildlife. These actions can result in death or reduced nesting success. Indirect effects include changes to habitat structure and suitability, such as thinning a dense forest below desired conditions for nesting and foraging.

Direct and Indirect Effects of Water Drafting

Drafting water via pump trucks would be undertaken to add water to haul roads to abate dust and stabilize the road surface. Existing water drafting sites would likely be utilized. Per BMP 2.5 (USDA 2012), this work would occur so that water would be pumped outside of the normally flowing stream channel, preventing impacts to in-stream flow and assuring that disturbance associated with pumping or maintenance of the water source would not cause turbidity in the stream. These actions would not harm water quality at these drafting sites.

Direct and Indirect Effects of Road Maintenance

Project activities include maintaining existing roads, replacing culverts, laying gravel and blading roads. This may cause a short-term increase in potential sedimentation. However, the road and culvert maintenance would reduce the long-term input of sediment into the streams. Adding 2.8 miles of temporary roads would create new sediment sources. BMPs would be used to reduce sediment input from temporary roads. The short-term increase of temporary roads would have negative impacts on wildlife through disturbance and short-term loss of habitat.

Alternative 1 (Proposed Action) Cumulative Effects

The existing condition reflects the landscape changes from all activities that have occurred in the past. The analysis of cumulative effects of the alternatives evaluates the impact on wildlife habitat from the existing condition within the wildlife analysis area. Under NEPA, cumulative effects represent the impact on the environment, which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions.

Present and future projects planned that overlap with the analysis area may have cumulative impacts to wildlife, fisheries and amphibians. The 2020 PNF Road and Trail Maintenance Project overlaps with the Walker Recovery Project Area. The Moonlight Spotted owl and Goshawk Fuels Reduction Project is west and north of the Walker Recovery project wildlife analysis area. Approximately 1142 acres of the Moonlight Spotted owl and Goshawk Fuels Reduction Project occurs adjacent to the wildlife analysis area. Treatment consists of hand thin and pile and follow-up underburn. Individual spotted owls, such as the Hungry spotted owl pair and Indian goshawks, are known to move back and forth from the Walker Fire area to the Moonlight Spotted Owl and Goshawk Fuels Reduction Project area (see Blakey et al. 2019 and Blakey et al. 2020).

The PNF firewood cutting program is ongoing and is expected to continue. This programs allow the public to purchase a permit to remove firewood, including standing dead trees often used for nesting by wildlife species, from National Forest System lands. The Walker Recovery Project area, as well as the analysis area is open to firewood tree cutting. Firewood cutting has greatly increased post-Walker Fire. Snags and down logs would continue to be removed, resulting in the cumulative loss of these habitat components across the landscape. Loss of these habitat features may indirectly impact wildlife species. Uncontrolled public use, especially during the breeding season, also may cause direct mortality, particularly of nesting birds, as well as disturbance to species nesting and denning nearby. Direct mortality to nesting woodpeckers and other cavity nesting wildlife is likely to occur when wood cutters harvest snags in the breeding season. Snag and log removal occurs along, or within a short distance from, open roads. The past and future effect of these actions would maintain overall similar forest structure, but with a reduction in the number of snags available to wildlife.

Alternative 2 (No Action Alternative) Direct and Indirect Effects

This analysis is applicable to all terrestrial and aquatic wildlife species. Therefore it will not be repeated under the "species analysis" section below. There are no proposed activities within the project area under No Action Alternative. No salvage, hazard tree abatement and removal, road maintenance, or water drafting would occur. No temporary roads would be constructed.

There would be no direct effects to terrestrial or aquatic wildlife species in the Walker Fire analysis area with implementation of the No Action Alternative, as no project activities would occur. Mechanical equipment would not come into contact with wildlife individuals or their habitat. No trees or snags would be felled under No Action (Alternative 2) and there would be no direct effects to nesting birds, terrestrial mammals or amphibians. No nest or roost trees would be cut down. There would be no risk of trees or snags falling onto wildlife species.

No indirect effects to terrestrial or aquatic wildlife species would occur under No Action Alternative. There are no disturbance related effects from heavy equipment or timber felling. No sediment would be delivered from logging areas or roads as a result of project activities.

Alternative 2 (No Action Alternative) Cumulative Effects

This analysis is applicable to all terrestrial and aquatic wildlife species. Therefore it will not be repeated under the "species analysis" section below. No project activities would occur under the No Action Alternative. There would be no direct or indirect effects from project implementation on terrestrial or aquatic wildlife species, or to suitable habitat. Therefore, the No Action Alternative would result in no cumulative effects upon the foothill yellow-legged frog or its habitat.

Western Bumble Bee (Bombus occidentalis) - Affected Environment

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects

Although potential direct effects on the western bumble bee include mortality of individuals or entire nesting colonies, it is difficult to precisely quantify the risk of and occurrence of such events for this species. We therefore focused on three management questions regarding the western bumble while designing and evaluating potential environmental consequences of the Walker Fire Recovery Project:

1. Continuous access to flowering plants from spring through autumn.
2. Adequate habitat for nesting and overwintering sites exist (undisturbed areas with logs and clumps of grass).
3. Floral resources and nesting habitat not fragmented or isolated in distribution (nesting habitat in close proximity to foraging habitat).

Flowering plant species (nectar sources) known to be used by *B. occidentalis* likely occur throughout the analysis area. Ground disturbing activities associated with the Walker Fire Recovery Project likely will reduce foraging opportunities for *B. occidentalis* in the project footprint (treatment units) in the short-term; however, this reduction in foraging habitat likely will be ephemeral as flowering plants will sprout and regenerate after implementation is complete. Ground disturbing activities may result in loss of suitable nesting and overwintering site availability for *B. occidentalis* (i.e. rodent burrows) within treatment units.

Throughout the project, both spatially and temporally, there will be habitat refugia for *B. occidentalis* via untreated areas and RCA equipment exclusion zones. RCA equipment exclusion zones will receive minimal disturbance during the project. As neither untreated nor RCA equipment exclusion zones area will experience significant ground disturbing activity, we expect suitable nesting and overwintering sites to persist throughout the length of the project. Further, given the linear nature of RCAs, equipment exclusion zones within RCAs also serve as habitat corridors for *B. occidentalis*, providing habitat

connectivity between and among foraging and nesting habitat.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

Cumulative effects on *B. occidentalis* could occur with the incremental loss of the quantity and/or quality of habitat for this species.

The Walker Fire had a profound and lasting impact on the bumble bee habitat in the analysis area. There were 29,448 acres of high severity fire that opened up the tree and brush canopy. The opening up of the forest canopy, combined with the effects of wildfire, is expected to enhance flowering plant density, and therefore increase the ability of the landscape to support western bumblebee. Flowering plants suitable for foraging by bumblebees will likely have a strong positive response to the wildfire. The salvage logging on 4,800 acres would have negative impacts on forage and nesting habitat. This is approximately 16 percent of the recently created (Walker Fire) forage habitat for bumble bees.

The woodcutting programs on the PNF is ongoing and is expected to continue. The past and future effect of the woodcutting program has and would be to reduce snags, in all forest types, along roadsides throughout much of the analysis area. However, snag and log removal through the woodcutting program has a limited spatial impact across the PNF as woodcutting is only permitted along open roads (within 100 feet). With the current PNF woodcutting program, the terrestrial wildlife analysis area would be open to public woodcutting 12 months a year, limited only by available access. Uncontrolled public use, especially during the nesting season, may cause disturbance to nesting colonies. However, *B. occidentalis* colonies are capable of deterring people and other animals from trampling the nest by repeatedly stinging them.

Determination

The implementation of the proposed actions for the Walker Fire Recovery Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for Western bumblebee.

Salvage logging would impact 16 percent of high-quality habitat created by the Walker Fire. Therefore, 84 percent of recently created high quality foraging habitat would be available for use by bumblebees.

Sierra Nevada Yellow-Legged Frog (Rana sierrae)

The Biological Assessment (BA) was prepared and submitted to US Fish and Wildlife Service in April 2020. The BA included the original Walker Fire Rehabilitation Project (see Public Involvement, Scoping, for more information) and a second, separate project named “2020 PNF Road and Trail Maintenance Project”. The follow analysis for Sierra Nevada yellow-legged frog is directly from the BA and unedited to maintain the integrity of the BA. There was no need to reinitiate consultation with USFWS on the Walker Fire Recovery Project, as the project was only reduced in size and new project locations were not added.

Rana sierrae is a federally endangered species that is endemic to California. *Rana sierrae* were once extremely abundant throughout their range, but have exhibited a rapid 95 percent decline in wild populations (Briggs, Knapp, and Vredenburg, 2010). In 2014, the USFWS classified *R. sierrae* as endangered under the Federal Endangered Species Act (USFWS 2014a; Federal Register, Vol. 79, No. 82. April 29, 2014). Most populations of *R. sierrae* occur primarily on public lands, including the El Dorado, Inyo, Lassen, Plumas, Sierra, Stanislaus, Tahoe, and Lake Tahoe Basin National Forests. The Plumas National Forest possesses one of the northernmost extant wild populations of *R. sierrae*. While typically found in alpine lakes through much of their southern range in the Sierra Nevada, on the Plumas National Forest *R. sierrae* are typically found in perennial and intermittent streams above 4,500 feet, forming small, isolated populations which suffer from a relatively high risk of local extinction.

Table 28. Acres of suitable habitat within action areas.

Acres	Area (acres)	Wolf Suitable Habitat (acres)	Sierra Nevada Yellow-legged Frog Suitable Habitat (acres)
Walker Fire Recovery Project Action Area	58,787	58,787	4,015
Walker Fire Recovery Project Treatment Area	3,742	3,742	269
2020 PNF Road and Trail Maintenance Project Action Area	71,235	70,394	4,335
2020 PNF Road and Trail Maintenance Project Treatment Area	7,886	7,886	769

Table 29. Acres of suitable habitat within each treatment type.

Treatment Type:	Walker Fire Recovery Project	2020 PNF Road and Trail Maintenance Project	Wolf Habitat	*R. sierrae* Suitable Habitat (0-82')
Timber Salvage (Mechanical)	3,742	0	0	267
Roadside activities (Mechanical Hazard Tree, culvert cleaning, ditch pulling)	0	7,886	7,886	769
Livestock Range Fence Replacement	17	0	17	2
Wildlife Guzzler Replacement	1	0	1	0
Road Surface Restoration (189 miles)	0	321	321	0
Acres Affected (Action Area):	3,742	7,886	8,225	1,038

*Road surface restoration spatially overlaps roadside activities, and is not included as additional acres in total estimates.

Habitat and Life History

Distribution-wide species account (life history and spatial ecology for the Sierra Nevada yellow-legged frog was provided in the Federal Register and the USDA Forest Service Biological Assessment for the Programmatic Consultation between the Pacific Southwest Region and the Fish and Wildlife Service (79 FR 24255; FF08ESMF00-2014-F-0557: Programmatic BA, June 16, 2014), and incorporated herein by reference.

Threats/Management Concerns

Risk factors and management concerns were thoroughly reviewed in the Federal Register and the USDA Forest Service Biological Assessment for the Programmatic Consultation between the Pacific Southwest Region and the Fish and Wildlife Service (79 FR 24255; FF08ESMF00-2014-F-0557: Programmatic BA, Pages 31-37, June 16, 2014), and incorporated herein by reference.

Population Status

Sierra Nevada yellow-legged frogs occupy at least seven areas on the Plumas National Forest: Boulder – Lone Rock Creek, Lakes Basin, Slate Creek, Deanes Valley, and three locations in Bucks Lake Wilderness (Bean Creek). Ongoing restoration efforts on the forest are designed to maintain resident populations of Sierra Nevada Yellow-legged Frog. The forest, in collaboration with several partners, is headstarting (eggs and larvae are collected in the field, reared in captivity, treated for chytrid fungus, and released as adults into natal streams) two populations of yellow-legged frog (Bean Creek and Bucks Lake

Wilderness), and the forest salvages tadpoles in drying pools in headwater streams (South Fork Rock Creek, Deanes Valley) and conducts mark-recapture monitoring in these populations and the Boulder - Lone Rock Creek population.

Lone Rock Creek represents the nearest extant *Rana sierrae* population to the project area. The nearest frog detection (in a tributary to Lone Rock Creek) is 3.2 linear miles from the Walker Fire Recovery Project Action Area (Figure 11 and Figure 13), and 210 feet from the 2020 Plumas National Forest Road and Trail Maintenance Project action area (Figure 12 and Figure 13). Survey efforts in 2019 included 24 surveys to locate eggs or tadpoles. Although no tadpoles or eggs were found in 2019, 6 adults and 5 metamorphs were located. In 2018, survey crews located two adult frogs and a single tadpole in Lone Rock Creek. In 2017, survey crews documented three adult frogs plus subadults and tadpoles in Lone Rock Creek. Frogs also have been detected in Boulder and Pierce Creeks as recently as 2016 (1.9 and 6.1 linear miles from the Action Area, respectively), but population sizes in these two creeks are critically low and current occupancy is unknown. Boulder and Pierce Creek populations may be locally extinct with zero detections in the past 3 years. Current information indicates that all populations of *Rana sierrae* on the Plumas National Forest contain fewer than 100 adult frogs, except perhaps the Goose Lake Population in the Lakes Basin on Beckwourth Ranger District. The forest seeks to expand ongoing headstarting efforts to include the adjacent Rock Creek site; however, the USFS has not yet located egg masses or adequate numbers of tadpoles to initiate head starting in that area as of 2019.

Critical Habitat

On August 24, 2016 Fish and Wildlife Service finalized designation of critical habitat for the Sierra Nevada yellow-legged frog (USFWS 2016; Federal Register, Vol. 81 FR 59045 59119). Based on the current knowledge of the physical or biological features and habitat characteristics required to sustain the species' life-history processes, the U.S. Fish and Wildlife Service identified three Primary constituent elements (PCEs) for Sierra Nevada yellow-legged frog critical habitat: Aquatic habitat for breeding and rearing (PCE 1), Aquatic nonbreeding habitat (including overwintering habitat; PCE 2), and Upland areas (PCE 3). The Walker Fire Rehabilitation Project does not overlap designated critical habitat for any species (Figure 11). The 2020 PNF Road and Trail Maintenance Project action area overlaps 1,312 acres of the Boulder – Lone Rock Creek critical habitat unit, with 16 acres of designated critical habitat overlapping treatment units (Figure 12 and Figure 13). Designated critical habitat overlapping treatment units is not suitable yellow-legged frog habitat and does not contain any PCEs.

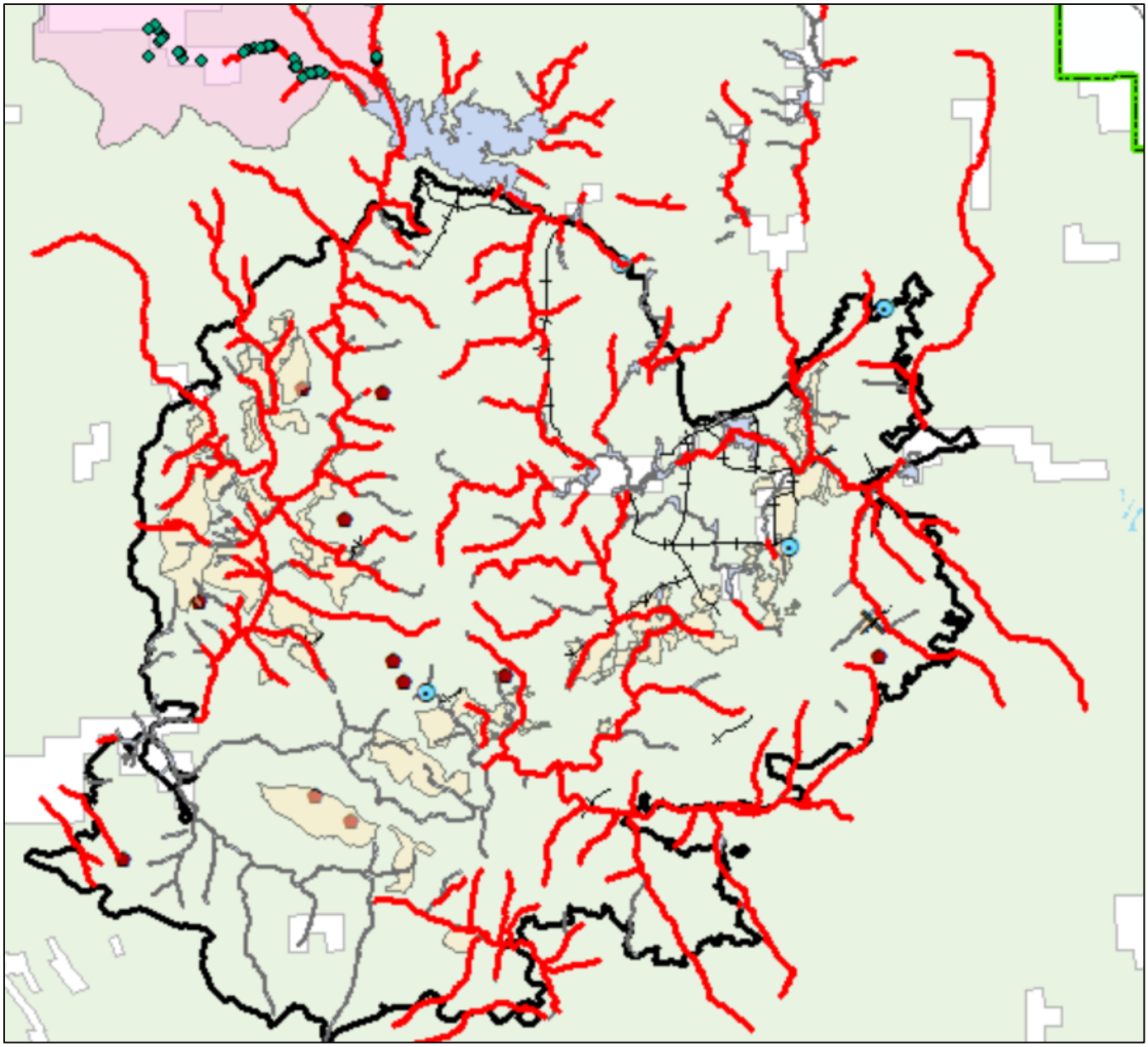

Figure 11. Walker Fire Recovery Project action area (black perimeter), salvage treatment units (yellow polygons), guzzler locations (maroon pentagon), range water improvement (blue points), range fence improvements (hatched black line), range guard wing (black X), amphibian surveys (red lines), suitable unsurveyed habitat (gray lines), critical habitat (purple polygon) and species observations (green dots).

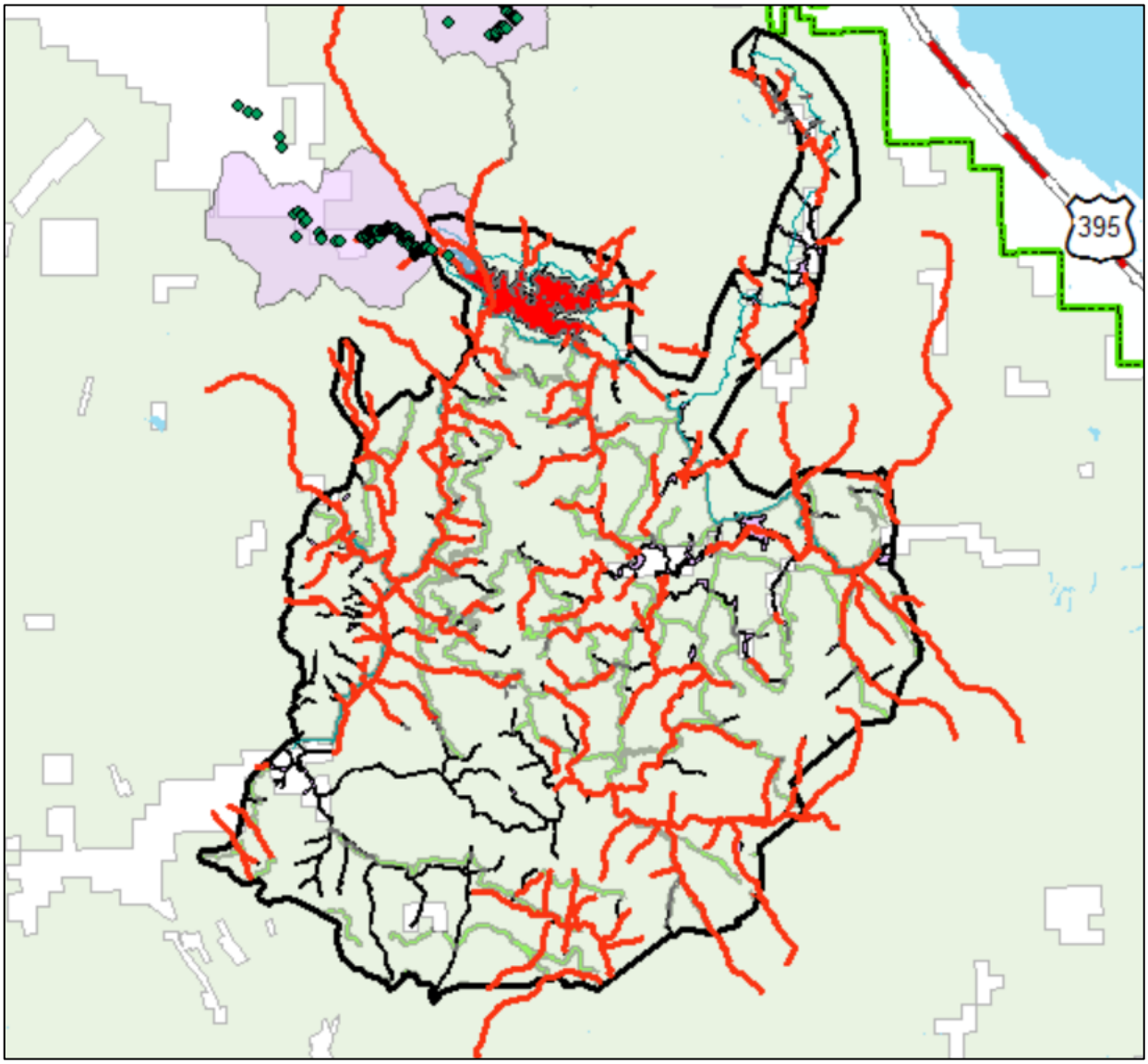

Figure 12. 2020 Plumas National Forest Road and Trail Maintenance action area (black perimeter), roadside hazard treatment units (green lines) and road surface treatments (blue lines), amphibian surveys (red lines), critical habitat (purple polygon) and species observations (green dots). Thin black lines show suitable habitat that has not been surveyed for SNYLF. Light green background is National Forest public ownership and white is other ownership.

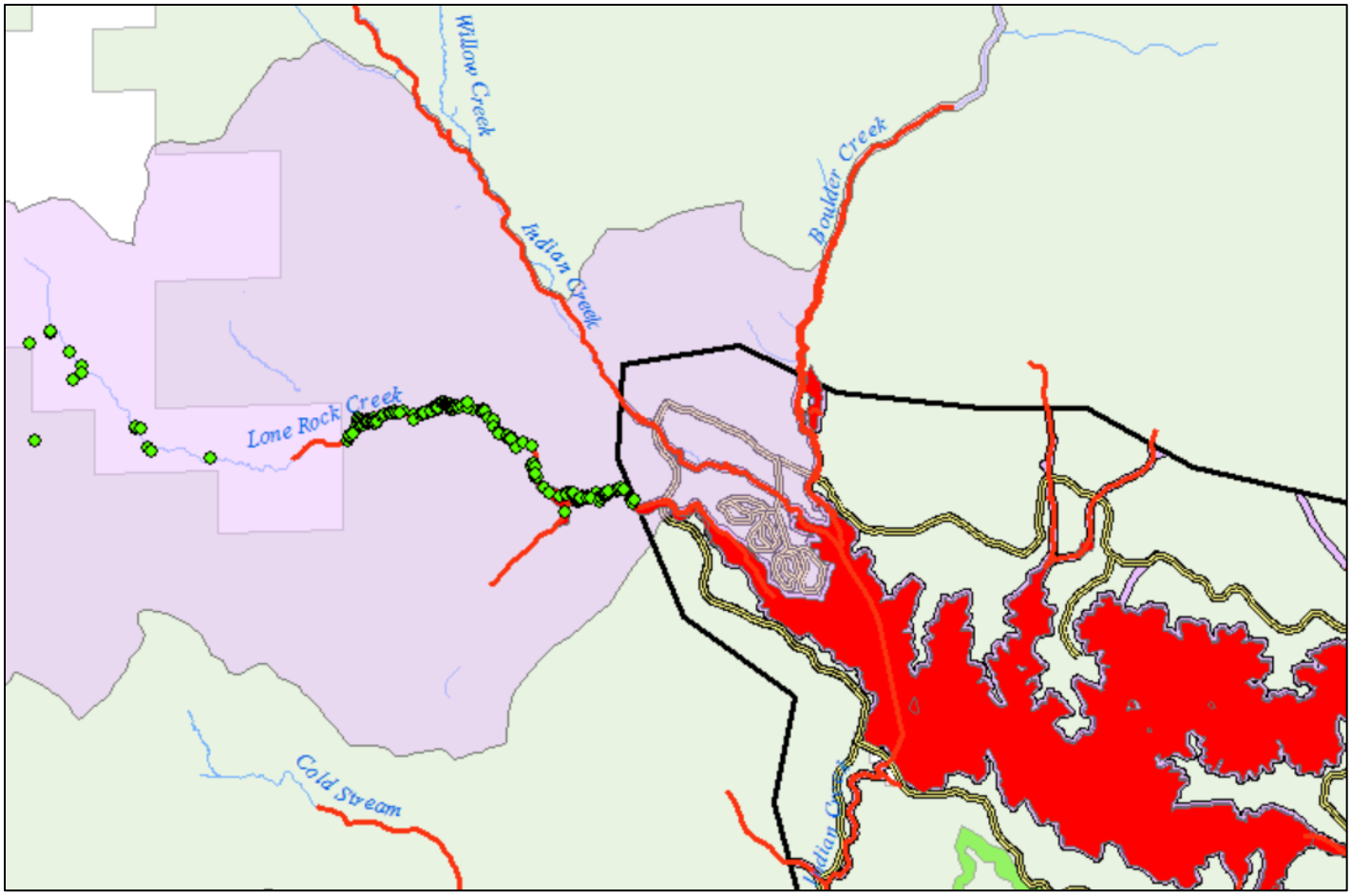

Figure 13. Map shows enlarged view of NW corner of 2020 Plumas National Forest Road and Trail Maintenance Project where it overlaps with critical habitat. Red lines and polygons are surveyed suitable habitat. Green dots are *Rana sierra*e observations. Yellow/black linear stripes are road surface treatments and green polygon south of Antelope Lake shows proposed roadside hazard removal. All frog locations are upstream of proposed action areas.

Project Surveys

No project specific surveys were conducted, due to the unplanned nature of the Walker Fire and these associated projects. However previous surveys had been conducted in both action areas. Amphibian visual encounter surveys were conducted in a portion of the suitable habitat within the Walker Fire projects following Fellers and Freel 1995 survey protocol. One to three surveys in suitable habitat (2010-2019) failed to detect any R. sierrae within the Walker Fire Recovery Project action area (Figure 11). There is a population of R. sierrae in Lone Rock Creek, and individuals have been found as close as 210 feet upstream of the Antelope Lake Road, which is included for road surface replacement as part of the 2020 PNF Road and Trail Maintenance Project (Figure 12 and Figure 13). Boulder Creek also has a population upstream of the action areas, with detections as recently as 2016. All surveys reported here are surveys conducted in the past 10 years for other projects in the Walker Fire projects area. There were 597 kilometers (373 miles) of streams surveyed in the 2020 Plumas National Forest Road and Trail Maintenance action area and 476 kilometers (298 miles) of streams surveyed in the Walker Fire Recovery Project action area. This survey distance includes survey overlap (i.e. if the same stream segment were surveyed twice, the distance of survey was duplicated). Due to the lack of historic records in the project action area, it is thought that R. sierrae may not occupy the project area. Both fish (trout) and aquatic

invasive species (signal crayfish) were observed during the surveys.

General Methods

The Walker Fire Recovery Project Action Area (58,787 acres) is the Walker Fire perimeter, contains all proposed activities, and includes all or portions of nine HUC-6 level-12 subwatersheds (Hungry Creek, Cold Stream-Indian Creek, Ward Creek-Indian Creek, Willow Creek-Last Chance Creek, Lower Red Clover Creek, Poison Creek-Last Chance Creek, Cottonwood Creek, Antelope Creek, and Squaw Queen Creek (Figure 10, Figure 12, and Figure 14). The 2020 Plumas National Forest Road and Trail Maintenance Project action area is relatively larger (71,325 acres) as it includes travel routes outside of the Walker Fire perimeter (Figure 11 and Figure 13), and it includes the same nine subwatersheds plus four additional subwatersheds (Boulder Creek, Lone Rock Creek-Indian Creek, McDermott Creek-Frontal Honey Lake and Clark's Creek (Figure 6). Within the Walker Fire Recovery project action area there are 4,015 acres of suitable habitat, and no recent or historic detections of *Rana sierrae*. Within the 2020 Plumas National Forest Road and Trail Maintenance Project action area there are 7,886 acres of suitable habitat, and *Rana sierra* occupy Lone Rock Creek upstream of the action area. There are 12,104 acres proposed for treatment within the Walker Fire projects (Table 28, Table 29, Figure 12 through Figure 15), and 1,038 acres of these acres are suitable habitat (Table 28 and Table 29). Acres of *Rana sierrae* suitable habitat were quantified for each action area and treatment type (Table 28 and Table 29). All water features (i.e., suitable habitat) were delineated and measured using the U.S.G.S. National Hydrography Dataset and ArcGIS software version 10.5.1.

Critical Habitat

The Walker Fire Rehabilitation Project action area is outside of designated critical habitat for *Rana sierrae* and is disconnected from any known populations (Figure 11), with the nearest population (3.2 linear miles away) in a separate watershed separated by mountainous ridges and Antelope Lake and Dam (Figure 11, Figure 13, and Figure 14). It is unlikely that a highly aquatic species such as *R. sierrae* would cross from these adjacent watersheds, even in winter months when frogs may move further overland. It is unlikely that *R. sierrae* would disperse into the project area by moving down Indian Creek, as they would have to navigate past Antelope Lake, which has many predators (both native and non-native) which would reduce the likelihood of success at such a large movement. Additionally, *R. sierrae* would have to descend Indian Creek (to approximately 4,000' elevation) and then move up either Hungry Creek, Last Chance Creek or Red Clover Creek before reaching the action area. It is therefore unlikely that the suitable habitat within the action area would become occupied during the implementation of the project.

