

Alpine County

Wildfire Risk Mitigation Plan

Draft Initial Study/Mitigated Negative Declaration

December 2020

717 Market Street, Suite 650
San Francisco, CA 94103
650-373-1200
www.panoramaenv.com

PANORAMA ENVIRONMENTAL, INC.

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Draft Initial Study/Mitigated Negative Declaration

December 2020

Prepared for:
Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120
530-694-1361
zwood@alpinecountyca.gov

Prepared by:
Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103
650-373-1200
tania.treis@panoramaenv.com

www.panoramaenv.com

PANORAMA ENVIRONMENTAL, INC.

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List of Acronyms and Definitions

A

AB	Assembly Bill
APCO	Air Pollution Control Officer

B

BLM	Bureau of Land Management

C

CAAQS	California Ambient Air Quality Standards
Cal-IPC	California Invasive Plant Council
CAL FIRE	California Department of Forestry and Fire Protection
CARB	California Air Resources Board
CCIC	Central California Information Center
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGS	California Geological Survey
CH_4	methane
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	carbon monoxide
CO_2	carbon dioxide
CRHR	California Register of Historic Resources
CWPP	Community Wildfire Protection Plan

CWHR	California Wildlife Habitat Relationships

D

dB	decibel
dBA	A-weighted decibel
DTSC	California Department of Toxic Substances Control

E

EAP	Energy Action Plan
EIR	Environmental Impact Report
ESA	environmentally sensitive area

F

FEMA	Federal Emergency Management Agency
FESA	Federal Endangered Species Act
FHSZ	Fire Hazard Severity Zones
FMMP	Farmland Mapping and Monitoring Program
FRA	Federal Responsibility Area
FRAP	CAL FIRE's Fire and Resource Assessment Program

G

GBUAPCD	Great Basin Unified Air Pollution Control District
GBVAB	Great Basin Valleys Air Basin
GHG	greenhouse gas

H

H_2S	hydrogen sulfide
HFCs	hydrofluorocarbons

I

IS/MND	Initial Study/Mitigated Negative Declaration

K

KMPUD	Kirkwood Meadows Public Utility District

L

L_{eq}	equivalent sound level
LRA	Local Responsibility Area
L_{max}	maximum sound level
LUST	leaking underground storage tank

M

MBTA	Migratory Bird Treaty Act
MLD	most likely descendant
MM	mitigation measure

N

N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAHC	Native American Heritage Commission
NO_2	nitrogen dioxide
NRHP	National Register of Historic Places

P

Pb	lead
PFCs	perfluorocarbons
PG&E	Pacific Gas and Electric

PM	particulate matter
PRC	Public Resources Code
PTA	potential treatment area

R

RWQCB	Regional Water Quality Control Board

S

SF_6	sulfur hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SR-	State Route
SRA	State Responsibility Area
SWRCB	State Water Resources Control Board

T

TAC	toxic air contaminant
THPO	Tribal Historic Preservation Officer
TPZ	Timberland Production Zone

U

U.S.	United States
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

W

WEAT	worker environmental awareness training
WRMP	Wildfire Risk Mitigation Plan
WUI	wildland urban interface

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Mitigated Negative Declaration

Project Summary

Alpine County (County) proposes implementation of a Wildfire Risk Mitigation Plan (WRMP) under a Fire Prevention Grant received from the California Department of Forestry and Fire Protection (CAL FIRE). The purpose of the project is to enable the County to implement activities that address the risk of wildfire and that can reduce wildfires that could impact communities. The project considers the implementation of wildfire fuel management activities across Alpine County and identifies specific vegetation management activities that would occur in three high-priority locations.

Project Proponent: Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120

Location: Alpine County, California

Findings

An Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared to assess the project's potential effects on the environment and the significance of those effects. Based on the Initial Study, it has been determined that the proposed project would not have any significant effects on the environment once mitigation measures are implemented. This conclusion is supported by the following findings:

1. The proposed project would have no impact related to any of the following: Agriculture and Forestry; Land Use/Planning; Mineral Resources; Population and Housing; Public Services.
2. The proposed project would have a less-than-significant impact on the following: Aesthetics; Energy; Greenhouse Gas Emissions; Noise; Utilities and Service Systems.
3. Mitigation is required to reduce potentially significant impacts related to the following: Air Quality; Biological Resources; Cultural Resources; Geology and Soils; Hazards and Hazardous Materials; Hydrology and Water Quality; Recreation; Transportation; Tribal Cultural Resources; Wildfire; Mandatory Findings of Significance. Mitigation measures would reduce all significant impacts to a less-than-significant level, and Alpine County has agreed to implement all required mitigation.

The mitigation measures that will be implemented by the County to avoid or minimize environmental impacts are presented at the end of this Mitigated Negative Declaration.

Environmental Determination

On the basis of this initial evaluation:

I find that the Project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared. ☐

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

I find that the Project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required. ☐

I find that the Project MAY have a "potentially significant impact" or "potentially significant impact unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed. ☐

I find that although the project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the project, nothing further is required. ☐

Pursuant to Section 21082.1 of the California Environmental Quality Act, Alpine County has independently reviewed and analyzed the Initial Study and Mitigated Negative Declaration for the proposed project and finds that the Initial Study and Mitigated Negative Declaration reflect the independent judgement of Alpine County. Alpine County further finds that the project mitigation measures shall be implemented as stated in this Mitigated Negative Declaration.

I hereby approve this project:

Signature	Name/Title	Date

Alpine County Board of Supervisors
(to be signed upon approval of the project after the public review period is complete)

Mitigation Measures

MM Air Quality-1: Fugitive Dust Control Measures
The following fugitive dust control measures as outlined in the Great Basin Unified Air Pollution Control District's Rule 401 will be implemented during vegetation management activities. The County shall take reasonable precautions to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the property from which the emission originates. Reasonable precautions include, but are not limited to: • Use, where possible, of water or chemicals for control of dust in vegetation management operations or the clearing of land; • Application of water, or suitable chemicals on unpaved roads, material stockpiles, and other surfaces that can give rise to airborne dusts; • Installation and use of hoods, fans, and fabric filters, to enclose and vent the handling of dusty materials. Adequate contaminant methods shall be employed during such handling operations; • Use of water, chemicals, chuting, venting, or other precautions to prevent particulate matter from becoming airborne in handling dusty materials to open stockpiles and mobile equipment; and • Maintenance of roadways in a clean condition.
Applicable Location(s): Areas where vegetation is cleared.
Performance Standards and Timing: • **Before Activity:** N/A • **During Activity:** (1) Use water or chemicals when using heavy equipment on unpaved roads or in areas with exposed soils, (2) apply water or suitable chemicals to dust-producing surfaces, (3) adequately contain dusty materials, (4) use precautions around dusty materials and mobile equipment, (5) maintain roadways. • **After Activity:** N/A

MM Biology-1: Pre-Construction Plant Survey

Priority Project Treatment Areas (PTAs): Markleevillage, Manzanita, Bear Valley

A qualified botanist shall conduct a pre-construction survey for special-status plants prior to any vegetation-treatment activities occurring in dry montane meadow vegetation communities and within ecotones along roadsides and at areas of transition between upland vegetation communities in all priority PTAs. The plant survey is required to occur during the plant blooming season within the year prior to treatment activities within the PTA. The qualified botanist will flag all special-status plant species for avoidance, and ESA fencing will be installed to protect the plant prior to commencement of vegetation-treatment activities.

Non-Priority PTAs

A qualified botanist shall conduct a pre-construction survey for special-status plants prior to any vegetation-treatment activities occurring in the PTAs. The plant survey is required to occur during the plant blooming season within the year prior to treatment activities within the PTA. The qualified botanist will flag all special-status plant species for avoidance, and ESA fencing will be installed to protect the plant prior to commencement of vegetation treatment activities.

Applicable Location(s): All PTAs that include the applicable habitat described above.

Performance Standards and Timing:

- **Before Activity:** 1) Qualified botanist/biologist conducts pre-construction plant survey and flags special-status species, 2) County or contractor install fence to avoid the plant(s).
- **During Activity:** Ensure that fenced plant populations are not disturbed during vegetation management activities.
- **After Activity:** Remove fencing.

MM Biology-2: Worker Environmental Awareness Training

Prior to implementation of vegetation-management activities within any PTA, the County or its contractor shall develop, and all workers participate in, a PTA-specific environmental awareness training provided by the qualified biologist. The training will identify the work limits of the specific PTA that will be treated. In addition, the training will include the following:

1) Alert the crew to all fenced and/or flagged environmentally sensitive areas and avoidance zones and instruct the crew to keep out of the area.

2) Inform the crew of the potential for special-status species to be encountered on site, where they are most likely to be found, which life forms are most likely to be encountered, and how the specific vegetation management activities implemented in the PTA could affect the species during vegetation-management activities.

3) Discuss the applicable mitigation measures from this IS/MND and any other applicable measures from other documents, such as permits, that have been incorporated into the project.

4) Inform crew of what to do if a sensitive species is encountered during vegetation-management activities. Specifically, crew shall be informed of the following actions:

- If a special-status species enters the treatment area, all work shall stop within 100 feet of the species. Work may resume after the species have vacated the treatment area.
- If vegetation treatment is planned to occur within big sagebrush scrub and dry montane meadow vegetation communities between April and October, crew shall stay alert for signs of ground-dwelling bumble bees and avoid treatment where ground-dwelling bees occur.

Applicable Location(s): All PTAs.

MM Biology-2: Worker Environmental Awareness Training

Performance Standards and Timing:

- **Before Activity:** 1) County to prepare PTA-specific Worker Environmental Awareness Training and 2) crew receive to training from qualified biologist
- **During Activity:** Training to be provided to any new crew members who begin working on the project after the initial training.
- **After Activity:** None.

MM Biology-3: Waters and Wetland Protection Zones

Prior to implementation of vegetation-management activities within any PTA, the County or its contractor shall identify waterbodies and wetland protection zones and implement controls to minimize erosion and runoff in all drainage plans, in accordance with California Forest Practice Rules (Title 14, California Code of Regulations, Chapters 4, 4.5, and 10) (CAL FIRE 2017). Prior to project activity, the County will assign a qualified biologist to identify the locations of riparian habitat and waterbodies as well as corresponding 50-foot (minimum) setbacks (Waters and Wetland Protection Zones) for avoidance. Identification of riparian habitat/waterbodies/wetlands for avoidance will be in addition to and distinguished from any required vegetation-management activities boundary flagging. Waters and Wetland Protection Zones will be identified as appropriate on project maps. Appropriate runoff controls, such as berms, straw wattles, silt fencing, filtration systems, and sediment traps, will be implemented to control siltation and the potential discharge of pollutants. Waters and Wetland Protection Zones and appropriate runoff controls, such as berms, straw wattles, silt fencing, filtration systems, and sediment traps, will be implemented to protect riparian habitat and control siltation and the potential discharge of pollutants.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Conduct riparian zone survey, 2) clearly mark exclusion zone for all identified waterbodies, drainages, or wetlands prior to project implementation, and 3) install appropriate runoff controls.
- **During Activity:** Ensure WRMP activities are conducted outside of exclusion zones and runoff controls are functional and undamaged.
- **After Activity:** 1) Remove flags and markers and 2) remove runoff controls once soils on site are stabilized.

MM Biology-4: Nesting Bird Surveys

If vegetation-management activities occur between March 1 and August 31 on the east slope of Alpine County, and between April 1 and August 31 on the west slope of Alpine County, a qualified biologist shall conduct pre-activity surveys for active nests of special-status and MBTA-protected birds before the start of any project activities. Surveys for nesting raptors will be conducted in accordance with established CDFW raptor survey protocols. If active nests are found, the County will establish avoidance buffers around nests that are sufficient so that breeding is not likely to be disrupted or adversely affected by project activities. An avoidance buffer will constitute an area where project-related activities (i.e., mechanized vegetation removal, pile burning, etc.) will not occur. Ground vegetation may be removed using non-mechanized hand tools if deemed by the biologist that no disturbance to nesting birds would occur. No treatment may be applied to the tree in which the nest occurs. Typical avoidance buffers during the nesting season will be 100 feet for nesting passerine birds and 500 feet for nesting raptors unless a qualified biologist determines that smaller buffers will be sufficient to avoid impacts on nesting raptors and/or other birds. Factors to be considered for determining buffer size will include the following: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory;

MM Biology-4: Nesting Bird Surveys

and baseline levels of noise and human activity. A qualified biologist will monitor any active nests during vegetation-management activities, to ensure that the species is not being harmed or harassed by the noise or activity resulting from project-related activities. Buffers will be maintained until a qualified biologist has determined that young have fledged and are no longer reliant on the nest or parental care for survival.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Conduct pre-construction survey and 2) establish active nest buffers
- **During Activity:** Maintain active nest buffers until the nest is no longer active.
- **After Activity:** N/A

MM Biology-5: Avoid Disturbance or Harm to Terrestrial Wildlife

A qualified biologist shall conduct a pre-construction survey within the PTAs for all potentially occurring terrestrial special-status wildlife species. Nesting bird surveys will occur in accordance with MM Biology-4.

Mammals. A qualified biologist shall conduct a pre-construction survey for special-status mammals identified in **Error! Reference source not found.** of this IS/MND and active special-status mammal forms or dens within the PTA. For surveys in inaccessible areas, the surveying biologist shall use binoculars to scan any suitable denning substrate for potential individuals or forms/dens. The pre-construction survey shall be conducted no more than 14 days before the initiation of vegetation-treatment activities. If an active special-status mammal form/den is identified within the PTA, a 10-foot no-disturbance buffer shall be established around the form/den to avoid disturbance of the nesting/denning mammal until a qualified biologist determines that the young have dispersed. The extent of these buffers shall be determined by the biologist in coordination with CDFW, the County, and the public landowner (USFS, BLM, or State Parks, as applicable) and shall depend on the species identified, level of noise or vegetation-management activity disturbance, line-of-sight between the form/den and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. In addition to the establishment of buffers, other avoidance measures (determined during agency coordination) may be implemented. If any non-denning species are observed in the PTA, the species will be allowed to move out of harm's way on its own. If needed, a qualified biologist will move the species to the nearest area of suitable habitat outside of the treatment area. If applicable, depending on the location and status of the species, agency approval will be obtained before any species is moved. If no active nests/dens are found during the preconstruction surveys, then no additional mitigation is required.

Southern long-toed salamander. A qualified biologist shall conduct a pre-construction survey for southern long-toed salamander if vegetation treatment occurs between April 1 and June 1. The biologist shall survey all suitable potential larval ponds for salamander larvae and adjacent uplands for migrating salamander. All ponds shall be fenced and avoided in accordance with MM Biology-3. Fencing type and installation shall not restrict migration of long-toed salamander into uplands. Any migrating adults observed during pre-construction surveys shall be relocated to an area of suitable habitat out of harm's way.

Following preconstruction surveys and initiation of vegetation management activities, it is possible that wildlife species could subsequently enter or return to the treatment area. The following measures shall be implemented to avoid disturbance or harm to these species:

- If any special-status species or other wildlife species are observed in the treatment area during vegetation-management activities, activities shall cease until the species is allowed to move out of harm's way on its own accord.

MM Biology-5: Avoid Disturbance or Harm to Terrestrial Wildlife

- If the species cannot be allowed to move out of harm's way on its own accord, a qualified biologist shall move the species to the nearest area of suitable habitat outside of the treatment area. If applicable, depending on the location and status of the species, agency approval will be obtained before any species is moved.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Qualified biologist conducts pre-construction surveys and establishes buffers for active natal forms/dens and 2) species are relocated as necessary.
- **During Activity:** Ensure that buffers around natal forms/dens are not disturbed during vegetation-management activities and 2) avoid species traveling through site.
- **After Activity:** N/A

MM Biology-6: Prescribed Burn Planning

Prior to conducting prescribed burns within any PTA, the following planning activities must occur and the appropriate impact avoidance measures described below must be incorporated into the project-specific prescribed burn planning effort (refer to MM Hazards-3).

Special-status plant species: To ensure that prescribed burn activities do not negatively impact special-status plant species, a qualified biologist shall review vegetation communities that occur within the footprint of the prescribed burn area and determine if any special-status plant species have potential to occur within the prescribed burn area. If special-status plant species have the potential to occur within the prescribed burn area, the biologist shall determine if the potentially occurring special-status plant(s) would be negatively affected by application of fire to the landscape. If the potentially occurring special-status plant(s) would be negatively affected by prescribed burn, the County shall either treat the entire PTA using mechanical and hand tool methods, while also implementing MM Biology-1, or complete the following steps to reduce the footprint of the prescribed burn area to avoid special-status plant species:

1. Conduct a pre-construction plant survey during the appropriate blooming season for each special-status plant that may occur within the PTA.
2. Determine if a prescribed burn can be completed while ensuring avoidance of all special-status plant species.
3. Modify the prescribed burn boundary within the project-specific Burn Plan (required in MM Hazards-3) to avoid the special-status plant(s).

A pre-construction plant survey in accordance with MM Biology-1 shall be conducted in all areas where firelines and temporary access or staging will take place. Fireline, access, and staging activities shall avoid special-status plant species.

Special-Status Wildlife: To ensure that prescribed burn activities do not negatively impact special-status wildlife species, a qualified biologist shall conduct a pre-construction survey for all potentially occurring wildlife within the footprint of the prescribed burn area. The pre-construction survey would occur no more than 14 days before the prescribed burn. If special-status wildlife is identified within the prescribed burn area, then the following buffers and additional impact avoidance measures shall be implemented, as applicable:

Prescribed burns shall maintain the following buffers from various sensitive species and wildlife habitats:

- Active bird nests shall be given species-appropriate buffers matching those outlined in MM Biology-4:
  - 100 feet for passerines
  - 500 feet for raptors such as accipiters, buteos, and eagles

MM Biology-6: Prescribed Burn Planning

  - A 10-foot buffer from forms, nests, or dens of Western white-tailed jackrabbit, American badger, Sierra marten, and Sierra Nevada mountain beaver
  - A 50-foot buffer from wolverine, West Coast DPS fisher, and Sierra Nevada red fox dens
  - A 20-foot buffer from occupied bat-roosting trees
  - A 20-foot buffer from ground-dwelling bee colonies
  - The listed buffer areas may be managed using other vegetation-management techniques following each burn (e.g., mechanical or hand tool treatment) but are to remain completely undisturbed during prescribed fire events. Every reasonable attempt shall be made to maintain 0.25 to 0.5 acre (0.1 to 0.2 hectare) of unburned habitat for every 10 acres (4 hectares) of burned habitat (e.g., 4 to 8 acres of retreat habitat are needed for a 160-acre burn, and 9 to 18 acres are needed for a 350-acre burn). Retreat areas shall be conserved randomly throughout the treatment area. These retreat areas may be naturally occurring areas such as rock formations, ponds, and other wetland/riparian areas, areas with a high density of burrows, and other areas not prone to burn, or these areas may be created and maintained using hand tools or water to create fire-breaks or wet-lines.

- No more than 24 hours prior to conducting prescribed fires, visual surveys shall be conducted by walking transects throughout the proposed burn area in an attempt to locate individual special-status wildlife. With permission from CDFW and/or USFWS, a permitted biologist or biological monitor shall capture, transfer, and release in a safe area any special-status reptiles or amphibians deemed to be in danger of being harmed by the prescribed fire activities. If individuals are located during the pre-treatment surveys but escape capture, an area approximately 50 feet (15 meters) in diameter around the individual shall be protected from the burn. If necessary, individuals may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the burn has been completed. The numbers of special-status reptiles and amphibians encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS and CDFW.
- All vehicles involved with the site-specific burn shall be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor shall ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads, and if it is necessary for a vehicle to travel off the designated main road, a monitor shall precede the vehicle to clear wildlife from the pathway of the vehicle. Only biological monitors specifically authorized by the USFWS and CDFW to handle species listed on the federal or State Endangered Species Acts (normally, these shall be individuals holding a federal recovery permit for the species) shall be allowed to handle, transport, and relocate individuals of these species.
- Immediately following each prescribed fire, the permittee shall search the affected post-treatment area to identify dead or injured individuals of all vertebrate taxa. Dead individuals of special-status species shall be collected and deposited at an approved repository. Injured individuals shall be handled only by a permittee authorized to capture and handle the species. The County shall ensure medical assistance is provided to injured animals by a certified wildlife veterinarian familiar with amphibian care.

Sensitive Communities: To ensure that prescribed burn activities within non-priority PTAs do result in substantial adverse effects to sensitive upland communities, prescribed burn planning efforts shall identify all sensitive natural communities within the PTAs, including the community rarity ranking, according to the most recent edition of CDFW's Natural Community List. No prescribed burn is to be conducted within a sensitive community identified with a ranking of S1 (critically imperiled) or S2 (imperiled). Work may be completed within sensitive vegetation communities ranked S1 or S2 using mechanical or hand tools only and must include invasive-species controls identified in MM Biology-6 of this IS/MND.

Applicable Location(s): All PTA.

MM Biology-6: Prescribed Burn Planning

Performance Standards and Timing:

- **Before Activity:** Prepare project-specific prescribed burn planning efforts to include consideration of potentially occurring special-status plant and wildlife species, sensitive vegetation communities, and appropriate avoidance measures indicated in this measure.
- **During Activity:** 1) Implement prescribed burn in accordance with the project-specific prescribed burn planning efforts and 2) maintain appropriate buffers.
- **After Activity:** 1) Search the affected post-treatment area immediately following each prescribed fire.

MM Biology-7: Invasive Species Control

To prevent the accidental introduction or spread of invasive species in the project area during vegetation management activities, the following measures would be implemented:

- Only certified noxious weed-free erosion control materials will be used. All straw material will be sterile and certified as weed-free prior to being used at the PTAs.
- Contractor will wash all construction equipment prior to bringing it onto the job site. Inspection will ensure that equipment arrives on site free of mud and seed-bearing material. If the same contractor will be used for work within multiple PTAs, equipment must be washed between use at each PTA.
- Seed-free mulch will be applied to areas of disturbed soils and de-vegetated slopes. Use of chipped or mulched native material will be applied whenever possible within sensitive natural communities.
- The Environmental Awareness Training described under MM Biology-1 will include information on noxious weeds in the PTAs and instruction on how crew can reduce potential introduction of noxious weeds to the site.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** Ensure all equipment and materials are free of weeds and dried vegetation or mud.
- **During Activity:** Use only certified weed-free straw and erosion-control products.
- **After Activity:** Apply mulch as necessary.

MM Cultural-1: Avoidance of Impacts to Cultural Resources

The following measures shall be implemented during vegetation management activities within any PTA where cultural resources have been inventoried or recorded:

- Prior to initiation of fuels management activities, a 100-foot radius surrounding each known cultural resource site shall be flagged by a qualified cultural resource specialist/archaeologist and designated as an environmentally sensitive area (ESA).
- Treatment activities within the 100-foot ESA shall be limited to hand thinning. The ESA around site ALP-269 should be fully avoided, and no treatment activities will occur within the ESA.
- Mechanical thinning, access roads, skid trails, and staging shall not be permitted within the ESA. All vehicle access shall avoid the ESA, and only foot traffic shall be allowed within the delineated ESA boundary. Pile burning shall not be conducted within the flagged ESA.

Applicable Location(s): Any PTA where cultural resources are known to occur within the project boundary.

MM Cultural-1: Avoidance of Impacts to Cultural Resources

Performance Standards and Timing:

- **Before Activity**: Flag a 100-foot ESA around all cultural resource sites within the PTA.
- **During Activity**: Limit activities within the flagged ESA as appropriate.
- **After Activity**: Remove flags.

MM Cultural-2: Previously Unidentified Cultural Resources

Cultural Resources Training

All employees and contractors shall receive cultural resource training conducted by a qualified cultural resources specialist (e.g., an archaeologist) prior to working in any PTA. The training shall address appropriate work practices necessary to effectively implement the mitigation measures (MM Cultural-1, -3, and -4), for historical resources, archaeological resources, tribal cultural resources, and human remains. The training shall address the potential for exposing subsurface resources, recognizing basic signs of a potential resource, understanding required procedures if a potential resource is identified, including reporting the resource to a qualified archaeologist or cultural resources specialist, and understanding all procedures required under Health and Safety Code § 7050.5 and PRC §§ 5097.94, 5097.98, and 5097.99 for the discovery of human remains. Workers will be specifically instructed as to the following:

- Leave all potential cultural resources (i.e., historical resource, archaeological resource, tribal cultural resource, or human remains) where they are found.
- Avoid all vehicle access within the boundary of an ESA.

The training shall take place during the WEAT required in MM Biology-1.

Procedures for Resource Discovery

In the event that a previously unidentified cultural resource is discovered during implementation of an activity, all work within 100 feet of the discovery shall be halted. The resource shall be located, identified, and recorded in the updated California Department of Parks and Recreation 523 form detailing current conditions. Data regarding archaeological resources shall be shared with Native American tribes identified by the Native American Heritage Commission (NAHC) to be traditionally and culturally affiliated with the geographic area of the PTA.

A qualified cultural resource specialist/archaeologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, the resource shall be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort shall be required. If work must commence in the sensitive area, it must be performed as described in MM Cultural-1. Alternatively, the cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is:

- Eligible for the CRHR (and a historical resource for purposes of CEQA);
- A unique archaeological resource as defined by CEQA; or
- A potential tribal cultural resource (all archaeological resources could be a tribal cultural resource).

If the cultural resources specialist/archaeologist determines that the resource could be a tribal cultural resource, he or she shall, within 48 hours of the discovery, notify each Native American tribe identified by the NAHC to be traditionally and culturally affiliated with the geographic area of the project site of the discovery. A tribal monitor shall inspect the resource to determine whether it constitutes a tribal cultural resource. If the resource is determined not to be a unique archaeological resource, an historical resource, or a potential tribal cultural resource, work may commence in the area.

If the resource meets the criteria for a historical resource, unique archaeological resource, and/or tribal cultural resource, work shall remain halted and the cultural resources specialist/archaeologist shall consult with the County staff regarding methods to ensure that no substantial adverse change would occur to the significance of

MM Cultural-2: Previously Unidentified Cultural Resources

the resource pursuant to CEQA Guidelines Section 15064.5(b). The responding tribes shall be given an opportunity to participate in determining the appropriate mitigation methods for tribal cultural resources in consultation with the County.

Avoidance of the area, or avoidance of impacts on the resource, is the preferred method of mitigation for impacts on cultural resources and shall be required unless there are other equally effective methods. Work may commence upon completion of evaluation, collection, recordation, and analysis, as approved by the qualified cultural resource specialist/archaeologist and tribal monitor, for tribal cultural resources.

Applicable Location(s): Any PTA.

Performance Standards and Timing:

- **Before Activity:** Train employees and contractors how to recognize basic signs of a potential resource and implement the mitigation measures (MM Cultural-1 through MM Cultural-4).
- **During Activity:** (1) Cease activity if a cultural resource is uncovered, (2) avoid resource if possible, and (3) evaluate and determine whether the resource is eligible, unique, or could be a tribal cultural resource. (4) If the resource could be a tribal cultural resource, notify Native American tribe identified by the NAHC to be traditionally and culturally affiliated with the geographic area of the site. (5) If the resource is not eligible, unique, and/or a tribal cultural resource, work may commence. (6) If the resource is eligible, unique, and/or a tribal cultural resource, work remains halted and a method selected to ensure that adverse change to the resource does not occur. (7) Preserve in place if possible. (7) If not possible to preserve in place, and as deemed appropriate by the qualified cultural resource specialist/archaeologist and tribal monitor for tribal cultural resources, recover and record cultural materials. Once recovered and recorded, the activity can commence in this area.
- **After Activity:** N/A

MM Cultural-3: Pre-Activity Record Search and Surveys

Prior to conducting any work in the non-priority PTAs identified in the WRMP that could disturb the ground surface or subsurface, an archival-records search at the Central California Information Center (CCIC) shall be completed.

A pre-activity cultural-resources survey shall be conducted by a qualified archaeologist or cultural resources specialist within PTAs that have not been surveyed in the last 20 years. New resources noted during the field survey shall be recorded and mapped on appropriate California Department of Parks and Recreation 523 forms. In the case of a previously recorded resource, an updated California Department of Parks and Recreation 523 form detailing current condition shall be completed, as appropriate. Alternatively, the County may complete a Cultural Resources Sensitivity Study for non-priority PTAs. The Cultural Resources Sensitivity Study must be prepared by a qualified archaeologist. Project activities in locations identified in a cultural sensitivity study as areas of low sensitivity may occur without a cultural resources field survey as long as tribal outreach and worker training for the recognition of cultural resources are implemented. All other applicable components of MM Cultural-3, including the records search, consultation with Native American tribes, and treatment of resources in accordance with MM Cultural-1, shall apply.

Any historical or archaeological resources located in the PTA (as identified in either previous surveys, in a discretionary records search, or during pre-activity surveys) shall be treated in accordance with MM Cultural-1.

The County shall contact and consult with local Native American tribes identified by the Native American Heritage Commission and request input on Tribal Cultural Resources within the PTAs if any prehistoric resources are identified during pre-activity surveys.

Applicable Location(s): All PTAs that have not been previously surveyed.

Performance Standards and Timing:

- **Before Activity:** N/A
- **During Activity:** 1) Conduct archival-records search, 2) conduct pre-activity survey, 3) comply with MM Cultural-1 for any known resources, and 4) consult with Native American tribes, if appropriate.
- **After Activity:** Update California Department of Parks and Recreation 523 form, if appropriate.

MM Cultural-4: Discovery of Human Remains

If human remains and associated or unassociated funerary objects are exposed during implementation of vegetation-management activities, work within 50 feet of the discovery shall be halted and the find protected from further disturbance. The County Coroner or Medical Examiner shall be notified immediately and, in the event of the determination that the human remains are Native American remains, notification of the Native American Heritage Commission shall be undertaken to obtain a most likely descendant (MLD) (PRC § 5097.98) for treatment recommendations. The County and the MLD shall make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines Section 15064.5[d]). The agreement shall take into consideration the appropriate removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects.

Any findings shall be submitted in a report to the MLD and filed with the CCIC.

Applicable Location(s): All PTAs, if applicable.

Performance Standards and Timing:

- **Before Activity:** N/A
- **During Activity:** (1) Avoid known location of human remains, (2) cease activity if human remains are uncovered, (3) appoint an MLD, (4) protect human remains until a decision is reached. (5) If avoidance is not possible, the County, a professional archaeologist, and an MLD shall be consulted and human remains and associated or unassociated funerary objects shall be removed from the location and relocated to selected location in accordance with the decision reached. Once remains are moved, then the activity can commence again in this area.
- **After Activity:** N/A

MM Geology-1: Erosion Control and Slope Stability Measures

Erosion control measures shall be implemented to ensure WRMP activities do not result in erosion, loss of topsoil, or slope instability in areas where work could expose bare soils or create loss of root-soil matrix strength. The following erosion control measures shall be implemented on sites with loose or unstable soils, steep slopes (greater than 30 percent), or where a large percentage of the groundcover will be removed (leaving groundcover less than 70 percent).

- Minimize areas to be disturbed to the greatest extent feasible.
- Prior to conducting work in any given area that could result in erosion or slope instability (e.g., vegetation removal or prescribed burns that could reduce the groundcover and expose soil), the area shall be inspected for existing signs of erosion or slope instability (e.g. rills, slumped soil).
- Install approved, biodegradable erosion-control measures (e.g., application of forest duff or mulches, straw bales, straw wattles or other erosion-control material, seeding, or planting of appropriate native plant species) and non-filament-based geotextiles (e.g., coir, jute) when causing soil disturbance on moderate to steep (10 percent slope and greater) slopes.

MM Geology-1: Erosion Control and Slope Stability Measures

- Avoid use of heavy equipment on slopes greater than 30 percent unless specialized equipment is used that does not impact slope stability.
- Sediment control devices, if installed, shall be certified weed-free, as appropriate.
- No substantial ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) shall occur during rain events and 48 hours after a rain event, defined as 0.5 inch of rain within a 48-hour or greater period, using the NOAA website as the official record for rain events.

Once work is completed, the areas shall be inspected as needed and as accessible but at least annually until groundcover exceeds 70 percent or it is clear that significant erosion and slope destabilization are not occurring. At that time, erosion control and slope stability devices may be removed at the discretion of County staff.

Applicable Location(s): Any PTAs where the ground is disturbed and soils are exposed through vegetation-management activities with measures specific to areas on steep slopes and sites with loose or unstable soils.

Performance Standards and Timing:

- **Before Activity:** Inspect areas prior to work to assess the potential for erosion and soil instability.
- **During Activity:** Implement protection measures as needed to avoid or minimize erosion and slope destabilization.
- **After Activity:** Conduct inspections as needed, depending on the size and nature of the work and the site, to ensure that erosion is not occurring and to remove any erosion-control devices once they are no longer needed.

MM Geology-2: Firelines During Prescribed Burns

The following measures shall be implemented during prescribed burns to reduce erosion from firelines:

- Use existing barriers such as roads, trails, or wet lines as firelines. If new firelines must be established for a prescribed burn, firelines shall be restored as described below.
- Restore firelines upon completion of the burn if they are not used again (unless they are existing roads, trails, or other permanent elements) within one year of use. Utilize erosion-control measures, such as sediment traps, during restoration to reduce sedimentation impacts. Rehabilitation methods may include use of a hydromulch with locally collected, genetically appropriate native species; pulling duff, litter, and cut material back over lines; and/or distribution of locally chipped fuels on the lines.
- Design prescribed burn boundaries to avoid gullies and highly erodible soils to the fullest extent possible.

Applicable Location(s): Sites within the identified PTAs suitable for prescribed burns.

Performance Standards and Timing:

- **Before Activity**: Determine firelines.
- **During Activity**: Set up provisions as specified in the measure.
- **After Activity**: Restore firelines that will no longer be used upon completion of work.

MM Hazards-1: Spill Prevention and Response

The County shall, at a minimum, implement best management practices that address the following procedures related to the use of hazardous materials during WRMP implementation:

- All workers shall be trained on the specific procedures for hazardous materials and emergency response and reporting procedures as an element of the required worker environmental training in MM Biology-1 prior to working in any PTA.
- Vehicles and equipment will undergo daily inspection for leaks and spill containment procedures.
- Secondary containment and spill rags will be used when fueling onsite.
- Fuels and lubricating oils for vehicles and heavy equipment will not be stored or transferred within 100 feet of any waterbodies unless otherwise isolated from waterbodies by secondary containment.
- Emergency spill supplies and equipment such as oil-absorbent material, tarps, and storage drums shall be available on site to respond in a timely manner if an incident should occur.
- Proper disposal or management of contaminated soils and materials (i.e., clean up materials) will be insured and reporting procedures implemented in accordance with applicable federal, State and local requirements.
- "Topping-off" of fuel tanks will be discouraged.

Applicable Location(s): Any PTA under the WRMP.

Performance Standards and Timing:

- **Before Activity**: N/A
- **During Activity**: (1) Implement appropriate best management practices that limit the potential for leaks and spills and (2) clean up any inadvertent spills appropriately.
- **After Activity**: N/A

MM Hazards-2: Fire Prevention and Suppression Practices

The County shall implement the following best management practices to prevent the ignition and spread of an unplanned fire during implementation of WRMP activities:

- Smoking will not be permitted on site, except in barren areas that measure a minimum of 20 feet in diameter and are cleared to mineral soil. Under no circumstances will smoking be permitted during the fire season (approximately July through October) while employees are operating equipment or are walking or working in forested areas.
- On-site idling of vehicles and vegetation-management equipment shall be minimized.
- All personal vehicles or vegetation-management equipment shall be parked in appropriate parking areas at all times, not located near dry grass or vegetation, and off of main roads and potential evacuation routes, with adequate space for emergency response vehicles to pass.
- All work crews shall maintain appropriate fire-suppression equipment (e.g., extinguishers, shovels) in vehicles at each work site to suppress inadvertently ignited fires.
- Activities that could cause sparks, such as use of mechanical equipment, are required to cease during extreme fire weather, including Red Flag Warning days and localized Public Safety Power Shut-Off events.

Applicable Location(s): Any PTA.

MM Hazards-2: Fire Prevention and Suppression Practices

Performance Standards and Timing:

- **Before Activity**: N/A
- **During Activity**: 1) Smoking shall be limited to permitted areas only, 2) vehicle and equipment idling shall be minimized, 3) fire suppression equipment shall be available on site, and 4) activities that are associated with increase fire risk shall be restricted during high fire-danger conditions.
- **After Activity**: N/A

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning

The following measures shall be implemented to reduce hazards associated with pile and prescribed burning:

- Contractor shall ensure it is an "approved burn day" announced daily by the CARB prior to pile burning and allowed by local fire agencies.
- A Smoke Management Plan shall be prepared and implemented in accordance with GBUAPCD's Rule 411 for any wildland vegetation-management burning projects greater than 1 acre in size.
- A Burn Plan shall be prepared for each prescribed burn in compliance with GBUAPCD Rules 409 – Range Management Burning, 410 – Forest Management Burning, and 411 – Wildland Vegetation Management Burning.
- Piles shall be burned or chipped prior to the fire season and within six months of treatment.
- Piles shall not be burned during the fire season.
- Pile burning shall only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph).
- Piles shall not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills.
- Piles shall be set back at least 100 feet from public roads and trails to minimize risk to residents, recreationalists, and other users.
- All requirements of the GBUAPCD shall be met, including any permit, notification, and reporting requirements.
- Public notification shall be provided at least 24 hours in advance of a prescribed burn to individuals within one mile and at trailheads and access roads leading to the area proposed for burning. The public notification shall include current contact numbers to the appropriate burn coordinator.
- Temporary signage shall be installed at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress.

Applicable Location(s): Wherever stockpiles of slash are made, where piles shall be burned, and where prescribed burns are proposed.

Performance Standards and Timing:

- **Before Activity:** Notify public, post signs, and obtain all permits and make all necessary notifications as required by GBUAPCD.
- **During Activity:** (1) Ensure that piles are located appropriately, (2) ensure proper weather conditions during pile burning, and (3) ensure signage is installed in locations in close proximity to all prescribed burns.
- **After Activity:** Remove signage.

MM Recreation-1: Recreational Facilities Coordination

Prior to planning vegetation-management activities in the Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine PTAs, the County shall identify the entity responsible for management of the recreational facility and coordinate implementation of WRMP activities to be completed outside of the peak recreation season. Any park or facility closures shall be posted in appropriate locations at the facility entrance and/or trailheads and provided on the facility or park webpages, if applicable.

Applicable Location(s): Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine PTAs.

Performance Standards and Timing:

- **Before Activity**: N/A
- **During Activity**: 1) Identify management entity, 2) schedule WRMP activities outside of peak recreation season, and 3) post park/facility closure information on site and online, if applicable.
- **After Activity**: N/A

MM TCR-1: Tribal Site Visit and Recommendations

Prior to implementation of vegetation-management activities within the priority and non-priority PTAs, the County shall:

- Arrange a site visit with the Washoe Tribe, and any other Native American tribe that expresses interest in consulting on the WRMP, to PTAs where resources occur within the PTA boundary.
- Provide the opportunity for the Washoe Tribe, and any other interested Native American tribe, to contribute resource-specific recommendations for the treatment and/or avoidance of known resources to ensure tribal cultural resources are not adversely affected by the WRMP activities.
- Incorporate resource-specific recommendations from tribes into project implementation plans.

Applicable Location(s): All PTAs.

Performance Standards and Timing:

- **Before Activity:** 1) Arrange site visit with Washoe Tribe and additional Native American tribes, if appropriate, and 2) solicit recommendations for the treatment and/or avoidance of tribal cultural resources.
- **During Activity:** Implement resource-specific recommendations for the treatment and/or avoidance of tribal cultural resources.
- **After Activity:** N/A

MM TCR-2: Tribal Outreach and Consultation

Prior to conducting any work in the non-priority PTAs identified in the WRMP, the County shall contact local Native American tribes identified by the Native American Heritage Commission and/or the County's AB 52 tribal contacts list and request input on PTA boundaries, specific avoidance areas, and any known Tribal Cultural Resources within the PTAs.

For any Native American tribe that is interested in providing input on the development of PTA boundaries and/or specific treatment methods to be implemented, the County shall provide all results of record searches and field surveys conducted within or surrounding PTAs, if applicable. The County shall consult with any interested Native American tribe to ensure any impacts to tribal cultural resources are minimized to the greatest extent feasible, including arranging a site visit and implementing site-specific recommendations as required by MM TCR-1.

MM TCR-2: Tribal Outreach and Consultation
Applicable Location(s): All non-priority PTAs.
Performance Standards and Timing: • **Before Activity:** Contact Native American tribes, if appropriate. • **During Activity:** N/A • **After Activity:** N/A

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1 Introduction

1.1 Introduction and Regulatory Guidance

This Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared by the Alpine County Community Development Department to evaluate the potential effects of implementing the Wildfire Risk Mitigation Plan within its jurisdictional boundaries. This document has been prepared in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) and the State CEQA Guidelines (Title 14 of the California Code of Regulations section 15000 et seq.).

An IS is prepared by a lead agency to determine if a project may have a significant effect on the environment (CEQA Guidelines Section 15063[a]) and thus to determine the appropriate environmental document. In accordance with CEQA Guidelines Section 15070, a "public agency shall prepare…a proposed negative declaration or mitigated negative declaration…when: (a) the IS shows that there is no substantial evidence that the project may have a significant impact on the environment, or (b) the IS identifies potentially significant effects but revisions to the project plans or proposal are agreed to by the applicant and such revisions would reduce potentially significant effects to a less-than-significant level." In this circumstance, the lead agency prepares a written statement describing its reasons for concluding that the proposed project would not have a significant effect on the environment and, therefore, does not require the preparation of an Environmental Impact Report (EIR). By contrast, an EIR is required when the project may have a significant environmental impact that cannot clearly be reduced to a less-than-significant effect by adoption of mitigation or by revisions in the project design.

1.2 Purpose of the Initial Study

As described in the environmental checklist (Chapter 2), the proposed project would not result in significant environmental impacts after implementation of certain mitigation measures. This IS concludes that an MND is the appropriate document for compliance with the requirements of CEQA. Under CEQA, the lead agency is the public agency with primary responsibility over approval of the proposed project. Alpine County is the lead agency for the proposed project and has directed the preparation of an analysis that complies with CEQA.

The purpose of this document is to present to decision-makers and the public the environmental consequences of implementing the proposed project. An IS is required in support of an MND and is attached to the MND. This disclosure document is being made available to the public for review and comment. The MND (with the attached IS) is available for a 30-day public review.

Comments should be addressed to:

Zach Wood, Planner III
Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120
zwood@alpinecountyca.gov
Phone: (530) 694-1371

After comments are received from the public and reviewing agencies, Alpine County may (1) adopt the MND and approve the proposed project; (2) undertake additional environmental studies or (3) disapprove the project. If the project is approved, Alpine County may proceed with implementation of the project.

1.3 Summary of Findings

Chapter 2 of this document contains the analysis and discussion of potential environmental impacts of the proposed project. Based on the issues evaluated in that chapter, it was determined that the proposed project would have no impact related to the following resource topics:

- Agriculture and Forestry
- Land Use and Planning
- Mineral Resources
- Population and Housing
- Public Services

Impacts of the proposed project for the following resource topics would be less than significant:

- Aesthetics
- Energy
- Greenhouse Gas Emissions
- Noise
- Utilities and Service Systems

Impacts of the proposed project for the following resource topics would be less than significant with the incorporation of the mitigation measures described in Chapter 2:

- Air Quality
- Biological Resources
- Cultural Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Recreation
- Transportation

- Tribal Cultural Resources
- Wildfire
- Mandatory Findings of Significance

Mitigation measures would reduce all significant impacts to a less-than-significant level. Alpine County has agreed to implement all required mitigation.

1.4 Environmental Permits and Approvals

The project would require approval from Alpine County. Other permits and approvals required for project implementation are identified in Table 1-1.

Table 1-1 Environmental Permits and Approvals

Permit/Approval	Entity	Reason
Landowner right-of-entry agreement	Private landowners	Landowner approval is necessary for any project that occurs on private land.
National Environmental Policy Act (NEPA) Approval	Bureau of Land Management United States Forest Service	NEPA approval from the applicable agency is necessary for any project that occurs on federal land.

1.5 Document Organization

This IS/MND is organized as follows:

Chapter 1: Introduction. This chapter provides an introduction to the environmental review process. It describes the purpose and organization of this and presents a summary of findings.

Chapter 2: Environmental Checklist. This chapter presents an analysis of a range of environmental resource topics identified in the CEQA Environmental Checklist and determines if each issue would result in no impact, a less-than-significant impact, a less-than-significant impact with mitigation incorporated, or a potentially significant impact. If any impacts were determined to be potentially significant, an EIR would be required. For this project, however, none of the impacts were determined to be significant after incorporation of recommended mitigation measures.

Chapter 3: References. This chapter lists the references used in preparation of this IS/MND.

Chapter 4: List of Preparers. This chapter identifies report preparers.

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2 Environmental Checklist

2.1 Project Information

1. **Project Title**

   Alpine County Wildfire Risk Mitigation Plan (WRMP)

2. **Lead Agency Name and Address**

   County of Alpine

3. **Contact Person and Phone Number**

   Debbie Burkett, Director
   Alpine County Community Development Department
   (530) 694-1361

4. **Project Location**

   Various locations in Alpine County. Refer to Table 3-1 in the WRMP for each project area's boundaries.

   Priority Project Potential Treatment Areas (PTAs):

   - Markleevillage (Project #1)
   - Manzanita (Project #2)
   - Bear Valley (Project #3)

   Non-Priority PTAs:

   - Grover Hot Springs (Project #4)
   - Mesa Vista (Project #5)
   - Hung-A-Lel-Ti (Project #6)
   - Turtle Rock Park (Project #7)
   - Bear Valley (Project #8)
   - Manzanita (Project #9)
   - Lake Alpine (Project #10)
   - Diamond Valley (Project #11)
   - Highway 89 (Project #12)

5. **Project Sponsor's Name and Address**

   Alpine County Community Development Department
   50 Diamond Valley Road
   Markleeville, CA 96120

6. **General Plan Designation and Zoning**

   The PTAs are included within the Open Space, Rural Residential, Residential Low Density, and Residential Medium Density General Plan land use designations and within the following zoning districts: Residential Neighborhood, Planned Development, Agriculture, and Timber Preserve.

7. **Description of Project**

   The County proposes to adopt and implement a WRMP, prepared under a Fire Prevention Grant received from CAL FIRE. The WRMP was prepared to identify areas of highest wildfire risk within the County and to define vegetation and fuel-management activities to reduce risks. The plan identifies 12 projects, with three projects prioritized and described in detail. The three priority projects are addressed at a project level while the remaining nine projects as well as other fuel reduction activities (such as prescribed burning) are addressed at a programmatic level. Refer to attached Wildfire Risk Mitigation Plan (Appendix A) for a detailed project description.

8. **Surrounding Land Uses and Setting**

   The WRMP area is located within Alpine County. The PTAs are adjacent to residential uses, agricultural uses, forest uses, and recreational uses.

9. **Other Public Agencies Whose Approval is Required**

   None.

10. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, is there a plan for consultation that includes, for example, the determination of significance of impacts to tribal cultural resources, procedures regarding confidentiality, etc.?**

    The Washoe Tribe of Nevada and California was consulted during the preparation of this Initial Study. Refer to Section 2.3.18 Tribal Cultural Resources.

2.2 Environmental Factors Potentially Affected

Section 2.3 of this IS checklist evaluates the potential environmental impacts of the WRMP. Each environmental resource subsection includes an Environmental Setting and Discussion component. The Environmental Setting component summarizes the existing conditions at the regional, subregional, and local levels, as appropriate, and identifies applicable plans and technical information for the issue area. The Discussion component provides a detailed discussion of each environmental issue checklist question. The level of significance for each resource topic is determined by considering the predicted magnitude of the impact. Four levels of impact significance are evaluated in this IS checklist:

No Impact. The project would not have the impact described. The project may have a beneficial effect, but there is no potential for the project to create or add increment to the impact described.

Less-Than-Significant Impact. The project would have the impact described, but the impact would not be significant. Mitigation is not required; however, the project applicant may choose to modify the project to avoid the impacts.

Less Than Significant with Mitigation. The project would have the impact described, and the impact could be significant. One or more mitigation measures have been identified that will reduce the impact to a less-than-significant level.

Significant and Unavoidable Impact. The project would have the impact described, and the impact could be significant. The impact cannot be reduced to a less-than-significant level by incorporating mitigation measures. An environmental impact report must be prepared for this project.

Resource topics that would have no impact as a result of the project are not discussed beyond the resource checklist. The environmental factors checked below would be potentially affected by the project, but impacts would be mitigated to a less-than-significant level as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agricultural and Forestry Resources	☒ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Energy Use
☒ Geology and Soils	☐ Greenhouse Gas Emissions	☒ Hazards and Hazardous Materials
☒ Hydrology and Water Quality	☐ Land Use and Planning	☐ Mineral Resources
☐ Noise	☐ Population and Housing	☐ Public Services
☒ Recreation	☒ Transportation	☐ Utilities and Service Systems
☒ Tribal Cultural Resources	☒ Wildfire	☒ Mandatory Findings of Significance

2.3 Environmental Checklist and Impact Discussion

2.3.1 Aesthetics

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
1. AESTHETICS. Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway or designated scenic roadway?	☐	☐	☒	☐
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from a publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

Environmental Setting

Open space and scenic vistas of valleys, mountains, and meadows are the dominant elements of the landscape scale character in Alpine County. The complex and diverse topographic conditions within Alpine County are characterized by high, rugged peaks and ridges, deep canyons, mountain meadows, and numerous streams and lakes. Elevations within Alpine County range from just over 4,500 feet to well over 11,000 feet above sea level. Elements of the built environment (structures, roads, and other man-made improvements) are present; however, these elements are clearly secondary to the dominant natural landscape. The WRMP addresses the entirety of Alpine County, which features low-density development in a few existing communities and large areas of undeveloped lands and natural areas. The Bear Valley priority PTA is located within the Bear Valley residential community and contains many structures in the wildland urban interface (WUI). The Manzanita priority PTA is located east of the Manzanita residential community in mostly open space. The Markleevillage priority PTA includes fuel-treatment activities within the Markleevillage neighborhood as well as in the open space areas east and south of residences. For each of the PTAs, scenic quality is generally considered high, and viewer sensitivity is also high.

Several State scenic highways and scenic roadways are located within Alpine County. State Route (SR) 88 is an officially designated State scenic highway from the Amador County line

through Alpine County to the Nevada state line. SR-4 is an officially designated State scenic highway from the Calaveras County line to SR-89. The portion of SR-89 that travels through Alpine County is also an officially designated State scenic highway (Caltrans, 2019). Ebbetts Pass National Scenic Byway is a 61-mile stretch of SRs 4 and 89, in between the towns of Arnold in Calaveras County and Markleeville in Alpine County, California. The State scenic highways are shown in Figure 2-1and identified in Table 2-1.

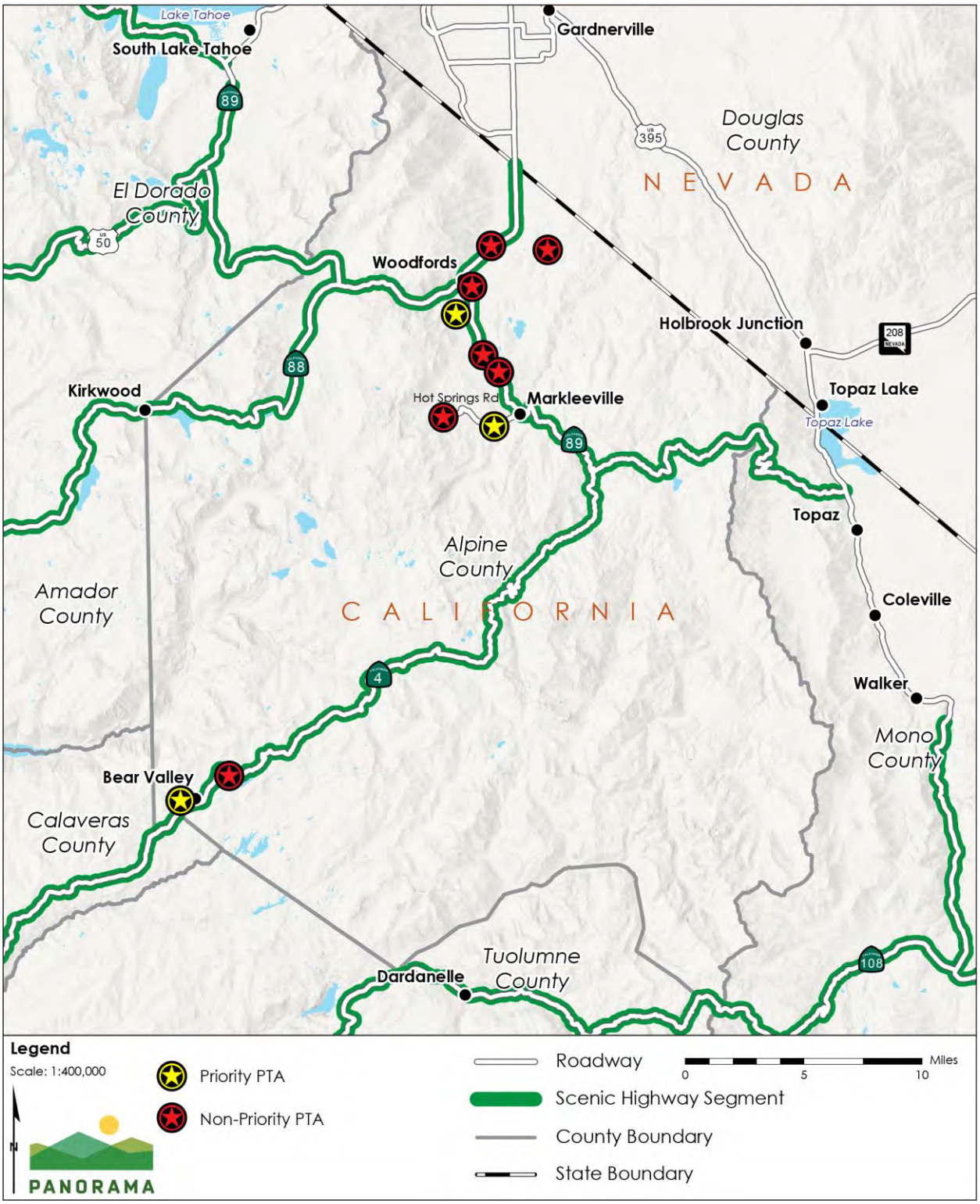
Element I, Section K of the Alpine County General Plan includes several policies designed to maintain and improve existing aesthetic resources in Alpine County which apply to these roadways (Alpine County, 2017).

Table 2-1 Scenic Highways Within 1 Mile of PTAs

Highway or Roadway	Priority PTAs Within 1 Mile	Non-Priority PTAs Within 1 Mile
SR-4	Bear Valley	Lake Alpine
SR-88	Manzanita	Mesa Vista Diamond Valley
SR-89	Manzanita Markleevillage	Turtle Rock Park Diamond Valley Highway 89
Ebbetts Pass National Scenic Byway	Bear Valley Markleevillage	Lake Alpine

Source: (Caltrans, 2019)

Figure 2-1 State Scenic Highways in Alpine County



Discussion

a) Would the project have a substantial adverse effect on a scenic vista?

Priority PTAs

Alpine County features various natural landscapes and unique scenic vistas of valleys, mountains, and meadows. The East Fork of the Carson River, from Hangman's Bridge crossing of SR-89 to the Nevada border, was designated as a State Scenic River in 1989 (Alpine County, 2017). The river is located approximately 1 mile east of the Markleevillage PTA. Mechanized equipment, work crews, and the post-project condition at the Markleevillage PTA likely would not be visible from this scenic vista, however, due to the distance, or if visible would only be viewable for a short period of time. Prescribed burning would not be implemented in the priority PTAs, but smoke may be temporarily visible from scenic vistas from pile burning at the Manzanita or Markleevillage priority PTAs. The visual impacts from implementation of the priority PTAs would not substantially affect scenic vistas because the PTAs would occur in relatively developed areas and would be similar to existing fuel management features and activities already in place within the county (e.g., fuel breaks, unpaved fire access roads, and prescribed burn areas). Impacts would be less than significant.

Non-Priority PTAs

Fuel-treatment projects within the non-priority PTAs under the WRMP may be visible from scenic vistas throughout the County and would include views of equipment and work crews, vegetation and debris piles, prescribed and/or pile burning, and associated smoke. Upon completion of vegetation-management activities, the treated areas would still resemble a natural forest with removal of dead vegetation, ladder fuels, smaller trees, and understory. Vegetation management activities would not involve substantial tree removal; therefore, scenic views of landscapes, which typically include views of canopy vegetation, would not be substantially altered with implementation of the WRMP. Impacts would be less than significant.

b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a State scenic highway or designated scenic roadway?

As described in the environmental setting above, the officially designated State scenic highways SR-4, SR-88, and SR-89 and Ebbetts Pass National Scenic Byway are located within Alpine County. The Bear Valley PTA is directly adjacent to SR-4, the Manzanita PTA is located within 0.5-mile of SR-88, the Markleevillage PTA is within 0.5-mile of SR-89, and portions of the Manzanita PTA is directly adjacent to SR-89. Several of the non-priority PTAs are within the vicinity of State-designated scenic highways or roadways (as shown in Figure 2-1 and described in Table 2-1). Although priority and non-priority PTAs may be in proximity to scenic highways and roadways, in many cases, intervening topography or vegetation would block views of vegetation-management equipment and post-project conditions. Priority or non-priority PTAs that border scenic roadways would be visible to motorists traveling on scenic highways or roadways. Motorists could observe implementation of vegetation-management activities that occur very close to the roadway. Views of equipment, crew, and post-project conditions would be of short duration (only a few seconds to a few minutes when driving at highway speeds) as motorists pass by. The WRMP activities would be similar to existing fuel-treatment actions and

features within the County (e.g., vegetation removal, pile burning, and fuel breaks) and would not include substantial removal of large trees (i.e., over 10 inches in diameter). Following vegetation-management activities, the treatment areas would still resemble a natural forest, and impacts would not change the unity, intactness, or character of the landscape. Implementation of the WRMP would not substantially damage scenic resources within a scenic highway or scenic roadway. Impacts would be less than significant.

c) Would the project substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

Priority PTAs

Overview

Alpine County is characterized by steep terrain contrasted by valleys and meadows and, therefore, numerous public vantage points are dispersed throughout the county. Several rural residential communities are located in Bear Valley, Manzanita, and Markleeville, where residents utilize local roads and may be able to view the priority PTAs.

Views of priority PTA implementation from public roadways would only be temporarily visible to motorists, and the work is consistent with similar fuel-treatment activities currently implemented in this region. Views of priority PTAs from recreational areas, hiking trails, roads, and scenic vistas may be experienced for longer durations but, similarly, views of work occurring is not out of character for the region and is perceived as temporary. During implementation of the WRMP activities, views of the three priority PTAs may include equipment, work crews, pile burning (only at Manzanita or Markleevillage PTAs), and smoke. Pile burning and smoke would only be visible for a short period of time. Large-scale prescribed fires would not be conducted in the three priority PTAs.

Long-term impacts to public views after implementation of the priority PTAs would include slightly altered landscapes following vegetation thinning and removal. Figure 2-2 provides an example of what priority PTAs may look like prior to and following vegetation-treatment activities. Similar fuel-reduction and vegetation-management projects have been conducted widely throughout the county, and the priority PTAs are small in comparison to the vast unaltered open space; therefore, the change in visual character as a result of the priority PTAs would not substantially degrade the existing visual character or quality of public views of the priority PTAs. Over time, viewers adjust to any changes in vegetation density and appearance in their expectations of visual character.

Impacts on visual quality and character both during and after implementation of vegetation management in the priority PTAs would be less than significant. The impacts to visual character and quality of public view is discussed in greater detail by region in the following sections.

Figure 2-2 Examples of Vegetation Thinning

Prior to fuel thinning.

After fuel thinning.

Bear Valley PTA

The Bear Valley PTA may be visible from nearby mountain peaks, including Bloods Ridge, Mattley Ridge, Sapps Hill, and Inspiration Point near Lake Alpine. The Bear Valley PTA is located approximately 2 miles southwest of Lake Alpine but would not be visible from the lake due to the distance, intervening topography, and tree cover between the two locations. The Alpine Bear Valley Mountain Resort, located approximately 1 mile north of the PTA, also attracts many visitors during the winter season. Only hand-thinning methods would be implemented at the Bear Valley PTA, and minor vegetation reduction and removal would not be noticeable from a distance post implementation.

Manzanita PTA

The Manzanita PTA may also be visible from nearby mountain peaks, including Hawkins Peak and Pickett Peak. Indian Creek Reservoir and campground is a popular recreational destination located approximately 2 miles east of the Manzanita PTA and likely would not afford a view of the site; however, even if the Manzanita PTA could be seen from this site, the views would consist solely of the tree canopy. Equipment would not likely be visible during implementation. Post implementation, the canopy could appear as somewhat thinned, but the overall character of the forested appearance would remain, minimizing perceived visual impact.

Markleeville PTA

Grover Hot Springs State Park is located approximately 1.5 miles from the Markleevillage PTA and attracts many visitors during the summer months. Motorists traveling on Hot Springs Road to reach Grover Hot Springs State Park may be able to view WRMP activities that contrast with the visual unity of the forest; however, views would only last a few seconds, and temporarily witnessing equipment, personnel, or pile burning is not out of character or unexpected within

the county. Post implementation, the canopy could appear as somewhat thinned, but the overall character of the forested appearance would remain, minimizing perceived visual impact.

Non-Priority PTAs

Depending on the location and proximity to public vantage points, fuel-treatment activities under the WRMP may be located within public view near the PTAs. Vegetation management activities may be visible from public vantage points surrounding the PTAs, but most impacts on public views would be temporary and only visible during implementation of the WRMP. Activities proposed under the WRMP include manual and mechanical vegetation-treatment methods, pile burning, and prescribed burning. Project equipment, work crews, debris piles, smoke, blackened ground, and reduced ground cover may be visible prior to, during, or following implementation of fuel-treatment activities; however, the activities proposed under the WRMP are similar to previous fuel-reduction projects conducted on U.S. Forest Service (USFS) land and are not unique to the existing landscape. Prescribed burns, if implemented, would only be used in Hung-A-Lel-Ti, Lake Alpine, Mesa Vista, and Turtle Rock Park PTAs and would not be visible to a large number of people due to the remote location. Prescribed fire would be managed and supervised by trained personnel to ensure that only ground-cover vegetation is burned, leaving the tree canopy unaltered. The blackened area resulting from prescribed fires would likely only be visible for one growing season. PTAs would be impacted on a small scale compared to the large areas of open space throughout the county; therefore, implementation of the WRMP would not substantially degrade the existing visual character of Alpine County. Substantial tree removal (e.g., trees over 10 inches in diameter) would not occur under the WRMP and, after implementation of fuel treatment projects, the treated areas would still resemble the surrounding forested area, would appear natural, albeit with thinner vegetation, and would not be out of character for the region. Significant degradation of visual character and quality would not occur. Over time, viewers adjust to any changes in vegetation density and appearance in their expectations of visual character. Impacts would be less than significant.

d) Would the project create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Vegetation management activities in both the priority and non-priority PTAs would be performed typically during the day and would not require artificial lighting. Some activities could extend into the night where vehicle lighting to manage the activities may be used, but light would be temporary and limited to a few evenings. Glare from equipment needed to implement various WRMP activities is not anticipated. Implementation of the proposed activities would not create a new source of substantial light or glare. The impact would be less than significant.

2.3.2 Agriculture and Forestry

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
2. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104[g])?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

Environmental Setting

Farmland is classified by the California Department of Conservation according to its ability to support crops or livestock. The most commonly used system for classifying agriculture in California is the Farmland Mapping and Monitoring Program (FMMP). The FMMP categorizes farmland into five types: Prime Farmland; Farmland of Statewide Importance; Unique Farmland; Farmland of Local Importance; and Grazing Land. These designations are described in order of productivity, from the most productive to the least productive farmland. According to the FMMP, Alpine County does not include any designated Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance (California Department of Conservation, 2016). The California Land Conservation Act of 1965 (California Government Code 51200–51295), commonly known as the Williamson Act, provides incentives

to property owners (property tax reductions) to keep their lands in active agricultural production. Property owners sign contracts agreeing not to develop their properties for a period of at least ten years. Alpine County has yet to execute any Williamson Act contracts (California Department of Conservation, 2018).

Section 12220(g) of the California Public Resources Code defines forest land as land that can support 10 percent native-tree cover of any species, including hardwoods, under natural conditions and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. "Timberland" is land owned by the federal government and designated by the State Board of Forestry and Fire Protection as experimental forest land that is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Sections 51112 or 51113 (h) of the California Public Resources Code defines "Timberland Production Zone" (TPZ) as land used for growing and harvesting timber and compatible uses. The County's Zoning Ordinance contains provisions for TPZ. In accordance with County ordinance and State law, landowners can apply to have forested lands zoned TPZ if the lands meet certain specified requirements. Significant tax savings can be realized by landowners who apply and qualify for TPZ zoning. The USFS defines a forested area as "forest land" if it is at least one acre in size and at least 10 percent occupied by forest trees of any size or formerly having had such tree cover and not currently developed for non-forest use. Over 91 percent of Alpine county is located within national forests. Alpine County has considerable acreages of lands that meet the federal and State definitions of forest land.

Open Space is the predominant land-use designation included in the Alpine County General Plan, which includes uses related to the wise use and protection of natural resources including, but not limited to, the protection or development of mineral resources, the growing or harvesting of forest products, ranch or farm-type agricultural production, protection of important wildlife and aquatic habitats, preservation of significant view corridors, and dispersed recreation such as hunting, fishing, hiking, cross-country skiing, and camping (Alpine County, 2017). Most known or suspected commercial timber lands are given an open space designation on the County's Land Use Map. The Zoning Code (Alpine County Code, Title 18) includes Agriculture and Timber Preserve zoning designations that are consistent with the Alpine County General Plan land-use designations. The northern, western, and southern boundaries of the Bear Valley PTA are adjacent to land zoned as Agriculture. The entire Manzanita PTA is located on Agriculture-zoned land. The Markleevillage PTA also includes land zoned as Agriculture and Timber Preserve.

Discussion

a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

As described above, Alpine County does not include any designated Prime Farmland, Unique Farmland, Farmland of Statewide Importance, or Farmland of Local Importance; therefore, the WRMP would not be implemented within any of these land use areas. No impact would occur.

b) Would the project conflict with existing zoning for agricultural use or a Williamson Act contract?

Portions of Alpine County include lands zoned for agricultural use. Implementation of the WRMP would not involve any land-use changes, and the proposed fuel-treatment activities would comply with existing zoning regulations; therefore, no conflict with existing zoning for agricultural use would occur. The priority and non-priority PTAs are neither on nor adjacent to any land designated as a Williamson Act parcel (California Department of Conservation, 2018). No impact would occur.

c) Would the project conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220[g]), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104[g])?

Alpine County includes lands zoned for forest land and timberland that are subject to the requirements provided in the Alpine County Zoning Ordinance and General Plan. Fuel treatment activities under the WRMP may be implemented within forest land or timberland, and the Markleevillage PTA comprises land zoned as Timber Preserve. However, the WRMP would not involve rezoning nor conflict with the Alpine County General Plan or County Code provisions; therefore, no impact would occur. Rezoning to timberland would not be required to perform the vegetation-management work. Impacts would be less than significant.

Should any of the wood removed as part of the WRMP be sold as a commercial product, it should be noted that the work may be subject to the Forest Practice Rules and may require the preparation of a Timber Harvest Plan with approval from CAL FIRE.

d) Would the project result in the loss of forest land or conversion of forest land to non-forest use?