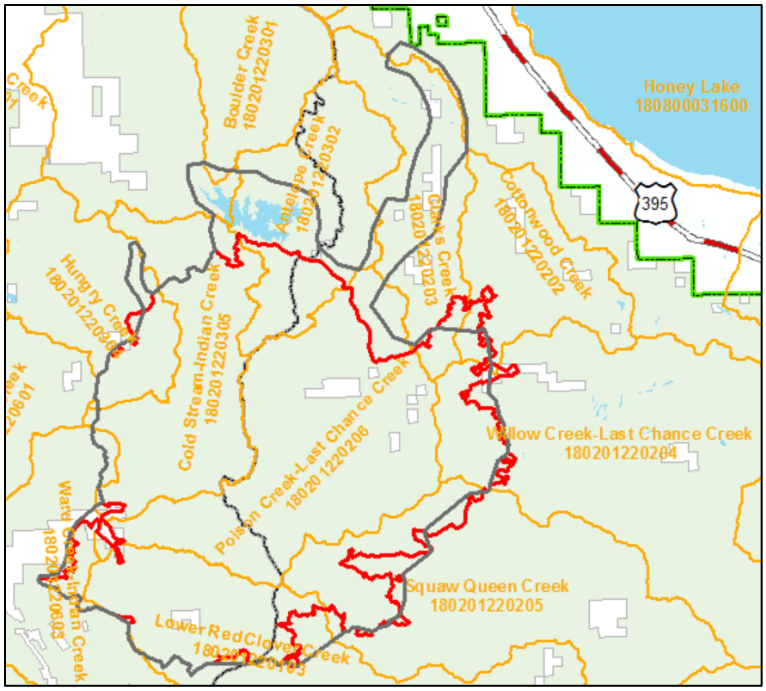

Figure 14. Subwatersheds (HUC-6, level-12) boundaries in the Walker Fire Recovery Project (red polygon) and 2020 Plumas National Forest Road and Trail Maintenance Project (gray polygons) action areas.

Other Key Assumptions:

- The existing condition of high severity fire areas within the Walker Fire is poor and these sites will continue to contribute high amounts of sediment to aquatic habitats and thereby adversely affect Sierra Nevada yellow-legged frog habitat.
- Project vegetation treatment will increase soil mobility and cause increased sedimentation.
- After the Project is fully implemented the sedimentation caused by both system and non-system roads will decrease, and the condition of aquatic habitats will improve.
- Sierra Nevada yellow-legged frog surveys are extensive in the Walker Fire projects area. No Sierra Nevada yellow-legged frogs have been detected in the Walker Fire perimeter, where timber salvage is proposed. Although possible, SNYLF presence is highly unlikely in the Walker Fire perimeter. Although unlikely, it is assumed that *R. sierrae* could both be present in unsurveyed habitat and/or move into previously unoccupied habitat during the project implementation timeframe.
- The standards and guidelines (S&Gs), best management practices (BMPs), project-specific design features, and terms and conditions prescribed in the USFWS programmatic biological opinion (USFWS 2014) will be implemented to minimize the Project's adverse effects to the Sierra Nevada yellow-legged frog.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects

There are approximately 269 acres of Sierra Nevada yellow-legged frog suitable habitat within the Walker Fire Recovery treatment area and 769 acres of suitable habitat within the 2020 Plumas National Forest Road and Trail Maintenance Project treatment area (Table 29). Heavy equipment use would not be permitted within 82 feet of aquatic features in suitable habitat, except for very limited stream crossings

(up to 5), and only after pre-project surveys do not detect SNYLF. Treatments within 82 feet of aquatic features will be limited to felling of hazard trees that will be directionally felled away from streams whenever possible. There would be instances when hazard trees cannot physically be felled away from streams due to lean or other factors. When these trees pose an unacceptable hazard to the public using existing roads, the trees would be felled in a manner that has the least direct impacts to the stream.

Rana sierrae are presumed to be absent from the project area based on pre-implementation survey results, and potential negative project effects on suitable Sierra Nevada yellow-legged frog habitat are expected to be short-term (a few years) with potential long-term benefits from road maintenance and tree planting beginning within a few years post-project implementation. This analysis relies on the numerous protective measures that are expected to substantially minimize the chance of negative effects in near-water habitats, particularly within the suitable habitat.

The direct effects of the proposed actions on *R. sierrae* and their habitat would be limited to the Project's implementation phase (a few years). Indirect effects such as vegetation modification through tree planting could last well-beyond the implementation period. The exact duration of indirect effects would depend on the timescale in which the proposed activities are implemented, coupled with the conditions when they are implemented in (e.g., early season vs. late season, high vs. low water years, etc.).

Potential effects from activities associated with vegetation management were outline in the Programmatic BA, as were best management practices (BMPs) and standards and guidelines (S&Gs) implemented at the project level to reduce negative impacts to individual frogs and habitat (Pages 12-13, 37-48, June 16, 2014). Aside from specific amphibian conservation measure (Table 3), the Walker Fire projects incorporates all applicable project design features and applicable Best Management Practices from the programmatic "Biological Opinion on Nine Forest Programs on Nine National Forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged frog, and Threatened Yosemite Toad (USDI, 2014b).

Heavy equipment use (e.g., salvage logging using feller-buncher equipment, biomass removal, grapple piling, landing use) would generally not be allowed within 82 feet of suitable aquatic habitat. A limited amount of road work at stream crossings for culvert repair and cleaning would allow heavy equipment within suitable habitat. The Sierra Nevada yellow-legged frog is highly aquatic, therefore the risk of direct injury from heavy equipment is generally minimal/absent as equipment does not operate within or immediately adjacent to the stream channel. Though quantifiable data regarding sub-lethal effects is not well known for this species, it is logical to assume that some level of behavioral modification (e.g., basking, feeding) could be influenced by mechanized equipment usage, even at some distance from occupied habitat. *R. sierrae* were not found in the project area during historic surveys; however, if the species is found during the implementation phase additional protective measures would be taken after notification/consultation with USFWS.

Indirect effects such as sediment mobilization and shade/temperature changes can occur with near-stream heavy equipment use. These effects are expected to be absent/minimal in nearly all areas due to project design features. Short-term sediment mobilization could occur due to road work and culvert cleaning, with a long-term decrease expected due to improved drainage. Though measurable sediment increase is possible in salvage and hazard tree removal units, project design features would be implemented to limit sediment delivery to streams. Riparian structure that provides habitat complexity (e.g., logs/debris) is not expected to change due to riparian buffers. Although the net effect of these habitat changes is not known for *R. sierrae*, it is highly unlikely to have any effect as the entire project area is thought to be unoccupied due to historic surveys.

Conservation Measures

In addition to ensuring that the Project's proposed actions are executed in compliance with the Sierra

Nevada Forest Plan (USDA 2004a, 2004b), proposed activities will be implemented using all pertinent standards and guidelines (S&Gs), best management practices (BMPs), project-specific design features (Table 3), and terms and conditions outlined in the USFWS programmatic biological opinion on nine forest programs on nine national forests in the Sierra Nevada of California for the Endangered Sierra Nevada Yellow-legged Frog, Endangered Northern Distinct Population Segment of the Mountain Yellow-legged Frog, and Threatened Yosemite Toad (USFWS 2014).

Alternative 1 (Proposed Action) Cumulative Effects

The action area of the Walker Fire Projects has been impacted by multiple wildfire several times in the past 20 years (Figure 15). The Stream Fire burned in 2001, the Boulder fire in 2006, Antelope Fire Complex in 2007, the Moonlight Fire in 2007, and the Walker Fire in 2019. These fires had large proportions that burned at high severity and had assessments completed analyzing fire effects and effectiveness of fuel treatments. The Stream fire burned 3,526 acres in 2001 (Murphy et al. 2010). The Boulder Complex burned 2,920 acres in 2006 (Murphy et al. 2010). The Antelope Fire Complex in 2007 burned 23,420 acres (Fites et al. 2007). The Moonlight Fire burned 64,997 acres in September 2007 (Dailey et al. 2008). These fires impacted Indian Creek as well as portions of other major tributaries in the project areas. The majority of Indian Creek in the project area is now in a deforested condition. The cumulative impacts of these fires may be more than *Rana sierrae* could withstand. Indian Creek also has small mining projects, impacts from sediment delivered by road systems, extensive grazing throughout the watershed, timber harvest and fuel reduction projects. The cumulative environmental effect of the proposed salvage treatments will be reduced fuels, reduced vegetation cover and short-term increased sedimentation to streams. Due to product design features, the salvage activities should pose a minimal risk to *R. sierrae* if they were present. Planned tree planting may provide long-term benefits by restoring ecosystem functions to the project area. Planned road and trail maintenance activities may provide long-term benefits by reducing chronic sedimentation issues from road surface erosion and culvert failures. Because of SNYLF highly aquatic nature, upland forest treatments and road surface work would be low-risk threats.

The 2020 Plumas National Forest Road and Trail Maintenance Project action area contains 1,312 acres of designated critical habitat for *Rana sierrae.* The proposed roadside hazard tree removal under this project is disconnected from any known populations. The discussion above for the Walker Fire Recovery Project applies for the roadside hazard portion of the 2020 Plumas National Forest Road and Trail Maintenance Project. Level 5 paved roads within the action area (Antelope Lake Road, Fruitgrowers Boulevard and Antelope Lake Campground roads) are within designated Critical Habitat, and this project proposed removing and replacing existing road surfaces, guard rails and signs, and cleaning ditches and culverts (such as removing sticks and logs that block the culvert entrance). The project does not include replacing culverts at Lone Rock or Boulder Creeks (occupied streams). No in stream work is proposed in critical habitat. Suitable habitat within designated critical habitat would not be impacted by the proposed actions, and therefore, no effects to designated critical habitat are anticipated.

It is possible that non-federal actions could occur on private lands within the project action area that may add to the Project's effects on the suitable habitat of *R. sierrae*. There are 1421 acres of non-Forest Service land within the Walker Fire perimeter. Quantifiable data regarding land use in this area was not available for this analysis. This area was burned in the Walker Fire, and similar timber salvage projects may occur.

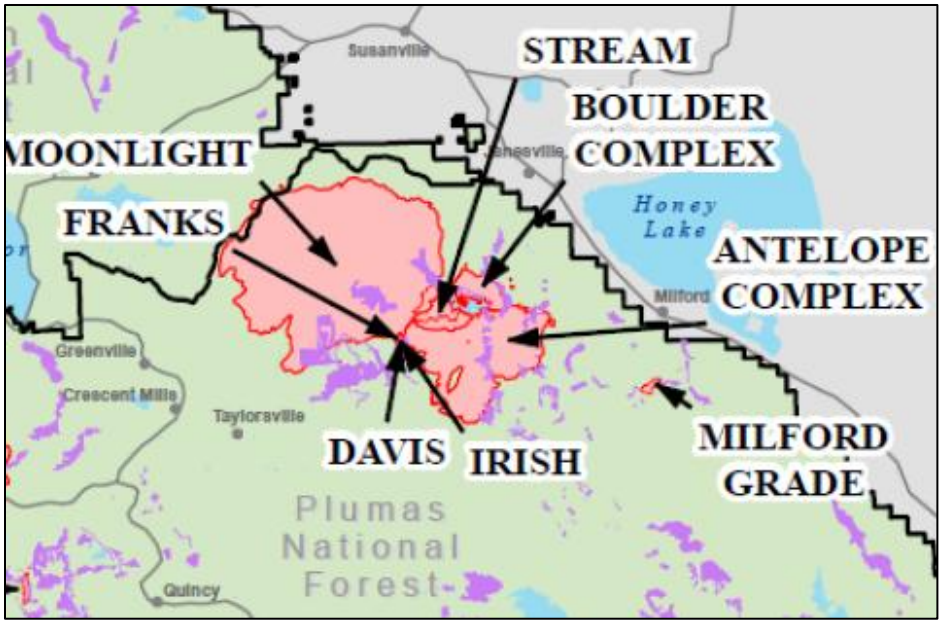

Figure 15. Multiple large scale wildfires have impacted the Walker Fire Projects area in the past 20 years. Purple areas are fuel reduction treatments (borrowed from Murphy et al. 2000).2000).

Interdependent and Interrelated Actions

The proposed Walker Fire Projects have independent utility and are not dependent on implementation of other projects. The project areas fall within both the planning areas of the Moonlight Fire Restoration environmental assessment and the Plumas Audubon Genesee Wildfire Restoration Plan. Wildlife Protected Activity Center (PAC) treatments from the Moonlight Restoration project are slated for land directly adjacent to the west and east of Walker Fire Recovery Project. The Franks Valley Project is located west of the Walker Fire Recovery project area, to reduce fuels, improve forest ability to fight insects and disease, improve wildlife habitat, and to protect homes in Franks Valley from wildfire. Other ongoing or future forest projects within the surrounding area either have been or will be submitted for formal or informal consultation as necessary.

Species Determination

The Walker Fire Recovery Project **May Affect, and is likely to adversely affect the Sierra Nevada yellow-legged frog.** The project would impact approximately 269 acres of suitable frog habitat; however, habitat does not appear to have ever been occupied by frogs, based on historic records. Because there is suitable habitat present that has never been surveyed, occupancy is possible. Occupancy within suitable habitat in the action area will be assessed annually throughout project implementation. Should any life stages of the species be found (i.e. the site becomes occupied), work activities will occur during the limited operating period identified in project conservation measures. Thus, the project is not likely to directly affect individual frogs. Project design features, conservation measures, BMP's, Standards and Guidelines, and survey requirements are expected to prevent/minimize direct injury/death of individual frogs that could immigrate to the action area during implementation. Short-term increases in sedimentation and turbidity may occur in aquatic habitats, but implementation of project design features and conservation measures will partially mitigate potential negative impacts to frog habitat.

The 2020 Plumas National Forest Road and Trail Maintenance project **May Affect, and is likely to adversely affect the Sierra Nevada yellow-legged frog.** The project would impact approximately 769 acres of suitable frog habitat; however, affected habitat is not known to be occupied by frogs, based on

historic records. Frogs that occupy Lone Rock Creek and Boulder Creek would not be impacted by the proposed project. Because there is suitable habitat present that has never been surveyed, occupancy is possible. Occupancy within suitable habitat in the action area will be assessed annually throughout project implementation. Should any life stages of the species be found (i.e. the site becomes occupied), work activities will occur during the limited operating period identified in project conservation measures. Thus, the project is not likely to directly affect individual frogs. Project design features, conservation measures, BMP's, Standards and Guidelines, and survey requirements are expected to prevent/minimize direct injury/death of individual frogs that could immigrate to the action area during implementation. Short-term increases in sedimentation and turbidity may occur in aquatic habitats, but implementation of project design features and conservation measures will partially mitigate potential negative impacts to frog habitat. Road maintenance projects have potential long-term benefits to frog habitat (i.e., long-term stream quality improvement via road system improvements).

Critical Habitat Determination

The Walker Fire Rehabilitation Project does not overlap and will have **no effect on designated critical habitat**.

The 2020 Plumas National Forest Road and Trail Maintenance project overlaps critical habitat, but it does not fall within suitable habitat. The proposed activities will not impact habitat primary constituent elements and will have **no effect on designated critical habitat**.

Foothill yellow legged frog (Rana boylii)

Table 30. Yellow-legged Frog Conservation Measures.

Criterion	Actions
Mechanical Harvest	No heavy equipment allowed within 82 feet from perennial or intermittent streams that have suitable habitat for frogs (includes harvest equipment, road building equipment, mastication equipment, etc.). Exceptions: trees may be removed with mechanical entry from 33 feet to 82 feet of the stream during the summer season (April 16 – October 31) when frogs are restricted to within 33 feet of streams. All equipment use would limit tracking to be perpendicular to the stream to limit portion of ground impacted.
Sediment Production	Adhere to all Best Management Practices and Standard Operating Procedures to prevent sediment from reaching streams as a result of all project activities.
Drafting sites	New or existing water draft sites would be evaluated with the Mt. Hough Ranger District Biologist prior to changes or use. Drafting sites shall be visually surveyed for amphibians and their eggs before drafting begins Back down ramps would be constructed and or maintained to ensure the streambank stability is maintained and sedimentation is minimized. Forest personnel and contractors shall use the Forest Service approved suction strainer (FSM 5161) or other foot vales with screens having openings less than 2mm in size at the end of drafting hoses. The suction strainer shall be inserted close to the substrate in the deepest water available; the suction strainer shall be placed on a shovel, over plastic sheeting, or in a canvas bucket to avoid uptake of substrate or aquatic biota.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects

Heavy equipment use (e.g., salvage logging using feller-buncher equipment, biomass removal, grapple piling, landing use) would generally not be allowed within 82 feet of suitable aquatic habitat. A limited amount of road work at stream crossings for culvert repair and cleaning would allow heavy equipment within suitable habitat. The Foothill yellow-legged frog is highly aquatic, therefore the risk of direct

injury from heavy equipment is generally minimal/absent as equipment does not operate within or immediately adjacent to the stream channel. Though quantifiable data regarding sub-lethal effects is not well known for this species, it is logical to assume that some level of behavioral modification (e.g., basking, feeding) could be influenced by mechanized equipment usage, even at some distance from occupied habitat. *R. boylii* were not found in the project area during historic surveys; however, if the species is found during the implementation phase additional protective measures would be taken after notification/consultation with USFWS.

Indirect effects such as sediment mobilization and shade/temperature changes can occur with near-stream heavy equipment use. These effects are expected to be absent/minimal in nearly all areas due to project design features. Short-term sediment mobilization could occur due to road work and culvert cleaning, with a long-term decrease expected due to improved drainage. Though measurable sediment increase is possible in salvage and hazard tree removal units, project design features would be implemented to limit sediment delivery to streams. Riparian structure that provides habitat complexity (e.g., logs/debris) is not expected to change due to riparian buffers. Although the net effect of these habitat changes is not known for *R. boylii*, it is highly unlikely to have any effect as the entire project area is thought to be unoccupied due to historic surveys.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

The existing condition reflects the changes of all activities that have occurred in the past. The analysis of cumulative effects of the proposed action evaluates the impact on TES habitat from the existing condition within the wildlife analysis area. It is anticipated that implementation of the proposed action, in combination with present and reasonably foreseeable future actions, would maintain the amount and improve the quality of riverine habitat by reducing conifer competition, improving overall riparian vegetation vigor and maintaining water surface shade within the aquatic wildlife analysis area.

The action area of the Walker Fire Projects has been impacted by multiple wildfire several times in the past 20 years. The Stream Fire burned in 2001, the Boulder fire in 2006, Antelope Fire Complex in 2007, the Moonlight Fire in 2007, and the Walker Fire in 2019. These fires had large proportions that burned at high severity and had assessments completed analyzing fire effects and effectiveness of fuel treatments. The Stream fire burned 3,526 acres in 2001 (Murphy et al. 2010). The Boulder Complex burned 2,920 acres in 2006 (Murphy et al. 2010). The Antelope Fire Complex in 2007 burned 23,420 acres (Fites et al. 2007). The Moonlight Fire burned 64,997 acres in September 2007 (Dailey et al. 2008). These fires impacted Indian Creek as well as portions of other major tributaries in the project areas. The majority of Indian Creek in the project area is now in a deforested condition. The cumulative impacts of these fires may be more than *Rana boylii* could withstand. Indian Creek also has small mining projects, impacts from sediment delivered by road systems, extensive grazing throughout the watershed, timber harvest and fuel reduction projects. The cumulative environmental effect of the proposed salvage treatments will be reduced fuels, reduced vegetation cover and short-term increased sedimentation to streams. Due to product design features, the salvage activities should pose a minimal risk to *R. boylii.* Planned tree planting associated with other projects may provide long-term benefits by restoring ecosystem functions to the project area. Planned road and trail maintenance activities may provide long-term benefits by reducing chronic sedimentation issues from road surface erosion and culvert failures. Because of FYLF highly aquatic nature, upland forest treatments and road surface work would be low-risk threats.

It is possible that non-federal actions could occur on private lands within the project action area that may add to the Project's effects on the suitable habitat of *R. boylii*. There are 1421 acres of non-Forest Service land within the Walker Fire perimeter. Quantifiable data regarding land use in this area was not available for this analysis. This area was burned in the Walker Fire, and similar timber salvage projects may occur.

The fuelwood cutting program on the PNF has been in existence for years and is expected to continue. The past and future effect of these actions has and would be to remove habitat structure, while generally retaining continuous forest cover which would have no effect on the YLFs.

Summary

Project design features have reduced the potential to directly affect FYLF through crushing a frog during harvest activities to a discountable risk. Surveys have not documented any FYLF in the project area, despite extensive effort over multiple years. There are also no historical detections in the analysis area. There is potential to indirectly affect their habitat by adding sediment to stream reaches. Project design features, such as equipment exclusion zones, would mediate potential effects to yellow-legged frogs.

Determination

It is my determination that the implementation of the proposed actions for the Walker Recovery Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for Foothill yellow-legged frog.

Because there is suitable habitat present that has never been surveyed, occupancy is possible. Occupancy within suitable habitat in the action area will be assessed annually throughout project implementation. Should any life stages of the species be found (i.e. the site becomes occupied), work activities will occur during the limited operating period identified in project conservation measures. Thus, the project is not likely to directly affect individual frogs. Project design features, conservation measures, BMP's, Standards and Guidelines, and survey requirements are expected to prevent/minimize direct injury/death of individual frogs that could immigrate to the action area during implementation. Short-term increases in sedimentation and turbidity may occur in aquatic habitats, but implementation of project design features and conservation measures will partially mitigate potential negative impacts to frog habitat.

California Spotted Owl (Strix occidentalis occidentalis) - Affected Environment

Population Status

The California Spotted Owl is currently managed as a USDA Forest Service sensitive species. The USFWS has received petitions to list the California spotted owl as endangered or threatened. In November, 2019 the USFWS determined that the California spotted owl does not require protection under the Endangered Species Act.

Four demographic studies of California spotted owls have been ongoing for a number of years within the Sierra Nevada: (1) Eldorado National Forest (since 1986); (2) Lassen National Forest (since 1990); (3) Sierra National Forest (since 1990); and (4) Sequoia-Kings Canyon National Park (since 1990). The Lassen demographic study area is closest and most relevant to the Walker Fire area. One of the primary objectives of these demographic studies is to monitor rate of change (lambda, λ) in owl populations (i.e., the number of owls present in a given year divided by the number of owls present the year before). For these demographic models a lambda (λ) value of 1 indicates a stable population; less than 1 indicates the population is decreasing, and greater than 1 indicates an increasing population. For the California spotted owl demographic studies, lambda has been estimated individually for each study area at five-year intervals (Franklin et al. 2004, Blakesley et al. 2010). The most recent meta-analysis, using data collected between 1990 and 2005, provided estimates of lambda for all four Sierra Nevada demography study areas (Blakesley et al. 2010):

- Lassen: $\lambda = 0.973$ (95 percent confidence interval, 0.946-1.001);
- Eldorado: $\lambda = 1.007$ (95 percent confidence interval, 0.952-1.066);
- Sierra: $\lambda = 0.992$ (95 percent confidence interval, 0.966-1.018);
- Sequoia-Kings Canyon: $\lambda = 1.006$, (95 percent confidence interval, 0.947-1.068).

The 95 percent confidence limit for lambda in the Lassen study area ranged from 0.946 to 1.001 (estimated value 0.973), which barely includes 1, and the analysis estimated a steady annual decline of 2-3 percent in the Lassen study population between 1990 and 2005 (Blakesley et al. 2010). Recent

demographic modeling efforts in central and northern Sierra Nevada reported similar lambda estimates (Conner et al. 2013; Tempel et al. 2014) to those summarized in Blakesley et al. (2010). Conner et al. (2013) emphasize that the realized population change provides a useful estimate of the probability that a population is declining. Realized population change is the proportion of the initial population size remaining each year. For the Lassen and Sierra National Forests, the evidence suggested a 21 percent decline and an 11 percent decline, respectively, while the Sequoia-Kings Canyon National Forest results suggested a 22 percent increase in the spotted owl populations during the 18 years between 1992 and 2010 (Conner et al. 2013). Conner et al. 2016 and Tempel et al. 2014, suggest that from the 1990s to 2013 in the Sierra Nevada, CSO populations declined within the demography study areas on National Forests by 44 percent (Lassen), 50 percent (Eldorado), and 31 percent (Sierra). Tempel et al. 2016, reported a 15 percent decline in territory occupancy probability in the Lassen demography study area, a 17 percent decline in territory occupancy probability on the Eldorado study area, and a 25 percent decline in occupancy probability on the Sierra study area between study initiation and 2011. It should also be noted that none of these references incorporate trends beyond 2013, so while we have assumed a continued decline for this analysis, the rate of that decline cannot be confirmed.

Tempel et al. 2016 also note that while they observed territory occupancy rates declined over the study period, canopy cover (which they showed clearly influences occupancy dynamics) remained "relatively constant over the duration of the study", suggesting canopy cover reduction is likely not the culprit of observed population trends on the demographic study areas. Other more recent scientific publications also suggest that these current population declines in the study areas on National Forest System lands are likely not the result of current forest management strategies but are instead likely due to a lag effect from historic large tree removal and a century of fire suppression (Jones et al. 2017), as well as continued fire suppression and other activities that maintain or increase forest homogeneity (e.g. large areas of high severity fire which perpetuate homogeneity), due to effects on high quality CSO prey species (Hobart et al. 2019). Finally, Tempel et al. 2016 conclude with: "Nevertheless, forest treatments that reduce canopy cover within Spotted Owl territories, if judiciously implemented, could maintain Spotted Owl habitat in the short term so that any long-term benefits as a result of reductions in high-severity fire can be realized."

Habitat Requirements

The California spotted owl is currently managed according to definitions of suitable habitat derived from those listed in the California Spotted Owl (CASPO) Technical Report (Verner et al. 1992), the SNFPA FEIS (2004) and 70 Federal Register of June 21, 2005 (USDI 2005). Based on these definitions, the following CWHR types in the analysis area provide high quality nesting habitat: Sierran Mixed Conifer, White Fir, and Ponderosa Pine (5D, 5M). These CWHR types have the highest probability of providing stand structure associated with preferred nesting, roosting and foraging. High canopy cover (greater than 70 percent) and large trees are the most important factors for spotted owl nesting and roosting habitat (Bias and Gutierrez 1992, Moen and Gutierrez 1997, Blakesley et al. 2005, Tempel et al. 2014). Data analyzed from 124 nest sites within the Sierra indicated that nest trees averaged 45 inches DBH, and more than 70 percent of all nest trees surveyed were larger than 30 inches DBH (Verner et al. 1992). Current definitions of suitable habitat use tree size and canopy cover to distinguish nesting and roosting habitat, as science indicates that both canopy cover (Tempel et al. 2016) and presence of large and very large trees (North et al. 2017) are important components of nesting and roosting habitat

Suitable foraging habitat is found in the same forest types listed above for nesting habitat (CWHR 5D, 5M) as well as 4D and 4M. Stands considered to be suitable for foraging have at least two canopy layers, dominant and co-dominant trees in the canopy averaging at least 12 inches in DBH, at least 40 percent canopy closure, and higher than average levels of snags and downed woody material.

California Spotted Owls are managed through the establishment of Protected Activity Centers (PACs) and Home Range Core Areas (HRCAs). PACs are 300 acres of the best available habitat surrounding each

territorial activity center on National Forest System lands. The total acres designated in a PAC and HRCA on the Plumas National Forest are 1,000 acres in size, comprised of the 300 acre PAC and 700 acres of the best available habitat around or adjacent to the PAC (USDA 2001; USDA 2004). Spotted owl PACs and HRCAs were established for owl activity centers based on criteria described in the California Spotted Owl Technical Report (Verner et al. 1992), California Spotted Owl Sierran Province Interim Guidelines Environmental Assessment (USDA 1993), the SNFPA (USDA 2001; USDA 2004).

Current direction from SNFPA

"PACs are delineated to: (1) include known and suspected nest stands and (2) encompass the best available 300 acres of habitat in as compact a unit as possible. The best available habitat is selected for California spotted owl PACs to include: (1) two or more tree canopy layers; (2) trees in the dominant and co-dominant crown classes averaging 24 inches DBH or greater; (3) at least 70 percent tree canopy cover (including hardwoods); and (4) in descending order of priority, CWHR classes 6, 5D, 5M, 4D, and 4M and other stands with at least 50 percent canopy cover (including hardwoods). Aerial photography interpretation and field verification are used as needed to delineate PACs."

"Stands in each PAC have: (1) at least two tree canopy layers; (2) dominant and co-dominant trees with average diameters of at least 24 inches DBH; (3) at least 60 to70 percent canopy cover; (4) some very large snags (greater than 45 inches DBH); and (5) snag and down woody material levels that are higher than average."

Current management standards and guidelines (USDA 2004, S&Gs 71-81) do not allow mechanical treatment within PACs other than PACs that occur in Wildland Urban Interface Defense Zones.

Management of California Spotted Owl Habitat on National Forest System Lands Post Walker Fire

The Walker Fire created major impacts to the California Spotted Owl habitat (Table 32) and designated protected habitat network (Protected Activity Centers and Home Range Core Areas). The Walker Fire rendered 77 percent of the nesting habitat and 68 percent of the foraging habitat unsuitable, for a total loss of 16,045 acres. In order to provide management of habitat to support viable populations of the California spotted owl, the Walker Fire necessitated remapping of the existing habitat network. Many existing areas of protected activity center and HRCA were lost during stand-replacing fire (Table 31). Best available scientific information suggests that California spotted owls are likely to abandon their territories when more than half of the territory burns at high severity (Jones et al. 2016), and that California spotted owls tend to avoid areas of high severity fire within their territories when more than 5 percent of their territory burns at high severity (Jones et al. 2020). Thus, it is important to re-map spotted owl PACs and HRCAs to better capture the likely places where owls will either re-establish abandoned territories, or re-focus their habitat use after avoiding severely burned areas. Direction from the Sierra Nevada Forest Plan Amendment recommendations were followed to create new PACs and HRCAs for spotted owls (Figure 16).

Table 31. Suitable spotted owl habitat types in the Walker Fire Wildlife Analysis Area.

CWHR Type	Habitat Type	Wildlife Analysis Area Pre-Walker Fire	Acres lost to Walker Fire (>50% fire severity)	Wildlife Analysis Area Acres Current Condition (<50% fire severity)	Harvest Unit Acres Current Condition (<50% fire severity)
5M, 5D,	Nesting	6,158	4,715 (77% lost)	1,443	17 (1% of

6					remaining)
4M, 4D	Foraging	16,588	11,330 (68% lost)	5,258	147 (3% of remaining)
<Total		22,746 acres	16,045 (70% lost)	6,701 acres	164 acres (2% of remaining)

Based on CWHR conifer forest types in the project area: JPN (Jeffery Pine), PPN (Ponderosa Pine), SMC (Sierran Mixed Conifer)
4 = Small Tree 11 - 24"DBH, 5 = Medium/Large Tree >24"DBH, 6 = Multi-layered Tree.
D = Dense Canopy Cover (> 60%), M = Moderate Canopy Cover (40 - 59%).

Acres with 50 percent fire severity or greater no longer meet suitable habitat conditions based on RAVG data and combined with post fire field analysis by wildlife biologist. RAVG data proved to be accurate and areas with 50 percent or greater severity did not have sufficient canopy cover to meet minimum habitat definitions.

Table 32. Acres of designated spotted owl habitat in the Walker Recovery wildlife analysis area

Spotted Owl PAC or HRCA Number*	Total Acres	Acres overlap Walker Fire Perimeter	Acres Overlap with Salvage Units	Acres burned 0-24% severity	Acres burned 25-49% severity	Acres burned 50-75% severity	Acres burned 75-90% severity	Acres burned 90-100% severity
SPLU033 PAC	357	283	0	235	16	9	5	18
PLU033 HRCA	706	407	0	181	38	24	15	149
SPLU072 PAC	510	276	0	245	13	4	4	10
PLU072 HRCA	503	118	0	112	3	1	1	0
SPOW PLU135	383	383	0	335	20	12	6	10
PLU135 HRCA	738	738	0	229	52	52	36	369
SPLU136 PAC	314	314	0	129	26	23	14	121
PLU136 HRCA	658	657	0	263	35	41	26	291
SPLU137 PAC	434	10	0	10	0	0	0	0
PLU137 HRCA	722	314	0	269	9	6	4	25
SPLU167 PAC	300	221	0	169	24	13	7	8
PLU167 HRCA	701	14	0	13	2	0	0	0
SPLU200 PAC	360	360	3	0	3	4	4	349
PLU200 HRCA	686	686	12	218	52	42	29	346

SPLU285 PAC	371	371	0	137	30	27	20	157
PLU285 HRCA	563	563	0	281	42	32	24	184
SPLU355 PAC	300	300	0	166	41	30	18	45
PLU355 HRCA	700	255	0	217	23	7	4	4

*Table shows data for redrawn PAC and HRCAs for PLU072, PLU167 and PLU355. Territory PLU200 did not have sufficient habitat in the area to provide for future spotted owl habitat. This PAC and HRCA will be retired from the network.

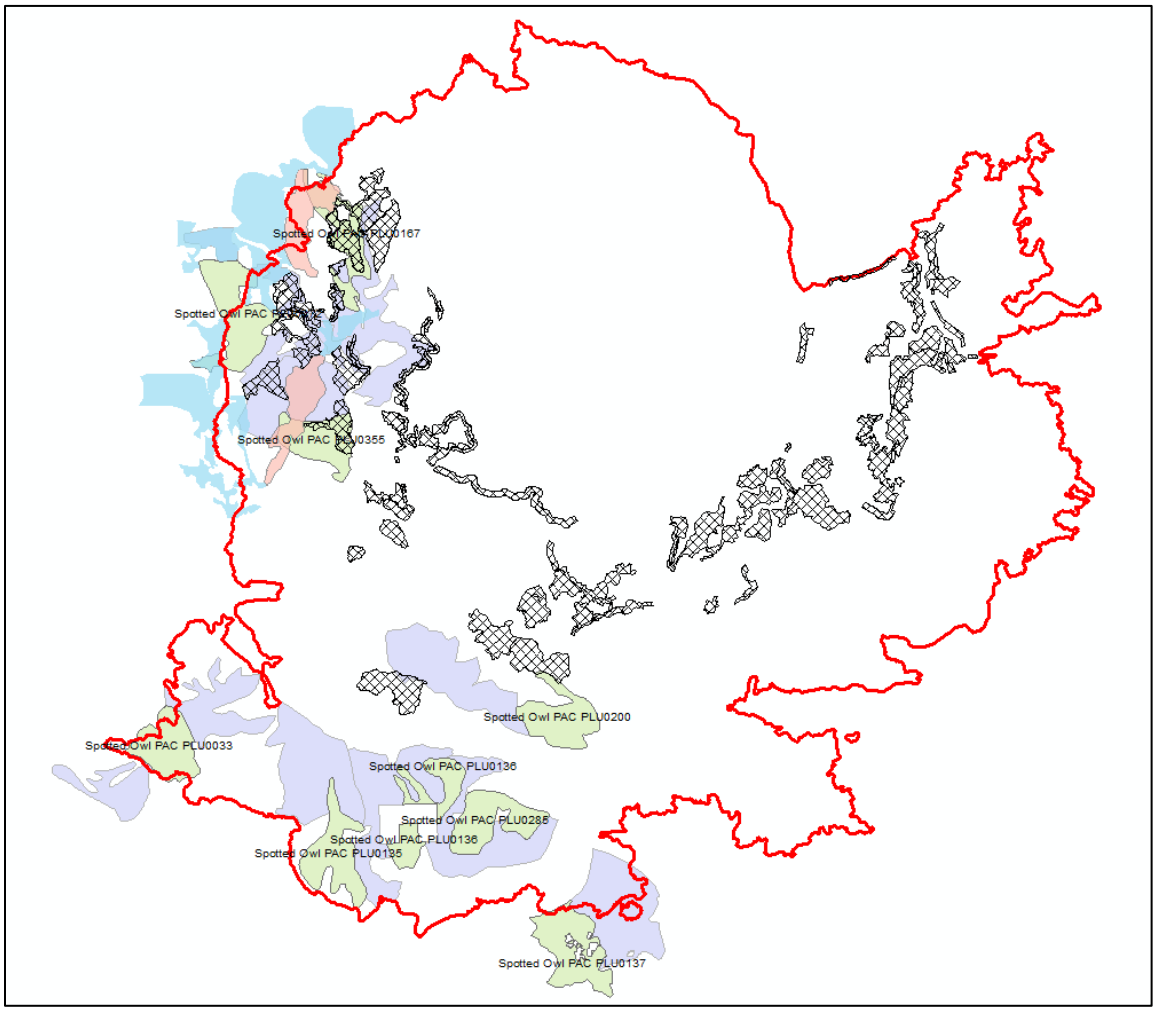

Figure 16. California spotted owl PACs and HRCAs within the Walker Recovery Wildlife Analysis Area. Map shows pre-Walker Fire PACS in green, and pre-Walker HRCA in lavender, replacement PACs in orange and replacement HRCA in blue. Salvage units shown in cross hatch.

Analysis Area Surveys

There are 8 spotted owl PACs and their associated HRCAs within the Walker Recovery Wildlife Analysis area (Figure 16). Additionally, PAC PLU0137 has a very small portion that overlaps with the southern portion of the analysis area and was not surveyed as part of the project (Figure 16). Project-specific surveys were initiated in 2020, and three visits were completed in 2020. There were two pairs confirmed

within the project area in 2020, in PAC PLU0072 (Hungry Creek) and PLU0033 (Flournoy), and two other PACs had single spotted owls detected (PLU0135 and PLU0285). Initial salvage logging units were modified to exclude PAC and/or replacement PACs (Figure 16). Survey results are compiled in Table 33 below.

Table 33. Recent observations of California spotted owls (CSO) within the Walker wildlife analysis area.

PAC Number/Name	Years last surveyed	Year last occupied	Year last with nesting
Flournoy PLU0033	2020	2020 (nest)	2020
Hungry PLU0072	2020, 2019, 2018, 2017	2020 (pair)	2015
Notson PLU0135	2020	2020 (single)	1989
Clover West PLU0136	2020	(not 2020)	No nesting
PLU0137	Not surveyed 2020	2008	2007
Middle Creek PLU167	2020, 2018, 2017, 2016	2018	2009
Last Chance PLU0200	2020, 2002, 2001	1991	No nesting
Clover East PLU0285	2020	2020 (single)	2003
Becknell Xing PLU355	2020, 2018, 2017, 2016	2018	No nesting

General Methods

Proposed actions include design features to protect spotted owls:

No mechanical treatment would occur within the designated PAC habitat acres for the spotted owl. PACs were revised to include the best available habitat post-Walker Fire. No treatments are planned in PACs except for using existing roads and skid trails.

To mitigate any potential disturbance effects to spotted owls present in the project area, a Limited Operating Period will be applied within 0.25 mile of any active pairs or nests. LOPs can be lifted by the District Wildlife Biologist if sites are determined to be unoccupied.

Jones et al. (2016) found that high severity fire had a strong negative impact on spotted owls, demonstrated both by avoidance of high severity burned areas by foraging owls and by a drastic increase in site extirpation. One purpose of the Walker Fire Environmental Assessment is to remap PACs to provide for spotted owls into the future. PAC and HRCA modifications can be found as an appendix to the Walker Fire Recovery Project biological evaluation.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects of Salvage Logging

California spotted owls have been shown to utilize areas of low and medium severity fire and areas with patches of high severity fire and therefore salvage logging likely reduces available habitat to California spotted owls (Gutierrez et al. 2017). While some authors suggest that California spotted owl occupancy decreases following salvage logging (Lee et al. 2013; Lee and Bond 2015), the methodologies of both of these studies were later called into question by Jones and Peery (2019) and Berigan et al. (2018). Other studies without these methodological issues show that the effects of severe fire itself are generally the main cause of changes to spotted owl occupancy, not the post-fire harvest that occurs in some areas following the fire (Jones et al. 2016, Jones et al. 2019). Further, when territories experience larger portions of high severity fire (> 5 percent), California spotted owls avoid high severity fire areas more strongly than they avoid salvage-logged areas. Conversely, in territories that experience relatively little severe fire (greater than 5 percent) California spotted owls tend to select severely burned areas and avoid

salvage-logged areas (Jones et al. 2020), suggesting that salvage logging within such occupied territories has a negative effect on habitat selection. Thus, logging in mixed severity fire areas, particularly where only small areas of occupied territories burned at high severity, may negatively affect spotted owls (Peery et al. 2017). However, "judiciously implemented" treatments may benefit California spotted owls in the long term (Tempel et al. 2016). No owl territories that burned at less than 5% burn severity would be treated with this project.

Potential negative effects to spotted owls may result from the modification or loss of habitat or habitat components, and rarely from direct mortality if nest trees are felled. Disturbance associated with logging, temporary road construction, or other associated activities within or adjacent to occupied habitat may disrupt nesting, fledging, and foraging activities. The proposed action would not cut or remove nest trees. Limited Operating Periods (LOPs) would be implemented within 0.25 mile of historic nest sites from March 1 to August 15 but could be lifted if determined owls are not nesting. No heavy equipment operations or tree felling would be allowed during the LOP. The LOPs, combined with avoidance of treatment/logging in PACs, are expected to mitigate effects from increased human activity and equipment noise.

Research has shown that activities that reduced canopy cover to a lower canopy classification can have negative effects on spotted owl reproduction, and recommend that fuel treatments focus on ladder fuels and reduction in tree density while maintaining relatively high canopy cover (Tempel et al 2014). There is no proposed salvage logging within the spotted owl PACs and consequently there would be no change to suitable habitat within PACs.

Salvage logging would occur on 17 acres of nesting habitat (1 percent of available) and 147 acres of foraging habitat (3 percent of available) in the analysis area (Table 32 and Table 34). Salvage logging is not planned in suitable spotted owl habitat and within spotted owl HRCAs or PACs. One PAC/HRCA, for PLU0200, would have 3 acres of PAC and 12 acres of the HRCA salvaged, but this PAC and HRCA were burned at high severity and it no longer provides suitable habitat. Salvage logging prescriptions within HRCAs would not remove any live trees. Trees would be completely dead (no green needles) before they were removed within HRCA. Salvage logging would result in a loss of canopy and related shade and forest structure. Past research conducted on the Plumas National Forest has shown spotted owls avoid mechanically treated areas and such treatments resulted in increased home range size and decreased population size within four years of treatment (Stephens et al. 2014).

Table 34. Comparison of treatments between treatment methods in suitable CA spotted owl

CWHR Size, Density	Habitat Suitability	Salvage Treatment (post fire conditions) (excludes pre-fire habitat that burned at greater than 50% severity)
5M, 5D	Nesting	17 (1% of available)
4M, 4D	Foraging	147 (3% of available)
Total		164 (2% of available)

Salvage logging has the potential to result in short term adverse disturbance effects to spotted owls. However, limited operating periods would be instituted surrounding spotted owl nests or activity centers (specifically the Hungry Owl pair (PLU0072) is within ¼ mile of proposed activities which would be conducted outside of the nesting period). Therefore, short-term adverse effects would be minimized.

The long-term effects of the Proposed Action would reduce forest complexity and result in large cleared areas that would not provide suitable owl habitat for decades. Salvage logging would impact 2 percent of the suitable habitat in the analysis area. The project proposes to salvage log trees (outside of PACs and HRCAs) that are dead, or have a 70 percent chance of dying. Removing live and dead trees would reduce

habitat suitability for spotted owls. Tree removal would reduce heterogeneity that may be important to spotted owls and their prey.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

The existing condition reflects habitat changes from all activities that have occurred in the past. The analysis of cumulative effects of the alternatives evaluates the impact on spotted owl habitat from the existing condition within the analysis area.

The Walker Fire had a profound and lasting negative impact on the spotted owl habitat in the analysis area. There were 22,746 acres of suitable habitat prior to the Walker Fire, and 70 percent (16,045 acres) were lost to high severity fire (Table 31). Nesting habitat was particularly impacted, with 77 percent (4,715 acres) of the nesting habitat lost. Protected Activity Centers were heavily impacted (Figure 16). PAC PLU0200 was completely consumed (Figure 16) and is planned for retirement from the PAC network. Foraging habitat was also heavily impacted, with 68 percent (11,330 acres) lost (Table 31).

The 2020 PNF Road and Trail Maintenance Project would impact an additional 362 acres of suitable spotted owl habitat, but none of these acres overlap with the redrawn PAC network. Hazard tree removal would occur within the 362 acres in spotted owl suitable habitat. Implementation of the proposed treatment would not likely result in any additional reduction of spotted owl habitat beyond what was caused by the Walker Fire. Hazard tree removal would occur on 52 acres of nesting habitat (2% of available post-fire) and 310 acres of foraging habitat (3% of available post-fire) in the project area.

The firewood cutting programs on the PNF are ongoing programs that have been in existence for years and are expected to continue. The past and future effect of the woodcutting program has been and would be to reduce snags, in all forest types including PACs and HRCAs along roadsides throughout much of the analysis area.

Salvage logging would have an overall indirect negative impact to the suitability of remaining spotted owl habitat in the analysis area, but impacts would be limited to 6 percent of remaining habitat.

Determination

It is our determination that the implementation of the proposed actions for the Walker Recovery Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for California spotted owls.

Salvage logging is planned in 3 percent of suitable spotted owl habitat in the analysis area. There would be no salvage logging in any PACs, and none in any HRCAs where spotted owls were found in 2020. Salvage logging is occurring in landscapes that are mostly considered lost as suitable habitat. For example, most HRCA habitat scheduled for salvage logging is associated with HRCA PLU0200. The PAC of PLU0200 burned at high severity on 357 of 360 acres (99 percent). Three surveys Post-Walker in PLU0200 did not detect any spotted owls, and this PAC is planned for retirement. Revised HRCA associated with PLU0355 and PLU0167 are not scheduled for harvest. In summary, the majority of the planned salvage logging in habitat that is described as suitable in this analysis, may in fact be unsuitable habitat due to effects caused by the Walker Fire.

Northern Goshawk (Accipiter gentilis)

Population Status

The latest published information regarding the goshawk, in terms of Sierra Nevada distribution, population and habitat trends, and species requirements can be found within SNFPA FEIS (Chapter 3, Part 4.4.2.2), and in Chapter 3.2.2.4 of the SNFPA FSEIS 2004. A total of 588 northern goshawk-breeding territories have been reported from Sierra Nevada National Forests. In 2000, there were approximately 75 Northern Goshawk nesting territories or PACs on PNF (USDA 2001), but by February 2019, this number had grown to 183 goshawk PACs on the Forest. Not included in this number are 9

PACs that were retired due to wildfire. These numbers represent goshawks that have been found as a result of both individual project inventories to standardized protocols, as well as nest locations found incidentally. The increase in the number of goshawk PACs from 2000 to 2019 is likely the result of increased survey effort during this period.

The PNF LRMP EIS stated that the PNF has the capacity for 100 goshawk pairs (USDA 1988). The 1988 PNF LRMP calls for a network of 60 nesting territories to provide for the viability of the goshawk. It is uncertain as to whether this figure is accurate. The Forest began delineating goshawk territories prior to implementation of SNFPA, and currently establishes 200-acre PACs for all newly discovered goshawk breeding sites (USDA 2004). The current number of goshawk PACs on the Forest (N=183) exceeds the minimum objectives in the PNF LRMP threefold. Thus, current density of goshawk territories on the Forest appears adequate to maintain goshawk population viability. Population trends for Northern Goshawks in the Sierra Nevada are unknown, but data from several studies has raised concern that goshawk populations and reproduction may be declining in California and throughout North America due to changes in the amount and distribution of habitat or reductions in habitat quality (Bloom et al., 1986, Reynolds et al. 1994, Kennedy 1997, Squires and Reynolds 1997, Smallwood 1998, DeStefano 1998). In-house surveys on the Mt. Hough RD (1998-2002) indicated that nesting occurred at approximately 36 percent of monitored sites annually (Natural Resources Information System (NRIS) wildlife database accessed 2014.). During 2004-2007, the mean number of offspring produced during 62 nesting attempts on the PNF ranged between 1.1-1.9 offspring/nest (Dunk et al. 2011). Considered as a whole, these data indicate that the goshawk population on PNF appears relatively stable.

Recent analyses by Blakey et al 2020a and Blakey et al. *in press* indicate goshawks avoid areas with high fire severity. Therefore, fires such as the Walker Fire likely have important negative impacts to goshawk populations.

Habitat Requirements

The Northern Goshawk is currently being managed under the PNF LRMP guidelines as amended by the SNFPA FSEIS ROD (USDA 2004, pages 66-67). Habitat requirements for this species can be found within the SNFPA FEIS and is summarized below.

Northern Goshawks require mature conifer and deciduous forest with large trees, snags, downed logs and dense canopy cover for nesting, and appears to prefer more open habitats for foraging (forests with moderately open overstory, open understory interspersed with meadows, brush patches, other natural or artificial openings and riparian areas). Recent studies indicate that goshawks typically select for canopy cover levels greater than 60 percent for nesting (Hall 1984, Richter and Calls 1996, Keane 1997). For purposes of this analysis, the following affected CWHR types provide suitable nesting habitat: Aspen, Douglas-fir, Eastside Pine, Jeffrey Pine, Lodgepole Pine, Montane Hardwood-Conifer, Montane Hardwood, Montane Riparian, Ponderosa Pine, Red Fir, Sierra Mixed Conifer, White Fir, (6, 5D, 5M, 4D, 4M). For purposes of this analysis, the following affected CWHR types provide suitable foraging habitat: Aspen, Douglas-fir, Eastside Pine, Jeffrey Pine, Lodgepole Pine, Montane Hardwood-Conifer, Montane Hardwood, Montane Riparian, Ponderosa Pine, Red Fir, Sierra Mixed Conifer, White Fir, (5P, 4P, 3D, 3M) (SNFPA FEIS Vol3, Chap.3, part 4.4 pg. 116, USDA 2004). Based on the pre-Walker Fire vegetation layer, then removing all habitat that burned at greater than 50 percent vegetation severity, we used the CWHR model, approximately 11 percent (6701 acres) of the wildlife analysis area may be considered suitable goshawk nesting habitat; with approximately 7 percent (3967 acres) of the wildlife analysis area may be considered suitable goshawk foraging habitat (Table 36).

PACs are designated from aerial imagery and GIS evaluations of CWHR types, and are the result of designating the best available habitat in relationship to geographical features and stand continuity (Figure 17). PACs are delineated based on guidelines provided in the SNFPA FEIS 2001 ROD and the SNFPA FSEIS 2004 ROD page 38. Where there is insufficient suitable habitat (6, 5D, 5M, 4D and 4M), to meet the 200-acre guideline for a PAC, the next best vegetation sizes and types are included. Post-Walker Fire

vegetation was used to remap PACs that burned at high severity.

Analysis Area Surveys

Project specific Northern goshawk surveys were conducted in 2020 in both pre-Walker and proposed replacement Northern Goshawk habitat. There are 4 Northern goshawk PACs within the analysis area where surveys were conducted. A goshawk was detected in the Indian replacement PAC, but none were detected in the other 3 goshawk PACs to date. Only one survey was completed in each PAC, with a second visit planned in mid-July, 2020.

Table 35. Occupation history of Northern goshawk PACs in the Walker Recovery wildlife analysis area.

PAC Number/Name	Years last surveyed	Year last occupied	Year last with nesting
Indian*	2020, 2019, 2018, 2017, 2016	2020 (new replacement PAC)	2018
Last Chance	2020, 2013	1993	1992
Poison	2020		
Old Railroad	2020, 2019, 2013, 2002, 2001	2001	No nesting documented

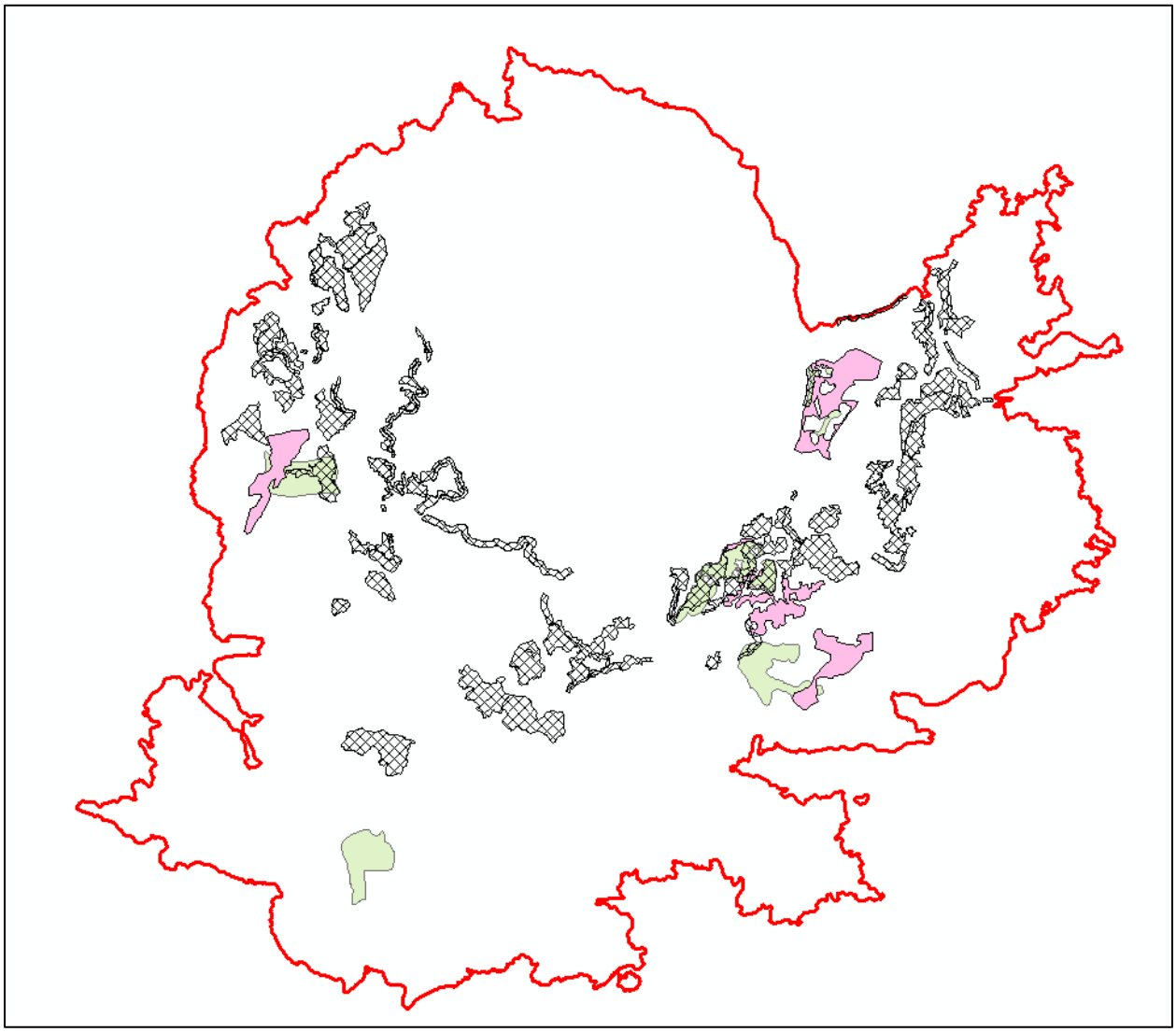

Figure 17. Northern goshawk Protected Activity Centers in Walker Recovery Wildlife Analysis Area. Green were pre-Walker PACs, pink are replacement goshawk PACs where high severity Walker Fire removed habitat, and hatch mark are proposed salvage units.

Table 36. Acres of designated northern goshawk habitat in the Walker Recovery wildlife analysis area.

PAC Number/Name	Total Acres	Acres overlap Walker Fire Perimeter	Acres Overlap with Salvage Units	Acres burned 0-24% severity	Acres burned 25-49% severity	Acres burned 50-75% severity	Acres burned 75-90% severity	Acres burned 90-100% severity
NOGO Camp 14	222	222	0	9	1	1	2	209
NOGO Indian	254	254	241 (0*)	27	9	7	5	207
NOGO Last Chance	252	252	0	41	14	18	13	166
NOGO Old Railroad	274	274	175 (0*)	30	26	26	22	167
NOGO Notson	214	214	0	53	35	18	7	126
NOGO Poison	341	341	0	264	35	15	6	21
NOGO Ward	203	110	0	106	3	1	0	0

* Asterisks indicate number of acres that overlapped with original PAC. PACs were revised and salvage units or portions of units were eliminated, so that no acres of the revised PACs overlap with salvage units.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects of Salvage Logging on Goshawk Populations

Table 37. Acres of Goshawk habitat before and after the Walker Fire and acres affected by proposed salvage logging

CWHR Type	Habitat Type	Wildlife Analysis Area Pre Walker Fire	Wildlife Analysis Area Lost to Walker Fire	Wildlife Analysis Area Post Walker Fire	Acres in Units Post Walker Fire
5M, 5D, 4M, 4D	Nesting+	22,746	16,045 (70% lost)	6,701 (11% of analysis area)	236 (4% of available habitat
5P, 4P, 3D, 3M	Foraging*	10,044	6077 (61% lost)	3,967 (7% of analysis area)	80 (2% of available habitat)
Total		32,790	22,122 67% lost	10,688	316

+**Nesting habitat**: Aspen, Douglas-fir, Eastside Pine, Jeffrey Pine, Lodgepole Pine, Montane Hardwood-Conifer, Montane Hardwood, Montane Riparian, Ponderosa Pine, Red Fir, Sierra Mixed Conifer, White Fir, (6, 5D, 5M, 4D, 4M); ***Foraging habitat**: Aspen, Douglas-fir, Eastside Pine, Jeffrey Pine, Lodgepole Pine, Montane Hardwood-Conifer, , Hardwoo783d, Montane Riparian, Ponderosa Pine, Red Fir, Sierra Mixed Conifer, White Fir, (5P, 4P, 3D, 3M) (SNFPA FEIS Vol3, Chap.3, part 4.4 pg. 116, USDA 2004).

No mechanical treatment would occur within any goshawk PACs. Mechanical treatment would occur on 236 acres of suitable nesting habitat outside of PACs within the treatment units. Additionally, 80 acres of foraging habitat would be salvage logged. All of these acres were burned in the Walker Fire, but at less than 50 percent vegetation burn severity. Some of these are likely still suitable habitat, but some may no longer provide suitable habitat.

Potential direct effects on northern goshawk may result from the modification or loss of habitat or habitat components, and rarely from direct mortality, if nest trees are felled. The proposed action would not cut or remove nest trees. Proposed activities could cause short-term displacement and disruption during the

time equipment is present. In addition, disturbances associated with logging, temporary road building, or other associated activities within or adjacent to occupied habitat may disrupt nesting, fledging, and foraging activities (Richardson and Miller 1997).

To mitigate any potential effects to goshawks present in the project area, Limited Operating Periods (LOPs) will be applied within 0.25 mile of any nests or activity centers from Feb 15 – Sept 15. LOPs can be lifted by the District Wildlife Biologist if the site is determined to be unoccupied.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

The existing condition reflects habitat changes from all activities that have occurred in the past. The analysis of cumulative effects of the alternatives evaluates the impact on northern goshawk habitat from the existing condition within the analysis area.

The Walker Fire had a profound and lasting negative impact on the goshawk habitat in the analysis area. There were 32,827 acres of suitable habitat prior to the Walker Fire, and 68 percent (22,159 acres) were lost to high severity fire (Figure 17). Nesting habitat was particularly impacted, with 77 percent (4,715 acres) of the nesting habitat lost. Protected Activity Centers were heavily impacted (Table 36). PAC PLU0200 was completely consumed (Figure 17) and is planned for retirement from the PAC network. Foraging habitat was also heavily impacted, with 68 percent (11,330 acres) lost (Figure 17).