The WRMP fuel-treatment activities involve the use of hand thinning along with mechanical mastication and prescribed burn where feasible. Trees would not be removed on a large scale, nor would clear cutting and full-scale timber harvest occur. Ground vegetation and ladder fuels would be removed to reduce the speed and intensity of fires and to restore the forest to a more fire resilient landscape. The WRMP implementation does not require any changes in land use; the use of the land following implementation of the WRMP would be the same as the existing land use. Treatment areas would remain forested following WRMP implementation, and no loss or conversion of forest land would occur; therefore, there would be no impact or potential to change a forest land to a non-forest use.

e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

As described above, the WRMP would involve thinning and removal of ground vegetation and ladders fuels within identified PTAs throughout Alpine County. The fuel-treatment activities would not conflict with existing zoning for agricultural use. No farmland is currently designated in Alpine County under the FMMP. Fuel treatment activities would not include substantial tree removal resulting in conversion of forest land. No impact would occur.

2.3.3 Air Quality

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☒	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	☒	☐

Environmental Setting

Alpine County is located within the Great Basin Valleys Air Basin (GBVAB) under the jurisdiction of the Great Basin Unified Air Pollution Control District (GBUAPCD). The GBVAB is north of the Mojave Desert and south of the Great Basin just along the Sierra Nevada on the eastern edge of California. Air quality within Alpine County is regulated by agencies including the U.S. Environmental Protection Agency (USEPA) and California Air Resources Board (CARB) at the federal and State levels, respectively, and locally by GBUAPCD. The GBUAPCD was established in 1974 with a joint-powers agreement between Alpine, Mono, and Inyo Counties. The GBUAPCD is responsible for enforcing federal, State, and local air quality regulations and ensuring that the GBVAB is in compliance with or moving towards compliance with federal and State air quality standards.

Various air pollutants may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation. Several criteria air pollutants have been identified by the USEPA and CARB as being of concern both on a nationwide and statewide level: ozone; carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead; and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM_{10}) and PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). The USEPA and CARB also regulate toxic air contaminants (TACs), also known as hazardous air pollutants. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health.

Federal, State, and local plans, policies, laws, and regulations provide a framework for addressing aspects of air quality that would be affected by the WRMP. Health-based air quality

standards have been established for the criteria air pollutants by USEPA at the national level and by CARB at the State level; these standards are referred to as the National Ambient Air Quality Standards (NAAQS) and the California Ambient Air Quality Standards (CAAQS), respectively.

Alpine County is designated as a nonattainment area for State PM_{10} standards; however, the nonattainment designation was made for the whole GBUAPCD area. As noted in the Alpine County General Plan, none of the test sites used to make this determination are located in Alpine County. The predominant sources of PM_{10} pollution in Alpine County are from controlled burns and wildfires. Alpine County is either in attainment or unclassified for all other State and federal air quality standards (see Table 2-2 below). Due to the rural lifestyle, low population density, and limited industry, the County's air quality is generally of good quality.

Any prescribed burning or pile burning implemented under the WRMP would be subject to the GBUAPCD's Smoke Management Program. The Smoke Management Program was developed in cooperation with the CARB, public and private land managers, and fire protection authorities for the purpose of minimizing adverse air quality impacts related to smoke from prescribed burning within the GBUAPCD's jurisdictions. The GBUAPCD has regulations related to open outdoor fires and prescribed burning for agricultural operations, forest management, range management, and wildlands and wildland/urban interface areas. Smoke Management Plans are required for forest management and wildland vegetation management burning, and the requirements vary depending on the size of the burn or amount of material burned (GBUAPCD, 2001).

Prescribed burning is only allowed on days when weather and/or fuel moisture conditions would not create a wildfire risk. "No burn" day determinations are declared by fire protection agencies and override permissive burn day determinations made by CARB.

Table 2-2 Alpine County Area Designations for State and National Ambient Air Quality Standards

Criteria Pollutant	State Designation	Federal Designation
Ozone	Unclassified	Unclassified/attainment
PM_{10}	Nonattainment	Unclassified
$PM_{2.5}$	Attainment	Unclassified/attainment
Carbon Monoxide (CO)	Unclassified	Unclassified/attainment
Nitrogen Dioxide (NO_2)	Attainment	Unclassified/attainment
Sulfur Dioxide (SO_2)	Attainment	Unclassified/attainment
Sulfates	Attainment	--
Lead (Pb)	Attainment	Unclassified/attainment
Hydrogen Sulfide (H_2S)	Unclassified	--
Visibility Reducing Particles	Unclassified	--

Source: (CARB, 2018; CARB, 2019)

Discussion

a) Would the project conflict with or obstruct implementation of the applicable air quality plan?

Four air quality plans have been developed for specific locations within the GBUAPCD boundaries (Owens Valley PM_{10} SIP, Mono Basin PM_{10} SIP, Coso PM_{10} SIP, Mammoth Lakes PM_{10} SIP); however, none of the plans include Alpine County. The WRMP would not conflict with or obstruct implementation of any air quality plans, and no impact would occur.

b) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?

Priority PTAs

By nature, air pollution is largely a cumulative impact. The nonattainment status of regional pollutants is a result of past and present development in the GBVAB, and this regional impact is cumulative rather than being attributable to any one source. A project's emissions may be individually limited but cumulatively considerable when taken in combination with past, present, and future development projects.

As described above, the entire area within the boundary of the GBUAPCD has been designated as a nonattainment area for PM_{10} under the State air quality standards; however, none of the test sites used to make that determination are located in Alpine County. Vegetation-management-related activities would result in short-term PM_{10} emissions from site preparation, use of off-road equipment, vehicle and equipment exhaust emissions, and vehicle travel. Fugitive dust emissions are associated primarily with site preparation and vary as a function of soil silt content, soil moisture, wind speed, acreage of disturbance, and vehicle miles traveled (VMT) on and off site. Only short-term, implementation-related activities and small-scale pile burning would produce PM_{10} emissions during implementation of the priority PTAs. Pile burning would not be implemented in the Bear Valley priority PTA. Dust and smoke emissions (typically, PM_{10} emissions) would be short term and are expected to remain localized and dissipate within the immediate vicinity. Given the limited PM_{10} that could be generated by implementation of the WRMP in priority PTAs, since the work would not involve grading or significant ground disturbance, impacts would be less than significant.

Pile burns would need to be performed in compliance with the GBUAPCD's Smoke Management Program regulations, and a Smoke Management Plan may be required, depending on the amount of material anticipated to be burned for pile burns. The regulations and limitations are established to minimize smoke impacts on ambient air quality. Emissions impacts from pile burning would be less than significant if all regulations are followed.

Non-Priority PTAs

The fuel treatment activities under the WRMP would generate short-term, intermittent PM_{10} emissions from vegetation removal (mainly through use of equipment), pile burning, and/or prescribed burning. Prescribed burning would not occur in the three priority PTAs and is only considered for the Hung-A-Lel-Ti, Lake Alpine, Mesa Vista, and Turtle Rock Park PTAs.

Because the GBVAB is a nonattainment area for PM_{10} under the State air quality standards, a significant contribution of PM_{10} emissions from implementation activities in combination with prescribed burning could result in a significant impact. The GBUAPCD has developed District Rules to reduce PM_{10} emissions within the basin. District Rule 401 includes provisions to reduce fugitive dust emissions from ground disturbance activities, and District Rule 404-A establishes limits to the amount of particulate matter discharge by pound per hour (GBUAPCD, 1981; GBUAPCD, 2006). At this time, the exact boundaries and extent of activities to be implemented in the non-priority PTAs have not been defined, but impacts are considered potentially significant for the purpose of this air quality assessment. To ensure impacts associated with vegetation-management-activity-related dust emissions would not be significant, MM Air Quality-1 would be implemented, which requires the application of the fugitive dust-control measures outlined in GBUAPCD's Rule 401 to reduce potential impacts.

By reducing heavily overgrown vegetation, the WRMP would reduce the incidence of catastrophic wildfires, thereby reducing emissions of greenhouse gases (GHGs) and increasing the carbon sequestration of forest areas. All prescribed burns in the PTAs, excluding the priority PTAs, would comply with the GBUAPCD Smoke Management Program. The WRMP would not result in a cumulatively considerable net increase of PM_{10} emissions or any criteria pollutants for which the GBVAB is in nonattainment. With implementation of MM Air Quality-1, impacts would be less than significant.

MM Air Quality-1: Fugitive Dust Control Measures

The following fugitive dust control measures as outlined in the Great Basin Unified Air Pollution Control District's Rule 401 will be implemented during vegetation management activities.

The County shall take reasonable precautions to prevent visible particulate matter from being airborne, under normal wind conditions, beyond the property from which the emission originates. Reasonable precautions include, but are not limited to:

- Use, where possible, of water or chemicals for control of dust in vegetation management operations or the clearing of land;
- Application of water, or suitable chemicals on unpaved roads, material stockpiles, and other surfaces that can give rise to airborne dusts;
- Installation and use of hoods, fans, and fabric filters, to enclose and vent the handling of dusty materials. Adequate contaminant methods shall be employed during such handling operations;
- Use of water, chemicals, chuting, venting, or other precautions to prevent particulate matter from becoming airborne in handling dusty materials to open stockpiles and mobile equipment; and
- Maintenance of roadways in a clean condition.

Applicable Location(s): Areas where vegetation is cleared.

Performance Standards and Timing:

- **Before Activity:** N/A
- **During Activity:** (1) Use water or chemicals when using heavy equipment on unpaved roads or in areas with exposed soils, (2) apply water or suitable chemicals to dust-producing surfaces, (3) adequately contain dusty materials, (4) use precautions around dusty materials and mobile equipment, (5) maintain roadways.
- **After Activity:** N/A

c) Would the project expose sensitive receptors to substantial pollutant concentrations?

Sensitive Receptors

Some members of the population, including children, older adults, and persons with pre-existing respiratory or cardiovascular illness, are especially sensitive to air-pollutant emissions. Such people are given additional consideration when the impacts of projects on air quality are evaluated. At-risk land uses that are sensitive to poor air quality would include residences, schools, daycare centers, playgrounds, medical facilities, and nursing homes. Recreational land uses, such as parks, also are considered moderately sensitive to air pollution.

Priority PTAs

Residential communities and other sensitive receptors are scattered throughout Alpine County and may be located near or adjacent to priority PTAs. The Bear Valley and Markleevillage priority PTAs are located within residential communities. Residential land uses are directly adjacent to the Manzanita PTA. Residents in these areas may be exposed to pollutants during implementation of the fuel-treatment activities conducted under the projects. As described in impact statements a) and b), the WRMP would not conflict with an existing air quality plan and would not result in the cumulative increase in criteria pollutants. Emissions generated from the implementing of vegetation management at the priority PTAs would be short term and intermittent and are assumed to be implemented between 2022 to 2024. Emissions would vary depending on the project site and treatment methods used. The three priority PTA activities involve the use of hand tools and mechanical masticators (where appropriate) for thinning and pruning and chipping or pile burning for the treatment of slash and vegetation removed. No prescribed burns would be conducted. Pile burns would not be conducted in the Bear Valley priority PTA. If pile burning is required in the Manzanita or Markleevillage priority PTAs, it would generally occur outside of the peak recreation season; however, pile burns would emit smoke emissions that could impact nearby residents or other sensitive receptors. Implementation of MM Hazards-3 requires piles to be set back at least 100 feet from public roads and trails to minimize risk to residents, recreationalists, and other users. In accordance with District Open Burning Rules, piled material to be burned would be prepared so that it will burn with a minimum of smoke in accordance with the GBUAPCD's Smoke Management Program regulations for open burning to limit the potential for smoke to drift and affect a sensitive population. Implementation of the vegetation-treatment activities in the priority PTAs would not result in long-term substantial pollutant concentrations that could impact sensitive populations as no emissions would occur after completion of the work. Substantial pollutant concentrations would not be generated during implementation of the fuel-treatment projects, and no significant impacts would occur to sensitive receptors near the priority PTAs with implementation of MM Hazards-3 and following all regulations related to pile burning.

Non-Priority PTAs

As described above, rural residential areas and sensitive receptors are scattered throughout Alpine County and may be located near PTAs. Diamond Valley, Turtle Rock Park, Grover Hot

Springs, Mesa Vista, and Lake Alpine are also located near residential areas and other sensitive receptors. Equipment and vehicles, pile burning, and prescribed burning may emit pollutants during vegetation-management activities; however, emissions would be temporary and minimized with implementation of MM Hazards-3 and through following GBUAPCD Smoke Management Program and Rules and Regulations for prescribed burning. Prescribed burns, if large enough to generate smoke that could impact sensitive receptors, would require the preparation of a Smoke Management Plan. The plan would include measures to minimize the amount of smoke that could drift and impact sensitive receptors. Many other limitations would be applicable to reduce smoke impacts on sensitive receptors, such as limiting prescribed burning to only certain weather and wind conditions. Smoke from prescribed burns would only last for a day or two. The WRMP would not result in long-term substantial pollutant concentrations; therefore, the WRMP would not expose sensitive receptors to substantial pollutant concentrations. The impact would be less than significant with implementation of mitigation.

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning

Refer to Section 2.3.9: Hazards and Hazardous Materials

d) Would the project result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

The WRMP would result in short-term diesel exhaust emissions from on-site vegetation-management equipment. Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by the CARB in 1998. Exhaust from diesel equipment, as well as smoke from pile burning and prescribed burns proposed only in the non-priority Hung-A-Lel-Ti, Lake Alpine, Mesa Vista, and Turtle Rock Park PTAs, may emit odors during implementation of the WRMP. Due to the temporary nature of these emissions and the diffusion of diesel exhaust, nearby receptors would not likely be adversely affected by project-related diesel exhaust or resulting odors. Nearby residences could be subject to brief periods of the smell of smoke, similar to a campfire smell, but the duration of impact would be limited. These emissions would be localized and generally confined to the immediate area surrounding the PTA. Any minor odors emitted during projects under the WRMP would be typical of most construction sites and vegetation-management projects within Alpine County. The WRMP would not result in other emissions, including odors, affecting a substantial number of people. The impact would be less than significant.

2.3.4 Biological Resources

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
4. BIOLOGICAL RESOURCES. Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

Environmental Setting

Vegetation Communities and Habitat Available in PTAs

Vegetation communities and habitats present within the priority PTAs were inventoried during visits to the Manzanita, Markleevillage, and Bear Valley sites during the months of July and August 2020. A total of 890 acres of Alpine County were inventoried (Paulus, 2020).Vegetation community inventory methodology and figures identifying the location of vegetation communities within each priority PTA are provided in Appendix B.

Vegetation communities within the non-priority PTAs were identified using CAL FIRE's Fire and Resource Assessment Program (FRAP) vegetation layer. The FRAP vegetation layer is developed from various data sets representing the best available land-cover data for the State. Data from these various sources are then converted to California Wildlife Habitat Relationships[1] (CWHR) habitat types. The FRAP vegetation layer is the most comprehensive data set of vegetation mapping available for the State. Vegetation communities identified using the FRAP vegetation layer provide a planning-level understanding of communities within the non-priority PTAs.

Vegetation types within the PTAs provide the primary basis for developing characterizations of the habitats available for potentially occurring special-status plants and animals. Sensitive plant community occurrence was also inventoried in the priority PTAs and are denoted in Table 2-3 below with an asterisk. Sensitive communities are determined by the global and State rarity ranks for plant and animal species in the California Natural Diversity Database (CNDDB).

Table 2-3 Vegetation Communities Present in the Priority PTAs

Community Name and CDFW Association Number	CNDDB Alliance Name and Primary Association	Acreage in Priority PTA
Manzanita		
Jeffrey pine forest	Jeffrey pine	
87.020.36	*Pinus jeffreyi-Ceanothus cordulatus-Artemisia tridentata*	146
Aspen forest	Aspen grove (S3.2)	
61.111.06*	*Populus tremuloides-Artemisia tridentata*	1.5
Montane manzanita chaparral	Greenleaf manzanita chaparral	
37.303.02	*Arctostaphylos patula-Quercus vacciniifolia*	251
Big sagebrush scrub	Mountain big sagebrush	
35.111.00	*Artemisia tridentata-Purshia tridentata*	20.1
Montane riparian scrub	Mountain alder thicket	
61.210.00*	*Alnus incana-Salix* spp.	4.3
Modoc-Great Basin riparian scrub	Arroyo willow thicket	

[1] CWHR is a state-of-the-art information system that contains life history, geographic range, habitat relationships, and management information on 712 species of amphibians, reptiles, birds, and mammals known to occur in the state. CWHR products aid in understanding, conserving, and managing California's wildlife.

Community Name and CDFW Association Number	CNDDB Alliance Name and Primary Association	Acreage in Priority PTA
61.201.00	*Salix lasiolepis-Prunus virginiana*	22.1
Wet montane meadow	(Narrow-leaved Sedge)	
45.000.00	*Carex angustata*-herbaceous	0.5
Dry montane meadow	Kentucky bluegrass turf	
42.060.00	*Poa pratensis*-herbaceous	11.0
	Markleevillage	
Jeffrey pine Forest	Jeffrey pine	
87.020.07	Pinus jeffreyi	65.4
87.020.21*	Pinus jeffreyi-Purshia tridentata	123
Singleleaf piñon woodland	Singleleaf pinyon	
87.040.00	Pinus monophylla-Artemisia tridentata	3.0
Big sagebrush scrub	Mountain big sagebrush	
35.111.00	Artemisia tridentata-Purshia tridentata	30.1
Montane black cottonwood riparian forest	Black Cottonwood	
61.120.03*	Populus trichocarpa-Pinus jeffreyi	12.2
Aspen riparian forest	Aspen grove (S3.2)	
61.111.09*	Populus tremuloides-Pinus jeffreyi	10.2
61.111.20*	Populus tremuloides-Poa pratensis	0.4
61.111.00*	Populus tremuloides-Prunus virginiana	0.2
Modoc-Great Basin riparian scrub	Arroyo willow thicket	
61.201.00	*Salix lasiolepis-Alnus incana-Salix* spp.	3.0
Wet montane meadow	(Narrow-leaved sedge)	
45.000.00	*Carex angustata*-herbaceous	4.1
Dry montane meadow	Kentucky bluegrass turf	
42.060.00	*Poa pratensis*-herbaceous	8.6
45.106.00	*Agrostis gigantea-Poa pratensis*	4.0
Dry montane meadow	Creeping ryegrass turf	
41.080.01*	*Elymus triticoides*-herbaceous	2.8

Community Name and CDFW Association Number	CNDDB Alliance Name and Primary Association	Acreage in Priority PTA
Bear Valley		
Sierran mixed coniferous forest	White fir	
88.500.00	*Abies concolor-Pinus jeffreyi-A.magnifica*	40.6
Jeffrey pine forest	Jeffrey pine	
87.020.30	*Pinus jeffreyi-Abies concolor*	3.5
87.020.10*	*Pinus jeffreyi-Ceanothus cordulatus*	7.4
Lodgepole pine forest	Lodgepole pine	
87.080.00	*Pinus contorta* ssp. *murrayana*	10.4
Aspen forest	Aspen grove (S3.2)	
61.111.04*	*Populus tremuloides*-upland	1.9
61.111.16*	*P. tremuloides-Symphoricarpos rotundifolius*	1.6
Mountain whitethorn chaparral	Mountain whitethorn	
37.209.00	*Ceanothus cordulatus-Quercus vacciniifolia*	16.9
Dry montane meadow	(Arrowleaf balsamroot)	
- -	*Balsamorhiza sagitata*-herbaceous	11.9
Mixed montane chaparral	Bitter cherry shrubland	
37.970.00	*Prunus emarginata-Frangula purshiana-Salix* spp.	0.4
Wet montane meadow	Blue wildrye montane meadow	
41.640.00*	*Elymus glaucus-herbaceous*	0.3
Wet montane meadow	Kentucky bluegrass turf	
42.060.00	*Poa pratensis-herbaceous*	1.0

* Indicates plant communities that are designated “sensitive” as described before this table.

Special-status Species with Potential to Occur in the PTAs

Special-status species include those listed as endangered, threatened, rare, or proposed for listing by U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW) and species with a California Native Plant Society (CNPS) Rank of 1 or 2. The following sources were reviewed to determine the potential for special-status plant and wildlife species to occur in the vicinity of the PTAs:

- CNDDB

- USFWS
- CNPS CalFlora
- California Invasive Plant Council (Cal-IPC)

Lists of special-status plant and animal species that potentially could occur within the PTAs were compiled. Literature describing the life histories of each species was reviewed in order to highlight those species that potentially could use the habitats available at each priority PTA. Pedestrian inventories of the habitats potentially available within the non-priority PTAs have not been completed; therefore, species that have been recently identified and recorded (i.e., within the last 15 years) are treated as though they may occur within the PTA. These species lists (Appendix B) were produced by reviewing regional data (CNPS 2001, 2020, CalFlora 2020, CDFW 2020a-d, Consortium of California Herbaria, 2020), regional floras (Baldwin, et al., 2012, Jepson Flora Project, 2020), reporting of biological resource surveys in preparation of local environmental documents (Cardo-Entrix, 2014, BLM, 2020), and personal communications with local agency biologists. July 2020 searches of the California Natural Diversity Database (CNDDB) records (CDFW, 2020e-g) for nine quadrangles surrounding each project area were conducted, and results are shown in Table 2-4 and Table 2-5.

Species with potential to occur are considered to be "special status" if they:

- Have State or federal status as rare, threatened or endangered (CDFW 2020a, 2020c);
- Are listed in the CNDDB lists of special plants and wildlife (CDFW 2020b, 2020d);
- Meet the definitions of rare or endangered wildlife species under the CEQA Guidelines;
- are listed by CNPS in their inventory of sensitive California plants (CNPS 2001, 2020); or
- Are included in the most recent sensitive plant lists or watch lists prepared by USFS, Stanislaus and Humboldt-Toiyabe National Forests (USFS, 2013), or Bureau of Land Management, Mother Lode Office, sensitive species lists (BLM, 2015).

No plant species listed by USFWS as Endangered or Threatened under the federal Endangered Species Act (FESA) are known to occur within 20 miles of the priority PTAs. State-listed plant species or species of special concern with potential to occur in a PTAs are listed in Table 2-4. Special-status wildlife with potential to occur in the PTAs are included in Table 2-5.

Table 2-4 Special-status Plant Species with Potential to Occur in the PTAs

Common Name	Scientific Name	Rank or Status[1]		Flowering Period	Communities	MV	MZ	BV
		CNPS	CNDDB					
Aquatic felt lichen	*Peltigera gowardii*	4.2	S3	-	Mixed montane chaparral Wet montane meadow			√
Bolander's candlemoss	*Bruchia bolanderi*	4.2	S3	-	Mountain alder thicket Arroyo willow thicket Wet montane meadow		√	
Broad-nerved hump moss	*Meesia uliginosa*	2B.2	S3	-	Mountain alder thicket Arroyo willow thicket Wet montane meadow		√	
Blandow's bog moss	*Helodium blandowii*	2B.3	S2	-	Mountain alder thicket Arroyo willow thicket Wet montane meadow	√	√	
Upswept moonwort	*Botrychium ascendens*	2B.3	S2	Sporangia June–Sept	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√	√	√
Scalloped moonwort	*Botrychium crenulatum*	2B.2	S3	Sporangia June–Sept	Mixed montane chaparral Wet montane meadow		√	√
Mingan moonwort	*Botrychium minganense*	2B.2	S3	Sporangia June–Sept	Mixed montane chaparral Wet montane meadow		√	√
Western goblin	*Botrychium montanum*	2B.1	S2	Sporangia June–Sept	Mixed montane chaparral Wet montane meadow			√

Common Name	Scientific Name	Rank or Status[1]		Flowering Period	Communities	MV	MZ	BV
		CNPS	CNDDB					
Stebbins' lomatium	*Lomatium stebbinsii*	2B.3	S3	June–Aug	Sierran mixed coniferous forest Jeffrey pine forest Aspen forest Mountain whitethorn chaparral Dry montane meadow			√
Fiddleleaf hawksbeard	*Crepis runcinata*[2]	2B.2	S3	July–Aug	Dry montane meadow	√	√	
Subalpine cryptantha	*Cryptantha crymophila*	1B.3	S3	July–Aug	Dry montane meadow (at lava cap habitat only)			√
Tall draba	*Draba praealta*	2B.3	S3	June–Aug	Mixed montane chaparral Wet montane meadow			√
Great Basin claytonia	*Claytonia umbellata*	2B.3	S1	May–Aug	Jeffrey pine forest Aspen grove	√	√	
Subalpine fireweed	*Epilobium howellii*	4.3	S4	July–Aug	Mountain alder thicket Arroyo willow thicket Wet montane meadow	√	√	
Marsh willowherb	*Epilobium palustre*	2B.3	S2	July–Sept	Mountain alder thicket Arroyo willow thicket Wet montane meadow	√	√	
Carson Valley monkeyflower	*Erythranthe carsonensis*	1B.1	S1	April–June	Greenleaf manzanita chaparral Big sagebrush scrub Disturbed/devegetated	√	√	
Jack's wild buckwheat	*Eriogonum luteolum*	1B.2	S1	July–Sept	Jeffrey pine forest Aspen grove Disturbed/devegetated	√	√	

Common Name	Scientific Name	Rank or Status[1]		Flowering Period	Communities	MV	MZ	BV
		CNPS	CNDDB					
Golden violet	*Viola purpurea* ssp. *aurea*	2B.2	S2	April–June	Jeffrey pine forest Singleleaf pinyon woodland Big sagebrush scrub Dry montane meadow	√	√	
Three-bracted onion	*Allium tribracteatum*	1B.2	S2	March–May	Dry montane meadow (at lava cap habitat only)			√
Davy's sedge	*Carex davyi*	1B.3	S3	June–Sept	Jeffrey pine forest Singleleaf pinyon woodland Big sagebrush scrub Dry montane meadow	√	√	√
Porcupine sedge	*Carex hystericina*	2B.1	S2	May–June	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√		
Liddon's sedge	*Carex petasata*	2B.3	S3	June–July	Jeffrey pine forest Singleleaf pinyon woodland Big sagebrush scrub Dry montane meadow	√	√	
Western valley sedge	*Carex vallicola*	2B.3	S2	July–Aug	Jeffrey pine forest Singleleaf pinyon woodland Big sagebrush scrub Dry montane meadow	√	√	

Common Name	Scientific Name	Rank or Status[1]		Flowering Period	Communities	MV	MZ	BV
		CNPS	CNDDB					
Water bulrush	*Schoenoplectus subterminalis*	2B.3	S3	June–Sept	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√		
Mountain bentgrass	*Agrostis humilis*	2B.3	S2	July–Aug	Jeffrey pine forest Singleleaf pinyon woodland Big sagebrush scrub Dry montane meadow	√	√	
Robbins' pondweed	*Potamogeton robbinsii*	2B.3	S3	Aug–Sept	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√		

1. Rank or status, by agency:
CNPS = California Native Plant Society listings (CNPS, 2020)
1B = rare and endangered in California and elsewhere
2B = rare, threatened, or endangered in California, but more common elsewhere
4 = plants of limited distribution in California – watchlist species.
Threat Code extensions:
.1 = seriously endangered in California (over 80% of occurrences threatened/high degree and immediacy of threat)
.2 = fairly endangered in California (20 to 80% of occurrences threatened)
.3 = not very endangered in California (< 20% of occurrences threatened or no current threats known).
CNDDB = California Natural Diversity Data Base rankings (CDFW, 2020b)
S1 = Critically Imperiled: often 5 or fewer populations, or steep rate of decline
S2 = Imperiled: often 20 or fewer populations, steep decline, or very restricted range
S3 = Vulnerable: often 80 or fewer populations, declining or restricted range
S4 = Apparently Secure: uncommon but not rare in California

2. syn. *Crepis runcinata* ssp. *hallii*

Table 2-5 Special-Status Wildlife Species with Potential to Occur in the PTAs

Taxonomic Group	Species	Status[1] CDFW / State Ranking	Communities	MV	MZ	BV
Insects						
Western bumblebee	*Bombus occidentalis*	Candidate/S1	Big sagebrush scrub Dry montane meadow	√	√	
Mono checkerspot butterfly	*Euphydryas editha monoensis*	S1/S2	Big sagebrush scrub Dry montane meadow	√	√	
Fish						
Mountain sucker	*Catostomus platyrhynchus*	SCC/S3	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub	√	√	
Mountain whitefish	*Prosopium williamsoni*	SSC/S3	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub	√	√	
Amphibians						
Southern long-toed salamander	*Ambystoma macrodactylum sigillatum*	SSC/S3	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√	√	√
Birds						
Sharp-shinned hawk	*Accipiter striatus* (nesting)	WL/S4	Sierran mixed coniferous forest Jeffrey pine forest Lodgepole pine forest			√
Willow flycatcher	*Empidonax traillii* (nesting)	Endangered/S1S2	Black cottonwood riparian forest Willow riparian scrub	√		

Taxonomic Group	Species	Status[1] CDFW / State Ranking	Communities	MV	MZ	BV
Bald eagle	*Haliaeetus leucocephalus* (nesting)	Endangered/FP/S3	Jeffrey pine forest Black cottonwood riparian forest Quaking aspen riparian forest	√	√	
Osprey	*Pandion haliaetus* (nesting)	WL/S4	Sierran mixed coniferous forest Jeffrey pine forest Lodgepole pine forest			√
Mammals						
Sierra Nevada mountain beaver	*Aplodontia rufa californica*	SSC/S2S3	Black cottonwood riparian forest Quaking aspen riparian forest Willow riparian scrub Wet montane meadow	√	√	
Western white-tailed jackrabbit	*Lepus townsendii townsendii*	SSC/S3?	Jeffrey pine forest forms in singleleaf pinyon woodland forms in big sagebrush scrub	√	√	
American badger	*Taxidea taxus*	SSC/S3	Jeffrey pine forest burrows in singleleaf pinyon woodland burrows in big sagebrush scrub	√	√	√
Sierra Nevada red fox	*Vulpes vulpes necator*	Threatened/S1	Jeffrey pine forest Singleleaf pinyon woodland burrows in big sagebrush scrub	√	√	

1. Rank or status, by agency:

CDFW = State of California under the California Endangered Species Act (CDFW, 2020d)

SSC = Species of Special Concern

WL = Watchlist species of limited distribution or recent decline

State ranking = CNDDB State Conservation Ranking as reported by CDFW (2020d)

S3 = Vulnerable: often 80 or fewer populations, declining or restricted range

S4 = Apparently Secure: uncommon but not rare in California

Discussion

a) Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Priority PTAs

Plants

Large populations of special-status plants were documented in upland habitats in the priority PTAs during the field inventory. The field inventory was not conducted during the plant blooming season; therefore, it is possible that additional special-status plant species occur in other habitats throughout the PTAs and were not observed due to the time of the inventory. Suitable habitat for special-status plant species occurs within the priority PTAs (Table 2-4). Special-status species may occur on the individual project sites within the PTAs where suitable habitat occurs, including where vegetation-treatment activities may be implemented or temporary access roads may be established. Small populations of special-status plant species may occur in dry montane meadow vegetation communities and ecotones—areas of transition between vegetation communities. Ecotones were documented along roadsides and at areas of transition between upland vegetation communities (Paulus, 2020).

If a small population of special-status plants were to occur in an area where vegetation treatment occurs or where temporary access roads are established, the impact from equipment or crew trampling of a special-status plant could be significant. Due to the robust population of special-status plants in upland habitats, equipment or vegetation-treatment activities would not substantially impact the upland populations, and the impact would be less than significant (Paulus, 2020). However, the impact from disturbance of special-status plants within dry montane meadow vegetation communities as well as within ecotones along roadsides and at areas of transition between upland vegetation communities would be significant. MM Biology-1 requires that a pre-construction survey occur within dry montane meadow vegetation communities and within ecotones along roadsides and at areas of transition between upland vegetation communities in each priority PTA within one year prior to implementation of vegetation-management activities. The pre-construction survey must occur during the blooming season for plants that may occur within each PTA. Any special-status plant species observed during the pre-construction survey would be flagged, and the plant would be fenced off during vegetation-management activities to ensure the plant is avoided. If plants are senescent or not occurring in the year of proposed work, the population would not likely be impacted. Vegetation-treatment activities proposed in the priority PTAs would involve minimal soil disturbance that could impact seed banks. Measures to reduce erosion of topsoil, including minimization of soil disturbance, restriction of activities on steep slopes, and implementation of soil-stabilization measures are also included (MM Geology-1). MM Biology-2 requires worker training that would reduce the potential for direct impacts related to construction worker contact with special-status plant species to a less-than-significant level. The impact on special-status plants would be less than significant with mitigation.

Special-status Wildlife

Fish. Two special-status fish species have potential to occur within creeks that occur in the Manzanita and Markleevillage PTAs (Table 2-5). No habitat for special-status fish occurs in the Bear Valley PTA. Project activities would not directly impact special-status fish because no vegetation treatment is proposed to occur in waterbodies or within the riparian habitat adjacent to waters. Indirect impacts to fish may occur through reduced water quality from increased erosion and sedimentation of streams caused by vegetation removal. Water quality may also be affected by accidental releases of fuels or lubricants near waterbodies. MM Biology-3 requires establishment of protection zones around waters, including riparian habitat, and use of appropriate runoff controls. MM Geology-1 limits erosion-generating work practices and requires implementation of erosion-control measures to reduce erosion and sedimentation. MM Hazards-1 requires spill prevention and containment measures. Implementation of mitigation would ensure water quality within the creeks is not degraded and fish are not indirectly impacted by vegetation treatment activities. The impact would be less than significant with mitigation.

Amphibians. The southern long-toed salamander has potential to occur in all three priority PTAs (Table 2-5). Adult southern long-toed salamanders live in burrows of small mammals or underground in loose, moist soil and heavy duff. They are visible and perhaps most vulnerable to direct impacts of forestry machinery and practices as they migrate above ground between habitats to reach nearby breeding ponds. Migration occurs during the period between snow/ice melt in early April and about June 1. Larval salamanders, which hatch from eggs in middle to late summer, may transform to terrestrial adults prior to winter or may remain in the pond as untransformed larvae for up to one year. Larval survivorship is dependent upon stable, productive pond conditions where crustaceans or tadpoles are present as prey (Paulus, 2020).

Impacts to larval salamanders may occur if water quality within the ponds is degraded. If an impact occurred to salamanders, it would be significant. MM Biology-3 requires avoidance of ponds and use of runoff controls to avoid impacts to runoff into ponds. MM Hazards-1 requires the use of best management practices to reduce the potential for fuel or oil leaks or accidental releases and ensures proper clean-up procedures to avoid degradation of water quality in ponds. Possible impacts to the southern long-toed salamander could also occur from machinery-related mortality or injury to migrating individuals if adult salamanders are present during the time of vegetation treatment. MM Biology-5 requires that the County conduct pre-construction surveys for salamander within the ponds and uplands if work is to occur between April 1 and June 1. Migrating individuals would be relocated to nearby suitable habitat, if found. Impacts to southern long-toed salamanders would be less than significant with mitigation.

Insects. Western bumble bee and Mono checkerspot butterfly have some potential to occur within the Markleevillage and Manzanita PTAs (Table 2-5). Neither species was observed during the field inventory; however, there is still potential for the species to occur. Bumble bees, if present, would occur at underground colony nest sites that may occur in upland habitats near wildflower pollen and nectar sources. Colonies, if present, would be active aboveground and

easily discoverable during the entire growing season (early April to late October). If vegetation treatment activities occur during this period and the colony were to fail due to WRMP activities, the impact would be significant. MM Biology-2 requires that the worker environmental awareness training (WEAT) inform crew to avoid ground-dwelling bee colonies if observed during vegetation-management activities. The impact would be less than significant with mitigation.

Special-status and Migratory Birds. Four special-status bird species have some potential to occur within the priority PTAs. Willow flycatcher and bald eagle may nest in trees found in the Markleevillage and Manzanita PTAs. Sharp-shinned hawk and osprey may nest within the Bear Valley PTA.

Migratory birds may also use the PTAs for foraging and nesting. Migratory Bird Treaty Act (MBTA) provisions prohibit direct destruction of nests or project activities that would indirectly threaten nesting success. Active nests are protected resources under Fish and Game Code Sections 3503, 3503.5, 3511, and 3513, and raptor nests may be protected from destruction even when inactive. On the east slope of Alpine County (i.e., within Markleevillage and Manzanita), the breeding period for birds is March 1 through August 31 and on the west slope of Alpine County (i.e., Bear Valley) is April 1 through August 31. Work initiated during the breeding period has the potential to cause nest destruction, nest abandonment, and/or mortality of young as a result of mechanized vegetation treatments as well as of standing tree, snag, or downed bole removal, regardless of habitat type. MM Biology-4 requires a pre-construction nesting bird survey prior to commencement of vegetation-treatment activities. Reduced activity buffers would be implemented around active nests, and work within the buffer zone would be completed using only non-mechanized hand tools until the nest is no longer active. Any tree that contains an active nest would not receive treatment until the nest is no longer active.

Mammals. There is some potential for four special-status mammals to occur in the priority PTAs. Sierra Nevada Mountain beaver may occur within riparian habitats and perennial streams. Rapidly growing trees can generate substantial deadwood at their bases; however, project treatments that remove woody accumulations of mid-canopy willows and taller quaking aspen where they occur directly within the banks of perennial streams, or at springs and streamside willow patch habitat, could destroy occupied burrow systems or could increase predation upon mountain beavers due to loss of concealing cover. The impact would be significant. MM Biology-3 would ensure that riparian habitats are avoided during project vegetation management activities so that the impact remains less than significant.

Western white-tailed jackrabbits and American badgers inhabit a variety of upland montane habitats in the Eastern Sierra Nevada, including big sagebrush scrub, singleleaf pinyon woodland, and Jeffrey pine forest, which provide a substantial shrub cover. One or more litters may be raised in shallowly depressed "form" nests during the period of May through July. Occupied forms would be most likely to be found in areas that support the densest sagebrush (Paulus, 2020). Project activities, including shrub canopy removal that occurs during the period

of May through July, have the potential to destroy occupied neonatal rabbit forms, resulting in injury or mortality of jackrabbits.

American badgers are considered active all year; however, they spend long periods in resting torpor underground and also raise litters in underground dens (Paulus, 2020). The holes and excavated dirt piles created by badgers are large and conspicuous. Direct impacts to aboveground individuals would be unlikely due to their mobility, but badgers that are day-denning or raising litters in enlarged rodent burrows may be buried as an unintended consequence of mechanized vegetation clearing and piling.

Any impacts to western white-tailed jackrabbits and American badgers would be potentially significant. MM Biology-5 requires a pre-construction survey for all potentially occurring special-status mammals, including Western white-tailed jackrabbit and American badger, and the avoidance of active forms and dens. The impact would be less than significant with mitigation.

Sierra Nevada red fox are listed as threatened under the California Endangered Species Act and are considered to be very rare animals restricted to high elevations, generally much higher than the 5,700 feet average project elevation in the priority PTAs. CNDDB records near the project area are from sightings from at least 45 years in the past; however, more recent collections (e.g., road kills) from Mono County suggests that lower elevation habitats may be used in the Eastern Sierra Nevada. Sierra Nevada red fox may move through or forage within any of the available habitats within eastern Alpine County; however, den establishment would likely only occur at less fragmented upland scrub and wetland fringe areas, away from developed areas. It is possible that the poorly understood Sierra Nevada red fox sometimes uses enlarged rodent or coyote burrows. Direct impacts to the Sierra Nevada red fox from implementation of the WRMP are unlikely, given that the priority PTAs occur at a lower elevation than where the fox has been observed in Alpine County, and the PTAs on the east slope are located near more developed areas, such as Markleevillage and Sierra Pines. The impact would be less than significant.

Non-Priority PTAs

Plants

WRMP activities completed within the non-priority PTAs have the potential to disturb special-status plant species through use of mechanical equipment, trampling by vehicle or crew, and application of prescribed fire. Sensitive plant surveys have not been completed within the non-priority PTAs and it is, therefore, assumed that special-status plant species may occur in all non-priority PTAs. WRMP activities that negatively impact the survival of special-status plant species would be a significant impact. MM Biology-1 requires that a pre-construction plant survey be completed within the treatment area and avoidance of all special-status plants. The impact would be less than significant with mitigation.

Prescribed burning has varying effects on special-status plant species depending on the species, intensity, duration, and timing. Some species or their seedbanks could be killed by burning while others benefit. Prescribed fire can be a tool to reduce non-native species but can promote

the spread of invasive species (Keeley, Franklin, & D'Antonio, 2011; Rice & Smith, 2008). Control lines could also increase the abundance of invasive species in the line as well as adjacent areas. Prescribed burns that cause mortality of special-status plant species or allow for the introduction of invasive weeds that could negatively impact populations would be a significant impact. MM Biology-6 identifies specific consideration for special-status plant species, including an assessment of potentially occurring species, the potential for the species to be negatively impacted by fire, and the avoidance of plant populations that would be negatively impacted by fire. The procedure defined in MM Biology-6 must be followed when defining prescribed burning activities. The impact from prescribed fire would be less than significant with mitigation. Implementation of MMs Biology-1 and 5 would reduce WRMP potential impacts on special-status plants within non-priority PTAs to a less-than-significant level.

Special-status Wildlife

Table 4-2 within the WRMP includes the potentially occurring special-status wildlife species within Alpine County. Many of the species identified in the WRMP were identified in the nine U.S. Geological Survey (USGS) quadrangles surrounding all non-priority PTAs. Since vegetation community and habitat surveys have not been completed within the non-priority PTAs, all species identified in the WRMP that occur within roughly the same elevation as the non-priority projects are assumed to have potential to occur within the non-priority PTAs. Impacts from vegetation-management activities within the non-priority PTAs are anticipated to be similar to those described for the priority PTAs. Indirect impacts to fish species may occur due to reduced water quality as a result of vegetation removal that increases erosion. Water quality may also be affected by accidental releases of fuels or lubricants near waterbodies. MM Biology-3, Geology-1 and Hazards-1 would reduce the potential impact to fish by establishing protection zones around waters, use of appropriate runoff controls, and implementation of erosion-control measures to reduce erosion and sedimentation. The impact would be less than significant with mitigation.

Special-status insects may also be impacted by direct disturbance of underground colonies as a result of mastication or vehicle travel if project activities occur where insects are present. MM Biology-2 requires all crew to attend a WEAT during which the crew will be instructed to be aware of and avoid potential ground-dwelling bee colonies. The impact would be less than significant with mitigation.

Terrestrial wildlife, including amphibians and mammals identified in the WRMP, have potential to occur within non-priority PTAs and may be impacted by vegetation-management activities if wildlife are present during the time of vegetation treatment. MM Biology-5 includes specific measures to avoid impacts to terrestrial wildlife, including pre-construction surveys, avoidance buffers, and relocation of species, as appropriate. Relocation of species identified as endangered, threatened, or a candidate species on either the Endangered Species Act or California Endangered Species Act would only be completed following consultation with USFWS and/or CDFW, as is required by law. Possible impacts to amphibians, particularly larval salamanders, may occur if water quality is degraded. If an impact occurred to salamanders, it would be significant. MM Biology-3 requires avoidance of ponds and use of runoff controls to

avoid impacts to runoff into ponds. MM Biology-4 requires that the County conduct pre-construction surveys for salamander within the ponds and uplands. Migrating individuals would be relocated to nearby suitable habitat. MM Hazards-1 requires the use of best management practices to reduce the potential for fuel or oil leaks or accidental releases and ensures proper clean-up procedures to avoid degradation of water quality in ponds. MM Geology-1 limits erosion-generating work practices and requires implementation of erosion-control measures to reduce erosion and sedimentation. The impact would be less than significant with mitigation.

Special-status bat species have potential to occur within the non-priority PTAs but are unlikely to be significantly impacted by project activities because the bat species that have potential to occur within PTAs typically roost in caves, mines, and abandoned buildings. Bats may use the PTAs for foraging but would not be affected by project activities because foraging typically occurs during dawn and dusk hours and would not occur at the same time as active vegetation-treatment activities. The impact would be less than significant.

Prescribed burning may occur as vegetation treatment on non-priority PTAs. Prescribed burns have the potential to directly impact special-status wildlife species if prescribed burns cause the failure or destruction of an active nest, form, den, or other natal feature. MM Biology-7 requires completion of pre-construction surveys to determine the presence of special-status wildlife species within the burn footprint and the incorporation of specific prescribed-burn avoidance buffers into the planning of the burn. The impact would be less than significant with mitigation.

Prescribed burns may also indirectly impact fish species by reducing water quality within streams and rivers. MM Biology-3 identifies required buffers around creeks and streams. MM Geology-1 requires implementation of sediment and erosion controls that would protect water quality. Buffers would ensure prescribed burn activities do not indirectly impact special-status fish. The impact would be less than significant with mitigation.

MM Biology-1: Pre-Construction Plant Survey

Priority Project Treatment Areas (PTAs): Markleevillage, Manzanita, Bear Valley

A qualified botanist shall conduct a pre-construction survey for special-status plants prior to any vegetation-treatment activities occurring in dry montane meadow vegetation communities and within ecotones along roadsides and at areas of transition between upland vegetation communities in all priority PTAs. The plant survey is required to occur during the plant blooming season within the year prior to treatment activities within the PTA. The qualified botanist will flag all special-status plant species for avoidance, and ESA fencing will be installed to protect the plant prior to commencement of vegetation-treatment activities.

Non-Priority PTAs

A qualified botanist shall conduct a pre-construction survey for special-status plants prior to any vegetation-treatment activities occurring in the PTAs. The plant survey is required to occur during the plant blooming season within the year prior to treatment activities within the PTA. The qualified botanist will flag all special-status plant species for avoidance, and ESA fencing will be installed to protect the plant prior to commencement of vegetation treatment activities.

Applicable Location(s): All PTAs that include the applicable habitat described above.

Performance Standards and Timing:

- **Before Activity:** 1) Qualified botanist/biologist conducts pre-construction plant survey and flags special-status species, 2) County or contractor install fence to avoid the plant(s).
- **During Activity:** Ensure that fenced plant populations are not disturbed during vegetation management activities.
- **After Activity:** Remove fencing.

Implementation of MMs Biology-2, 3, 4, 5, and 6, MM Hazards-1, and MM Geology-1 would reduce WRMP potential impacts on special-status wildlife within non-priority PTAs to a less-than-significant level.

MM Biology-2: Worker Environmental Awareness Training

Prior to implementation of vegetation-management activities within any PTA, the County or its contractor shall develop, and all workers participate in, a PTA-specific environmental awareness training provided by the qualified biologist. The training will identify the work limits of the specific PTA that will be treated. In addition, the training will include the following:

1) Alert the crew to all fenced and/or flagged environmentally sensitive areas and avoidance zones and instruct the crew to keep out of the area.

2) Inform the crew of the potential for special-status species to be encountered on site, where they are most likely to be found, which life forms are most likely to be encountered, and how the specific vegetation management activities implemented in the PTA could affect the species during vegetation-management activities.

3) Discuss the applicable mitigation measures from this IS/MND and any other applicable measures from other documents, such as permits, that have been incorporated into the project.

4) Inform crew of what to do if a sensitive species is encountered during vegetation-management activities. Specifically, crew shall be informed of the following actions:

- If a special-status species enters the treatment area, all work shall stop within 100 feet of the species. Work may resume after the species have vacated the treatment area.
- If vegetation treatment is planned to occur within big sagebrush scrub and dry montane meadow vegetation communities between April and October, crew shall stay alert for signs of ground-dwelling bumble bees and avoid treatment where ground-dwelling bees occur.

Applicable Location(s): All PTAs.

Performance Standards and Timing:

- **Before Activity:** 1) County to prepare PTA-specific Worker Environmental Awareness Training and 2) crew receive to training from qualified biologist
- **During Activity:** Training to be provided to any new crew members who begin working on the project after the initial training.
- **After Activity:** None.

MM Biology-3: Waters and Wetland Protection Zones

Prior to implementation of vegetation-management activities within any PTA, the County or its contractor shall identify waterbodies and wetland protection zones and implement controls to minimize erosion and runoff in all drainage plans, in accordance with California Forest Practice Rules (Title 14, California Code of Regulations, Chapters 4, 4.5, and 10) (CAL FIRE 2017). Prior to project activity, the County will assign a qualified biologist to identify the locations of riparian habitat and waterbodies as well as corresponding 50-foot (minimum) setbacks (Waters and Wetland Protection Zones) for avoidance. Identification of riparian habitat/waterbodies/wetlands for avoidance will be in addition to and distinguished from any required vegetation-management activities boundary flagging. Waters and Wetland Protection Zones will be identified as appropriate on project maps. Appropriate runoff controls, such as berms, straw wattles, silt fencing, filtration systems, and sediment traps, will be implemented to control siltation and the potential discharge of pollutants. Waters and Wetland Protection Zones and appropriate runoff controls, such as berms, straw wattles, silt fencing, filtration systems, and sediment traps, will be implemented to protect riparian habitat and control siltation and the potential discharge of pollutants.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Conduct riparian zone survey, 2) clearly mark exclusion zone for all identified waterbodies, drainages, or wetlands prior to project implementation, and 3) install appropriate runoff controls.
- **During Activity:** Ensure WRMP activities are conducted outside of exclusion zones and runoff controls are functional and undamaged.
- **After Activity:** 1) Remove flags and markers and 2) remove runoff controls once soils on site are stabilized.

MM Biology-4: Nesting Bird Surveys

If vegetation-management activities occur between March 1 and August 31 on the east slope of Alpine County, and between April 1 and August 31 on the west slope of Alpine County, a qualified biologist shall conduct pre-activity surveys for active nests of special-status and MBTA-protected birds before the start of any project activities. Surveys for nesting raptors will be conducted in accordance with established CDFW raptor survey protocols. If active nests are found, the County will establish avoidance buffers around nests that are sufficient so that breeding is not likely to be disrupted or adversely affected by project activities. An avoidance buffer will constitute an area where project-related activities (i.e., mechanized vegetation removal, pile burning, etc.) will not occur. Ground vegetation may be removed using non-mechanized hand tools if deemed by the biologist that no disturbance to nesting birds would occur. No treatment may be applied to the tree in which the nest occurs. Typical avoidance buffers during the nesting season will be 100 feet for nesting passerine birds and 500 feet for nesting raptors unless a qualified biologist determines that smaller buffers will be sufficient to avoid impacts on nesting raptors and/or other birds. Factors to be considered for determining buffer size will include the following: the presence of natural buffers provided by vegetation or topography; nest height; locations of foraging territory; and baseline levels of noise and human activity. A qualified biologist will monitor any active nests during vegetation-management activities, to ensure that the species is not being harmed or harassed by the noise or activity resulting from project-related activities. Buffers will be maintained until a qualified biologist has determined that young have fledged and are no longer reliant on the nest or parental care for survival.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Conduct pre-construction survey and 2) establish active nest buffers
- **During Activity:** Maintain active nest buffers until the nest is no longer active.
- **After Activity:** N/A

MM Biology-5: Avoid Disturbance or Harm to Terrestrial Wildlife

A qualified biologist shall conduct a pre-construction survey within the PTAs for all potentially occurring terrestrial special-status wildlife species. Nesting bird surveys will occur in accordance with MM Biology-4.

Mammals. A qualified biologist shall conduct a pre-construction survey for special-status mammals identified in Table 2-5 of this IS/MND and active special-status mammal forms or dens within the PTA. For surveys in inaccessible areas, the surveying biologist shall use binoculars to scan any suitable denning substrate for potential individuals or forms/dens. The pre-construction survey shall be conducted no more than 14 days before the initiation of vegetation-treatment activities. If an active special-status mammal form/den is identified within the PTA, a 10-foot no-disturbance buffer shall be established around the form/den to avoid disturbance of the nesting/denning mammal until a qualified biologist determines that the young have dispersed. The extent of these buffers shall be determined by the biologist in coordination with CDFW, the County, and the public landowner (USFS, BLM, or State Parks, as applicable) and shall depend on the species identified, level of noise or vegetation-management activity disturbance, line-of-sight between the form/den and the disturbance, ambient levels of noise and other disturbances, and other topographical or artificial barriers. In addition to the establishment of buffers, other avoidance measures (determined during agency coordination) may be implemented. If any non-denning species are observed in the PTA, the species will be allowed to move out of harm's way on its own. If needed, a qualified biologist will move the species to the nearest area of suitable habitat outside of the treatment area. If applicable, depending on the location and status of the species, agency approval will be obtained before any species is moved. If no active nests/dens are found during the preconstruction surveys, then no additional mitigation is required.

Southern long-toed salamander. A qualified biologist shall conduct a pre-construction survey for southern long-toed salamander if vegetation treatment occurs between April 1 and June 1. The biologist shall survey all suitable potential larval ponds for salamander larvae and adjacent uplands for migrating salamander. All ponds shall be fenced and avoided in accordance with MM Biology-3. Fencing type and installation shall not restrict migration of long-toed salamander into uplands. Any migrating adults observed during pre-construction surveys shall be relocated to an area of suitable habitat out of harm's way.

Following preconstruction surveys and initiation of vegetation management activities, it is possible that wildlife species could subsequently enter or return to the treatment area. The following measures shall be implemented to avoid disturbance or harm to these species:

- If any special-status species or other wildlife species are observed in the treatment area during vegetation-management activities, activities shall cease until the species is allowed to move out of harm's way on its own accord.
- If the species cannot be allowed to move out of harm's way on its own accord, a qualified biologist shall move the species to the nearest area of suitable habitat outside of the treatment area. If applicable, depending on the location and status of the species, agency approval will be obtained before any species is moved.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** 1) Qualified biologist conducts pre-construction surveys and establishes buffers for active natal forms/dens and 2) species are relocated as necessary.
- **During Activity:** Ensure that buffers around natal forms/dens are not disturbed during vegetation-management activities and 2) avoid species traveling through site.
- **After Activity:** N/A

MM Biology-6: Prescribed Burn Planning

Prior to conducting prescribed burns within any PTA, the following planning activities must occur and the appropriate impact avoidance measures described below must be incorporated into the project-specific prescribed burn planning effort (refer to MM Hazards-3).

Special-status plant species: To ensure that prescribed burn activities do not negatively impact special-status plant species, a qualified biologist shall review vegetation communities that occur within the footprint of the prescribed burn area and determine if any special-status plant species have potential to occur within the prescribed burn area. If special-status plant species have the potential to occur within the prescribed burn area, the biologist shall determine if the potentially occurring special-status plant(s) would be negatively affected by application of fire to the landscape. If the potentially occurring special-status plant(s) would be negatively affected by prescribed burn, the County shall either treat the entire PTA using mechanical and hand tool methods, while also implementing MM Biology-1, or complete the following steps to reduce the footprint of the prescribed burn area to avoid special-status plant species:

1. Conduct a pre-construction plant survey during the appropriate blooming season for each special-status plant that may occur within the PTA.
2. Determine if a prescribed burn can be completed while ensuring avoidance of all special-status plant species.
3. Modify the prescribed burn boundary within the project-specific Burn Plan (required in MM Hazards-3) to avoid the special-status plant(s).

A pre-construction plant survey in accordance with MM Biology-1 shall be conducted in all areas where firelines and temporary access or staging will take place. Fireline, access, and staging activities shall avoid special-status plant species.

Special-Status Wildlife: To ensure that prescribed burn activities do not negatively impact special-status wildlife species, a qualified biologist shall conduct a pre-construction survey for all potentially occurring wildlife within the footprint of the prescribed burn area. The pre-construction survey would occur no more than 14 days before the prescribed burn. If special-status wildlife is identified within the prescribed burn area, then the following buffers and additional impact avoidance measures shall be implemented, as applicable:

Prescribed burns shall maintain the following buffers from various sensitive species and wildlife habitats:

- Active bird nests shall be given species-appropriate buffers matching those outlined in MM Biology-4:
  - 100 feet for passerines
  - 500 feet for raptors such as accipiters, buteos, and eagles
  - A 10-foot buffer from forms, nests, or dens of Western white-tailed jackrabbit, American badger, Sierra marten, and Sierra Nevada mountain beaver
  - A 50-foot buffer from wolverine, West Coast DPS fisher, and Sierra Nevada red fox dens
  - A 20-foot buffer from occupied bat-roosting trees
  - A 20-foot buffer from ground-dwelling bee colonies
  - The listed buffer areas may be managed using other vegetation-management techniques following each burn (e.g., mechanical or hand tool treatment) but are to remain completely undisturbed during prescribed fire events. Every reasonable attempt shall be made to maintain 0.25 to 0.5 acre (0.1 to 0.2 hectare) of unburned habitat for every 10 acres (4 hectares) of burned habitat (e.g., 4 to 8 acres of retreat habitat are needed for a 160-acre burn, and 9 to 18 acres are needed for a 350-acre burn). Retreat areas shall be conserved randomly throughout the treatment area. These retreat areas may be naturally occurring areas such as rock formations, ponds, and other wetland/riparian areas, areas with a high density of burrows, and other areas not prone to burn, or these areas may be created and maintained using hand tools or water to create fire-breaks or wet-lines.
- No more than 24 hours prior to conducting prescribed fires, visual surveys shall be conducted by walking transects throughout the proposed burn area in an attempt to locate individual special-status wildlife. With

MM Biology-6: Prescribed Burn Planning

permission from CDFW and/or USFWS, a permitted biologist or biological monitor shall capture, transfer, and release in a safe area any special-status reptiles or amphibians deemed to be in danger of being harmed by the prescribed fire activities. If individuals are located during the pre-treatment surveys but escape capture, an area approximately 50 feet (15 meters) in diameter around the individual shall be protected from the burn. If necessary, individuals may be held in captivity in a pillowcase for less than 24 hours and may later be released near the point of capture after the burn has been completed. The numbers of special-status reptiles and amphibians encountered and transferred to safe areas or held in captivity during treatment shall be reported to USFWS and CDFW.

- All vehicles involved with the site-specific burn shall be retained in a prearranged, marked parking area in a clearing as close to the main road as possible. At least one monitor shall ensure wildlife is clear from the parking area while vehicles are arriving and leaving. All vehicles must stay on designated roads, and if it is necessary for a vehicle to travel off the designated main road, a monitor shall precede the vehicle to clear wildlife from the pathway of the vehicle. Only biological monitors specifically authorized by the USFWS and CDFW to handle species listed on the federal or State Endangered Species Acts (normally, these shall be individuals holding a federal recovery permit for the species) shall be allowed to handle, transport, and relocate individuals of these species.
- Immediately following each prescribed fire, the permittee shall search the affected post-treatment area to identify dead or injured individuals of all vertebrate taxa. Dead individuals of special-status species shall be collected and deposited at an approved repository. Injured individuals shall be handled only by a permittee authorized to capture and handle the species. The County shall ensure medical assistance is provided to injured animals by a certified wildlife veterinarian familiar with amphibian care.

Sensitive Communities: To ensure that prescribed burn activities within non-priority PTAs do result in substantial adverse effects to sensitive upland communities, prescribed burn planning efforts shall identify all sensitive natural communities within the PTAs, including the community rarity ranking, according to the most recent edition of CDFW's Natural Community List. No prescribed burn is to be conducted within a sensitive community identified with a ranking of S1 (critically imperiled) or S2 (imperiled). Work may be completed within sensitive vegetation communities ranked S1 or S2 using mechanical or hand tools only and must include invasive-species controls identified in MM Biology-6 of this IS/MND.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** Prepare project-specific prescribed burn planning efforts to include consideration of potentially occurring special-status plant and wildlife species, sensitive vegetation communities, and appropriate avoidance measures indicated in this measure.
- **During Activity:** 1) Implement prescribed burn in accordance with the project-specific prescribed burn planning efforts and 2) maintain appropriate buffers.
- **After Activity:** 1) Search the affected post-treatment area immediately following each prescribed fire.

MM Geology-1: Erosion Control and Slope Stability Measures

Refer to Section 2.3.7 Geology and Soils

b) Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?

Definition of Sensitive Natural Communities

Fish and Game Code Section 1940 requires CDFW to develop and maintain a vegetation mapping standard for the State. Over half the vegetation communities in the State have been mapped through the Vegetation Classification and Mapping Program.

Natural vegetation communities are evaluated by CDFW and are assigned global (G) and State (S) ranks based on rarity of and threats to these vegetation communities in California. Natural communities with ranks of S1 to S3 are considered sensitive natural communities to be addressed in the environmental review processes of CEQA and its equivalents. Sensitive natural communities are defined by CDFW as vegetation alliances with state ranks of S1–S3 (S1: critically imperiled; S2: imperiled; S3: vulnerable) as identified in the List of Vegetation Alliances and Associations (CDFG 2010) and subsequent updates. Additionally, all vegetation associations within the alliances with ranks of S1 to S3 are considered sensitive habitats. CEQA requires that impacts to sensitive natural communities be evaluated and mitigated to the extent feasible.

Sensitive natural communities are communities that have a limited distribution and are often vulnerable to the environmental effects of projects. These communities may or may not contain special-status species or their habitats. For purposes of this assessment, sensitive natural communities are considered to include vegetation communities listed in CNDDB and communities listed in the CDFW Natural Communities List (CDFW, 2020) with a rarity rank of S1 (critically imperiled), S2 (imperiled), or S3 (vulnerable).

Priority PTAs

A total of 12 sensitive natural communities, including riparian, wetland, meadow, and forest communities, have been inventoried within the boundaries of the priority PTAs (Table 2-3). The WRMP does not propose any activities within wetlands, watercourses, or associated riparian areas. Construction crew conducting vegetation removal or driving vehicles and equipment may inadvertently disturb wetland or riparian habitat if they are not aware that the habitat exists. The impact would be potentially significant. MM Biology-3 requires that all riparian and wetland habitat be identified and flagged for avoidance prior to commencement of project activities. MM Biology-2 requires all crew to receive worker environmental awareness training prior to completing project activities within any of the PTAs. The impact to riparian habitat within the priority PTAs would be less than significant with mitigation.

Sensitive upland communities within the priority PTAs include Jeffrey pine forest and aspen forest alliances. Vegetation thinning, including mechanized removal of a substantial portion of the shrub layer anywhere within non-riparian sensitive communities, is very unlikely to change the overall extent of occurring sensitive communities unless new populations of invasive non-native plants are introduced (Paulus, 2020). The introduction of invasive plant species and subsequent loss of a sensitive upland community would be a significant impact. MM Biology-7

would reduce the potentially significant impact by avoiding introduction of weed seed, replacing disturbed soil, and application of mulch where necessary to cover disturbed soils. The impact to sensitive upland communities would be less than significant with implementation of mitigation.

Non-Priority PTAs

Sensitive communities, including riparian habitat, wetlands, and other sensitive upland vegetation communities, may occur within the boundaries of non-priority PTAs identified in the WRMP. WRMP activities include mechanical (e.g., mastication) or hand thinning to remove ladder fuels and dead and dying trees. The WRMP also includes the construction of temporary overland access roads when adequate access does not exist. Implementation of WRMP activities is not planned within riparian and wetland communities but would likely occur within other CDFW-defined sensitive vegetation communities. Vegetation inventories have not been completed within the non-priority PTAs, and it is assumed that sensitive vegetation communities may occur within the non-priority PTAs. Implementation of WRMP activities involves selective removal of vegetation within a PTA and is not anticipated to substantially alter a vegetation community; however, activities could result in the loss of sensitive vegetation communities if invasive weed species are introduced to PTAs where disturbed soils may occur and invasive species are allowed to establish. The impact would be significant. MM Biology-7 requires implementation of invasive species controls, such as equipment washing, use of weed-free materials, and application of mulch to disturbed areas to reduce the potential spread of invasive weeds to the PTAs. The impact would be less than significant with mitigation.

The WRMP also allows for use of prescribed burns in some PTAs. In addition to applying fire within a prescribed burn site, additional vegetation treatments would be necessary to ensure firelines are maintained and to ensure operational safety. Treatments may include, but are not limited to, mowing, mastication, chipping, falling of snags, and brushing of roads. Prescribed burns conducted under the WRMP are designed to improve ecosystem health and resiliency; however, prescribed burns have the potential to change vegetation communities through disturbance of a sensitive community and introduction of forest diseases and invasive species. The indirect impact from spread of invasive species and forest diseases caused by prescribed burns could be significant. A project-specific plan for prescribed burns would address characteristics of the land being treated (such as topography and vegetation type). MM Biology-6 requires the prescribed burn planning effort to include a classification of vegetation communities according to Holland (1986) and Sawyer, et al., (2009) and determination of community status per CDFW and other applicable agencies, depending on the project. Sensitive vegetation communities identified with a ranking of S1 or S2 shall be avoided during the prescribed burn. Vegetation treatment within S1- or S2-ranked communities would be completed using mechanical or hand tools only. MM Biology-7 would be required for work in any sensitive community to avoid the potential introduction of invasive species. The impact of prescribed burns would be less than significant with mitigation.

MM Biology-7: Invasive Species Control

To prevent the accidental introduction or spread of invasive species in the project area during vegetation management activities, the following measures would be implemented:

- Only certified noxious weed-free erosion control materials will be used. All straw material will be sterile and certified as weed-free prior to being used at the PTAs.
- Contractor will wash all construction equipment prior to bringing it onto the job site. Inspection will ensure that equipment arrives on site free of mud and seed-bearing material. If the same contractor will be used for work within multiple PTAs, equipment must be washed between use at each PTA.
- Seed-free mulch will be applied to areas of disturbed soils and de-vegetated slopes. Use of chipped or mulched native material will be applied whenever possible within sensitive natural communities.
- The Environmental Awareness Training described under MM Biology-1 will include information on noxious weeds in the PTAs and instruction on how crew can reduce potential introduction of noxious weeds to the site.

Applicable Location(s): All PTA.

Performance Standards and Timing:

- **Before Activity:** Ensure all equipment and materials are free of weeds and dried vegetation or mud.
- **During Activity:** Use only certified weed-free straw and erosion-control products.
- **After Activity:** Apply mulch as necessary.

c) Would the project have a substantial adverse effect on State or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No project activities are proposed within a water body/water course; therefore, project-related activities would result in no direct fill or indirect temporary or permanent loss of State or federally protected wetlands. Equipment mobilization and staging areas for the proposed vegetation-removal activities would be located in disturbed area and uplands (i.e., annual grassland and ruderal areas) such that these activities would not directly affect any State or federally protected wetlands. Project activities (i.e., vegetation clearing and mastication) encroaching on aquatic features could result in indirect impacts on vegetation, degradation of water quality, and/or changes in hydrology. Project-related spills, worker errors, and soil erosion in or near aquatic features are other potential sources of indirect impacts on State or federally protected wetlands. Introduction of invasive species, dust, and settling of contaminants associated with vehicular emissions during project activities may also indirectly affect aquatic wetlands and resources. Indirect impacts could be significant. MM Biology-3 requires the establishment of Waters and Wetland Protection Zones. MM Biology-7 requires implementation of measures to avoid spread of invasive species to wetland and riparian habitats. The impact would be less than significant with mitigation.

d) Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Wildlife movement corridors typically are associated with ridgelines, rivers, and creeks supporting riparian vegetation. WRMP activities are not proposed within riparian corridors, in creeks or rivers, or along ridgelines. The less developed PTAs, including Manzanita, Lake

Alpine, Mesa Vista, Turtle Rock Park, and parts of Markleevillage, provide good cover for wildlife movement and foraging of many species. WRMP activities would reduce vegetative cover but would not remove vegetative cover completely. Mature trees would continue to provide cover in PTAs following vegetation-treatment activities. Adjacent, un-treated land would be available to wildlife and, thus, impacts to migration would be less than significant.