The woodcutting program on the Plumas NF has been in existence for years and is expected to continue. Uncontrolled public use within the areas used by Northern goshawks, especially during the nesting season, could cause disturbance that could disrupt and preclude successful nesting as well as the continued removal of current and future snags. The past and future effect of the woodcutting program has and would be to reduce snags, in all forest types, along roadsides throughout much of the analysis area.

Most of the recreation use within the wildlife analysis area consists of dispersed camping, hiking, horseback riding, hunting, mining, mountain biking, OHV use, pleasure driving, and wildlife watching. Such use is expected to continue at the current rate. These activities would have no effect on late seral habitat in the analysis area.

Determination

It is my determination that the implementation of the proposed actions for the Walker Fire Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability for Northern goshawks.

Treatments are designed to avoid Goshawk protected activity centers and were designed to concentrate harvest on areas with high severity fire that offer little habitat to northern goshawks (93 percent of harvest units are not considered suitable nesting or foraging habitat). A total of 236 acres of potentially suitable goshawk nesting habitat would be removed and 80 acres of potentially suitable goshawk foraging habitat would be removed with this project. Reducing the amount of nesting habitat in the Walker Recovery Project area may have some negative effects to any goshawks present.

Gray Wolf (Canis lupus)

The Biological Assessment (BA) was prepared and submitted to US Fish and Wildlife Service in April 2020. The BA included the original Walker Fire Recovery Project (see Public Involvement, Scoping, for more information) and a second, separate project named “2020 PNF Road and Trail Maintenance Project”. The follow analysis for gray wolf is directly from the BA and unedited to maintain the integrity of the BA.

Gray wolves historically occurred throughout the contiguous United States including California. The Fish and Wildlife classified the gray wolf as endangered and designated the species’ critical habitat in 1978 (43 FR 9607). No critical habitat occurs in California. Although the species was likely extirpated from California during the 1920s, the gray wolf is now recolonizing California via dispersal from populations

in other states. Wolf reproduction (denning) has been documented in the Shasta-Trinity and Lassen National Forests.

Habitat and Life History

Gray wolves are habitat generalists occupying a variety of plant communities, typically containing a mix of forested and open areas within a variety of topographic features. Historically, they occupied a broad spectrum of habitats including grasslands, sagebrush steppe, and coniferous, mixed, and alpine forests. They have extensive home ranges and prefer areas with few roads, generally avoiding areas with an open road density greater than 1.0 mile per square mile (Witmer et al. 1998).

Wolves are strongly territorial, defending an area of 75 to 150 square miles, with home range size and location determined primarily by abundance of prey (USFWS 1987). Wolves are generally limited by prey availability and threatened by human disturbance. Land management activities may be compatible with wolf protection and recovery when management actions maintain viable ungulate populations on the landscape. During all seasons, ungulates constitute the highest percentage of biomass (USFWS 1987). Because they are an important prey item, factors affecting ungulate distribution and abundance (e.g., habitat use and management, winter range productivity) also affect wolves. Mule deer can be expected to provide the most frequent foraging opportunities for wolves on the Plumas National Forest because they are the most numerous and accessible ungulate.

Dens are usually located on moderately steep slopes with southerly aspect near surface water. Rendezvous sites, used for resting and gathering, are complexes of wet thicket adjacent to timber and near water. Both dens and rendezvous sites are often characterized by having nearby forest cover remote from human disturbance. Wolves may exhibit den site fidelity from year to year, or they may maintain several den sites used in different years (USFWS 1987). Wolf packs appear sensitive to human disturbance near den sites and may abandon the site (Ballard et al. 1987).

Rendezvous sites refer to specific resting and gathering areas wolves use during the summer and early fall. Several rendezvous sites may be used by a pack, generally located between 1 to 6 miles from the natal den. A pack uses rendezvous sites until pups are mature enough to travel with adults, generally early autumn. Wolf response to human disturbance is due to a variety of factors including specific setting, individuality of wolves, and whether the population is exploited or protected (USFWS 1987). Because CDFW biologists routinely monitor GPS collared wolves on the Plumas National Forest and visit areas used by wolves (CDFW 2018b), the locations of den and rendezvous sites will likely be readily identified.

Threats/Management Concerns

Effects to gray wolves are assessed in terms of threats to wolves through human contact and conflict (i.e., livestock or grazing concerns), through activities that compromise denning or rendezvous sites, or through activities that affect prey base. Wolves initially experienced population declines due to conflicts with humans. This included human settlement, direct conflict with livestock, and a lack of understanding of wolf ecology and habits as well as subsequent eradication programs (USFWS 1987). Today, human conflict still exists, most notably over livestock depredations and the associated economic losses.

Local Information

Gray wolf occupies the northern portion of Plumas National Forest (Mount Hough and Beckwourth Ranger Districts). Wolf activity on Plumas National Forest currently ranges from the forest boundary near Lake Almanor (see Figure 18 for photograph of one wolf in 2017), south along the east shore of the lake to approximately Mt Hough, Grizzly Mountain, Turner Ridge, and Antelope Lake (CDFW 2020). The Lassen pack has reproduced annually (2017-2019), denning on adjacent Lassen National Forest lands. The pack produced 4 pups in 2017, 5 pups in 2018 and 4 pups in 2019. Current pack size is estimated at two adults, one yearling and four pups, and there also are multiple singleton wolves (i.e., dispersers) using Plumas National Forest that are not associated with the Lassen pack (CDFW 2020). Despite broad use of

the forest, no den or rendezvous sites have been observed in the Plumas National Forest. The Lassen pack appears to use a greater amount of the Plumas National Forest during summer months compared to winter range use, with winter range approximately a third the size of summer range; however, wolves made larger movements over a larger area during winter 2018-2019 compared to 2017-2018 (Laudon 2019). Wolves use relatively lower elevation sites during winter on Plumas National Forest, where deer also congregate; however, wolves have made multiple forays during winter into the higher elevations of the forest (Laudon 2019). Current wolf activity (https://www.wildlife.ca.gov/conservation/mammals/gray-wolf) overlaps the Walker Fire Salvage area.

Potentially suitable habitat for wolves is broad and vast on Plumas National Forest because wolves range widely and use diverse habitats. We assessed impacts to wolf throughout the action area by evaluating risks. Wolves are anticipated to use the entire project area, except Antelope Lake, and therefore all 58,787 acres within the Walker Fire Rehabilitation Project and 70,394 acres within the 2020 Plumas National Forest Road and Trail Maintenance project, are considered suitable habitat to assess indirect impacts to wolf.

Figure 18. Gray wolf detected at the north end of the Plumas NF near the Lassen NF boundary, June 29, 2017.

Project Surveys

No project specific carnivore surveys were conducted, however previous surveys had been conducted in the action area. Camera stations were monitored (using deer meat for bait and gusto scent) for a minimum of 28-days per camera station following the Zielinski and Kucera (1998) protocol (Figure 18). There were 122 camera stations in the larger 2020 Plumas National Forest Road and Trail Maintenance Project Action area and 90 of these stations were in the smaller Walker Fire Recovery Project Action area. All camera stations were run between 1995 and 2016, prior to the establishment of the Lassen Pack. No wolves were detected during camera station surveys. Wolf tracks were located during project layout along road 26N54B1 (Figure 20, Figure 21, and Figure 22). Wolves are capable of large-scale movements and it is plausible that wolves from the Lassen Pack wintering in the North Arm of Indian Valley are the wolf tracks recently detected in the Walker Fire Projects area. The Walker Fire Projects area is considered to be part of the Lassen Pack home range area

(https://www.wildlife.ca.gov/conservation/mammals/gray-wolf).

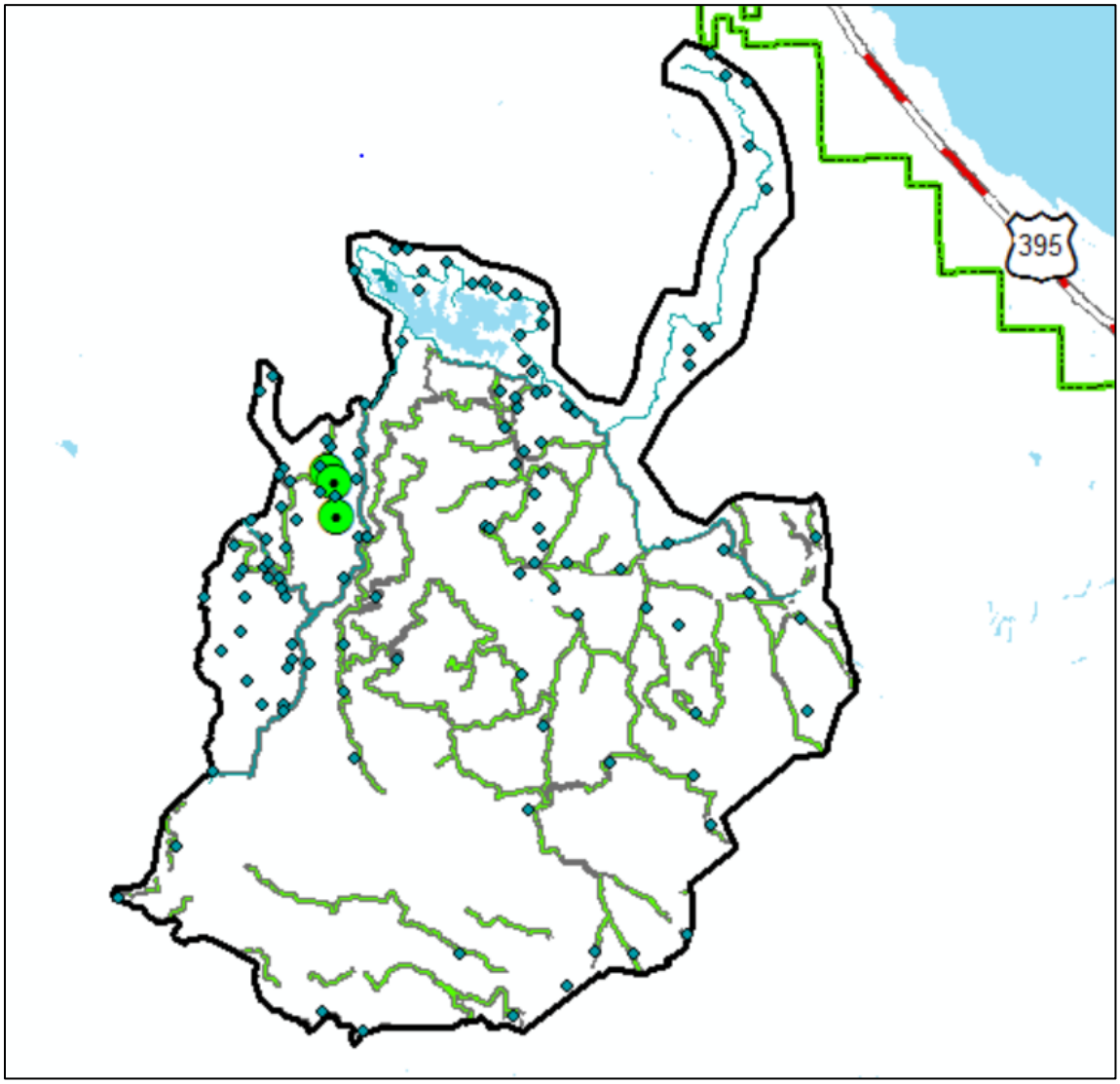

Figure 19. Camera station deployment (blue points, N=122) in the action area of the 2020 Plumas National Forest Road and Trail Maintenance Project. Planned roadside hazard tree removal areas shown in green and road surface maintenance shown in blue lines. No wolves were detected with camera station deployment in the action area (1995-2016). Large green points show incidental wolf track locations detected in March 2020.

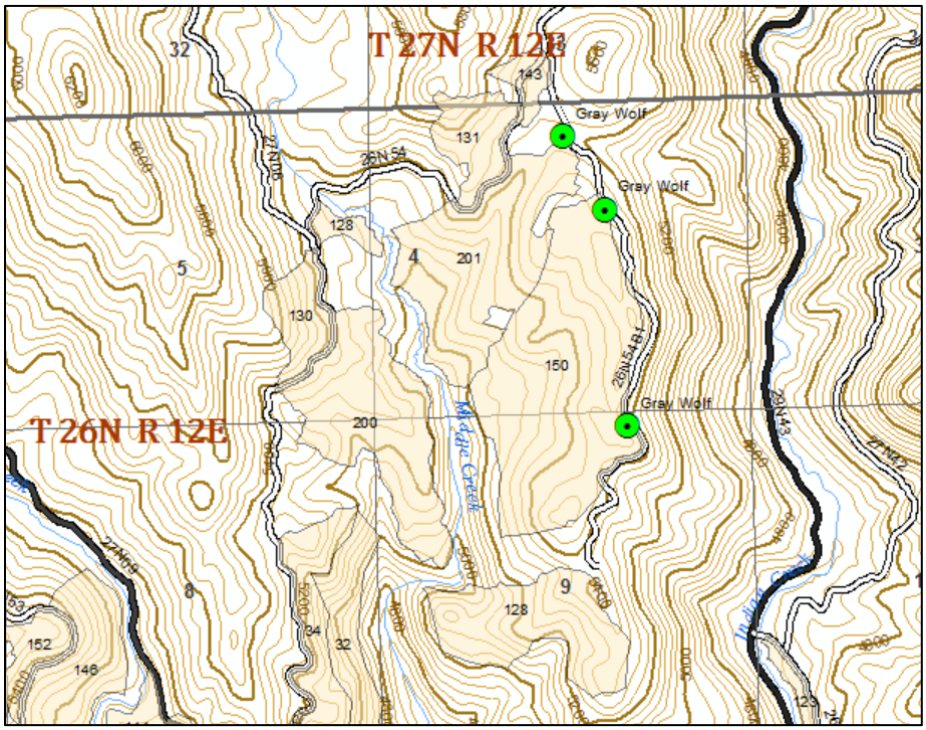

Figure 20. Tracks went up and down the 26N54B1 road and connect all three points on this map. Three points are where Plumas NF employee Zach Wood added three game camera stations at areas of dense tracks and where trees provided potential game camera location. All tracks were observed March 5, 2020. Game cameras were added March 10, 2020. To date, no wolves were photographed on these 3 camera stations. Salvage harvest units are shown in beige polygons.

Figure 21. Photograph of gray wolf track taken on March 5, 2020 in the project area by Zach Wood (Plumas NF employee). Track on right was approximately 5.25 inches long by 4 inches wide. These two tracks likely two different wolves based on size difference between tracks.

Figure 22. Multiple sets of wolf tracks in Walker Fire project area, March 5, 2020 (photograph by Zach Wood, Plumas NF).

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects

While wolves aren't currently denning in the project area, wolves do defend large home ranges (ranging

from 30 – 400 square miles, depending on location, Kovacs et al. 2016) and exhibit considerable daily movements (>5 miles/day, Kovacs et al. 2016), making it is difficult to determine if a gray wolf might occur in or near the project area at the time of project implementation (2020-2024). Gray wolf space use is dynamic, depending on motivation (e.g., feeding versus denning) and wolf pack boundaries frequently shift, as does annual den site selection (Kovacs et al. 2016). Because the project area overlaps the Lassen Pack home range, there is the potential for future denning or rendezvous sites to become established in the project area prior to or during implementation. Regardless of the whereabouts of the Lassen Pack, it is not expected that the wolves would be directly impacted by the proposed actions. Wolves' typical reaction to human disturbance is avoidance (Kovacs et al. 2016), and wolves have been documented to relocate pups out of areas of heavy equipment disturbance (Theil et al. 1998). While reproductive success may not be influenced by the amount or types of human activities, wolf pups may be vulnerable to disturbance when younger (Frame et al. 2007).

There is potential for injury or mortality to individuals from vehicle collision. However, the likelihood of a collision between logging vehicles or road maintenance vehicles is low due the relatively slow speed traveled on Forest Service roads in the project areas (15-35 mph).

While direct effects to the gray wolf are unlikely, the proposed action could potentially effect prey resources and could alter the wolves' behavior. Therefore, to prevent indirect effects from occurring, conservation measures have been recommended. The project overall would not make any habitat unsuitable to wolves, other than disturbance-caused short-term avoidance of otherwise suitable habitat. Because disturbance-caused effects would be mitigated, therefore the project effects are largely discountable and insignificant.

Wolf packs are sensitive to human disturbance near den sites and may abandon the site (Ballard et al. 1987). Subsequently, most den sites are located away from trails and backcountry campsites. Wolves are denning on the adjacent Lassen National Forest (2017-2019) and the northern portion of the Plumas National Forest is currently occupied by wolves in the Lassen Pack as well as multiple singleton (dispersing) wolves. The risk of avoidance behaviors from the Walker projects is considered low as the spatial overlap of these projects with wolf range is relatively small compared to the large, and possibly expanding areas traversed by the species.

Conservation Measures

One month prior to commencement of timber harvest, road maintenance or other project activities that have the potential to cause direct effects to wolves, the Plumas NF shall contact California Department of Fish and Wildlife (CDFW) and the Fish and Wildlife Service (the Service) to verify the presence of wolf activity near the project area. If no wolves are GPS-collared at the time of project implementation, the Forest Service will work closely with the CDFW and the Fish and Wildlife Service to ensure the best available information on wolf locations and habitat use are employed to inform management activities and monitoring on the Plumas National Forest. If an active den or rendezvous site is located within one mile of the project area, the following conservation measures would be implemented:

A limited operating period (LOP) restricting all noise or smoke generating activities shall be instated from April 1 through July 15. Further discussions and coordination with CDFW and the Service may result in a modified distances or more flexible dates for this specific conservation measure. In addition, if the den or rendezvous sites are clearly separated from project-generated disturbances by topographic features or terrain, seasonal restrictions may be adjusted or eliminated, as approved by the Service. These conservation measures would avoid or minimize disturbance at active den or rendezvous sites that could disrupt reproductive success or result in adverse effects. Dens that are known to be used in consecutive years but not used in the current year may require a LOP if CDFW or the Service determines it is necessary.

Early rendezvous sites are typically close to dens: implementing a LOP within 1 mile of den sites will

generally mitigate effects to early rendezvous sites when pups are still vulnerable. Again, coordination with CDFW and the Service prior to implementation would be done to ensure protection of all known and/or newly discovered den and rendezvous sites.

If a den is discovered during implementation of the proposed project, the LOP shall be implemented and coordination with CDFW and the Service shall be pursued.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

There are 58,787 acres of suitable habitat in the Walker Fire Recovery action area, with 4,218 acres to be potentially impacted in the Walker Fire Recovery project. There are 70,394 acres of suitable habitat in the 2020 Plumas National Forest Road and Trail Maintenance Project action area, with 7,886 acres to be potentially impacted in the treatment units. It is possible that non-federal actions could occur on private lands on 1,404 acres within the Walker Fire area adjacent to the project action area. These potential actions can add to the Project's disturbance effects to wolves. The Moonlight Restoration project and the Genesee Woods project could create additional disturbance in the action area.

Interdependent and Interrelated Actions

The proposed project has independent utility and is not dependent on implementation of other projects. The project area falls within both the planning areas of the Moonlight Fire Restoration EA and the Plumas National Forest Oversnow Vehicle Use Designation project. Wildlife Protected Activity Center (PAC) treatments from the Moonlight Restoration environmental assessment are planned for restoration to the west of Walker Fire Salvage project area. The Franks Valley project proposes to harvest trees and complete fuel reduction treatments adjacent to the Walker Fire area. The other projects capable of impacting threatened, endangered, and proposed species or critical habitat have been, or will be, submitted for formal or informal consultation. This project is not expected to have direct effects on the wolf, and potential indirect effects have been mitigated through conservation measures. Therefore, the potential for cumulative effects is negligible.

Species Determination

The Walker Fire Rehabilitation Project May Affect, but is not likely to adversely affect the Gray Wolf. No direct effects to wolves are anticipated, and indirect impacts to prey species will be insignificant (spatially and temporally); however, it is not currently feasible to quantify such indirect effects through existing resources. It is anticipated that wolves will avoid the action area during implementation; however, the Forest Service will be able to mitigate any negative direct or indirect effects to wolves that may develop during implementation through project conservation measures. That is, if future wolf pack activity patterns indicate potential project impacts are no longer discountable, consistent coordination with partners at CDFW will direct appropriate project mitigations.

The 2020 Plumas National Forest Road and Trail Maintenance Project **May Affect, but is not likely to adversely affect the Gray Wolf.** No direct effects to wolves are anticipated, and indirect impacts to prey species will be insignificant (spatially and temporally); however, it is not currently feasible to quantify such indirect effects through existing resources. It is anticipated that wolves will avoid the action area during implementation; however, the Forest Service will be able to mitigate any negative direct or indirect effects to wolves that may develop during implementation through project conservation measures. That is, if future wolf pack activity patterns indicate potential project impacts are no longer discountable, consistent coordination with partners at CDFW will direct appropriate project mitigations.

Bats (Corynorhinus townsendii, Antrozous pallidus, Myotis thysanodes)

Three of the 17 bat species occurring on Plumas National Forest are designated as Forest Service sensitive species (*Antrozous pallidus, Corynorhinus townsendii, Myotis thysanodes*) and five are listed as species of special concern by the California Department of Fish and Wildlife (*A. pallidus, C. townsendii, Euderma maculatum, Lasiurus blossevillii, Eumops perotis californicus*; Figure 23). Throughout

California, Townsend's big-eared bat (*Corynorhinus townsendii*) populations have declined over the last 40-60 years (USDA 2001). Approximately 52 percent of historic maternity roosts are unoccupied and 40 percent of these sites have been rendered unsuitable. Data used to estimate *C. townsendii* trends were collected from across California (1987-1991) but not on PNF (USDA 2001). There is no indication that there has been a change in the distribution of the pallid bat (*Antrozous pallidus*, USDA 2001), but there is concern for the pallid bat because it is very sensitive to disturbance. Any disturbance, even hiking, can cause the species to abandon a roosting area completely (Arroyo-Cabrales and Grammont 2008). The fringed myotis (*Myotis thysanodes*) ranges throughout western North America from British Columbia south to Mexico. There is little information on size and trend of populations, and it may be locally abundant or rare (Keinath 2004). In California, *M. thysanodes* is distributed statewide except the Central Valley and the Colorado and Mojave Deserts (Mayer and Laudenslayer 1988). Like other California bat species, it appears there have been declines in numbers and colonies of *M. thysanodes* (Keinath 2004; USDA 2005). No major threats have been identified throughout the species' range, but the Mexican subspecies *M. thysanodes aztecus* has experienced approximately 40 percent reduction in habitat (Arroyo-Cabrales and Grammont 2008).

Habitat Requirements

Forest structure is an important determinant of insectivorous bat assemblages (Blakey et al 2017), as bats have diverse morphological and call adaptations for a range of forests from cluttered to open in structure (Figure 23; Schnitzler et al 2003; Blakey et al 2017, 2019b). For example, a large-bodied bat with narrow (high aspect ratio) wings and a long duration, low frequency call is well adapted to forage on fast prey in open spaces, but has difficulty maneuvering and detecting prey in cluttered habitat (Denzinger and Schnitzel 2013). In contrast, clutter-adapted bats can differentiate prey from surrounding vegetation using high frequency, wide bandwidth calls and maneuver well in small spaces with low aspect ratio wings. All three sensitive bat species occurring on PNF exhibit morphological and call adaptation for cluttered environments (*Myotis thysanodes*: O'Farrell and Studier 1980, Schnitzler et al 2003; *Antrozous pallidus*: Frick et al 2009; *Corynorhinus townsendii*: Fellers and Pierson 2002, Segura-Trujillo et al 2016).

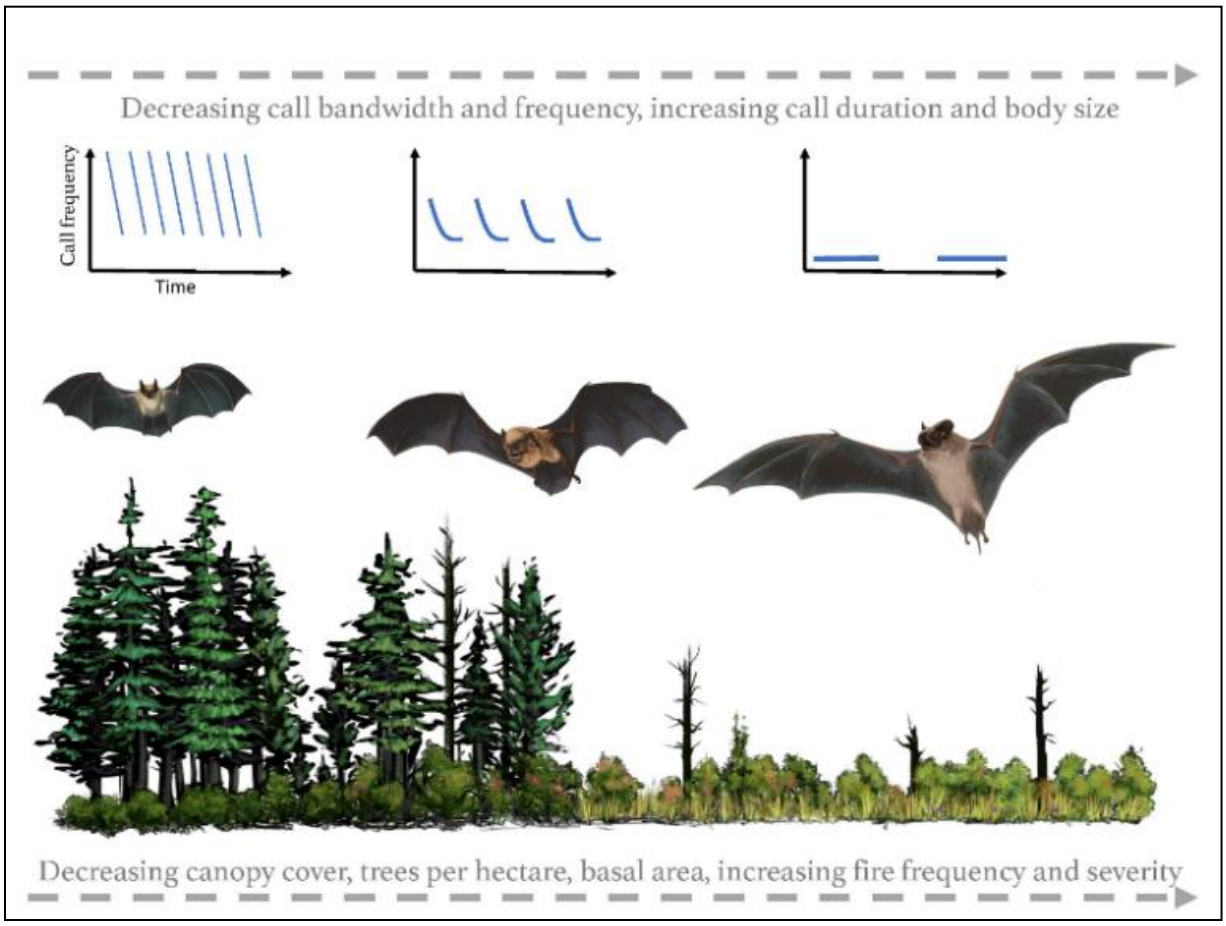

Figure 23. Illustration of ecomorphological relationships in Plumas National Forest bat community.

As habitats change across a gradient of increasing burn severity and frequency and decreasing clutter (left to right), larger bats with narrower bandwidth, lower frequency and longer duration calls are more likely to occupy the area. From left to right, representatives from three bat foraging strategies are shown: clutter-adapted (Myotis thysanodes), edge-adapted (Eptesicus fuscus) and open-adapted (Tadarida brasiliensis). Body sizes are not to scale (after Blakey et al 2019b). Illustrations by Lauren Helton.

C. townsendii are usually found below 6,000 feet but have been found up to 10,000 feet elevation occupying a wide variety of habitats (older forest, desert, grasslands/plains, riparian, coastal; Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). Roosting habitat is generally near drinking water and included caves, mines, abandoned human structures, and rock crevices (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). *C. townsendii* appears to prefer mesic habitats and foraging has been reported in riparian areas, late seral forests, mixed hardwood-conifer forest, feeding primarily on the wing for flying insects (specializing in moths) or by gleaning from foliage (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). *C. townsendii* form maternity colonies of up to several hundred females and exhibit a high degree of roost site fidelity. If undisturbed, colonies appear to be occupied indefinitely (Philpott 1997, Pierson and Rainey 1998, Pierson et al. 1999). As a result of colonial roosting, there is potential for a single disturbance event to impact large number of individuals (Philpott 1997).

Table 38. Bat species detected in Plumas National Forest, with percentage of the 83 sample sites in which each species was recorded (%), total nights detected (n), and mean detection (ρ) and occupancy (ψ) probabilities for top-ranked models (modified after Blakey et al 2019b). Sparse detections for 8 species precluded modeling detection and occupancy probabilities. Call traits included characteristic call frequency (Fc), call bandwidth (BW) and call duration (Dur) and were obtained from summaries of western US bat call characteristics included in Sonobat (SonoBat 4.2.2, SonoBat, Arcata, CA, US), after Blakey et al (2019b).