WRMP activities would not involve erecting fences or other barriers around the boundary PTAs; however, MM Cultural-1 requires the use of fencing to delineate sensitive cultural resource areas. The fenced areas would be relatively small and would not significantly impede wildlife movement through the PTA. The WRMP would not interfere substantially with the movement or migration of species. No wildlife nursery sites occur in the PTAs. The impact would be less than significant.

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
and

f) Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or State habitat conservation plan?

No tree preservation policy or ordinance applies to the project. No Habitat Conservation Plans, Natural Community Conservation Plans or other approved plans adopted to protect sensitive species or habitats apply to any of the PTAs. The WRMP would be consistent with the Alpine County General Plan and would not conflict with local policies or ordinances protecting biological resources. No impact would occur.

2.3.5 Cultural Resources

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
5. CULTURAL RESOURCES. Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?	☐	☒	☐	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐

Environmental Setting

Historical Context

Alpine County has a uniquely rich historic and prehistoric heritage. The County lies within the traditional Washoe aboriginal lands and the mountains, and valleys of Alpine County have provided subsistence and spiritual sustenance to the Washoe for millennia. Euro-American travel through the County and its later settlement are equally of interest and importance to the people of Alpine County, for the County's identity is closely related to these historic events. Tribal history within Alpine County and known resources are discussed further in Section 2.3.18 Tribal Cultural Resources.

Historic roads, towns, and mining districts occur throughout the county; however, few historic settlements or structures are standing today. Several historic buildings have been moved from early sites to Markleeville. One of these is the Alpine Hotel, which stands as a landmark in the center of town. Most of the county's historic town sites and trails are provided protection by open space land-use designation in the Alpine County General Plan (Alpine County, 2017).

Methodology

The cultural resources discussion and analysis is based on the assessment conducted by Great Basin Consulting Group to support the CEQA environmental review for the WRMP. A record search was conducted at the Central California Information Center (CCIC) of all previous cultural resource inventories and known archaeological and architectural resources within a one-mile radius of each of the identified priority PTAs. The record search request included GIS datasets for the cultural resource components, cultural resource reports and resources, Bureau of Land Management (BLM) General Land Office Records plats, and historic maps within a one-mile radius of each priority PTA. The CCIC results were returned on June 4, 2020. A similar search for supplemental information was requested from the BLM, Carson City District, U.S. Department of Agriculture (USDA), Humboldt-Toiyabe National Forest, and USDA, Stanislaus National Forest, records.

Approximately 890 acres were surveyed in a cultural resources field inventory to locate any known or previously unidentified cultural resources within the priority PTAs. The findings regarding located resources and evaluation of significance and eligibility for inclusion to the California Register of Historic Places (CRHR) and National Register of Historic Places (NRHP) are summarized below and described in detail in the Cultural Resources Assessment Report (Orvald & Drews, 2020). The report (excluding confidential information not available for public review) is attached to this document in Appendix C.

Known Cultural Resources within Priority PTAs

Between August 17 and 21, 2020, previously un-surveyed portions of the priority PTAs were surveyed for cultural resources, and previously recorded sites within the priority PTAs were re-visited. The previously recorded resources are described in Appendix C. Five new sites and two isolated artifacts were recorded during the survey. Table 2-6 summarizes the record search and survey results.

Table 2-6 Cultural Resource Inventories and Resources within One Mile of the Priority PTAs

PTA	Previous Inventories (1-mile Radius)	Previous Inventories (PTA Boundary)	Recorded Resources from Previous Inventories (1-mile Radius)	Recorded Resources from Previous Inventories (PTA Boundary)	Resources Found During August 2020 Surveys (PTA Boundary)
Manzanita	12	3	53	0	3
Markleevillage	27	7	80	7	4
Bear Valley	62	11	42	0	0

Source: (Orvald & Drews, 2020)

None of the resources located within the Manzanita PTA and the Bear Valley PTA are considered eligible to the CRHR. Two previously recorded sites and one newly recorded site are considered eligible to the CRHR within the Markleevillage PTA. ALP-238/P-02-315 and ALP-270/P-02-347 contain bedrock grinding features and a surface archaeological component. Alp6 is a lithic scatter with a historic component that may address important research questions. ALP-269 consists of a disturbed milling station. While the site lacks integrity, it may be of cultural significance to the Washoe Tribe and is treated as a significant resource for purposes of this cultural resource impact analysis.

Discussion

a) Would the project cause a substantial adverse change in the significance of a historical resource pursuant to § 15064.5?

b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?

Priority PTAs

Impacts on historical and archaeological resources from WRMP activities could occur primarily from any activity that could disturb the ground surface. Impacts could occur if a known or previously undiscovered significant archeological or historic resource is damaged or destroyed by any WRMP activities. Vegetation thinning and removal and use of heavy equipment, in particular, have some potential to damage, destroy, or disturb significant historical or archaeological resources.

As listed in Table 2-6, numerous cultural resources have been inventoried and recorded within the boundaries of the priority PTAs. Two known archaeological resources within the Markleevillage PTA are considered eligible for listing in the CRHR. Damage, destruction, or disturbance of either of these two known resources would be considered a significant impact. Implementation of MM Cultural-1 requires a qualified archaeologist to flag a 100-foot radius around all known cultural resource sites, within which the WRMP activities would be limited to hand thinning. Mechanical thinning, pile burning, access roads, skid trails, and staging would not be conducted within the flagged boundaries. Pile burning would also not be conducted in the Bear Valley priority PTA. Furthermore, site ALP-269 is considered a significant resource to the Washoe Tribe and would be fully avoided per MM Cultural-1. No treatment activities will occur within the ESA around site ALP-269.

Implementation of vegetation management activities has the potential to damage, destroy, or disturb previously undiscovered resources that may be present within the treatment area. Disturbance, damage, or destruction of any previously undiscovered resources could be considered a significant impact. If a previously unidentified resource is encountered during work, MM Cultural-2 would be implemented, requiring cessation of work within 100 feet of the resource, followed by an appropriate evaluation or avoidance of the cultural resource prior to commencement of work in the area. Impacts would be less than significant with implementation of mitigation.

Non-Priority PTAs

A record search and detailed evaluation of cultural resources was not conducted within the boundaries of the non-priority PTAs.[2] Known and unknown significant cultural resources may

[2] Non-priority PTAs include the following: Grover Hot Springs, Mesa Vista, Hung-A-Lel-Ti, Turtle Rock Park, Lake Alpine, Diamond Valley, and Highway 89.

be located within the PTA boundaries. In addition to the activities described above under "Priority PTAs," prescribed burning also has the potential to cause a significant impact on historical or archaeological resources. Prescribed burning, if implemented, would only occur in the Hung-A-Lel-Ti, Lake Alpine, Mesa Vista, and Turtle Rock Park PTAs. Prescribed burns may extend into areas where workers are not readily located, so incidental discovery by workers is not adequate to reduce potential impacts to cultural resources, particularly those that occur on the ground surface. Any disturbance to known or eligible cultural resources through vegetation removal, pile burning, or prescribed burning could result in a significant impact to the cultural resource. MM Cultural-3 requires a record search and a pre-activity survey or sensitivity analysis if the area has not been previously surveyed within the last 20 years, with the objective of determining the presence/absence of known cultural resource locations before any work commences. Any found resources are either to be avoided entirely or evaluated for eligibility for and, if eligible, handled in accordance with the measures described in MM Cultural-1. MM Cultural-2 requires crews to be trained how to recognize basic signs of a potential resource and implement the mitigation measures. Discovery of any previously unidentified cultural resources in the non-priority PTAs would also be handled according to MM Cultural-2 to ensure a significant impact to undiscovered resources would not occur. The impact would be less than significant with mitigation incorporated.

MM Cultural-1: Avoidance of Impacts to Cultural Resources

The following measures shall be implemented during vegetation management activities within any PTA where cultural resources have been inventoried or recorded:

- Prior to initiation of fuels management activities, a 100-foot radius surrounding each known cultural resource site shall be flagged by a qualified cultural resource specialist/archaeologist and designated as an environmentally sensitive area (ESA).
- Treatment activities within the 100-foot ESA shall be limited to hand thinning. The ESA around site ALP-269 should be fully avoided, and no treatment activities will occur within the ESA.
- Mechanical thinning, access roads, skid trails, and staging shall not be permitted within the ESA. All vehicle access shall avoid the ESA, and only foot traffic shall be allowed within the delineated ESA boundary. Pile burning shall not be conducted within the flagged ESA.

Applicable Location(s): Any PTA where cultural resources are known to occur within the project boundary.

Performance Standards and Timing:

- **Before Activity**: Flag a 100-foot ESA around all cultural resource sites within the PTA.
- **During Activity**: Limit activities within the flagged ESA as appropriate.
- **After Activity**: Remove flags.

MM Cultural-2: Previously Unidentified Cultural Resources

Cultural Resources Training

All employees and contractors shall receive cultural resource training conducted by a qualified cultural resources specialist (e.g., an archaeologist) prior to working in any PTA. The training shall address appropriate work practices necessary to effectively implement the mitigation measures (MM Cultural-1, -3, and -4), for historical resources, archaeological resources, tribal cultural resources, and human remains. The training shall address the

MM Cultural-2: Previously Unidentified Cultural Resources

potential for exposing subsurface resources, recognizing basic signs of a potential resource, understanding required procedures if a potential resource is identified, including reporting the resource to a qualified archaeologist or cultural resources specialist, and understanding all procedures required under Health and Safety Code § 7050.5 and PRC §§ 5097.94, 5097.98, and 5097.99 for the discovery of human remains. Workers will be specifically instructed as to the following:

- Leave all potential cultural resources (i.e., historical resource, archaeological resource, tribal cultural resource, or human remains) where they are found.
- Avoid all vehicle access within the boundary of an ESA.

The training shall take place during the WEAT required in MM Biology-1.

Procedures for Resource Discovery

In the event that a previously unidentified cultural resource is discovered during implementation of an activity, all work within 100 feet of the discovery shall be halted. The resource shall be located, identified, and recorded in the updated California Department of Parks and Recreation 523 form detailing current conditions. Data regarding archaeological resources shall be shared with Native American tribes identified by the Native American Heritage Commission (NAHC) to be traditionally and culturally affiliated with the geographic area of the PTA.

A qualified cultural resource specialist/archaeologist shall inspect the discovery and determine whether further investigation is required. If the discovery can be avoided and no further impacts shall occur, the resource shall be documented on California State Department of Parks and Recreation cultural resource record forms and no further effort shall be required. If work must commence in the sensitive area, it must be performed as described in MM Cultural-1. Alternatively, the cultural resource specialist/archaeologist shall evaluate the resource and determine whether it is:

- Eligible for the CRHR (and a historical resource for purposes of CEQA);
- A unique archaeological resource as defined by CEQA; or
- A potential tribal cultural resource (all archaeological resources could be a tribal cultural resource).

If the cultural resources specialist/archaeologist determines that the resource could be a tribal cultural resource, he or she shall, within 48 hours of the discovery, notify each Native American tribe identified by the NAHC to be traditionally and culturally affiliated with the geographic area of the project site of the discovery. A tribal monitor shall inspect the resource to determine whether it constitutes a tribal cultural resource. If the resource is determined not to be a unique archaeological resource, an historical resource, or a potential tribal cultural resource, work may commence in the area.

If the resource meets the criteria for a historical resource, unique archaeological resource, and/or tribal cultural resource, work shall remain halted and the cultural resources specialist/archaeologist shall consult with the County staff regarding methods to ensure that no substantial adverse change would occur to the significance of the resource pursuant to CEQA Guidelines Section 15064.5(b). The responding tribes shall be given an opportunity to participate in determining the appropriate mitigation methods for tribal cultural resources in consultation with the County.

Avoidance of the area, or avoidance of impacts on the resource, is the preferred method of mitigation for impacts on cultural resources and shall be required unless there are other equally effective methods. Work may commence upon completion of evaluation, collection, recordation, and analysis, as approved by the qualified cultural resource specialist/archaeologist and tribal monitor, for tribal cultural resources.

Applicable Location(s): Any PTA.

Performance Standards and Timing:

- **Before Activity:** Train employees and contractors how to recognize basic signs of a potential resource and implement the mitigation measures (MM Cultural-1 through MM Cultural-4).

MM Cultural-2: Previously Unidentified Cultural Resources

- **During Activity:** (1) Cease activity if a cultural resource is uncovered, (2) avoid resource if possible, and (3) evaluate and determine whether the resource is eligible, unique, or could be a tribal cultural resource. (4) If the resource could be a tribal cultural resource, notify Native American tribe identified by the NAHC to be traditionally and culturally affiliated with the geographic area of the site. (5) If the resource is not eligible, unique, and/or a tribal cultural resource, work may commence. (6) If the resource is eligible, unique, and/or a tribal cultural resource, work remains halted and a method selected to ensure that adverse change to the resource does not occur. (7) Preserve in place if possible. (7) If not possible to preserve in place, and as deemed appropriate by the qualified cultural resource specialist/archaeologist and tribal monitor for tribal cultural resources, recover and record cultural materials. Once recovered and recorded, the activity can commence in this area.
- **After Activity:** N/A

MM Cultural-3: Pre-Activity Record Search and Surveys

Prior to conducting any work in the non-priority PTAs identified in the WRMP that could disturb the ground surface or subsurface, an archival-records search at the Central California Information Center (CCIC) shall be completed.

A pre-activity cultural-resources survey shall be conducted by a qualified archaeologist or cultural resources specialist within PTAs that have not been surveyed in the last 20 years. New resources noted during the field survey shall be recorded and mapped on appropriate California Department of Parks and Recreation 523 forms. In the case of a previously recorded resource, an updated California Department of Parks and Recreation 523 form detailing current condition shall be completed, as appropriate. Alternatively, the County may complete a Cultural Resources Sensitivity Study for non-priority PTAs. The Cultural Resources Sensitivity Study must be prepared by a qualified archaeologist. Project activities in locations identified in a cultural sensitivity study as areas of low sensitivity may occur without a cultural resources field survey as long as tribal outreach and worker training for the recognition of cultural resources are implemented. All other applicable components of MM Cultural-3, including the records search, consultation with Native American tribes, and treatment of resources in accordance with MM Cultural-1, shall apply.

Any historical or archaeological resources located in the PTA (as identified in either previous surveys, in a discretionary records search, or during pre-activity surveys) shall be treated in accordance with MM Cultural-1.

The County shall contact and consult with local Native American tribes identified by the Native American Heritage Commission and request input on Tribal Cultural Resources within the PTAs if any prehistoric resources are identified during pre-activity surveys.

Applicable Location(s): All PTAs that have not been previously surveyed.

Performance Standards and Timing:

- **Before Activity:** N/A
- **During Activity:** 1) Conduct archival-records search, 2) conduct pre-activity survey, 3) comply with MM Cultural-1 for any known resources, and 4) consult with Native American tribes, if appropriate.
- **After Activity:** Update California Department of Parks and Recreation 523 form, if appropriate.

c) Would the project disturb any human remains, including those interred outside of formal cemeteries?

No human remains have been previously encountered in the vicinity of the priority PTAs. Although considered unlikely, WRMP activities have the possibility of disturbing human remains within the PTAs, which would be a potentially significant impact.

Vegetation removal using heavy equipment has at least some potential for encountering of human remains. If human remains are encountered, MM Cultural-4 requires work to halt within 50 feet of the discovery of human remains, and contact with the County Coroner's office to be made, followed by the appointment of a most likely descendent to determine the appropriate course of action. The impact on human remains would be reduced to less than significant with implementation of mitigation.

MM Cultural-4: Discovery of Human Remains
If human remains and associated or unassociated funerary objects are exposed during implementation of vegetation-management activities, work within 50 feet of the discovery shall be halted and the find protected from further disturbance. The County Coroner or Medical Examiner shall be notified immediately and, in the event of the determination that the human remains are Native American remains, notification of the Native American Heritage Commission shall be undertaken to obtain a most likely descendant (MLD) (PRC § 5097.98) for treatment recommendations. The County and the MLD shall make all reasonable efforts to develop an agreement for the treatment of human remains and associated or unassociated funerary objects with appropriate dignity (CEQA Guidelines Section 15064.5[d]). The agreement shall take into consideration the appropriate removal, recordation, analysis, custodianship, curation, and final disposition of the human remains and associated or unassociated funerary objects. Any findings shall be submitted in a report to the MLD and filed with the CCIC.
Applicable Location(s): All PTAs, if applicable.
Performance Standards and Timing: • **Before Activity:** N/A • **During Activity:** (1) Avoid known location of human remains, (2) cease activity if human remains are uncovered, (3) appoint an MLD, (4) protect human remains until a decision is reached. (5) If avoidance is not possible, the County, a professional archaeologist, and an MLD shall be consulted and human remains and associated or unassociated funerary objects shall be removed from the location and relocated to selected location in accordance with the decision reached. Once remains are moved, then the activity can commence again in this area. • **After Activity:** N/A

2.3.6 Energy

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
6. ENERGY. Would the project:				
a) Result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐
b) Conflict with or obstruct a State or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐

Environmental Setting

Alpine County adopted the Energy Action Plan (EAP) in 2016, which serves as the County's roadmap for achieving County-wide energy efficiency and renewable energy (Alpine County, 2016). The EAP focuses on three energy use sectors within the community—residential, non-residential, and municipal. The EAP includes goals and strategies that can be taken by residents, businesses, and public agencies to increase their energy efficiency, increase their generation and use of renewable energy, and reduce water waste. The two primary energy sources consumed by these community sectors are electricity, which is distributed by Pacific Gas and Electric Company (PG&E), Liberty Utilities, and Kirkwood Meadows Public Utility District (KMPUD), and propane, which is supplied by several regional providers (Alpine County, 2016).

Discussion

a) Would the project result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?

Implementation of the WRMP would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources. The WRMP would not include the construction or operation of facilities that would require electricity from a regional or local utility provider. Proposed activities would include fuel usage for vehicles, trucks, hand-held machinery, and heavy-duty equipment to implement fuel treatments. The WRMP would not significantly increase consumption of energy in the region or state or result in inefficient energy use and would not include the construction of new facilities that would require energy. During implementation of the WRMP, the fuel-treatment activities would only require fuel for vehicles and equipment used by working crews. The impact would be less than significant.

b) Would the project conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Alpine County's EAP only evaluates energy consumed by residential and municipal operations; therefore, the goals included in the plan would not apply to activities included in the WRMP. The EAP does not restrict vegetation management activities within Alpine County, and

equipment and machinery used would comply with all State and local energy efficiency standards. The WRMP would not conflict with any State or local plan for renewable energy or energy efficiency. The impact would be less than significant.

2.3.7 Geology and Soils

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
7. GEOLOGY AND SOILS. Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist–Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☒	☐	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project and, potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒

Environmental Setting

The Alquist-Priolo Act requires the California Geological Survey (CGS) to establish earthquake fault zones around the surface traces of active faults and to issue appropriate maps. CGS has identified earthquake fault zones in thirty-seven California counties. The various PTAs under

the WRMP are located within the Markleeville and Woodfords earthquake fault zones (California Geological Survey, 2020). The Genoa Fault, which extends along the eastern front of the Carson Range south of Alpine County, Nevada, into the northern reaches of Alpine County, has been identified as responsible for two large earthquakes measuring in the magnitude seven (7) range during the past 1,000 years (Alpine County, 2018).

Alpine County is located within the physiographic unit referred to as the Sierra Nevada Geomorphic Province (California Geological Survey, 2018). This province encompasses some well-known landmarks such as Yosemite Valley and Mt. Whitney and is bounded by the Great Valley to the west, the Great Basin to the east, the Mojave Desert to the south, and the Cascade Range to the north. The Sierra Nevada is composed chiefly of Mesozoic granitic rocks and Paleozoic and Mesozoic metamorphosed sedimentary and volcanic rocks (Bateman, 1986). The majority of Alpine County is comprised of volcanic rocks (California Geological Survey, 2010). The predominant soil types in the County include the Aiken series, Donica series, and Clallam series (USDA NRCS, 2020). The Aiken series is classified as clayey and consists of very deep, well-drained soils formed in material weathered from basic volcanic rocks (National Cooperative Soil Survey, 1997). Similarly, the Donica series consists of very deep, somewhat excessively drained soils that formed in volcanic ash and alluvium derived from mixed volcanic rocks (National Cooperative Soil Survey, 2006a). The Clallam series consists of moderately deep to densic materials, and moderately well-drained soils formed in glacial till over very compact glacial till (National Cooperative Soil Survey, 2004).

Liquefaction is a specialized form of ground failure caused by earthquake ground motion. It is a "quicksand" condition occurring in water-saturated, unconsolidated, relatively clay-free sands and silts caused by hydraulic pressure (from ground motion) forcing apart soil particles and forcing them into quicksand-like liquid suspension. Since Alpine County primarily consists of clayey soils, they are not considered highly susceptible to liquefaction.

Discussion

a) Would the project directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist–Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42;

ii. Strong seismic ground shaking?

iii. Seismic-related ground failure, including liquefaction?

The PTAs cross known earthquake faults and are potentially at risk for strong seismic ground shaking or seismic-related ground failure. The Markleeville USGS 7.5-minute quadrangle, which includes the Markleeville (priority PTA), Turtle Rock Park, and Grover Hot Springs PTAs, is located within an Alquist-Priolo Earthquake Fault Zone. The Woodfords USGS 7.5-minute quadrangle is also located within an Alquist–Priolo Earthquake Fault Zone and includes the Manzanita (priority PTA), Hung-a-Lel-Ti, Mesa Vista, and Diamond Valley PTAs (California Geological Survey, 2020). Fault rupture or seismic-related ground failure poses risks to workers; however, seismic ground shaking events are unpredictable, and the potential

occurrence of such events coinciding with WRMP activities is minimal. Implementation of the WRMP would not exacerbate existing or future seismic hazards by increasing the severity or likelihood of such hazards that would exist without the project. The WRMP involves implementation of various vegetation management activities and does not include any substantial new structures or operational activities that could create or exacerbate a ground-shaking risk to the surrounding populations. Implementation of the WRMP would not cause an increased risk of loss, injury, or death involving rupture of a known earthquake fault, strong seismic ground shaking, or seismic-related ground failure, including liquefaction. No impact would occur.

iv. Landslides?

Alteration of land with implementation of the WRMP may increase landslides, primarily through vegetation removal, which can weaken soil-matrix strength. Risk of landslide is greatest on steep slopes, which occur throughout the PTAs. In order to minimize risk of landslide, the WRMP defines use of mechanical equipment to be appropriate only on land with a slope less than 30 percent. In areas of slopes greater than 30 percent, where the greatest potential for landslide would occur, vegetation management activities would be limited to crews conducting thinning and pruning with chainsaws and hand tools. Refer to Impact c) for further analysis of the potential for the WRMP to increase landslide risk due to underlying unstable geologic units or soils. Impacts would be less than significant.

b) Would the project result in substantial soil erosion or the loss of topsoil?

Priority PTAs

The priority PTAs are underlain by a variety of surficial soil units susceptible to erosion. The Manzanita PTA primarily consists of Dixmine-Toadtown soil, which is a very deep, well-drained, fine soil with medium to high runoff (National Cooperative Soil Survey, 2006b). The majority of the Markleevillage PTA is underlain by the Donica series and the Joecutt-Heenlake association, which consists of very deep, well-drained soils with high surface runoff (National Cooperative Soil Survey, 2006c). Implementation of the WRMP would include actions that could cause erosion and loss of topsoil through removal of vegetation covering slopes and exposing bare soil and through the removal of plants by the root systems that bind soil, particularly on slopes. Erosion could degrade soil nutrient levels, could reduce habitat sustainability, and could result in downstream sedimentation, which could have an adverse impact on downstream waters. No erosion and topsoil loss impacts would occur as a result of pile burning in the Manzanita or Markleevillage priority PTAs. Piles would be localized and relatively small in size and generally would not result in burn scars over any areas significant enough to result in increased erosion. Soil erosion and topsoil loss would be limited by implementing MM Geology-1, which includes standard construction practices and BMPs for erosion and sediment control. Impacts would be less than significant with mitigation.

Non-Priority PTAs

Vegetation management activities under the WRMP would result in ground disturbance of at least the top layer of soil, which could result in erosion and loss of topsoil. Prescribed burns

may be implemented in several non-priority PTAs (Mesa Vista, Hung-A-Lel-Ti, Turtle Rock Park and Lake Alpine) in addition to manual vegetation removal activities and pile burns. Prescribed burns would require fire lines that are linear areas clear of vegetation and wide enough to contain the fire to the intended burn area. Fire lines, if created only for the purpose of the prescribed burn, would result in additional denuded areas that are more prone to erosion. Prescribed burning would result in the removal of vegetation on the surface, increasing the potential for erosion in the burned area, particularly if performed near waterways and riparian corridors. Water-repellent soils can be created by moderate to severe fires (including prescribed burns). Storm water can then flow over the exposed soils and pick up silt and small soil particles, eroding the surface. Groundcover of less than 70 percent has been found to result in excessive runoff and erosion (Lang & McDonald, 2005). Prescribed burns that retain at least 70 percent of groundcover would not result in a significant impact. Prescribed burns in the PTAs could be sizable enough that the removal of vegetation and resultant exposed hydrophobic soil could result in a substantial increase in erosion and loss of topsoil, which would be a potentially significant impact. MM Geology-1 would minimize erosion and loss of topsoil in denuded areas by requiring use of erosion-control measures on moderate to steep (10 percent slope and greater) slopes and where groundcover would be reduced to less than 70 percent and prohibits substantial ground-disturbing activities during or following a rain event. MM Geology-2 requires use of existing facilities for fire lines, implementation of erosion-control measures during and after prescribed burns, follow-up inspections, and restoration actions for new fire lines. Impacts would be less than significant with mitigation.

MM Geology-1: Erosion Control and Slope Stability Measures

Erosion control measures shall be implemented to ensure WRMP activities do not result in erosion, loss of topsoil, or slope instability in areas where work could expose bare soils or create loss of root-soil matrix strength. The following erosion control measures shall be implemented on sites with loose or unstable soils, steep slopes (greater than 30 percent), or where a large percentage of the groundcover will be removed (leaving groundcover less than 70 percent).

- Minimize areas to be disturbed to the greatest extent feasible.
- Prior to conducting work in any given area that could result in erosion or slope instability (e.g., vegetation removal or prescribed burns that could reduce the groundcover and expose soil), the area shall be inspected for existing signs of erosion or slope instability (e.g. rills, slumped soil).
- Install approved, biodegradable erosion-control measures (e.g., application of forest duff or mulches, straw bales, straw wattles or other erosion-control material, seeding, or planting of appropriate native plant species) and non-filament-based geotextiles (e.g., coir, jute) when causing soil disturbance on moderate to steep (10 percent slope and greater) slopes.
- Avoid use of heavy equipment on slopes greater than 30 percent unless specialized equipment is used that does not impact slope stability.
- Sediment control devices, if installed, shall be certified weed-free, as appropriate.
- No substantial ground disturbing work (e.g., use of heavy equipment, pulling large vegetation) shall occur during rain events and 48 hours after a rain event, defined as 0.5 inch of rain within a 48-hour or greater period, using the NOAA website as the official record for rain events.

Once work is completed, the areas shall be inspected as needed and as accessible but at least annually until groundcover exceeds 70 percent or it is clear that significant erosion and slope destabilization are not occurring. At that time, erosion control and slope stability devices may be removed at the discretion of County staff.

MM Geology-1: Erosion Control and Slope Stability Measures

Applicable Location(s): Any PTAs where the ground is disturbed and soils are exposed through vegetation-management activities with measures specific to areas on steep slopes and sites with loose or unstable soils.

Performance Standards and Timing:

- **Before Activity:** Inspect areas prior to work to assess the potential for erosion and soil instability.
- **During Activity:** Implement protection measures as needed to avoid or minimize erosion and slope destabilization.
- **After Activity:** Conduct inspections as needed, depending on the size and nature of the work and the site, to ensure that erosion is not occurring and to remove any erosion-control devices once they are no longer needed.

MM Geology-2: Firelines During Prescribed Burns

The following measures shall be implemented during prescribed burns to reduce erosion from firelines:

- Use existing barriers such as roads, trails, or wet lines as firelines. If new firelines must be established for a prescribed burn, firelines shall be restored as described below.
- Restore firelines upon completion of the burn if they are not used again (unless they are existing roads, trails, or other permanent elements) within one year of use. Utilize erosion-control measures, such as sediment traps, during restoration to reduce sedimentation impacts. Rehabilitation methods may include use of a hydromulch with locally collected, genetically appropriate native species; pulling duff, litter, and cut material back over lines; and/or distribution of locally chipped fuels on the lines.
- Design prescribed burn boundaries to avoid gullies and highly erodible soils to the fullest extent possible.

Applicable Location(s): Sites within the identified PTAs suitable for prescribed burns.

Performance Standards and Timing:

- **Before Activity**: Determine firelines.
- **During Activity**: Set up provisions as specified in the measure.
- **After Activity**: Restore firelines that will no longer be used upon completion of work.

c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse?

As discussed under Impact a), Alpine County is underlain by primarily well-drained, clayey soils. Clay soils may be subject to instability (shrink and swell); however, implementation of the WRMP would not involve grading or substantial ground disturbance that could result in loss of stability of the geologic unit. Therefore, the WRMP would not result in lateral spreading, subsidence, liquefaction, or collapse. The proposed vegetation-management activities could alter vegetative cover, expose soils, and/or minimize soil root-matrix strength where vegetation management activities are conducted on slopes greater than 30 percent, which could induce landslides. MM Geology-1 requires application of erosion-control measures on PTAs with the highest potential for erosion or landslide, including sites with loose or unstable soils and steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed (leaving groundcover less than 70 percent). The potential increased risk of unstable soils or

landslides as a result of the WRMP would be reduced with implementation of MM Geology-1. Impacts would be less than significant with mitigation.

d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

The WRMP would not include construction of habitable structures and, therefore, is not expected to create substantial risks to life or property. No impact would occur.

e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

The WRMP would not include the use of septic tanks or alternative wastewater disposal systems. No impact would occur.

f) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Implementation of the WRMP would result in only limited ground disturbance, confined to surface-level activities involved in vegetation removal, pile burning, and prescribed burning. Pile burns would not be conducted in the Bear Valley priority PTA and prescribed burning would not occur in any of the priority PTAs. Paleontological resources are typically present below surface level in sedimentary rock formations. The likelihood of paleontological resources being present in the PTAs is considered very low as Alpine County's geology is primarily igneous (volcanic) where paleontological resources are not known to exist. Few occurrences of paleontological resources have been documented in Alpine County (University of California Museum of Paleontology, 2020). Implementation of the WRMP would not unearth or destroy a unique paleontological resource or site or unique geologic feature. No impact would occur.

2.3.8 Greenhouse Gas Emissions

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
8. GREENHOUSE GAS EMISSIONS. Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐
b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐

Environmental Setting

Certain gases in the Earth's atmosphere, classified as GHGs, play a critical role in determining Earth's surface temperature. A portion of the solar radiation that enters the atmosphere is absorbed by the Earth's surface, and a smaller portion of this radiation is reflected toward space. This infrared radiation (i.e., heat) is absorbed by GHGs within the atmosphere; therefore, infrared radiation released from Earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere known as the "greenhouse effect." GHG emissions associated with human activities are likely responsible for intensifying the greenhouse effect and have led to a trend of unnatural warming of Earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (IPCC, 2014).

GHGs are present in the atmosphere naturally and can also be released by natural and anthropogenic (human-caused) sources. The GHGs that are widely accepted as the principal contributors to human-induced global climate change include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Impacts of GHGs are borne globally as opposed to localized air-quality effects of criteria air pollutants and TACs. The quantity of GHGs that it takes ultimately to result in climate change is not known precisely; the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to a global or local climate or to a microclimate. From the standpoint of CEQA, GHG-related effects to global climate change are inherently cumulative.

Discussion

a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?

The goal of the WRMP is to reduce wildfire risk in Alpine County and to protect important resources throughout the County. WRMP implementation would generate short-term GHG emissions related to the use of vehicles, mechanical equipment, pile burning, and prescribed burning. Pile burns would not be conducted in the Bear Valley priority PTA, and prescribed burning would not occur in any of the priority PTAs. GHG emissions generated by the WRMP activities would consist primarily of CO_2. The project-related GHG emissions would be

temporary and would disperse quickly. Individual prescribed burns produce far less CO_2 than a large wildland fire could generate. While vegetation-management activities related equipment, pile burns, and prescribed burns implemented under the WRMP would introduce some CO_2 emissions, implementation of the WRMP would reduce the potential release of GHG emissions in the long term by reducing wildland fire hazards and reducing the potential intensity and severity should a wildland fire break out. The WRMP would not generate GHG emissions that may have a significant impact on the environment. Impacts would be less than significant.

b) Would the project conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Neither the County nor any other agency with jurisdiction over the WRMP area has adopted climate change or GHG reduction measures with which the WRMP would conflict. Alpine County has created community-wide and local-government-operations GHG inventories through the Green Communities project and is working towards adoption of a Climate Action Plan, which will recommend implementation measures to reduce GHG emissions (Alpine County, 2017). Implementation of the WRMP would not conflict with any applicable plan, policy, or regulation for the purpose of reducing GHG emissions. Impacts would be less than significant.

2.3.9 Hazards and Hazardous Materials

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
9. HAZARDS AND HAZARDOUS MATERIALS. Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☒	☐	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☒	☐
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☒	☐	☐

Environmental Setting

The State Water Resources Control Board (SWRCB) GeoTracker, and the California Department of Toxic Substances Control (DTSC) EnviroStor database were searched to identify toxic releases, hazardous waste, or other violations that could affect the PTAs under the WRMP. No active leaking underground storage tank (LUST) cleanup sites are located in Alpine County. As of April 2017, assessment and remedial actions are currently being implemented by the SWRCB at an active cleanup site at Kirkwood Mountain Resort, where a pipe leaking gasoline was discovered. This site is not in close proximity to any of the PTAs. The Woodfords Sodium Hypochlorite Spill is an additional SWRCB active cleanup site as of December 2018 and is

located approximately 0.7 mile north of the Manzanita PTA and 1 mile northwest of the Diamond Valley PTA. The Alpine County Hazardous Waste Management Plan identifies five specific sites in the County as possibly suitable for a future hazardous-waste facility. None of the PTAs are located in close proximity to these sites (Alpine County, 2017).

The Alpine County Airport is the only public aviation facility in the county. The Caltrans Division of Aeronautics classifies the airport as a Limited Use Airport. Limited Use Airports serve recreational, training, military, and emergency uses and accommodate predominately single engine aircraft under 12,500 pounds. Alpine County Airport currently serves approximately 650 users annually (Alpine County, 2017). The Bear Valley Airport is located approximately 0.5 mile east of the Bear Valley PTA; however, this airport is not available for public use (Airnav.com, 2020).

Alpine County has not adopted a formal emergency response plan or emergency evacuation plan at this time. The Alpine County Fire Safe Council, in coordination with local law enforcement and volunteer fire agencies, has determined emergency egress routes and evacuation locations for the County (Alpine County, 2017). Hot Springs Road, routinely used by recreationists and residents to access Grover Hot Springs State Park, serves as an important access route for fire and emergency response providers and travels near the Markleevillage and Grover Hot Springs PTAs.

Discussion

a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Vegetation management activities would involve the use of vehicles and equipment, which could result in the leakage or spillage of fuels. Spills could occur during fueling or at work sites during WRMP implementation. Improper cleanup or handling of fuels and other hazardous materials could result in impacts on workers, the public, or the environment. MM Hazards-1 requires the County to implement spill prevention and response best management practices during implementation of vegetation-management activities. These best management practices would ensure that hazardous materials are properly stored on site and that any accidental releases of hazardous materials would be properly controlled and quickly cleaned up. Impacts would be less than significant with mitigation.

MM Hazards-1: Spill Prevention and Response

The County shall, at a minimum, implement best management practices that address the following procedures related to the use of hazardous materials during WRMP implementation:

- All workers shall be trained on the specific procedures for hazardous materials and emergency response and reporting procedures as an element of the required worker environmental training in MM Biology-1 prior to working in any PTA.
- Vehicles and equipment will undergo daily inspection for leaks and spill containment procedures.
- Secondary containment and spill rags will be used when fueling onsite.
- Fuels and lubricating oils for vehicles and heavy equipment will not be stored or transferred within 100 feet of any waterbodies unless otherwise isolated from waterbodies by secondary containment.
- Emergency spill supplies and equipment such as oil-absorbent material, tarps, and storage drums shall be available on site to respond in a timely manner if an incident should occur.
- Proper disposal or management of contaminated soils and materials (i.e., clean up materials) will be insured and reporting procedures implemented in accordance with applicable federal, State and local requirements.
- "Topping-off" of fuel tanks will be discouraged.

Applicable Location(s): Any PTA under the WRMP.

Performance Standards and Timing:

- **Before Activity**: N/A
- **During Activity**: (1) Implement appropriate best management practices that limit the potential for leaks and spills and (2) clean up any inadvertent spills appropriately.
- **After Activity**: N/A

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Priority PTAs

The closest school to a priority PTA is Diamond Valley Elementary School, located approximately 0.37 mile east of the Manzanita PTA. No schools are located within 0.25 mile of a priority PTA. No impacts would occur with implementation of the priority PTAs.

Non-Priority PTAs

Diamond Valley Elementary School is located within 1,000 feet of the Diamond Valley PTA. No other PTAs are located within 0.25 mile of an existing or proposed school. The use of equipment for vegetation management activities within the PTAs could lead to fuel leaks and spills. Improper handling of hazardous materials and leaks and fuel spills from refueling at work sites could pose a significant hazard to the public or the environment. MM Hazards-1 requires the County to implement spill prevention and response best management practices, which would minimize the potential for leaks and spills and ensure proper handling of hazardous materials in the event of a spill or leak. Impacts associated with implementation of the WRMP at PTAs other than the priority PTAs would be less than significant with mitigation.

d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

There are two active cleanup sites located in Alpine County, one at Kirkwood Mountain Resort and one at the Woodfords Maintenance Station. None of the PTAs are located on or in close enough proximity to these hazardous materials sites to result in an impact to workers or the public. No impact would occur.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Priority PTAs

The closest public airport to a priority PTA is Alpine County Airport, located approximately 3 miles southeast of the Manzanita PTA and approximately 3.2 miles northeast of the Markleevillage PTA. The Bear Valley Airport is located approximately 0.5 mile east of the Bear Valley PTA; however, this airport is not available for public use (Airnav.com, 2020). No public airports are located within 2 miles of a priority PTA. No impacts would occur with implementation of the priority PTAs.

Non-Priority PTAs

The Alpine County Airport is located approximately 2 miles east of the Turtle Rock Park PTA. As stated in the Alpine County General Plan, the County airport receives very limited use and is located three miles from the nearest developed area; it is therefore not included as a significant noise-producing transportation facility in the County. Implementation of prescribed burns may occur within the non-priority PTAs, including Turtle Rock Park, Mesa Vista, Hung-A-Lel-Ti, and Lake Alpine PTAs. Prescribed burning and pile burning would be maintained at low intensities that would not generate sufficient smoke to affect visibility or air traffic. Impacts would be less than significant.

f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

No emergency response plan or emergency evacuation plan has been adopted by Alpine County. Implementation of vegetation-management projects under the WRMP would not include road closures or generate substantial traffic volumes that could create a hazard or slow the movement of vehicles. No impact would occur.

g) Would the project expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Priority PTAs

The purpose of the WRMP is, in large part, to reduce fuel loads and wildland-fire risks in Alpine County compared with the baseline conditions. Implementation of the WRMP would have beneficial effects with regard to reducing wildland fire risks or the size and spread of wildland fires, were one to break out. Performance of fuel treatment activities could increase risk of wildland fire ignition due to the use of vehicles and equipment that generate sparks or

heat. Certain parts of the county could be more susceptible to fire ignition and spread, such as areas on steep slopes, south-facing slopes, and areas where significant fuel is found (e.g., dead trees and thick understories of weeds). Pile burns also have a higher potential for starting a wildfire were the burns to become uncontrolled. The ignition of any fire is considered a significant impact as it could turn into a wildfire. Most equipment uses renewable diesel fuel, minimizing the potential for ignition, but gasoline spills could be ignited, resulting in a wildfire. Any fuel spills would be handled according to the best management practices implemented in MM Hazards-1 to prevent wildfire ignition. Implementation of best management practices defined in MM Hazards-2 would also reduce the likelihood of a fire ignition and spread. Under MM Hazards-2, workers would not be permitted to smoke on site or during the fire season, fire suppression equipment shall be maintained on site, and activities that create increased risk of fire ignition would be restricted during high fire-danger conditions (e.g., red flag warnings or during public safety power shut-off events).

Pile burning would be conducted as part of the WRMP in the Manzanita and Markleevillage priority PTAs and all non-priority PTAs. Piles of vegetation would be created following manual and mechanical vegetation removal and allowed to dry prior to burning. The stockpiling of dry vegetative material has the potential to increase fire risks prior to burning because it is a concentrated source of flammable fuels. If a pile-burn event were to ignite a wildfire of any size or with potential for spread, the impact would be considered significant. MM Hazards-3 would ensure all pile burns would be conducted in accordance with Title 17 of the CCR and GBUAPCD's Rule 411, which prohibits wildland vegetation management burning on "no burn" days as announced daily by the State Air Resources Board for the Inyo, Mono, and Alpine Counties or when such burning is prohibited by the Air Pollution Control Officer (APCO) (GBUAPCD, 2001) or a fire-management agency. A Smoke Management Plan would also be prepared and implemented with implementation of MM Hazards-3 in accordance with GBUAPCD's Rule 411 and the Smoke Management Program for any wildland vegetation-management burning projects greater than 1 acre in size (including pile burns or prescribed burns). The Smoke Management Plan would require procedures for public notification and education, including appropriate signage at burn sites, and for reporting of public smoke complaints. Pile-burning events would be registered with GBUAPCD and include a completed Smoke Management Plan and Smoke Management Permit Application Form consistent with the requirements of CCR, Title 17.

Compliance with the aforementioned regulations would minimize the effect, but impacts could remain significant. MM Hazards-3 requires pile burning to not occur on days with wind speeds over 15 mph and outside the fire season when vegetation is damp. Pile burning would only be performed under permits or with notification, as required, on allowable burn days. MM Hazards-3 also includes provisions for stockpiling that would reduce the likelihood of unintended ignition. Piles would also be constructed in areas of lowest risk for rapid fire spread, at least 100 feet away from the edge of public trails or roads and not at the base of slopes. Impacts would be less than significant with mitigation.

Non-Priority PTAs

The proposed WRMP activities would decrease the risk of extreme wildland fire behavior, slow the spread of a wildland fire, and aid in the suppression and control of a wildland fire. MM Hazards-2 and MM Hazards-3 (described above under Priority PTAs) would also be applied during WRMP implementation at the non-priority PTAs to reduce the risk of a wildfire ignition and uncontrolled spread. Prescribed burning would also be a potential fuel-treatment activity in Mesa Vista, Hung-A-Lel-Ti, Turtle Rock Park, and Lake Alpine PTAs. Like pile burns, prescribed burns also have some, although very minimal based on past experience, likelihood to become uncontrolled and potentially start a wildfire, which would be considered a significant impact. Uncontrolled fires could place firefighters and residents or other sensitive receptors outside of PTAs at risk of injury or death. Structures within and adjacent to PTAs could be placed at risk, as well. The impact from an escaped prescribed burn, although the chances of it occurring are exceedingly rare, would be significant. As previously described, per MM Hazards-3, all pile and prescribed burns would be conducted in accordance with CCR Title 17 and GBUAPCD's Rule 411, which requires submittal of a Smoke Management Plan for any wildland vegetation-management burning projects greater than 1 acre in size. A Burn Plan would also be prepared for each prescribed burn to ensure compliance with GBUAPCD Rules 409 – Range Management Burning, 410 – Forest Management Burning, and 411 – Wildland Vegetation Management Burning. The Burn Plan would include, at minimum, the project objectives, contingency responses for when the fire is out of prescription with the smoke management plan, the fire prescription (including smoke management components), and a description of the personnel, organization, and equipment.

Residents within the prescribed burn area may not be aware of the prescribed burn and, thus, could put themselves in harm's way. Directly exposing the public to a wildfire event could result in a significant impact. MM Hazards-3 requires providing public notification to individuals within one mile and at trailheads and access roads leading to all areas proposed for burning at least 24 hours in advance of a prescribed burn. Signs would be placed at trailheads and access roads notifying the public of where burning would occur and while the prescribed burn is in progress. Impacts would be less than significant with implementation of mitigation.

MM Hazards-2: Fire Prevention and Suppression Practices

The County shall implement the following best management practices to prevent the ignition and spread of an unplanned fire during implementation of WRMP activities:

- Smoking will not be permitted on site, except in barren areas that measure a minimum of 20 feet in diameter and are cleared to mineral soil. Under no circumstances will smoking be permitted during the fire season (approximately July through October) while employees are operating equipment or are walking or working in forested areas.
- On-site idling of vehicles and vegetation-management equipment shall be minimized.
- All personal vehicles or vegetation-management equipment shall be parked in appropriate parking areas at all times, not located near dry grass or vegetation, and off of main roads and potential evacuation routes, with adequate space for emergency response vehicles to pass.
- All work crews shall maintain appropriate fire-suppression equipment (e.g., extinguishers, shovels) in vehicles at each work site to suppress inadvertently ignited fires.
- Activities that could cause sparks, such as use of mechanical equipment, are required to cease during extreme fire weather, including Red Flag Warning days and localized Public Safety Power Shut-Off events.

Applicable Location(s): Any PTA.

Performance Standards and Timing:

- **Before Activity**: N/A
- **During Activity**: 1) Smoking shall be limited to permitted areas only, 2) vehicle and equipment idling shall be minimized, 3) fire suppression equipment shall be available on site, and 4) activities that are associated with increase fire risk shall be restricted during high fire-danger conditions.
- **After Activity**: N/A

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning

The following measures shall be implemented to reduce hazards associated with pile and prescribed burning:

- Contractor shall ensure it is an "approved burn day" announced daily by the CARB prior to pile burning and allowed by local fire agencies.
- A Smoke Management Plan shall be prepared and implemented in accordance with GBUAPCD's Rule 411 for any wildland vegetation-management burning projects greater than 1 acre in size.
- A Burn Plan shall be prepared for each prescribed burn in compliance with GBUAPCD Rules 409 – Range Management Burning, 410 – Forest Management Burning, and 411 – Wildland Vegetation Management Burning.
- Piles shall be burned or chipped prior to the fire season and within six months of treatment.
- Piles shall not be burned during the fire season.
- Pile burning shall only be allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph).
- Piles shall not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills.
- Piles shall be set back at least 100 feet from public roads and trails to minimize risk to residents, recreationalists, and other users.
- All requirements of the GBUAPCD shall be met, including any permit, notification, and reporting requirements.
- Public notification shall be provided at least 24 hours in advance of a prescribed burn to individuals within one mile and at trailheads and access roads leading to the area proposed for burning. The public notification shall include current contact numbers to the appropriate burn coordinator.

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning
• Temporary signage shall be installed at intervals ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress.
Applicable Location(s): Wherever stockpiles of slash are made, where piles shall be burned, and where prescribed burns are proposed.
Performance Standards and Timing: • **Before Activity:** Notify public, post signs, and obtain all permits and make all necessary notifications as required by GBUAPCD. • **During Activity:** (1) Ensure that piles are located appropriately, (2) ensure proper weather conditions during pile burning, and (3) ensure signage is installed in locations in close proximity to all prescribed burns. • **After Activity:** Remove signage.

2.3.10 Hydrology and Water Quality

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
10. HYDROLOGY AND WATER QUALITY. Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
i) result in substantial erosion or siltation on- or off-site;	☐	☒	☐	☐
ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;	☐	☐	☒	☐
iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or	☐	☐	☐	☒
iv) impede or redirect flood flows?	☐	☐	☐	☒
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☐	☒
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	☒

Environmental Setting

The State Regional Water Quality Control Boards (RWQCB) assume primary responsibility for insuring maintenance of water quality in California. Western Alpine County is managed by the Central Valley RWQCB, and the eastern side is managed by the Lahontan RWQCB. Most rural residences in Alpine County are served by on-site wells and septic systems. Surface waters in the eastern slope of Alpine County have been adjudicated (Alpine County, 2017).

Alpine County is located at the headwaters of five rivers and corresponding watersheds, which provide water to Western Nevada and California's Central Valley – the Carson, Mokelumne,

Stanislaus, Truckee, and American. The Carson River Watershed is located east of the crest of the Sierra Nevada, and approximately 46 percent of the watershed is within Alpine County. The Stanislaus River Watershed encompasses approximately 1,075 square miles, and the Stanislaus River is one of the largest tributaries to the San Joaquin River. The American River Watershed includes the North, Middle, and South Forks of the American River. The South Fork, the only major tributary in Alpine County, drains approximately 804 square miles of watershed (Alpine Watershed Group, 2020).

The Markleevillage priority PTA includes the area where Hot Springs Creek first converges with Spratt Creek and then with Pleasant Valley Creek. The name of the drainage changes to Markleeville Creek downstream from the confluence with Pleasant Valley Creek. Markleeville Creek is recognized as a major tributary to East Fork Carson River. Scott Creek flows perennially at the Manzanita priority PTA, as do numerous isolated outflows from perennial springs. Surface flows at the Bear Valley priority PTA occur mainly after snow that has accumulated during the winter period begins to melt; therefore, surface flows are strictly seasonal or ephemeral in duration at this PTA (Paulus, 2020).

The Alpine County General Plan estimates that the most reliable supplies of groundwater in Alpine County may be found in recent alluvial deposits. Areas important to groundwater recharge include coarse sand near stream deposits along mountain fronts and stream and river channels. The Carson River West Fork alluvial fan underlies the vicinity of Woodfords, Paynesville, and Fredericksburg. It is reported that not all appropriations are used in a given year and, therefore, groundwater extractions are nearly equal to supply (Alpine County, 2017).

The entirety of Alpine County is not within the boundary of any 100-year floodplains, as indicated by the Federal Emergency Management Agency (FEMA) flood maps. The boundary of a 100-year floodplain is used to demarcate flood hazards and indicates the geographic area having a one-percent chance of being flooded in any given year. Alpine County is entirely within a Zone D flood hazard area. The Zone D designation is used for areas where there are possible but undetermined flood hazards as no analysis of flood hazards has been conducted (Alpine County, 2017; FEMA, 2020).

Discussion

a) Would the project violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality?

Implementation of vegetation-management actions could result in some water quality impacts from sedimentation and siltation of waterbodies or waterways due primarily to erosion of exposed soils. Movement of surface soils could occur during the process of clearing vegetation through hand thinning, mechanical methods, and prescribed burn (excluding the priority PTAs). Any erosion or sedimentation of waterbodies that results in the violation of water quality standards or water discharge requirements would be a significant impact. MM Biology-3 requires locations of riparian habitat and water bodies and corresponding 50-foot (minimum) setbacks (Waters and Wetland Protection Zones) to be identified and avoided during WRMP activities. Waters and Wetland Protection Zones and appropriate runoff controls, such as berms,

straw wattles, silt fencing, filtration systems, and sediment traps, would be implemented to protect riparian habitat and control siltation and the potential discharge of pollutants.

The vegetation management activities included in the WRMP would not require grading of soil to create access roads as work crews can utilize existing roads and trails to access treatment areas. As described in the WRMP, site access would be achieved by creating skid trails in some locations, which include foot trails, or by using former trails that have grown over and can be cleared for access. Clearing of skid trails would not occur when soils are wet, and sensitive habitats, creeks, and wetlands would be avoided. The skid trails would not be graded or scraped. Skid trails would be rehabilitated following use, which involves decompacting soils, removing skid lines, distributing surrounding litter/duff back on site, and obscuring entrance points with brush. Vegetation clearance would occur by use of powered tools, machinery, and hand tools. No herbicides or other chemical treatments would be applied during the vegetation management activities. Fuel treatments conducted along steep slopes would be conducted by crews using handheld equipment rather than motorized machinery. This approach would reduce potential for erosion because steep gradients can accumulate sediment and debris that can mobilize, suddenly creating debris flows and severe scouring.

Drainages within the priority PTAs were identified during biological surveys conducted in August 2020 and will be clearly marked for avoidance during implementation of the WRMP, per MM Biology-3. Crews may not be aware of riparian exclusion areas in the non-priority PTAs without proper surveying prior to conducting vegetation management activities. MM Biology-3 also requires identification and establishment of protection zones around water bodies, including riparian habitat, and use of appropriate runoff controls prior to implementing fuel treatments within any of the non-priority PTAs. Completion of these runoff controls and clearly marking exclusion areas will provide a buffer of land that separates soil disturbed by vegetation clearing and minimize the potential for surface runoff to transport sediment to a drainage and degrade water quality. Impacts would be less than significant with mitigation incorporated.

MM Biology-3: Waters and Wetland Protection Zones
Refer to Section 2.3.4: Biological Resources

b) Would the project substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Implementation of the WRMP would not involve extraction of groundwater or involve placement of impervious surfaces in an area designated for groundwater recharge. The fuel treatment activities would not result in expansion in the amount of impervious surfaces in the PTAs. The WRMP would provide beneficial impacts for forest and wildfire management and is not expected to interfere with groundwater recharge. The WRMP would not deplete

groundwater supplies and would not interfere substantially with groundwater recharge. No impact would occur.

c) Would the project substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

a. result in substantial erosion or siltation on- or off site;

The vegetation-management activities proposed in the WMRP would not substantially alter the existing drainage pattern of the PTAs or alter the course of a stream or river. As discussed in Section 2.3.7 Geology and Soils, implementation of the WRMP would include actions that could cause erosion and loss of topsoil through removal of vegetation covering slopes and exposing bare soil and through the removal of plants by the root systems that bind soil, particularly on slopes. Soil erosion and topsoil loss would be limited by implementing MM Geology-1, which includes standard construction practices and BMPs for erosion and sediment control. Impacts would be less than significant with mitigation.

b. substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off site;

As described above, vegetation-management activities proposed in the WMRP would not substantially alter the existing drainage pattern of the PTAs or alter the course of a stream or river. Minor increases in surface-runoff rates after prescribed burns or pile burns (due to hydrophobic soils in burned areas) would be minimal. Impacts would be less than significant.

c. create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

The WRMP would not include any new developed land uses and would not require connection to or otherwise contribute to existing or planned stormwater drainage systems. Implementation of the WRMP would not contribute runoff that would exceed the capacity of existing stormwater drainage systems or provide substantial additional sources of polluted runoff. No impact would occur.

d. impede or redirect flood flows?

As described above, none of the PTAs are located within a 100-year floodplain, and no additions of impervious surfaces would occur as a result of WRMP implementation (Alpine County, 2017; FEMA, 2020). Additional hydrophobic soils would not be significant on a large scale due to other sources of infiltration throughout Alpine County and would not impede or redirect flood flows. No impact would occur.

d) Would the project in flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Alpine County does not include identified flood hazard, tsunami, or seiche zones. Implementation of the WRMP would not increase the potential or risk of release of pollutants due to inundation. No impact would occur.

e) Would the project conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

The 2007 Alpine County Groundwater Management Plan identifies and addresses groundwater management needs at a local level. As discussed above under Impact b), the WRMP would not deplete groundwater supplies and would not interfere substantially with groundwater recharge. Vegetation-management activities would not result in conditions that would alter or contribute to conflicts with an applicable water-quality control plan or sustainable groundwater-management plan. Fuel treatments can lower the effects of a catastrophic wildfire on water quality, increasing the water temperature and creating the potential for subsequent rain to carry sediment from newly exposed soil into waterways. Implementation of the WRMP would not result in conflicts with implementation of a water quality control plan or sustainable groundwater management plan. No impact would occur.

2.3.11 Land Use and Planning

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
11. LAND USE AND PLANNING. Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒

Environmental Setting

Alpine County is primarily a rural place, featuring many nearby public lands, outdoor recreation opportunities, agricultural lands, and small residential communities. The primary land use designation in Alpine County is Open Space (Alpine County, 2017). Alpine County is the least populated county in California, with approximately 1,200 full-time residents (U.S. Census Bureau, 2019). Alpine County is divided by the crest of the Sierra Nevada into east and west slope geographic regions. The Sierra crest becomes a significant boundary between east and west Alpine County during winter months, when SR- 4 connecting Bear Valley with Markleeville is closed, resulting in a minimum of three to four hours of travel time between the communities. The majority of the County's population lives in only a few communities scattered throughout the east and west regions.

The priority PTAs include 860 acres of privately owned land spanning three sites: Bear Valley, Manzanita, and Markleevillage. The Bear Valley site is located on the western edge of the Bear Valley residential community. The Manzanita site is located within open space land just outside of the Manzanita community. The Markleevillage site is located within the Markleevillage residential area and includes open space land on the eastern and western edges.

Discussion

a) Would the project physically divide an established community?

Implementation of the WRMP does not include new development, and no changes in land use are needed for WRMP implementation. The fuel treatment projects involve vegetation management and do not involve construction of infrastructure that would physically divide an established community. No impact would occur.

b) cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Implementation of the WRMP do not require changes in land use. The WRMP activities would not conflict with any land-use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. No impact would occur.

2.3.12 Mineral Resources

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
12. MINERAL RESOURCES. Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

Environmental Setting

According to the CGS Mineral Land Classification, no area within Alpine County is designated as a Mineral Resource Zone (California Department of Conservation, 2015). Five mines and quarry sites occur in Alpine County. Two mines are currently active, two are closed, and one is fully reclaimed. Table 2-7 provides the status and product details for each mine and quarry.

Table 2-7 Status of Mines and Quarries in Alpine County

Mine/Quarry Name	Status	Primary Product
Diamond Valley Borrow Site	Closed (reclamation in progress)	Fill dirt
Diamond Valley Boulder Site	Reclaimed	Dimension stone
Fredericksburg Gravel Pit	Idle (reclamation not started)	Rock
Gansberg Sand	Active (reclamation in progress)	Sand and gravel
Merril Borrow Pit	Active (reclamation not started)	rock

Source: (California Department of Conservation, 2016)

Discussion

a) Would the project result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Various fuel-treatment activities would occur at surface level within the identified PTAs under the WRMP. Vegetation management and other activities associated with the WRMP would not preclude or inhibit the extraction of known, available high-quality mineral resources in Alpine County and would not result in obstruction of access to mineral resources within Alpine County. No impact would occur.

2.3.13 Noise

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
13. NOISE. Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐

Environmental Setting

Noise is defined as unwanted sound. Various noise descriptors are used to quantify the sound experience, dependent upon different time scales and perception. Sound is measured on a logarithmic scale of sound pressure level known as a decibel (dB). A sound level of zero dB corresponds to the minimum threshold of human hearing for those without hearing damage (Ray, 2013). The average threshold of hearing is close to 10 dB (Caltrans, 2009). USEPA has determined that over a 24-hour period, an equivalent continuous sound level (L_{eq}) of 70 decibels, A-weighted value (dBA), will result in some hearing loss. Interference with activity and annoyance will not occur if exterior levels are maintained at an L_{eq} of 55 dBA and interior levels at or below 45 dBA.

Due to the lack of sizeable industrial operations, the county's small population, and topography, existing noise emissions in Alpine County are generally limited to transportation facilities and corridors. Recreation and tourism in the County create higher levels of noise at these facilities and corridors than would otherwise exist. The Alpine County airport presently receives very limited use and is located three miles from the nearest developed area. It is therefore not included as a significant noise producing transportation facility (Alpine County, 2017). The Alpine County Noise Ordinance (County Code §18.68.090) establishes noise compliance standards based on the Alpine County General Plan zoning designations (Table 2-8). However, §18.68.090(F) states:

> "Exemptions. Sound or noise from the following sources and activities are exempt from the requirements of this section:

1. Construction. Noise from construction activities between the hours of eight a.m. and six p.m. Monday through Friday; and between nine a.m. and three p.m. on Saturday and Sunday. Construction noise that does not exceed the maximum sound levels allowed in this section is not subject to these time restrictions."

The noise compliance standards in Table 2-8 have been provided for informational purposes.

Table 2-8 Alpine County Maximum Allowable Noise Exposure by Land Use

Zone	Maximum Leq
Residential neighborhood (RN*)	65 dBA
Residential estates (RE*)	60 dBA
Institutional (INS)	70 dBA
Planned development (PD)	70 dBA
Commercial recreational (CR)	75 dBA
Commercial (C)	75 dBA

Source: (Alpine County, 2009)

Discussion

a) Would the project result in generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

The WRMP would not generate or result in long-term noise levels in excess of existing conditions at the PTAs or vicinity. Noise generated during implementation of vegetation-management activities would be limited to short-term, temporary vegetation-management activities. Types of equipment that may be used to implement the WRMP activities and their corresponding noise levels is identified in Table 2-9. Nearby sensitive receptors include residents and recreationalists. The intensity of noise would be highest at adjacent residences and would diminish over distance to other residences; however, as stated in the WRMP, only hand tools would be used during activities that occur within 100 feet of homes or structures. The noise associated with fuel-treatment equipment (e.g. chainsaws) is not abnormal for the rural conditions of Alpine County and would be limited to short-term exposure.

Vegetation management activities conducted under the WRMP could be considered "construction" as the work involves the same types of equipment and work. Vegetation management activities conducted during standard construction hours, therefore, would be exempt from the Alpine County Noise Ordinance and the noise-exposure limits defined in County Code §18.68.090. As described in the WRMP, implementation of vegetation-management activities would be conducted between the hours of 8 am and 6 pm, Monday through Friday, and between 9 am and 3 pm on Saturday and Sunday; therefore, implementation of the WRMP would be completed in accordance with the County's Noise Ordinance. Impacts would be less than significant.

Table 2-9 Noise Generation Levels of Representative Equipment Used to Implement the WRMP

Technique	Key Equipment/ Activity Noise	Noise Levels at 50 Feet (dBA)	
		L_{max}	L_{eq} [a]
Manual and mechanical	Backhoe	78	74
	Excavator	81	77
	Skid steer with masticating head	79	75
	Backhoe with masticating head	78	74
	Tractor	84	80
	Brushcutter[b, c]	78	74
	Chainsaw	82	77
	Power pole saw[b, c]	66	64
	Hand tools[c, d]	40	36
	Hand tools[c, d]	40	36
	Excavator with masticating head	81	77
	Chipper[b, c]	85	81
Pile burning	Water pump (on fire engine)	81	78
	Leaf blower[b]	76	72
	Livestock	--	35
	Dog barking	100 - 125	--
Prescribed burning (pre-treatment, burn, and mop up)	Fire engine (Wildland Type 3 or 6)	77	73
	Water pump (on fire engine)	81	78
	Skid steer	79	75
	Tractor	84	80
	Chainsaw	82	77
	Power pole saw[b, c]	66	64
	Leaf blower[b]	76	72
Vehicle Travel	Pickup truck	75	71

Notes:

[a] The hourly L_{eq} is based on the hourly use factor and L_{max}.

[b] The noise level at the operator/receptor to noise source is generally three feet for the purposes of determining the noise level at 50 feet.

[c] A usage factor of 40 percent was assumed, similar to other equipment.

[d] Chopping wood is used as a proxy for the upper limit of noise.

b) Would the project result in generation of excessive groundborne vibration or groundborne noise levels?

As described in the WRMP, implementation of fuel-treatment activities would generally not occur within 100 feet of homes or structures, and any activities that are proposed within this buffer would be executed exclusively with hand tools. The use of hand tools would not result in generation of groundborne vibration or groundborne noise levels. Mechanical equipment would be used at least 100 feet away from residences, and any associated groundborne vibration would dissipate before reaching the structure. Vibration from trucks and typical construction equipment dissipates below the damage threshold for sensitive structures within 10 feet (FTA, 2018). Any vibration experience from trucks passing by receptors would be very brief and periodic and would only occur during implementation of WRMP activities. Impacts would be less than significant.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Priority PTAs

As discussed in Section 2.3.9 Hazards and Hazardous Materials, no public airport is located within two miles of the Bear Valley, Manzanita, or Markleevillage priority PTAs. The Bear Valley Airport is located approximately 0.5 mile east of the Bear Valley PTA and is only available for limited private use (Airnav.com, 2020). No noise impacts related to worker exposure to airport noise would occur.

Non-Priority PTAs

The Alpine County Airport is located approximately 2 miles east of the Turtle Rock Park PTA. As stated in the Alpine County General Plan, the County airport receives very limited use and is located three miles from the nearest developed area; it is therefore not included as a significant noise-producing transportation facility in the county. Implementation of vegetation-management activities at the Turtle Rock Park PTA would not result in excessive noise for people residing or working in the PTA. Impacts would be less than significant.

2.3.14 Population and Housing

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
14. POPULATION AND HOUSING. Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

Environmental Setting

As described in Section 3.3.11 Land Use and Planning, Alpine County is located in a predominantly rural region of the state. Alpine County is the least populated county in California, with approximately 1,200 full-time residents ((U.S. Census Bureau, 2019). The majority of the permanent residents in Alpine County live in the east region of the County, separated from the west region by the crest of the Sierra Nevada. Many residences within the county are vacation or second homes. Although the county's permanent population is very low, peak population (including permanent and second-home residents, overnight visitors, and day visitors) is likely in the range of 10,000 to 20,000 persons. Peak populations occur during winter holidays and weekends, when the Bear Valley and Kirkwood resort areas are near capacity (Alpine County, 2017).

The WRMP activities may be implemented within the identified PTAs in Alpine County. These areas feature high fire-hazard risk and/or are located near communities or other valuable resources. The three priority PTAs are located on privately owned lands in Alpine County. Portions of the Bear Valley and Markleevillage PTAs include residential areas.

Discussion

a) Would the project induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

The WRMP involves the implementation of vegetation-management activities in selected PTAs throughout Alpine County. The priority PTAs were determined through a wildfire-risk assessment that considered existing population and vegetation conditions. Vegetation-management activities would be implemented to protect existing homes and assets within the County from wildfire. The WRMP does not include construction of new homes or businesses and therefore would not directly or indirectly induce substantial unplanned population growth, nor would it displace housing or people. No impact would occur.

2.3.15 Public Services

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
15. PUBLIC SERVICES.				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

Environmental Setting

Eastern Alpine Fire/Rescue and CAL FIRE provide fire-protection services to Alpine County. The Alpine County Fire Station #92 is located on Hot Springs Road in Markleeville, and the Bear Valley Fire Department is located on Bear Valley Road. The Alpine County Sheriff's Department has a Bear Valley Substation Location and a Markleeville Department Location.

Discussion

a) **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:**

Fire protection?

Police protection?

Schools?

Parks?

Other public facilities?

The WRMP would not include construction of new housing or businesses that would increase population levels and result in an increased demand for public services. Implementation of vegetation-management projects would not affect emergency response times or other performance objectives. Due to the rural setting of Alpine County, pile burns occur frequently throughout the county and therefore would not alarm residents. Residents or recreationalists who witness a prescribed burn within a non-priority PTA could become alarmed if they are

unaware of the scheduled burn and proceed to notify emergency response personnel; however, prescribed burns would be attended by appropriate management personnel at all times and would reassure potentially alarmed individuals. The WRMP would not generate the need for construction of new or expansion of existing fire-protection facilities, police protection facilities, schools, parks, or other public facilities. Impacts would be less than significant.

2.3.16 Recreation

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
16. RECREATION.				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☒	☐	☐
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

Environmental Setting

Many local residents and travelers from outside of the area visit recreational areas within Alpine County during the summer and winter seasons. Recreational use is more limited at other times of the year and is primarily by local residents. During the summer months, large numbers of visitors visit the campgrounds, lakes, and trails near the PTAs. The popular summer tourist attraction, Grover's Hot Springs State Park, and dispersed recreation sites near the Markleevillage PTA, can add hundreds of people to the community during peak season. Recreationalists also visit Lake Alpine during the summer season, which is located near the Lake Alpine PTA. During the winter, vehicular traffic is extremely high in the County with visitors passing through for winter recreation. The Bear Valley Resort, Bear Valley Cross Country, and the snow parks at Lake Alpine and Spicer Reservoir are popular destinations during winter months near the Bear Valley and Lake Alpine PTAs. Kirkwood Mountain resort is another popular winter resort located along SR-88.

Discussion

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

WRMP implementation would not increase the population in the PTAs. No new housing or permanent employment opportunities would be created. WRMP activities would include localized fuel-treatment projects, which would not create additional recreational demand that would increase the use of existing neighborhood and regional parks or other recreational facilities. No recreational facilities located near the Bear Valley, Manzanita, or Markleevillage priority PTAs would be impacted with implementation of the WRMP. Non-priority PTAs are located in Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine, which would be partially or fully closed to the public during vegetation-management activities. A significant impact could occur if recreationalists are unable to access these facilities during WRMP implementation. MM Recreation-1 requires the county and responsible management entities to coordinate implementation of vegetation-management activities to avoid the peak recreation

season and notify recreationalist of park closures. Substantial physical deterioration of these recreational facilities would not occur or be accelerated as a result of the WRMP. Impacts would be less than significant with implementation of mitigation.

MM Recreation-1: Recreational Facilities Coordination
Prior to planning vegetation-management activities in the Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine PTAs, the County shall identify the entity responsible for management of the recreational facility and coordinate implementation of WRMP activities to be completed outside of the peak recreation season. Any park or facility closures shall be posted in appropriate locations at the facility entrance and/or trailheads and provided on the facility or park webpages, if applicable.
Applicable Location(s): Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine PTAs.
Performance Standards and Timing: • **Before Activity**: N/A • **During Activity**: 1) Identify management entity, 2) schedule WRMP activities outside of peak recreation season, and 3) post park/facility closure information on site and online, if applicable. • **After Activity**: N/A

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

The WRMP includes fuel-treatment and vegetation-management activities to reduce wildfire risk in Alpine County. Implementation of the WRMP would not include creation of additional recreational demand that would require the construction or expansion of recreational facilities. Refer to impact statement a) above for a discussion of potential impacts for WRMP work that could occur in Turtle Rock Park, Grover Hot Springs State Park, and Lake Alpine areas. No impact would occur.

2.3.17 Transportation

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
17. TRANSPORTATION. Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	☐	☒
b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	☐	☒
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☒	☐	☐
d) Result in inadequate emergency access?	☐	☒	☐	☐

Environmental Setting

The total WRMP area includes up to 1,500 acres of land throughout 10 PTAs within Alpine County. The priority PTAs include 860 acres of privately-owned land spanning three sites in the Bear Valley, Manzanita, and Markleevillage areas. SRs 4, 88 and 89, Hot Springs Road, and Diamond Valley Road provide primary regional access to the PTAs.

Transportation within Alpine County is predominately automobile-oriented due to the rural setting and limited options for other modes of transportation. Weather-related road closures can occur in winter months. Traffic peaks occur in both the summer months, when all roadways are open, and the winter weekends due to the proximity to nearby resort communities such as Bear Valley and Kirkwood resorts (Alpine County, 2017).

Discussion

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Implementation of the WRMP would involve conducting vegetation-management activities at the identified PTAs in Alpine County. The WRMP would not interfere with a plan, program, or policy directed at the circulation system. No impact would occur.

b) Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Implementation of the WRMP would not introduce any new land uses or activities in the PTAs that would generate long-term increases in traffic volume. Potential traffic increases would be limited to intermittent travel to and from the PTAs over a limited period of time during WRMP implementation from 2021 to 2024. No impact would occur.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Vegetation-management activities proposed in the WRMP include manual and mechanical treatment methods, pile burning, and prescribed burns, if implemented, in the non-priority Mesa Vista, Hung-A-Lel-Ti, Turtle Rock Park, and Lake Alpine PTAs to reduce wildfire risk in Alpine County. Pile burning would not be implemented in the Bear Valley priority PTA. Implementation of the WRMP would not change the existing design features of roads and highways in the PTA vicinity. The proposed fuel-treatment activities would not intentionally increase hazards due to a design feature or incompatible use. Slow-moving trucks or equipment entering and exiting the PTAs could pose a hazard to other vehicles traveling on the nearby roadways; however, proposed activities would be temporary, and access to the sites is from existing roadways with adequate line of site. Motorists who witness pile burn or prescribed burn activities (if implemented in the non-priority Mesa Vista, Hung-A-Lel-Ti, Turtle Rock Park and Lake Alpine PTAs), while traveling along a road may become distracted by the smoke or slow down to observe the fire. Implementation of MM Hazards-3 would reduce potential impacts associated with motorists becoming distracted or slowing down to observe a burn event. MM Hazards-3 requires all pile burns to be conducted at least 100 feet from public roads, providing public notification to individuals within one mile and at trailheads and access roads leading to all areas proposed for burning at least 24 hours in advance of a prescribed burn, and posting signs ahead of and adjacent to the prescribed burn indicating that a prescribed burn is in progress. Impacts would be less than significant with mitigation.

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning

Refer to Section 2.3.9: Hazards and Hazardous Materials

d) Result in inadequate emergency access?

No long-term street or lane closures would be needed, and no new roads would be constructed as part of the vegetation-management activities under the WRMP. Slow-moving trucks or equipment entering and exiting the PTAs could slightly delay the movement of emergency vehicles. Trucks and equipment would typically pull to the side of the road when emergency vehicles use their sirens. Vehicle traffic increases would be short-term and intermittent and would only contribute a small percentage of the overall traffic. Vegetation-management-related vehicles and equipment could delay emergency response if they were parked in such a way that blocks main roads or prevents access for emergency-response vehicles. To ensure adequate emergency response is maintained on main roads and highways, MM Hazards-2 would be implemented, requiring all personal vehicles or construction equipment to be parked in appropriate parking areas off of main roads and potential evacuation routes, with adequate space for emergency response vehicles to pass. The WRMP would not result in inadequate emergency access during project implementation. Impacts would be less than significant with mitigation incorporated.

MM Hazards-2: Fire Prevention and Suppression Practices
Refer to Section 2.3.9: Hazards and Hazardous Materials

2.3.18 Tribal Cultural Resources

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
18. TRIBAL CULTURAL RESOURCES.				
a) Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐

Environmental Setting

Tribal cultural resources are defined in CEQA as a site, feature, place, cultural landscape, sacred place, or object with cultural value to a California Native American tribe, which may include non-unique archaeological resources previously subject to limited review under CEQA. Alpine County is located within the ethnographic territory of the Washoe Tribe.

The NAHC was contacted to request a search of the Sacred Lands file for the vicinity of the priority PTAs and contact information for Native American tribes that may be traditionally or culturally affiliated with the geographic area of the priority PTAs. The NAHC replied that no Native American cultural resources were reported from the Sacred Lands file records search for the priority PTAs and provided a list of Native American contacts for Alpine County. Contacts included one representative from the Washoe Tribe of Nevada and California.

The County provided formal notification of the decision to undertake the WRMP to the Washoe Tribe of Nevada and California, Ione Band of Miwok Indians, and Calaveras Band of Mi-Wuk Indians on May 28, 2020. The County received response from the Washoe Tribe of Nevada and California and engaged in informal consultation during development of the WRMP.

On October 12, 2020, the County sent a notification letter to the Washoe Tribe of Nevada and California Tribal Historic Preservation Officer (THPO), Darrel Cruz, regarding the WRMP and an invitation to engage in formal consultation per Assembly Bill (AB 52). No tribes requested formal notice of information on implementation of the WRMP. The County has engaged in informal consultation with the Washoe Tribe of Nevada and California during development of the WRMP. During an initial conversation with the Washoe Tribe's THPO on August 12, 2020, tribal representatives expressed interest in resources of cultural importance near the Bear Valley PTA. These resources were determined to be located outside of the Bear Valley PTA boundary. Results of the cultural record search and survey were also provided to the Washoe Tribe of Nevada and California on August 12, 2020.

The Washoe Tribe and County representatives discussed cultural and tribal cultural resource mitigation on November 17, 2020, and mitigation measures were modified to reflect the discussion. During the conversation, the Washoe Tribe expressed their support for the WRMP goals and provided information about known archaeological sites in the non-priority PTAs. The Washoe Tribe expressed interest in participating in a site visit as well as the opportunity to provide recommendations to ensure tribal cultural resources are not adversely affected by the WRMP.

On December 1, 2020, representatives of the Washoe Tribe and the County visited the Markleevillage archaeological resources sites. Recommendations from tribe representatives have been incorporated into project mitigation measures to ensure that tribal cultural resources are not significantly impacted during WRMP implementation.

To facilitate cultural resource documentation, a record search was also conducted at the CCIC in July 2020, and portions of the priority PTAs were surveyed for cultural resources in August 2020. As described in Section 2.3.5 Cultural Resources, numerous cultural resources have been recorded within the priority PTA boundaries. None of the resources located within the Manzanita PTA and the Bear Valley PTA are considered eligible for the CRHR. Two previously recorded sites and one newly recorded site are considered eligible for the CRHR within the Markleevillage PTA. ALP-238/P-02-315 and ALP-270/P-02-347 contain bedrock grinding features and a surface archaeological component. Alp6 is a lithic scatter with a historic component that may address important research questions. ALP-269 consists of a disturbed milling station. While the site lacks integrity, it may be of cultural significance to the Washoe Tribe and is treated as a significant resource for purposes of this tribal cultural resource impact analysis.

Discussion

a) **Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:**

   i. **Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or**

   ii. **A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.**

Implementation of the WRMP has the potential to significantly impact known and previously undiscovered Native American archaeological resources through any activity that could disturb the ground surface or subsurface (refer to Impact Cultural Resources a]). Any prehistoric resource discovered, as addressed in Impact Cultural Resources a), could be considered a tribal cultural resource as well.

The County has consulted with the Washoe Tribe regarding WRMP. Through consultation with the Washoe Tribe, the County has determined that project activities have the potential to alter the tribal significance of known archaeological resources in Markleevillage. WRMP activities would not result in physical impacts to known cultural resources; however, vegetation-management activities could result in alteration of the tribal significance of known resources in Markleevillage, which would be considered a significant impact. MM TCR-1 requires the County to arrange a site visit with the Washoe Tribe to visit the archaeological sites within the Markleevillage PTA and allow the Tribe to provide resource-specific recommendations to ensure tribal cultural resources are not adversely affected by the WRMP. Implementation of the WRMP would result in less-than-significant impacts on previously discovered tribal cultural resources with implementation of MM TCR-1.

The boundaries of the non-priority PTAs and location of specific treatment methods to be implemented in the non-priority PTAs have not yet been defined. The Washoe Tribe and other local tribes may be interested in providing input on the non-priority PTA details and/or tribal cultural resources near any of the non-priority PTAs, and if they are unable to do so, impacts could be significant. To reduce potential impacts to tribal resources within the non-priority PTAs, MM TCR-2 would be implemented. MM TCR-2 requires the County to contact local Native American tribes prior to implementing fuel treatment projects at the non-priority PTAs and to provide relevant information to any tribes that wish to receive information or consult. Upon initiating tribal outreach, any Native American tribes interested in consultation would be provided the opportunity to attend a site visit and provide resource-specific recommendations for the treatment and/or avoidance of known resources, per MM TCR-1, in both the non-priority and priority PTAs. With implementation of MM TCR-2 and MM TCR-1, implementation of the WRMP would result in less-than-significant impacts on tribal cultural resources in the non-priority PTAs.

The vegetation-management activities have potential to damage, destroy, or disturb known or previously undiscovered resources that may be present within the PTAs. Disturbance, damage, or destruction of any resources could be considered a significant impact. Several mitigation measures are proposed to reduce impacts on CRHR-eligible resources to less than significant. MM Cultural-1 requires a qualified archaeologist to flag a 100-foot radius around all known cultural resource sites, where the WRMP activities would be limited to hand thinning only. If a previously unidentified resource is encountered during work, MM Cultural-2 would be implemented, requiring cessation of work within 100 feet of the resource, followed by an appropriate evaluation or avoidance of the cultural resource prior to commencement of work in the area. MM Cultural-2 also requires all employees and contractors to be trained how to recognize basic signs of a potential resource and implement the mitigation measures. MM Cultural-3 requires a record search and a pre-activity survey if the area has not been previously surveyed, with the objective of determining the presence/absence of known cultural resource locations before any work commences. Any found resources are either to be avoided entirely or evaluated for eligibility for and, if eligible, handled in accordance with the measures described in MM Cultural-1.

If human remains are encountered during implementation of vegetation-management activities, MM Cultural-4 would be implemented, which requires work to halt within 50 feet of the discovery of human remains and contact with the County Coroner's office to be made, followed by the appointment of an MLD to determine the appropriate course of action. Refer to Section 2.3.5 Cultural Resources for further details regarding mitigation requirements. Impacts on tribal cultural resources would be less than significant with implementation of mitigation.

MM TCR-1: Tribal Site Visit and Recommendations

Prior to implementation of vegetation-management activities within the priority and non-priority PTAs, the County shall:

- Arrange a site visit with the Washoe Tribe, and any other Native American tribe that expresses interest in consulting on the WRMP, to PTAs where resources occur within the PTA boundary.
- Provide the opportunity for the Washoe Tribe, and any other interested Native American tribe, to contribute resource-specific recommendations for the treatment and/or avoidance of known resources to ensure tribal cultural resources are not adversely affected by the WRMP activities.
- Incorporate resource-specific recommendations from tribes into project implementation plans.

Applicable Location(s): All PTAs.

Performance Standards and Timing:

- **Before Activity:** 1) Arrange site visit with Washoe Tribe and additional Native American tribes, if appropriate, and 2) solicit recommendations for the treatment and/or avoidance of tribal cultural resources.
- **During Activity:** Implement resource-specific recommendations for the treatment and/or avoidance of tribal cultural resources.
- **After Activity:** N/A

MM TCR-2: Tribal Outreach and Consultation

Prior to conducting any work in the non-priority PTAs identified in the WRMP, the County shall contact local Native American tribes identified by the Native American Heritage Commission and/or the County's AB 52 tribal contacts list and request input on PTA boundaries, specific avoidance areas, and any known Tribal Cultural Resources within the PTAs.

For any Native American tribe that is interested in providing input on the development of PTA boundaries and/or specific treatment methods to be implemented, the County shall provide all results of record searches and field surveys conducted within or surrounding PTAs, if applicable. The County shall consult with any interested Native American tribe to ensure any impacts to tribal cultural resources are minimized to the greatest extent feasible, including arranging a site visit and implementing site-specific recommendations as required by MM TCR-1.

Applicable Location(s): All non-priority PTAs.

Performance Standards and Timing:

- **Before Activity:** Contact Native American tribes, if appropriate.
- **During Activity:** N/A
- **After Activity:** N/A

MM Cultural-1: Avoidance of Impacts to Cultural Resources

See Section 2.3.5: Cultural Resources

MM Cultural-2: Previously Unidentified Cultural Resources

See Section 2.3.5: Cultural Resources

MM Cultural-3: Pre-Activity Record Search and Surveys

See Section 2.3.5: Cultural Resources

MM Cultural-4: Discovery of Human Remains

See Section 2.3.5: Cultural Resources

2.3.19 Utilities and Service Systems

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
19. UTILITIES AND SERVICE SYSTEMS. Would the project:				
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☐	☒
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	☒	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	☒
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒

Environmental Setting

Alpine County is primarily a rural place that features small, dispersed residential communities. The main population centers are located in the general Bear Valley, Kirkwood, Markleeville, and Woodfords areas. The Markleeville Public Utilities District provides wastewater collection and conveyance service to the unincorporated community of Markleeville. Domestic water service to Markleeville is provided by Markleeville Mutual Water Company, which is a small district with limited resources. Lake Alpine Water Company, a privately owned water utility, serves the Bear Valley area. The County's Small Water System Program is responsible for the permitting, inspection, and monitoring of 39 small public water systems in Alpine County. Most rural residences in the County are served by on-site wells and septic systems (Alpine County, 2017). PG&E, Liberty Utilities, and KMPUD provide electricity to Alpine County. Alpine County has three distinct solid waste service providers: Douglas Disposal & Recycling Service (Markleeville and Woodfords areas); ACES Waste Services working with KMPUD (Kirkwood area); and Cal-Waste (Bear Valley area).

Discussion

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

The WRMP would not be served by any stormwater, electric power, natural gas, or telecommunication facilities. The WRMP would not include any new development that would require relocation or construction of new or expanded municipal wastewater treatment, stormwater drainage, natural gas, or telecommunications facilities. Temporary restrooms for workers may be available during implementation of WRMP activities; however, the amount of wastewater generated by a small number of workers would not significantly contribute to the existing wastewater generation in Alpine County and relocation or expansion of wastewater treatment facilities would not be required. No impact would occur.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Pile burning (excluding the Bear Valley priority PTA) and prescribed burning (excluding the priority PTAs) under the WRMP could involve the use of water as a suppression or contingency source. This increase in water consumption would be minimal compared to the quantity of water available in the County and would not substantially increase the volume of water used in the PTAs. Implementation of the Program would not necessitate the expansion of any water supplies or facilities. Impacts would be less than significant.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Temporary restrooms may be available for workers during WRMP implementation; however, the amount of wastewater generated by the small number of workers on site at one time would not exceed existing wastewater treatment capacity. The sanitation contractor providing the portable restrooms would dispose of the waste at a sewage treatment plant in compliance with standards established by the Central Valley or Lahontan RWQCB. No impact would occur.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

No solid waste would be generated by the WRMP. No impact would occur.

e) Comply with federal, State, and local management and reduction statutes and regulations related to solid waste?

No solid waste would be generated by the WRMP. No impact would occur.

2.3.20 Wildfire

Environmental Impacts	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact
20. WILDFIRE. If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☒	☐	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	☒
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☒	☐

Environmental Setting

Wildland fire is a dangerous threat in Alpine County. Wildfires tend to originate in lesser developed areas, which poses a difficult problem for fire suppression personnel. Natural lands tend to contain a denser variety of vegetation, providing more fuels to ignite and spread a fire. Fires can grow rapidly in these denser fuel environments. Firefighting personnel are usually located farther from lesser developed areas. The extended time it takes for fire suppression personnel to reach and react to a wildfire further complicates the effort to contain and extinguish the fire. The threat of wildland fire increases as winter snowpack melts, summer temperatures rise, and forest fuels become dry and susceptible to fire. The summer months of June, July, August, and September are traditionally the wildland fire season in Alpine County, but fire season can extend later into the year until precipitation arrives in the fall. The National Weather Service issues Fire Weather Watches and Red Flag Warnings up to three days in advance for instances of strong winds and low humidity or thunderstorms with abundant dry lightning. These critical fire weather conditions result in the rapid spread of wildfire, which can overwhelm initial fire suppression efforts. On average, eight to fifteen Red Flag Warnings are issued for Alpine County each year (Alpine County, 2018). There have been four major wildland fires in Alpine County in the last 20 years: the Indian Creek Fire in 1984 (17,000 acres total) near Indian Creek on the east slope of the Sierra Nevada east of Woodfords; a 1986 fire (3,000 acres total) near Fredericksburg to the north of the Indian Creek Fire; the Acorn Fire in

1987 (6,000 acres and destroyed 26 structures) near Woodfords; and the Washington Fire in June 2015 (17,790 acres).

The California Public Resources Code (PRC) 4201-4204 and Govt. Code 51175-89 direct CAL FIRE to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors. These zones, referred to as Fire Hazard Severity Zones (FHSZ), define the application of various mitigation strategies to reduce risk associated with wildland fires. CAL FIRE maintains FHSZ maps for State Responsibility Areas (SRAs) and Local Responsibility Areas (LRAs) based on new data, science, and technology. In such areas, CAL FIRE delineates three hazard ranges: Moderate, High, and Very High.

The majority of Alpine County is designated as a Federal Responsibility Area (FRA); however, several SRAs and LRAs are also included in the County. The various SRAs are classified as Very High, High, or Moderate FHSZ. CAL FIRE has determined that Alpine County has no Very High Fire Hazard Severity Zones in LRAs (CAL FIRE, 2020). The responsibility area and associated FHSZ of each PTA are listed in Table 2-10. Several figures in the WRMP show the various fire hazards throughout the county. In Alpine County, CAL FIRE does not maintain a physical presence (fire station or engine); instead, they delegate their responsibilities to the federal agencies by virtue of a Cooperative Fire Agreement. This agreement allows CAL FIRE to trade wildfire responsibility in some private areas of California, such as Alpine County, for protection of federal lands elsewhere.

Several PTAs are located within areas considered a wildland–urban interface (WUI). The WUI is a transition zone between human development and wildland areas that could be affected by wildland fire. Vegetation-management activities can prevent wildfires and protect disadvantaged communities, infrastructure, and forest resources within the WUI. The priority PTAs in Bear Valley, Manzanita, and Markleevillage are located in WUI areas, where vegetation-management activities are focused on protecting life and property. The Grover Hot Springs, Mesa Vista, Hung-A-Lel-Ti, and Diamond Valley PTAs are also in WUI zones, and fuel-reduction activities in these areas would improve WUI defense in the event of a wildfire.

Table 2-10 Designated Responsibility Areas and Fire Hazard Severity Zones by PTA

PTA	Responsibility	FHSZ
Priority PTAs		
Bear Valley	SRA	Very High, High
Manzanita	SRA	Very High, High
Markleevillage	SRA	Very High
Non-Priority PTAs		
Diamond Valley	SRA	High
Grover Hot Springs	SRA, LRA (Unincorporated)	Very High

PTA	Responsibility	FHSZ
Highway 89	FRA	n/a
Hung-A-Lel-Ti	FRA	n/a
Lake Alpine	FRA	n/a
Mesa Vista	FRA, SRA	Very High, High
Turtle Rock Park	SRA	Very High

Source: (CAL FIRE, 2020)

Discussion

a) Would the project substantially impair an adopted emergency response plan or emergency evacuation plan?

As previously discussed in Section 2.3.9 Hazards and Hazardous Materials, Impact f), no emergency response plan or emergency evacuation plan has been adopted by Alpine County; therefore, implementation of the WRMP would not impair an adopted emergency response plan or emergency evacuation plan. As stated in the WRMP, there would be no street or lane closures, and no new roads would be constructed as part of the WRMP activities. Additional potential impacts associated with emergency response and access are discussed in Section 2.3.17 Transportation, Impact d). No impact would occur.

b) Would the project due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

The purpose of the WRMP is to reduce fuel loads and wildland fire risks in Alpine County to protect the County's population and valuable resources. Implementation of the WRMP would have beneficial effects with regard to reducing wildfire risks and the size and spread of potential wildfires. The WRMP would support the goals and objectives of strategic wildfire planning in the area, including the Alpine County Community Wildfire Protection Plan (CWPP) and the Alpine County Hazards Mitigation Plan.

As described in Section 2.3.9 Hazards and Hazardous Materials, some activities could increase risks of wildland-fire ignition and spread during the actual performance of fuel-treatment activities, which require the use of vehicles and equipment that could ignite a fire through generation of sparks or heat. Certain parts of the county could be more susceptible to fire ignition and spread, such as areas on steep slopes, south-facing slopes, and areas where significant fuel is found (e.g., dead trees and thick understories of weeds). Pile burns also have a higher potential for starting a wildfire were the burns to become uncontrolled (although likelihood is exceedingly small). Implementation of fire prevention and suppression best management practices defined in MM Hazards-2 would also reduce the likelihood of a fire ignition and spread. Under MM Hazards-2, workers would not be permitted to smoke on site or during the fire season, fire suppression equipment shall be maintained on site, and activities that create increase risk of fire ignition would be restricted during high fire-danger conditions.

The stockpiling of dry, vegetative material for pile burning has the potential to increase fire risks prior to burning because it is a concentrated source of flammable fuels. If a pile burn event were to ignite a wildfire of any size or with potential for spread, the impact would be considered significant. Implementation of MM Hazards-3 would require all pile burns to be conducted in accordance with Title 17 of the CCR and GBUAPCD's Rule 411, which prohibits wildland vegetation management burning on "no burn" days as announced daily by the CARB for Inyo, Mono, and Alpine Counties or when such burning is prohibited by the APCO (GBUAPCD, 2001). A Smoke Management Plan would also be prepared and implemented in accordance with GBUAPCD's Rule 411 per MM Hazards-3 for any wildland vegetation-management burning projects greater than 1 acre in size (including pile burns or prescribed burns). MM Hazards-3 also stipulates that pile burns are only allowed on days when fire is less likely to spread (e.g., wind speeds are less than 15 mph) and will not be constructed in areas where burning cannot be safely controlled, such as bottoms of steep, vegetated hills, and that all piles would be burned or chipped prior to the fire season and within six months of treatment.

Implementation of the WRMP would not exacerbate wildfire risks and expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire. Impacts would be less than significant with mitigation.

MM Hazards-3: Hazard Reduction for Stockpiling, Pile Burning, and Prescribed Burning

Refer to Section 2.3.9: Hazards and Hazardous Materials

c) Would the project require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

Implementation of the WRMP would include conducting manual and mechanical vegetation management activities, pile burns (excluding the Bear Valley priority PTA), and prescribed burns (excluding the priority PTAs) in the identified PTAs in Alpine County. The WRMP would not require the installation or maintenance of associated infrastructure, and therefore, implementation of the WRMP would not exacerbate fire risk or result in temporary or ongoing impacts to the environment. No impact would occur.

d) Would the project expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

As described in Section 2.3.7 Geology and Soils and Section 2.3.10 Hydrology and Water Quality, implementation of vegetation-management activities would minimally disrupt surficial soil and could result in erosion or slope instability, leading to landslide. Implementation of MM Geology-1 would minimize erosion and loss of topsoil in denuded areas by requiring use of erosion control and slope-stability measures, reducing the risk of landslide. Vegetation-management activities proposed in the WMRP would not substantially alter the existing drainage pattern of the PTAs and would not result in an addition of impervious surfaces. Minor increases in surface-runoff rates resulting from additional hydrophobic soils would not be

significant on a large scale due to other sources of infiltration throughout Alpine County and would not result in flooding.

The WRMP would not include development that would expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire instability, or drainage changes. Impacts would be less than significant with implementation of mitigation.

MM Geology-1: Erosion Control and Slope Stability Measures
Refer to Section 2.3.7 Geology and Soils

2.3.21 Mandatory Findings of Significance

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

Discussion

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Implementation of the WRMP would not substantially reduce the habitat of fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce the number or restrict the range of a rare or endangered plant or animal. Implementation of the mitigation measures presented in Section 2.3.4 Biological Resources would mitigate potential significant impacts that could substantially degrade the quality of the environment or impact biological resources. Mitigation measures presented in Section 2.3.5 Cultural Resources would ensure that the WRMP would not significantly affect previously undiscovered resources or eliminate important examples of the major periods of California history or prehistory. The biological and cultural resource mitigation measures are listed below.

- MM Biology-1: Pre-construction Plant Survey
- MM Biology-2: Worker Environmental Awareness Training

- MM Biology-3: Waters and Wetland Protection Zones
- MM Biology-4: Nesting Bird Surveys
- MM Biology-5: Avoid Disturbance or Harm to Terrestrial Wildlife
- MM Biology-6: Prescribed Burn Planning
- MM Biology-7: Invasive Species Control
- MM Cultural-1: Avoidance of Impacts to Cultural Resources
- MM Cultural-2: Previously Unidentified Cultural Resources
- MM Cultural-3: Pre-Activity Record Search and Surveys
- MM Cultural-4: Discovery of Human Remains

Given the fact that potential impacts to biological and cultural resources would primarily occur during active vegetation-management activities (not long term) and that measures have been identified to reduce these temporary impacts, impacts would not be considered significant. Impacts would be less than significant with mitigation incorporated.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Many fuels-treatment projects have been implemented in Alpine County. The local organizations and federal agencies responsible for managing forest health projects throughout Alpine County are discussed in the WRMP. The temporary and intermittent nature of vegetation-management activities and negligible long-term effects would not result in significant impacts.

Section 15064(h)(1) of CEQA Guidelines states that the lead agency shall consider whether a cumulative impact is significant and the incremental effects of a project are cumulatively considerable. The lead agency may determine that a project's incremental contribution would be less-than-cumulatively considerable when one or more of the following occur: 1) the contribution would be rendered less than cumulatively considerable through implementation of mitigation measures; 2) the project would comply with the requirements of a previously approved plan or mitigation program that provides specific requirements that would avoid or substantially lessen the project's cumulative effects; and/or 3) the project's incremental effects would be so small that the environmental conditions would be essentially the same regardless of whether the project is implemented.

The WRMP includes impacts that are mostly short term. Any effects, such as less than significant impacts on aesthetics, that persist following active treatment of a PTA are not expected to be cumulatively considerable when considering concurrent or future projects. Once a PTA has been treated under the WRMP, no additional vegetation-management activities would be required in the same area in the short term. Individual projects within PTAs would be treated sequentially and not concurrently. Other vegetation-management projects currently proposed in the county may occur adjacent to the PTAs proposed in the WRMP but are not anticipated to occur at the same time as implementation of priority or non-priority projects.

Potential impacts of the cumulative projects are not anticipated to be cumulatively considerable, based on the small scale and treatment methods that are anticipated to be implemented for the cumulative projects. There would be no significant cumulative effect.

The WRMP is not growth inducing, would not result in further development, and would comply with all zoning and land-use designations. Potential impacts associated with the WRMP are primarily short term (vegetation-management activity related) and intermittent and would be mitigated to less-than-significant levels. There would be no long-term significant effects from the implementation of the WRMP. Therefore, the WRMP's incremental contribution to cumulative conditions would be less than cumulatively considerable.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Potential adverse effects to human beings would occur as a result of implementation of vegetation-management activities and use of equipment. Potential impacts would include effects to air quality and some minor increases in noise. These impacts would be short-term and would cease upon completion of the vegetation-management activities. The WRMP outcome would promote healthy forests that are less prone to catastrophic wildfires and would support the protection of WUI communities and resources at risk of wildfire throughout Alpine County. Potential adverse effects on human beings as a result of the WRMP would be less than significant.

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4 List of Preparers

This section lists those individuals who either prepared or participated in the preparation of this IS/MND. The following staff listed in Table 4-1 contributed to this IS/MND.

Table 4-1 Consultant Team

Contributor	Agency/Affiliation	Role/Resource Section
Alpine County Community Development Department		
Debbie Burkett, Director	Alpine County	Contract oversight/project direction and definition/ document review
Zach Wood, Planner III	Alpine County	County Project Manager/project direction and definition/document review
Steering Committee		
Kris Hartnett	Alpine Fire Safe Council	Project direction and definition/document review
Michael Barton	Alpine Biomass Collaborative	Project direction and definition/ document review
Kellin Brown	USFS Region 5	Project direction and definition/document review
Annabelle Monti	USFS Region 4	Project direction and definition/document review
Terry Hughes	East Alpine Fire & Rescue	Project direction and definition/document review
Mike Deacon	CAL FIRE Amador El Dorado Unit	Project direction and definition/document review
Tribes		
Darrel Cruz, Tribal Historic Preservation Officer	Washoe Tribe of Nevada and California	Tribal Consultation
Consultant Team		
Tania Treis, Principal/Project Director	Panorama Environmental, Inc.	Quality Control/document review and revision for all IS sections
Rita Wilke, Project Manager/Environmental Scientist	Panorama Environmental, Inc.	Project Management, Quality Control/document review and revision for all IS sections, Biological Resources

4 LIST OF PREPARERS

Contributor	Agency/Affiliation	Role/Resource Section
Madeleine Jones, Environmental Analyst	Panorama Environmental, Inc.	Introduction, Draft IS sections, technical editing
James Paulus, Ph.D., Biologist/Botanist	N/A	Biological Resources
Tucker Orvald Mike Drews	Great Basin Consulting Group	Cultural Resources, Tribal Cultural Resources

APPENDICES

APPENDIX A

Draft Wildfire Risk Mitigation Plan



Alpine County

Wildfire Risk Mitigation Plan

November 2020

Alpine County
Wildfire Risk Mitigation Plan

November 2020

Prepared for:

Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120
530-694-1371
zwood@alpinecountyca.gov

Prepared by:

Scott Conway; Jason Moghaddas, RPF
Spatial Informatics Group
2529 Yolanda Ct.
Pleasanton, CA 94566

Tania Treis
Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103
650-373-1200

Cover Photo Credit: (Monti, 2020; Paulus, 2020)

www.panoramaenv.com

PANORAMA ENVIRONMENTAL, INC.

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Acronyms and Abbreviations

A

ABC	Alpine Biomass Collaborative
AFSC	Alpine Fire Safe Council

B

BLM	Bureau of Land Management
BRIC	Building Resilient Infrastructure Communities

C

CAL FIRE	California Department of Forestry and Fire Protection
CalOES	California Office of Emergency Services
CalVTP	California Vegetation Treatment Program
CAR	Community-at-Risk
CCI	California Climate Investments
CEQA	California Environmental Quality Act
CWPP	Community Wildfire Protection Plan

D

dbh	diameter at breast height

E

EIR	Environmental Impact Report

F

FEMA	Federal Emergency Management Agency
FY	Fiscal Year

G

GIS	Geographic Information System

H

HVRA	High Valued Resources and Assets

I

IFTDSS	Interagency Fuel Treatment Decision Support System
IS/MND	Initial Study/Mitigated Negative Declaration

L

LANDFIRE	Landscape Fire and Resource Management Planning Tools
LHMP	Local Hazard Mitigation Plan

M

MTT	Minimum Travel Time

N

NEPA	National Environmental Policy Act

R

RAWS	Remote Automatic Weather Stations
RPF	Registered Professional Forester

T

THP	Timber Harvest Plan

U

U.S.	United States
USFS	United States Forest Service

V

VTP	Vegetation Treatment Plan

W

WRMP	Alpine County Wildfire Risk Mitigation Plan
WUI	wildland urban interface

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ES Executive Summary

ES.1 Overview

Alpine County applied for and was awarded a California Department of Forestry and Fire Protection (CAL FIRE) Community Fire Prevention Grant in the amount of $223,756 to create the Alpine County Wildfire Risk Mitigation Plan (WRMP or plan). The goal of the WRMP is to reduce wildfire risk in Alpine County and to protect important resources throughout the County. The WRMP identifies up to 12 fuels reduction projects that can be implemented over the next 10 years, with three top priority projects to be implemented in the next two years. The WRMP is a County-wide effort that encompasses all communities within Alpine County.

ES.2 Fire Behavior Modeling

ES.1.1 Overview of Modeling

Wildfire modeling is a field of computational science that uses numerical simulations to predict fire behavior. Wildfire modeling attempts to reproduce fire behavior characteristics like how quickly a fire can spread, in which directions it may spread, and how much heat it may generate given the conditions of the fuels, land, and predicted weather. Fire behavior modeling also looks at whether a fire would transition from the ground surface to tree crowns, which is much more dangerous. Once fire behavior is estimated through modeling, an assessment of fire hazards to surrounding life and property can be made and modifications can be made to the vegetation to reduce the exposure of important human values to that hazard, known as vegetation treatments or prescriptions.

The factors that influence fire behavior serve as the key inputs in modeling efforts. These factors include:

- **Landscape:** Topography factors influence wildfires. Orientation toward the sun, which influences the amount of energy received from the sun, and the slope (fire spreads faster uphill) influence fire behavior. Fire can accelerate in narrow canyons and it can be slowed down or stopped by barriers such as creeks and roads.
- **Fuels**: Fuels include anything that can burn. In wildland areas, fuels are primarily comprised of vegetation. Dead trees with low moisture ignite more easily and burn faster than live trees with higher moisture. Leaf litter and dried twigs and branches also ignite easier and burn faster.
- **Weather:** Weather influences fire through wind and moisture. Wind can increase the spread of fire in the direction of the wind, wind speed can accelerate spread,

and higher temperatures can result in a fire burning faster, as can low humidity and low precipitation.

Outputs of fire behavior modeling can include different parameters, but for the WRMP, modeling focused on burn probability and fire intensity at 97th percentile weather (described further in Section 2.3). Burn probability is the likelihood that a wildfire will burn a given point or area over a specified period. Flame length can be used as a proxy for fire intensity, where flame length is the height of the flames, with taller flame lengths indicating a higher intensity fire. Generally, if flame lengths are less than 4 feet, then fire can be effectively controlled with professional suppression resources. Flame lengths between 4 and 8 feet require multiple, more specific types and numbers of professionally trained firefighting resources and suppression success goes down. Flame lengths greater than 8 feet generally prevent firefighters and resources from directly attacking the fire front because the fire is too intense. Many times, this scenario results in more land being burned and unfortunate effects on property and even life. Vegetation treatments should be identified to reduce undesirable fire intensities when flame lengths exceed 4 feet, so that fire fighters have the highest probability of safely controlling a wildland fire under most weather conditions.

ES.1.2 Model Used for WRMP Analysis

The wildfire analysis for the WRMP was accomplished through development and implementation of a tailored, spatially dependent fire modeling framework that utilized industry standard probabilistic fire models designed specifically for land management. The modeling exercise was undertaken by Fire Ecologist, Scott Conway, of Spatial Informatics Group (SIG).

The Interagency Fuel Treatment Decision Support System (IFTDSS) fire behavior modeling program was used to understand the existing fire hazard throughout Alpine County. IFTDSS utilizes two imbedded models, FlamMap and Minimum Travel Time. IFTDSS is a web-based application designed to make fuels treatment planning and analysis more efficient and effective. IFTDSS provides access to data and models through one simple user interface. IFTDSS is designed to address the planning needs of users with a variety of skills, backgrounds, and needs. A simple and intuitive interface provides the ability to model fire behavior across an area of interest under several weather conditions and to easily generate downloadable maps, graphs, and tables of model results. The application provides a step by step process for testing a variety of fuels treatment impacts (thin, clear cut, prescribed burn) on fire behavior and comparing results to determine the modeled treatment to best achieve desired results in terms of reduced fire behavior potential. It can be used at a variety of scales from local to landscape level (US Department of Interior, 2020).

The methods chosen to model the fire behavior within and around Alpine County took advantage of several best in class, comprehensive datasets, modeling technologies, and systems to quantify the vegetation and fuels consistently and appropriately across the County. The modeling protocol was based off *A Wildlife Risk Assessment Framework for Land and Resource*

Managers (Scott, Thompson, & Calkin, 2013). The methodology was approved by the steering committee in November 2019. The modeling workflow is shown in Figure 2-2, included in Section 2.3.1.

ES.1.3 Model Inputs

The Landscape Fire and Resource Management Planning Tools (LANDFIRE) was used for the inputs for landscape and fuels, that is, topography and vegetation cover types. LANDFIRE is a shared program between the wildland fire management programs of the U.S. Forest Service (USFS) and U.S. Department of the Interior. The datasets in LANDFIRE for topography and vegetation are based on remote sensing data.

For all topography, vegetation, and fuels analysis, the project took advantage of comprehensive, yet explicit (30-meter squared resolution) LANDFIRE data through IFTDSS. The Remote Automatic Weather Stations (RAWS) provided the inputs for weather. The RAWS system is a network of automated weather stations run by the USFS and Bureau of Land Management (BLM) and monitored by the National Interagency Fire Center, mainly to observe potential wildfire conditions (Desert Research Institute, 2020). This analysis utilized 97th percentile historical weather (average wind speed, average wind direction, dead and live fuel moistures) to analyze fire behavior. Percentiles are based on a scale of 0 to 100 and are used to sort and rank a collection of data. For wildfire, when values at the upper end of the scale occur, complex fires are expected, where initial attack may often fail. The 97th percentile is often termed "the worst-case scenario" (US Department of Interior, 2020). These are the days where weather conditions are greatest for wildfire ignition and spread.

Modeling conditions at the 97th percentile fire weather for the County was chosen not to serve as an understanding of the very worst-case fire effects are, but to determine how the current vegetation and fuels environment react to what is considered a threshold for problem fires. Choosing percentile weather removes subjectivity and thus bias as the calculation is run directly from the data. This process is objective and has become the industry standard for everything from determining national fire danger ratings to, as in this case, estimating hazard. The team analyzed the weather outputs, compared them to their respective knowledge base, and determined they were indeed in the threshold range of problem fire weather for Alpine County.

ES.1.4 Current Condition Modeling Results/Outputs

Overview

The results of the fire behavior modeling indicated that numerous areas throughout Alpine County could benefit from some form of vegetation treatment to reduce fire hazard, particularly within the eastern portion of the county.

Fire Intensity

Frontal fire intensity is a valid measure of forest fire behavior that is solely a physical attribute of the fire itself. It is defined as the energy output rate per unit length of fire front and is directly

related to flame size. Flame length was focused on to quantify fire intensity for this study because of the direct correlation to suppression resources and effectiveness.

The IFTDSS (with FlamMap) model indicated approximately 20 percent of the county exhibited flame lengths greater than 4 feet. Under current conditions, as modeled, Alpine County would likely exhibit high intensity fire in many areas and put some homes and infrastructure at risk because suppression resources would have trouble safely directly attacking the fire and direct suppression effectiveness might be limited during the first burn period.

Fire Probability

Fire probability quantifies the relative likelihood of a fire occurring under a fixed set of weather and fuel moisture conditions (US Department of Interior, 2020). Within the minimum travel time model, randomly located ignition points are used to simulate fires. Ignitions are only located and retained on burnable fuels, if an ignition is located on a non-burnable fuel it is discarded. The number of ignitions is determined by IFTDSS to most efficiently produce outputs for the user.

Burn Probability = number of times burned / total number of ignitions

The wildfire behavior modeling results indicated that the eastern portion of the County generally has much higher probabilities of fire occurrence than the west side. This condition is most likely due to the prevailing winds under the critical fire weather scenario and more continuous fuels that blanket the lower elevations of eastern Alpine County.

Integrated Hazard

The term "hazard" is used by the wildland fire community to define a variety of conditions or situations where damage to assets by fire is being evaluated. The integrated hazard combines fire intensity (determined by proxy with flame length) and burn probability. Burn probabilities were calculated using Minimum Travel Time in IFTDSS.

Figure 2-18, included in Section 2.3.5, highlights areas where there is a high fire intensity that overlaps with a high fire probability and thus, a high integrated hazard. Although some areas are considered low hazard, much of the area has elevated hazard numbers, which creates undesirable exposure to the surrounding homes and infrastructure.

ES.2 Susceptibility Analysis – HVRA Analysis

ES.2.1 Overview of HVRA Analysis

Knowing where wildfires are probable and the intensity at which they might burn gives the critical information needed to understand and address possible impacts to High Valued Resources and Assets (HVRAs). HVRAs are valued elements of the man-made and natural environment. The identification and characterization of HVRAs in Alpine County was a time consuming but critical step in the risk assessment process. Three primary characteristics must

be determined for each HVRA identified: spatial extent (mapping), response to wildfire (benefit or loss), and relative importance (Scott, Thompson, & Calkin, 2013).

ES.2.2 Methods

Determination of Spatial Extent of HVRAs

For use in wildfire risk calculations, spatial HVRA data must be in raster format. To effectively evaluate and apply any HVRA dataset, it is imperative to work with the spatial data in a geographic information system (GIS), and not solely rely on map products. The raster data should match the extent, cell size, and coordinate system of the fire modeling landscape. The compilation of HVRA data entails collecting data from various sources. A variety of regional or national data sources tend to be a good starting place when developing and accounting for HVRAs. Local data sources are often the most up-to-date and reflect local knowledge of the landscape. Local data can be used to refine the regional or national datasets.

The spatial extent of HVRAs within Alpine County were defined using industry standard buffers based on the types of HVRA that occur in Alpine County. The location and spatial extent of HVRAs were reviewed by the steering committee and a select group of additional community stakeholders.

Calculation of HVRA Response to Wildfire

The response function framework requires quantifying the relationship between HVRA value and wildfire intensity (measured by flame length). HVRA response is related to fire intensity because it is the best fire characteristic available associated with fire effects. This approach quantifies net value change (NVC) to a given HVRA as the percentage change in the initial resource value resulting from a fire at a given intensity. Response functions address relative, rather than absolute change in resource or asset value and represent both beneficial and adverse effects to the HVRA (Scott, Thompson, & Calkin, 2013).

The project steering committee and a select group of additional community stakeholders were invited to respond to a questionnaire regarding each HVRA's response to wildfire. Survey responses were then reviewed during a steering committee meeting, during which all steering committee members agreed on each HVRA's response to wildfire. The HVRA Wildfire Response Questionnaire is provided in Appendix C.

Calculation of HVRA Relative Importance

Balancing competing or conflicting land and resource management objectives is a significant challenge to land and resource management planners. It is also difficult to articulate quantitative weights establishing the relative importance of HVRAs. Relative importance helps understand risk in areas where multiple HVRAs overlap and allows for comparing risks across different spatial areas that house different HVRAs. Using relative importance scores allows for summarization and visualization of risks in a single metric. If assessment results are to ultimately be used for planning mitigation treatments and strategies, then prioritization decisions that integrate all HVRAs will still ultimately need to be made. Articulating relative

importance scores and how objectives are balanced makes this decision explicit rather than implicit and increases the overall transparency of decision processes (Marcot, 2012).

The project steering committee and a select group of additional community stakeholders were invited to respond to a questionnaire regarding each HVRA's relative importance. Survey responses were then reviewed during a steering committee meeting, during which all steering committee members developed a relative importance ranking of the HVRAs within the County. The Relative Importance Questionnaire is provided in Appendix D.

ES.2.3 Results of HVRA Characterization

Spatial Extent of HVRAs

HVRA accounting began with the Alpine County GIS database and was augmented through collaboration with the project steering committee. Table ES-1 shows the HVRAs that were selected while Figure 2-19 (included in Section 2.4.3)shows locations and extent of each HVRA.

Table ES-1 HVRA Accounting for Alpine County

HVRA Category	Buffer Extent
Residential Structures	100 feet
Education Facilities (Daycares/Schools)	100 feet
Recreation Facilities – campgrounds, RV parks (non-ski areas)	25 feet
Business and Public Structures	100 feet
Places of Worship	100 feet
Non-habitable Structures (barns/sheds)	100 feet
Health and Elder Care Facilities	100 feet
High Hazard Buildings	250 feet
Airport/Helibase	250 feet
Communication Infrastructure (cell towers, microwave towers, etc.)	200 feet
Potable Water Storage (e.g., tanks); Snow-making Infrastructure	100 feet
Major/Minor Evacuation Corridors (ingress and egress routes)	300 feet
Community Evacuation/Refuge/Safe Zones/ Areas	250 feet
Cemeteries or Significant Resource Buildings/Areas	100 feet
Watersheds of Special Significance	25 feet
WUI Defense	0.25 mile
Ski Area Terrain	No Buffer

HVRA Calculated Response to Wildfire

A total of six responses to the HVRA Response Function Questionnaire were received. Responses included an Alpine County resident, USFS staff, Alpine County staff, and CAL FIRE staff. Surveys limited responses to between negative 3 and positive 3 points and were then averaged across surveys. Results then went into risk calculation as the response function (RF) as a normalized value percent change. For example, negative 3.0 = 100% value loss where a positive 1.0 = 33% value gained. Response to wildfire survey results are shown in Table 2-14, provided in Section 2.4.3.

HVRA Calculated Relative Importance

A total of eight responses to the HVRA Relative Importance Questionnaire were received. Responses included an Alpine County resident, USFS staff, Alpine County staff, and CAL FIRE, Bear Valley Water District staff, and Fire Safe Council member. Each rating category had a potential ranking from 1-10; 10 being the highest score. The average score for all surveys by category is shown in Table 2-15 (provided in Section 2.4.3)and the total score is the sum of those averaged scores.

ES.3 Wildfire Risk Assessment

ES.3.1 Overview of Risk Assessment

Wildfire risk is the compilation of the integrated hazards (fire likelihood and intensity) with the susceptibility of the HVRAs identified. Fire hazard outputs can be valuable when trying to understand the patterns of potentially high severity fire across large landscapes; however, these outputs often display an overwhelming amount of information. First, there may simply be too much hazard for an entity to deal given their available resources. Second, even if resources to reduce all fire intensities were available, then hazard provides little insight into where you should go first. A wildfire risk assessment can be extremely valuable for an entity that has limited resources to implement as it allows them to prioritize treatments.

ES.3.2 Methods

Methods of Determining Wildfire Risk

Exposure Analysis of HVRAs

Exposure analysis is the characterization of wildfire likelihood and intensity where HVRAs occur and was performed within a GIS using one of several geospatial techniques that identify or summarize the wildfire hazard characteristics of all pixels where an HVRA is mapped.

Effects Analysis on HVRAs

Effects analysis integrates wildfire hazard (likelihood and intensity) and HVRA vulnerability (exposure and susceptibility), producing a comprehensive measure of wildfire risk. Wildfire risk is quantified as the weighted expectation of net value change, where *NVC* is expressed in

relative terms on a percentage basis, as defined by expert-based loss/benefit functions (for example, complete loss = -100 percent).

Methods for Project Development Based on Wildfire Risk

Wildfire Risk Compilation

Compiling the total negative net value change of each pixel within the study area in a GIS raster format is required to appropriately organize results of the effects analysis. The results highlight which pixels, compared to others, have the highest net value change and thus, the highest amount of risk to fire during extreme fire weather scenarios. This information, in and of itself, can highlight what areas should be focused on first for treatments provided scale limitations are considered.

Opportunities for Treatment Compilation

Areas or pixels that exhibit a positive value change to the effects of fire during extreme fire weather scenarios, could still benefit from treatment. In fact, these "opportunity" areas could have beneficial fire prescribed across many areas within the project area that would not only enhance the value of a particular HVRA, but also keep it and the surrounding area from moving towards conditions that would result in a modeled net value loss in the future as vegetation grows and fuels accumulate. These identified opportunity areas would most likely be treated with low intensity prescribed fire during times of the year when the potential for high severity fire is very low.

Project Developer

Even with the comprehensive and relatively high-fidelity risk and opportunity data across the project area, some additional filters and workflows were needed to improve results and further facilitate efficient and effective decision-making. Risk and opportunity data from the wildfire risk assessment were refined using a project-specific workflow. Additional filters by slope and by land ownership were used to further divide information into meaningful results.

Section 2.5.3 presents the results of the risk calculations and processes. The results are presented in maps showing the areas of moderate, high, very high, and highest risk.

ES.3.3 Results of Wildfire Risk Assessment

Wildfire Risk Maps

Although HVRAs are well distributed across the county, considerably more and higher risk is on the east side. County-wide risk is shown in Figure 2-21. This higher risk is mostly due to the higher fire probabilities shown and explained in Figure 2-17. To effectively evaluate and apply any risk and opportunity dataset, it is imperative to work with the spatial data in a GIS and not solely rely on map products.

Project Development Outputs

Opportunities for Prescribed Fire

Based on the wildfire risk assessment, areas of the HVRAs were opportunities to control and reduce fuels through prescribed fire were also identified. The suitability of an area for prescribed fire is assessed based on whether fire in that area would have a net positive outcome, such as areas of HVRAs where there were not structures, infrastructure, or any other features that could be negatively affected by fire. The suitability was estimated by calculating the net value change that is expected when a typical pixel in the area burns. Prescribed fire in these areas would serve to further protect the HVRAs that fall within the moderate to highest wildfire risk categories.

Project Developer Workflow Results

The project developer workflow and filters were applied to risk and opportunity outputs to help focus areas for project development coalesced by ownership and by treatment type to make the data actionable. Figure 2-25 shows that output County-wide and Figure 2-26 through Figure 2-30 zooms into each of the five planning areas for a view of what the processed wildfire risks with prescribed fire opportunities looks like at an appropriate scale to inform decisions.

ES.4 Wildfire Risk Mitigation Plan

ES.4.1 Development and Prioritization of Potential Projects

The modeling efforts to assess wildfire risks across Alpine County assisted the team in defining where fire hazard areas occur, and which resources and assets are at moderate to highest risk. County staff and the steering committee were tapped for their knowledge of recently completed projects or projects underway in the County, as well as areas of particular concern based on their understanding of fire response and evacuation procedures, and on-the-ground conditions.

The roster of projects focused on Markleeville, Woodfords, Hung-a-Lel-Ti, and Bear Valley. Project boundaries were drawn up based on parcels, and with the grouping of adjacent projects, a total of 12 total projects were identified. Once the projects were identified by geographic area, qualitative criteria were considered to prioritize the projects into three tiers (Tier 1 or highest priority, Tier 2 or moderate priority, and Tier 3 or lower priority), and to identify the three projects in Tier 1 that would move forward for detailed definition and environmental review.

ES.4.2 Summary of Projects

Table 3-1 provides an overview of the 12 projects and 23 subprojects that were identified for inclusion in this WRMP. The table is followed by maps depicting the locations of the projects. The project boundaries are largely based on parcel boundaries; however, preliminary project boundaries were delineated regardless of land ownership.

The Tier 1 projects are carried forward with detailed implementation plans and environmental review, described in Chapter 5. Implementation of other projects in Tier 2 and Tier 3 would

require supplemental implementation plans in the future. The process for implementing the Tier 2 and Tier 3 projects, as well as prescribed burning across larger HVRA areas is described in Section 4.7.

The three projects moving forward for detailed definition are Bear Valley, Manzanita, and Markleevillage. These projects were prioritized primarily because they provide protection to communities at the highest wildfire risk (Markleevillage in Markleeville); protects a larger community in combination with high wildfire risk (Manzanita community in Woodfords); and provides protection to a considerable number of higher density homes and infrastructure that can build off of existing work for greater benefit even though the overall wildfire risk is lower in this area (Bear Valley).

ES.4.3 Types of Vegetation Management Treatments

Areas with high fire hazard are mitigated through modifications to the live vegetation and removal of dead fuels onsite to reduce the risks. Fuels is the parameter for which the landowner has control, since neither weather nor topography can be altered. The modification of vegetation to reduce a fire's potential is typically called a "method" or "treatment." Several methods or treatments are available in vegetation management practice. Table ES-2 summarizes the methods available for implementation of the three Tier 1 projects that would also apply to the Tier 2 and Tier 3 projects identified in this plan. Other projects in this plan could also be implemented; however, would require an additional planning process to better define the projects and to conduct the environmental review.

Table ES-2 Typical Vegetation Treatments

Treatment Activity	Description	Method of Application
Mechanical (Mastication)	Use of motorized equipment to cut, uproot, crush/compact, or chop existing vegetation. Used on slopes from 0 to 30 percent only.	Mastication, chipping, piling; often combined with pile burning (if allowed)
Manual Treatment	Use of hand tools and hand-operated power tools to cut, clear, or prune herbaceous or woody species.	Hand pull and grub, thin, prune, hand pile; often combined with pile burning (if allowed)
Pile Burn	Use of fire to remove cut or dead vegetative material where chipping, hauling, or decomposition are not feasible. Piles can be constructed of dry vegetative material, covered, and burned.	Hand pile, ignition devices

Chapter 3 also identifies large areas of opportunity for prescribed fire across multiple land ownerships. Prescribed fire activities could be implemented in accordance with a pre-written plan (Burn Plan) that identifies land management goals and specific fire use strategies to safely achieve those goals, with prior approval by the applicable regulatory agencies.

ES.4.4 Environmental Review

Implementation of the WRMP has the potential to impact environmental resources. Projects carried out or approved by the County that occur on private land would require review under the California Environmental Quality Act (CEQA). Projects that the County completes on federal land (e.g., Bureau of Land Management, United States Forest Service) would require review under the National Environmental Policy Act (NEPA) in addition to CEQA review.

Biological and cultural resource assessments are required to ensure that the WRMP projects do not significantly impact biological and cultural resources. General protection measures for biological and cultural resources are identified in the WRMP and would be applied to all projects, as appropriate.

ES.4.5 Estimated Costs

The cost of implementing the WRMP projects varies depending on the size of the project and treatment method used. From a cost perspective, prescribed burning is the most cost-effective way to treat large areas; however, prescribed burning can only be implemented under very specific weather, land development, and topography conditions. None of the Tier 1 projects propose prescribed burning. The cost of mastication is generally higher per acre than prescribed burning but lower than hand thinning methods. Mastication could be used as an alternative to prescribed burning and can also be used in areas where prescribed burning would not be possible. Estimated costs of each treatment type, as well as a list of potential funding sources are provided in Section 4.6 of the WRMP.

ES.4.6 Future Project Implementation

The WRMP includes defined activities that would occur during implementation of the Tier 1 projects. Extensive planning and public outreach has occurred in preparation of defining the Tier 1 projects. Future Tier 2 and Tier 3 projects would require additional definition of project boundaries, treatment methods, and public outreach. Environmental review would be required for future projects. The type and level of environmental review would be determined based on future project boundaries, land ownership, treatment methods, and potential environmental impacts.

ES.5 Community Access Risk Assessment

ES.5.1 Ingress/Egress Identification

Alpine County's population is focused in the five communities of Woodfords, Hung-A-Lel-Ti, Markleeville, Kirkwood, and Bear Valley. During the HRVA characterization and analysis, Alpine County officials helped identify and designate primary and secondary ingress and egress routes, and constraints to access for vulnerable communities.

Grover Hot Springs, Shay Creek, and Markleevillage share Hot Springs Road as a single ingress/egress route; however, options for feasible secondary evacuation routes are constrained

by terrain and significant distances to a higher functional class route. Similarly, the Sherman Acres, Old and New Bear Valley subdivisions, and Bear Valley Mountain Resort have single access to the State highway system. All of the communities discussed above are surrounded by mountainous terrain. The most feasible secondary access alternatives would need to parallel the primary evacuation route, due to site constraints, and would not create safer evacuation conditions; therefore, vegetation management efforts along ingress and egress routes is especially important for adequate emergency response and evacuation.

ES.5.3 Community Evacuation Areas Identification

During the HRVA characterization and analysis, Alpine County officials and the Steering Committee helped identify community evacuation areas or refuge areas. Community evacuation areas are zones where emergency service vehicles and personnel can stage for an incident. These zones can also serve as a rendezvous point for the public or, potentially, a safety zone from fire when egress is compromised.

Evacuation zones are even more important in areas where ingress/egress infrastructure is limited. The Hot Springs Road corridor, Sherman Acres, Old and New Bear Valley subdivisions, and Bear Valley Mountain Resort are lacking secondary access routes. Since establishing secondary ingress and egress to vulnerable communities is not feasible, establishment of pre-incident evacuation zones that meet minimum safe separation distances is recommended. Potential evacuation zones identified as HVRAs during the wildfire hazard and risk assessments include:

- Turtle Rock Park;
- Diamond Valley Elementary School;
- Grover Hot Springs State Park; and
- Bear Valley Library and parking lot.

ES.5.4 Community Access Risk Report

Analysis shows that about 832 acres surrounding major ingress and egress routes are at risk. This means that during a critical wildfire incident, portions of the major emergency routes do not have the appropriate clearance of vegetation and fuels around the road for traffic to safely pass if fire impacted those areas during critical fire weather. About 1,868 acres surrounding minor ingress and egress routes are shown to have at least some risk. Like major routes, this means that areas do not have sufficient vegetation and fuel clearance adjacent to routes so that traffic can safely pass. Finally, community evacuation areas might be vegetation and fuels free within the zone, but the WRMP fire hazard analysis shows that about 150 acres surrounding those areas exhibit high enough fire hazard that, during a critical wildfire incident, fire could compromise the effectiveness of those evacuation areas. Vegetation management efforts focused on treatment of the area surrounding major emergency routes and evacuation areas are recommended.

1 Introduction

1.1 Background

1.1.1 Fire Hazards and History in Alpine County

Alpine County, located in the Sierra Nevada, is largely comprised of vast areas of undeveloped land across different topographies. Wildland fires within the wildland urban interface (WUI), where development is interspersed with wildlands, pose the greatest threat to lives and property. Four major wildfires have occurred in Alpine County since 1981. In 1984, the Indian Creek Fire burned approximately 6,000 acres of forest in Alpine County (17,000 acres total) near Indian Creek on the East Slope. In 1986, a fire burned 2,000-3,000 acres of wildland plus two structures near Fredericksburg and in 1987 the Acorn Fire burned 6,000 acres and 26 structures near Woodfords. In 2015, the Washington Fire consumed approximately 18,000 acres south of Markleeville and came within two miles of the town of Markleeville, prompting evacuations and significant coordinated response from local, State, and federal firefighting agencies. Fortunately, none of these fires resulted in loss of life (C.G. Celio & Sons Co., 2018).

1.1.2 Grant for Fire Hazard Mitigation Planning

CAL FIRE awarded $43 million in Local Fire Prevention Grants to various entities across the state in April 2019. These grants fund 66 local fire prevention projects. The Fire Prevention Grants are meant to enable local organizations, like fire safe councils, to implement activities that address the risk of wildfire and reduce wildfire potential to communities. The awarded projects all meet the goals and objectives of California's Strategic Fire Plan adopted in 2018, as well as the recommendations of CAL FIRE's "Community Wildfire Prevention & Mitigation Report" to Governor Gavin Newsom submitted in April 2019. Most of the award funding is provided by the Greenhouse Gas Reduction Fund for California Climate Investments (CCI).

Fuels reduction projects to reduce the risk of wildland fire are a high priority in Alpine County and several have been undertaken or are ongoing, including neighborhood fire breaks and larger scale fuels reduction projects on federal lands. Approximately 1,780 residential units are in Alpine County; over 1,200 of these are in high or very high wildfire hazard severity zones (C.G. Celio & Sons Co., 2018). Key planning areas include Woodfords, Markleeville, Bear Valley, and Kirkwood. Community Wildfire Protection Plans have been defined for the east and west County. The Alpine Biomass Collaborative additionally, is an important collaborative group within the County to share information regarding ongoing fuels projects.

In order to build off of the existing work underway and to expedite the County's ability to protect its communities in the face of increasing catastrophic wildland fires across California,

Alpine County applied for and was awarded a CAL FIRE Community Fire Prevention Grant in the amount of $223,756 to create the Alpine County Wildfire Risk Mitigation Plan.

1.2 Goals and Objectives

The goal of the WRMP is to reduce wildfire risk in Alpine County and to protect important resources throughout the county. The objectives of the plan are to:

- Assess the risks of fire within the WUI,
- Identify opportunities to mitigate risks to protect communities through fuel treatments, and
- Define up to three specific projects in enough detail to perform environmental review and prepare for funding and implementation.

1.3 Scope of Wildfire Risk Mitigation Plan

1.3.1 Overview

The WRMP addresses the entirety of Alpine County, but through a defined process of wildfire risk assessment, focuses in on key areas where wildfire hazards generate risks to life, property, and important resources. Alpine County encompasses over 476,000 acres of land yet has the smallest population of any county in the state with just over 1,175 people per the 2010 census (U.S. Census Bureau, 2011). The planning effort to prepare the WRMP was agnostic to land ownership, but inherently focused on the WUI and the five major areas of population, where the greatest risks to life and property are located.

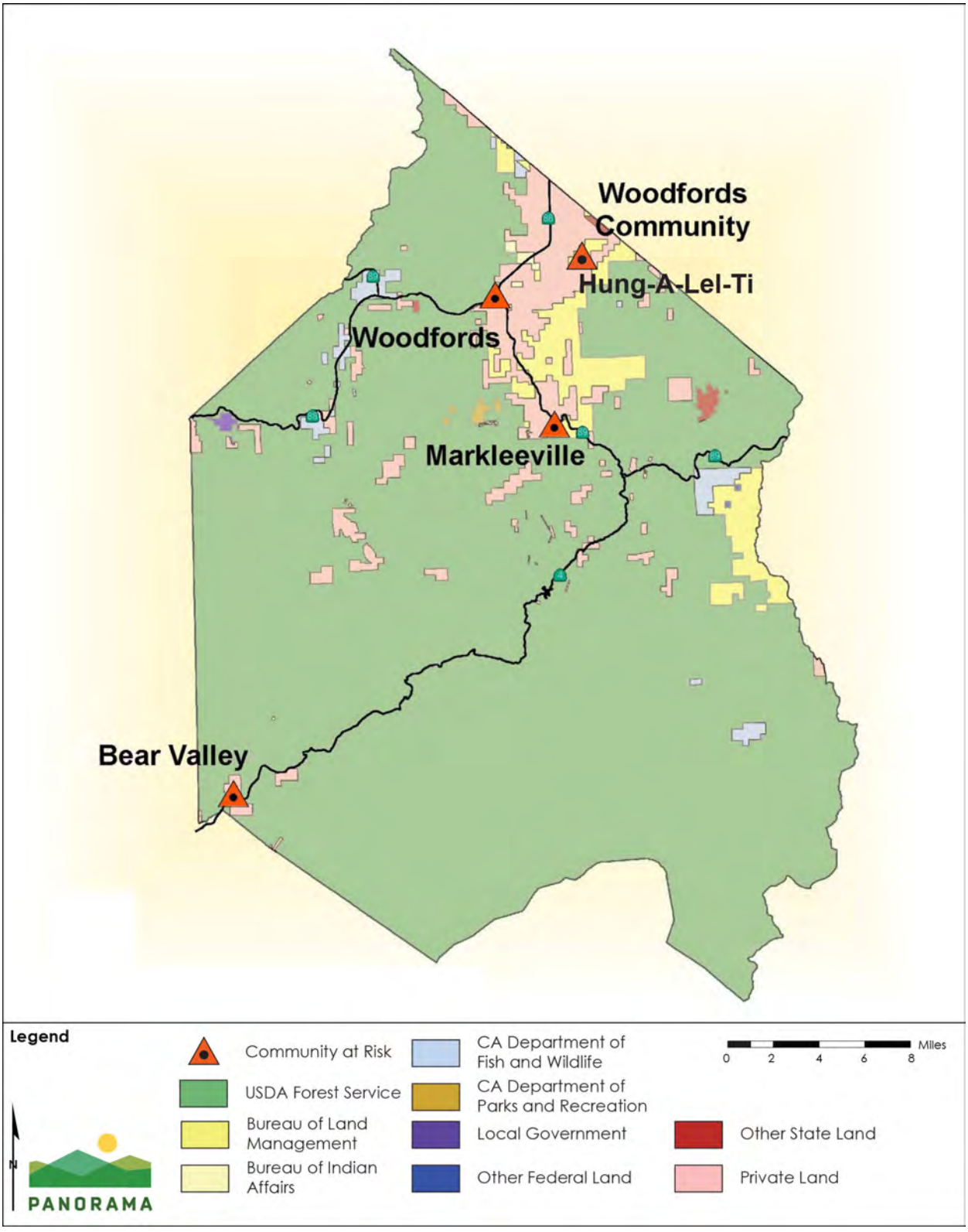
1.3.2 Location Map of Planning Areas

Figure 1-1 shows the land ownership across Alpine County. Approximately 95 percent of the land is in public ownership, with the vast majority managed by the United States Forest Service (USFS). Additional lands are focused on five key community areas, including Woodfords, Hung-a-Lel-Ti, Markleeville, Kirkwood, and Bear Valley. The United States (U.S.) Department of the Interior, Bureau of Land Management (BLM) also manages a considerable amount of land abutting private land in the Woodfords and Markleeville areas.

The population of the county is focused into the following five planning areas (C.G. Celio & Sons Co., 2018):

- **Woodfords Planning Area:** There is a long history of wildfire in this area with the Woodfords community, with four major wildfires occurring since 1981. In 1984, the Indian Creek Fire burned approximately 6,000 acres near Indian Creek, only to be followed by a 2,000-acre fire near Fredericksburg in 1986 and then the Acorn Fire in 1987, which burned nearly 6,000 acres and twenty-six homes. Woodfords is

Figure 1-1 Land Ownership and Communities in Alpine County



listed on the Federal Register as a community threatened by wildfire. Eastern Alpine Fire and Rescue and the USFS provide wildland fire protection.