Scientific name	Common name	Foraging strategy	%	n	ρ	ψ	Fc kHz	BW kHz	Dur ms	Mass g
Myotis californicus	California myotis	Edge	83	160	0.77 ± 0.03	0.92 ± 0.04	49.1	54.3	3.8	4.2
Myotis evotis	Western long-eared myotis	Clutter	74	114	0.58 ± 0.04	0.89 ± 0.05	34.3	50.4	3.7	7.3
Lasionycteris noctivagans	Silver-haired bat	Edge	53	92	0.67 ± 0.05	0.58 ± 0.07	26.5	16.1	9.2	10.6
Eptesicus fuscus	Big brown bat	Edge	42	66	0.55 ± 0.06	0.53 ± 0.01	28.2	29.4	7.8	15.9
Tadarida brasiliensis	Mexican free-tailed bat	Open	37	59	0.55 ± 0.17	0.43 ± 0.08	25.5	8.2	11.5	12.5
Lasiurus cinereus	Hoary bat	Open	29	32	0.27 ± 0.06	0.47 ± 0.12	20.1	6.3	11.0	33.0
Myotis lucifugus	Little brown bat	Edge	29	48	0.46 ± 0.08	0.29 ± 0.09	40.8	36.4	6.0	7.1
Myotis thysanodes	Fringed myotis[+]	Clutter	24	30	0.38 ± 0.08	0.26 ± 0.08	24.5	52.6	3.9	8.4
Myotis yumanensis	Yuma myotis	Edge	19	28	0.29 ± 0.08	0.25 ± 0.08	49.2	44.4	5.5	5.2
Antrozous pallidus	Pallid bat*[+]	Clutter	19	21	NA	NA	28.0	28.3	6.8	17.3
Myotis volans	Long-legged myotis	Edge	18	18	NA	NA	41.6	52.7	4.8	10.4
Lasiurus blossevillii	Western red bat*	Edge	10	13	NA	NA	38.9	15.8	10.7	12.5
Corynorhinus townsendii	Townsend's long-eared bat*[+]	Clutter	5	6	NA	NA	23.4	21.1	4.6	10.2
Myotis ciliolabrum	Small-footed myotis	Edge	4	5	NA	NA	44.3	54.5	3.2	4.9
Parastrellus hesperus	Canyon bat	Edge	5	5	NA	NA	45.9	15.2	5.5	4.4
Eumops perotis californicus	Western mastiff bat*	Open	2	3	NA	NA	10.4	10.4	15.4	53.5
Euderma maculatum	Spotted bat*	Clutter	2	2	NA	NA	10.0	4.9	3.2	17.9

* California Species of special Concern by California Department of Fish and Wildlife.
[+] USDA Forest Service, Pacific Southwest Region, 2013, Regional Forester's Sensitive Species (https://www.fs.usda.gov/detail/r5/plants-animals/wildlife

C. townsendii roost sites include caves and mine tunnels, but also may include old buildings, bridges, rock crevices, and hollow trees (Fellers and Pierson 2002; Piaggio 2005; Jameson & Peeters 1988; Zeiner et al. 1990), as long as there is an open, dark space from which to hang (Barbour and Davis 1969; Pierson and Rainey 1998). Fellers and Pierson (2002) documented tree roosts in large (45-75 inch DBH) fire-scarred, hollowed redwoods in coastal California. Availability of cave and cave-like roost and hibernation sites appears to be a critical habitat feature for the species, and some have suggested that roost availability may be more important than availability of specific vegetation features (Barbour and Davis 1969, Gruver and Keinath 2006, Piaggio 2005, Pierson and Rainey 1998).

A. pallidus occur in a wide variety of habitats, including grasslands, shrublands, and woodlands to mixed conifer forests (USDA 2001). They are most abundant below 6,000 feet elevation, but have been recorded up to 10,000 feet in the Sierra Nevada (USDA 2001). *A. pallidus* commonly occupy open, dry habitats with rocky areas for roosting. They commonly roost in caves, crevices, mines, and occasionally in hollow trees/snags, crevices in oaks (USDA 2001). Philpott (1997) emphasized the importance of oak woodlands for foraging in this species, and the 2001 SNFPA FEIS (USDA 2001) emphasized protection and enhancement of oak habitat components (westside foothill and montane oaks) to provide and maintain *A. pallidus* foraging habitat.

M. thysanodes is most frequently observed at middle elevations (3,900–7,050 feet) in desert, grassland, and woodland habitats, but ranges along coastal areas of the Pacific Ocean to 9,350 feet elevation in spruce-fir habitat in New Mexico (Keinath 2004). In some areas, oak and pinyon woodlands appear to be the most commonly used habitat, and bats roost in dead trees, caves, mines, rock crevices, buildings, and other protected sites with nearby access to drinking water (Weller and Zabel 2001, Keinath 2004). *M. thysanodes* commonly day and night roost under bark and in tree hollows, and bats exclusively used snags for day roosts in Douglas-fir forests in Northwestern California (Six Rivers National Forest data, Weller and Zabel 2001). In one study, all roost trees were snags in early to medium stages of decay and *M. thysanodes* likelihood of occurrence increased as the number of snags greater than 12 inches DBH increased and percent canopy cover decreased (Keinath 2004). Although bats appear to switch roosts often, roost snags are generally taller (85 feet taller) with larger DBH (17 inches larger), closer (135 feet closer) to streams, and in areas with slightly lower (11 percent lower) canopy cover compared to random sites (Keinath 2004, Weller and Zabel 2001). Nursery colonies occur in caves, mines, and sometimes buildings, with individuals moving up to five miles between roosting and foraging areas (Keinath 2004). Fringed Myotis are known to migrate, but little is known about the magnitude of movements. Among others, *M. thysanodes* diet includes beetles and moths and it forages in or near the vegetative canopy with relatively slow and highly maneuverable flight (Keinath 2004).

Analysis Area Surveys and Bat Analysis

The bat analysis area, the same as the Walker Fire perimeter (58,787 acres), was delineated to encompass the project area as well as representative habitat surrounding the project area to provide a relative context on the landscape while evaluating potential direct, indirect and cumulative project impacts to bats and their habitat.

Blakey et al (2019b) sampled bats acoustically at 83 randomly selected sites (n = 249 recording nights) across the Plumas National Forest over three summers (2015-2017), investigating relationships between fire regime, physiographic variables and forest structure and probability of bat occupancy for nine frequently detected species (17 bat species detected on the forest in total, Table 38). Results indicated relationships between bat traits were underpinned by adaptations to diverse forest structure (Figure 23, Table 38). Bats with traits adapting them to foraging in open habitats, including emitting longer duration and narrow bandwidth calls, were associated with higher severity and more frequent fires, whereas bats with traits consistent with clutter tolerance (structurally complex vegetation) were negatively associated with fire frequency and burn severity; relationships between edge-adapted bat species and fire were variable on the forest and may be influenced by prey preference or habitat configuration at a landscape scale (Blakey et al 2019b). All three Forest Service sensitive species (*A. pallidus and C. townsendii, M. thysanodes*) employ a clutter-adapted foraging strategy (i.e., utilizing structurally complex vegetation, Table 38, Figure 23). Clutter-adapted bats can differentiate prey from surrounding vegetation using high frequency, wide bandwidth calls and maneuver well in small spaces with low aspect ratio wings; however, some of these attributes (e.g., slow flight speed) may result in clutter-adapted bats being relatively more susceptible to predation in open habitats (Sleep and Brigham 2003).

Environmental Consequences

The implementation of Management Area direction and habitat prescriptions and allocations for late seral species such as California spotted owl and Northern goshawk, including the retention of large trees, retention of hardwoods, snags and large logs, and maintaining aquatic/riparian ecosystem processes, would provide many of the habitat attributes necessary to support sensitive bat species. All three sensitive species (*M. thysanodes, C. townsendii, and A. pallidus*) are predicted to occur within the project area, but no project acoustic surveys were conducted to confirm their presence. Proposed treatments would have short- and mid-term negative impacts (1-50 years post implementation) to sensitive bat species through reduction in complex forest vegetation structure. These three bat species exhibit a continuum of roost site requirements. *C. townsendii* is colonial and roosts in caves, mines, and abandoned human structures (hanging in open areas from a wall or the ceiling). *M. thysanodes* and *A. pallidus* roost in caves, crevices, and mines, but these species also utilize live trees and snags for roosting. Although the Walker Recovery Project would not physically alter roosting habitat for *C. townsendii* (caves, mines, abandoned buildings), project activities could disturb or cause abandonment of colonies if present. Coloniality places *C. townsendii* at high risk for a single disturbance event to impact the entire population (e.g., tractor operations). The single most important non-structural requirement for roost sites for this species is absence of human disturbance (USDA 2001*). A. pallidus* also is very sensitive to disturbance; even hiking past a roosting site can cause the bat to abandon the area completely, but unlike *C. townsendii*, *A. pallidus* uses live and dead trees for roosting. Thus *A. pallidus* roost sites could potentially be removed during the Walker Recovery Project, and any roost sites in the areas that are not physically altered could be abandoned as a result of disturbance. *M. thysanodes* also is very sensitive to disturbance at or modification of roosts and the surrounding environment. Due to the small size of bats, and the difficulty of surveying for them, it is hard to determine where roost sites are located. However, if a roost site is discovered prior to or during projects activities a limited operating period would be applied.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects of Salvage Logging on Bat Populations

Salvage logging would run over logs and remove snags on 3901 acres within the analysis area that provide potential bat roost sites. Limited snag retention on these 3901 treated acres would retain some roost sites, but at a much lower density than currently provided in the post-Walker Fire landscape. However, the Walker Fire burned 22,783 acres of CWHR size class 4 and 5, and these acres provide abundant snags on the landscape for roosting. Therefore, salvage effects are expected to impact 17 percent of the highest quality snag roosting habitat available in the analysis area.

Direct effects are possible through the destruction of active roosts through felling or removal of trees with hollows or loose bark, especially older snags. Recent fire-killed snags are less likely to have loose bark and roosting bats present. Bats utilize large conifer snags and tree hollows as day roosting sites, so some roosting habitat may be lost through snag removal during harvest activities. Hazard trees, including snags, along the road, and those removed for safety reasons, could result in direct mortality of bat species that may be roosting within the tree or snag. The use of heavy equipment causing ground vibrations may cause noise and tremor disturbance significant enough to cause temporary or permanent roost abandonment resulting in lowered reproductive success. These effects would be most severe during the breeding season (May 1 to August 15) when the potential exists for disturbance to active breeding females and maternity colonies. If any of these sensitive bat species breed in the area, project activities during the breeding season could affect individual bats, including direct mortality. Proposed treatments would have short- and mid-term negative impacts (1-50 years post implementation) to sensitive bat species through reduction in complex forest vegetation structure. Salvage activities may potentially remove all clutter-adapted sensitive habitat within salvage units. Proposed treatments also may result in clutter-adapted bats being relatively more susceptible to predation as it is reasonable to expect more open habitat will be created by proposed salvage treatments (Sleep and Brigham 2003, Blakey et al 2019b). Aside from changes in habitat availability for clutter-adapted (sensitive) bats, prey availability also may be impacted by treatments and indirectly affect sensitive species foraging efficiency.

Alternative 1 (Proposed Action Alternative) Cumulative Effects

The existing condition reflects changes on the landscape from all activities that have occurred in the past, and analysis of cumulative effects of the proposed action evaluates the impact of the project on the existing condition within the analysis area. Cumulative effects to sensitive bat species could occur with the potential incremental loss of quantity and/or quality of habitat. Personal firewood cutting is a permitted ongoing activity in the analysis area along National Forest System Roads, and may negatively impact roost site availability and quality, given most bat species on the Plumas National Forest use trees (alive and/or dead) for roosting. Road improvements associated with project activities may result in increased personal firewood collecting in the analysis area due to improved accessibility and snag visibility; however, data is not gathered on firewood collecting to permit such an evaluation. Future activities on this landscape are dominated by revegetation, fuels and other silviculture activities designed to restore habitat to the project area, as well as to the north of the project area in the Moonlight fire footprint. Moonlight restoration efforts are designed to reduce the risk of high-severity fire re-burning the area while post-fire vegetation recovers. The risk of cumulative effects from the proposed activities will likely be negligible at this time based on the relatively small size of the project area in relation to habitat availability across the forest.

Determination

The Walker Recovery project may directly impact individual sensitive bats (*Corynorhinus townsendii, Antrozous pallidus, Myotis thysanodes*) through implementation disturbance, reduced roost site availability and suitability, and will have short- and mid-term negative impacts (1-50 years post implementation) on sensitive bat foraging habitat; however, the project is not likely to result in a loss of viability in the analysis area, nor cause a trend toward federal listing.

Conclusion

The Proposed Action would protect and maintain key sensitive species habitat areas through project design. Disturbance to sensitive wildlife species would be limited through implementation of the necessary LOPs, BMPs, and Forest Service Standards and Guidelines. Nevertheless, impacts resulting from the Walker Salvage Project are expected to contribute to cumulative impacts on certain sensitive wildlife species.

Determinations of effects on threatened, endangered, proposed, and sensitive species in the Walker Fire analysis area.

Threatened, Endangered and Sensitive Species **(Scientific Name)**	**Species Status***	**Determinations****
Insects		
Valley elderberry longhorn beetle (Desmocerus californicus dimorphus)	FT	WNA
Western Bumblebee (Bombus occidentalis)	USFS : S	MAI
Carson wandering skipper (Pseudocopaeodes eunus obscurus)	FE	WNA
Fish		
Hardhead minnow (Mylopharodon conocephalus)	USFS : S DFW :SSC	WNA
Delta smelt (Hypomesus transpacificus)	FT	WNA
Amphibians		

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Determinations**
California red-legged frog (Rana aurora draytonii)	FT	WNA
Foothill yellow-legged frog (Rana boylii)	USFS : S, DFW : SSC	MAI
Sierra (Mountain) yellow-legged frog (Rana sierrae)	FC, USFS : S, DFW : SSC	MAI
Northern leopard frog (Rana pipiens)	USFS : S, DFW : SSC	WNA
Reptiles		
Northwestern pond turtle (Clemmys marmorata marmorata)	USFS : S, DFW : SSC	WNA
Birds		
Bald eagle (Haliaeetus leucocephalus)	USFS : S, SE, USFWS : BCC	WNA
California spotted owl (Strix occidentalis occidentalis)	USFS : S, USFS : MIS, DFG : SSC, USFWS : BCC	MAI
Greater sandhill crane (Grus canadensis tabida)	USFS : S, ST	WNA
Great gray owl (Strix nebulosa)	USFS : S, SE	WNA
Northern goshawk (Accipiter gentilis)	USFS : S, DFG : SSC	MAI
Swainson's hawk (Buteo swainsoni)	USFS : S, DFG : SSC	WNA
Willow flycatcher (Empidonax trailii brewsteri)	USFS : S, SE, USFWS : BCC	WNA
Mammals		
American marten (Martes americana)	USFS : S	WNA
California wolverine (Gulo gulo luteus)	USFS : S, ST	WNA
Pacific fisher (Martes pennanti pacifica)	FC, USFS : S, DFG : SSC	WNA
Pallid bat (Antrozous pallidus)	USFS : S, DFG : SSC	MAI

Threatened, Endangered and Sensitive Species (Scientific Name)	Species Status*	Determinations**
Sierra Nevada red fox (Vulpes vulpes necator)	USFS : S, ST	WNA
Townsend's big-eared bat (Corynorhinus townsendii)	USFS : S, DFG : SSC	MAI
Fringed myotis (Myotis thysanodes)	USFS : S DFW : SSC	MAI

*__Species Status: FE__ = Federal Endangered, **FT** = Federal Threatened, **FP** = Federal Proposed, **FC** = Federal Candidate, **USFS : S** = U.S. Forest Service - Sensitive, **USFS : MIS** = U.S. Forest Service – Management Indicator Species, **SE** = State Endangered, **ST** = State Threatened, **DFW : FP** = State Fully Protected, **DFW : SSC** = State species of Special Concern, **USFWS : BCC** = U. S. Fish and Wildlife Service Birds of Conservation Concern, **SOI** = Species of Interest.
****Determinations: T, E & P Species: WNA** = Will Not Affect, **MANLAA** = May Affect but Is Not Likely to Adversely Affect Individuals or their designated critical habitat, **MAILAA** = May Affect and Is Likely to Adversely Affect Individuals or their designated critical habitat. **FS Sensitive Species: WNA** = Will Not Affect, **MAI** = May Affect Individuals, but is not likely to result in a trend toward Federal listing or loss of viability, **MAILRTFL** = May Affect Individuals, and is Likely to Result in a Trend toward Federal Listing or loss of viability.

These project level effects determinations are consistent with the determinations reached in the SNFPA 2004 ROD by meeting the following three conditions:

1. The project is designed in accordance with all Forest Plan design criteria as analyzed in the SNFPA FSEIS 2004 ROD;
2. The spatial location and timing of this project, when considered cumulatively with all other projects affecting TES species and TES habitat in the area, have been displayed and analyzed, and analysis results indicate a determination consistent with that reached in the SNFPA FSEIS 2004 ROD;
3. Available new information that was not available in the SNFPA FSEIS 2004 ROD has been included in this project level analysis and this new information leads to the same conclusion as that within the SNFPA FSEIS 2004 ROD.

Shrubland (West-Slope Chaparral) Habitat (Fox Sparrow)

Habitat/Species Relationship.

The fox sparrow was selected as the MIS for shrubland (chaparral) habitat of the Sierra Nevada, comprised of montane chaparral (MCP) and mixed chaparral (MCH) as defined by the California Wildlife Habitat Relationships System (CWHR) (CDFG 2005). Recent empirical data from the Sierra Nevada indicate that, in the Sierra Nevada, the fox sparrow is dependent on open shrub-dominated habitats for breeding. The empirical data include six years of point count vegetation data and analysis from the Lassen National Forest (Burnett and Humple 2003, Burnett et al 2005) and analysis of the 2002-2006 data from the Plumas-Lassen Study (Sierra Nevada Research Center 2007).

Project-level Effects Analysis - Shrubland (Montane Chaparral) Habitat

Habitat factor(s) for the analysis:

- Acres of shrubland (chaparral) habitat [CWHR montane chaparral (MCP) and mixed chaparral (MCH)]
- Acres with changes in shrub ground cover class
- Acres with changes in CWHR shrub size class

Current Condition of the Habitat Factor(s) in the Analysis Area

The analysis area supported 15,310 acres combined of montane chaparral (MCP) and mixed chaparral (MCH) prior to the Walker Fire, making up approximately 26 percent of the vegetative component within the analysis area. Much of the analysis area burned in the Stream Fire in 2001, the Wheeler Fire in 2007 and the Moonlight Fire in 2007. These fires burned at high severity and converted forest land into shrub land, which was a great

benefit for Fox Sparrow. The Walker Fire burned 27,392 acres of forest habitat at greater than 50 percent vegetation burn severity. Much of this will grow into shrubland habitat without intensive forest management. The pre-Walker Fire shrubland also burned at high severity, with 10,569 acres burned at high severity. The high severity burned habitat will mostly return to suitable fox sparrow habitat in the short term (2-5 years). However, approximately 1,200 acres of the Wheeler Fire plantations were replanted in the spring of 2020, and these acres may become forest lands in the future rather than shrublands. Post-Walker Fire, there are currently 4,741 acres of shrubland that burned at moderate to low fire severity and are still providing suitable nesting habitat for fox sparrows.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects to Habitat

Under proposed action, no acres of shrub dominated land are proposed for salvage logging. Salvage logging would occur on 3,742 acres of forest land. Much of this would likely be replanted in the future and would not be recruited into shrubland habitat.

There would be no change in the amount and distribution of shrubland post project from salvage logging.

Alternative 1 (Proposed Action Alternative) Cumulative Effects to Habitat in the Analysis Area.

Past, present, and reasonably foreseeable future actions affecting the habitat in the analysis area have been identified in the Walker Fire Recovery Project BE.

Fox sparrow are known to use open shrubland for nesting and ground foraging, but there would be short- term negative effects to fox sparrow nesting habitat caused by the Walker Fire on 69 percent of the suitable habitat in the analysis area. Burned shrub habitat grows back quickly due to stored underground resources in the roots and would return to suitable nesting habitat within 2-5 years, so the Walker Fire effects would not have long-term negative effects. Quite the contrary, the Walker Fire is likely to recruit much of the 27,392 acres of high severity forest land habitat into shrubland habitat within 3-10 years as seeds in the soil sprout into small shrub seedlings and they quickly grown into suitable fox sparrow habitat. The 4,838 acres of proposed salvage logging would likely grow sufficient shrub habitat to support fox sparrows, even if planted with conifers, for the short-mid-term (3-20 years). Approximately 1,200 acres of the Wheeler Fire plantations were replanted in the spring of 2020 after the Walker Fire, and these acres may become forest lands in the long-term rather than shrublands. These 1200 acres are likely to support fox sparrows for the short to mid-term (3-20 years) until the conifer forest shades out shrubs on this landscape.

Alternative 1 (Proposed Action Alternative) Cumulative Effects Summary

Habitat effects caused by the Walker Fire combined with proposed actions on FS lands would result in a very large increase in chaparral habitat within the Walker Fire Restoration Project area. Therefore, there would be no negative cumulative effects to shrubland habitat or fox sparrow.

Summary of Fox Sparrow Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the fox sparrow; hence, the shrubland effects analysis for the Walker Fire Restoration Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the fox sparrow. This information is drawn from the detailed information on habitat and population trends in the 2010 Sierra Nevada Forests Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Habitat Status and Trend

There are currently 1,009,681 acres of west-slope chaparral shrubland habitat on National Forest System lands in the Sierra Nevada. Over the last two decades, the trend is slightly increasing (changing from 8 percent to 9 percent of the acres on National Forest System lands).

Population Status and Trend

Monitoring of the fox sparrow across the ten National Forests in the Sierra Nevada has been conducted since 2009 in partnership with PRBO Conservation Science, as part of a monitoring effort that also includes mountain quail, hairy woodpecker, and yellow warbler (USDA 2010a, http://data.prbo.org/partners/usfs/snmis/). Fox sparrows were detected on 36.9 percent of 1,659 point counts in 2009 and 44.3 percent of 2,266 point counts in 2010, with detections on all 10 national forests in both years. The average abundance (number of individuals recorded on passive point count surveys) was 0.563 in 2009 and 0.701 in 2010. These data indicate that fox sparrows continue to be distributed across the 10 Sierra Nevada National Forests. In addition, the fox sparrows continue to be monitored and surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA 2008). Current data at the range wide, California, and Sierra Nevada scales indicate that, although there may be localized declines in the population trend, the distribution of fox sparrow populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Fox Sparrow Trend

Under the proposed actions for the Walker Fire Restoration Project, the amount and distribution of MCP shrubland currently existing within the analysis area would change very little over time; there would be no net reduction and little ephemeral increase in the amount of MCP in the Franks Valley analysis area. Therefore the direct, indirect, and cumulative effects to shrubland habitat in the Walker Fire Restoration Project analysis area would not alter the existing trend in the habitat, nor would it lead to a change in the distribution of fox sparrows across the Sierra Nevada bioregion.

Snags in Burned Forest Ecosystem Component (Black-backed woodpecker)

Habitat/Species Relationship.

The black-backed woodpecker was selected as the MIS for the ecosystem component of snags in burned forests. Recent data indicate that black-backed woodpeckers are dependent on snags created by stand-replacing fires (Hutto 1995, Kotliar et al. 2002, Smucker et al. 2005, Tingley et al. 2016, Campos et al. 2020). The abundant snags associated with severely burned forests provide both prey (by providing food for the specialized beetle larvae that serve as prey) and nesting sites (Hutto and Gallo 2006).

Project-level Effects Analysis – Snags in Burned Forest Ecosystem Component

Habitat factor(s) for the analysis:

- Modeled quantity of black-backed woodpecker habitat in the analysis area (Campos et al. 2020).
- Modeled density of black-backed woodpeckers in the analysis area (Tingley et al. 2016).
- Current Condition of the Habitat Factor(s) in the Project Area.

The Walker Fire analysis area was used in two different modeling efforts. Authors of two significant black-backed woodpecker papers (Tingley, Campos and Burnett) were recruited to analyze the Walker Fire analysis area.

Table 39. Results of modeling using Campos et al (2020) modeling for black-backed woodpeckers. This model incorporates density and size of trees (mid-sized nest-tree diameters important), high-severity fire at local scale, lower burn severity at the 1-km scale, elevation as important model variables.

Black-backed Woodpecker Habitat Quality	Acres in Analysis Area Post-Walker Fire	Acres in Units	% of Analysis within Units
High	2,923	303	10%
Moderate	6,762	751	11%
Low	48,977	2,681	5%

Unclassified	123	7	6%
Total	58,787	3,742	6%

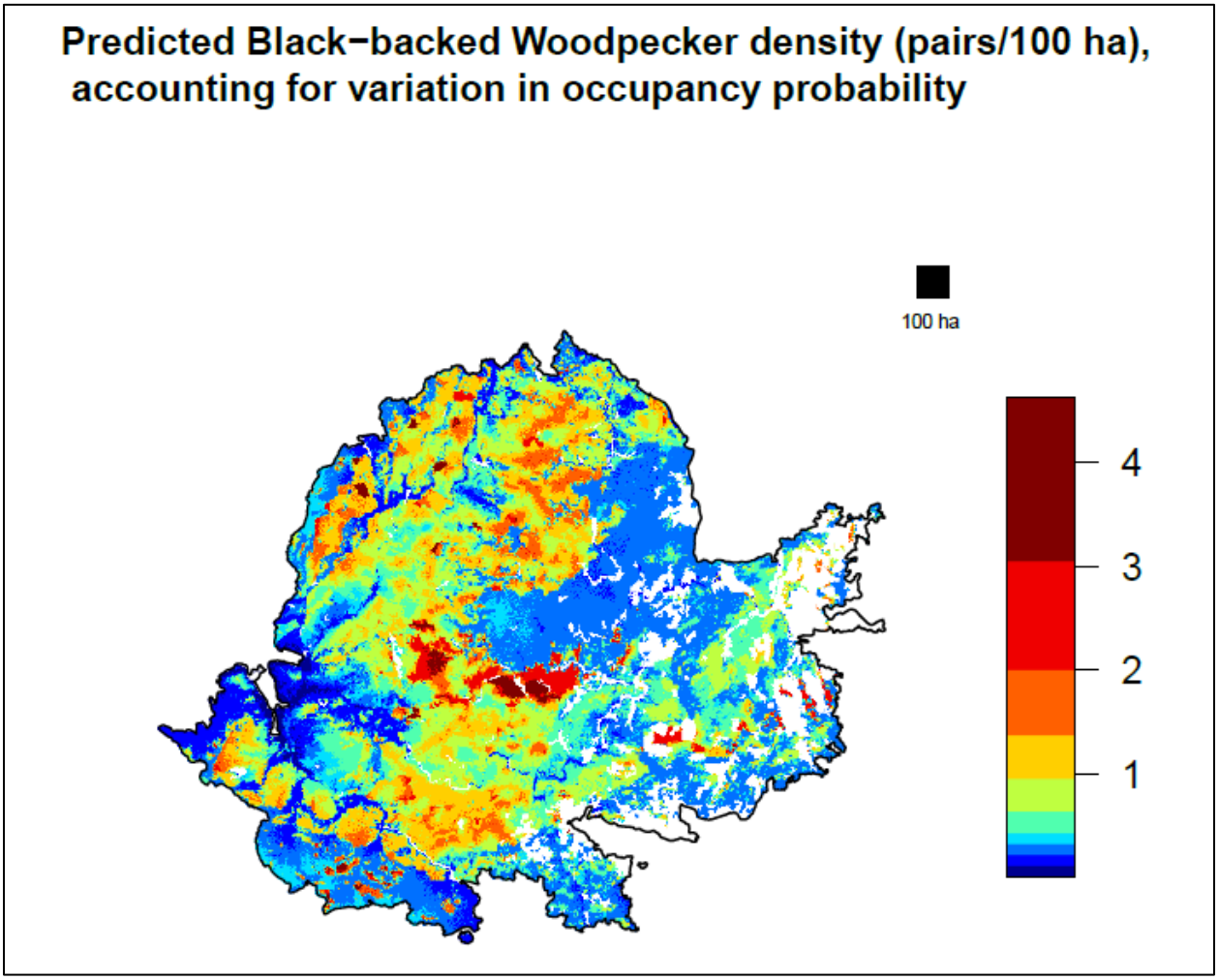

Figure 24. Tingley model estimated black-backed woodpecker density in the Walker Fire analysis area.

Using this method, the entire Walker fire is expected to hold 140 Black-backed Woodpecker pairs based off the Tingley model. Because the model has uncertainty, the 95 percent probability estimate is that the entire fire will hold between 106 and 219 pairs of Black-backed woodpeckers.

Alternative 1 (Proposed Action Alternative) Direct and Indirect Effects to Habitat.

The Walker Recovery Project would remove 10 percent (303 acres) of the highest quality black-backed woodpecker habitat and 11 percent (751 acres) of moderate quality woodpecker habitat, equating to 11 percent reduction of both high and moderate quality woodpecker habitat (1,054 of 9,688 acres removed, Table 39). Removing 11 percent of high and moderate quality black-backed woodpecker habitat, when using the estimate of 140 pairs of black-backed woodpeckers in the Walker Fire using the Tingley model, would remove habitat for approximately 15 pairs of black-backed woodpeckers from the Walker Recovery area landscape. No nest surveys are being conducted on this landscape, so there are potential direct negative effects to nesting black-backed woodpeckers. Nestlings in snags would be directly killed when nest trees are cut and harvested in salvage units. Much of the proposed harvest would occur after July 31, 2020 and before May 2021, when the majority of nestlings have fledged from nest trees. Any salvage that occurs between May 1 and July 31, 2021 would likely have direct mortality resulting from harvest as the 2021 nesting season is initiated.

When forests burn at high severity, most trees are killed in a single pulse and subsequent decay rates and black-

backed woodpecker occupancy rates are limited in duration to a shorter time period (White et al. 2017). When forests burn at lower fire severity, mortality rates are extended and trees die over many years, this allows black-backed woodpecker populations to subsist at these sites for a decade (Saracco et al. 2011, White et al. 2017). Campos et al. (2020) found that black-backed woodpeckers utilize dense burned forest habitat most commonly when in juxtaposition to areas with green forest habitats or areas that burned at lower fire severity. Large expanses of high severity fire were used less.

Using modeling from Campos et al. (2020), initial planning efforts in the Walker Fire excluded large areas of the analysis area to protect some of the highest quality black-backed woodpecker habitat available. Specifically, most of the southern portion of the Walker Fire area, where there is high quality habitat, was almost completely excluded from proposed harvest. These areas will provide long-term high-quality habitat as the mixed severity fire in this area will continue to provide a long-term supply of snags useful for black-backed woodpecker populations (see Saracco et al. 2011, White et al. 2017). Approximately 89 percent of the best habitat for black-backed woodpecker would not be salvage logged (8,631 of 9,685 acres retained, Table 39). Recent evidence from adjacent Forest Service lands suggested fledgling black-backed woodpeckers select habitat with more live trees than adults and used more heterogeneous habitats including unburned forest and forest burned at lower severity (Stillman et al 2019). Proposed activities would not likely impact current and future black-backed woodpecker fledgling habitat as live trees will not be removed during proposed activities and salvage efforts are focused in areas burned at moderate and high severity.

Alternative 1 (Proposed Action Alternative) Cumulative Effects to Habitat in the Analysis Area.