- **Hung-a-Lel-Ti Area:** This community is near Woodfords and is the community of the Southern Band of the Washoe Tribe of Indians. Fire hazards are similar to those described for Woodfords.
- **Markleeville Planning Area:** Some large wildfires have burned in this area, most recently the Washington Fire south of Markleeville, which consumed 18,000 acres, and fuel loadings remain high. The Washington Fire burned within 2 miles of the town of Markleeville, prompting evacuations and significant coordinated response from local, State, and federal firefighting agencies. Markleeville is listed on the Federal Register as a community threatened by wildfire. Eastern Alpine Fire and Rescue and the USFS provide wildland fire protection.
- **Bear Valley Planning Area:** This area has little wildland interface issues given its elevation and relatively wet climate. Bear Valley is, however, listed on the Federal Register as a community at risk for wildfire. The community is geographically isolated from the rest of the County much of the year. Bear Valley provides its own fire protection.
- **Kirkwood Planning Area:** This area has a small area of wildland interface, however, the assets at risk are significant due to the value of the homes and infrastructure.

1.4 Existing Fuel Management Planning, Projects, and Regional Capabilities

1.4.1 Alpine Fire Safe Council

The Alpine Fire Safe Council (AFSC) was established in 2003 through a cooperative effort of the Alpine County Board of Supervisors and the Alpine County Resource Advisory Committee. The mission of the AFSC is to provide community leadership, resources, and a forum to improve wildfire preparedness in Alpine County. The AFSC provides educational material to the community, facilitated the Fire Services Plan Ad-Hoc Committee that prepared the 2005 Eastern Alpine County Fire Services Plan, and encouraged various planning efforts at the County to support public safety and fire ordinances (C.G. Celio & Sons Co., 2018).

In 2018, the AFSC published the Alpine County Community Wildfire Protection Plan (CWPP), which served as a major reference and resource in preparation of this WRMP. The CWPP is a roadmap for the community to reduce wildfire hazards and risks. It outlines the risks and hazards and provides specific recommendations and projects to address risks. This WRMP built off the recommendations provided in the CWPP for fuel reduction projects.

The AFSC has also implemented several fuel reduction projects throughout the County, including the Diamond Valley Road spur shaded fuelbreak in 2019 and Alpine Village projects in 2020. Additional AFSC efforts include coordinating a reflective address marker program to

provide improved visibility and recognition for emergency personnel and advocating for fire safe development standards within the County.

1.4.2 Alpine Biomass Collaborative

The Alpine Biomass Collaborative (ABC), formerly known as the Alpine Biomass Committee, is a collaborative group in Alpine County whose mission statement is "Unifying partners to promote forest and watershed health, and local economic development." The ABC believes that by improving forest and watershed health, the risk of catastrophic wildfire can be reduced, and the local economy will benefit by using local labor to implement these efforts. Historically, there has been little coordination between the different land managers and non-government organizations in Alpine County and the ABC recognizes the importance of coordinated planning efforts to ensure successful project outcomes (Alpine Biomass Collaborative, 2020).

In 2016, the ABC received a $12,000 Capacity Building grant from the National Forest Foundation to begin forest and watershed health improvement efforts. The ABC does not conduct any projects on its own accord; its role is to help other organizations maximize the impact of their forest and watershed health projects. The ABC assists with facilitation between the National Park Service, BLM, USFS, Alpine Watershed Group, Hung-A-Lel-Ti Washoe Community, and other local and federal organizations. The ABC has received support from the Amador-Calaveras Consensus Group, the Sierra Institute, Calaveras Health Impact Product Solutions, and the Sierra Nevada Conservancy (Alpine Biomass Collaborative, 2020).

1.4.3 US Forest Service Work and Other Federal Projects

Alpine County includes four national forests managed by the USFS: Stanislaus, El Dorado, Lake Tahoe Basin Management Unit, and Humboldt-Toiyabe, as well as other federally managed lands. Federal agencies such as the USFS and BLM implement forest planning and management projects throughout Alpine County. The BLM Carson City District has implemented several fuels treatment projects near the Markleeville and Turtle Rock Park communities along Highway 89. The projects, implemented between 1997-2011, include mechanical fuels treatment techniques and prescribed burning. One project is located along Hot Springs Road, north of Markleevillage, and another project is located along Poor Boy Road, south of Markleeville. Various smaller projects are located along the western edge of Indian Creek Reservoir, along Airport Road, and immediately south of Turtle Rock Park.

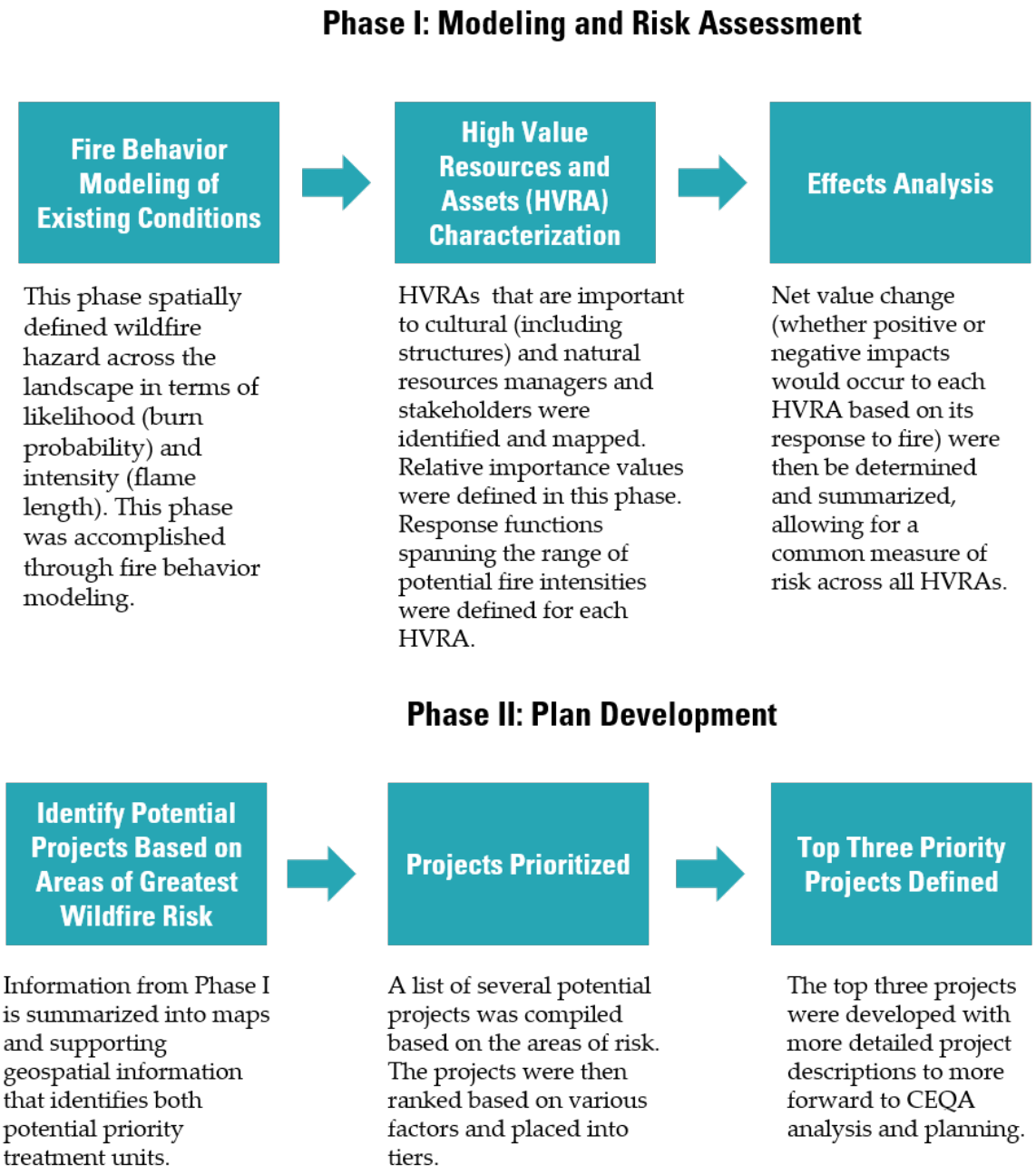
The Humboldt-Toiyabe National Forest continues to implement within several active project areas, treating approximately 200 acres per year in Eastern Alpine County. These projects all have a fuels reduction and vegetation management emphasis, including hand thinning, mechanical thinning, and prescribed fire treatments. Active projects in the greater Markleeville area are: Manzanita Hazardous Fuels Reduction Project, Markleevillage Hazardous Fuels Reduction Project, Monitor Pass Habitat Improvement Project, and West Carson Watershed Habitat Improvement Project (USFS, 2010; USFS, 2013).

1.5 Plan Development Process

1.5.1 Plan Development Process

This WRMP has been developed following the process shown in Figure 1-2. Phase I is described in detail in Chapter 2. Phase II is described in Chapters 3 and 4. A community access risk assessment was also performed, and the results are presented in Chapter 5.

Figure 1-2 Summary of WRMP Development Process



1.5.2 Roles of Steering Committee in Plan Development

The County coordinated a steering committee of individuals to advise on WRMP development.[1] The committee members included individuals from:

- Humboldt-Toiyabe National Forest – Carson Ranger District: Annabelle Monti
- Stanislaus National Forest – Calaveras Ranger District: Kellin Brown
- Alpine Fire Safe Council: Kris Hartnett
- Alpine Biomass Collaborative: Michael Barton
- Eastern Alpine Fire and Rescue: Terry Hughes
- Alpine County Community Development Department: Zach Wood and Debbie Burkett
- CAL FIRE Amador El Dorado Unit: Mike Deacon

An initial kick-off meeting was held with the steering committee, as well as several check in points throughout Phase I and Phase II to receive feedback and to assist and direct the decision-making process as the development of the plan progressed.

1.5.3 Community Participation

WRMP Development Process

The County prioritized community participation in the development of the WRMP. The County held two public workshops to obtain public input on the components of the plan and methodology for prioritizing projects. The first public meetings and workshops were held on February 25, 2020, in Markleeville and February 26, 2020 in Bear Valley. The meetings included a presentation to introduce the WRMP effort, to give an overview of existing activities, to introduce the methods of wildfire risk assessment being undertaken, and to identify the process by which projects will be determined. The meeting included a question and answers session and breakout stations where individuals could ask questions or provide input on specific aspects of the process. A second workshop was held on April 28, 2020 via videoconference. This workshop focused on presenting results of modeling with a focus on candidate project locations, prioritization, and next steps in the project implementation process. Appendix A includes the Community and Stakeholder Input Report.

The County will also hold a CEQA workshop to inform the public of the potential impacts from implementation of the plan during the CEQA document public review period.

[1] Matthew Hilden (Stanislaus National Forest – Calaveras Ranger District) and Brian Peters (Alpine County Community Development Department) participated in the WRMP preparation process but retired prior to the WRMP publication.

Partnerships to Achieve Project Success

The WRMP had been developed to consider wildfire risk across Alpine County, regardless of landowner. The County recognizes that projects to be implemented on private land require significant engagement and participation of private landowners. Section 3 of this WRMP identifies a list of candidate projects throughout Alpine County. Many of the candidate projects include privately owned land. Projects that include a majority of private land, including private subdivided lots, would not be viable without participation from the hundreds of property owners within the project boundaries.

The County has a longstanding commitment to working with federal, State, and local government agencies, non-governmental organizations, and private property owners to reduce wildfire risk and protect important resources throughout Alpine County. Non-governmental organizations, including the Alpine Fire Safe Council and Alpine Biomass Collaborative have been instrumental in communicating the WRMP goals and objectives to the public and cultivating support for the WRMP. Participation from all agencies, organizations, and the public is greatly appreciated.

2 Technical Analyses

2.1 Key Terms

Several key terms are used throughout this section. The following terms that are used in this guide are defined as follows (Scott, Thompson, & Calkin, 2013):

- **High Valued Resources and Assets (HVRAs):** are simply valued elements of the manmade and natural environment.
- **Hazard:** a physical situation with the potential to cause damage to HVRAs, resulting in loss or benefit
- **Risk:** The likelihood, intensity, and susceptibility to effects of wildfires on HVRAs
- **Exposure analysis:** an analysis that explores the potential spatial interactions of HVRAs with risk factors- fire likelihood and fire intensity- without considering how these factors affect HVRA value.
- **Effects analysis:** explores the response of HVRAs to varying levels of these risk factors. Fire effects are often expressed as a percentage loss of value for a given intensity level.
- **Expected net value change:** a measure of wildfire risk to resources and assets that forms the basis for the quantitative wildfire risk assessment process.

2.2 Introduction

The fundamental need driving fuel treatment efforts, and pre-suppression fire management in general, is the need to reduce risk. Developing an optimal fuel treatment scenario can be initiated by developing a clear, baseline understanding of how wildfire risk is distributed across the landscape to be managed. The understanding of the wildfire risk is established by a quantitative, spatially explicit, landscape-scale wildfire risk assessment. A wildfire risk assessment most directly complements the larger goal of prioritizing fuel treatments by providing the means to quantitatively compare fuel treatment alternatives.

There are three main components of wildfire risk: likelihood, intensity, and susceptibility to effects. Knowing where wildfires are probable and the intensity at which they might burn gives the critical information needed to understand and address possible impacts (effects) to HVRAs. Wildfire likelihood, intensity, and effects to HVRAs (susceptibility) may be integrated and quantified in a single expression of net value change, which can be translated into the overall risk while also highlighting opportunities were fire can safely be returned to the landscape without known unintended consequences. Figure 2-1 highlights the three key pieces of information needed before risk can be quantified.

Figure 2-1 Components of Wildfire Risk Analysis

Fire hazard analysis outputs can also serve as likelihood (fire probability) and intensity (flame length) risk analysis inputs. An additional analysis workflow is required to assess **susceptibility** to characterize wildfire risk, which begins with HVRA identification and characterization. **Susceptibility** is determined through several steps, including HRVA characterization, an exposure analysis, and an effects analysis.

Finally, project development is determined from risk compilation, opportunity compilation, and the reduction of noise in the data to ultimately develop projects. Each step is described in the following sections.

2.3 Fire Hazard Analysis

2.3.1 Method Overview

Wildfire modeling is a field of computational science that uses numerical simulations to predict fire behavior. Wildfire modeling attempts to reproduce fire behavior characteristics like how quickly a fire can spread, in which directions it may spread, and how much heat it may generate given the conditions of the fuels, land, and predicted weather. Fire behavior modeling also looks at whether a fire would transition from the ground surface to tree crowns, which is much more dangerous. Once fire behavior is estimated through modeling, an assessment of fire hazards to surrounding life and property can be made in a risk assessment.

The factors that influence fire behavior serve as the key inputs in modeling efforts. These factors include:

- **Landscape:** Topography factors influence wildfires. Orientation toward the sun, which influences the amount of energy received from the sun, and the slope (fire spreads faster uphill) influence fire behavior. Fire can accelerate in narrow canyons and it can be slowed down or stopped by barriers such as creeks and roads.

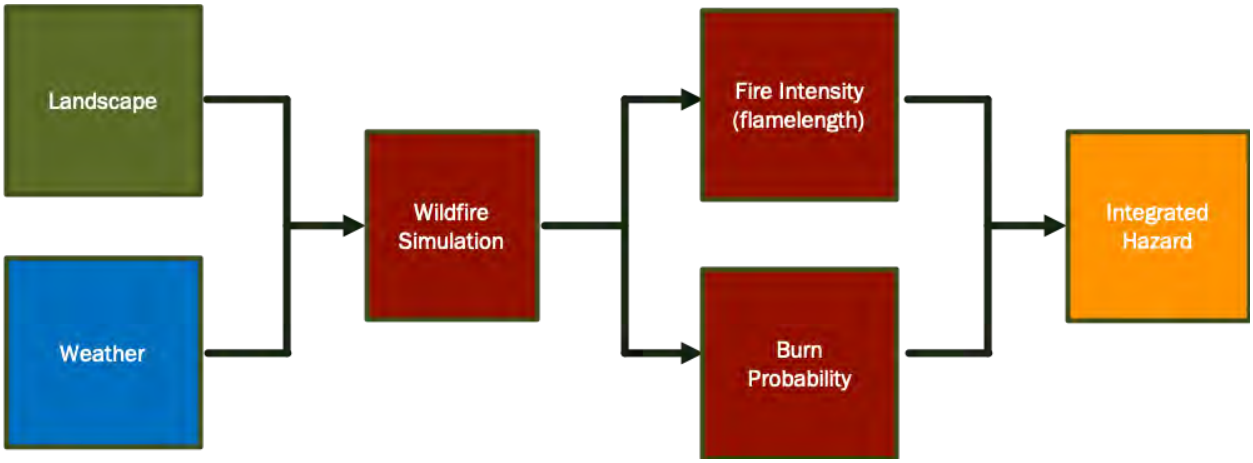
- **Fuels**: Fuels include anything that can burn. In wildland areas, fuels are primarily comprised of vegetation. Dead trees with low moisture ignite more easily and burn faster than live trees with higher moisture. Leaf litter and dried twigs and branches also ignite easier and burn faster.
- **Weather:** Weather influences fire through wind and moisture. Wind can increase the spread of fire in the direction of the wind, wind speed can accelerate spread, and higher temperatures can result in a fire burning faster, as can low humidity and low precipitation.

Outputs of fire behavior modeling can include different parameters, but for this project modeling focused on burn probability and fire intensity at 97th percentile weather (described below). Burn probability is the likelihood that a wildfire will burn a given point or area over a specified period. Flame length can be used as a proxy for fire intensity, where flame length is the height of the flames, with taller flame lengths indicating a higher intensity fire. Generally, if flame lengths are less than 4 feet, then fire can be effectively controlled with professional suppression resources. Flame lengths between 4 and 8 feet require multiple, more specific types and numbers of professionally trained firefighting resources and suppression success goes down. Flame lengths greater than 8 feet generally prevent firefighters and resources from directly attacking the fire front because the fire is too intense. Many times, this scenario results in more land being burned and unfortunate effects on property and even life. Vegetation treatments should be identified to reduce undesirable fire intensities when flame lengths exceed 4 feet, so that fire fighters have the highest probability of safely controlling a wildland fire under most weather conditions.

For Alpine County, this analysis was accomplished through development and implementation of a tailored, spatially dependent fire modeling framework that utilized industry standard probabilistic fire models designed specifically for land management. The modeling exercise was undertaken by Fire Ecologist, Scott Conway, of Spatial Informatics Group (SIG).

The methods chosen to model the fire behavior within and around Alpine County took advantage of several best in class, comprehensive datasets, modeling technologies, and systems to quantify the vegetation and fuels consistently and appropriately across the County. The modeling protocol was based off *A Wildlife Risk Assessment Framework for Land and Resource Managers* (Scott, Thompson, & Calkin, 2013). The methodology was approved by the steering committee in November 2019. The modeling workflow is shown the figure, below.

Figure 2-2 Fire Behavior Modeling Workflow



2.3.2 Model Inputs

Overview

The Landscape Fire and Resource Management Planning Tools (LANDFIRE) was used for the inputs for landscape and fuels, that is, topography and vegetation cover types. LANDFIRE is a shared program between the wildland fire management programs of the USFS and U.S. Department of the Interior. The datasets in LANDFIRE for topography and vegetation are based on remote sensing data.

For all topography, vegetation, and fuels analysis, the project took advantage of comprehensive, yet explicit (30-meter squared resolution) LANDFIRE data through the Interagency Fuel Treatment Decision Support System (IFTDSS). IFTDSS is a web-based application designed to make fuels treatment planning and analysis more efficient and effective. IFTDSS provides access to data and models through one simple user interface. It is available to all interested users, regardless of agency or organizational affiliation. IFTDSS is designed to address the planning needs of users with a variety of skills, backgrounds, and needs. A simple and intuitive interface provides the ability to model fire behavior across an area of interest under several weather conditions and to easily generate downloadable maps, graphs, and tables of model results. The application provides a step by step process for testing a variety of fuels treatment impacts (thin, clear cut, prescribed burn) on fire behavior and comparing results to determine the modeled treatment to best achieve desired results in terms of reduced fire behavior potential. It can be used at a variety of scales from local to landscape level (US Department of Interior, 2020).

LANDFIRE is a shared program between the wildland fire management programs of the USFS and U.S. Department of the Interior, providing landscape scale geo-spatial products to support cross-boundary planning, management, and operations. LANDFIRE vegetation products describe the following elements: Existing Vegetation Type, Existing Vegetation Canopy Cover,

and Existing Vegetation Height. These layers are created using predictive landscape models based on extensive field-referenced data, satellite imagery and biophysical gradient layers using classification and regression trees. LANDFIRE fuel products describe the composition and characteristics of surface and canopy fuel, which provide consistent fuel information to support fire planning, analysis, and budgeting to evaluate fire management alternatives that supplement strategic and tactical planning for fire operations (LANDFIRE, 2020). Although there are other high-fidelity datasets that can augment or replace LANDFIRE data, there was no other data source that has recently and consistently mapped all Alpine County. Therefore, LANDFIRE is the primary data source for analysis.

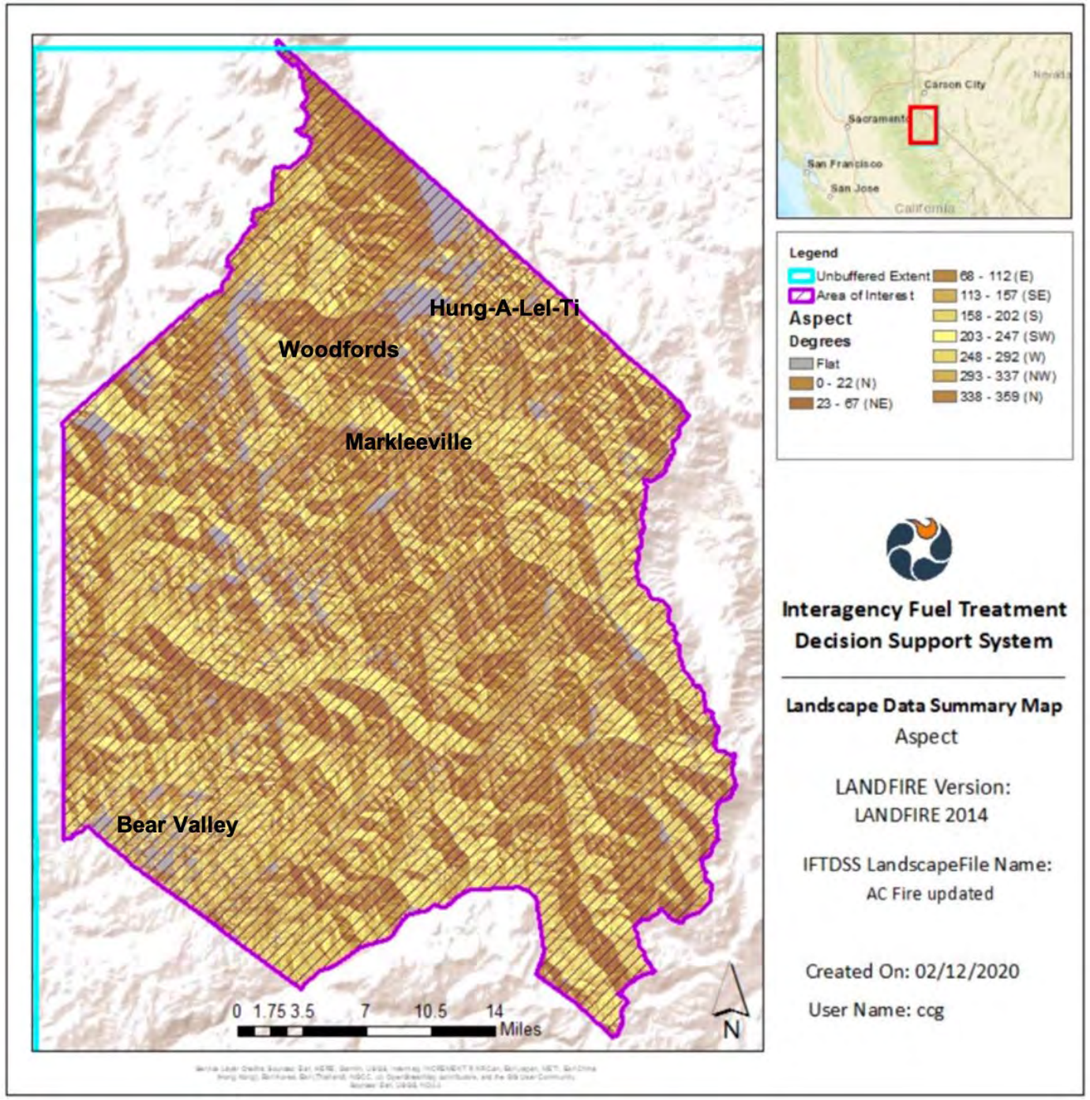
See Appendix B, the Alpine County Auto 97 Current Condition Report, for more in-depth and comprehensive analysis of the current conditions utilized from IFTDSS tools.

Landscape Inputs from LANDFIRE

Topography
Alpine County is characterized by complex and diverse topographic conditions, including rugged peaks and ridges, deep canyons, mountain meadows, and numerous streams and lakes. Elevations range from just over 4,500 feet to well over 11,000 feet. These dynamic physical conditions create a variety of vegetation conditions. Aspect and elevation data from LANDFIRE are shown in the following figures.

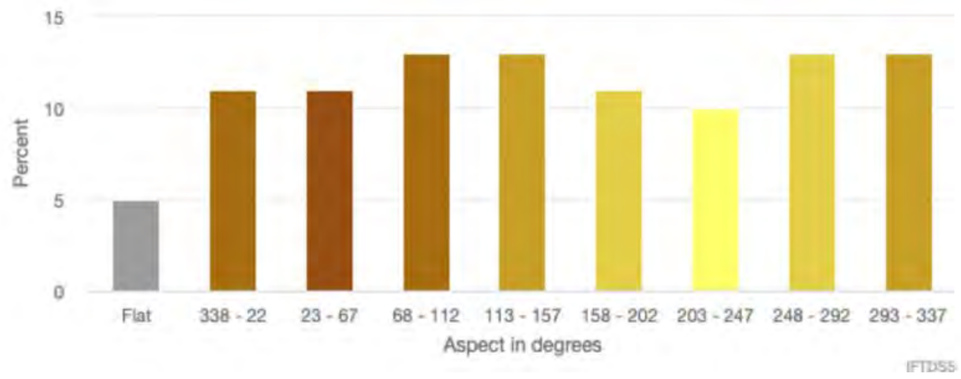
Vegetation
Many vegetation types are found across Alpine County (Figure 2-6). The majority cover types and their distribution across Alpine County are presented in Figure 2-7. The land cover types found within the planning areas are identified in Table 2-4.

Figure 2-3 Aspect Data for Alpine County from LANDFIRE



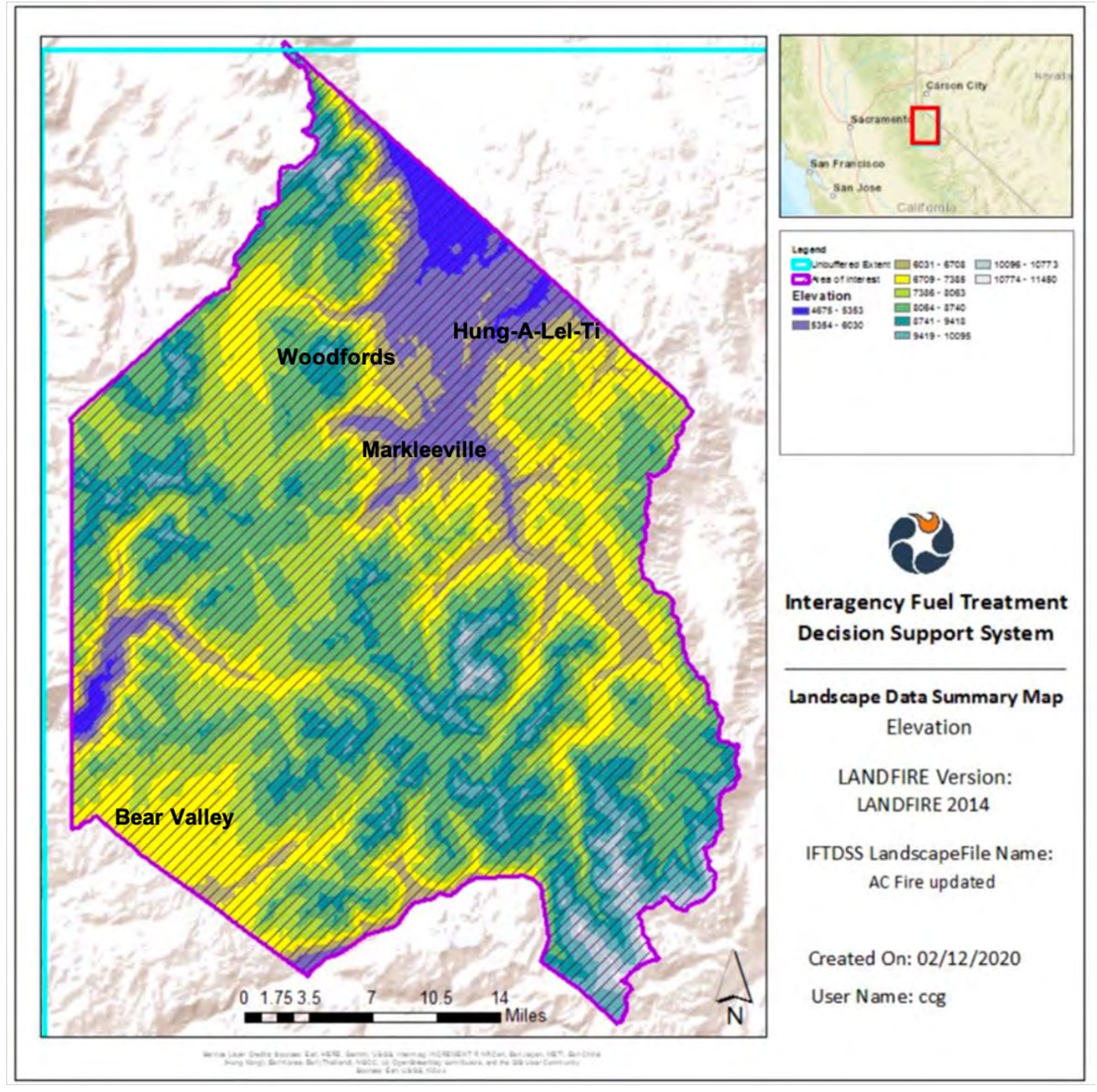
Source: (LANDFIRE, 2020)

Table 2-1 Aspect Data for Alpine County by Percent



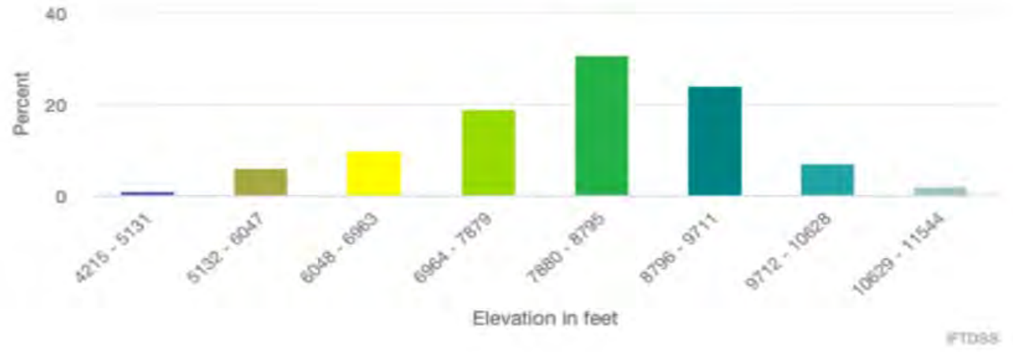
Source: (US Department of Interior, 2020)

Figure 2-4 Elevation Data for Alpine County from LANDFIRE



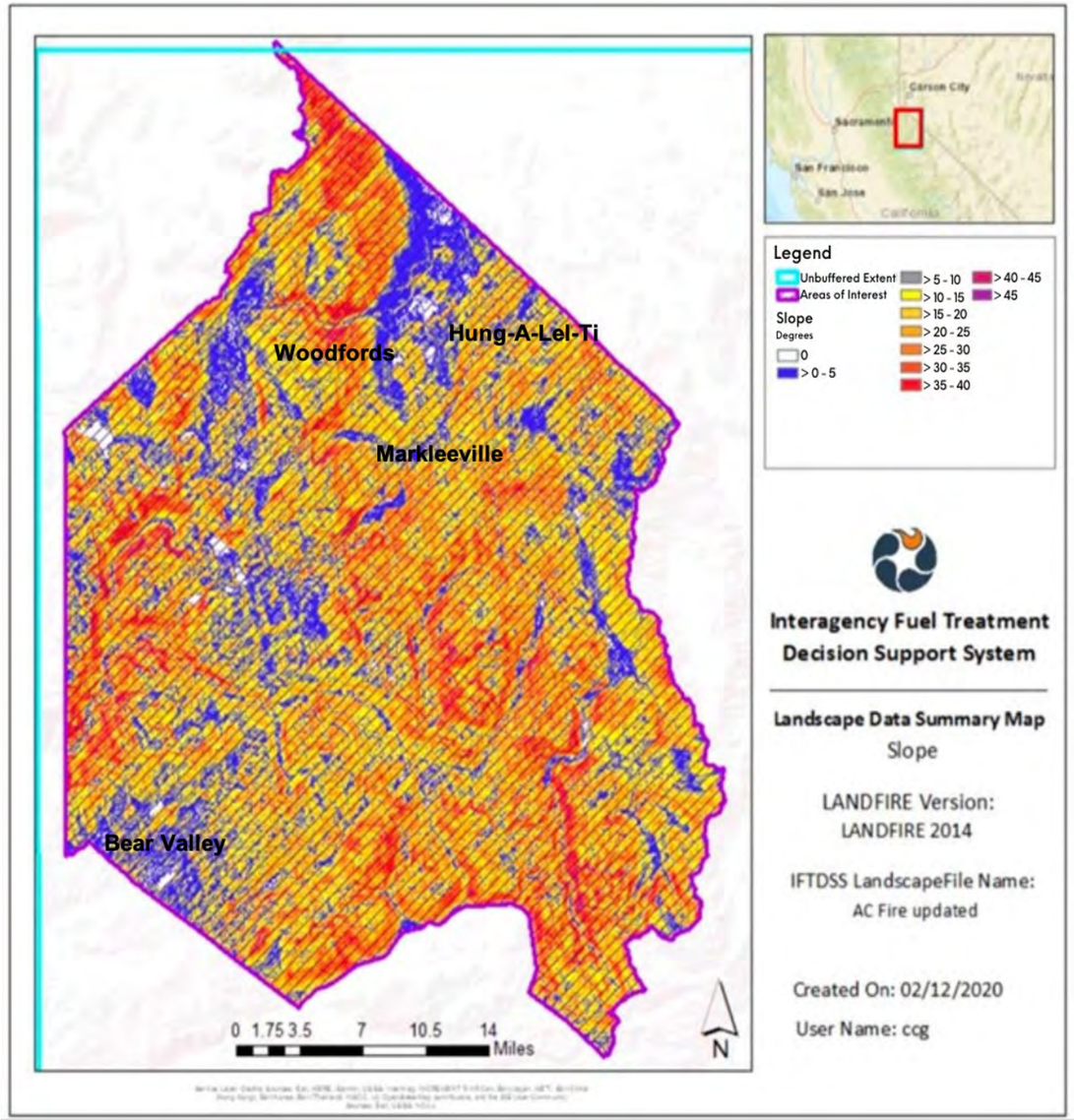
Source: (LANDFIRE, 2020)

Table 2-2 Elevation Data for Alpine County by Percent



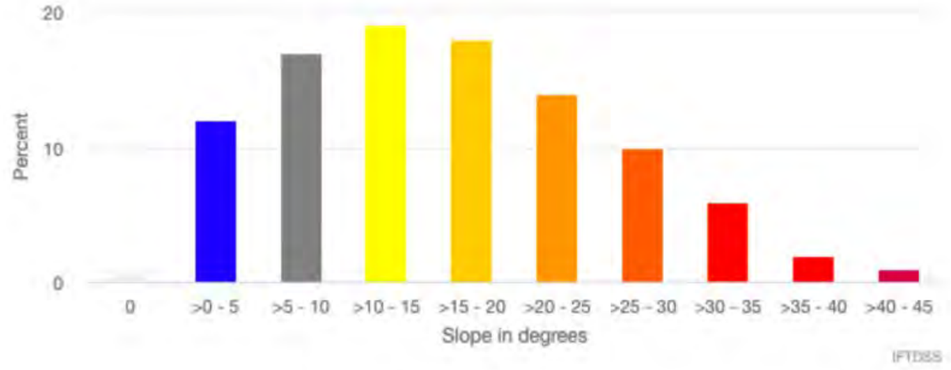
Source: (US Department of Interior, 2020)

Figure 2-5 Slope Data for Alpine County from LANDFIRE



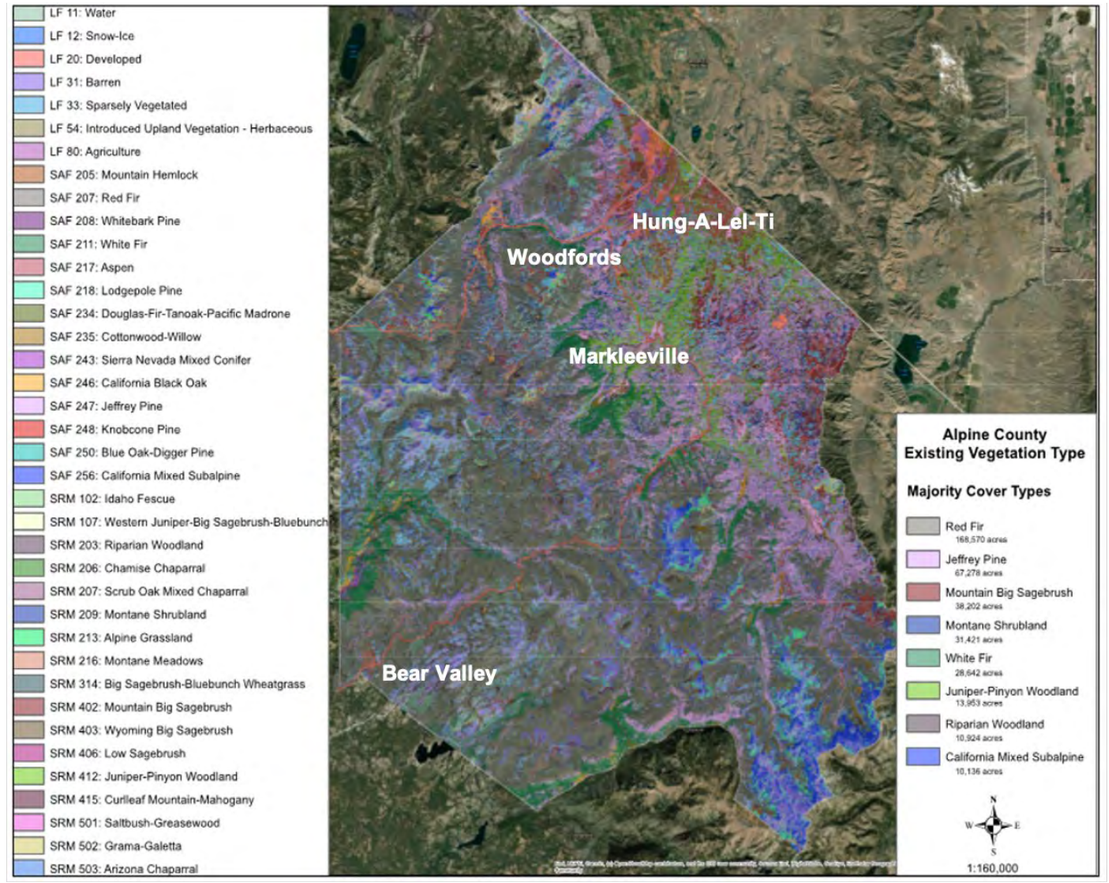
Source: (LANDFIRE, 2020)

Table 2-3 Slope Data for Alpine County by Percent



Source: (US Department of Interior, 2020)

Figure 2-6 Existing Vegetation Types in Alpine County



Source: (LANDFIRE, 2020)

Figure 2-7 Majority Vegetation Cover in Alpine County

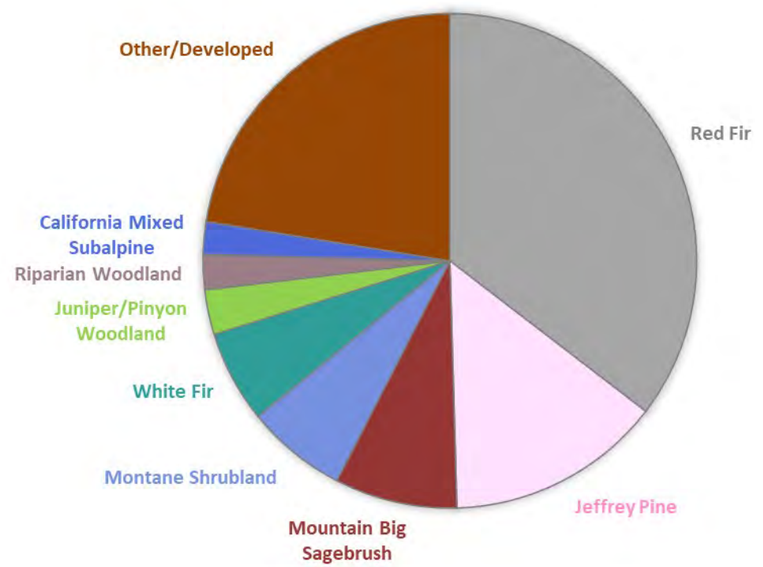


Table 2-4 Land Cover Types within Alpine County Planning Areas

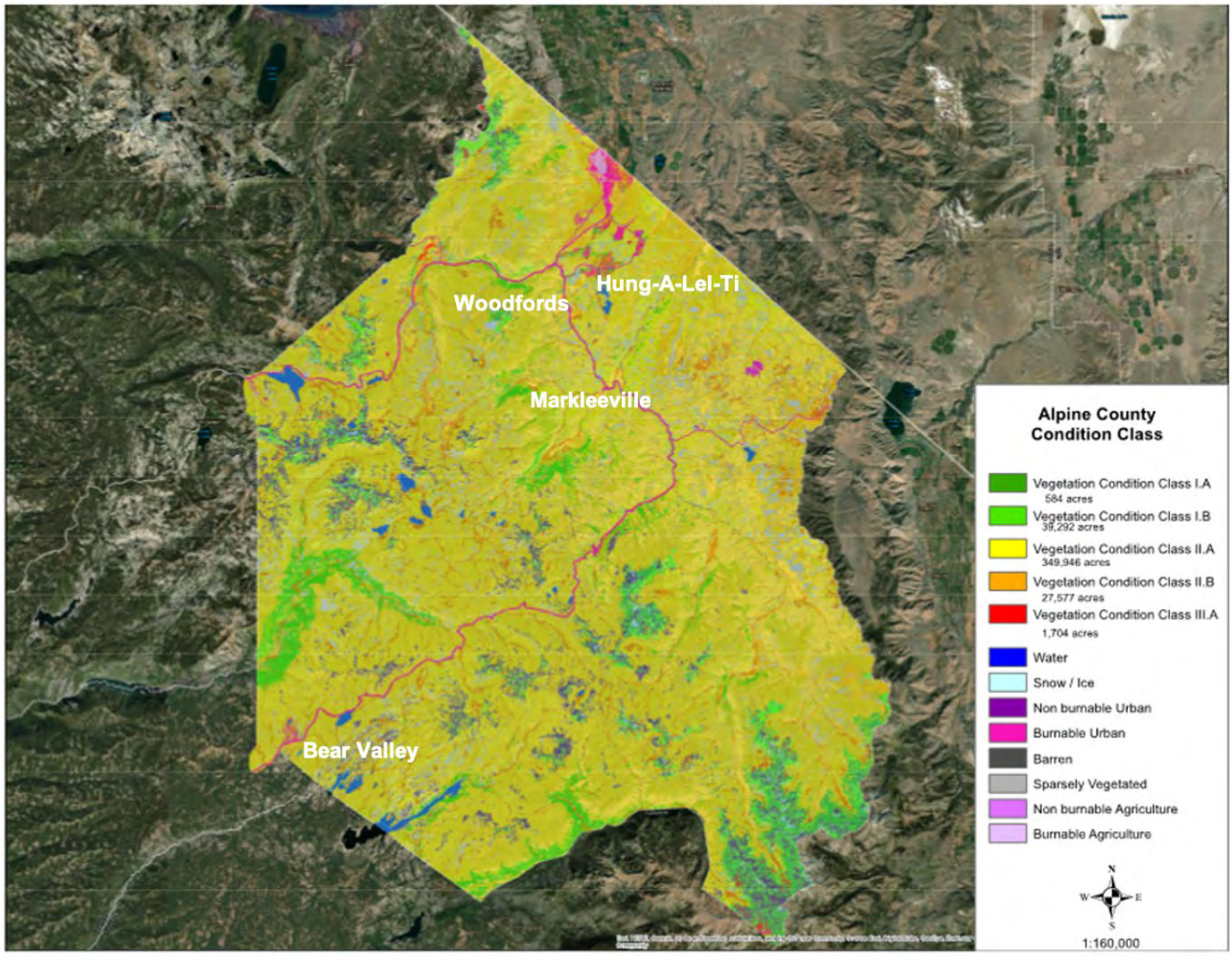
Planning Area	Majority Vegetation Cover Type	Burn Probability	Integrated Hazard
Woodfords	Jeffrey Pine/ Montane Shrubland	Higher	Higher Hazard
Hung-a-Lel-Ti	Developed	Moderate	Middle Hazard
Markleeville	Jeffrey Pine	Higher	Higher Hazard
Bear Valley	Sierra Nevada Mixed Conifer/ Chamise Chaparral/ Lodgepole Pine/ Montane Meadow	Lower	Lower Hazard
Kirkwood	Red Fir	Lowest	Lower Hazard

The vegetation cover types throughout Alpine County evolved with low, middle, and higher severity fire. Jeffrey pine is primarily associated with the Woodfords and Markleeville planning areas and Jeffrey pine cover types evolved with higher severity fire. Developed cover type evolved with middle severity hazard and is primarily associated with the Hung-a-Lel-Ti planning area. The Bear Valley planning area primarily features Sierra Nevada Mixed Conifer, Chamise Chaparral, Lodgepole Pine, and Montane Meadow vegetation cover type which have evolved with a lower severity fire. Red fir is primarily associated with the Kirkwood planning areas and evolved with lower severity fire. Fire suppression policies, however, have all but eliminated this periodic disturbance at low and mixed severities. The result is a departure from the historic and natural range of variation measured from reference conditions and has led to an unnatural and undesirable vegetation densities and accumulation of fuels in many areas. Vegetation condition class, shown on Figure 2-8 exhibit how much and where departure has occurred.

Vegetation condition classes reflect the current conditions' degree of departure from modeled reference conditions (Table 2-5). Vegetation condition class assessments measure departure in two main components of ecosystems: 1) fire regime (fire frequency and severity) and 2) associated vegetation. Managers can use the departure and condition class data to document possible changes to key ecosystem components (Schmidt, Menakis, Hardy, Hann, & Bunnell, 2002). Examples include vegetation characteristics (species composition, structural stage, stand age, canopy closure, and mosaic pattern); fuel composition; fire frequency, severity, and pattern; and other associated disturbances, such as insect and disease mortality, grazing, and drought. Common causes of departure include advanced succession, effective fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, and introduced insects and disease (Barrett, et al., 2010).

The majority of Alpine County is in the vegetation condition class II.A at almost 370,000 acres (Figure 2-8). Vegetation class II.A indicates that the landscape is moderately departed from reference conditions and will have elevated vegetation densities and fuel accumulation that might exhibit undesirable fire intensities in many places across the county, including populated WUI communities.

Figure 2-8 Existing Vegetation Condition Classes



Source: (LANDFIRE, 2020)

Table 2-5 Vegetation Condition Class Definitions

Condition Class	Vegetation Departure from Reference Conditions[a]	Definition
Class I.A	0-16%	**No or very low departure** from reference conditions. The vegetation and fuels are within the natural range of variability and fire would behave and have similar effects as pre-settlement landscape fire.
Class I.B	17-33%	**Low departure** from reference conditions. The vegetation and fuels are slightly departed from the natural range of variability and fire behavior would be slightly elevated compared to pre-settlement fire.
Class II.A	34-50%	**Moderate departure** from reference conditions. The vegetation and fuels are moderately departed from the natural range of variability and fire behavior would be moderately elevated compared to pre-settlement fire.
Class II.B	51-66%	**Moderate to high departure** from reference conditions. The vegetation and fuels are moderately to highly departed from the natural range of variability and fire behavior would be elevated compared to pre-settlement fire.
Class III.A	67-83%	**High departure** from reference conditions. The vegetation and fuels are highly departed from the natural range of variability and fire behavior would be highly elevated compared to pre-settlement fire.
Class III.B	84-100%	**Very high departure** from reference conditions. The vegetation and fuels are significantly departed from the natural range of variability and fire behavior would be significantly elevated compared to pre-settlement fire

Notes:

[a] Reference conditions describe historical seral stages[2], vegetation patterns, and fire regimes. Vegetation Condition Class used reference conditions to define pre-settlement landscapes. These became the baseline against which current conditions were compared.

Source: (LANDFIRE, 2020)

Fuels

Fuels are any materials that can burn from leaf litter to timber. Fuel characteristics include:

- Subsurface fuels - roots, peat, and decomposed organic matter

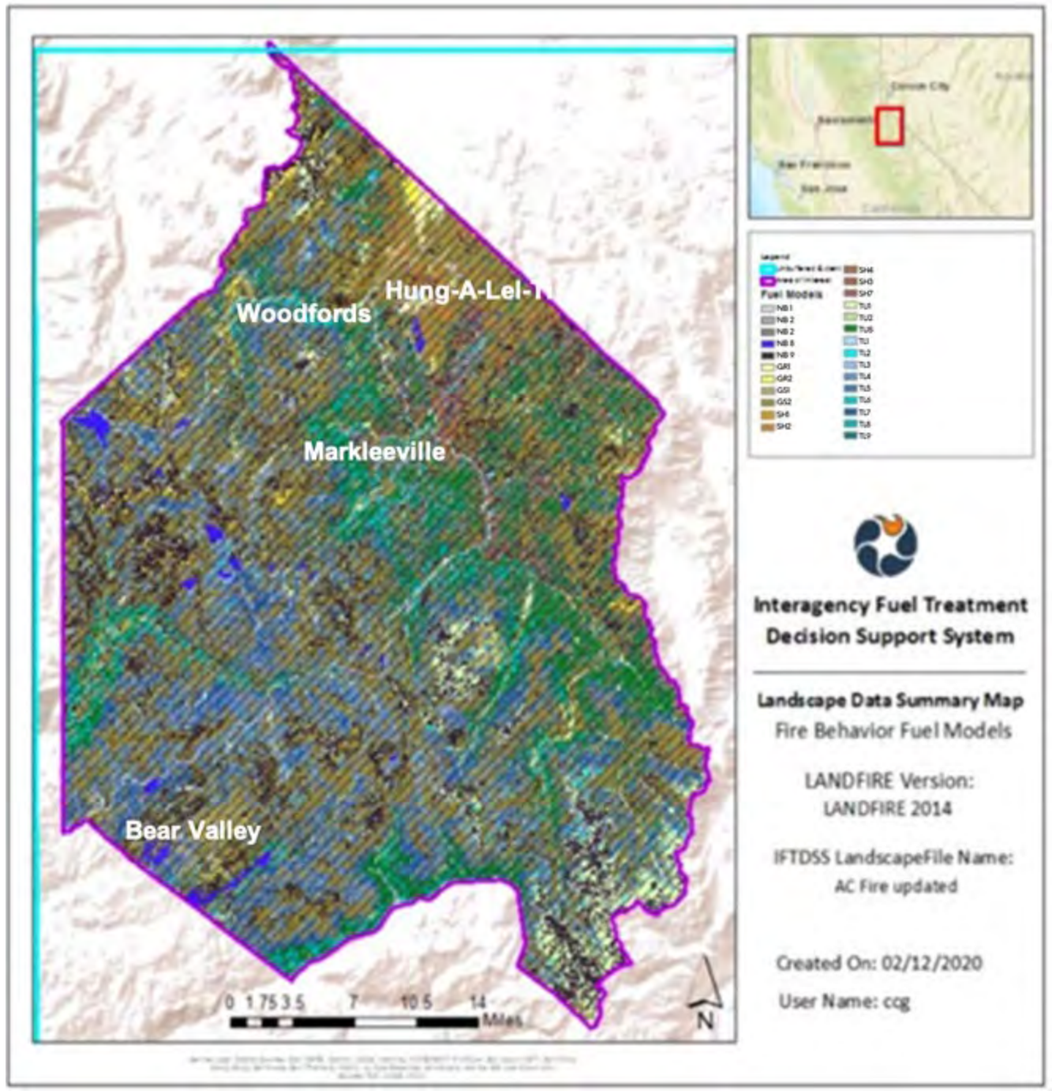
[2] Stages of secondary successional development of plant communities which occur during ecological succession from bare ground to the climax stage (USDA, 2012).

- Surface fuels - include needles, twigs, brush, leaves, small trees, and logging slash
- Aerial fuels - include brush over 6 feet, leaves/needles on trees, etc. Air is able to circulate between the fuel and the ground. This allows the fire to burn at a rapid rate. The rate is dependent on the proximity to other aerial fuels, winds, and environment

Fuels can be classified as light (grasses, forbs), medium (light brush and small trees), heavy (dense brush, timber, and hardwoods), and slash (residue on floor). Although fuel conditions in much of the county might exhibit moderate fire severities under a variety of weather conditions, approximately 50,000 acres have an undesirable mix of high surface fuel loads, dense canopies with a lot of bulk, and tall stands with short base heights that will most likely translate to higher severity fire under severe fire weather conditions (Idaho State University, 2020).

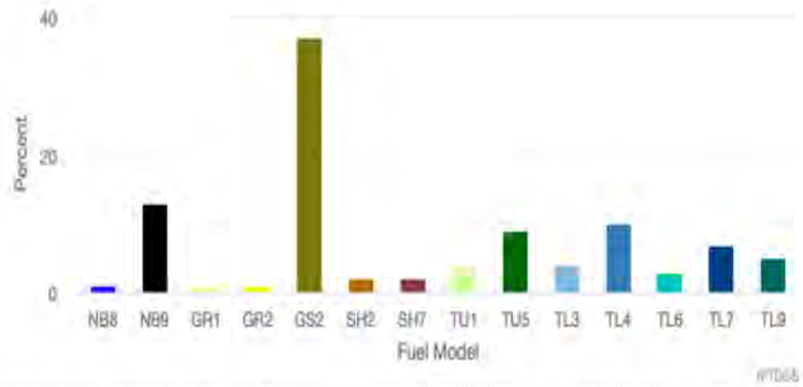
The following figures and tables highlight the vegetation densities and fuel loads that exist across Alpine County.

Figure 2-9 Fuel Load Model Types in Alpine County



Source: (LANDFIRE, 2020)

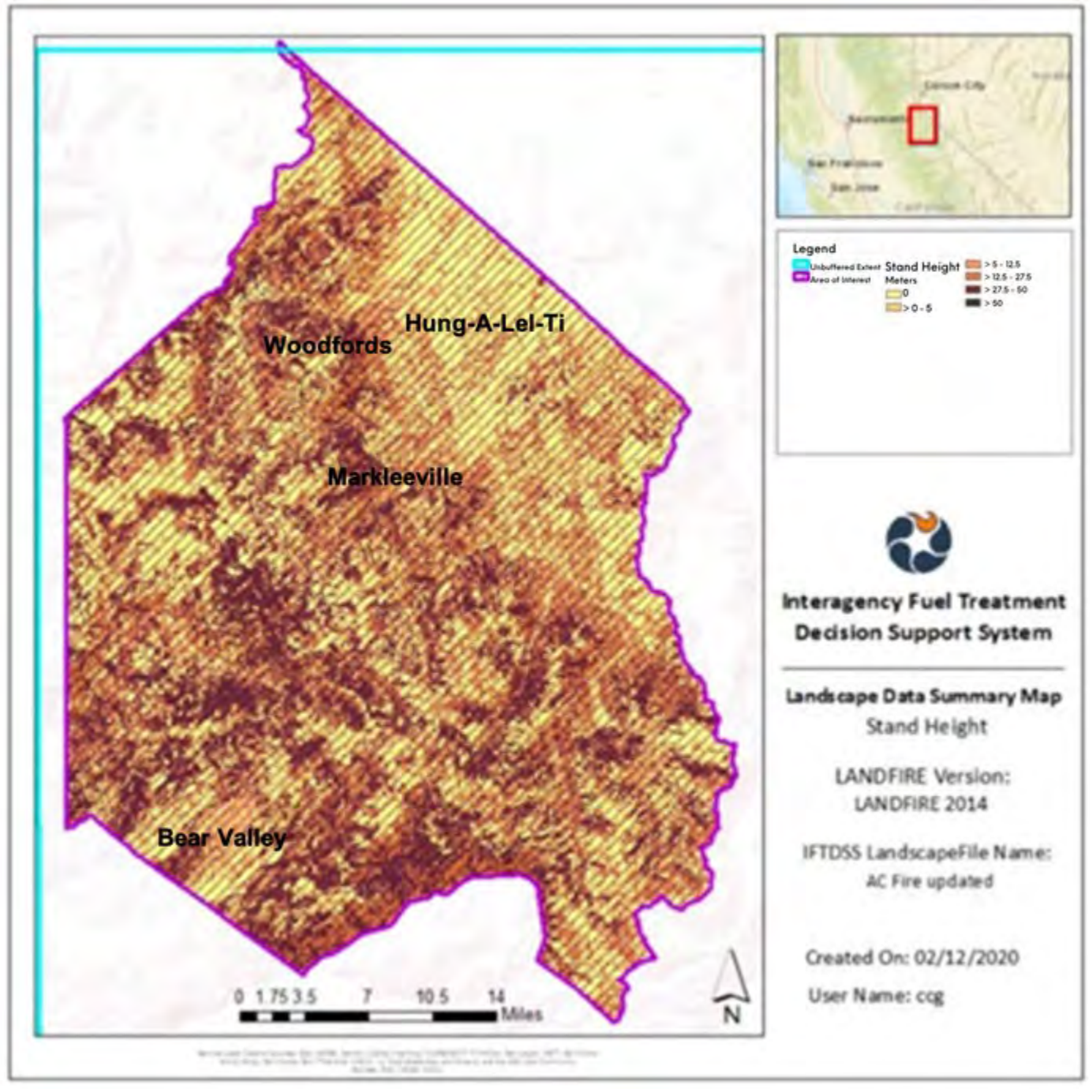
Table 2-6 Fuel Model Type by Percent



GR1: Short, Sparse, Dry Climate Grass	**TU5**: Very High Load, Dry Climate Timber-Shrub
GR2: Low Load, Dry Climate Grass	**TL3**: Moderate Load Conifer Litter
GS2: Moderate Load, Dry Climate Grass-Shrub	**TL4**: Small downed logs
SH2: Moderate Load Dry Climate Shrub	**TL6**: Moderate load broadleaf litter
SH7: Very High Load, Dry Climate Shrub	**TL7**: Large Downed Logs
TU1: Low Load Dry Climate Timber-Grass-Shrub	**TL9**: Very high load broadleaf litter

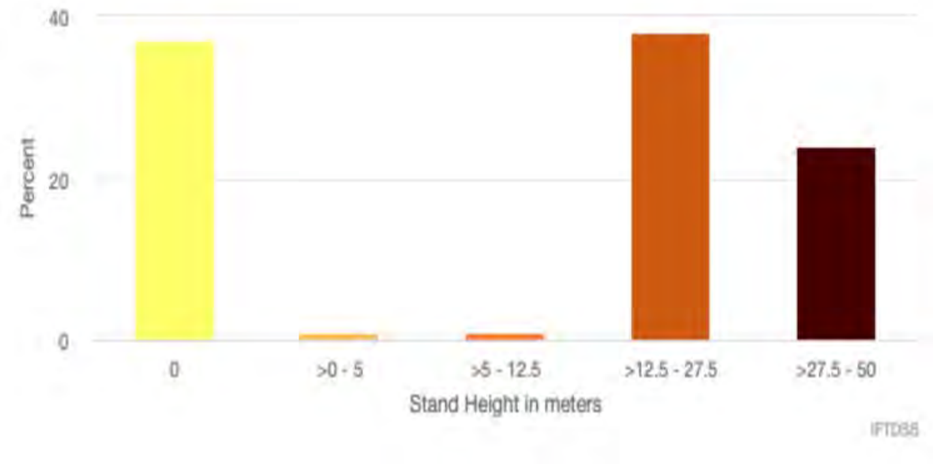
Source: (US Department of Interior, 2020)

Figure 2-10 Stand Heights in Alpine County



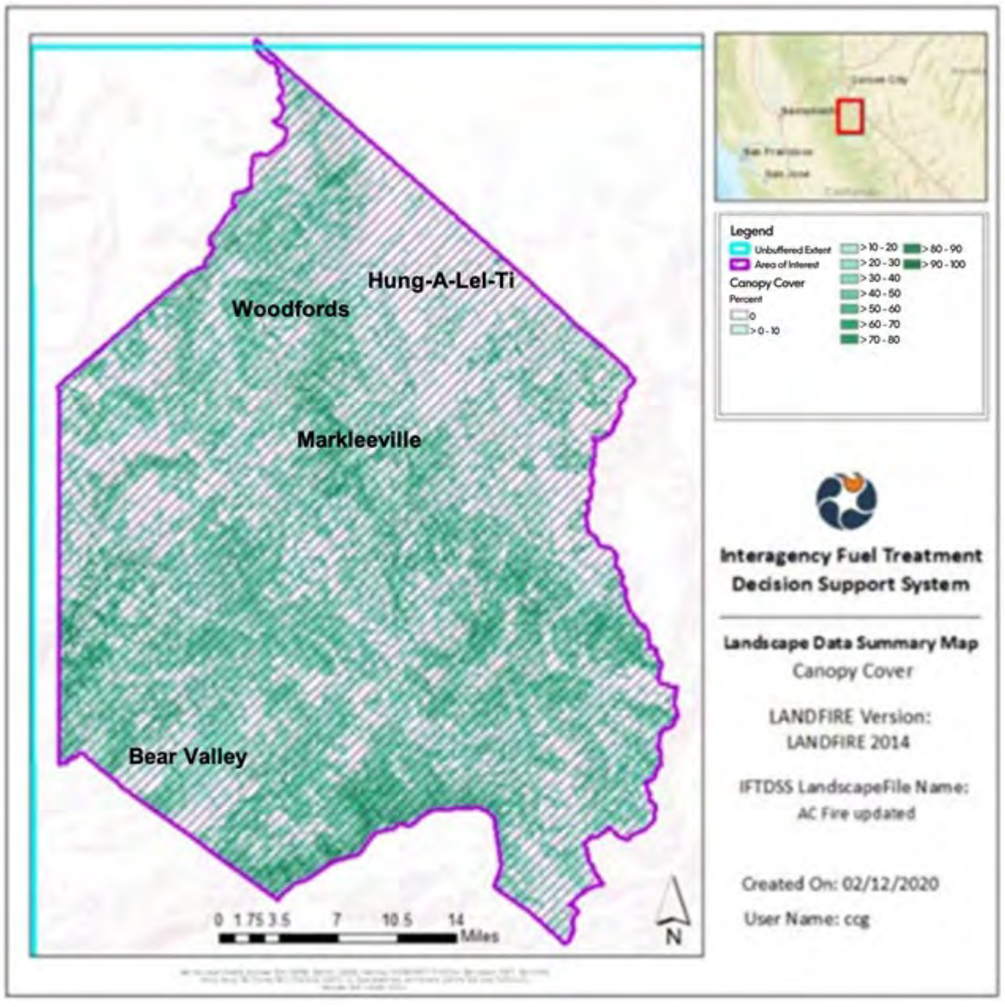
Source: (LANDFIRE, 2020)

Table 2-7 Stand Heights by Percent



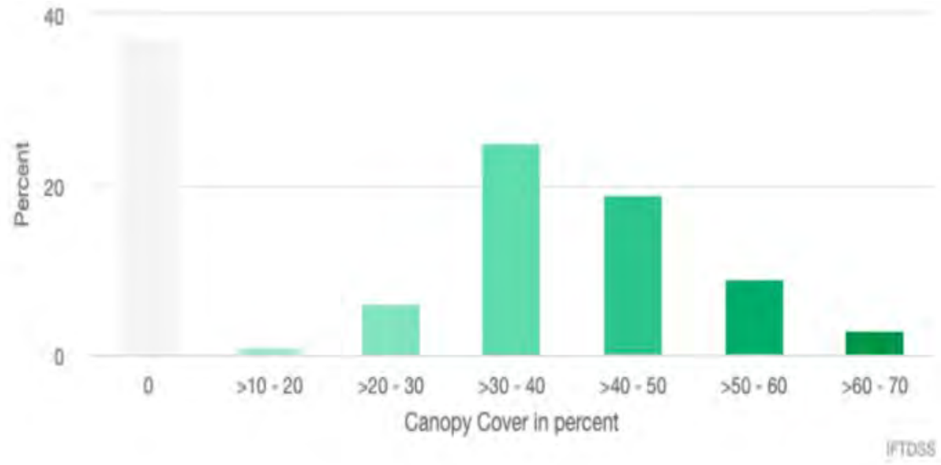
Source: (US Department of Interior, 2020)

Figure 2-11 Canopy Cover in Alpine County



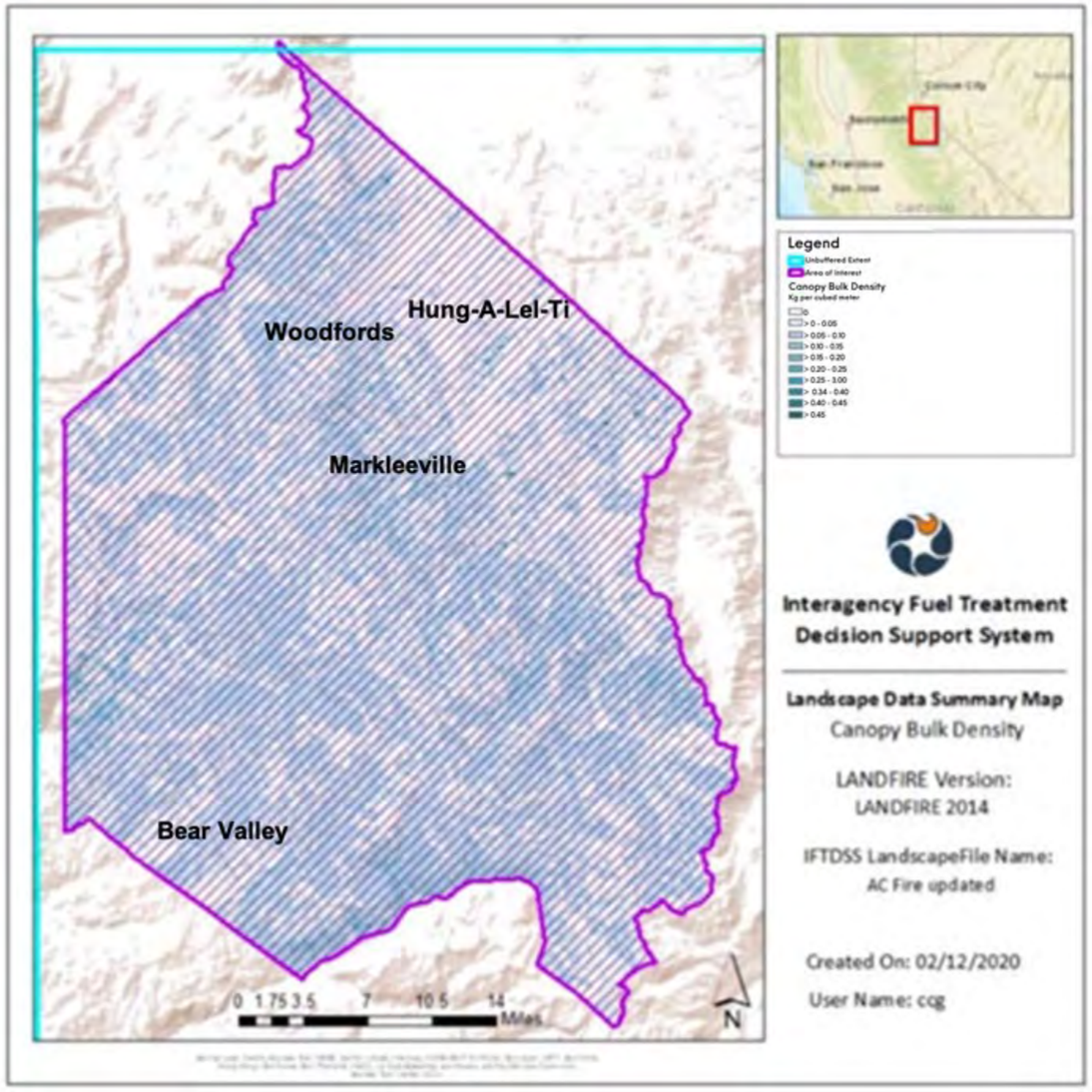
Source: (LANDFIRE, 2020)

Table 2-8 Canopy Cover by Percent



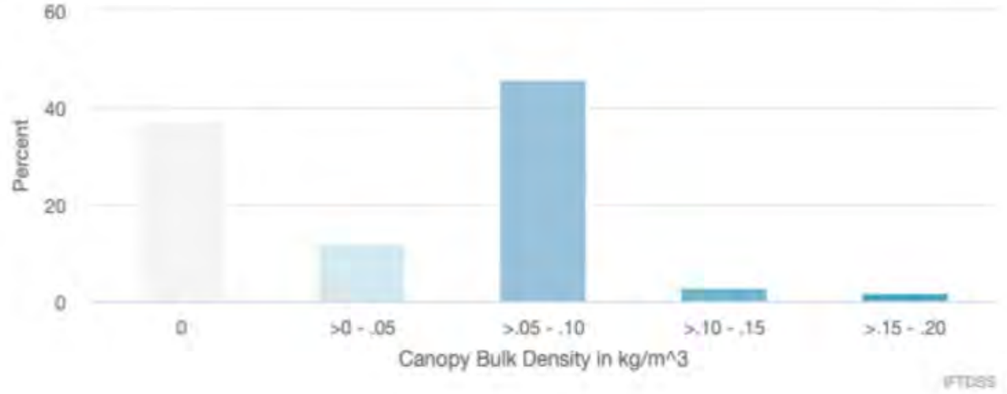
Source: (US Department of Interior, 2020)

Figure 2-12 Canopy Bulk Density in Alpine County



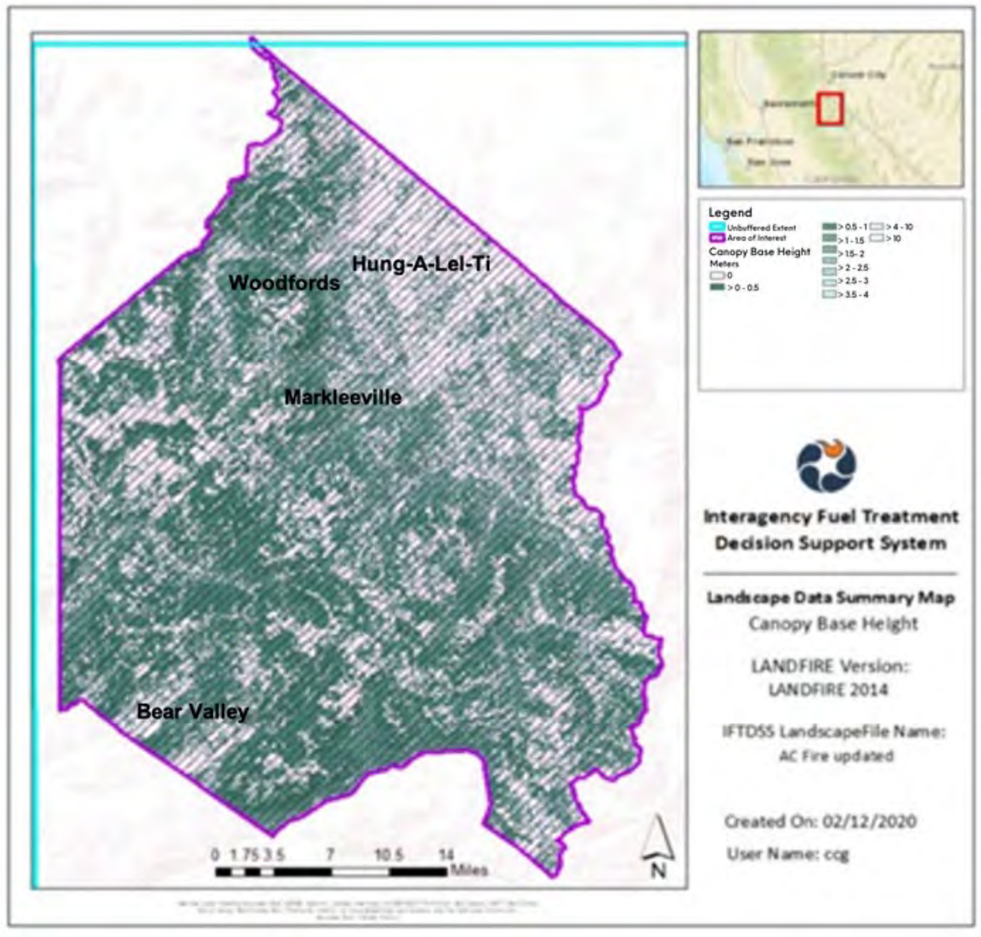
Source: (LANDFIRE, 2020)

Table 2-9 Canopy Bulk Density by Percent



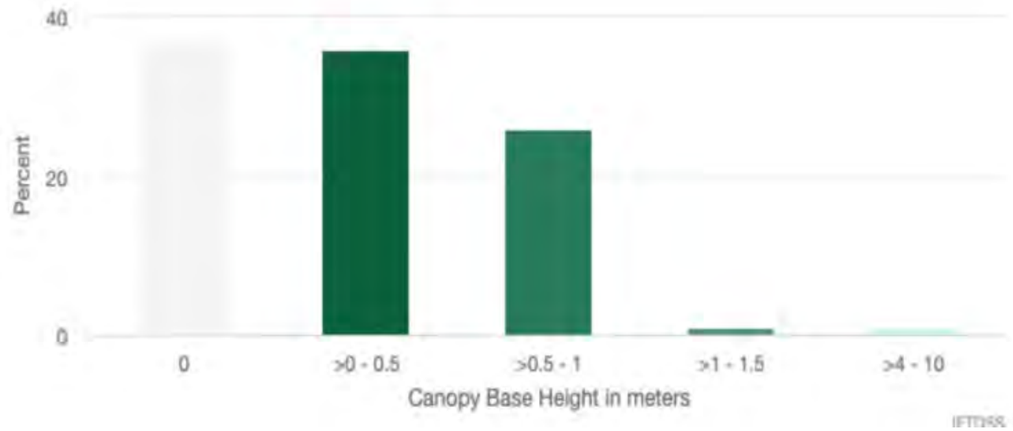
Source: (US Department of Interior, 2020)

Figure 2-13 Canopy Base Height



Source: (LANDFIRE, 2020)

Table 2-10 Canopy Base Height by Percent



Source: (US Department of Interior, 2020)

Weather Inputs from Remote Automated Weather System (RAWS)

The Remote Automatic Weather Stations (RAWS) system is a network of automated weather stations run by the USFS and BLM and monitored by the National Interagency Fire Center, mainly to observe potential wildfire conditions (Desert Research Institute, 2020).

This analysis utilized 97th percentile historical weather (average wind speed, average wind direction, dead and live fuel moistures) to analyze fire behavior. Percentiles are based on a scale of 0 to 100 and are used to sort and rank a collection of data. For wildfire, when values at the upper end of the scale occur, complex fires are expected, where initial attack may often fail. The 97th percentile is often termed "the worst-case scenario" (US Department of Interior, 2020).

Modeling conditions at the 97th percentile fire weather for the County was chosen not to serve as an understanding of the very worst-case fire effects are, but to determine how the current vegetation and fuels environment react to what is considered a threshold for problem fires. Choosing percentile weather removes subjectivity and thus bias as the calculation is run directly from the data. This process is objective and has become the industry standard for everything from determining national fire danger ratings to, as in this case, estimating hazard. The team analyzed the weather outputs, compared them to their respective knowledge base, and determined they were indeed in the threshold range of problem fire weather for Alpine County.

The data from RAWS is as follows:

- Calculated 97th Percentile Model Weather Parameters:
  - Run Date: February 12, 2020 11:58:38 PM
  - Wind Type: Gridded Winds
  - Wind Speed: 14 mph
  - Wind Direction: 225 degrees
  - Crown Fire Method: Scott/Reinhardt
  - Foliar Moisture: 100
  - Conditioning: On - Extreme – Northern Sierra Nevada
  - Conditioning start: 1300, August 11, 2012
  - Conditioning end: 1500, August 17, 2012
  - Station Name: Markleeville
  - Station Observation Start Date: May 13, 1985
  - Station Observation End Date: October 4, 2016
  - Station Elevation: 5,501
  - Station Aspect: 8
  - Station Latitude: 38.69
  - Station Longitude: 119.77
- Fuel Moisture:
  - 1 Hour Fuel Moisture: 2 %
  - 10 Hour Fuel Moisture: 2 %
  - 100 Hour Moisture: 4 %
  - Live Herbaceous Moisture: 78 %

– Live Woody Moisture: 101 %

2.3.3 Fire Model

FlamMap Basic

The fire model used was FlamMap Basic with Minimum Travel Time (MTT) embedded. FlamMap is a fire analysis desktop application that runs in a 64-bit Windows Operating System environment, or in this case, the IFTDSS system. It can simulate potential fire behavior characteristics (spread rate, flame length, fireline intensity, etc.), fire growth and spread, and conditional burn probabilities under constant environmental conditions (weather and fuel moisture) (USDA - U.S. Forest Service, 2020b).

FlamMap Basic is a spatially dependent, deterministic model that incorporates several established fire model base algorithms including:

- Rothermel's 1972 surface fire model
- Van Wagner's 1977 crown fire initiation model
- Rothermel's 1991 crown fire spread model
- Nelson's 2000 dead fuel moisture model

Outputs are generally in the form of raster maps of potential fire behavior characteristics (such as spread rate, flame length, fireline intensity, and crown fire activity) and environmental conditions (dead fuel moistures, mid-flame wind speeds, and solar irradiance) over an entire landscape. These raster maps show fire behavior and environmental conditions for one instant in time and can be viewed in FlamMap or exported for use in a GIS or word processor, or in this case packaged as an IFTDSS report.

FlamMap Basic is an ideal model to use for pre and post fuel treatment evolution by "showing the expected change in fire behavior based on how the surface fuel models and/or canopy characteristics will change as a result of the fuel treatment" when all other variables remain constant (WFDSS, 2020). The FlamMap Basic outputs, also known as Landscape Fire Behavior in IFTDSS, are highlighted in Appendix B appendices for the current condition.

Minimum Travel Time

MTT is a spatially dependent, stochastic model that "computes fire growth between the cell corners, holding all environmental conditions constant in time (Finney, 2006; Stratton, 2009). Fire growth is computed under the same assumptions as FlamMap Basic fire behavior. It also enables end-users to create all the necessary results and files from multiple ignition simulations (burn probabilities, fire perimeters, flame length probabilities, fire size list). MTT results can be used both for fuel management planning and for single event fire propagation (spread and intensity)" (Kalabokidis, et al., 2013).

The MTT outputs, also known as Landscape Burn Probability in IFTDSS are described in the results section. The combination or "integration" of two primary Landscape Burn Probability outputs, conditional flame length and fire probability, create "Integrated Hazard." Integrated

Hazard helps to better understand exposure of assets by incorporating variability through the modeled ignition of thousands of fires. The inherent variability of stochastic models, however, makes it difficult to measure the absolute change in specific areas, and therefore, it is difficult successfully quantify effects of proposed treatments without additional information, like what FlamMap Basic provides.

Scale

Although the majority of the vegetation and fuel inputs are at a resolution of 30 square meters, this size of the analysis area, at 723 square miles, makes processing prohibitive to model at that same resolution. Instead, the scale of this analysis will transition to a 90 square meter pixel, or about 2 acres in size. The scale will still provide sufficient resolution to do county-wide analysis but will not be appropriate for making management decisions at or below 90 square meters. However, it is understood that coupling results with field verification and augmentation will maximize the effectiveness of this exercise.

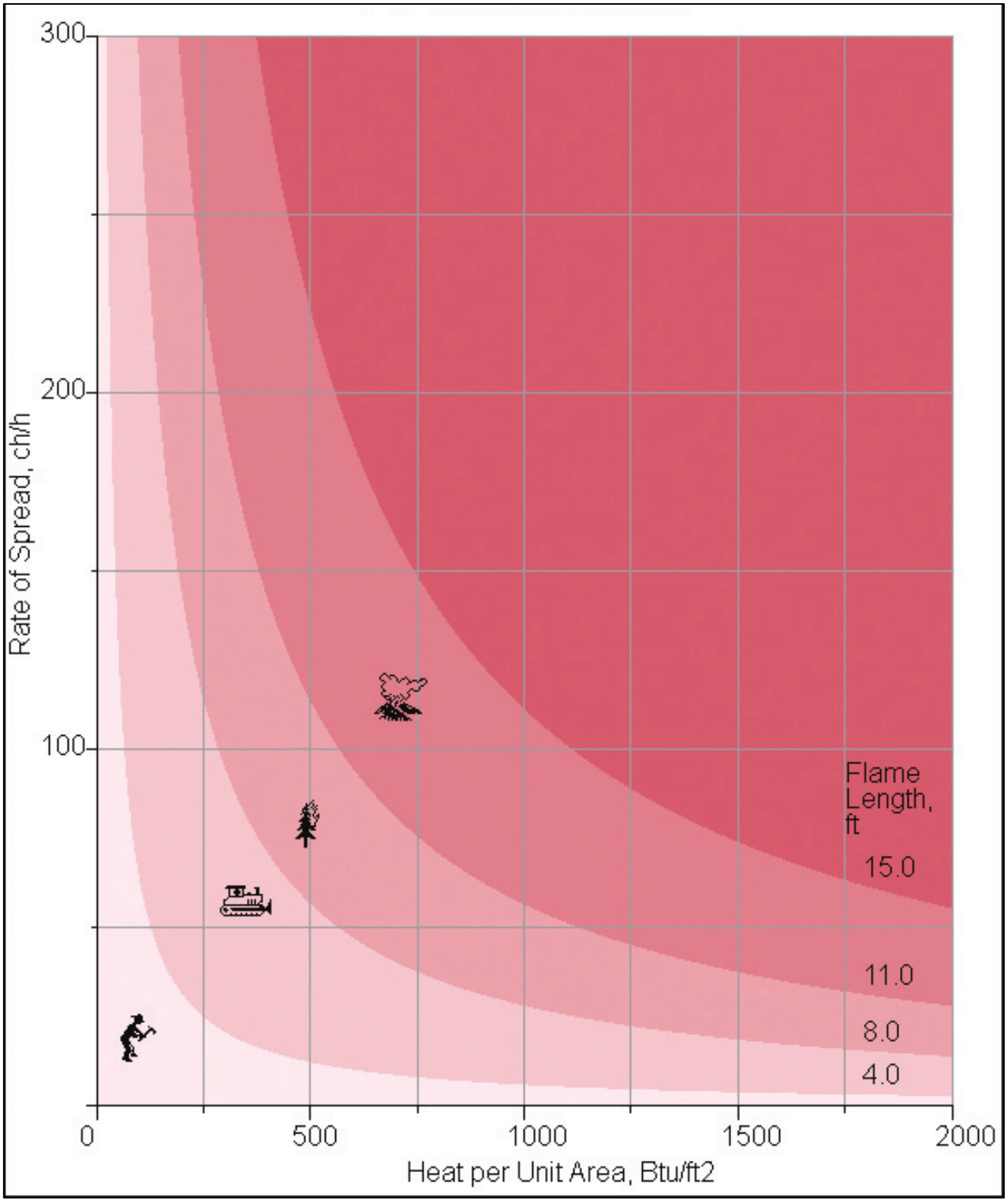
2.3.4 Outputs

Fire Intensity

Frontal fire intensity is a valid measure of forest fire behavior that is solely a physical attribute of the fire itself. It is defined as the energy output rate per unit length of fire front and is directly related to flame size. Numerically, it is equal to the product of net heat of combustion, quantity of fuel consumed in the active combustion zone, and a spreading fire's linear rate of advance. This concept of fire intensity provides a quantitative basis for fire description useful in evaluating the impact of fire on forest ecosystems (Alexander, 1982).

Flame length was focused on to quantify fire intensity for this study because of the direct correlation to suppression resources and effectiveness. “The flame length of a spreading surface fire within the flaming front is measured from midway in the active flaming combustion zone to the average tip of the flames.” Figure 2-14 shows surface fire behavior fire characteristics (US Department of Interior, 2020). Generally, if flame lengths are less than 4 feet, then fire can be effectively controlled with professional suppression resources. Flame lengths between 4 and 8 feet require multiple, more specific types and numbers of professionally trained firefighting resources; suppression success goes down. Flame lengths greater than 8 feet generally removes resources from directly attacking the fire front. When flame lengths are modeled to exceed 4 feet, effort should be made to closely examine and prescribe treatment to reduce undesirable fire intensities. All proposed projects within the County should also be maintained after development such that, on average, flame lengths remain below 4 feet when anthropogenic assets are in close proximity. Natural resource areas might be more nuanced where some pockets of higher fire behaviors are not only acceptable but desired when life and property cannot be threatened.

Figure 2-14 Surface Fire Behavior Characteristics Chart



Fire Probability

Fire probability quantifies the relative likelihood of a fire occurring under a fixed set of weather and fuel moisture conditions (US Department of Interior, 2020). Within the minimum travel time model, randomly located ignition points are used to simulate fires. Ignitions are only located and retained on burnable fuels, if an ignition is located on a non-burnable fuel it is discarded. The number of ignitions is determined by IFTDSS to most efficiently produce outputs for the user.

Burn Probability = number of times burned / total number of ignitions

For example, if the model ran 17,000 times and a pixel burned 1,462 times it would have burn probability of 0.086, (1,462/17,000 = 0.086). If a pixel burned 17,000 times in 17,000 fire simulations, it would have burn probability of 1.0, (17,000/17,000 = 1.0). If a pixel never burned during those 17,000 fire simulations, it would have a burn probability of 0 (0/17,000 = 0).

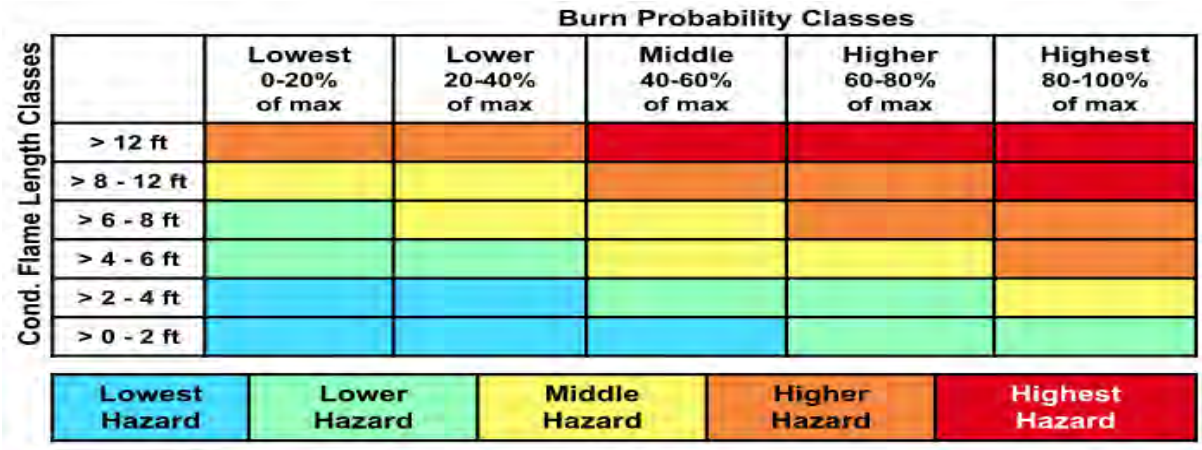
Integrated Hazard

The term "hazard" is used by the wildland fire community to define a variety of conditions or situations where damage to assets by fire is being evaluated. Hazard is quantified and categorized in IFTDSS using the FlamMap and Minimum Travel Time models evaluating (US Department of Interior, 2020):

- The probability of a fire occurring at a specific point under a specified set of conditions (burn probability)
- The intensity at a specific point given a fire occurs (flame length)

"Integrated Hazard" in IFTDSS then combines these two important measures into a single value that can be easily understood and mapped. Figure 2-15 shows the integrated hazard classification chart, where flame length classes are combined burn probability categories. Although high flame lengths will always be correlated to higher hazard, the relative classification of burn probabilities means there is no absolute set of integrated hazard heuristics. The value results are relative to only the area analyzed.

Figure 2-15 Integrated Hazard Classification Chart



Source: DOI 2020

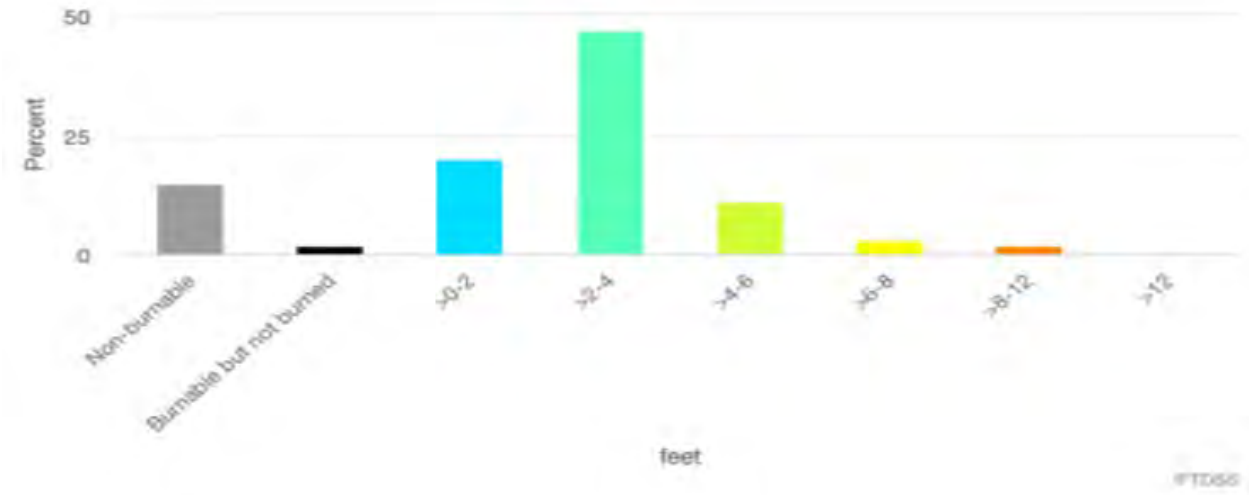
2.3.5 Results of Wildfire Behavior Modeling

Fire Intensity

Figure 2-16 shows the predicted size and location of flame lengths that could occur within Alpine County under existing conditions. Table 2-11 quantifies spatial distribution across a set of flame length classes. Approximately 20 percent of the county is exhibiting flame lengths greater than 4 feet.

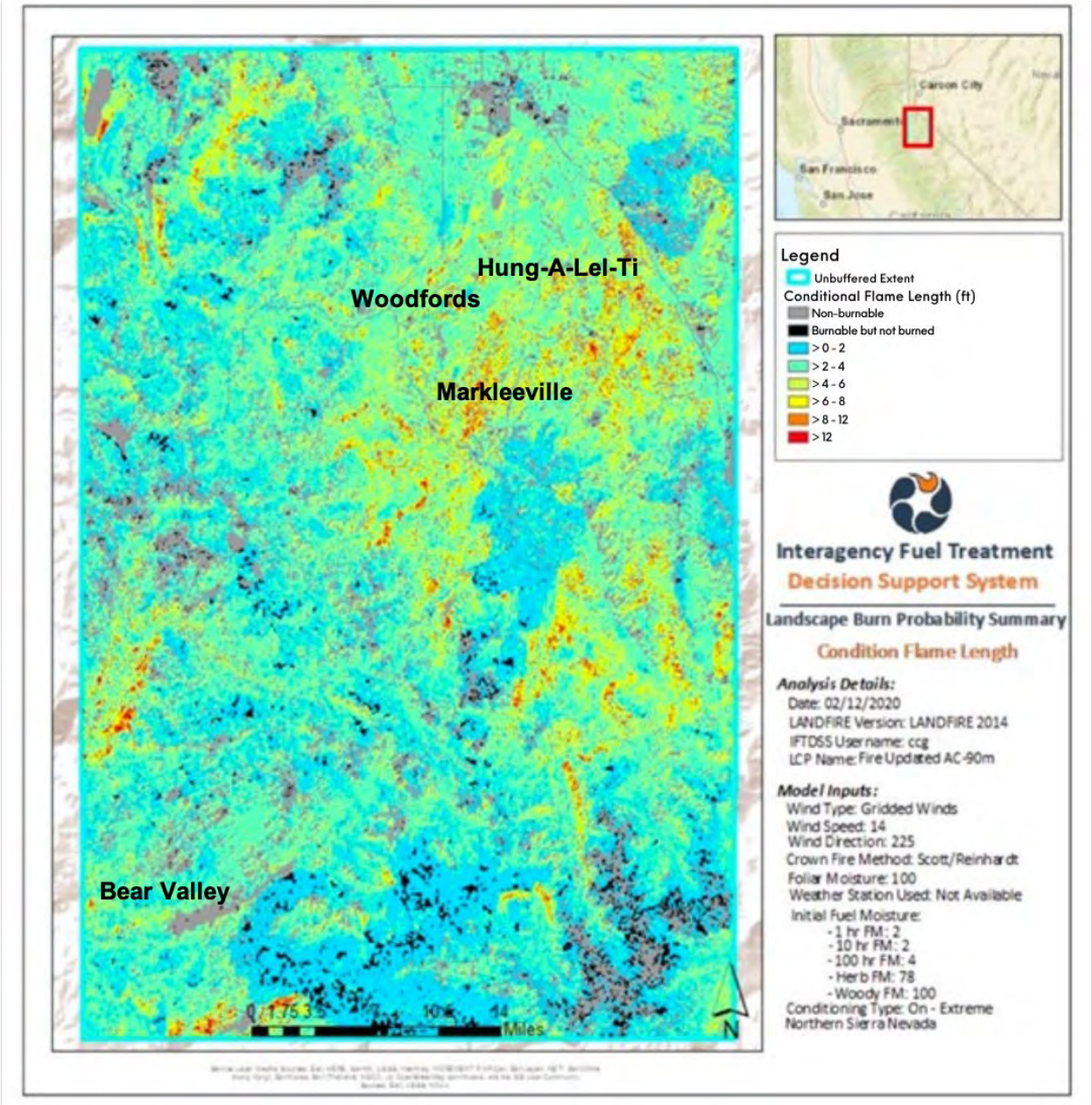
It is apparent that under current conditions, as modeled, Alpine County would likely exhibit high intensity fire in many areas and put some homes and infrastructure at risk because suppression resources would have trouble safely directly attacking the fire and direct suppression effectiveness might be limited during the first burn period.

Table 2-11 Spatial Distribution of Flame Length Classes



Source: (US Department of Interior, 2020)

Figure 2-16 Modeled Flame Lengths in Alpine County

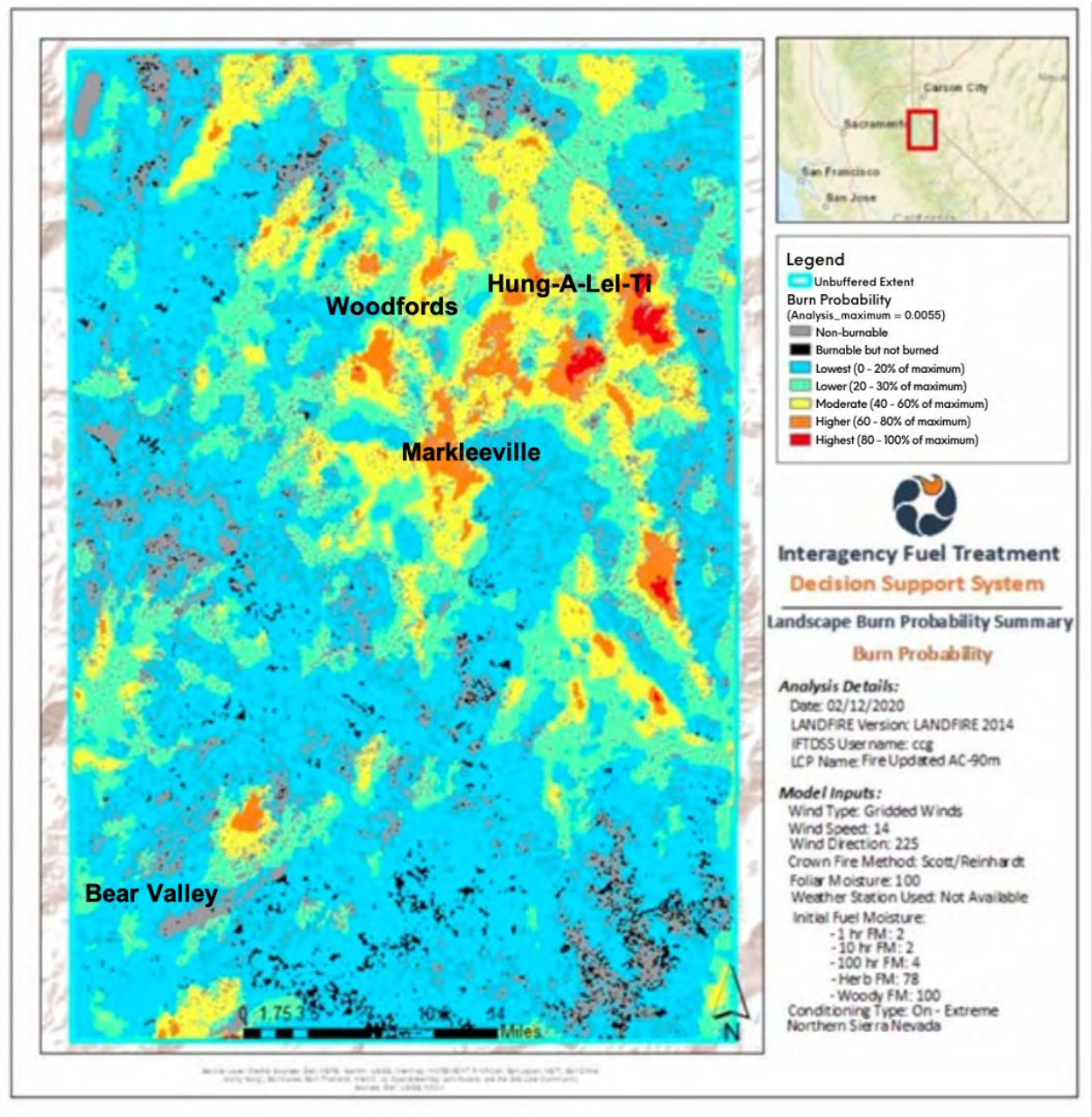


Source: (LANDFIRE, 2020)

Fire Probability

Figure 2-17 shows where fires will most likely occur across the county. The eastern portion of the county generally has much higher probabilities than the west side. This condition is most likely due to the prevailing winds under the critical fire weather scenario and more continuous fuels that blanket the lower elevations of eastern Alpine County.

Figure 2-17 Modeled Fire Probability in Alpine County



Source: (LANDFIRE, 2020)

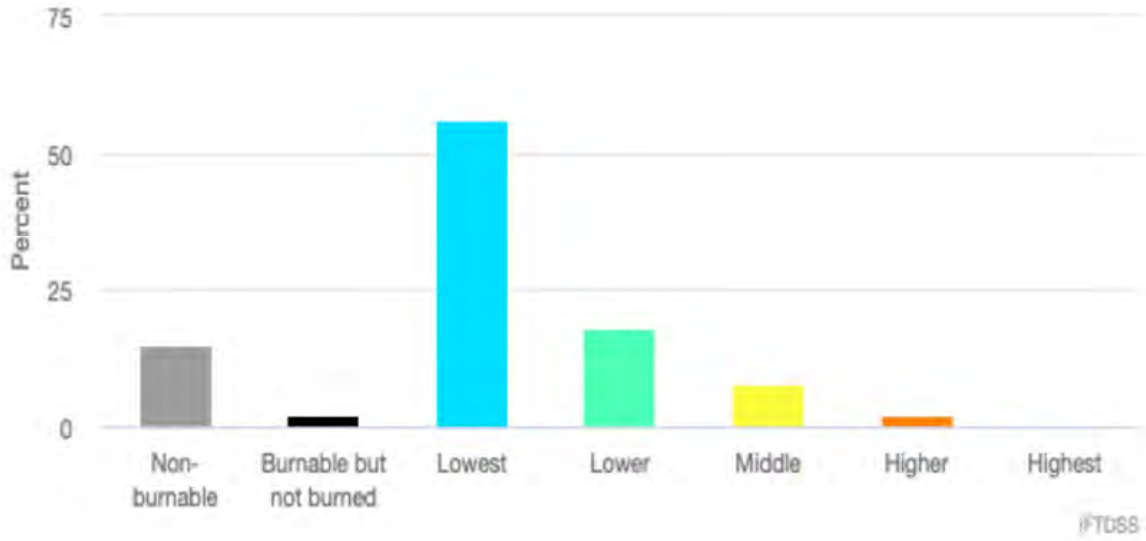
Integrated Hazard

Current condition integrated hazard inputs were modeled with the weather with just over 70,000 random ignitions occurring within a burn period of 12 hours with a 20 percent spotting probability within the county and a buffered analysis extent. Figure 2-18 highlights areas where there is a high fire intensity that overlaps with a high fire probability. Although some areas are considered low hazard, much of the area has elevated hazard numbers, which creates undesirable exposure to the surrounding homes and infrastructure.

Table 2-12 shows the percent of each class of integrated hazard. While the largest percentage of land is in the lowest and lower categories, the middle, higher, and highest areas still represent over 50,000 acres of land. Treating this much landscape would cost between $75 and $175 million, depending on the treatment methods used.

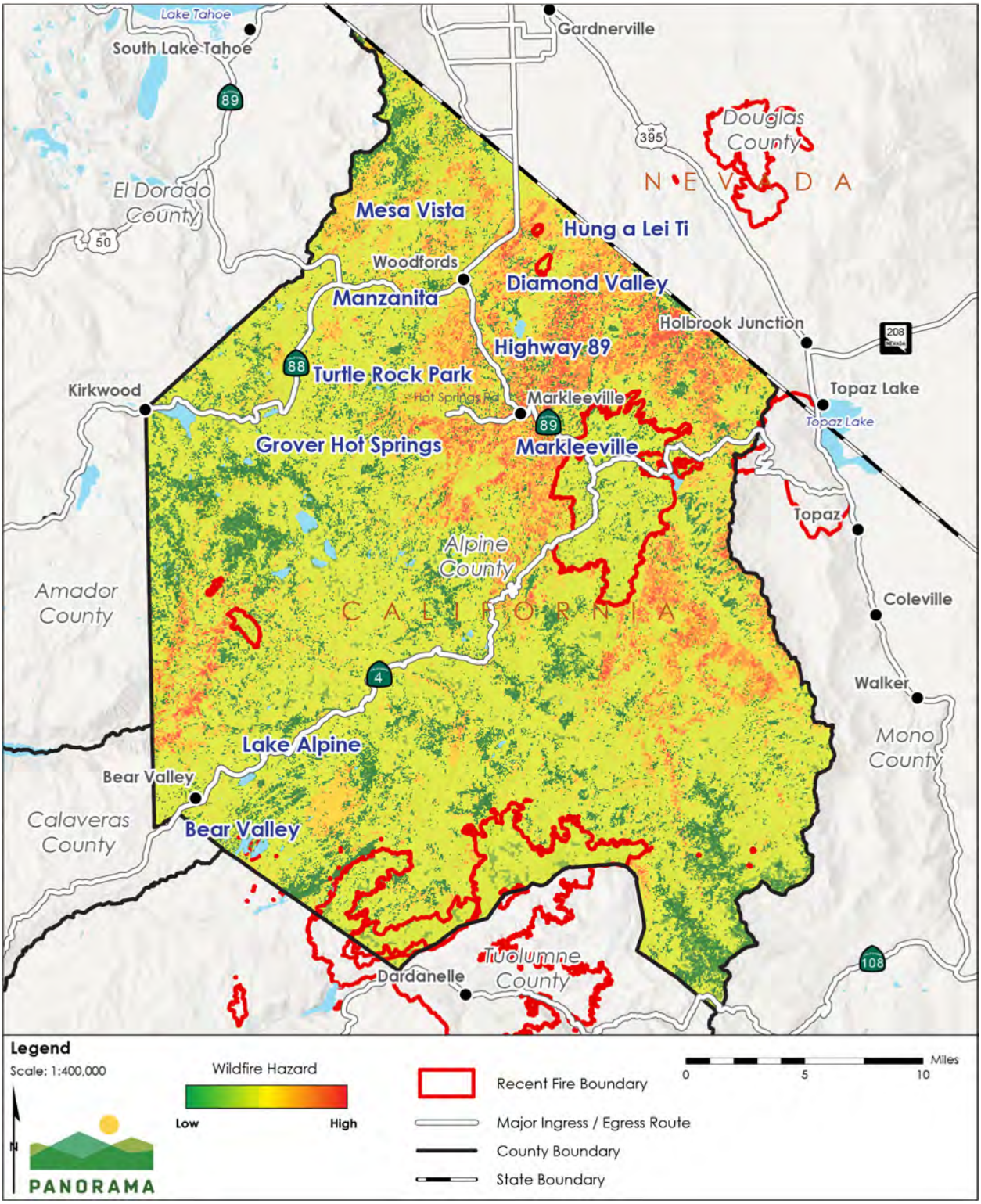
Hazard outputs can be valuable when trying to understand the patterns of potentially high severity fire across large landscapes; however, these outputs often display an overwhelming amount of information. First, there may simply be too much hazard for an entity to deal given their available resources. Second, even if resources to reduce all fire intensities were available, then hazard provides little insight into where you should go first. The next step was to conduct the wildfire risk assessment. This risk assessment can be extremely valuable for an entity that has limited resources to implement as it allows them to prioritize treatments.

Table 2-12 Percent of Each Classification of Integrated Hazard



Source: (US Department of Interior, 2020)

Figure 2-18 Modeled Integrated Hazard for Alpine County



2.4 Susceptibility Analysis – HVRA Analysis

2.4.1 Introduction

The identification and characterization of HVRAs in Alpine County was a time consuming but critical step in the risk assessment process. Three primary characteristics must be determined for each HVRA identified: spatial extent (mapping), response to wildfire (benefit or loss), and relative importance (Scott, Thompson, & Calkin, 2013).

2.4.2 Methods

Determination of Spatial Extent of HVRAs

For use in wildfire risk calculations, spatial HVRA data must be in raster format. To effectively evaluate and apply any HVRA dataset, it is imperative to work with the spatial data in a GIS, and not solely rely on map products. The raster data should match the extent, cell size, and coordinate system of the fire modeling landscape. Any number of geoprocessing tasks are required, such as: converting feature class data (points, lines, or polygons) to raster format, re-sampling existing raster-format data to a different cell size, or re-projecting to a different coordinate system. Due to limitations on the spatial accuracy in HVRA mapping and fire modeling, it may be necessary to include a small buffer around point and line features to ensure they are adequately represented in the assessment. It may be undesirable for a point HVRA (e.g., a communication site) to be mapped to a single grid cell, especially if the accuracy of the point is small compared to the cell size. Including a buffer size will increase the exposure of the HVRA to wildfire as measured by expected area burned, but otherwise the buffer simply increases the sample size for estimating fire behavior and effects (Scott, Thompson, & Calkin, 2013). The compilation of HVRA data entails collecting data from various sources. A variety of regional or national data sources tend to be a good starting place when developing and accounting for HVRAs. Local data sources are often the most up-to-date and reflect local knowledge of the landscape. Local data can be used to refine the regional or national datasets.

The spatial extent of HVRAs within Alpine County were defined using industry standard buffers based on the types of HVRA that occur in Alpine County. The location and spatial extent of HVRAs were reviewed by the steering committee and a select group of additional community stakeholders.

Calculation of HVRA Response to Wildfire

The response function framework requires quantifying the relationship between HVRA value and wildfire intensity (measured by flame length). HVRA response is related to fire intensity because it is the best fire characteristic available associated with fire effects. This approach quantifies net value change (NVC) to a given HVRA as the percentage change in the initial resource value resulting from a fire at a given intensity. Response functions address relative, rather than absolute change in resource or asset value and represent both beneficial and adverse effects to the HVRA (Scott, Thompson, & Calkin, 2013).

The project steering committee and a select group of additional community stakeholders were invited to respond to a questionnaire regarding each HVRA's response to wildfire. Survey responses were then reviewed during a steering committee meeting, during which all steering committee members agreed on each HVRA's response to wildfire. The HVRA Wildfire Response Questionnaire is provided in Appendix C.

Calculation of HVRA Relative Importance

Balancing competing or conflicting land and resource management objectives is a significant challenge to land and resource management planners. It is also difficult to articulate quantitative weights establishing the relative importance of HVRAs. Understanding relative importance is not necessary when assessing wildfire risk to a single HVRA such as municipal watersheds or the WUI. It is only when attempting to combine the risk to multiple overlapping HVRAs, or when comparing risk among several HVRAs, that the issue of weighting arises. The task can be avoided altogether by assuming that each pixel of each HVRA is of equal value, or weight. With that assumption, however, over-mapping an HVRA will overstate its risk, and extensive HVRAs will always be shown to have greater effects than HVRAs that cover a small amount of land area. There are some major tradeoffs to consider before avoiding the step of articulating relative importance. Relative importance helps understand risk in areas where multiple HVRAs overlap and allows for comparing risks across different spatial areas that house different HVRAs. Using relative importance scores helps to address all these questions and allows for summarization and visualization of risks in a single metric. If assessment results are to ultimately be used for planning mitigation treatments and strategies, then prioritization decisions that integrate all HVRAs will still ultimately need to be made. Articulating relative importance scores and how objectives are balanced makes this decision explicit rather than implicit and increases the overall transparency of decision processes (Marcot, 2012).

The project steering committee and a select group of additional community stakeholders were invited to respond to a questionnaire regarding each HVRA's relative importance. Survey responses were then reviewed during a steering committee meeting, during which all steering committee members developed a relative importance ranking of the HVRAs within the county. The Relative Importance Questionnaire is provided in Appendix D.

2.4.3 Results of HVRA Characterization

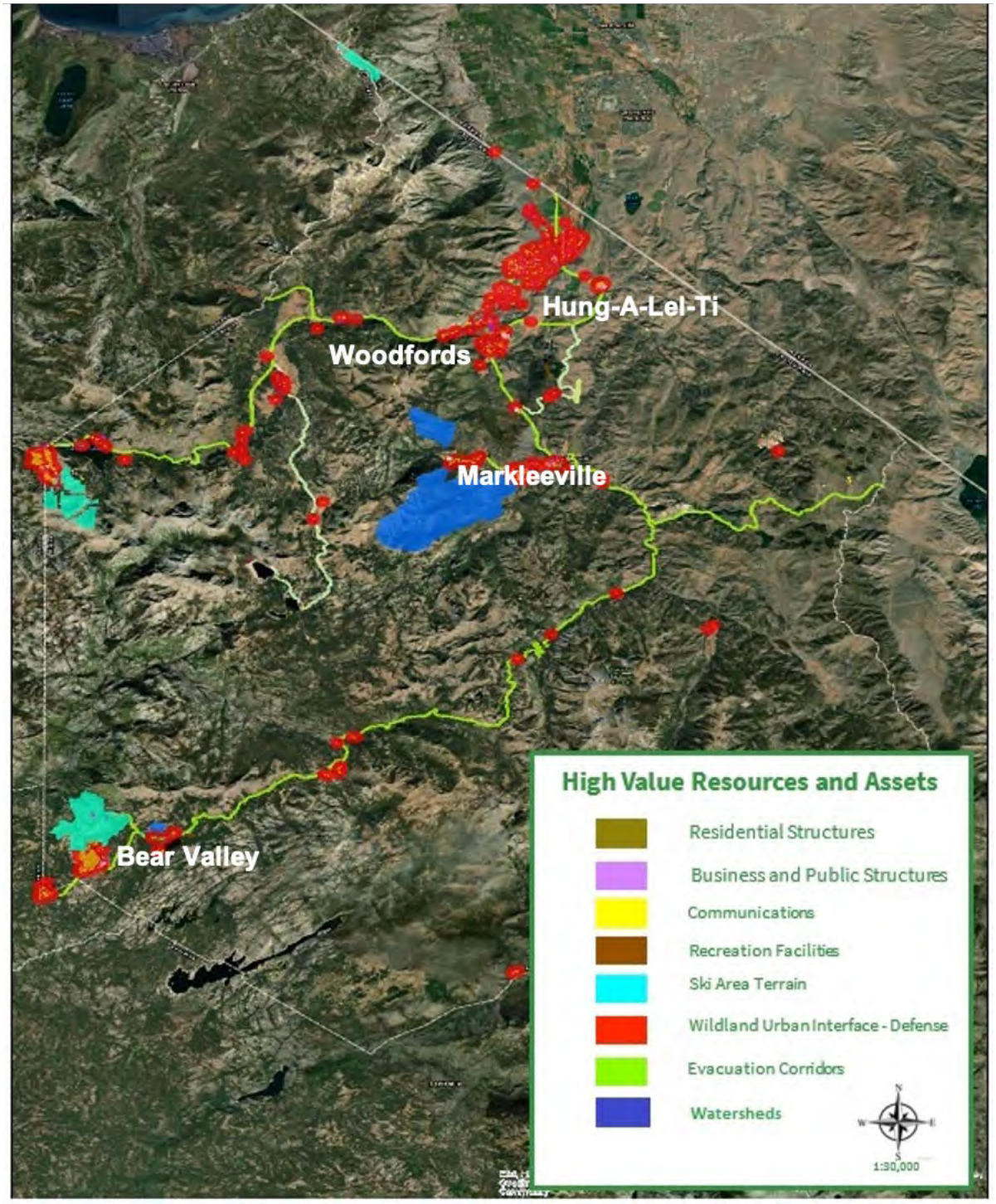
Spatial Extent of HVRAs

HVRA accounting begin with the Alpine County GIS database and was augmented through collaboration with the project steering committee. Table 2-13 shows the HVRAs that were selected while Figure 2-19 shows locations and extent of each HVRA. Figure 2-20 is a more detailed look at Bear Valley as an example of the specificity in the HVRA raster layer that was developed.

Table 2-13 HVRA Accounting for Alpine County

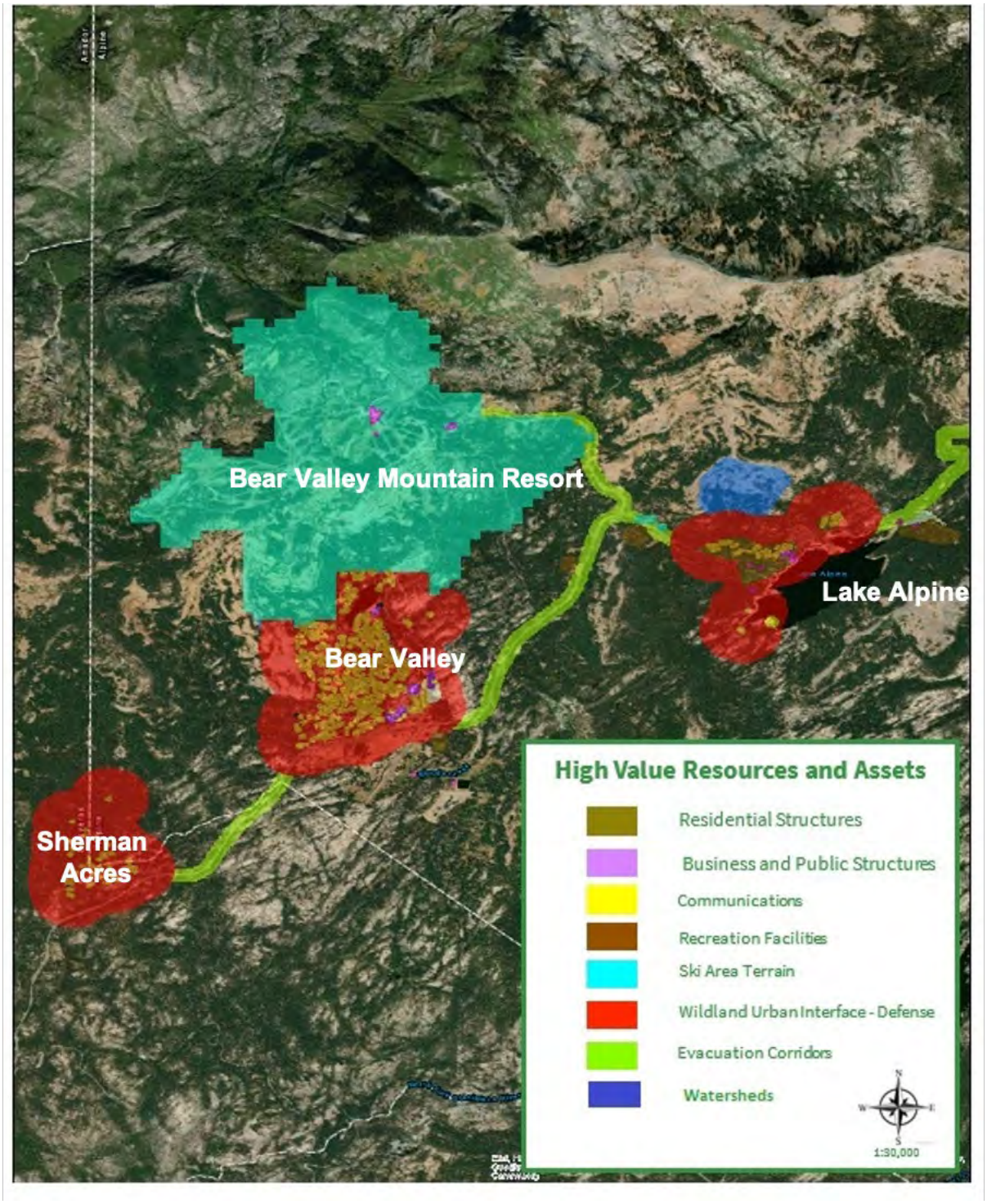
HVRA Category	Buffer Extent
Residential Structures	100 feet
Education Facilities (Daycares/Schools)	100 feet
Recreation Facilities – campgrounds, RV parks (non-ski areas)	25 feet
Business and Public Structures	100 feet
Places of Worship	100 feet
Non-habitable Structures (barns/sheds)	100 feet
Health and Elder Care Facilities	100 feet
High Hazard Buildings	250 feet
Airport/Helibase	250 feet
Communication Infrastructure (cell towers, microwave towers, etc.)	200 feet
Potable Water Storage (e.g., tanks); Snow-making Infrastructure	100 feet
Major/Minor Evacuation Corridors (ingress and egress routes)	300 feet
Community Evacuation/Refuge/Safe Zones/ Areas	250 feet
Cemeteries or Significant Resource Buildings/Areas	100 feet
Watersheds of Special Significance	25 feet
WUI Defense	0.25 mile
Ski Area Terrain	No Buffer

Figure 2-19 Location and Extent of HVRAs in Alpine County



Source: (LANDFIRE, 2020)

Figure 2-20 HVRA Raster Layer Example for Bear Valley Planning Area



Source: (LANDFIRE, 2020)

HVRA Calculated Response to Wildfire

Response to wildfire survey results are shown in Table 2-14. A total of six responses to the HVRA Response Function Questionnaire were received. Responses included an Alpine County resident, USFS staff, Alpine County staff, and CAL FIRE staff. Surveys limited responses to between negative 3 and positive 3 points and were then averaged across surveys.

Results then went into risk calculation as the response function (RF) as a normalized value percent change. For example, negative 3.0 = 100% value loss where a positive 1.0 = 33% value gained. The response function survey template is available as Appendix C.

Table 2-14 Results of Surveys Determining Response to Wildfire

HVRA	Flame Length 0-2 feet	Flame Length 2-4 feet	Flame Length 4-6 feet	Flame Length 6-8 feet	Flame Length 8-12 feet	Flame Length 12+ feet
Residential Structures	Neg 1.17	Neg 2.17	Neg 2.67	Neg 3.00	Neg 3.00	Neg 3.00
Education Facilities (Daycare/Schools/Colleges)	Neg 1.17	Neg 2.33	Neg 2.67	Neg 3.00	Neg 3.00	Neg 3.00
Recreational Facilities – Campgrounds, RV Parks (Non-ski Area)	Neg 0.50	Neg 1.50	Neg 2.33	Neg 2.83	Neg 2.83	Neg 2.83
Business and Public Structures	Neg 1.17	Neg 2.17	Neg 2.50	Neg 3.00	Neg 3.00	Neg 3.00
Places of Worship	Neg 1.17	Neg 2.17	Neg 2.67	Neg 3.00	Neg 3.00	Neg 3.00
Non-Habitable/Unknown Structures (Barns/Sheds)	Neg 0.67	Neg 1.83	Neg 2.50	Neg 2.83	Neg 2.83	Neg 3.00
Health and Elder Care Facilities	Neg 1.33	Neg 2.67	Neg 2.67	Neg 3.00	Neg 3.00	Neg 3.00
High Hazard Buildings	Neg 1.80	Neg 2.40	Neg 2.80	Neg 3.00	Neg 3.00	Neg 3.00
Airport/Helibase	0.00	Neg 0.67	Neg 2.00	Neg 2.83	Neg 3.00	Neg 3.00
Communication Infrastructure (Cell Towers, Microwave Towers, etc.)	Neg 0.83	Neg 1.83	Neg 2.50	Neg 2.83	Neg 3.00	Neg 3.00
Potable Water Storage (E.g. Tanks); Snow Making Infrastructure	Neg 0.17	Neg 1.33	Neg 2.33	Neg 2.83	Neg 3.00	Neg 3.00
Major Evacuation Corridors (Ingress and Egress Routes)	Pos 0.40	0.00	Neg 1.40	Neg 1.80	Neg 2.40	Neg 2.80
Minor Evacuation Corridors (Ingress and Egress Routes)	Post 0.50	Neg 0.17	Neg 1.33	Neg 1.83	Neg 2.50	Neg 2.83

HVRA	Flame Length 0-2 feet	Flame Length 2-4 feet	Flame Length 4-6 feet	Flame Length 6-8 feet	Flame Length 8-12 feet	Flame Length 12+ feet
Community Evacuation/ Refuge/Safe Zones/Areas	Neg 0.17	Neg 0.83	Neg 1.83	Neg 2.17	Neg 2.50	Neg 2.50
Cemeteries or Significant Resource Buildings/Areas	Neg 0.50	Neg 1.33	Neg 2.17	Neg 2.67	Neg 3.00	Neg 3.00
Watersheds of Special Significance	Pos 2.50	Pos 1.67	Pos 0.67	Neg 1.17	Neg 2.17	Neg 2.67
WUI Defense	Pos 2.00	Pos 1.33	Neg 0.17	Neg 1.00	Neg 2.17	Neg 2.67
Ski Area Terrain	Pos 1.50	Post 0.83	Neg 0.50	Neg 1.50	Neg 2.33	Neg 2.83

HVRA Calculated Relative Importance

Relative Importance survey results are shown in Table 2-15. A total of eight responses to the HVRA Relative Importance Questionnaire were received. Responses included an Alpine County resident, USFS staff, Alpine County staff, and CAL FIRE, Bear Valley Water District staff, and Fire Safe Council member. Each rating category had a potential ranking from 1-10; 10 being the highest score. The average score for all surveys by category is shown below and the total score is the sum of those averaged scores. The relative importance survey template is available as Appendix D.

Table 2-15 Results of Surveys Determining Relative Importance

HVRA	Uniqueness/Rarity/ Endemism	Replaceability	Safety/Critical Infrastructure	Total Score
Residential Structures	2.13	3.63	3.25	9.01
Education Facilities (Daycare/Schools/Colleges)	2.63	4.38	3.5	10.51
Recreational Facilities – Campgrounds, RV Parks (Non-ski Area)	3.25	3.63	2.38	9.26
Business and Public Structures	2.63	4.00	4.00	10.63
Places of Worship	2.13	3.67	2.71	8.51
Non Habitable/Unknown Structures (Barns/Sheds)	1.71	2.57	1.71	5.99
Health and Elder Care Facilities	2.17	4.00	4.14	10.31
High Hazard Buildings	3.00	3.83	3.33	10.16
Airport/Helibase	2.57	3.00	4.00	9.57
Communication Infrastructure (Cell Towers, Microwave Towers, etc.)	3.13	3.88	4.50	11.51

HVRA	Uniqueness/Rarity/ Endemism	Replaceability	Safety/Critical Infrastructure	Total Score
Potable Water Storage (E.g. Tanks); Snow Making Infrastructure	3.13	4.13	4.50	11.76
Major Evacuation Corridors (Ingress and Egress Routes)	3.13	4.00	4.25	11.38
Minor Evacuation Corridors (Ingress and Egress Routes)	2.88	3.13	3.88	9.89
Community Evacuation/ Refuge/Safe Zones/Areas	3.25	2.86	4.13	10.24
Cemeteries or Significant Resource Buildings/Areas	3.25	4.50	n/a	7.75
Watersheds of Special Significance	3.25	4.00	n/a	7.25
WUI Defense	5.00	5.00	n/a	10.00
Ski Area Terrain	3.14	4.00	n/a	7.14

2.5 Wildfire Risk Assessment

2.5.1 Introduction

Wildfire risk is the compilation of the integrated hazards (fire likelihood and intensity) with the susceptibility of the HVRAs identified.

2.5.2 Methods

Methods of Determining Wildfire Risk

Exposure Analysis of HVRAs

Exposure analysis is the characterization of wildfire likelihood and intensity where HVRAs occur and was performed within a GIS using one of several geospatial techniques that identify or summarize the wildfire hazard characteristics of all pixels where an HVRA is mapped. **Equation 1** provides the formula that was used for calculating $E(NVC_j)k$, the expected net value change or exposure to HVRA j on landscape pixel k. BPk is the probability of pixel k burning at what flame length class (CFL_k) multiplied by RF_{jk} the response function for HVRA j on pixel k.

Equation 1

$$E(NVC_j)_k = \sum BP_k * CFL_k * RF_{jk}$$

Effects Analysis on HVRAs

Effects analysis integrates wildfire hazard (likelihood and intensity) and HVRA vulnerability (exposure and susceptibility), producing a comprehensive measure of wildfire risk. Wildfire risk is quantified as the weighted expectation of net value change, where *NVC* is expressed in relative terms on a percentage basis, as defined by expert-based loss/benefit functions (for example, complete loss = -100 percent). **Equation 2** displays how to calculate risk across HVRAs for a given landscape pixel k. Expected net value change across all HVRAs and the entire landscape can be derived through **Equation 3**.

Equation 2

$$E(NVC)_k = \sum_j E(NVC_j)_k * RI_j$$

Equation 3

$$E(NVC) = \sum_k E(NVC)_k$$

Methods for Project Development Based on Wildfire Risk

Wildfire Risk Compilation

Compiling the total negative net value change of each pixel within the study area in a GIS raster format is required to appropriately organize results of the effects analysis. Considering each pixel of negative value is cumulative based on the above equations and is relative to other pixels within the project area, the results highlight which pixels, compared to others, have the highest net value change and thus, the highest amount of risk to fire during extreme fire weather scenarios. This information, in and of itself, can highlight what areas should be focused on first for treatments provided scale limitations are considered. Decisions on risk in areas less than 90-meter square area is not supported by this data and must be further evaluated with field visits.

Opportunities for Treatment Compilation

Areas or pixels that exhibit a positive value change to the effects of fire during extreme fire weather scenarios, could still benefit from treatment. In fact, these "opportunity" areas could have beneficial fire prescribed across many areas within the project area that would not only enhance the value of a particular HVRA, but also keep it and the surrounding area from moving towards conditions that would result in a modeled net value loss in the future as vegetation grows and fuels accumulate. These identified opportunity areas would most likely be treated with low intensity prescribed fire during times of the year when the potential for high severity fire is very low. It is understood that the more positive net value change value per pixel, the higher the opportunity which would translate to a higher priority implementation project area. Like the risk compilation, however, decisions on opportunity in areas less than a 90-meter square area is not supported by this data and should be further evaluated with field visits.

Project Developer

Even with the comprehensive and relatively high-fidelity risk and opportunity data across the project area, some additional filters and workflows were needed to improve results and further facilitate efficient and effective decision-making. Outputs from models that deal with a large amount of data may also produce additional meaningless information, often referred to as "noise," which can negatively affect the results of a data analysis and skew conclusions. Risk and opportunity data from the wildfire risk assessment were refined using a project-specific workflow intended to better contrast useful data from the noise. Additional filters identified in Table 2-16 and Table 2-17 were used to further divide information into meaningful polygons.

The following section presents the results of the risk calculations and processes. The results are presented in maps showing the areas of moderate, high, very high, and highest risk.

Table 2-16 Additional Filter by Slope

Slope Percent Break	Explanation
0-35%	All treatment methods available
35-75%	Too steep for most mechanical treatment methods; majority of area can only be treated manually
>75%	Too steep for all mechanical and most manual treatment; aerial prescribed fire treatment only

Table 2-17 Additional Filter by Land Ownership

Ownership Group	Notes
United States Forest Service	Designated by forest (e.g., Humboldt-Toiyabe vs Stanislaus) and land designation (e.g., wilderness)
Bureau of Land Management	Sierra Front Field Office
Bureau of Indian Affairs	Western Nevada Agency – Woodfords Community
Alpine County	n/a
NGO/Service Districts/Pacific Gas & Electric	Designated by entity
State of California	Designated by entity (e.g., State parks)
Private	Individual parcels were lumped together unless they were > 2 acres

2.5.3 Results of Wildfire Risk Assessment

Wildfire Risk Maps

County-wide risk is shown in Figure 2-21. Although HVRAs are well distributed across the county, considerably more and higher risk is on the east side. This higher risk is mostly due to the higher fire probabilities shown and explained in Figure 2-17. Figure 2-22 is zoomed into the Markleeville area that highlights an area where risk exists at its highest while covering a relatively moderate amount of area. To effectively evaluate and apply any risk and opportunity dataset it is imperative to work with the spatial data in a GIS and not solely rely on map products.

Project Development Outputs

Opportunities for Prescribed Fire

Based on the wildfire risk assessment, areas of the HVRAs were opportunities to control and reduce fuels through prescribed fire were also identified. The suitability of an area for prescribed fire is assessed based on whether fire in that area would have a net positive outcome, such as areas of HVRAs where there were not structures, infrastructure, or any other features that could be negatively affected by fire. The suitability was estimated by calculating the net value change that is expected when a typical pixel in the area burns. Figure 2-23 shows the additional areas within the overall HVRA areas where there is an opportunity to put prescribed fire on the landscape. Figure 2-24 highlights what the prescribed fire opportunities look like at a smaller scale in the Markleeville HVRA area. Prescribed fire in these areas would serve to further protect the HVRAs that fall within the moderate to highest wildfire risk categories.