The Walker Fire created 9,685 acres of new high-quality (2,923 acres) and moderate-quality habitat (6,762 acres). The Walker Recovery Project would remove 11 percent (1,054 acres) of this newly created habitat. Therefore, the project area would have an overall increase of 89 percent of habitat from Pre-Walker Fire conditions.

Alternative 1 (Proposed Action Alternative) Cumulative Effects Conclusion

Salvage logging treatments would reduce the amount of high severity burned forest in the project area. However, 89 percent of the high and moderate quality habitat within the analysis area would remain after this project.

It is anticipated that implementation of proposed actions, in combination with present and reasonably foreseeable future actions, would result in some cumulative effect to the habitat within the analysis area, but would not affect population and habitat distribution across the Plumas National Forest.

Summary of Black-backed Woodpecker Status and Trend at the Bioregional Scale

The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the black-backed woodpecker; hence, the snags effects analysis for the Walker Fire Recovery Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the black-backed woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend

Current average number of medium-sized and large-sized snags (> 15" DBH, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these forest types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (-0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

These data include snags in both green forest and burned forest. Between 2000 and 2007, 211,000 acres underwent severe burn and 176,000 acres underwent moderate burn in the Sierra Nevada.

Population Status and Trend

Monitoring of the black-backed woodpecker across the 10 National Forests in the Sierra Nevada has been conducted since 2008 in partnership with the Institute for Bird Populations (IBP) (USDA Forest Service 2010a, http://www.birdpop.org/Sierra/bbwo.htm). In 2008, black-backed woodpeckers were detected at 68 survey stations distributed across 10 of the 19 fire areas surveyed. In 2009, black-backed woodpeckers were detected at 169 survey station distributed across 28 of the 51 fire areas surveyed. In both years, occupied sites were well distributed across the Sierra Nevada national forests, included burned areas of a variety of sizes, and included areas 1 to 10 years post-fire. These data indicate that black-backed woodpeckers continue to be distributed across the 10 Sierra Nevada National Forests. Additionally, mean occupancy probability for stations surveyed during 2009 was 0.253 (95 percent credible interval: 0.222 – 0.289); applying this probability across the 10 national forests yields an estimate that approximately 81,814 ha (25.3 percent) (range of 71,921 – 93,610 ha) the 323,358 ha of burned forest (burned between 1999 and 2008) on the ten national forest units within monitoring area was occupied by Black-backed Woodpeckers in 2009. In addition, the black-backed woodpeckers continue to be surveyed in the Sierra Nevada at various sample locations by avian point count, spot mapping, mist-net, and breeding bird survey protocols. These are summarized in the 2008 Bioregional Monitoring Report (USDA Forest Service 2008). Current data at the rangewide, California, and Sierra Nevada scales indicate that the distribution of black-backed woodpecker populations in the Sierra Nevada is stable.

Relationship of Project-Level Habitat Impacts to Bioregional-Scale Black-Backed Woodpecker Trend

The Walker Recovery Project would remove 11 percent of the newly created high-quality and moderate-quality black-backed woodpecker habitat on the landscape. However, 89 percent of the newly created habitat would be retained in the analysis area. The Walker Recovery Project would not lead to a change in the distribution of black-backed woodpecker across the Sierra Nevada bioregion.

Soil Productivity

Introduction

This section discusses soil productivity in regards to soil porosity, soil cover, and organic matter comparing the existing condition to the two alternatives and disclosing direct, indirect, and cumulative effects.

The Plumas National Forest LRMP standards and guidelines provide the relevant substantive standards to comply with the National Forest Management Act. The 1988 LRMP (USDA 1988) establishes standards and guidelines to prevent significant or permanent impairment of soil productivity. The Sierra Nevada Forest Plan Amendment ROD (USDA 2004b) amends the Plumas National Forest LRMP and includes a standard and guideline for large down wood.

Effects Analysis Methodologies

Geographic Analysis Area

For the soil resource assessment, the analysis area is bounded by the treatment units where ground disturbing activities are proposed. Proposed treatment units were surveyed by conducting linear transects that roughly traversed the slope. Soil type and texture were analyzed at each site along with pertinent soil cover characteristics. Meadows, streams, springs and unstable slopes were mapped for avoidance.

Duration of Impacts

Short-term time frame: 1-2 years. Project-induced impacts to effective soil cover and compaction could lead to accelerated erosion during the first substantial runoff season.

Long-term and cumulative effects time frame: 10-30 years. If impacts to soil cover and compaction continually persist from one season to the next, this time frame is expected to yield degraded soil conditions exacerbated by accelerated erosion. It is expected that cumulative effects to the soil resource would be fully recovered within this time frame.

Existing Soil Conditions

The majority of the proposed Walker Fire Recovery Project treatment units do not meet the standard for fine organic matter or large woody debris. Both of these soil attributes were all but completely consumed by the fire. Some post-fire needle cast has improved soil cover where canopy conditions are favorable. Soil texture across the project area is primarily classified as sandy loam. Texture, rock content, and slope are some of the major factors that determine erosion hazard rating (EHR), refer to Figure 25 for a spatial display of EHR. None of the surveyed units exceed the soil compaction threshold of 15 percent.

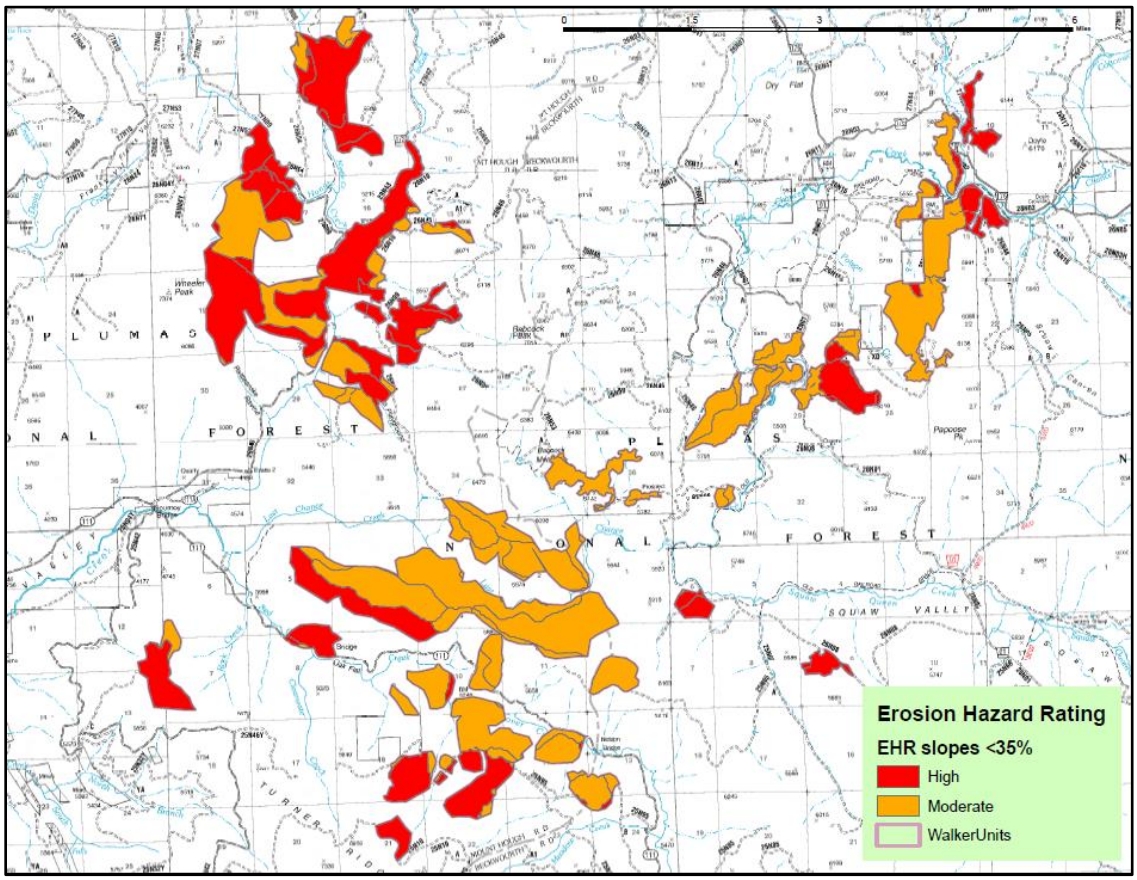

Figure 25. Salvage unit Erosion Hazard Rating map

Alternative 1 (Proposed Action) Direct and Indirect Effects

Soil cover, soil porosity and soil organic matter are used as indicators for discussing the potential effects of Alternative 1 on soil productivity. Direct and indirect effects are determined largely based on literature, monitoring results, existing conditions and professional observations. The following summarizes the effects of the Walker Fire Recovery Project on the three soil productivity indicators.

For the soil resource assessment, the analysis area is bounded by the project activity areas (treatment unit based assessment), where the potential ground disturbing activities are proposed.

Soil Porosity

The extent of detrimental soil compaction should not be of a size or pattern that would result in a significant change in production potential for the activity area and should not result in common occurrences of overland flow

and erosion within treated units (indicating that the infiltration and permeability capacity of the soil has been exceeded for the local climate). The compaction threshold for Plumas National Forest timber lands is 15 percent. The soils in the Walker Fire are not particularly susceptible to detrimental compaction and detrimental compaction is not anticipated.

It is expected that soil compaction would increase (decreased porosity) in areas such as temporary roads, skid trails, and landings where mechanical equipment is concentrated. The dominant soil found in Walker is derived from decomposed granite; a well-drained sandy soil. Studies have shown that productivity on sites with sandy soil textural classes was actually enhanced more than 40 percent by compaction (Powers et al. 2005). This is due in part to improved water holding capacity. Sub-soiling, where feasible, will be evaluated on a case by case basis to alleviate some of detrimental compaction caused by salvage operations. Wet weather soil restrictions shall be enforced for all mechanical equipment operations to reduce the occurrence of detrimental soil compaction and displacement.

Soil Cover

Soil cover standards vary by erosion hazard rating (EHR). Minimum effective groundcover for moderate EHR is 50 percent and high EHR requires 60 percent. Very High EHR should be assumed for all slopes greater than 35 percent that are treated under this project, a minimum of 70 percent cover is necessary on these locations. Rock greater than ¾ of an inch, live vegetation, and organic matter all contribute to soil cover. Most salvage operations cause tree and branch breakage. This logging slash combined with some vegetative recovery usually results in meeting these standards. There will be extra acres of ground cover included in the contract for particularly sensitive areas near streams.

Organic Matter

Large down woody debris retention is recommended at a rate of 10-15 tons per acre with a preference for large wood greater than 12 inches diameter and 10 feet long. For context, a recently fallen 30 inch diameter tree may weigh upwards of 3 tons. Fine organic matter (less than 3 inch diameter material) compliments large woody debris and together they promote site productivity.

In units that are currently devoid of organic matter, salvage logging activities are expected to immediately increase organic matter accumulations. The removal of merchantable logs from the site would result in reduced long term accrual of organic matter. Watershed staff will coordinate with sale administrators to ensure that sufficient organic matter is maintained in salvage units.

Alterative 2 (No Action Alternative) Direct and Indirect Effects

Under the No Action alternative there would be no ground based harvest, temporary road construction, mechanical site preparation, or tree planting within the Walker Fire Recovery Project area. Early seral forest vegetation would continue to re-establish itself. Alternative 2 would have no direct effects on soil porosity, soil cover, or soil organic matter. Under this alternative, routine land stewardship, including fire suppression, road maintenance, or other administrative activities that address threats to life and property, would continue.

Dead trees would continue to add soil cover in the form of branches, limbs, bark, and eventually large boles. Therefore, under the No Action Alternative, it is expected that the soil cover standard would be met within 1 to 2 years and the organic matter standard would be met within approximately 5 years.

Alternative 1 (Proposed Action) Cumulative Effects

The cumulative effects assessment area for the soil resource is bounded in space within the proposed activity areas, where a potential for soil disturbing activities take place. The analysis is further bounded in time by the foreseeable future period during which effects of this project could persist as detectable effects and may be short- term or long-term in nature.

Past effects due to forest management and the 2019 Walker Fire have been considered and discussed in the direct and indirect effects analysis. In summary, wildfire and forest management have impacted soil cover and organic matter, which currently do not meet soil quality standards on most of the activity area. Management requirements,

discussed in the effects analysis, have been developed to add soil cover to skid trails when EHRs are high off of skid trails. Wildlife management requirements would maintain sufficient standing and down woody material to provide long term organic matter. Another management requirement requires reusing existing skid trails. These management requirements would minimize the cumulative effects of the present project, past activities, and wildfire to soil porosity, soil cover, and organic matter.

Reasonably foreseeable future actions include the "2020 PNF Road and Trail Maintenance Project," which is currently being planned. Actions will be limited in scope to buffers along roads in the fire where commercial timber harvest is not occurring. Actions will likely include hand falling of fire killed trees, mastication, hand or grapple piling. Management requirements to maintain soil function plus the small spatial area of impacts will reduce cumulative effects to minimal. Additionally the PNF is planning on reforestation efforts in the fire. Prepping areas for planting can be a concern for soil cover, particularly if done with dozers. Management requirements will ensure that soil cover is maintained and so, cumulative effects are not anticipated.

In the event of a future wildfire, large woody fuels, present during the next 10 to 15 years could burn and intense soil heating could occur beneath them. The proposed alternative would decrease large woody material over the long term and would decrease the potential for this to occur.

Alternative 2 (No Action Alternative) Cumulative Effects

The cumulative effects assessment area for the soil resource is the same as described for Alternative 1. The No Action Alternative would generally improve soil conditions from adverse impacts caused by past wildfire and forest management. Large woody material and soil cover would be abundant, and no additional decreases to soil porosity would occur.

Potential impacts to soil productivity due to future wildfire have been described above. In the event of a wildfire, the No Action Alternative would have a slightly greater potential to impact soil productivity because more large woody fuel would be on the ground, and larger diameter woody material would persist longer compared to the Proposed Action.

Conclusion

Soil productivity has been affected by the Walker Fire, salvage logging and associated actions will provide some improvements and some further degradation depending on the particular indicator. Adaptive management, including good coordination with Sale Administrators during implementation to ensure mitigation measures are in place will adequately protect the soil resource.

Hydrology and Water Quality

Introduction

Forest management activities have the potential to affect water resources by causing soil disturbance, altering vegetative cover, and changing local drainage patterns. The primary concern to water quality is the possible impairment of beneficial uses (i.e., municipal and domestic water supply, hydroelectric power generation, recreation, cold freshwater fisheries habitat, and wildlife habitat) due to an increase in fine sediment caused by accelerated erosion from the proposed activities. The potential effects of the proposed management activities are closely related to the vegetation management and fuel reduction techniques used during implementation; however, applying the Forest Plan Standards and Guidelines, effective Best Management Practices (BMPs) (Table 3), management requirements for RCAs (BMP 1.8), and general water and soil directed management requirements (Table 3) would reduce the extent of effects to water resources.

BMPs have been selected using specific information regarding soil, slope, geology, and climate conditions typically found in the Walker Fire Recovery Project area. Most of the BMPs have been integrated into project design or included as a management requirement. Effectiveness of BMPs in mitigating direct and indirect effects is largely related to proper implementation and the magnitude of climatic events during the first several seasons after project completion. There is a risk that heavy precipitation or rain on accumulations of snow could overwhelm erosion control structures and render them ineffective. Increased sediment delivery to channels would only occur during rare events and for short periods of time.

Background

Watershed resources include riparian and aquatic habitats and water quality. Riparian and aquatic habitats within the project area include springs/seeps, perennial streams, intermittent and ephemeral streams.

The project area is primarily located on land that drains to Indian Creek and then on to the East Branch North Fork Feather River. The primary perennial streams in the project area include Indian Creek, Red Clover Creek, and Last Chance Creek.

The Walker Fire overlapped burn scars from recent significant fires. The Moonlight and Antelope Complex Fires that occurred in 2007 and the subsequent salvage harvest activities are considered an impact that may still be playing a role in the hydrology and watershed health of the area.

State designated beneficial uses within the Feather River, include municipal and domestic water supplies, irrigation and stock watering, hydroelectric power generation, contact and non-contact recreation, canoeing and rafting, warm and cold freshwater fisheries habitat migration and spawning, and wildlife habitat (CRWQCB 2011).

The project is located within nine 14-digit hydrologic units (HU), which range in size from nearly 4,000 to over 9,000 acres. These 9 14-digit HUs are nested within larger HUs. Watershed condition has been assessed at the 14-digit HU for this project.

Riparian Conservation Areas

According to Plumas National Forest corporate data, there are approximately 591 miles of stream channels within the project/fire perimeter area. These channels are accompanied by 22,636 acres of Riparian Conservation Areas (RCAs). RCAs range in width from 300 feet on each side of perennial channel to 150 feet on intermittent and ephemerals, and meadows.

As of the writing of the draft EA, there were 1,968 acres of RCA that overlapped with treatment units as of the writing of this document, but after further refinement and field work, that number is now 395 acres

Condition of the Post-Fire Watershed

The Walker Fire altered the condition of the watersheds in the project area. The Burned Area Emergency Response (BAER) assessment determined that around 27 percent of the burned area was at a moderate and 16 percent high. The rest was low or unburned (USDA Forest Service 2019). The primary change in condition due to the fire is the amount of soil cover from organic duff, which in turn changes the risk of erosion.

In areas of high soil burn severity, most of the duff layer was consumed. Also, most of the leaves and needles in standing vegetation were consumed. This left very little organic material available to cover the soil and protect the soil from erosion from rainfall impact and water flowing on the surface. Therefore, the post-fire risk of erosion increased in high soil burn severity areas. Areas within moderate soil burn severity also have little to no duff remaining. However, most of the needles and leaves were burned, but not completely consumed. This material, referred to as ‘needle cast’ has been falling out of the standing dead trees since the fire and has provided good cover for the soil surface. This needle cast has moderated the increase in post-fire erosion risk.

Outside of the high and moderate soil burn severity areas, the post-fire condition is little changed from pre-fire. Some of the organic duff was consumed and some standing live trees were burned. However, exposure of bare soil in these areas due to the fire was limited in size and scattered throughout the burn. The risk of increased soil erosion and sedimentation in the low and unburned areas of the fire is low.

Many miles of roads and trails were maintained through the BAER and Suppression Repair activities in order to provide adequate drainage, prevent erosion and prevent damage to this infrastructure. An additional benefit of these treatments was the reduction of impacts to water quality.

As of the date of the draft EA, the 2020 water year, which began October 1, 2019, has been relatively cold and dry. Monitoring of the burn area showed that little significant hillslope erosion occurred. Evidence of erosion was limited to areas where surface flows were concentrated, such as in small swales or headwater drainages and at outlets of road drainage features. Also, water has been flowing mostly clear. That just changed as of the writing of the final EA in July. The burn area was impacted by two convective storms that caused severe erosion along

Indian Creek. No debris flows were found, but sediment was delivered to the creek and plugged drainages along the main access road. A plan to address this situation is being developed.

Effects Analysis Methodologies

Environmental effects are assessed with the management requirements effectively applied to the proposed action (Table 3). Management requirements are prescriptive measures that are designed to prevent adverse effects upon the soil resource, rather than traditional mitigation which aims to resolve the problem once it has occurred. Management requirements incorporated into the proposed action are designed to reduce the risk of accelerated erosion and sedimentation adversely impacting aquatic and riparian habitats due to the proposed action activities.

Methodology for Calculating Cumulative Watershed Effects

The Pacific Southwest Region (R-5) of the Forest Service has developed a standardized cumulative watershed effects (CWE) analysis (FSH 2509.22) that serves as a surrogate method for determining the risk of delivering excess sediment to streams. This cumulative watershed effects analysis compares (a) the existing level of land disturbance across all ownerships within a watershed with (b) an estimate of the upper limit of watershed tolerance to disturbance, referred to as the Threshold of Concern (TOC). The level of land disturbance is measured using Equivalent Roaded Acres (ERAs), whereby all disturbances are equated to an acre of road. The cumulative watershed effects analysis then recovers these disturbances over some period of time following a specified recovery curve. Using this analysis, the calculated ERA of a watershed is compared to the TOC to provide an assessment of the potential for cumulative watershed effects. The TOC is not an exact point at which effects will occur. It is an indicator that a watershed is more susceptible to impacts. As ERA approaches or exceeds the TOC, additional measures are employed to protect and monitor watershed conditions.

The Plumas National Forest has developed a standard method for determining watershed TOC values during the Quincy Library Group planning process. Each watershed is assessed for its ability to withstand erosional processes and handle sediment delivery to stream channels. Examples given in the R5 Soil and Water Conservation Handbook estimate the TOC for watersheds of moderate sensitivity to be 15 to 16 percent. For this project, the TOC is conservatively estimated to be 14 percent of the watershed area.

ERA coefficients and recovery rates have been developed based on soil monitoring results, literature reviews, and consultation with other hydrologists. Coefficients and recovery rates assigned to the project are shown in Table 40.

Table 40. ERA coefficients and recovery rates

Landscape impact	ERA coefficient	Recovery Rate
High Soil Burn Severity	0.3	25 years
Moderate Soil Burn Severity	0.10	25 years
Aerial Salvage Harvest	0.20	25 years
Roadside Mastication and Hand Treatment.	0.1	25 years
Ground-Based Salvage Harvest	0.3	25 years

The TOC does not represent the exact point at which cumulative watershed effects will occur. Rather, an ERA/TOC approaching or greater than one serves as a “yellow flag” indicator of increasing susceptibility for significant adverse cumulative effects occurring within a watershed. Susceptibility of CWE generally increases from low to high as the level of land disturbing activities increase towards or past the TOC.

Geographic Analysis Area

For this watershed resource assessment, the spatial analysis is bounded by the 14 digit HU drainages that have the potential to be impacted directly or indirectly (as well as cumulatively as discussed later in this chapter) by the proposed activity.

Duration of Impacts

The first 3-4 years after the fire and salvage logging are considered the period of elevated risk of detrimental effects. The first winter has seen as particularly crucial. As stated above, the winter was relatively dry after the Walker Fire, but detrimental effects from the fire are now happening due to an active summer thunderstorm cycle.

Assumptions

There are assumptions built into the CWE model as stated above, the exact spatial area of impact and local terrain interact in a range of possible outcomes. All these methodologies are generalizations to some extent.

Alternative 1 (Proposed Action) Direct and Indirect Effect

Mechanical Salvage Harvest with Ground based equipment, Including the Removal of Roadside Hazard Trees

Erosion, sediment and water quality. Mechanical harvest involves the use of mechanical, ground-based equipment.

Mechanical harvest with ground-based equipment would be conducted on slopes generally less than 35 percent with chainsaws and/or mechanical harvesters. The potential direct effects of mechanical, ground-based equipment on soils include a reduction in soil cover; an increase in compaction due to the building of new and the reopening of existing, temporary roads, skid trails, and landings; soil displacement during skidding operations; and a loss of nutrients and organic material through removal of small material, such as tree tops and limbs. The potential direct effects of the harvest on hydrology and water quality would depend on how much ground is detrimentally compacted, how much cover is removed, steepness of the treated slopes, and the proximity to stream channels.

The project primarily plans to use a conventional logging system, one where the trees are felled, limbed and bucked in place with chainsaws and then skidded to the landing. This system would result in the reduction of ground cover on the skid trails and landings. However, limbs and other slash could be moved or lopped and scattered in place, therefore increasing cover on the units outside the skid trails and landings. Also, as stated in the management requirements, additional cover would be added to the skid trails in areas where the overall cover is less than desired. Compaction would be reduced by placing skid trails a minimum of 75 feet apart, operating when soils are dry, and subsoiling after operations are complete.

There should be minimal alteration of drainage patterns, because runoff would be dispersed by implementation of effective erosion control structures on roads, skid trails, and landings. The harvest operation as proposed should have little direct effects on soil productivity, water quality and/or quantity or flow regime (Litschert and MacDonald 2009).

The potential indirect effects of the harvest operation include increased risk of erosion due to isolated removal of soil cover and increased compaction resulting in greater overland flow caused by reduction in infiltration and soil water storage. The ground-based harvest operation has the potential to indirectly affect hydrology and water quality by increasing water yields, peak flows, and the timing of runoff by compacting forest soil and decreasing transpiration. The amount of cover removed should not increase the risk of erosion. Maintaining slash on skid trails and implementing effective erosion control structures would reduce erosion from compacted skid trails. The harvest operation as proposed should result in a minimal increase in the risk of erosion. The hydrologic effects in areas treated with the primary prescription are expected to be minimal. The effects of compaction on water yield should be minimal with implementation of project design features, best management practices, standard management requirements, and Forest Plan standards and guidelines. Grass, shrubs, and herbaceous ground cover would quickly establish or reoccupy harvested areas. Remaining canopy cover and expected revegetation would aid in reestablishing infiltration rates. Roots of residual and newly established vegetation would hold soil masses together and provide for erosion control.

Up to 11 miles of temporary roads are included in the proposed action. The direct and indirect effects of constructing new, temporary roads (2.8 miles) would be the removal of the topsoil layer and compaction of the road surface. This could increase and redistribute surface drainage and has the potential to increase erosion and sediment delivery to streams downhill of the road. New road cuts have the potential to affect hydrologic function by disrupting and increasing surface drainage by interrupting the shallow subsurface water flow. The temporary

roads and some other nearby non-system roads would be closed and rehabilitated following completion of harvest activities. This would include subsoiling to minimize compaction where appropriate, reshaping to facilitate drainage, distributing ground cover, and closure to eliminate further use. These rehabilitation treatments of the temporary roads would minimize the impact and facilitate revegetation of the road surface.

Near stream soil disturbance. Riparian Conservation Areas (RCAs) have been established on all streams within the project area to protect the aquatic and riparian ecosystems (Table 3). The following RCA widths would be established for the project area: perennial streams – 300 feet, seasonal streams, including intermittent and ephemeral streams – 150 feet, and Special Aquatic Features such as springs/seeps and ponds – 300 feet. Within the RCA, an equipment exclusion zone would be established where harvest would generally not occur except after direct coordination with a riparian resource specialist.

The outer areas of the RCAs under 35 percent slope are being treated if they fall in units, however, following the management requirements listed above would limit operations on a significant portion of these acres. No ground-based equipment would travel in the equipment exclusion zone. This would reduce aerial harvest in the RCAs. Detrimental impacts to RCAs should be reduced with these precautions and balance the need to remove the fire killed trees, see the RCA analysis below.

Repairing Existing Roads to Implement Project Activities

Erosion, sediment and water quality. Project activities would require approximately 76 miles of road maintenance and repair. Some of this work will be directly related to minimizing risk of degradation of waters of the state as required by the Central Valley Water Quality Control Board through compliance with the Basin Plan and permit process. Types of repairs include roadside brushing, reconditioning and installation of drainage structures such as dips, water bars, and roadside ditches, culvert cleaning and replacement, surface grading, hazard tree felling, and potential spot rocking. It is well documented that road related erosion is a primary source of accelerated erosion in forests throughout the western United States (Kattleman 1996). Road erosion rates are typically much greater than hillslope erosion rates and are highly variable, dependent on factors such as percent hillslope, location on slope, parent material, and years since construction or maintenance (Reid and Dunne 1984).

The proposed repairs would both increase and reduce sources of erosion and sediment delivered to the stream system. Grading road surfaces and clearing ditches loosens and exposes bare ground, temporarily increasing sediment erosion (Coe 2006). Opening and using previously closed roads would also increase erosion during project activities (Reid and Dunne 1984). However, unmaintained roads can also be a major erosion problem. Drainage features such as cross drains or culverts on unmaintained roads often plug with debris and fail. This can lead to concentration of flow on the road surface, causing significant erosion of the road prism and damage to the infrastructure. These erosion features are often permanent and chronic sources of erosion. Repair of this damage is more difficult and costly than periodic maintenance.

Near stream soil disturbance. These road repair activities would have little direct or indirect effects on riparian and aquatic resources when management requirements, RCA Guidelines, and BMPs are implemented. The resulting repair work of identified roads would have direct and indirect benefits to the stream system by reducing erosion and sediment sources coming from the road system, reducing the hydrological connectivity of the existing road system, and improving the road effects on downstream beneficial uses.

Alterative 2 (No Action Alternative) Direct and Indirect Effects

Under Alternative 2, existing conditions for erosion, sediment and water quality in the 9 HU14 drainages would continue to proceed through natural processes. Natural processes include: hill slope erosion and stream channel sedimentation, recruitment of coarse large woody debris (CWD), and balancing stream flow, stream gradient and stream substrate composition.

A positive outcome of the No Action Alternative is that no short-term ground disturbance would occur, thus reducing the potential for increased sediment transport to streams, loss of soil cover, or degradation of riparian or aquatic habitats associated with land management activities.

Potential negative effects include, road erosion issues that have been identified would not be addressed, in some areas the increased fuel from dead trees may contribute to detrimental fire effects in a future fire.

Alternative 1 (Proposed Action) Cumulative Effects

As discussed in the section on hydrology and water quality earlier in this chapter under Intensity Element 1, ground-disturbing activities can cause both direct and indirect effects that persist through time. The cumulative result of all these effects is the potential to adversely affect downstream beneficial uses of the water. Cumulative watershed effects (CWE) analysis may reveal that, even though the proposed activities themselves may not be sufficient to substantially impact the watershed, when analyzed in connection with past and future activities, they may become a cause for concern.

For this cumulative watershed effects analysis, the spatial area analyzed is bounded by the nine 14 digit HU drainages that have the potential to be impacted cumulatively by the proposed activities, combined with effects of past, present, and reasonably foreseeable future actions. The temporal boundary is approximately 25 years for past projects (based on the assumed recovery period for land disturbing activities) and any known, foreseeable projects that have enough detail to reasonably analyze in the CWE analysis and that would contribute to effects of proposed actions.

Cumulative Effects Analysis

CWE calculations considered the effects of past, present, and reasonably foreseeable actions that fell within the spatial and temporal boundaries established for this analysis, The Walker Fire Recovery Watershed Disturbance Map and supporting tables used to make the CWE calculations are a part of the project record.

The primary past events included in the analysis are the Moonlight and Antelope Complex Fires that occurred in 2007 and the subsequent salvage harvest activities. Past fires and salvage logging are considered a lasting impact on watersheds in the ERA model. Increased sediment loads can persist and degrade some aquatic habitat and rotting of fire killed tree roots have been observed to correspond with some landslide initiation in the Moonlight Fire. It was found that the 2019 Walker Fire is the primary reason these watersheds are approaching or over thresholds of concern.