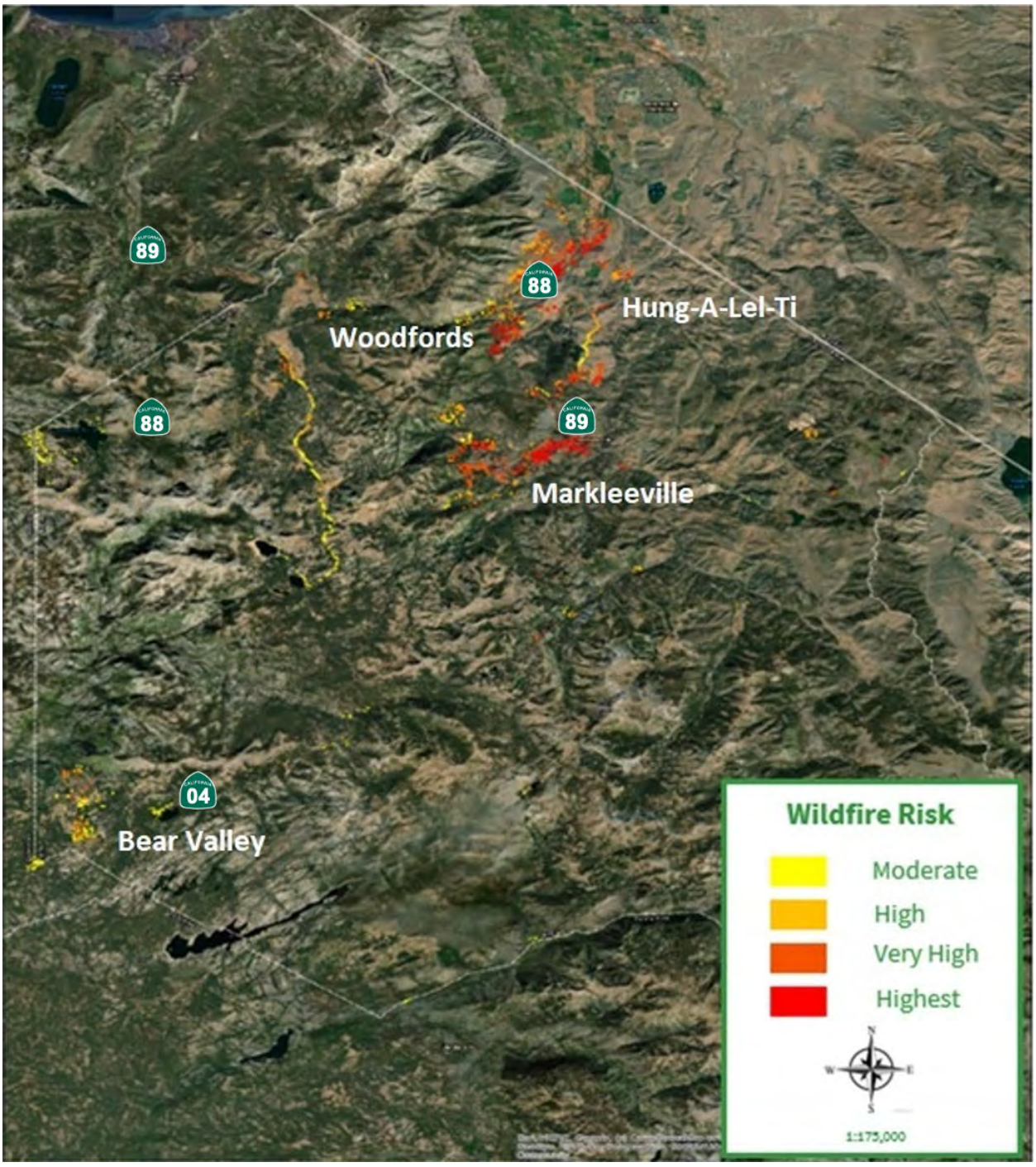
Project Developer Workflow Results

The project developer workflow and filters were applied to risk and opportunity outputs to help focus areas for project development coalesced by ownership and by treatment type to make the data actionable. The following process was part of the workflow:

- Remove the noise
  - Drop areas < 2 acres in size
- Package by 25% risk categories
- Break up by slope
  - < 35%
  - > = 35% & < 75%
  - >= 75%
- Break up by ownership: USFS, BLM, Bureau of Indian Affairs, County, Non-Government Organization/Service District/PG&E, State, and Private

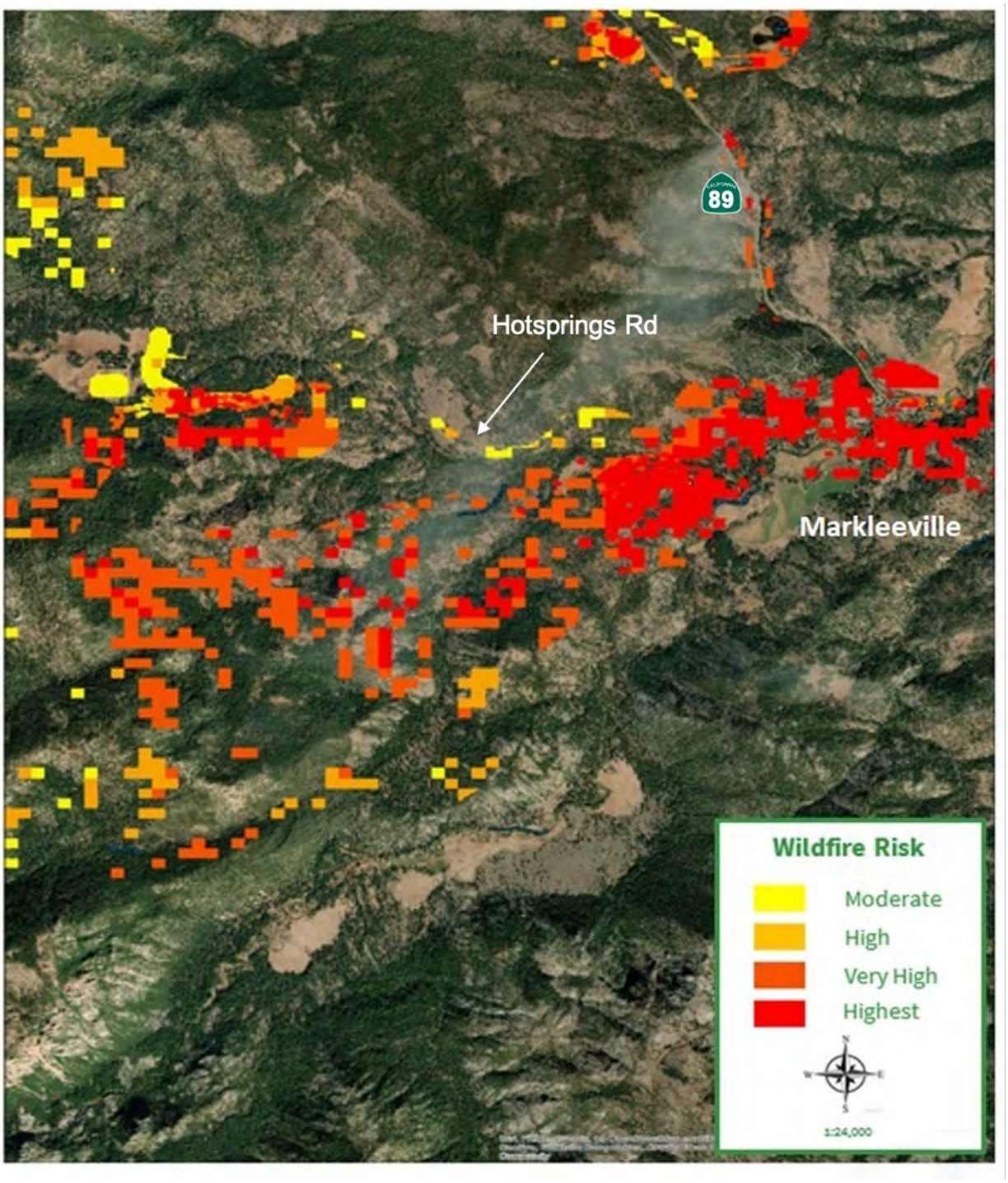
Figure 2-25 shows that output County-wide and Figure 2-26 through Figure 2-30 zooms into each of the five planning areas for a view of what the processed wildfire risks with prescribed fire opportunities looks like at an appropriate scale to inform decisions. Table 2-18 lays out land ownership of risk and opportunity.

Figure 2-21 Countywide Areas of Moderate to Highest Wildfire Risk



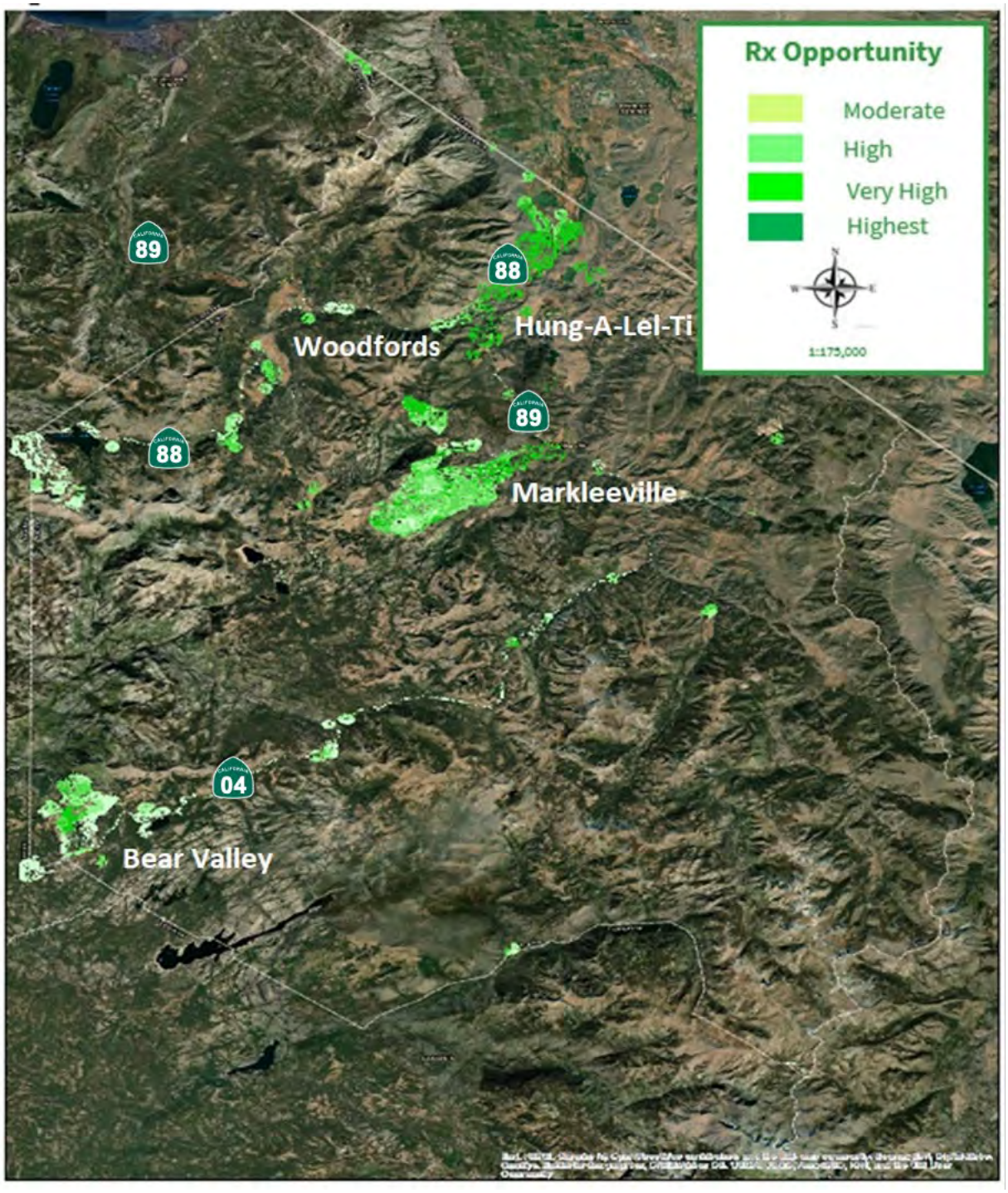
Source: (LANDFIRE, 2020)

Figure 2-22 Areas of Moderate to Highest Wildfire Risk for Markleeville



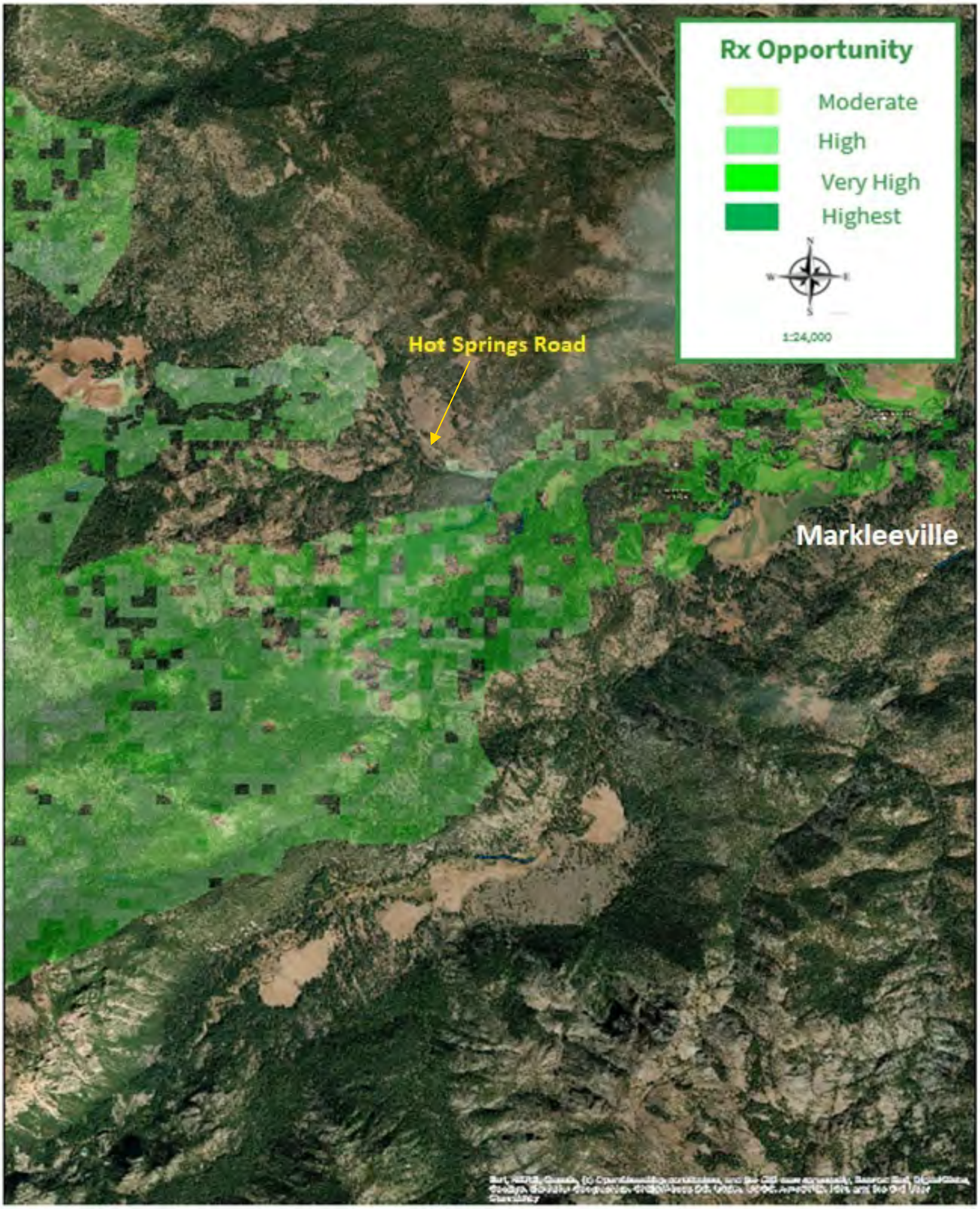
Source: (LANDFIRE, 2020)

Figure 2-23 Opportunities in Alpine County for Prescribed Fire within the HVRAs



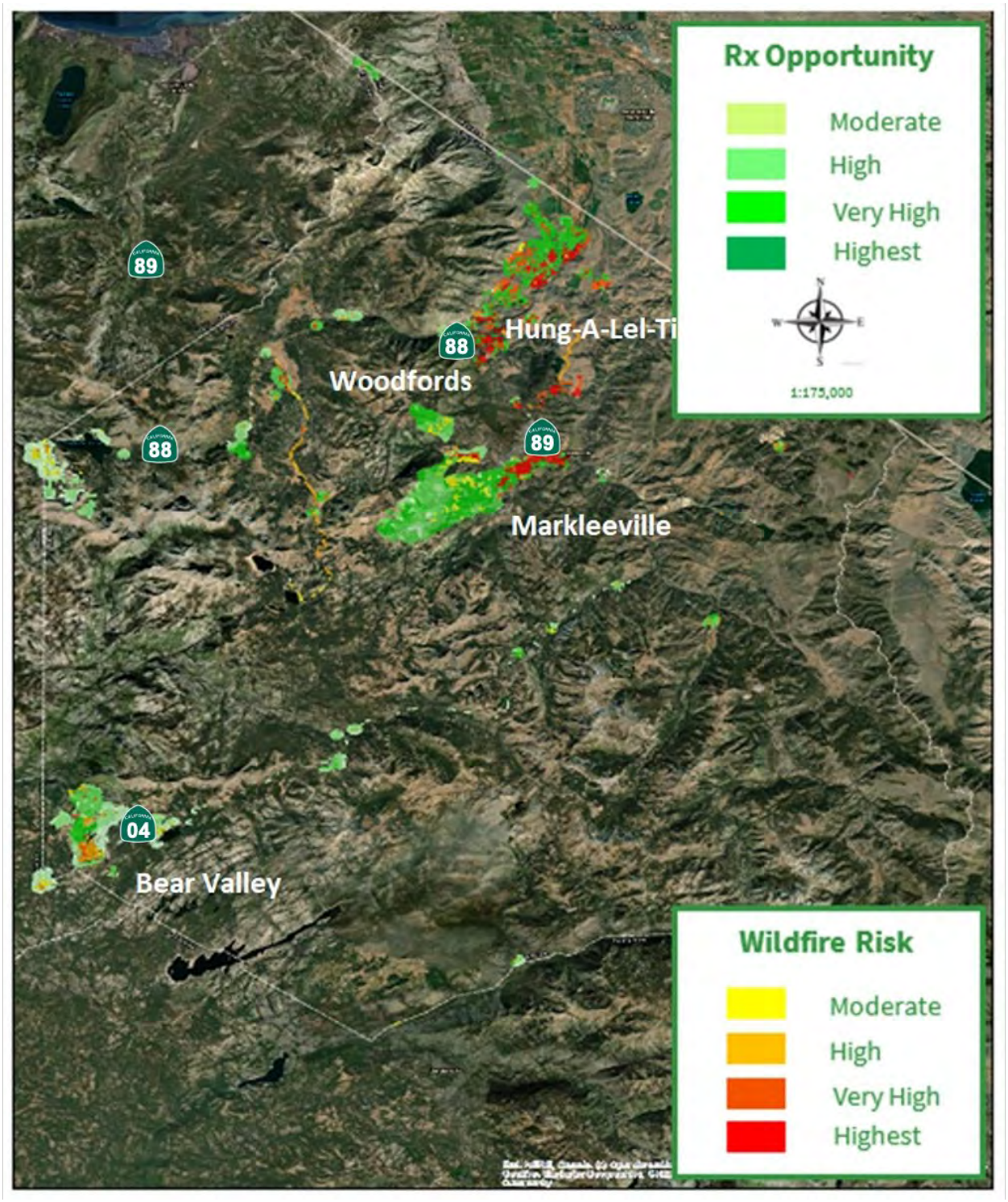
Source: (LANDFIRE, 2020)

Figure 2-24 Opportunities for Prescribed Fire in Markleeville within the HVRAs



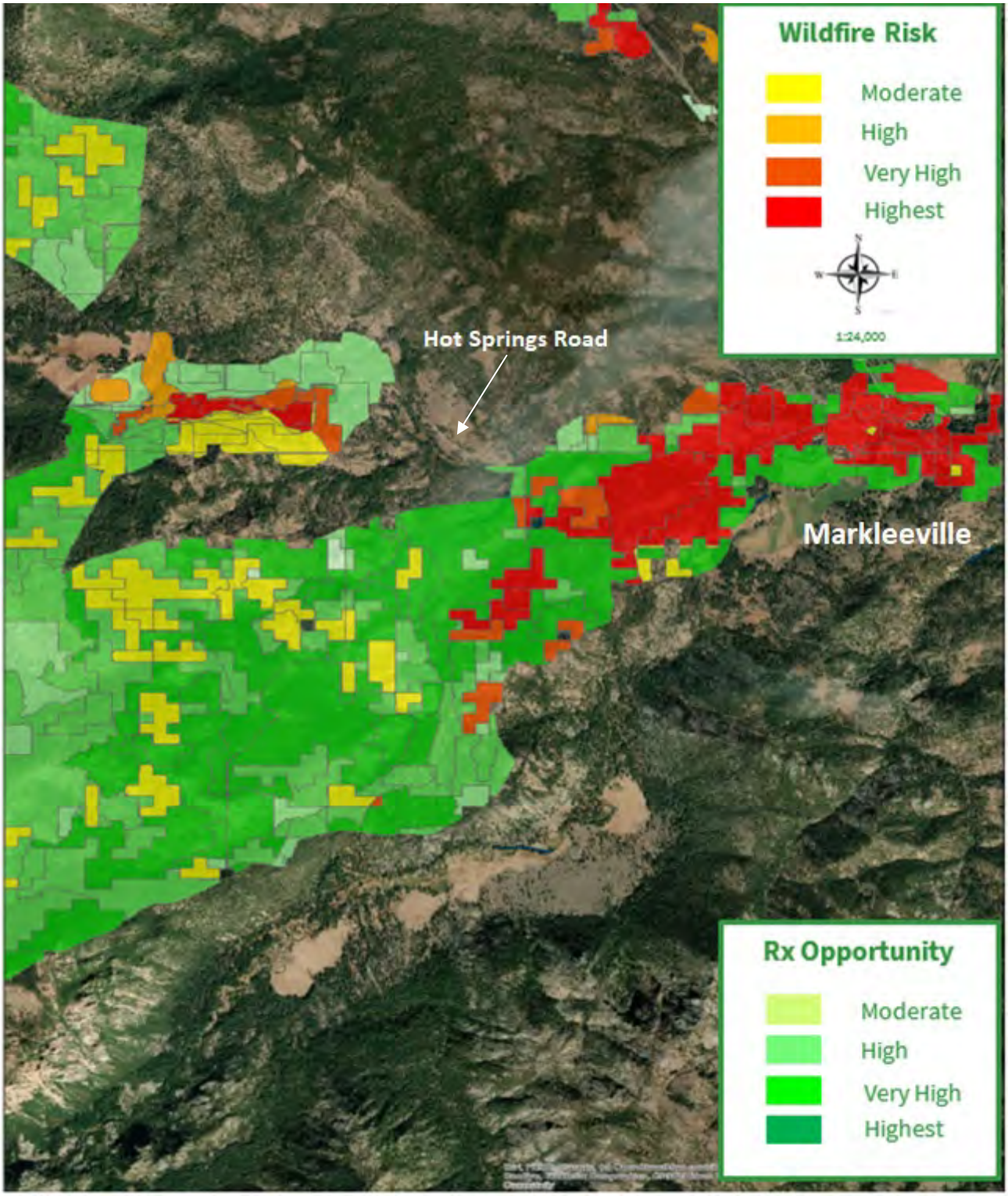
Source: (LANDFIRE, 2020)

Figure 2-25 Countywide Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



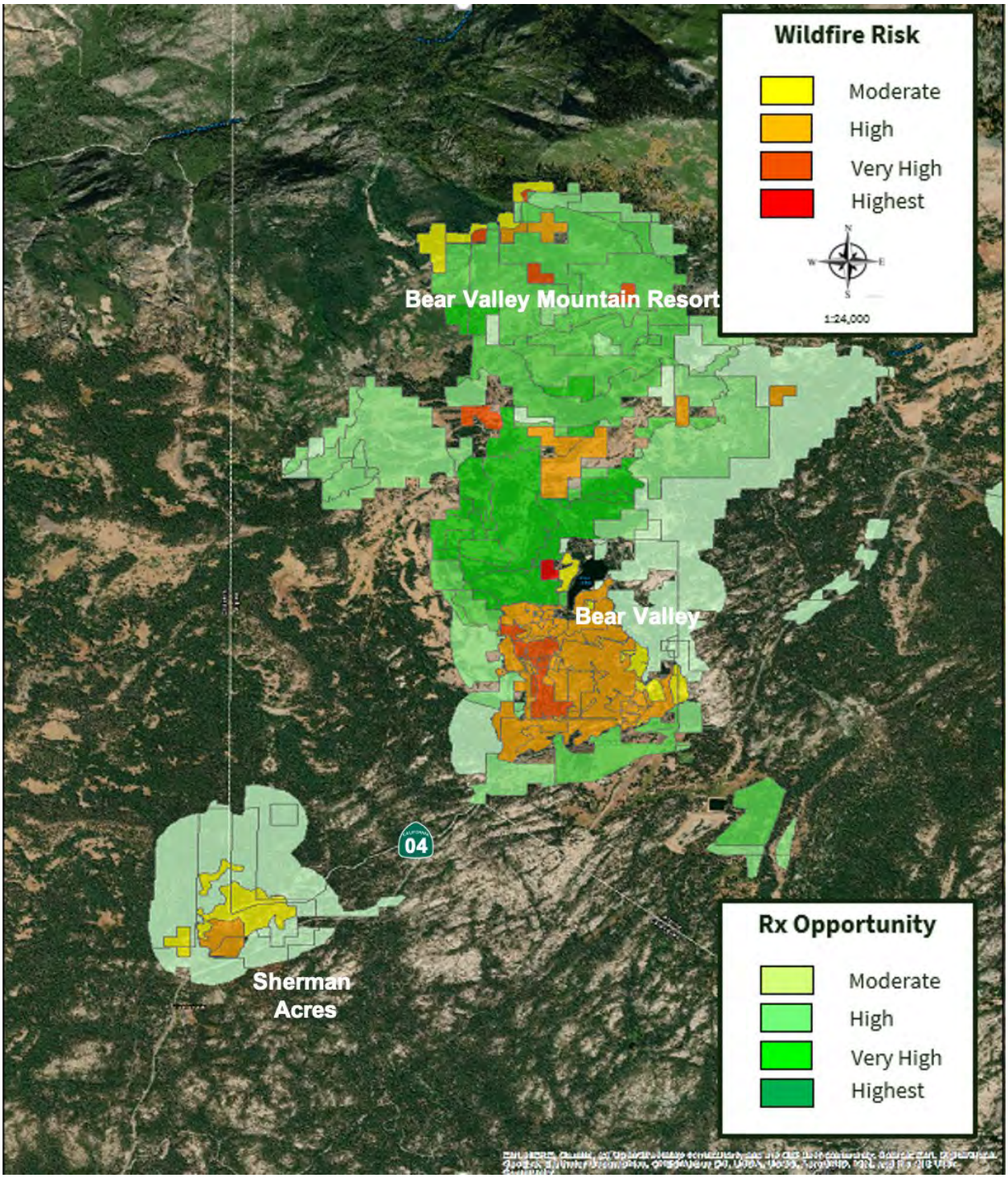
Source: (LANDFIRE, 2020)

Figure 2-26 Markleeville Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



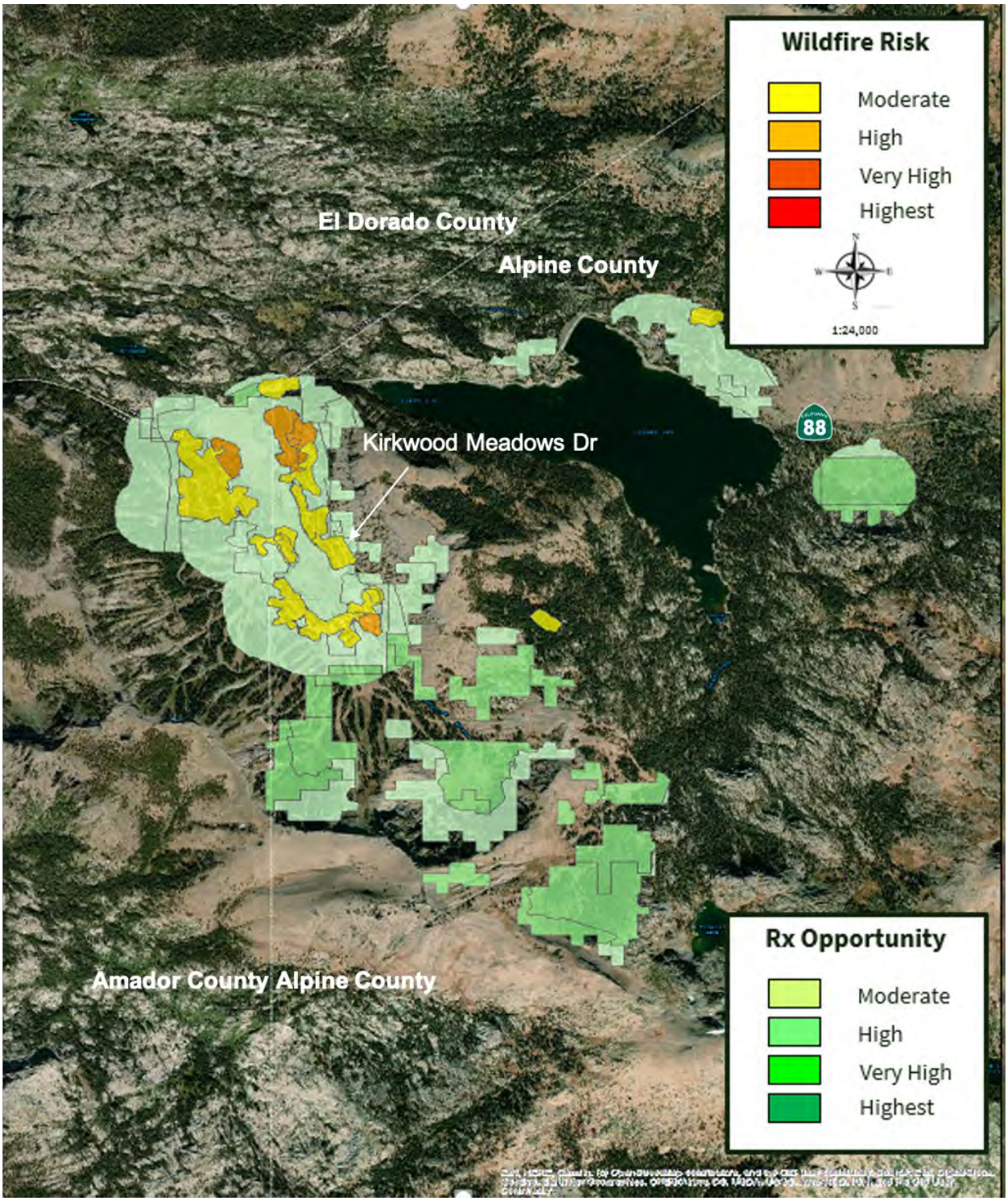
Source: (LANDFIRE, 2020)

Figure 2-27 Bear Valley Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



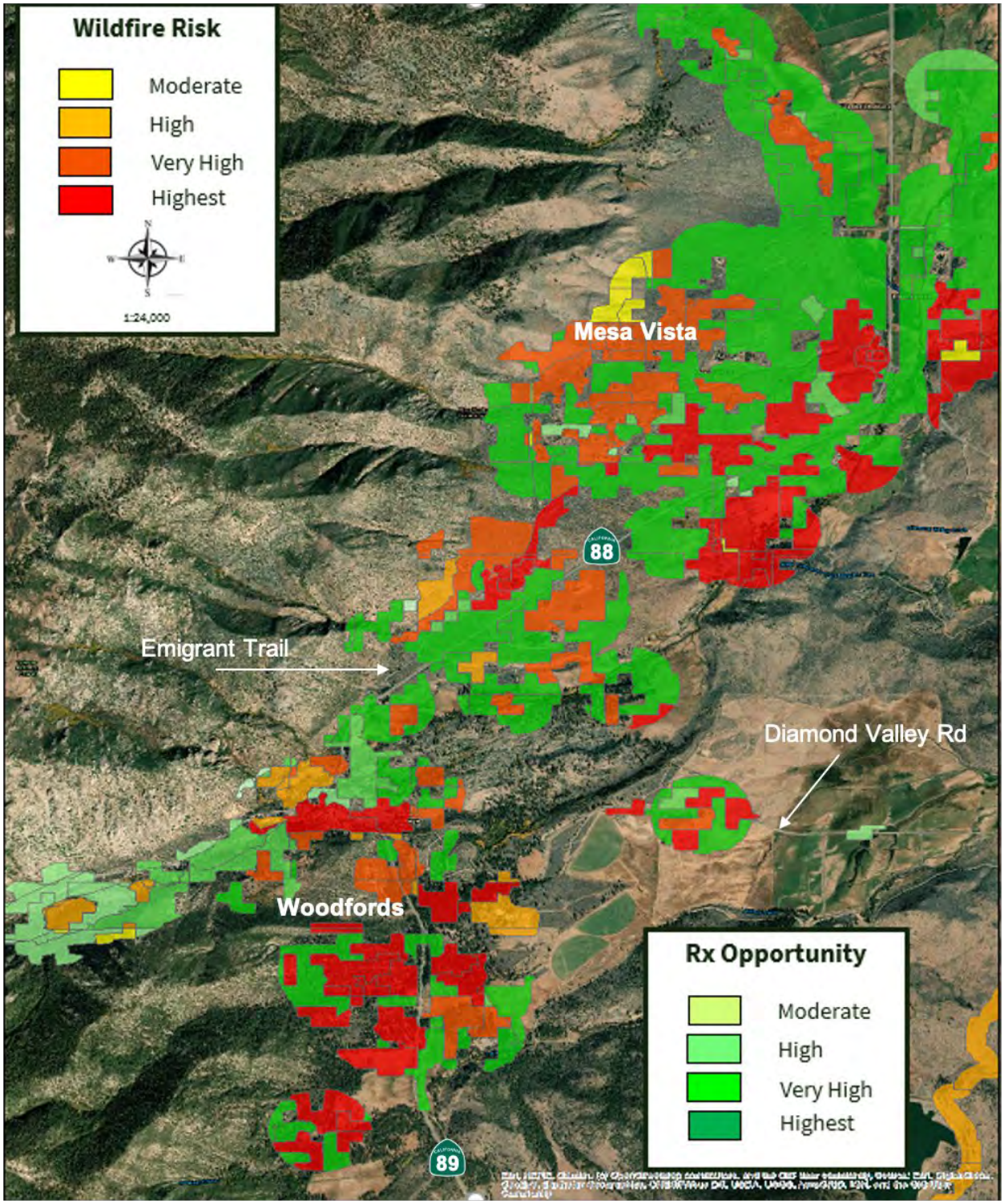
Source: (LANDFIRE, 2020)

Figure 2-28 Kirkwood Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



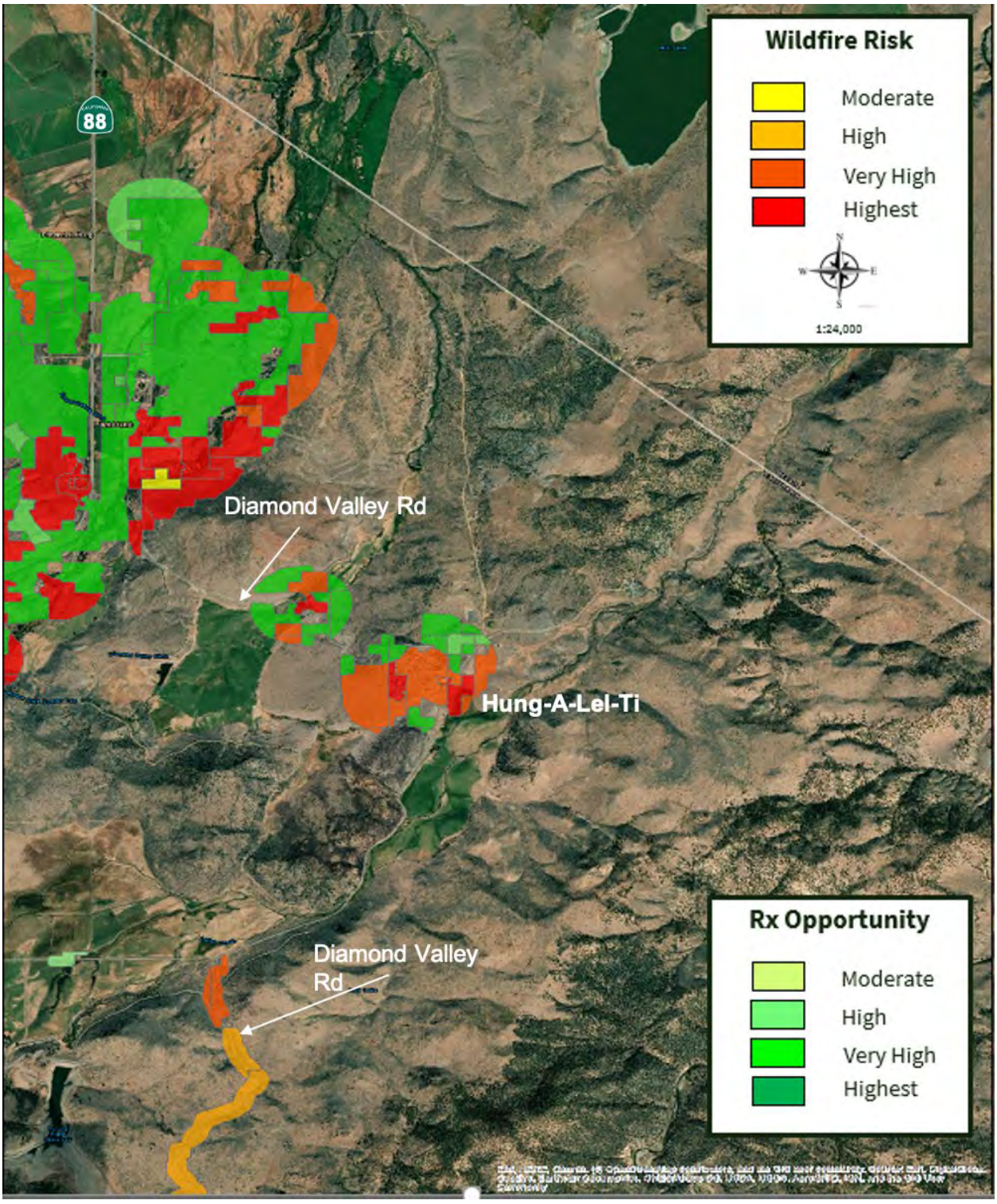
Source: (LANDFIRE, 2020)

Figure 2-29 Woodfords Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



Source: (LANDFIRE, 2020)

Figure 2-30 Hung-A-Lel-Ti Wildfire Risk Output After Workflow with Prescribed Fire Opportunities



Source: (LANDFIRE, 2020)

Table 2-18 Areas of Risk and Acres of Opportunity by Land Management or Ownership

Ownership Group	Acres of Risk	Acres of Opportunity (including prescribed fire)
United States Forest Service	2,087	10,455
Bureau of Land Management	378	137
Bureau of Indian Affairs	207	203
Alpine County	168	36
NGO/Service Districts/Pacific Gas & Electric	80	192
State of California	76	215
Private	2,598	3,957
Unknown	16	47
Totals	**5,610**	**15,242**

3 Wildfire Risk Mitigation Projects

3.1 Development and Prioritization of Potential Projects

The modeling efforts to assess wildfire risks across Alpine County assisted the team in defining where fire hazard areas occur, and which resources and assets are at moderate to highest risk. The information allowed the team to focus in on specific areas where projects could be developed to mitigate the risks. County staff and the steering committee were tapped for their knowledge of recently completed projects or projects underway in the County, as well as areas of particular concern based on their understanding of fire response and evacuation procedures, and on-the-ground conditions.

The land ownerships with the majority of the acres at risk included lands managed by the USFS at 1,403 acres (Humboldt-Toiyabe NF = 1,155 acres; Stanislaus NF = 230 acres; Eldorado NF = 18 acres) and private land at 2,598 acres (see Table 5-2). Areas within USFS ownership at highest risk, primarily on the east side of the County, are already being treated or are planned for near-term treatment by the USFS (Annabelle Monti, pers. Comm., 2020). The roster of projects defined for the mitigation program, therefore, did not include lands within USFS ownership. The wildfire risk assessment also demonstrated that the Kirkwood planning area had the least risks of the five planning areas within the WUI, with few areas in moderate and very limited areas in high wildfire risk. The roster of projects, therefore, focused on Markleeville, Woodfords, Hung-a-Lel-Ti, and Bear Valley. Project boundaries were drawn up, based on parcels, for 23 projects with an additional three projects identified but not mapped. While 23 projects were identified, several are adjacent to each other and could be grouped into a single project. With the grouping of adjacent projects, a total of 12 total projects were identified.

Once the projects were identified by geographic area, qualitative criteria were considered to prioritize the projects into three tiers (Tier 1 or highest priority, Tier 2 or moderate priority, and Tier 3 or lower priority), and to identify the three projects in Tier 1 that would move forward for detailed definition and environmental review. The criteria included:

- Degree of wildfire risk
- Project size and ability to implement
- Land ownership and likelihood to obtain permission to perform work: Is the landowner likely to approve the work and interested in the projects
- Feasibility of completing environmental review under existing constraints (i.e., grant timeframe, grant funds)
- Consistency with the CWPP: Is the project or area identified as a key area in the CWPP?

3.2 Projects Included in the WRMP by Tier

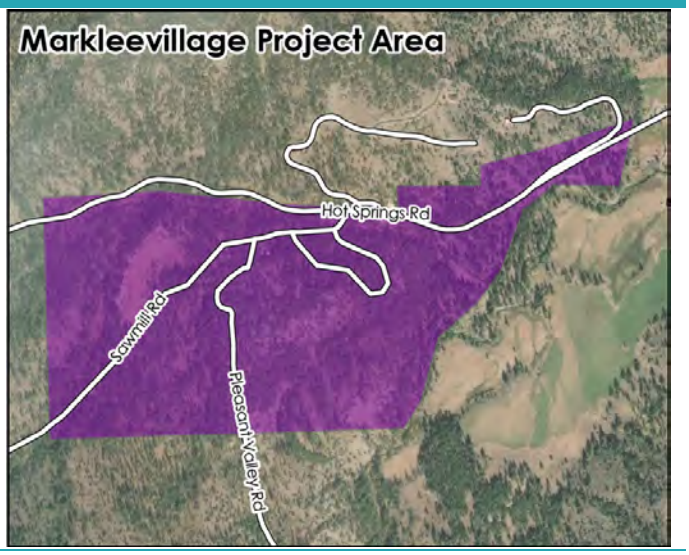
3.2.1 Summary of All Projects

Table 3-1 provides an overview of the 12 projects and 23 subprojects that were identified for inclusion in this WRMP. The table is followed by maps depicting the locations of the projects. The project boundaries are largely based on parcel boundaries; however, preliminary project boundaries were delineated regardless of land ownership.

The Tier 1 projects are carried forward with detailed implementation plans and environmental review, described in Chapter 4. Implementation of other projects in Tier 2 and Tier 3 would require supplemental implementation plans in the future. The process for implementing the Tier 2 and Tier 3 projects, as well as prescribed burning across larger HVRA areas is described in Section 4.7.

3.2.2 Summary of the Tier 1 Projects for Detailed Definition and Environmental Analysis

The three projects moving forward for detailed definition are shown below. These projects were prioritized primarily because they provide protection to communities at the highest wildfire risk (Markleevillage in Markleeville); protects a larger community in combination with high wildfire risk (Manzanita community in Woodfords); and provides protection to a considerable number of higher density homes and infrastructure that can build off of existing work for greater benefit even though the overall wildfire risk is lower in this area (Bear Valley). The Grover Hot Springs area also ranked highly, as the first project under Tier 2. This project could also reasonably be developed in the future following additional definition and environmental review.

Project 1: Markleevillage (Subprojects MV1, MV2, MV3, MV4, MV5, and MV6)	
Size: 300 acres	
Goal: WUI protection and evacuation corridor protection	
Benefits: Addressing the area with the highest wildfire risks in the County	
Land Ownership: Private	
CWPP Projects: Markleeville Priority 1, 3, and 4	

Project 2: Manzanita (Subprojects MV1, MV2, MV3, MV4, MV5, and MV6)

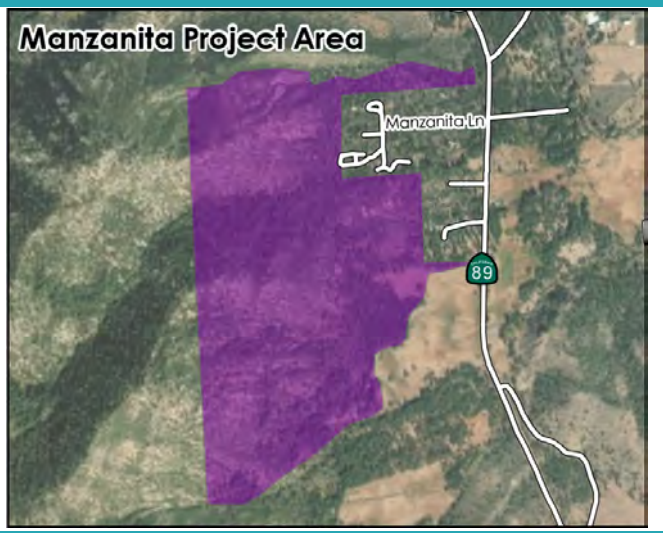
Size: 430 acres

Goal: WUI protection

Benefits: Protection of the Manzanita community

Land Ownership: Private

CWPP Projects: Woodfords/Upper Manzanita Priority 1



Project 3: Bear Valley (Subproject BV1)

Size: 130 acres

Goal: WUI protection and defensible space

Benefits: Community protection building on USFS, County, and resident work

Land Ownership: Private

CWPP Projects: Bear Valley Priority 1, 2, 3

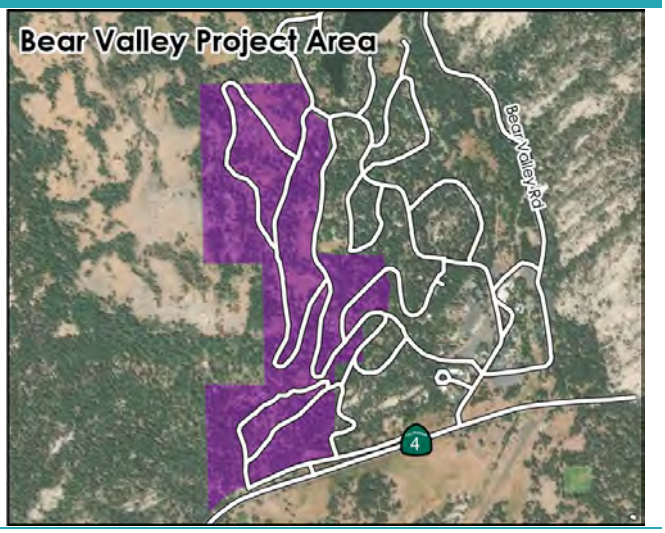


Table 3-1 Projects Included in the Wildfire Risk Mitigation Plan by Tier

Project #	Sub-Project ID	Project Location and Summary	Potential Treatment Types and Methods	Estimated Project Size	Landowner Type(s)		Likelihood of Receiving Landowner Permission	Anticipated Environmental Review [1]	Environmental Review Considerations	CWPP Consistency
					Public	Private				
Tier 1 Priority Projects (Highest Priority)										
1	MV1	**Saw Mill Road** Community protection south of Hot Springs Road and west of Pleasant Valley Road	• WUI fuel treatment • Mechanical • Hand tools	118 acres	No	Yes -Single landowner	Feasible	CEQA – Portions are covered by CALVTP EIR Treatment of entire area may require additional CEQA review for work in meadow. CalVTP Project Specific Assessment could be used for all other areas.	• Majority of the area is covered by the CalVTP EIR. Large meadow is excluded from VTP EIR treatment area.	• Part of Markleeville Priority 3 – Land Co-op
	MV2	**Pleasant Valley Road - East** Defensible space and emergency access south of Hot Springs Road and east of Pleasant Valley Road	• WUI fuel treatment • Mechanical • Hand tools	75 acres	No	Yes – Multiple landowners	Multiple private landowners could be a challenge for conducting studies/surveys and project implementation	CEQA – CalVTP Project Specific Assessment	• CalVTP identifies fuel break opportunity near Pleasant Valley Road	• Markleeville Priority 4 residential treatment
	MV3	**Pleasant Valley Road - South** Community protection for community east of Pleasant Valley Road	• WUI fuel treatment • Fuel break • Mechanical • Hand tools	39 acres	No	Yes - Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR	• No, not included with Priority 3 Co-op
	MV4	**Hot Springs Road - West** Emergency access protection on Hot Springs Road; community protection for community east of Pleasant Valley Road	• WUI fuel treatment • Mechanical • Hand tools	47 acres	No	Yes - Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR	• Markleeville Priority 1 and 3
	MV5	**Hot Springs Road to Markleeville (North)** Emergency access protection north of Hot Springs Road west of Markleeville	• WUI fuel treatment • Mechanical • Hand tools	10 acres	No	Yes – Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR	• Markleeville Priority 1 and 3
	MV6	**Hot Springs Road to Markleeville (South)** Emergency access protection south of Hot Springs Road west of Markleeville	• WUI fuel treatment • Mechanical • Hand tools	7 acres	No	Yes – Single landowner	Feasible	CEQA – Portions are covered by CALVTP EIR Treatment of entire area requires additional CEQA review for work adjacent to Pleasant Valley Creek. CalVTP Project Specific Assessment could be used for all other areas.	• CalVTP excludes the area adjacent to Pleasant Valley Creek	• Markleeville Priority 1, not included in Priority 3 land co-op

Project #	Sub-Project ID	Project Location and Summary	Potential Treatment Types and Methods	Estimated Project Size	Landowner Type(s)		Likelihood of Receiving Landowner Permission	Anticipated Environmental Review[1]	Environmental Review Considerations	CWPP Consistency
					Public	Private				
2	MZ1	**Manzanita** Emergency access protection along Highway 89 and community protection for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	658 acres	No	Yes – Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• CalVTP identifies fuel break opportunities along Randall Creek • CalVTP excludes some of the meadows in the area from treatment	• Not included in Woodfords\Upper Manzanita Priority 1 project
	MZ2	**Manzanita** Community protection for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	71 acres	No	Yes – Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR • CalVTP identifies fuel break opportunities along Scott Creek and with topography in the area	• No included in Woodfords\Upper Manzanita Priority 1 project
	MZ3	**Manzanita** Community protection for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	39 acres	No	Yes – Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR • CalVTP identifies fuel break opportunities along Scott Creek and with topography in the area	• Woodfords\Upper Manzanita Priority 1 project
	MZ5	**Manzanita** Community protection for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	108 acres	No	Yes – Single landowner	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR • CalVTP identifies fuel break opportunities within the parcel as well as just north of the northern property along existing fuel break	• Woodfords\Upper Manzanita Priority 1 project
3	BV2	**Bear Valley** Defensible space and community protection for Bear Valley community; Emergency access to Highway 4	• Defensible space • WUI fuels reduction • Mechanical • Hand tools	130 acres	No	Yes – Multiple landowners	Multiple private landowners could be a challenge for conducting studies/surveys and project implementation	CEQA – project-specific CEQA document	• The majority of the area is **not** covered by the CalVTP	• Consistent with BV Projects 1,2,3
Tier 2 Priority Projects (Moderate Priority)										
4	GHS1	**Grover Hot Springs State Park** Protection of Grover Hot Springs campground and emergency access protection on Hot Springs Road.	• Ecological restoration • Fuel break • Mechanical • Hand tools • Prescribed burn	339 acres	Yes – State of California	No	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR	• Markleeville Priority 1 is roadway access treatments • Markleeville Priority 5 is alternate routes and evac sites like Grover Meadow pg 115

Project #	Sub-Project ID	Project Location and Summary	Potential Treatment Types and Methods	Estimated Project Size	Landowner Type(s)		Likelihood of Receiving Landowner Permission	Anticipated Environmental Review[1]	Environmental Review Considerations	CWPP Consistency
					Public	Private				
	GHS2	**Shay Creek Subdivision** Defensible space protection of the Shay Creek subdivision and emergency access on Hot Springs Road.	• Ecological restoration • WUI fuel treatment • Mechanical • Hand tools	77 acres	No	Yes – Multiple landowners	• Multiple private landowners could be a challenge for conducting studies/surveys and project implementation	• CEQA – CalVTP Project Specific Assessment • Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• Entire area covered by the CalVTP EIR	• Assume Priority 1 roadway access treatments are consistent even if they don't describe Shay Creek
	GHS3	**Hot Springs Road near Shay Creek Road** Emergency access protection on Hot Springs Road, east of Shay Creek Road.	• WUI fuel treatment • Mechanical • Hand tools • Prescribed burn	8 acres	Yes – State of California	No	Feasible	CEQA – The project will require evaluation under a project-specific CEQA document. Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land).	• The area is not included in the CalVTP analysis area but the omission may be due to a mapping error. The case can be made for treating it as a CalVTP-covered area (within SRA) • Land use within the project boundary includes year-round workforce housing; therefore, the area is considered higher priority	• Markleeville Priority 1 and 5 projects
5	MS1	**Mesa Vista** Community protection for Mesa Vista	• WUI fuels reduction • Mechanical • Hand tools • Prescribed burn	66 acres	No	Yes -Washo Tribe	Feasible	• NEPA – Categorical Exclusion • CEQA – project-specific CEQA document necessary	• Area not included in the CalVTP • BIA NEPA Categorical Exclusion[2] available	• Woodfords\Mesa Vista Brush Treatment-Priority 4, 100 ac
	MS2	**Mesa Vista** Community protection for Mesa Vista; Emergency access protection of Emigrant Trail and Highway 88	• WUI fuels reduction • Mechanical • Hand tools	282 acres	Yes -BIA	Yes -Washo Tribe	Feasible	• NEPA – Categorical Exclusion • CEQA – project-specific CEQA document necessary.	• Area not included in the CalVTP • BIA NEPA Categorical Exclusion[2] available	• Woodfords\Mesa Vista Brush Treatment – Priority 4 100ac
Tier 3 Priority Projects (Lower Priority)										
6	HLT1	**Hung-A-Lel-Ti** Community protection for Hung-a-Lel-Ti and emergency access on Diamond Valley Road	• WUI fuels reduction • Mechanical • Hand tools • Prescribed burn *	78 acres	Yes -BIA	No	Feasible	• NEPA – Categorical Exclusion • CEQA – project-specific CEQA document necessary. Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• Area not included in the CalVTP • BIA NEPA Categorical Exclusion[2] available • CEQA Class 4 Exemption may apply * Prescribed burn outside of 100' buffer of structures	• No recommended project

Project #	Sub-Project ID	Project Location and Summary	Potential Treatment Types and Methods	Estimated Project Size	Landowner Type(s)		Likelihood of Receiving Landowner Permission	Anticipated Environmental Review [1]	Environmental Review Considerations	CWPP Consistency
					Public	Private				
7	TRP1	**Turtle Rock Park** Emergency access protection along Highway 89	• Ecological restoration • Mechanical • Hand tools • Prescribed burn	126 acres	Yes – Alpine County	No	Feasible	CEQA – CalVTP Project Specific Assessment	• Majority of area covered by CalVTP EIR • Developed areas (parking lots) were excluded from CalVTP EIR treatable area • CalVTP identifies opportunity for fuelbreak on the western edge of the polygon extending west along Millberry Creek	• No, pg 65 sect 8.3 recognizes BLM treatments adjacent to TRP
8	BV1	**Bear Valley** Defensible space and community protection for Bear Valley community at Bear Lake; Emergency access protection on Bear Valley Road	• Defensible space • WUI fuels reduction • Mechanical • Hand tools	18 acres	No	Yes – Multiple landowners	Feasible	CEQA – project-specific CEQA document. Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• None of the area is covered by the CalVTP • Multiple private landowners could be a challenge for conducting studies/surveys and project implementation	• Consistent with BV Projects 1,2,3
	BV3	**Bear Valley** Defensible space and community protection for Bear Valley community; Emergency access to Highway 4	• Defensible space • WUI fuels reduction • Mechanical • Hand tools	185 acres	Yes – State or County	Yes – Multiple landowners	Feasible	• CEQA – project-specific CEQA document using CalVTP. • Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• Multiple private landowners could be a challenge for conducting studies/surveys and project implementation • CalVTP covers area along Creekside Drive	• Consistent with BV Projects 1,2,3
9	MZ4	**Manzanita** Emergency access protection along Highway 89 and defensible space for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	17 acres	No	Yes - Single landowner	Current landowner is not interested in wildfire mitigation projects on property at the time of WRMP development	• CEQA – CalVTP Project Specific Assessment. • Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• Entire area covered by the CalVTP EIR • CalVTP identifies fuel break opportunities along Scott Creek and with topography in the area	• Woodfords\Upper Manzanita Priority 1 project
	MZ6	**Manzanita** Emergency access protection along Highway 89 and defensible space for Sierra Pines Mobile Home Park	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	79 acres	No	Yes – Multiple landowners	Current landowners are generally not interested in wildfire mitigation projects on property at the time of WRMP development	• CEQA – CalVTP Project Specific Assessment • Project could qualify for Class 4 Exemption (CEQA Guidelines Section 15304 Minor Alterations to Land)	• Entire area covered by the CalVTP EIR • CalVTP identifies fuel break opportunities along Scott Creek • Multiple private landowners could be a challenge for conducting studies/surveys and project implementation	• Woodfords\Upper Manzanita Priority 1 project • Identifies poor defensible space and difficult emergency access along Manzanita Lane and Hawkins Ranch Road
10	LA1	**Lake Alpine** Protection of recreational uses and emergency access	• Ecological restoration • Mechanical • Hand tools • Prescribed burn	449 acres	Yes – USFS	Yes - PG&E	Feasible	NEPA – CE or EA CEQA – project-specific CEQA document necessary tiering off CalVTP	• PG&E-owned land covered by CalVTP • NEPA required for work on USFS land	• No CWPP project, reference on pg 133 to 2013 timber stand project

Project #	Sub-Project ID	Project Location and Summary	Potential Treatment Types and Methods	Estimated Project Size	Landowner Type(s)		Likelihood of Receiving Landowner Permission	Anticipated Environmental Review [1]	Environmental Review Considerations	CWPP Consistency
					Public	Private				
11	DV1	**Diamond Valley Triangle** Protection of County services and Diamond Valley School	• WUI fuel reduction • Fuel breaks • Mechanical • Hand tools	73 acres	Yes – Alpine County	No	Feasible	CEQA – project-specific CEQA document.	• Alpine Fire Safe Council Phase 2 project. AFSC completed Phase 1 project to the west, adjacent to Highway 89. • Area is not covered by the CalVTP	• Woodfords\Upper Manzanita Priority 2 project
	DV2	**Washoe Cemetery** Protection of cemetery, Woodfords residences, and County services	• WUI fuel reduction • Ecological restoration • Fuel breaks • Mechanical • Hand tools • Prescribed burn	77 acres	Yes – Alpine County, BIA	No	Feasible	CEQA – CalVTP Project Specific Assessment	• Entire area covered by the CalVTP EIR	• Not specifically identified in CWPP but project consistent with Manzanita Fuels Treatment (Priority 1 Project) and Diamond Valley Triangle Fuels Treatment (Priority 2 Project) • CWPP identifies the area as a completed project
12	HWY1	**Highway 89 North of Turtle Rock Park** Emergency access protection along Highway 89	• Ecological restoration • Mechanical • Hand tools	36 acres	No	Yes	Unknown	CEQA – project-specific CEQA document	• Area is not covered by the CalVTP	• Not specifically identified in CWPP but project is consistent with goals for maintaining emergency access

Notes:

[1] CalVTP Project Specific Assessment - Assessment checklist would be completed to determine if the project is consistent with the CalVTP EIR. If the checklist indicates that there would be a potentially new or more severe impact, then additional CEQA review would be required. The checklist could be used to prepare tiered CEQA review with additional evaluation for areas of new or more severe impact. Public review and comment periods would be necessary in accordance with CEQA. See Section 3.3 for more details on the Cal VTP EIR and CEQA review.

[2] Department of Interior Categorical Exclusion (k) Hazardous Fuels Reduction; or Bureau of Indian Affairs Categorical Exclusion H. Forestry (9)

Figure 3-1 Index of Project Maps in WRMP

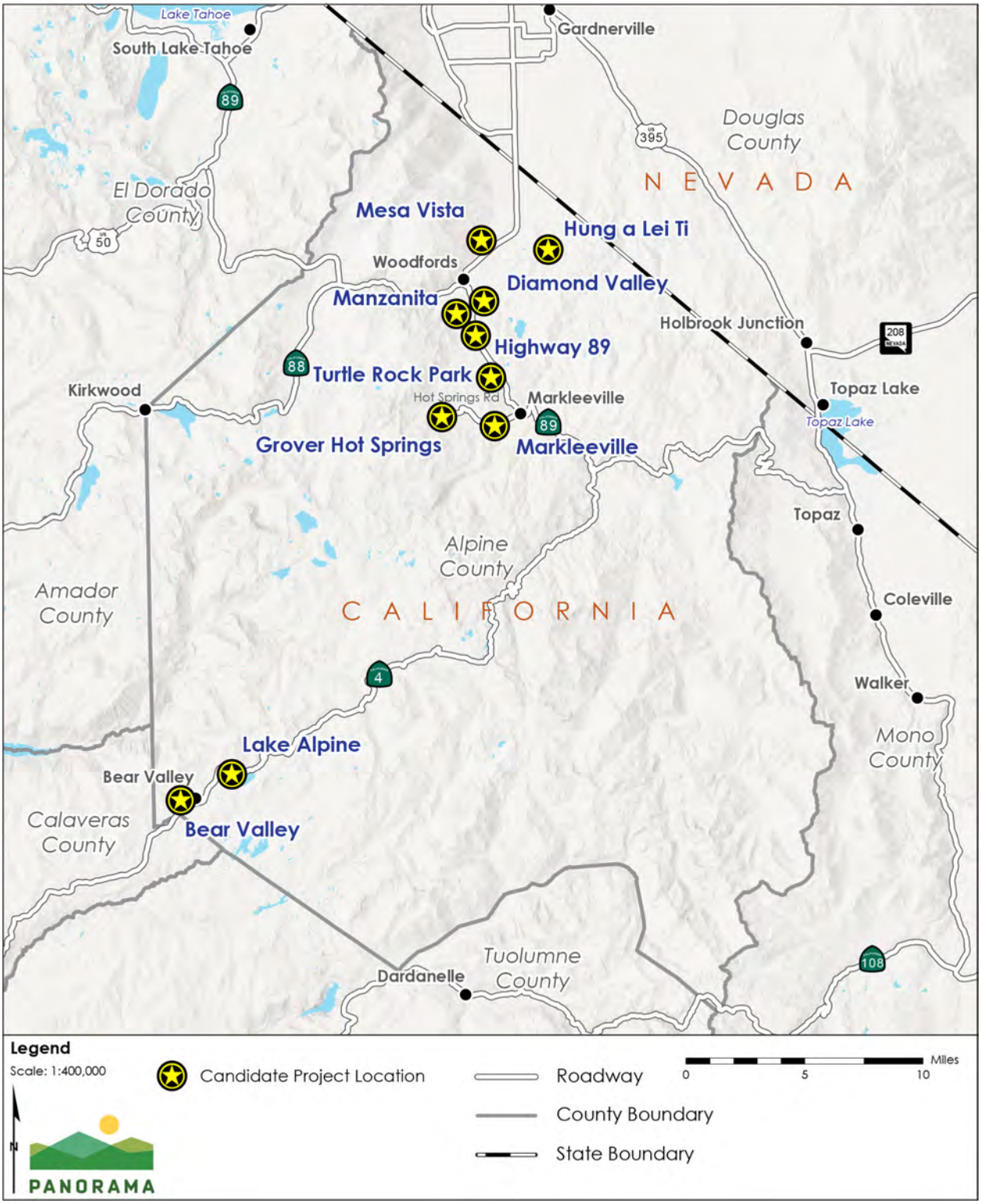


Figure 3-2 Mesa Vista Project Area (Tier 1, Project 5)

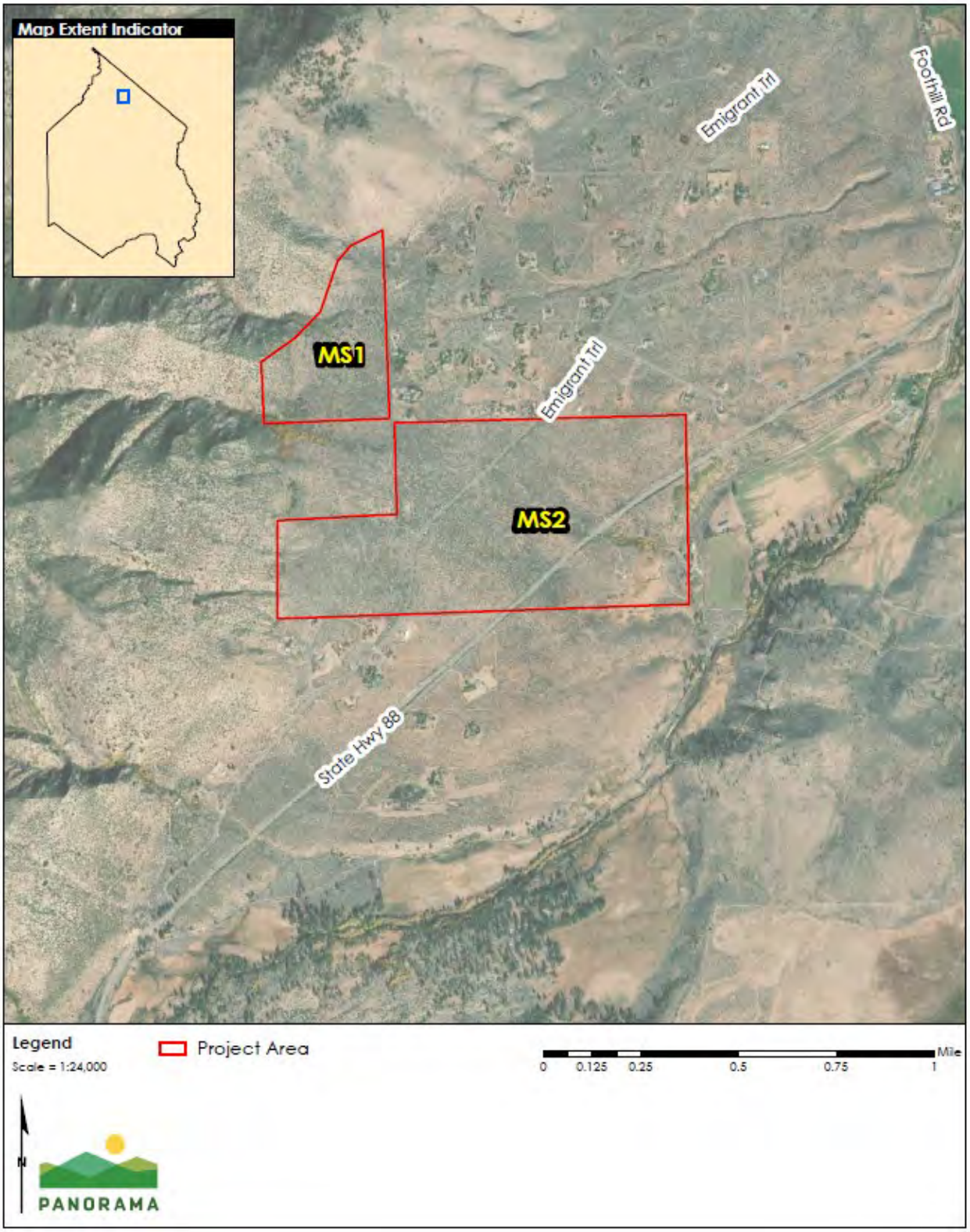


Figure 3-3 Hung-a-Lel-Ti Project Area (Tier 3, Project 6)

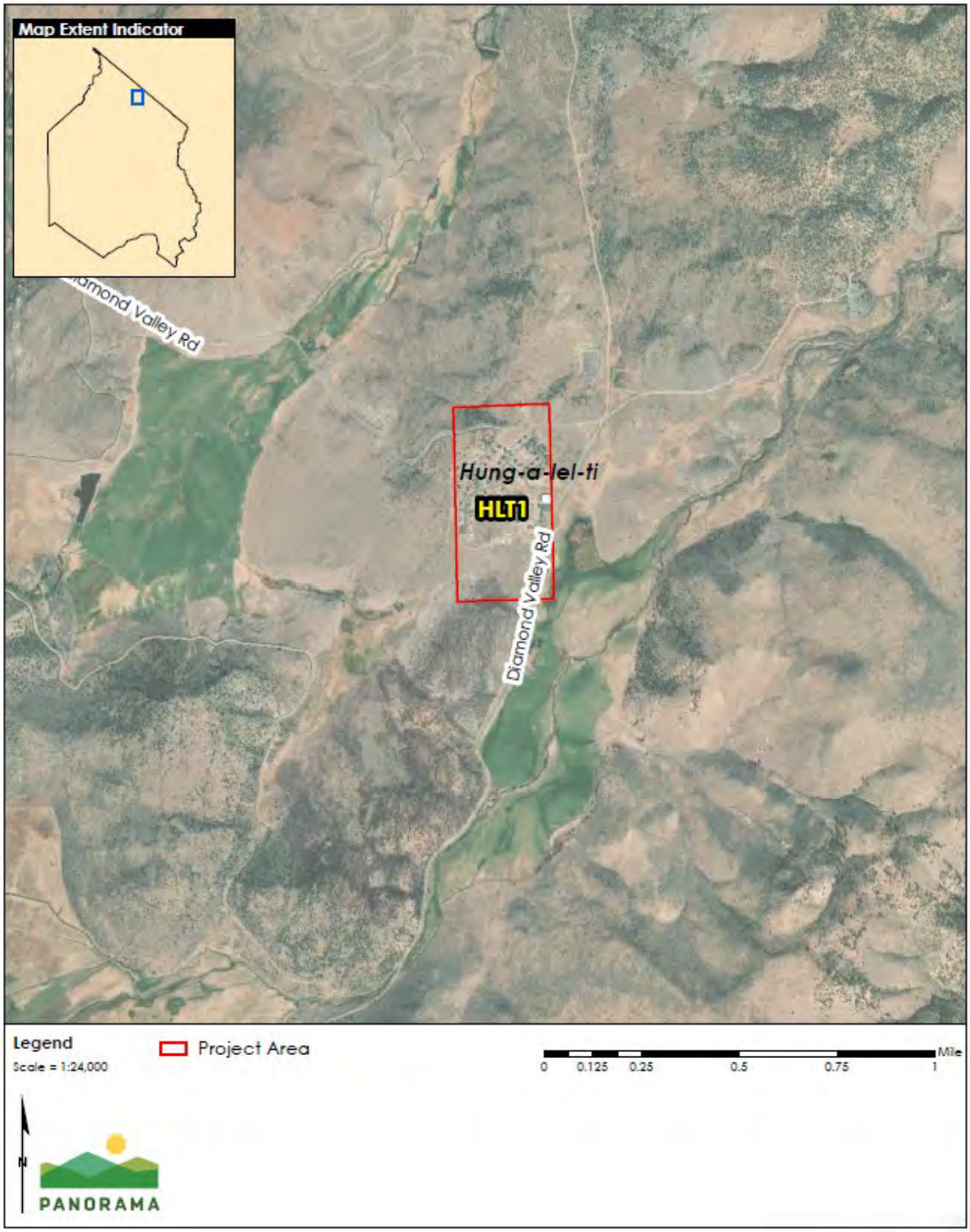


Figure 3-4 Manzanita Project Area (Tier 1, Project 2 and Tier 3, Project 9)