Future or simultaneous actions also considered include the “2020 PNF Road and Trail Maintenance Project” which is in the analysis. There is also likely going to be reforestation efforts that may include site preparation with grapple pile machines, and/or herbicide treatment. Management requirements for leaving adequate ground cover and the low ground impact usually ensure these activities have a minimal risk of detrimental cumulative effects. At the time of that planning effort, the watershed effects will be examined again.

The CWE calculations for the project area, shown below in Table 41, are dominated by the effects of the Walker Fire. The vast majority of the fire was located within 7 of the 9 HU 14 drainages being analyzed for this project. These watersheds experienced large areas of high and moderate soil burn severity ranging from 2,000 to 5,000 acres. This condition is shown in the ERA results, where those seven watersheds have higher existing condition values than the rest. In the seven watersheds, the fire resulted in the existing condition approaching or exceeding the threshold of concern. However, the recovery rate for burned areas is rapid. Elevated rates of erosion from the burn are expected to recover to pre-fire conditions within 3 to 7 years (MacDonald and Robichaud 2008). This is supported by field observations. Burned leaves and needle debris along with branches and logs are continually adding cover to the soil. New vegetative growth is also helping the recovery.

The watersheds with the most severely burned areas, logically, also have the most acres of proposed salvage harvest and reforestation activities. The amount of treatment proposed has resulted in ERA values from going below to excess of the TOC in only the Lower Hungry Creek sub-watershed. This means that implementation of the proposed actions would require extra attention to the implementation, maintenance, and monitoring of management requirements and BMPs intended to protect watershed conditions. Restricting activities within RCAs would decrease impacts dramatically. Providing adequate cover on skid trails, and subsoiling landings and main skid trails, where appropriate, would also reduce impacts. In this project the sale administrators will be working with sale administrators get slash and ground cover placed at the outlet of the water bars on skid trails in the RCAs where possible. This is based on the latest science on salvage logging that has shown this to be an effective mitigation. (Wagenbrenner et al. 2015)

Project-wide, salvage harvest would not occur within riparian buffers or the equipment exclusion zones. This

would retain those trees that would provide a source of large woody debris to the channels and riparian zones. This material plays a crucial role in the functions of these areas (Reeves et al. 2006). One key role it can play in this project area is the capture and storage of sediment. Large wood in channels captures and stores sediment and thus helps stabilize stream beds (Montgomery et al. 2003). It also influences the formation of pools, riffles and overall stream morphology which directly drives aquatic habitat. In ephemeral, headwater drainages, large wood provides stabilizing ground cover that can prevent or reduce landslide and debris flow potential (Montgomery et al. 1996). It can also reduce the extent of such mass movements (Lancaster et al. 2003).

Table 41. Cumulative Watershed Effects Analysis Results Highlighted is over threshold.

Drainage Name	Acres	% TOC	Alternative 2 (Existing Condition and roadside hazard) % ERA	Alternative 1 (Proposed Action) % ERA
Lower Red Clover Creek	8,683	14	12.0	12.4
Lower Last Chance Creek	6,512	14	16.8	19.7
Babcock Peak	6,092	14	9.8	12.7
Poison Creek	4,746	14	8.5	11.6
Babcock Crossing	7,930	14	14.1	14.9
Lower Hungry Creek	4,535	14	11.6	16.5
McCellen Canyon	9,941	14	2.9	2.9
Lower Clarks Creek	6,267	14	2.3	3.0
Elephants Playground	6,369	14	17.1	21.0

Alternative 2 (No Action Alternative) Cumulative Effects

Under Alternative 2, existing conditions in the nine HU14 drainages would continue to proceed through natural processes. Natural processes include hill slope erosion and stream channel sedimentation, recruitment of coarse large woody debris (CWD), and balancing stream flow, stream gradient and stream substrate composition. Alternative 2 would have both positive and negative impacts on watershed conditions. One positive outcome of the No Action Alternative is that no short-term ground disturbance would occur, thus reducing the potential for increased sediment transport to streams, loss of soil cover, or degradation of riparian or aquatic habitats associated with land management activities.

The cumulative effect within the project area of lands impacted by past management activities, impacts related to ground-disturbing salvage activities on private lands within the analysis area, and the soil compaction effect of roads, landings, and skid trails would continue to recover over time. Alternative 2 (No Action Alternative) represents the existing condition in the drainages and includes the impacts of activities on private land.

Riparian Conservation Objective Analysis

Riparian Conservation Objectives (RCOs) are presented and described in Appendix A of the 2004 ROD for the Sierra Nevada Forest Plan Amendment (USDA 2004b). Integral to achievement of these objectives are the 32 prescribed standards and guidelines for riparian conservation areas listed in section D of the ROD appendix. These standards and guides provide requirements for stream crossing structures, coarse woody debris in treated areas, identification of restoration needs, and many other Forest activities that are not applicable to the Walker Fire Recovery Project. Many of these standards and guidelines are covered in more detail in the National BMPs An analysis of the RCOs relative to proposed Walker Fire Recovery Project activities are presented below.

RCO #1: Ensure that identified beneficial uses for the water body are adequately protected. Identify the specific beneficial uses for the project area, water quality goals from the Regional Basin Plan, and the manner in which the standards and guidelines will protect the beneficial uses.

Beneficial uses of surface water bodies that may be affected by activities on the Forest are listed in Chapter 2 of the Central Valley Region's Water Quality Control Plan (commonly referred to as the "Basin Plan") for the Sacramento and San Joaquin River basins (CRWRCB 2011). The Walker Fire Recovery Project drains to North Fork Feather River, for which existing beneficial uses include municipal and domestic water supply, hydropower generation, recreation, freshwater habitat, habitat suitable for fish reproduction and early development, and wildlife habitat. Among these beneficial uses, aquatic habitat is the most sensitive to the most common water quality effect (delivery of fine sediment) that could potentially result from land disturbing activities such as those proposed for the Walker Fire Recovery Project. For example, delivery of fine sediments from the project could decrease the quality of coldwater fish habitat by infilling pools and embedding spawning gravels.

Alternatively, land disturbance could cause concentration of surface runoff, which could result in detrimental changes to stream channel condition that could subsequently have effects on downstream water quality and beneficial uses.

As described in the soil and water resource effects analysis in Chapter 3 of this EA, the 2019 Walker Fire is the largest land disturbance that has affected watershed condition. Increased watershed response, including increased magnitudes of runoff and debris flows and increased potential for accelerated soil erosion, is expected over the next few years due to several prominent effects of the fire, including increased soil hydrophobicity and consumption of effective cover of the soil surface such as duff, litter, live vegetation, and fine woody debris.

Project management requirements, including streamside protection zones and features to increase soil cover in treated units, and standard BMP implemented during harvest activities would prevent sediment delivery to streams that would significantly affect water quality. When the proposed action is considered along with other past or reasonably foreseeable actions in the area, the cumulative watershed effects model predicts that 4 of the nine analysis watersheds would exceed the threshold of concern. The primary cause of these exceedances is the Walker Fire rather than the Recovery Project.

RCO #2: Maintain or restore: (1) the geomorphic and biological characteristics of special aquatic features, including lakes, meadows, bogs, fens, wetlands, vernal pools, springs; (2) streams, including in stream flows; and (3) hydrologic connectivity both within and between watersheds to provide for the habitat needs of aquatic-dependent species.

In general, restoration of these aquatic features is beyond the scope of the Walker Fire Recovery Project. Meadows in the east side of the project area are mostly seasonally dry and conditions will likely improve in some areas as non-system roads will be closed after being used for haul. The primary threat to all of these aquatic features is the increased watershed response potential that will exist in uplands burned by the Walker Fire over the next several years. Restoration to prevent potential impacts to aquatic features due to an increased watershed response would involve large scale re-establishment of ground cover in areas of the Walker Fire that burned at high or moderate severity. In order to effect a measurable change in watershed response, treatment would have to improve most, if not all, of those severely burned acres, requiring import and helicopter application of thousands of tons of straw mulch or contour felling and placement of thousands of burned trees. Even with such a monumental effort, changes to watershed response in treated areas may not differ substantially from untreated areas as all burned areas naturally recover soil cover over the next 1-3 years. BAER treatments will continue along roadways in burned areas to disperse runoff and protect stream crossing structures; these treatments will occur regardless of whether or not the Walker Fire Recovery Project is implemented. Utilizing project-generated slash and woody debris, the Walker Fire Recovery Project would add effective soil cover to treated units. But the benefit of this additional cover would be small and the primary factor that would prevent impacts to aquatic features is natural recovery of soil cover.

RCO #3: Ensure a renewable supply of large down logs that: (1) can reach the stream channel and (2) provide suitable habitat within and adjacent to the RCA.

Since the units proposed for treatment in the Walker Fire Recovery Project are located in areas with high tree

mortality, the high level of fire-killed trees assures that streams within the project area will have an ample source of large down logs over the next several years. The equipment exclusion zones around streams will ensure fire killed trees are not all removed from these areas.

RCO #4: Ensure that management activities, including fuels reduction actions, within RCAs and CARs enhance or maintain physical and biological characteristics associated with aquatic- and riparian-dependent species.

As described above, maintenance of physical and biological characteristics associated with aquatic- and riparian-dependent species would be assured for Walker Fire Recovery Project treatment areas through implementation of BMPs and manage requirements. In the event of a prolonged, intense precipitation event on areas of high or moderate soil burn severity, or an even larger rain-on-snow runoff event, effects to RCA habitat characteristics within and downstream of units treated by the Walker Fire Recovery Project would be very similar to impacts in untreated stands with similar soil burn severity.

RCO #5: Preserve, restore, or enhance special aquatic features, such as meadows, lakes, ponds, bogs, fens, and wetlands, to provide the ecological conditions and processes needed to recover or enhance the viability of species that rely on these areas.

For these features, impacts to ecological condition due to Walker Fire Recovery Project activities would not be expected due to implementation of project BMPs and management requirements. No fens or bogs have been identified within the Walker Fire Recovery Project area. Restoration to prevent potential impacts to aquatic features due to an increased watershed response would involve large scale re-establishment of ground cover in areas of the Walker Fire that burned at high or moderate severity, which is beyond the scope of this project.

RCO #6: Identify and implement restoration actions to maintain, restore or enhance water quality and maintain, restore, or enhance habitat for riparian and aquatic species.

Restoration to treat the primary threat to water quality and aquatic habitat would involve large scale re-establishment of ground cover in areas of the Walker Fire that burned at high or moderate severity, which is beyond the scope of the Walker Fire Recovery Project. At a smaller scale, Proposed Action activities would provide localized, but long-term, enhancements to water quality protection. The proposed construction or reconstruction of water sources, per BMP 2.5, would improve long-term protection of water quality at these drafting sites. Additionally, many road improvement projects that will benefit water quality and aquatic habitat are included in this project.

Finding of No Significant Impact

Although there are sub-watersheds over the threshold of concern for Cumulative Watershed Effects, because management requirements, BMPs etc. are followed and implemented, it is anticipated that the slight amounts of sediment generated because of activities during a high runoff event would not be measurable or detectable at the analysis watershed scale and would not affect identified downstream beneficial uses of water.

Conclusion

The Walker Fire itself has proven to be an impact to water quality because of high intensity rainfall hitting the fire affected landscape. In some cased salvage logging after a fire can lead to additional impacts, but this project as designed is anticipated to have a very low risk of additional detrimental impacts to water quality.

Recreation

A forested landscape provides a high quality experience for visitors engaging in a wide range of recreational activities. A variety of recreational activities occur year round in most of the Walker Fire Recovery Project area including: use of Off Highway Vehicles (OHVs), hiking, automobile touring, camping, hunting, fishing, mountain bicycling, equestrian use, target shooting, and other snow sports such as cross country skiing or snowshoeing.

Background

The Walker Fire burned adjacent to and within old fire scars from the Moonlight Fire, Cold Stream Fire and

others. This continual shifting of the landscape has created years of challenges with maintenance of recreation facilities in the project area, primarily trails.

Effects Analysis Methodologies

Geographic Spatial and Temporal Boundaries

The recreation analysis considers the effects of the proposed action and no action alternatives within the larger project area boundary, not just the treatment area footprint. There are three primary reasons for looking at the entire project area: current public access, use of the road system to implement the project, and the interconnected nature of trails. Effects are expected to be immediate (during implementation), short-term (1-5 years) and long-term (15 years). The following recreation related resources occur within the project area and would be affected by the proposed action and no action alternatives.

General Forest Access

There is a year-round variety of motorized activities and routes in the Walker Fire Recovery Project area. The road system identified for hazard tree abatement provides access to private property, Forest Service permitted use areas, and access to National Forest System (NFS) lands. The existing trails and road system optimize user satisfaction and provide quality recreation experiences. Maintenance Level (ML) 2, 3, 4, and 5 roads provide a diverse motoring experience. Generally, OHV users tend to enjoy the ML 2 roads, and passenger cars enjoy the higher standard ML 3, 4, and 5 roads. There are approximately 113 miles of National Forest Transportation System (NFTS) roads within the Project area and 31 miles of designated trail (not including OSV routes). The proposed action includes reducing hazard trees along approximately 40 miles of prioritized roads and trails.

Off Highway Vehicles Users and Uses

Sixteen motorized trails fall within the Walker Fire Recovery Project area (Table 42). These routes are spread out within or adjacent to treatment units, and may be used to access treatment units. These motorized trails include:

Table 42. Sixteen motorized trails within the Walker Fire Recovery Project area.

Route Number	Name (if known)	Mileage	Notes
12M09	Last Chance Ridge	3.08	Intersects Unit 140 and 147
12M09A	Last Chance Ridge Spur	.84	Intersects Unit 140
12M13		.4	East of Unit 23
12M15		.23	Access to dispersed camping
12M17	Babcock Crossing	.16	
13M12		1.5	Crosses between Unit 5 and 6
13M14		1.33	North edge of Unit 25
13M15		.81	Intersects Unit 19
13M17		1.02	Access to 13M34 to Unit 18
13M31	Papoose	2.33	Access to Unit 19
13M31A	Papoose Peak	1.56	East of Unit 29
13M34	Last Chance Tie	.54	Intersects Unit 18

A quality riding experience, and successful management of a designated route system, can be achieved by vegetation manipulation. Vegetation management is an important aspect of keeping off highway vehicle use where it is desired and limiting resource impacts.

Non-Motorized Trails

There is one non-motorized trail within the project area. The Middle Creek Trail (12E08) is 5.9 miles long. The trailhead is along the Antelope Lake Road. Before the fire, the trail meandered along Middle Creek and crossed several lush meadows before tying into the Antelope-Taylor Trail which connects Antelope Lake and Taylor Lake.

The lower 2/3rds of the trail were heavily impacted by the Walker Fire. Signs were burned and the fire intensity was severe at the trailhead. Logging in units 128, 200, and 201 will remove some of the hazard trees from alongside the trail.

Dispersed Recreation including Camping

Camping is allowed in most areas across the Plumas National Forest. Dispersed camping and use most often occurs at or near the intersections of trails, at spur roads that access creeks, at the end of roads, at previous landings, or other past- project staging areas. Occasionally, dispersed recreation users open closed roads, skid trails, and closed landings when there is water or other desirable features, or when solitude is sought. Camping, mining, hiking, OHV use, equestrian use and hunting are the prevalent recreation activities associated with dispersed use.

Wild and Scenic Rivers

Little Last Chance Creek has been determined as eligible for Wild and Scenic River status. On November 16, 1992, the Plumas National Forest issued Wild and Scenic River Interim Guidelines that stated "management activities within 1/4 mile of each bank of a river or stream would be consistent with the direction for Wild and Scenic Rivers until eligibility was determined". All Walker Fire Recovery Project treatment areas are a minimum of 0.33 miles away from the Little Last Chance Creek corridor, and therefore these actions will not violate any terms or conditions of the Wild and Scenic Rivers Act, or the interim guidance.

Alternative 1 (Proposed Action) Direct and Indirect Effects Due to the Walker Fire, the roads, trails, developed and dispersed use areas within the project area are currently affected by a large quantity of roadside/trailside hazards. The proposed action mitigates these safety concerns within the individual units. Additional hazards along roads and trails will remain outside of designated units.

Although there were no comments on the proposed action in regards to recreation or land uses, internal scoping has identified potential issues. Management requirements designed to reduce potential direct, indirect, and cumulative effects of the proposed action have been specifically developed for recreation uses in the Walker Fire Recovery Project area (Table 3). Management requirements provide for visitor safety; protect the quality of recreational experiences and opportunities; minimize disturbance and potential encounters during salvage operations; and protect the improvements described above.

The project activities would result in an increase in project related traffic on roads in the area. Roads and short trail segments may be used as access roads to treatment areas. Recreational users and private property owners would be affected by increased traffic and associated disturbance, or by temporary closures. These effects may discourage recreational use, create unexpected inconveniences from large vehicles, including dust, noise, delays related to congestion and slow vehicles, and intimidation associated with meeting large vehicles and equipment on roads. Some favorite use areas may not be available for possibly the entire year. Logging noise may reduce recreational and private property enjoyment.

Operationally active areas would be temporarily unavailable for public use. Signs and announcements as to the location and duration of salvage activities would allow recreationists to plan and mitigate some of these effects.

The following are anticipated or known effects of the project on recreation use:

- Off highway Uses: Segments of OHV trails and roads would be temporarily closed during logging and post-harvest treatment, and if necessary during other activities for public safety. Detours would be established, when possible, to maintain availability of motorized recreation opportunities when closures of trail or road segments are required for public safety. Salvage operations and associated activities, such as skid trails or landings, may increase use of unauthorized routes adjacent to, or inside of the treatment areas. Unauthorized uses and routes would trigger a need for a counter action to abate the unauthorized use and repair any resulting resource impacts. The proposed road and trailside hazard tree work and salvage treatments would have a long-term beneficial effect on public safety and resource protection.
- Middle Creek Trail: Most of the Middle Creek Trail, including the trailhead, is within the Walker Fire closure area. The trail will be signed as “Closed” at its northern entrance point, where it can be accessed by

the Antelope-Taylor Trail. The Middle Creek Trail is a non-motorized trail (12E08), and it is adjacent to and/or within four treatment units. Treatment within these units is expected to have an overall beneficial effect on this trail, as treatment would remove hazard trees that threaten to fall on the trail. Removal of these hazards would create opportunity to safely rehabilitate the trail. In the longer term, this would provide for safe passage of trail users once the trail can be re-opened.

- Dispersed Camp Sites: Management Requirements included in the proposed action are designed to prevent expansion of the existing dispersed use areas as well as limit the creation of new dispersed campsites to areas where resource impacts can be minimized. When unclosed/unmitigated temporary roads, landings, service or staging areas occur as a result of vegetation management activities it invites further dispersed camping and may result in increased resource damage, including sanitation issues. Management requirements would be applied to mitigate this impact. Current popular dispersed campsites may be unavailable for use during operations, and potentially encumbered until slash can be treated.
- Private properties in the vicinity of treatment areas may be affected by the operations in many of the same ways that recreational use is affected. Management Requirements have been designed to allow access to private land inholdings. However, there may be impacts from noise, dust, and short-term increased use of areas surrounding private inholdings that cannot be mitigated.

Overall the proposed project would, in the long-term, directly benefit recreating public and private land owners by removing salvage material that would contribute to long-term fuel loading.

Alternative 1 (Proposed Action) Cumulative Effects

Several other ongoing projects may influence the overall impacts to recreation within the Walker Fire Recovery Project boundary. These projects are aimed at reducing fuel loading along roads and trails, improving drainage, restoring signage, and ensuring safe and appropriate use of roads and trails. The anticipated cumulative effects of these projects is to support and enhance the Walker Fire reforestation efforts. Reforestation efforts would provide additional benefits to roads and trails by limiting brush encroachment and creating long term canopy cover.

Past activities (vegetation management, road maintenance, and recreation maintenance), present activities (salvage under the Walker Recovery Project and trail maintenance) and reasonably foreseeable future actions (reforestation) would not lead to adverse cumulative effects on recreation resources or safe access to recreation opportunities.

Alternative 2 (No Action) Direct and Indirect Effects

Under the No Action alternative, dispersed recreation sites, roads and trails would remain in their current condition unless additional road and trail projects are implemented. They would not be affected by the proposed treatments of salvage. Impacts to recreation and the human environment are expected to be greater with the implementation of the no action alternative. Public safety would be at risk due to standing snags near OHV routes, trails, trailheads, and dispersed recreation sites. The effects on the quality of experience would tend to be negative. Alternative 2 (No Action) has a greater likelihood of having adverse effects to recreation resources due to an increased number of snags falling across roads and trails.

Alternative 2 (No Action) Cumulative Effects

Over time, with no treatment, trails would continue to deteriorate, due to falling snags, brush encroachments and erosion issues due to lack of tread maintenance. Although some annual maintenance may occur, the extent of needed maintenance in severely burned areas would exceed the capacity of crews to address it. An imbalance in the spending of limited recreation funds would occur as the greatest hazards would need to be mitigated on an annual basis, as trees that break and/or fall are cut out of trails. This would reduce funding to other recreation areas on the District and/or Forest. This imbalance would probably be greatest along the primary OHV routes (ML 3, 4, and 5), where there are no plans for current or foreseeable maintenance projects. In addition, where snags created by fire-killed and weakened trees along roads and trails and at recreation sites in the Walker Fire Recovery Project area remained unabated under Alternative 2, the Forest Service would likely have to close some roads, trails, and recreation sites to public access to protect public safety. However, the probability of additional dispersed use sites being created would be less under Alternative 2, as logging operations would not clear landings or staging areas

that could be utilized by dispersed campers.

Past activities (vegetation management, road maintenance, and recreation maintenance), present activities (trail maintenance), and reasonably foreseeable future actions (reforestation) would not lead to adverse cumulative effects on recreation resources, however safe access to recreation opportunities would be compromised.

Cultural Resources

Introduction

The USDA Forest Service complies with the requirements set forth within Section 106 of the National Historic Preservation Act of 1966 (NHPA) and its implementing regulations found within 36 CFR 800. The NHPA requires federal agencies to take into account the effects of undertakings to historic properties. As defined within 36 CFR 800.16(I)(1), historic properties are "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP). The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria." The Walker Fire Recovery Project is an undertaking as defined in 36 CFR 800.16(y) and has the potential to effect historic properties.

The Plumas National Forest complies with Section 106 of the NHPA by its participation in the First Amended Regional Programmatic Agreement Among the U.S.D.A. Forest Service, Pacific Southwest Region, California State Historic Preservation Officer, the Nevada State Preservation Officer, and Advisory Council on Historic Preservation Regarding the Process for Compliance with Section 106 of the National Historic Preservation Act for Undertakings on the National Forests of the Pacific Southwest Region (2018 PA). In addition, the Forest utilizes the Plumas National Forest Heritage Program Plan and Cultural Resource Inventory Strategy (HPP) that provides a Forest-specific inventory strategy and program protocol for managing historic properties.

The project area has been inventoried and analyzed for the presence of cultural resources. Cultural resources are objects or definitive locations of human activity, occupation, or use identifiable through field survey, historical documentation, and/or oral evidence (FSM 2360.5). All cultural resources within the project's area of potential effects (APE) are treated as potentially significant historic properties unless they have been evaluated as not eligible for inclusion on the NRHP.

Background

Historical documentation (archives, records, and published works), results of past cultural resource inventories, along with past and present consultation with Indian tribes, local Native American organizations and knowledgeable individuals, all serve to characterize past human activity in proximity to the project area. Pre-contact (prehistoric) and ethnographic era cultural resources in this vicinity generally reflect seasonal use patterns. Archaeological data suggests that the region was inhabited at least 8,000 years before present. Indigenous peoples who lived within and managed the forests of the northern Sierra Nevada Mountains often favored areas nearby watercourses or natural springs for encampments. Occupational sites are far less common on steeper slopes. Task specific locations or short term campsites can be represented by small sites with occurrences of flake stone tools, projectile points (arrowheads or dart points) and light scatters of lithic flakes (the by-product of manufacture or modification of flaked stone tools). Groundstone artifacts associated with processing plants for food or other uses can also be encountered along with bedrock mortars or grinding slicks. Quarry sites for basalt and crypto-crystalline (i.e. chert) tool-stone have been identified in the project vicinity. Petroglyphs (incised or pecked rock art) do occur in the northern Sierra Nevada Mountains although none are recorded in proximity to the Project area. These places were all interconnected by a series of well-established trails. For uncounted generations the Mountain Maidu people would return each year to permanent villages in the mountain valleys during winter months; the closest to the project area being Genesee Valley.

The historic era in the northeastern Sierra Nevada Mountains generally begins at or just after 1850; the date of the beginning of the California Gold Rush in what would become Plumas County. Historic themes represented within and nearby the project area are associated primarily with small-scale gold mining, railroad logging and past livestock management. Historic cultural resources include early roads and trails, abandoned railroad grades, logging campsites and associated activity areas, along with mining ditches, tailings and excavations. Occasional

Basque sheepherding encampments have been recorded including arborglyphs (messages, names, dates and abstract designs carved on aspen trees). This latter resource class has most likely been decimated by the recent Walker Fire. Historic era railroad logging was undertaken in the eastern portion of the project area in the 1930s and 1940s by the Clover Valley Lumber Company.

Effects Analysis Methodologies

An extensive records search, cultural resource field inventory and site monitoring program has been completed within the APE for the Walker Fire Recovery Project. An Archaeological Reconnaissance Report (ARR) documenting inventory methodology and findings has been completed (July 2020). The ARR documents the presence of cultural resource sites and isolated features or artifacts within the Project area. This report identifies the location and nature of sensitive resources and remains confidential as per Section 304 of the NHPA (16 U.S.C. 4702-3) and Section 9 of the Archaeological Resources Protection Act of 1979 (ARPA) (16 U.S.C. 470aa-470mm).

Geographic Analysis Area

The geographic analysis area considered in response to the proposed project for cultural resource management requirements includes all proposed activity units and transportation systems that will be used in connection with the project. This includes the need to recondition existing or create new temporary roads and landings as well as the safe utilization of all existing roads planned for use as part of this project. Any area that would be potentially subjected to ground disturbing activities is included in this analysis along with buffers as needed and is defined as the APE for the purposes of compliance with NHPA and the 2018 PA.

Duration of Impacts

As described below, incompliance with Section 106 of the NHPA and under the provisions of the 2018 PA, the Forest has made a finding that the proposed Walker Recovery Project will have no effect to historic properties. No impacts are anticipated during or following implementation of the project.

Alternative 1 (Proposed Action) Direct and Indirect Effects

The Forest has found that by utilizing standard resource protection measures outlined within Stipulation 1.0 and 2.0 in Appendix E of the 2018 PA, the project will have no effect to historic properties. All cultural resources will be demarcated (red and black stripped flagging) for complete avoidance during the course of all project implementation activities. Provisions for project activities within cultural resource site boundaries may be approved by utilizing Stipulation 2.2 of Appendix E on a case-by-case basis at the discretion of the Heritage Program Manager (HPM) or delegated District Archaeologist. Such measures must be approved and documented prior to any actions within site boundaries. These measures may allow for selected activities (re-use of temporary roads, harvesting timber within sites, etc.) to occur without impact to cultural resources.

It is not anticipated that project activities will have any incremental impact or indirect effects. Provisions to prevent excessive soil displacement following the completion of the project will help insure that cultural resource sites will not be subsequently effected.

Alternative 1 (Proposed Action) Cumulative Effects

With the finding of no effect under NHPA and the 2018 PA, cumulative effects are not anticipated. Cultural resource sites could foreseeably be impacted as a result of surrounding soil disturbance – primarily in the form of erosion. Project-wide mitigations will be utilized that will alleviate any reasonable likelihood of future effects associated with excessive erosion.

Alterative 2 (No Action Alternative) Direct and Indirect Effects

Under the No Action Alternative, cultural resources would not experience direct or indirect effects by proposed project activities. There would be no undertaking and, therefore, no compliance with Section 106 of the NHPA would be required.

Alternative 2 (No Action Alternative) Cumulative Effects

Under the No Action Alternative, dead or dying conifers within or surrounding cultural resource sites would not be removed and would presumably fall uncontrolled resulting in the possibility of direct impact to artifacts and/or features. Cultural resources within the fire area may foreseeably remain vulnerable to exposure, erosion and excessive fuel loading in the future. Therefore, while it cannot be quantified, some potential for cumulative effects resulting from the No Action Alternative do exist over time.

Finding of No Significant Impact

The intensity of effects of the project to cultural resource is negligible. While cultural resources are identified within and in proximity to the project area, there will be no significant effects on unique characteristics of the area, because all cultural resources in the project area will be protected from any direct or indirect effect (FONSI Factor 3). Utilizing the provisions of the 2018 PA, the project will not affect districts, sites, highways, structures, or objects listed in or eligible for listing in the NRHP (historic properties) nor will it result in the loss or destruction of significant scientific, cultural, or historical resources (FONSI Factor 8).

Conclusion

The Walker Fire Recovery Project complies with Section 106 of the NHPA and with the provisions of the 2018 PA. The project will have no effect to historic properties and no direct or indirect impact to cultural resources. If any unanticipated cultural resources are discovered as a result of project implementation, operations will cease in the immediate vicinity of the new discovery until the HPM and/or District Archaeologist can assess the significance of the resource and can implement adequate protection measures as needed.

While it is considered very unlikely, should any Native American human remains or associated items of cultural significance be encountered as a result of project activity, the Plumas National Forest shall utilize the *Native American Graves Protection and Repatriation Act Protocol for the Inadvertent Discovery and Identification of Native American Human Remains, Funerary Objects, Sacred Objects and Objects of Cultural Patrimony, Plumas National Forest – May 2017.* This approved protocol is found within Appendix 2 of the Forest's HPP and provides for immediate protection measures, rapid notification, and a consultation process for unanticipated discoveries of this nature.

Findings Required by Other Laws

National Forest Management Act

The National Forest Management Act (NFMA) of 1976 establishes congressional policy to maintain appropriate forest cover on all forested lands in the National Forest System with species of trees, degree of stocking, rate of growth, and conditions of stand designed to secure the maximum benefits of multiple use sustained yield management in accordance with land management plans.

The proposed action complies with NFMA. Soil, slope or other watershed conditions would not be irreversibly damaged. Protection would be provided for stream and stream banks. Prescribed treatments for all stands proposed are designed to conserve soil and water resources and not allow significant or permanent impairment of the productivity of the land. All stands proposed for treatment with timber production objectives are on lands suitable for timber.

Authorization of Timber Harvest in NFMA

The minimum specific management requirements to be met in carrying out projects and activities for the National Forest System are set forth in this section. Under 16 U.S.C. 1604 (g)(3)(E), a Responsible Official may authorize project and activity decisions on NFS lands to harvest timber only where:

1. *Soil, slope, or other watershed conditions will not be irreversibly damaged*. Implementation of the proposed action would adhere to Best Management Practices for Protecting Water Quality (BMPs) and Forest Plan standards and guidelines (including RCA guidelines in BMP 1.8) for protecting soil and water resources. Slopes generally greater than 30 percent would be aerially yarded to avoid impacts to

soils on steep ground, and requirements for maintaining soil cover and protecting streams would be followed. Best Management Practices and Riparian Conservation Area Guidelines (BMP 1.8) for the Walker Fire Recovery Project are included in the project record.

2. *There is assurance that such lands can be adequately restocked within five years after harvest.* The proposed action includes conifer tree planting and follow-up release of planted conifers from competing vegetation to ensure that harvested areas are adequately restocked with conifers within 5 years after harvest. Prior to the fire, the Project Area had a history of regeneration harvesting followed by successful establishment of fully stocked plantations. The same success in anticipated under the proposed action.
3. *Protection is provided for streams, stream banks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat.* Management requirements incorporated into the proposed action are designed to reduce the risk of accelerated erosion and sedimentation due to thinning and fuels treatment activities. The proposed action's Best Management Practices for Protecting Water Quality (BMPs) and the Forest Plan standards and guidelines (including RCA guidelines) for protecting soil and water resources are the primary measures for preventing and mitigating impacts from nonpoint source water pollution, such as fine sediment and changes in water temperature. Consistent with Forest Plan direction, a riparian conservation objective (RCO) analysis has been completed for the proposed action (available in the project record), which demonstrates that proposed harvesting would not seriously or adversely affect water quality or riparian/aquatic conditions.
4. *The harvesting system to be used is not selected primarily because it will give the greatest dollar return or the greatest unit output of timber.* Harvest system selection was based on resource protection rather than economics. Steeper slopes (those generally over 35 percent) are not included in this proposal except for short pitches (100 feet). Ground based harvesting is less expensive and allows treatments to be more economical compared to aerial yarding.

A Responsible Official may authorize project and activity decisions on NFS lands using clearcutting, seed tree cutting, shelterwood cutting, and other cuts designed to regenerate an even-aged stand of timber as a cutting method only where:

1. <u>For clear cutting, it is determined to be the optimum method, and for other such cuts it is determined to be appropriate, to meet the objectives and requirements of the relevant land management plan (16 U.S.C. 1604 (g)(3)(F)(i)):</u> The proposed action would only salvage fire-killed trees with a 0.7pm. The proposed action would be consistent with management direction in the *Plumas National Forest Land and Resource Management Plan* (1988), as amended by the *Sierra Nevada Forest Plan Amendment Record of Decision* (SNFPA 2004).

The SNFPA ROD provides forest-wide direction across all land allocations that allows Forest Service managers to respond to large catastrophic events, including wildfires. Salvage harvest of dead and dying trees may be conducted following such events to recover the economic value of this material and to support objectives for reducing hazardous fuels, improving forest health, re-introducing fire, and/or re- establishing forested conditions (SNFPA ROD, pg. 52).

SNFPA ROD forest-wide standard and guideline #14 directs managers to avoid conducting salvage harvest in at least 10 percent of the area affected by a large catastrophic fire (SNFPA ROD, pg. 52). The proposed action would not conduct salvage harvest on approximately 53,246 acres (approximately 92 percent) of the 58,787 acres of National Forest System lands that burned in the Walker Fire.

The SNFPA ROD also directs managers to consider the ecological benefits of retaining small patches of mortality in old forest emphasis areas following large catastrophic disturbance events (SNFPA ROD, Standard and Guideline #17, pg. 53). The proposed action is consistent with this direction in the following ways: approximately 87 percent of the national forest lands that burned with moderately high to high vegetation burn severity effects

(29,083 acres) would not be salvaged. Hence, numerous patches of tree mortality of varying sizes would be retained across the 58,787 acre landscape encompassed in the Walker Fire.

2. The interdisciplinary review as determined by the Secretary has been completed and the potential environmental, biological, esthetic, engineering, and economic impacts on each advertised sale area have been assessed, as well as the consistency of the sale with the multiple use of the general area (16 U.S.C. 1604 (g)(3)(F)(ii)); An interdisciplinary team of resource specialists assisted in the design of the proposed action and provided management requirements that have been incorporated into the proposed action to ensure potential adverse environmental, biological, esthetic, engineering, and economic impacts would be mitigated. The interdisciplinary team reviewed the final proposal and assessed potential adverse environmental impacts as well as consistency with the Forest Plan. Each resource specialist's analyses and conclusions are documented in the Walker Fire Recovery Project record.
3. Cut blocks, patches, or strips are shaped and blended to the extent practicable with the natural terrain (16 U.S.C. 1604 (g)(3)(F)(iii)); Salvage harvesting would be conducted in areas that experienced high and moderate vegetation burn severity effects. The shape of the treatment areas has been largely dictated by the fire's effects and harvesting operational needs. The visual quality of these treatment areas has already been impacted by the fire.
4. There are established according to geographic areas, forest types, or other suitable classifications the maximum size limits for areas to be cut in one harvest operation, including provision to exceed the established limits after appropriate public notice and review by the responsible Forest Service officer one level above the Forest Service officer who normally would approve the harvest proposal; provided, that such limits shall not apply to the size of areas harvested as a result of natural catastrophic conditions such as fire, insect and disease attack, or windstorm (16 U.S.C. 1604 (g)(3)(F)(iv)); The proposed salvage harvesting is responding to fire; hence, maximum size limits do not apply. Salvage tree removal as proposed is accepted as a standard silvicultural treatment in the Sierra mixed conifer and the true fir forest types and presented as a "Current Silvicultural Practice" in the Sierra Nevada Ecosystem Project (SNEP) Report (Helms and Tappeiner, 1996).
5. Such cuts are carried out in a manner consistent with the protection of soil, watershed, fish, wildlife, recreation, and esthetic resources, and the regeneration of the timber resource (16 U.S.C. 1604 (g)(3)(F)(v)). As described throughout this EA, applicable Forest Plan standards and guidelines would be adhered to under the proposed action to minimize potential adverse effects on forest resources.
6. Under 16 U.S.C. 1604 (m) even-aged stands of trees scheduled for regeneration harvest generally have reached culmination of mean annual increment of growth, unless the purpose of the timber cutting is excepted in the land management plan (FSM 1921.17f). Culmination of mean annual increment is not a consideration under the proposed action as the trees that would be salvaged under the proposed action would be those killed by the fire.

Forest Service Pacific Southwest Region Sensitive Wildlife Species

The Wildlife Biological Evaluation prepared for the Walker Fire Recovery Project, which is incorporated by reference and available in the project record, the Interdisciplinary Team Wildlife Biologist has determined that the Walker Fire Recovery Project may affect individuals, but is not likely to result in a trend toward Federal listing or loss of viability within the planning area of the Plumas National Forest for the following Forest Service Pacific Southwest Region Sensitive Species: western bumble bee, California spotted owl, northern goshawk, Pacific marten, California wolverine, pallid bat, and fringed myotis. Further, as explained in the Wildlife Biological Evaluation, the Wildlife Biologist has determined that the Walker Fire Recovery Project will not affect the Townsend's big eared bat nor will it affect the bald eagle, great gray owl, greater sandhill crane, willow flycatcher, fisher, either due to absence of suitable habitat in the Project area or the Project area being outside the current range of the species.

Forest Service Pacific Southwest Region Sensitive Plant Species

The Interdisciplinary Team Botanist has determined that implementation of the Walker Fire Recovery Project would not affect the following sensitive species: *Botrychium ascendens, Botrychium crenulatum, Botrychium lunaria, Botrychium minganense, Botrychium montanum, Botrychium pinnatum, Bruchia bolanderi, Buxbaumia viridis, Cypripedium fasciculatum,* and *Cypripedium montanum.* The Project contains habitat suitable for those sensitive species. Wetland habitats would be disturbed at approximately 32 identified sites where work is needed to allow for transportation, erosion prevention, and use of water sources. These sites will be surveyed by PNF botanists prior to implementation. If sensitive plants are found appropriate management prescriptions will apply. Management prescriptions can be found in the project file. The management prescriptions for these species do not allow disturbance.

This determination is based on several factors including: surveying the Project Area prior to Project operations and buffering rare plant occurrences from disturbance, falling trees away from rare plant occurrences and riparian vegetation whenever possible, leaving the tree bole in place when it falls across a stream and cannot be fully suspended to remove it, excluding equipment from riparian buffers, implementing best management practices for soil and water, and implementing the NNIP requirements for prevention, control, and eradication.

Implementation of the Project may affect the following sensitive plants: *Astragalus lentiformis, Astragalus pulsiferae* var. *coronensis, Astragalus pulsiferae* var. *pulsiferae, Astragalus webberi,* and *Lomatium roseanum*. Individuals and/or their habitats may be affected but project implementation is not likely to result in a trend toward Federal listing or loss of viability for these species within the planning area of the PNF. Surveys of suitable habitat for these species have started but have not been completed. They are planned to be completed prior to implementation of project activities. If sensitive plants are found appropriate management prescriptions will apply. Management prescriptions can be found in the project file.

If the wetland species discussed above occur in the Project Area they would be located within the riparian buffer areas and equipment is excluded from those areas except at the identified sites where work on roads, culverts, and water sources is needed to facilitate the project. Those identified sites will be surveyed by qualified botanists prior to implementation. Impacts to streams/springs/seeps would be minimized by implementation of soil and water BMPs, by felling hazard trees away from riparian vegetation whenever possible, and avoiding any disturbance to rare plants whenever feasible.

Plumas National Forest Watchlist Plants

The National Forest Management Act (NFMA) directs that a diversity of plant species be provided as consistent with overall multiple-use goals. NFMA regulations also direct the Forest Service (FS) to preserve and enhance the diversity of plant communities, including native and desirable naturalized plant species such that diversity mimics what might be expected under natural conditions, where appropriate and to the extent practicable (USDA 2001).

Biological diversity can be viewed as the representation of the variation in living organisms and the physical and biological complexes in which they occur (Luce et al. 2001). Diversity also includes within- species variation as represented by genes, distinct life histories, life stages, or even behavioral types, as well as the structural and functional characteristics of whole communities (Franklin 1993 IN: Luce et al. 2001). Since natural disturbances such as wildfires will alter habitats whether humans manage them or not, all habitats are vulnerable to change. Therefore, some redundancy of diverse habitat representation is important.

Weed Risk Assessment

The SNFPA (2004) lists fourteen Standards and Guidelines for management of Non-Native Invasive Plants (NNIP). In summary, the Standards and Guidelines applicable to this project direct the Forest to conduct a NNIP risk assessment that includes NNIP risk, prevention, and treatment. The Weed Risk Assessment conducted for the Walker Fire Recovery proposed action, hereby incorporated by reference and available upon request, determined the following (Table 43):

Table 43. Summary of Non-Native Invasive Plant (NNIP) Risk from Implementation of the Project

Factors	Variations	Project Risk

Inventory	Surveys of the Project Area are not complete.	High risk
Known NNIP	Infestations of NNIPs known to occur in the Project area: Canada thistle, Scotch broom, spotted knapweed, yellow star thistle, and Dalmatian toadflax. These five species combine for a total of 66 acres known to be currently infested with noxious weeds prior to surveys being completed.	High risk
Habitat vulnerability	The Project Area is highly vulnerable to NNIP introduction, increased rate of NNIP establishment, and spread from existing NNIP infestations since it burned with high intensity in 2019 leaving much of the landscape without vegetative and litter/duff soil cover.	High risk
Non-project dependent vectors	The Project Area is a mixture of National Forest System and privately owned lands. All lands are accessed primarily by the same roads – Antelope Lake Road, Janesville-Frenchman Road, and Beckwourth-Genesee Road, and connecting roads. Public and private lands are used for a variety of other uses including mining, hunting, and off highway vehicle use. All of these uses are considered non-project vectors.	Moderate to high risk
Habitat alteration expected as a result of project	Implementation of the Project will further disturb the soil and increase the amount of bare soil in the Project and Analysis areas. Sprouting and germinating vegetation will be injured. Soil cover will be disturbed. Landings will be created and/or cleared and re-used. Temporary roads will be built. In some cases trailheads will be used as landings. In some cases, hazard trees will be skidded down roads – further disturbing roadside vegetation. Several NNIPs are known to infest roadsides and those infestations will be disturbed.	High risk
Increased vectors as a result of project implementation	The number of vectors will increase during Project operations – which could go on for several years. This is considered a high risk due to the many vehicles and equipment that will enter and operate in the Project Area during implementation.	High risk
Mitigation measures	The NNIP introduction risk from Project operations is reduced by requiring that equipment that goes off roads be washed before it enters the Project Area and attempts to complete work in un-infested portions of the Project Area before moving to infested areas or vice versa. Also, equipment operating in areas known to be infested must be washed before moving to a new area. The risk of establishment/spread is reduced somewhat by Non- Project related activities – specifically the planned early detection/rapid treatment actions that will be implemented during the 2020-21 field seasons (as part of the BAER efforts). Implementation of the Project creates conditions that favor increased NNIP rate of establishment – especially since proposed disturbances are located next to and in some cases on roads - by reducing soil cover and disturbing soil. Known infestations are expected to have an increased rate of spread since native plant competition will be further reduced.	Moderate to high risk

Anticipated NNIP response to proposed action	NNIP can be introduced to new areas via vehicles and equipment on roads and in treatment areas. The soil disturbance and removal of existing vegetation caused by timber harvest activities create conditions favorable to the spread of noxious weeds. Existing infestations will continue to spread via Project operations and through other vectors such as road use by the public. It is estimated that native vegetation will re-sprout and provide increased soil shade in about 5 years. However, re-sprouting vegetation will be cleared again in areas planned to be planted with conifer trees. It is likely that some portions of the Project Area will be disturbed for several years. Continued early detection and rapid treatment surveys are needed for years 2020-2025– especially along roads and in highly disturbed areas.	High risk
Recommendations	Continued early detection and rapid treatment surveys are needed for years 2020-2025 – especially along roads and in highly disturbed areas.	Reduction in risk

Management Indicator Species

Direct, indirect, and cumulative project-level impacts to MIS habitat are related to broader scale (bioregional) population and/or habitat trends in this section of Chapter 3, consistent with Forest Plan direction. The appropriate approach for relating project-level impacts to broader scale trends depends on the type of monitoring identified for MIS in the *Plumas National Forest Land and Resource Management Plan* (LRMP 1988) as amended by the *Sierra Nevada Forests Management Indicator Species* (SNF MIS) *Amendment Record of Decision* (ROD 2007). Hence, where the Plumas NF LRMP as amended by the SNF MIS Amendment ROD identifies distribution population monitoring for an MIS, the project-level habitat effects analysis for that MIS is informed by available distribution population monitoring data, which are gathered at the bioregional scale. The bioregional scale monitoring identified in the Plumas NF LRMP, as amended, for MIS analyzed for the Walker Fire Recovery Project is summarized in this section.

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

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

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

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

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

There are a myriad of approaches for monitoring populations of MIS, from simply detecting presence to detailed tracking of population structure (USDA Forest Service 2001, Appendix E, page E-19). A distribution population monitoring approach is identified for all of the terrestrial MIS in the 2007 SNF MIS Amendment, except for the

greater sage-grouse (USDA Forest Service 2007a). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations over time. Presence data are collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. The specifics regarding how these presence data are assessed to track changes in distribution over time vary by species and the type of presence data collected, as described in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

Specific Bioregional-Scale Monitoring. This section contains the most up to date information regarding the bioregional-scale habitat information and distribution population monitoring for the black-backed woodpecker.

Summary of Black-backed Woodpecker Status and Trend at the Bioregional Scale. The Plumas NF LRMP (as amended by the SNF MIS Amendment) requires bioregional-scale habitat and distribution population monitoring for the black-backed woodpecker; hence, the snags effects analysis for the Walker Fire Recovery Fire Salvage and Restoration Project must be informed by both habitat and distribution population monitoring data. The sections below summarize the habitat and distribution population status and trend data for the black-backed woodpecker. This information is drawn from the detailed information on habitat and distribution population trends in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a), which is hereby incorporated by reference.

Ecosystem Component Status and Trend. The current average number of medium-sized and large-sized snags (≥ 15" dbh, all decay classes) per acre across major coniferous and hardwood forest types (westside mixed conifer, ponderosa pine, white fir, productive hardwoods, red fir, eastside pine) in the Sierra Nevada ranges from 1.5 per acre in eastside pine to 9.1 per acre in white fir. In 2008, snags in these forest types ranged from 1.4 per acre in eastside pine to 8.3 per acre in white fir (USDA Forest Service 2008).

Data from the early-to-mid 2000s were compared with the current data to calculate the trend in total snags per acre by Regional forest type for the 10 Sierra Nevada national forests and indicate that, during this period, snags per acre increased within westside mixed conifer (+0.76), white fir (+2.66), productive hardwoods (+0.35), and red fir (+1.25) and decreased within ponderosa pine (-0.16) and eastside pine (- 0.14).

Detailed information by forest type, snag size, and snag decay class can be found in the 2010 SNF Bioregional MIS Report (USDA Forest Service 2010a).

National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA) directs all Federal agencies to take into account the effects of their undertakings (actions, financial support, and authorizations) on properties included in or eligible for the National Register of Historic Places. Advisory Council on Historic Preservation regulations found within 36 CFR 800 implement Section 106 process. The Plumas National Forest complies with Section 106 through by its participation in the 2018 Region 5 Programmatic Agreement for Compliance with Section 106. Cultural resource management protocols for the Walker Fire Recovery Project follow the provisions of the Programmatic Agreement and, therefore, complies with the NHPA for a finding of no historic properties effected.

Clean Air Act

The proposed activities would not have a significant impact on air quality standards because of adherence to a Smoke Management Plan and a Burn Plan (consistent with the Clean Air Act).

Clean Water Act

This project complies with the Clean Water Act through use of "Best Management Practices" designed to minimize or prevent the discharge of both point and non-point source pollutants from Forest roads, developments and activities. The Forest incorporated existing and potential erosion sites and water sources into the proposed action to Under the Clean Water Act regulations, the Forest Service is required to obtain permits from the Central Valley Regional Water Quality Control Board (RWQCB). At this time, the Forest Service is working with the RWQCB to secure the appropriate permit(s) for this project.

Endangered Species Act

Biological assessments for endangered and threatened wildlife species have been completed to document analysis

of the potential effects of the alternatives on two listed endangered species and their habitats *(Rana sierrae* and *Canis lupus)*. These analyses, which are summarized in Chapter 3 and presented in detail in the Biological Assessment prepared for the Walker Fire Recovery Project, provided the basis of consultation with USDI Fish and Wildlife Service (FWS). The Forest Service made initial contact with the FWS Forest and Foothills Branch Office in Sacramento, CA regarding the Walker Fire Recovery Project proposal on April 10, 2020. Consultation regarding these species was completed upon receipt of the USFWS' letter of concurrence on May 13, 2020.

The endangered Sierra Nevada yellow-legged frog (*Rana sierra*) and gray wolf (*Canis lupus*) may occur or have proposed suitable habitat in the Walker Fire Recovery area. Implementation of the proposed action for the Walker Fire Recovery Project may affect, is likely to adversely affect the Sierra Nevada yellow-legged frog and may affect, is not likely to adversely affect the gray wolf.

Migratory Land Bird Treaty Act

Under the National Forest Management Act (NFMA, the Forest Service is directed to "provided for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." (P.L. 94-588, Sec 6 (g) (3) (B)). The January 2000 USDA Forest Service (FS) Landbird Conservation Strategic Plan, followed by Executive Order 13186 in 2001, in addition to the Partners in Flight (PIF) specific habitat Conservation Plans for birds and the January 2004 PIF North American Landbird Conservation Plan all reference goals and objectives for integrating bird conservation into forest management and planning.

In late 2008, A Memorandum of Understanding (MOU) between the USDA Forest Service and the USDI Fish and Wildlife Service to Promote the Conservation of Migratory Birds was signed. The intent of the MOU is to strengthen migratory bird conservation through enhanced collaboration and cooperation between the Forest Service and the Fish and Wildlife Service as well as other federal, state, tribal and local governments. Within the National Forests, conservation of migratory birds focuses on providing a diversity of habitat conditions at multiple spatial scales and ensuring that bird conservation is addressed when planning for land management activities.

The Plumas National Forest is proposing to manage lands on the Beckwourth and Mount Hough Ranger Districts. Proposed management would implement direction contained within the Forest Plan. Opportunities to promote conservation of migratory birds and their habitats in the project area were considered during development and design of the Walker Fire Recovery Project (MOU Section C: items 1 and 11 and Section D: items 1, 3, and 4).

Likely impacts to habitats and select migratory bird populations resulting from the proposed action and No Action alternatives of the Walker Fire Recovery Project have been assessed in a project specific Migratory Land Bird Report, Management Indicator Species (MIS) Report, and impacts to select Threatened, Endangered, and Sensitive (TES) bird species and their habitats have been analyzed in the Biological Evaluation/Biological Assessment.

Proposed Action

Changes to habitat as a result of the Walker Fire Recovery Project would affect migratory bird populations that utilize burned forests or snags to meet their habitat needs. Effects to habitat of select migratory species, including the black-backed woodpecker and hairy woodpecker, which utilize burned forest habitat or snags as important habitat attributes have been assessed in the Walker Fire Recovery Project Management Indicator Species (MIS) Report. Effects to TES birds and their habitats have been analyzed in the Walker Fire Recovery Project Biological Evaluation/Biological Assessment.

Impacts to migratory landbirds are expected to vary across the analysis area because the effects of past, present, and reasonably foreseeable future actions vary spatially. The past, present, and future of one part of the analysis area may be quite different from those for another. Due to the complexity of these spatial variations and because each species responds differently to its environment, the direction, magnitude, and duration of impacts to migratory landbirds are also expected to vary. Despite this inherent variability, project management requirements, forest-wide protections, and project design are expected to moderate these impacts to migratory landbirds. For example, in California spotted owl protected activity centers (PACs), implementation of limited operating periods within ¼ mile of nest sites would reduce the scope of potential impacts to this migratory landbird during the nesting season. Riparian buffers on streams within the treatment areas would contribute to snag retention including

snags in the largest size classes and will allow for faster regeneration of shrub and riparian vegetation in those areas. Burned forest habitat would be retained in areas not receiving treatment and through snag retention in riparian buffers, inoperable areas, and through snag retention requirements, which will provide habitat for migratory landbirds adapted to burned areas.

No Action Alternative

Under this alternative the proposed action would not be implemented. All habitat discussed in this document would remain in its current condition with future habitat changes resulting from natural forest regeneration.

CHAPTER 4: External and Internal Scoping Lists

Public Scoping List

The Walker Fire Recovery Project scoping and comment period letter and relevant documents were sent to the following individuals, groups, and agencies:

Table 44. Public Scoping and Comment Period List

Name	Representation
5 Dot Land and Cattle Co.	Range Permit Holder
Aaron Albaugh	Supervisor, District 4, Lassen County Board of Supervisors
Alex Rocco	Mining Claimant
Ann Brown	Center for Biological Diversity
Bill Wickman	Sustainable Forest Action Coalition
Calvin Courtnier	Mining Claimant
Carol Tolen	Mining Claimant
Chad Hanson	The John Muir Project
Chris Gallagher	Supervisor, District 1, Lassen County Board of Supervisors
Cindi Harrington	Mining Claimant
Colt Brockman	Central Valley Regional Water Quality Board
Comstock Gold Prospectors, Inc.	Mining Claimant
Curtis and Anna Bateman	Private Landowner
Cynthia Dawley	Private Landowner
David and Brandy Williams	Mining Claimant
David and Nancy Talbot	Private Landowner
David and Pamela Schaffer	Private Landowner
David Teeter	Supervisor, District 2, Lassen County Board of Supervisors
Dennis Holcomb	Mining Claimant
Derek Heafey	Private Landowner
Don and Shirley Wildes	Mining Claimant
Don Siegel	Mining Claimant
Donald and Patricia Aitken	Private Landowner
Donald Sampfli	Private Landowner
Douglas and Lorena Millar	Private Landowner
Edward and Mary Lou Ebersole	Private Landowner
Feather River Land Trust	Private Landowner

Gloria Farris	Private Landowner
Graydon Johnson	Mining Claimant
Hungry Creek LLC	Private Landowner
Jake Blaufuss	Sierra Pacific Industries
Jeff Engel	Supervisor, District 5, Plumas County Board of Supervsiors
Jeff Hemphill	Supervisor, District 3, Lassen County Board of Supervisors
Joe and Dawn Egan	Range Permit Holder
John Nickerson	Private Landowner
John Zicker	Private Landowner
Jose Sul	Mining Claimant
Joshua Bartella and Sara Darsky	Private Landowner
Judd Leach	Mining Claimant
Justin Augustine	Center for Biological Diversity
Karen Peterson	Private Landowner
Ken and Kathryn Wemple	Ranger Permit Holder
Kenneth and Linda Bailey	Private Landowner
Kenneth and Terri Wiggins	Mining Claimant
Kenneth Falkenstrom	Private Landowner
Kevin Goss	Supervisor, District 2, Plumas County Board of Supervisors
Kin Dessarrssois	Mining Claimant
Larry Millar	Private Landowner
Lilliana Vasey	Private Landowner
Linda Doyle	Mining Claimant
Lori Simpson	Supervisor, District 4, Plumas County Board of Supervisors
Louie Ettlin	Mining Claimant
Lydia Hough	Mining Claimant
Mary Ann and Timothy Wells	Private Landowner
Michael and Annette Cupp	Mining Claimant
N/A	Plumas County Fire Safe Council
Neil Fischer	Collins Pine Company
Norman Allen	Mining Claimant
Pension Services Inc.	Private Landowner
Peter and Rosalinda Bonerz	Private Landowner
Richard and Holly Egan	Range Permit Holder
Scott Stawiarski	American Forest Resource Council

Sherrie Thrall	Supervisor, District 3, Plumas County Board of Supervisors
Sid Calija	Mining Claimant
Steve Brink	California Forestry Association
Steven and Donna Carlon	Private Landowner
Susan Britting	Sierra Forest Legacy
Tauni and Latham Sauvage	Private Landowner
Thomas Teeter	Private Landowner
Tom and Cindy Massie	Mining Claimant
Tom and Vick Flux	Private Landowner
Tom Downing	Sierra Pacific Industries
Tom Hammond	Supervisor, District 5, Lassen County Board of Supervisors
Trina Cunningham	Tribal Consultation
Valerie Landon	Private Landowner
Walter and Elizabeth Kraemer	Private Landowner
William and Nancy Young	Private Landowner
William Reboin	Mining Claimant

Tribal Consultation List

The following Indian tribes and tribal organizations were formally consulted:

Name	Representation
Greenville Rancheria	Federally Recognized Indian Tribe
Susanville Indian Rancheria	Federally Recognized Indian Tribe
Washoe Tribe of Nevada and California	Federally Recognized Indian Tribe
Maidu Summit Consortium	Maidu Tribal Organization/Collaborative
Ya-Mani Maidu Cultural Association	Maidu Tribal Organization/Collaborative

List of Preparers

The individuals listed in Table 45 are members of the Interdisciplinary Team for the Walker Fire Recovery Project. These specialists, as well as other District personnel, contributed to the development and analysis of this EA.

Table 45. Walker Fire Recovery Interdisciplinary Team and Contributors to the Document

Name	Interdisciplinary Team Role
Christopher Frappier	Transportation Planner
Colin Dillingham	Wildlife Biologist
Craig Kusener	Roads Manager
Daniel Elliott	Forest Archaeologist/Heritage Program Manager
Daniel Hopkins	Civil Engineer Technician
Elaine Vercruysse	Tribal Liaison and Partnership Coordinator
Kasandra Meyer	Timber Management Officer

Katherine Carpenter	NEPA Coordinator
Kelby Gardiner	Hydrologist
Kristin Winford	Silviculturist
Kurt Sable	Hydrologist
Kyla Sabo	Timber Management Officer
Leslie Edlund	Recreation Specialist
Lynee Crawford	Geographic Information Systems
Martha Roberts	Rangeland Management Specialist
Michael Friend	Botanist
Morris Johnson	Research Fire Ecologist
Ryan Bauer	Fuels Specialist
William Brendecke	Forest Vegetation Program Manager

CHAPTER 5: Documents Incorporated by Reference and Literature Cited

Documents Incorporated by Reference

The following reports (Table 46) are included in the Walker Fire Recovery Fire Salvage and Restoration Project Record and are available upon request:

Table 46. Documents Incorporated by Reference

Document	Author(s)
Archaeological Reconnaissance Report (Confidential)	Native-X (contract) and Plumas NF
Best Management Practices	Kurt Sable, Hydrologist
Borax Application Report	Kristin Winford, Silviculturist
Economic Analysis	William Brendecke, Forest Silviculturist
Hydrology Report	Kurt Sable, Hydrologist
Management Indicator Species Report	Colin Dillingham, Wildlife Biologist
Migratory Landbird Conservation Report	Colin Dillingham, Wildlife Biologist
Noxious Weed Risk Assessment	Michael Friend, Botanist
Riparian Conservation Objectives Analysis	Kurt Sable, Hydrologist
Road Management Objectives	Christopher Frappier, Transportation Planner
Plant Biological Evaluation	Michael Friend, Botanist
Wildlife Biological Assessment	Colin Dillingham, Wildlife Biologist Matthew Johnson, Wildlife Program Manager
Silviculture Report	Kristin Winford, Silviculturist
Soils Report	Kelby Gardiner, Hydrologist
Plumas National Forest Watchlist Plants Report	Michael Friend, Botanist
Wildlife Biological Evaluation	Colin Dillingham, Wildlife Biologist

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