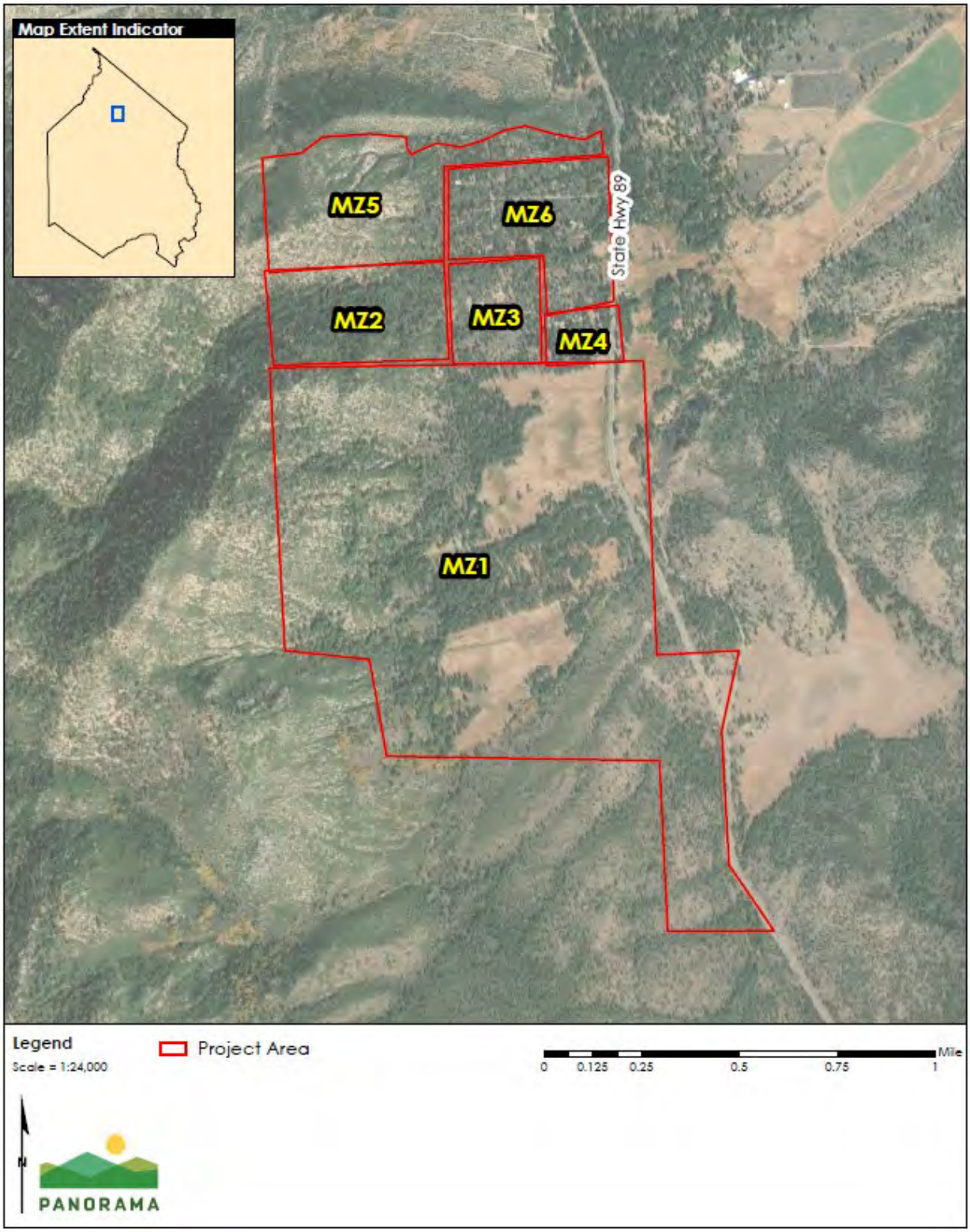


Figure 3-5 Turtle Rock Park Project Area (Tier 3, Project 7)

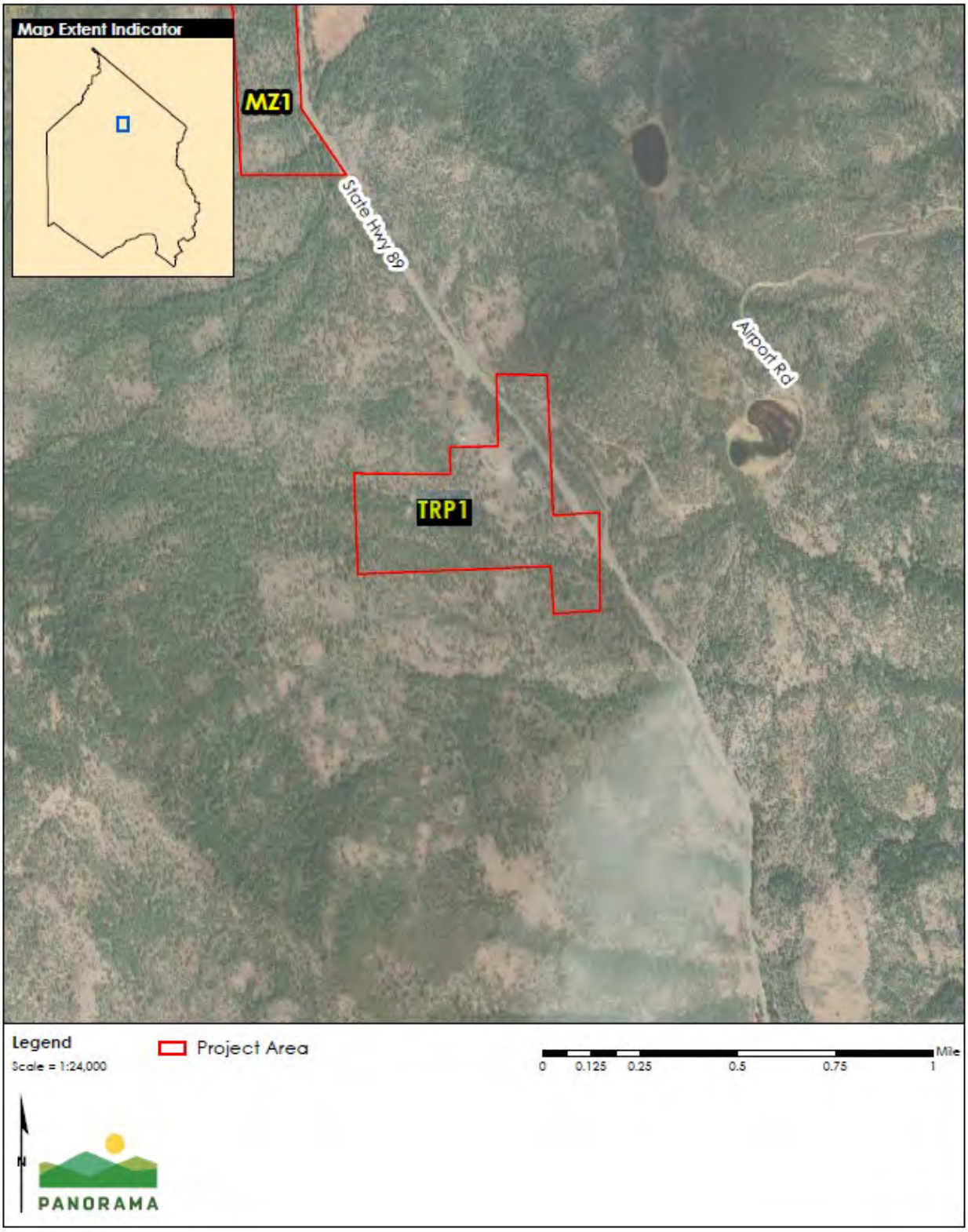


Figure 3-6 Grover Hot Springs Project Area (Tier 2, Project 4)

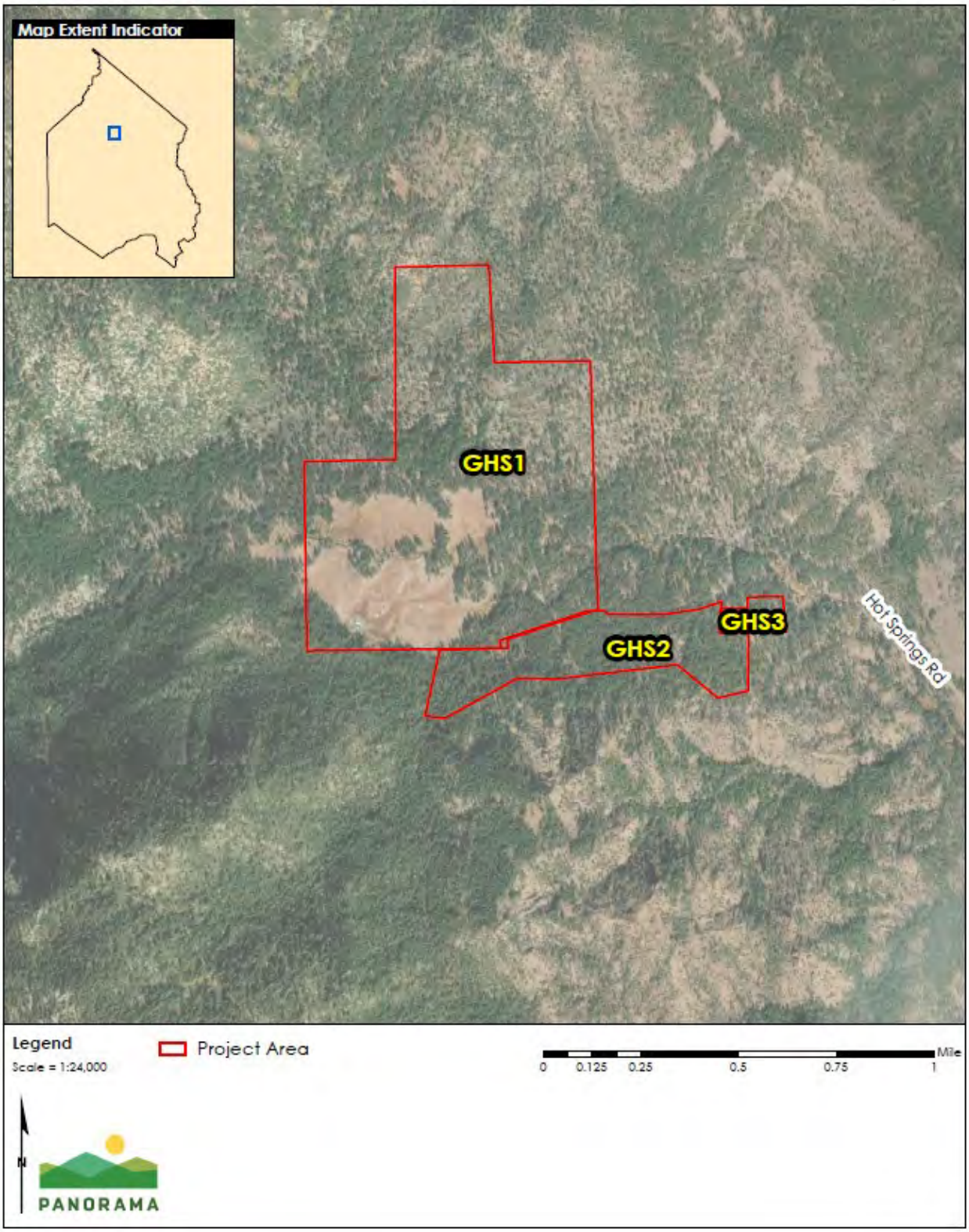


Figure 3-7 Markleevillage Project Area (Tier 1, Project 1)

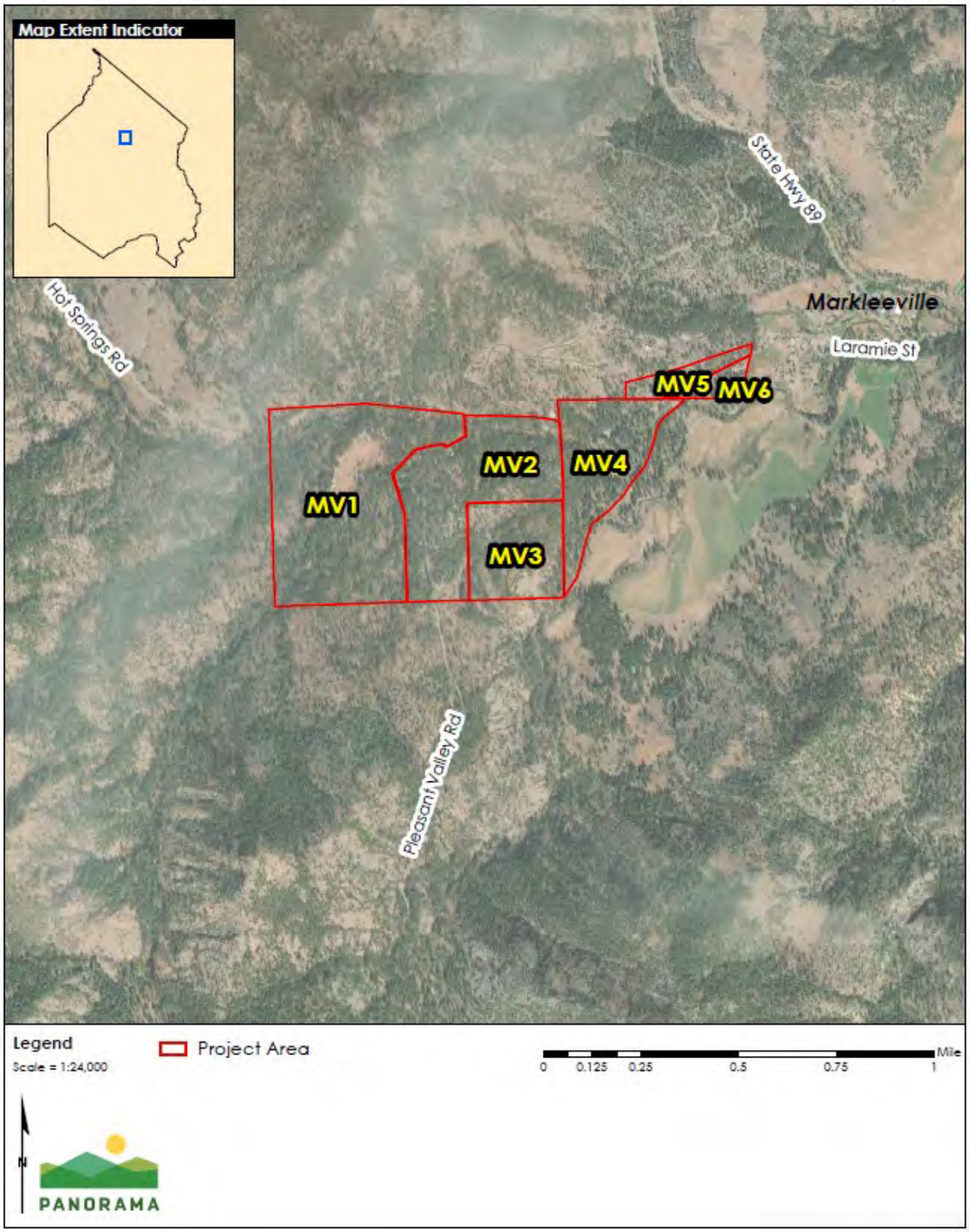


Figure 3-8 Bear Valley Project Area (Tier 1, Project 3)

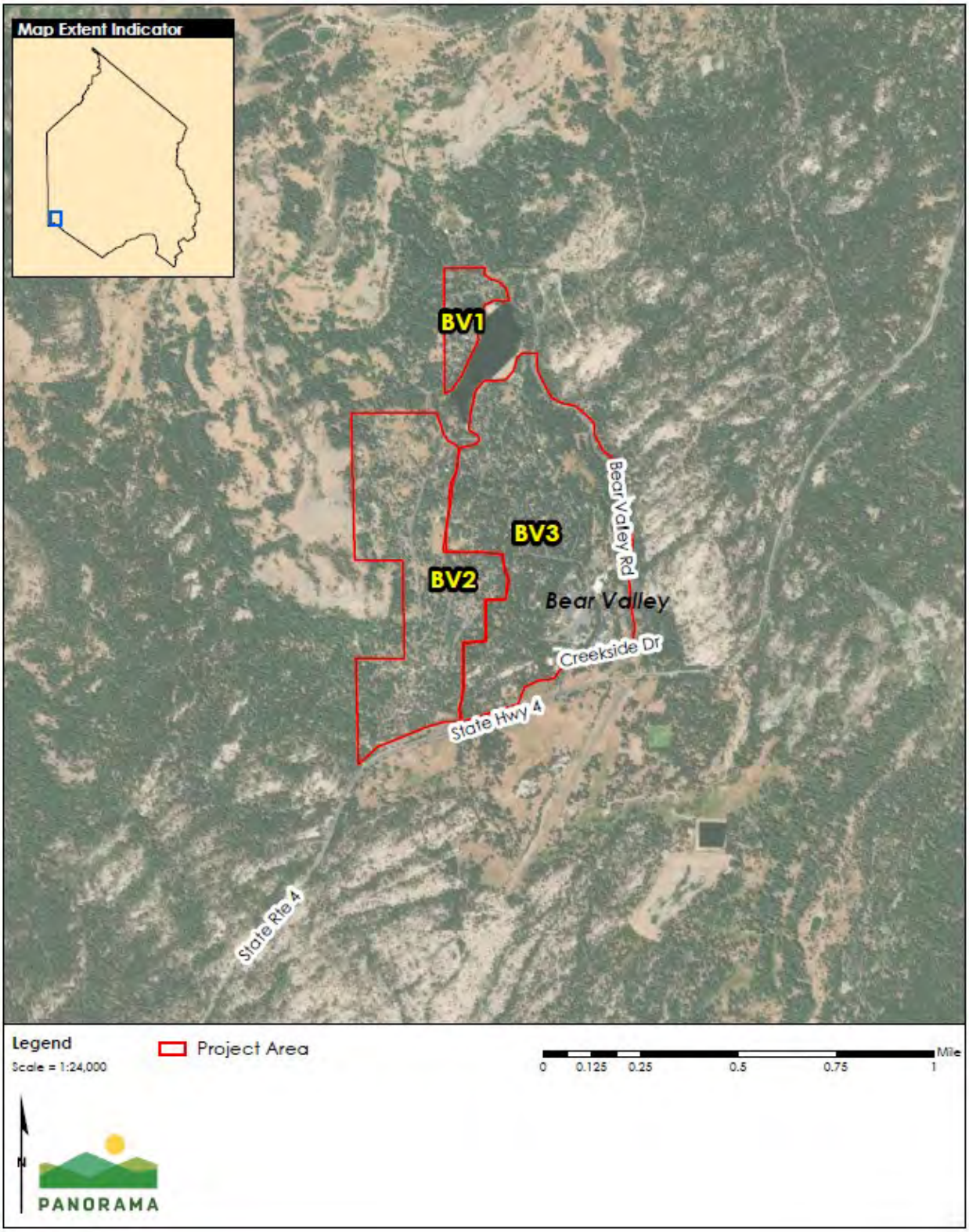


Figure 3-9 Lake Alpine Project Area (Tier 3, Project 10)

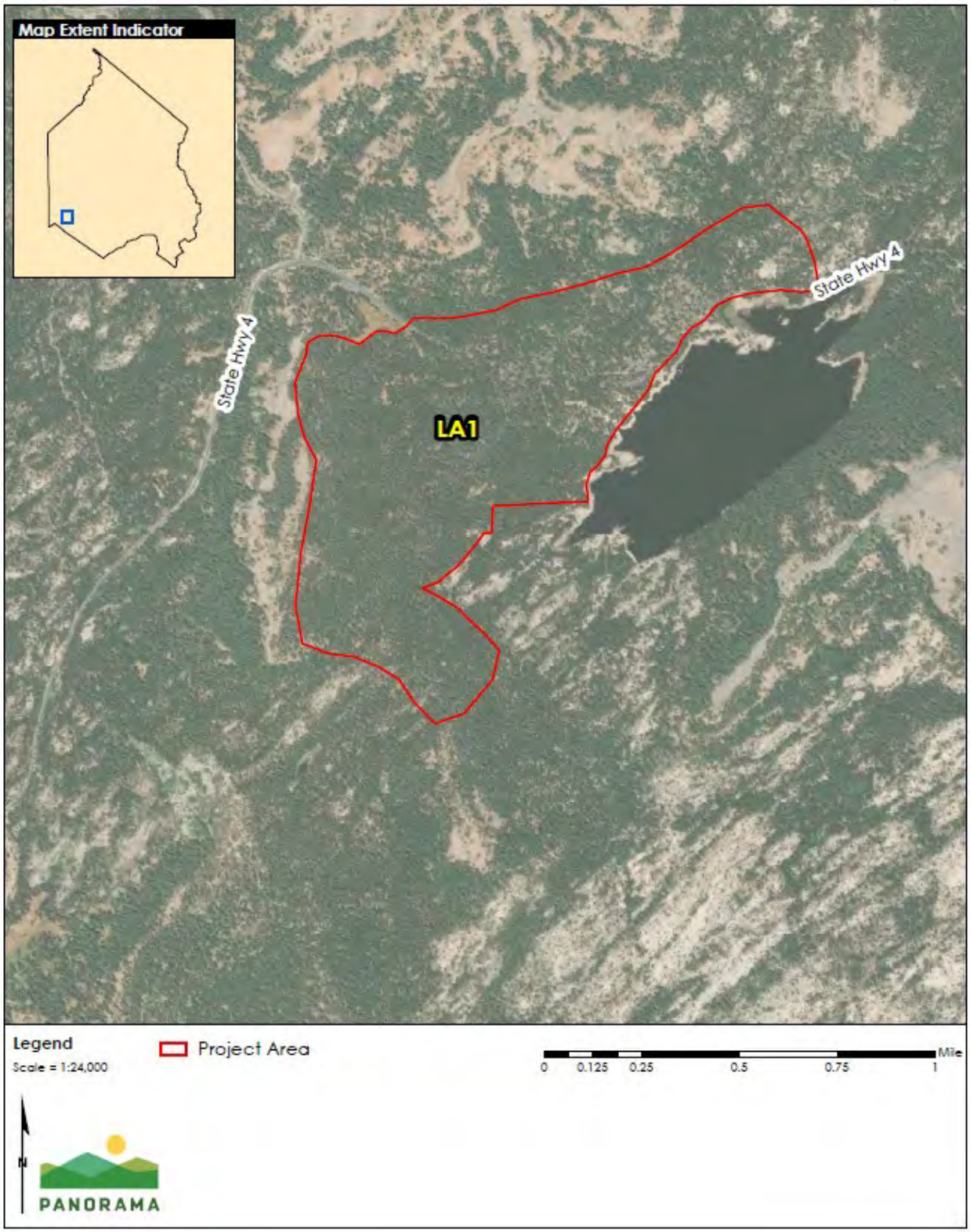


Figure 3-10 Diamond Valley Project Area (Tier 3, Project 11)

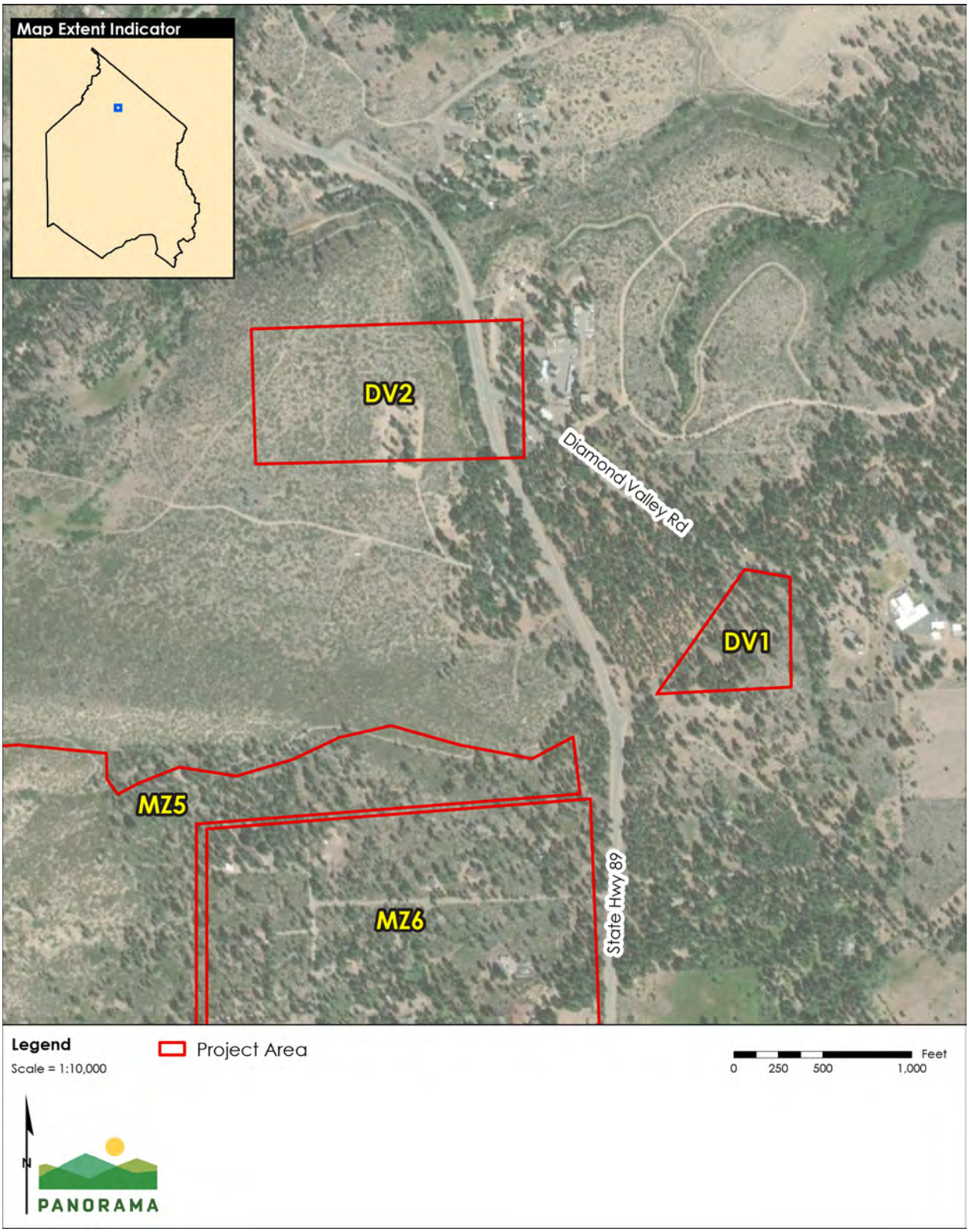
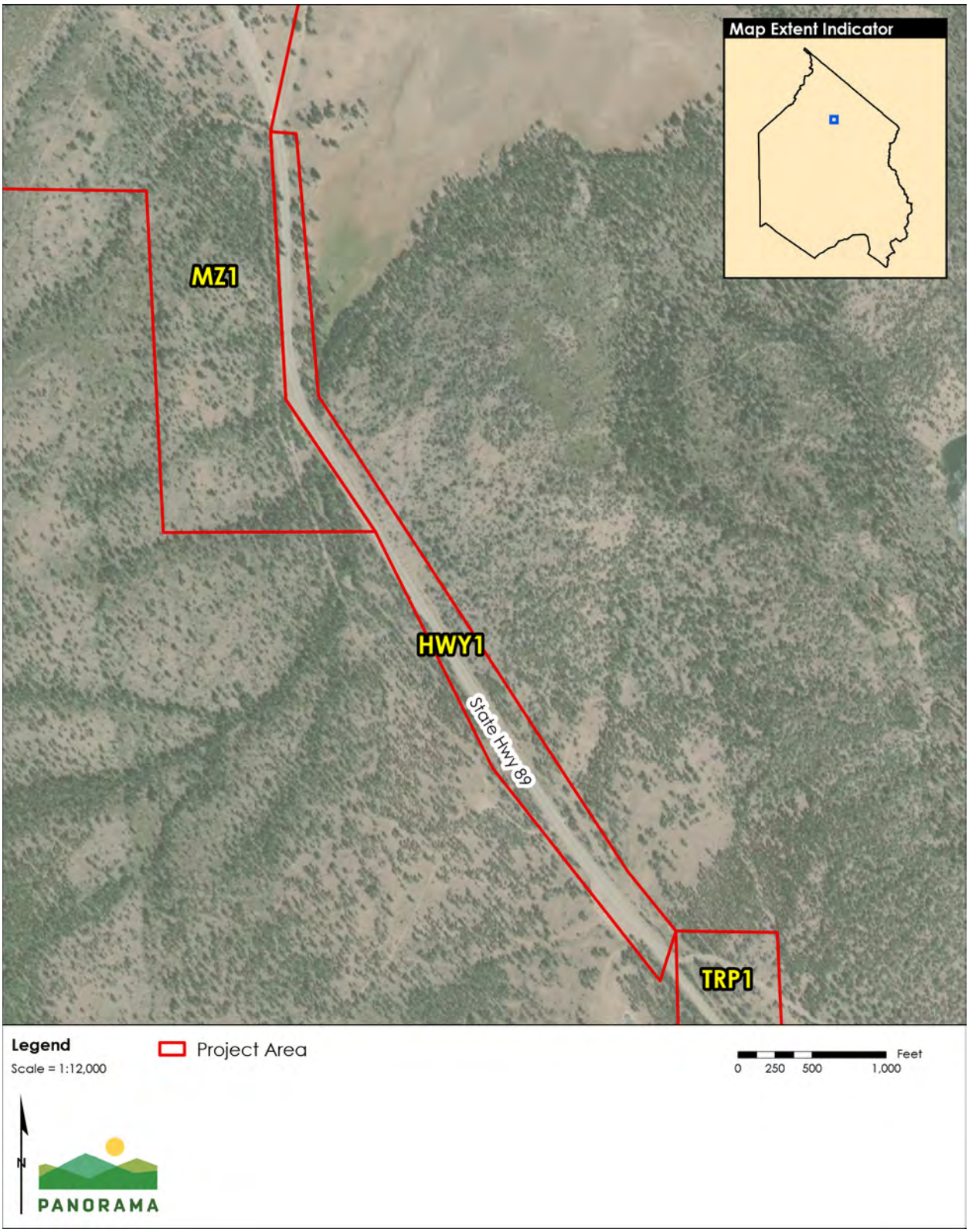


Figure 3-11 Highway 89 Project Area (Tier 3, Project 12)



3.3 Environmental Review Considerations for Risk Mitigation Projects

Projects undertaken by the County or utilizing State or federal funding sources will be subject to environmental review under the California Environmental Quality Act (CEQA) or through the California Forest Practice Rules (Title 14CCR1038(i)). Table 3-2 summarizes the options for environmental review, depending on the project type, location, and environmental resources present. For projects where timber would be harvested and sold or bartered, the project review would be subject to the California Forest Practice Rules and a Timber Harvest Plan or Exemption.

Other key avenues for review include under a currently certified Programmatic Environmental Impact Report (EIR) by CAL FIRE called the Vegetation Treatment Plan (VTP) EIR. This document was certified in December of 2019 and covers many different types of forest management and fuel reduction projects on public and private lands. The VTP EIR does not cover every area within Alpine County, but where the area is covered, a process has been laid out, known as a Project Specific Analysis, to identify how the project can be assessed and coverage documented. The VTP EIR includes mitigation, where if applicable, must be implemented to ensure coverage under the program. Other avenues, if utilizing State funding but if material will not be harvested, is to complete an Initial Study and Mitigated Negative Declaration (IS/MND) or a project specific EIR under CEQA, with the County as the lead agency.

The three Tier 1 projects defined in greater detail in Chapter 4 are all being addressed through a CEQA IS/MND, with the County as lead agency.

Table 3-2 Options for Project Environmental Review under CEQA

CEQA Vehicle	Applicable Land	Other Parameters to Determine Applicability
CAL FIRE Forest Fire Prevention Exemption [1]	Timberland in areas that are moderate, high, or very high CAL FIRE Hazard Severity Mapping [2]	• Limited to maximum 300-acre area • Only trees <30 inches in diameter at stump height[3] may be harvested • Trees between 30 – 36 inches in diameter at stump height[3] may be removed for the purpose of road construction/reconstruction when no other feasible option exists for road activities • Notice of Exemption must be prepared, signed, and submitted by a Registered Professional Forester (RPF) • Work must be completed within 1 year of filing the exemption with CAL FIRE. If burning slash for disposal, burning must be completed within 2 years of filing the exemption.

CEQA Vehicle	Applicable Land	Other Parameters to Determine Applicability
Timber Harvest Plan (THP) CEQA Exemption[5]	Private timberland used for forest logging operations.	• Prepared by RPFs • Notice of Intent to Harvest Timber (Notice of Intent) must be prepared by a RPF if: - (1) any proposed Plan boundary lies within 300 feet of any property not owned by the Timberland owner - (2) any Plan amendment that changes a Plan boundary so that the new boundary lies within three hundred (300) feet of property not owned by the Timberland owner, or - (3) any Plan amendment changes the silvicultural method if a Notice of Intent was required for the Plan by condition (1) or (2) above or, - (4) any overhead electrical power line, except a line from a transformer to a service panel, is present within the Plan area or within two hundred (200) feet outside the Plan boundary, or - (5) any Plan amendment changes a Plan boundary so that any overhead electrical power line, except a line from a transformer to a service panel, is within the new boundary or is within two-hundred (200) feet outside the new Plan boundary.
Modified THP	Private timberland used for forest logging operations.	• On an ownership of 160 acres, or a quarter (1/4) section or less of Timberland • No more than 70 percent of any existing tree canopy layer is to be harvested on parcels 40 acres or less, and not more than 50 percent on parcels 41-160 acres or a quarter (1/4) section • Clearcutting and shelterwood removal, as defined in 14 CCR §§ 913.1(b) and (d) [933.1(b) and (d), and 953.1(b) and (d)] shall not be used
Modified THP for Fuel Hazard Reduction	Private timberland used for forest logging operations.	• Project area not to exceed 2,500 acres • An average of at least 40 percent of the existing overstory tree canopy shall be retained • No operations shall occur in areas having average slopes greater than 50 percent based upon sample areas that are 20 acres in size, and no tractor operations in areas with high or extreme erosion hazard ratings
California Vegetation Treatment Program (CalVTP) EIR Project Specific Analysis	Land identified as treatable area in the CalVTP [4]	• Projects with new impacts that were not analyzed in the CalVTP EIR require additional CEQA review • Projects with more severe impacts than those analyzed in the CalVTP EIR require additional CEQA review

CEQA Vehicle	Applicable Land	Other Parameters to Determine Applicability
Limited Suspension of Requirements of CEQA pursuant to Governor's Proclamation of a State of Emergency (October 20, 2015) [6]	Land identified as high-hazard zone pursuant to Directive 1 of the Proclamation	• Project must be necessary to protect public health and safety • Project involves removal of dead/dying trees that threaten residences, critical community infrastructure, roads and other excavation corridors • Work is completed in accordance with the Guidelines for High Hazard Zone Tree Removal [7]
Senate Bill 901	Federal lands where NEPA review for projects to reduce the risk of high-severity wildfire has been completed	• CEQA would not apply to prescribed fire, thinning, or fuel reduction projects undertaken on federal lands to reduce the risk of high-severity wildfire • SB 901 exemption expires January 1, 2023

1. https://www.fire.ca.gov/media/10411/forest-fire-prevention-exemption-form.pdf
2. https://osfm.fire.ca.gov/divisions/wildfire-planning-engineering/wildland-hazards-building-codes/fire-hazard-severity-zones-maps/
3. Diameter at stump height is measured at 8 inches above ground level
4. CalVTP Treatable Area: https://calfire-forestry.maps.arcgis.com/apps/webappviewer/index.html?id=78782787ae4d459e8cb313141a5c41be
5. 14 CCR § 1031-1052. Timber Harvesting Plan: https://govt.westlaw.com/calregs/Browse/Home/California/CaliforniaCodeofRegulations?guid=I96E74730D48211DEBC02831C6D6C108E&originationContext=documenttoc&transitionType=Default&contextData=(sc.Default)
6. Governor's October 30, 2015 Proclamation of a State of Emergency: https://www.gov.ca.gov/docs/10.30.15_Tree_Mortality_State_of_Emergency.pdf
7. Guidelines for High Hazard Zone Tree Removal: http://www.fire.ca.gov/treetaskforce/downloads/Draft_Tree_Removal_Guidelines_3-1-16.pdf

4 Implementation Plan

4.1 Methods and Tools

4.1.1 Overview

The fuel treatment strategies to be implemented on the three, Tier 1 priority projects include a combination of fuel reduction methods depending on the location, facility access, slope, and types of vegetation. Based on these considerations, the County in consultation with a RPF, developed the approach to reducing fuel loads. Fuel treatment methods to be implemented include mastication and hand thinning. Pile burn may be implemented as a method of fuels disposal. The logging and selling of material are not currently proposed under any priority project.

If logging were to be considered for future fuels reduction projects, the County would prepare a THP or THP Exemption with an RPF. All project activities would occur in a manner consistent with the California Forest Practice Rules. Each of the currently proposed treatment methods for the three priority projects are described here.

4.1.2 Methods

Mastication

Mastication is the main type of mechanical treatment method that would be implemented under the project. Mastication is implemented using a mastication head attached to an excavator, small tractor, or other type of machine. The mastication head is used to chip or shred ladder fuels from brush and small trees (up to 12 inches diameter at breast height [dbh]) in place. Shredded material is either incorporated into the duff layer during operations, left on site, or reduced using a prescribed burn following post-treatment evaluation. Mastication is typically implemented in areas of high brush cover or that need ladder fuel treatment where biomass removal is not feasible.

Mastication would be used for larger scale vegetation removal activities. Mastication requires heavy machinery and would only be implemented in areas of relatively flat, accessible ground. Operations with a traditional masticator generally would not occur on slopes over 30 percent.

Figure 4-1 Rotary Masticator

Photo source: (Spatial Informatics Group, 2020)

Equipment used for mastication may include:

- Excavator, small tractor, or similar machine
- Mechanical mastication head
- Chipper

Hand Thinning

Implementation of hand thinning treatment methods under the project would require the use of powered and non-powered hand tools. Powered hand thinning treatment is completed by an individual or teams using chainsaws, with cut material either chipped, hauled, or piled and burned. Chipping can be done using several types of machines that are both hand- or machine-fed.

Hand thinning methods would be used for thinning stands of small-diameter trees and shrubs. Hand thinning is typically used on trees up to 9 inches in diameter, but most effective for trees up to 6 inches in diameter or shrubs. Hand thinning treatments could be used in areas with up

to 80 percent slope. Hand thinning would be the only method implemented in treatment areas that occur within 100 feet of homes or structures.

Hand tools would be brought to the project site and removed daily. Equipment used for hand thinning treatment methods may include:

- Powered hand tools: brushcutters (metal blade), string trimmers (monofilament plastic line), chainsaws, power pole saws, hedge trimmers
- Non-powered hand tools: loppers, hand pruners, hand saws, hatchets, pulaskis, machetes, brush hooks, brush axes

Figure 4-2 Hand Thinning with Chainsaw

Photo source: (Spatial Informatics Group, 2020)

Pile Burn

Pile burning may be used to remove cut or dead vegetative material where chipping, hauling, or decomposition are not feasible. Piles can be constructed of dry vegetative material, covered, and burned. Piles could vary in size from 5 to 10 feet in diameter and 4 to 6 feet in height.

Figure 4-3 Pile Burn

Photo source: (Spatial Informatics Group, 2020)

Equipment used for pile burn activities may include:

- Approved ignition devices
- Fire hose/water truck
- Hand tools

4.1.3 Access and Staging/Landing

Access to conduct project activities would be entirely from existing roads and trails and no street or lane closures would occur during project implementation. No new permanent access roads are included as part of the project to implement fuel treatment activities. In some cases, access to work sites would not be accessible directly from maintained trails and roads and would be achieved by creating temporary, overland access roads, which include foot trails or using former trails that have grown over and can be cleared for access. Sensitive habitats, creeks, and wetlands would be avoided. Clearing of temporary access roads would not occur when soils are wet. The temporary access roads would not be graded or scraped. Temporary

access roads would be rehabilitated following use, which involves decompacting soils, distributing surrounding litter/duff back on-site, and obscuring entrance points with brush.

All existing roads within the project boundary may be used for project access. Staging activities would occur on treated land within the project boundary near an access point. Staging activities would include overnight storage of mechanical equipment, placement of material piles, and other specific actions for each project site. The expected size of staging areas for equipment storage would be relatively small and would be up to approximately 0.1-acre area. Product material piles would be left in place within the project boundary or adjacent to existing roads if eligible for a local chipping program. Product material would not be stored in wetlands, creeks, drainages, or associated riparian habitats. Erosion and drainage control would be installed as needed.

4.1.4 Personnel to Complete Work

Personnel needed to conduct project activities varies depending upon the project site, activities, treatment methods, and the timing of implementation. The work crew would arrive by van with equipment and supplies delivered by heavy truck. Work crews would be comprised of local personnel who commute to the project site daily.

The number of workers by treatment method is summarized in Table 4-1. The scale of the project activities that would be completed would depend on landowner compliance, funding, and other resource availability. Up to 30 workers, not including additional required pile burn contingency resources, may be conducting fuel treatment activities at a single site.

Table 4-1 Personnel Needed to Implement Treatment Methods

Treatment Method	Crew Size (Average)	Crew Size (Minimum and Maximum)
Mastication	5	2-10
Hand thinning	5	2-10
Pile burning	15	10-30

4.1.5 Timing

Implementation of the activities outlined in the fuel treatment projects would begin after funding is secured. Construction would occur up to 7 days per week. Work activities would take place during daylight hours between the hours of 8:00 a.m. and 6:00 p.m. Monday through Friday, and between 9:00 a.m. and 3 p.m. on Saturday and Sunday. Activities would occur as weather and site conditions permit over the project implementation timeline. Project activities would likely be conducted June through October, due to limitations from the snow season, site access abilities, species protection requirements, permitting and/or landowner restrictions, and official fire season. Project activities would not occur on red flag warning days.

The phasing of project activities will be based on weather conditions and contractor commitments to be determined as part of the contracting process. For purposes of evaluation it

is assumed that fuel treatment activities would occur sequentially on a single site over a period of five months (June-October) each year of 2022-2024, depending on project funding. Implementation of treatment activities may occur simultaneously at the various project areas, requiring several work crews to be operating at different project areas at the same time.

4.2 Project 1: Markleevillage

4.2.1 Description and Location

The Markleevillage project site includes fuel treatment on 300 acres south of Hot Springs Road along Sawmill Road and Pleasant Valley Road. Mastication and hand thinning fuel treatment methods would be implemented throughout the treatment area. Hand thinning only would be implemented in the central region of the site surrounding Pleasant Valley Road. Only hand tools would be used during activities that occur within 100 feet of homes or structures. Mastication would be conducted in most of the site with slopes up to 30 percent. Brush and trees less than 10 inches dbh would be mechanically masticated. All existing woody fuel would be masticated concurrently with treatment of standing fuel ladder vegetation. Steep inclusions over 30 percent would not be treated by mastication. All live and dead vegetation less than 10 inches dbh would be cut, as well as most dead trees over 10 inches dbh. Approximately 90 percent of the shrubs would be treated. Mastication may be implemented where feasible, materials could dispersed by lopping and scattering although the preference will be for small hand pile disposal through pile burning.

4.2.2 Access and Personnel

Main access roads to conduct the work would include Hot Springs Road, Pleasant Valley Road, and Sawmill Road. Staging would be within the project footprint. Given the size of the project, approximately 10 crew members are expected on-site but up to 30 may be needed while pile burning.

4.2.3 Timing

Timing for implementation would be as identified in Section 4.1.5. Work would likely occur in June to October, with a goal of commencing in 2022.

4.3 Project 2: Manzanita

4.3.1 Description and Location

The Manzanita project site includes fuel treatment on 460 acres of open space east of Manzanita Lane and south of Zellmer Lane. The fuel treatment activities would include mastication and hand thinning methods. Only hand tools would be used during activities that occur within 100 feet of homes or structures. Mastication would be conducted only in the northern portion of the site in areas with slope up to 30 percent. Brush and trees less than 10 inches dbh would be

mechanically masticated. All existing woody fuel would be masticated concurrently with treatment of standing fuel ladder vegetation. Steep inclusions over 30 percent would not be treated by mastication. All live and dead vegetation less than 10 inches dbh would be cut and as well as most dead trees over 10 dbh in diameter. Approximately 90 percent of the shrubs would be treated. Chipping may be implemented where feasible and materials could dispersed by lopping and scattering although the preference will be for small hand pile disposal through pile burning.

4.3.2 Access and Personnel

Access would occur via SR 89 and private driveways. Staging would be within the project footprint. Given the size of the project, approximately 10 crew members are expected on-site but up to 30 may be needed while pile burning.

4.3.3 Timing

Timing for implementation would be as identified in Section 4.1.5. Work would likely occur in June to October, with a goal of commencing in 2022 or 2023.

4.4 Project 3: Bear Valley

4.4.1 Description and Location

The Bear Valley project site includes fuel treatment on 130 acres surrounding Quaking Aspen Road, Bloods Ridge Road, and Alpine Way. The fuel treatment would include hand thinning methods within the entire 130-acre area. Fuel reduction activities will be targeted in areas where excess wildfire fuel buildup has occurred. Landscaping will not be altered during these fuel treatment activities. All live and dead target vegetation less than 10 inches dbh would be cut. Approximately 90 percent of the shrubs would be treated. Chipping may be implemented where feasible, otherwise materials will be dispersed by lopping and scattering. No pile burns would be conducted at the Bear Valley site. All work at the Bear Valley treatment area must be done by hand crews due to the slope and inaccessibility of the terrain.

4.4.2 Access and Personnel

Main access roads to conduct the work would include Bear Valley Road, Quaking Aspen Road, Bloods Ridge Road, and Immigrant Road/Alpine Way. Staging would be within the project footprint. Given the size of the project, approximately 10 crew members are expected on-site.

4.4.3 Timing

Timing for implementation would be as identified in Section 4.1.5. Work would likely occur in June to October, with a goal of commencing between 2022 and 2024.

4.5 Environmental Considerations and Review

4.5.1 Biological Resources

Potential Concerns

Biological resources may occur in any of the three project areas and could be negatively impacted by implementation of project activities. Key resources include potential special status plants, listed wildlife species, nesting birds, and aquatic or riparian habitats. Table 4-2 identifies the types of special status species known to occur in the region.

Protection Measures

Prior to implementation of the projects, biological field reconnaissance surveys would be conducted to gain a more complete understanding of the potential resources present and to develop project-specific measures to minimize or avoid impacts. Nesting birds may be the biggest concern.

For all activities that could result in potential noise and other land disturbances that could affect nesting birds (e.g., tree removal, mowing during nesting season, mastication, chipping), treatment sites should be surveyed to evaluate the potential for nesting birds. Trees should be removed outside the nesting season for migratory birds and raptors (typically March through August). If activities that could disturb nesting birds are performed during the nesting season (generally if work is performed from March 1 to August 30), then preconstruction nesting surveys would be performed and any active nests and a buffer area around the nest avoided until the young have fledged. If other species such as amphibians could occur in project areas, a biologist should be on-site to check areas prior to work and to ensure that any individuals found are avoided.

Table 4-2 Potential Special Status Species Found in Alpine County

Common Name	Scientific Name	Status	General Habitat Description
		Insects	
Western bumble bee	*Bombus occidentalis*	USFS sensitive SC	Typically inhabit sandy soil, dunes, and grasslands between 0 and 9,000 feet elevation.
Mono checkerspot butterfly	*Euphydryas editha monoensis*	USFS sensitive	Found in relatively wet meadow and coniferous forest in the Eastern Sierra Nevada and western Great Basin.
		Fish	
Lahontan cutthroat trout	*Oncorhynchus clarkii henshawi*	FT	Cool, well-oxygenated streams that are free of other salmonids. Elevation range between 5,250 and 9,300 feet.
Mountain sucker	*Catostomus platyrhynchus*	SSC	Found in rivers in the Sierra Nevada from Mono County north to Lake Tahoe and Truckee River.
Mountain whitefish	*Prosopium williamsoni*	SSC	Found in rivers in Eastern Sierra Nevada from Mono County north to Lake Tahoe and Truckee River.
Lahontan Lake tui chub	*Siphateles bicolor pectinifer*	SSC	Found in the Lahontan Basin, including Lake Tahoe and Pyramid Lake.
		Amphibians	
Yosemite toad	*Anaxyrus canorus*	FT, USFS sensitive SSC	Restricted to central high Sierra Nevada. Prefers mountain, alpine meadow, lodgepole pine, successional stages of mixed conifer, Jeffrey pine, and red fir typically at elevations between 4,000 to 11,200 feet.
Sierra Nevada yellow-legged frog	*Rana sierrae*	FE, USFS sensitive ST, CDFW watchlist	Associated with streams, lakes, and ponds in montane riparian, lodgepole pine, subalpine conifer, and wet meadows. Breeds in shallow water in low gradient perennial streams and lakes.
Foothill yellow-legged frog	*Rana boylii*	USFS sensitive, BLM sensitive SC, SSC	Found in usually subalpine to alpine ponds, streams, and adjacent meadows.
Southern long-toed salamander	*Ambystoma macrodactylum sigillatum*	SSC	Inhabit submerged shoreline areas of small lakes, seasonal ponds, and vernal pools.

Common Name	Scientific Name	Status	General Habitat Description
Northern leopard frog	*Lithobates pipiens*	SSC	Found in a variety of aquatic habitats ranging from low elevation irrigation ditches to subalpine lakes.
		Birds	
Great gray owl	*Strix nebulosa*	USFS sensitive SE	Found in mixed conifer or red fir forest habitat, in or on edges of meadows. Requires large diameter snags in a forest with high canopy closure.
Willow flycatcher	*Empidonax traillii*	FE, USFS sensitive, BCC SE	Found nesting in extensive willow riparian scrub stands, often near wet meadow habitat.
Bald eagle	*Haliaeetus leucocephalus*	Federally delisted, BLM sensitive, USFS sensitive, BCC SE, FP	Typically found nesting in large trees, often pines, often within 1 mile of water.
Northern goshawk	*Accipiter gentilis*	BLM sensitive, USFS sensitive SSC	Found nesting in expansive stands of relatively closed coniferous forest in elevation ranging 1,000 to 10,800 feet.
Black swift	*Cypseloides niger*	BCC SSC	Typically nests near water on steep canyon walls, usually in close proximity to a waterfall.
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	Typically nests at lakeshores and other large freshwater emergent marsh habitats. May nest in open riparian delta habitat at lakes.
Sharp-shinned hawk	*Accipiter striatus*	WL	Found nesting in mixed coniferous or hardwood forest, sometimes in tree clumps in scrub habitat.
American peregrine falcon	*Falco peregrinus anatum*	Federally delisted, BCC State delisted, FP	Found nesting on cliffs and sometimes urban structures including high-rise buildings.
Osprey	*Pandion haliaetus*	WL	Nests in large trees; forages at aquatic and riverine habitats.

Common Name	Scientific Name	Status	General Habitat Description
		Mammals	
Fisher – west coast DPS	*Pekania pennanti*	BLM sensitive, USFS sensitive ST, SSC	Typically found in intermediate to large-tree stages of coniferous forests and deciduous-riparian areas with high percent canopy closure. This species uses cavities, snags, logs and rocky areas for cover and denning. This species requires large areas of mature dense forest.
California wolverine	*Gulo gulo*	Proposed FT, USFS sensitive ST, FP	Found in many remote habitats, particularly in high elevation Sierra Nevada and northern Coast Ranges.
Sierra Nevada red fox	*Vulpes vulpes necator*	FC, USFS sensitive ST	Typically inhabit forest and forest gaps in high elevation central Sierra Nevada. Recent sightings indicate may use lower elevations in Eastern Sierra Nevada.
Sierra Nevada mountain beaver	*Aplodontia rufa californica*	SSC	Found in burrow systems along streams in coniferous riparian forest with areas of dense scrub and understory herbs.
Western white-tailed jackrabbit	*Lepus townsendii townsendii*	SSC	Typical habitats include sagebrush scrub and open coniferous forest in elevations ranging 6,400-11,000 feet.
Sierra marten	*Martes caurina sierrae*	USFS sensitive	Found in closed-canopy forest with snags and downed tree boles, usually old growth coniferous, in the Cascades and Sierra Nevada ranges.
Fringed myotis	*Myotis thysanodes*	BLM sensitive, USFS sensitive	Typically found in roosts and nursery colonies in caves, mines, sometimes abandoned buildings, and forages over meadow, scrub vegetation or water.
American badger	*Taxidea taxus*	SSC	Found in a variety of relatively dry and open scrub, forest and grassland habitats.
Spotted bat	*Euderma maculatum*	SSC	Roost and natal colonies occur in crevices and caves; typically forages at lakeside and riverine habitats.
		Plants	
Hall's meadow hawksbeard	*Crepis runcinate* ssp. *Halli*	2B.2	Found in moist, alkaline valley bottoms at elevations between 375 – 2,100 feet.

Common Name	Scientific Name	Status	General Habitat Description
Mountain bent grass	*Agrostis humilis*	2B.3	Typically found in open alpine slopes, subalpine meadows, and sometimes openings in coniferous forest
Upswept moonwort	*Botrychium ascendens*	USFS sensitive 2B.3	Found in seeps, moist meadows and shaded to open subalpine forest.
Scalloped moonwort	*Botrychium crenulatum*	USFS sensitive 2B.2	Typically found in seeps, moist and shaded stream margins.
Mingan moonwort	*Botrychium minganense*	USFS sensitive 2B.2	Found in seeps and moist soil at partly to deeply shaded forest and meadow margins.
Davy's sedge	*Carex davyi*	1B.3	Found in meadows, often moist slopes in subalpine and upper montane coniferous forest.
Porcupine sedge	*Carex hystericina*	2B.1	Typically found within perennially wet soil at marshes and swamps.
Mud sedge	*Carex limosa*	2B.2	Found in bogs, including floating sphagnum bogs.
Liddon's sedge	*Carex petasata*	2B.3	Found in upland broadleaf and coniferous forests, pinyon-juniper woodland, and meadows.
Western valley sedge	*Carex vallicola*	2B.3	Found in moist forested slopes and scrub at margins of meadows.
Alpine dusty maidens	*Chaenactis douglasii* var. *alpina*	2B.3	Typically found in alpine forest and meadows, and open areas including talus and crevices.
Fell-fields claytonia	*Claytonia megarhiza*	2B.3	Found in alpine boulder fields, rock crevices, and gravelly subalpine forest.
Great Basin claytonia	*Claytonia umbellate*	2B.3	Typically found in rocky subalpine coniferous forest, including talus and crevices.
Fiddleleaf hawksbeard	*Crepis runcinata*	2B.2	Found in moist meadow margin, usually alkaline clays.
Subalpine cryptantha	*Cryptantha crymophila*	1B.3	Found in subalpine coniferous forest, often in volcanic soil in forest gaps and scree.
Tahoe draba	*Draba asterophora*	USFS sensitive 1B.2	Typically found in alpine rocks and scree, and crevices.
Tall draba	*Draba praealta*	2B.3	Found in subalpine and alpine meadows and seeps.

Common Name	Scientific Name	Status	General Habitat Description
Scribner's wheat grass	*Elymus scribneri*	2B.3	Typically inhabit alpine fellfields and scree.
Subalpine fireweed	*Epilobium howellii*	4.3	Found near lake shores, wet meadows and seeps.
Marsh willowherb	*Epilobium palustre*	2B.3	Found near lake shores and marshy areas in wet meadows.
Jack's wild buckwheat	*Eriogonum luteolum* var. *saltuarium*	USFS sensitive 1B.2	Typically found in upland woodlands and coniferous forest, sandy soil, and sometimes disturbed habitat.
Carson Valley monkeyflower	*Erythranthe carsonensis*	1B.1	Typically found within sagebrush scrub and bitterbrush scrub, and often moist soil.
Robbins' pondweed	*Potamogeton robbinsii*	2B.3	Found in perennial aquatic habitats, marshes, and lake margins.
Water bulrush	*Schoenoplectus subterminalis*	2B.3	Found within aquatic habitats at lake margins and bogs.
Cream-flowered bladderwort	*Utricularia ochroleuca*	2B.2	Typically found in bogs, wet meadows and seeps and in acidic habitat.
Golden violet	*Viola purpurea* ssp. *aurea*	2B.2	Found in pinyon-juniper woodland, sagebrush scrub, and often sandy habitats.
Blandow's bog moss	*Helodium blandowii*	USFS sensitive 2B.3	Typically found along lake shores and streambanks.
Tahoe yellow cress	*Rorippa subumbellata*	USFS sensitive SE 1B.1	Typically found within sandy lake margins at Lake Tahoe.
Galena Creek rockcress	*Arabis rigidissima* var. *demote*	USFS sensitive 1B.2	Typically found in partial shade in subalpine red fir or white pine forest.
Bolander's candlemoss	*Bruchia bolanderi*	USFS sensitive 4.2	Found in moist grassy areas, recently eroded banks of streams, trailside, and often shaded habitats.
Blandow's bog moss	*Helodium blandowii*	USFS sensitive 2B.3	Typically found along lake shores and streambanks.
Broad-nerved hump moss	*Meesia uliginosa*	USFS sensitive 2B.2	Typically found along lake shores, streambanks, and wet meadows.

Common Name	Scientific Name	Status	General Habitat Description
Three-bracted onion	*Allium tribracteatum*	USFS sensitive 1B.2	Found in coniferous forest, meadows, often openings at ridgelines, and volcanic soil.
Western goblin	*Botrychium montanum*	USFS sensitive 2B.1	Found at least seasonally moist soil at seeps and streambanks in shaded forest.
Male fern	*Dryopteris filix-mas*	2B.3	Typically found in granite cliffs with deep crevices.
Stebbins' lomatium	*Lomatium stebbinsii*	USFS sensitive 1B.1	Found in openings at ridgelines in coniferous forest, volcanic soil, and often seasonally moist clay.
		Mollusks	
Great Basin rams-horn	*Helisoma newberryi*	USFS sensitive	Found in mud substrate in large lakes and slow-flowing rivers.
Aquatic felt lichen	*Peltigera gowardii*	USFS sensitive 4.2	Typically found in submerged rocks or streamside, possibly open sunny meadows.
		Bryophytes	
Holzinger's orthotrichium moss	*Orthotrichium holzingeri*	1B.3	Found within perennial streams, on shaded streamside rocks or in-stream boulders.

Common Name	Scientific Name	Status	General Habitat Description

Notes:

Potential species search based on CNDDB and U.S. Fish and Wildlife Service (USFWS) species lists for the Heenan Lake, Wolf Creek, Markleeville, Carson Pass, Pacific Valley, Ebbetts Pass, Carters Station, Freel Peak, Minden, South Lake Tahoe, Tamarack, Mokelumne Peak, Bear River Reservoir, Calaveras Dome, Boards Crossing, Liberty Hill, Donnell Lake, Spicer Meadows Reservoir, Pacific Valley, and Woodfords quadrangles.

Abbreviations:

Federal: USFWS listings under the Endangered Species Act

FT: Federally listed as threatened

FE: Federally listed as endangered

FC: Federal candidate

FC-T: Federal candidate – threatened

FC-E: Federal candidate – endangered

BCC = Birds of Conservation Concern

State: California Department of Fish and Wildlife (CDFW) listings under the California Endangered Species Act

ST: State listed as threatened

SE: State listed as endangered

SC: State candidate

SSC: CDFW Species of Special Concern

FP: Fully Protected

California Native Plant Society (CNPS) listings

1B: Rare and endangered in California and elsewhere

2B: Rare, threatened or endangered in California, but more common elsewhere

4: Watchlist species of limited distribution Threat Code extensions:

.1 – Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)

.2 – Fairly endangered in California (20-80% of occurrences threatened)

.3 – Not very endangered in California (< 20% of occ's threatened or no current threats known.

4.5.2 Cultural Resources

Archaeological resources can be impacted by use of heavy equipment and any activity that results in ground disturbance. A cultural resources survey would be required prior to performing work, with identification of the appropriate measure to address and protect any resources discovered. Measures would likely include avoidance with an appropriate buffer given the resources or use of hand tools only, around the resource.

4.5.3 Fire Protection and Safety

While the purpose of the work is to reduce wildfire risks, conducting the work brings personnel and equipment into the WUI. Fire protection would be ensured through the requirement that all personnel are trained in fire protection safety and that they always maintain firefighting equipment on their person or vehicles. Special precautions would also apply, including obtaining the appropriate approvals, for pile burning.

4.6 Estimated Cost and Funding Sources

4.6.1 Estimated Costs

The following table summarizes estimates of costs by types of treatments. These costs are rough estimates based on input from a few different Bay Area jurisdictions that implement similar treatments in similar landscapes. These are only meant to be estimates and costs may deviate depending on individual site conditions, contracted labor, demand, and other factors.

Table 4-3 Estimates of Cost by Treatment Types

Treatment Type	Estimated Costs per Acre
Mastication and mechanical removal and pile burning	$1,500 to $3,500 per acre
Hand thinning	$3,500 to $5,000 per acre
Prescribed burning	$1,500/acre

Very rough estimates of costs per project are as follows, based on an average cost of $3,500 an acre per project.

- **Markleevillage**: $1,050,000
- **Manzanita:** $1,610,000
- **Bear Valley:** $455,000

Costs presented here are not meant to be a binding bid price but a rough ballpark estimate. Pricing of actual work will be specific to the time and location of the work. Additionally, estimated treatment acreage within each project area includes acreage of existing roads, landscaped yards, maintained defensible space, and structures; the amount of actual acreage to be treated within each project is expected to be reduced during project implementation to avoid areas that would not receive treatment. Treatment of acreage on private property would be

determined in consultation with the landowner and documented through a memorandum of understanding or similar agreement. Actual costs should be determined by obtaining detailed estimates from prospective contractors.

4.6.2 Potential Funding Sources

Funding sources are available at the regional, State, and even federal level. Opportunities will likely vary by year, depending upon the financial conditions at the time of application. Most grants are competitive and have varying qualifications. A summary of grant programs available is provided in the table, below.

Table 4-4 Potential Grant Opportunities for Fuel Management Projects

Type of Grant	Grant Issuing Agency	Grant/Program	Summary of Qualifying Projects	Funding
Applicable to Wildland Fire Planning and Fire Modeling/ Implementation	CAL FIRE	California Climate Investments (CCI) Fire Prevention Grant Program	Qualifying projects and activities include those related to hazardous fuel reduction and removal of dead, dying, or diseased trees, fire prevention planning, and fire prevention education.	Funding was eliminated for the Fiscal Year (FY) 2020-21 cycle. It may be available again in future years.
Forest Management	CAL FIRE	California Forest Improvement Grant Program	Projects are non-commercial operations typically used to modify sub-merchantable trees or ones with no commercial value. Technical and financial assistance for planning, reforestation and resource management investments that improve the quality and value of forestland. If a new Forest Management Plan is needed, then the program can provide cost share funding for its completion by a private Registered Professional Forester. Funding provided by the Wildfire Resiliency Program Block Grant (Prop 68).	Competitive Grant Cost sharing 75/25 (90/10 under some circumstances); no cost sharing with any other federal grant for the same acreage/area (Natural Resources Conservation Service, USDA, likely USFS). This is landowner cost sharing.
Fuel Management	CAL FIRE	California Climate Investments (CCI) Forest Health Grant Program	Qualifying projects must: Focus on large, landscape-scale forestlands composed of one or more landowners, which may cover multiple jurisdictions. Large landscapes usually mean sub-watersheds, firesheds, or larger logical management units. Maintain a net reduction of established greenhouse gas emissions levels as calculated by the California Air Resources Board's methodology and testing. Be designed to ensure the project benefits are as permanent as possible. Types of activities may include: Forest fuels reduction; Prescribed fire; Pest management; Reforestation; Biomass utilization; Conservation easements and/or land acquisition through the Forest Legacy Program; Research as a component, or stand-alone through the Forest Research Program.	Competitive grant

Type of Grant	Grant Issuing Agency	Grant/Program	Summary of Qualifying Projects	Funding
Local Hazard Mitigation Plan (LHMP) and Implementation of Fuel Management Projects	FEMA/Cal OES	Hazard Mitigation Grant Program 404	Provides funding for long-term hazard mitigation measures following major disaster declarations. Funding is available to implement projects in accordance with State, territorial, federally recognized tribal, and local priorities. Subapplicants must be tribes, state agencies, tribal agencies, local governments (city, county, special districts), and some private nonprofits. Must have a FEMA-approved and locally-adopted LHMP or be part of Multi-Jusidictional Hazard Mitigation Plan. Eligible planning activities include new or updates to plan, Safety Element, Community Wildfire and Flood Protection Plan, General Plan, Plan annex for climate adaptation, etc. Priority given to impacted counties with disaster declarations. Non-impacted counties can apply under Priority 3, Hazard Mitigation Planning, and Priority 4, Post Fire Mitigation Activities for the 2020 grant. A Cal OES/FEMA-approved LHMP is required prior to requesting funding for a wildland fire/veg management planning activity or implementation activity. Can also apply for LHMP funding. Note that implementation projects are preferred.	Yes, 75/25 (monetary caps as well)
LHMP and Implementation of Fuel Management Projects	FEMA/Cal OES	BRIC (Building Resilient Infrastructure Communities) (previously called the Pre-Disaster Mitigation Grant)	Provides funding to develop a new or updated FEMA-approved and locally-adopted LHMP, and implementation of hazard mitigation projects. Provides funds on an annual basis for hazard mitigation planning and the implementation of mitigation projects. FEMA provides funding for measures to reduce or eliminate overall risk from natural hazards. A Cal OES/FEMA-approved LHMP is required prior to requesting funding for a wildland fire/veg management planning activity or implementation activity. Can also apply for LHMP funding. Note that implementation projects are preferred.	Yes, 75/25

Type of Grant	Grant Issuing Agency	Grant/Program	Summary of Qualifying Projects	Funding
Implementation of fuel management projects in CWPP	California Fire Safe Council; State Fire Assistance Program; U.S. Forest Service, Pacific Southwest Region	Under the terms of Grant number 18-DG-11052012-134	Projects must be in the wildland urban interface (WUI) and protecting an officially designated Community-at-Risk (CAR). Programs, projects, or activities must address areas identified and prioritized in a CWPP or equivalent document.	Yes, 50/50 (monetary cap of $200k per org)

4.7 Implementation of Other Projects Identified in the WRMP

4.7.1 Vegetation Treatment Methods

The implementation for the three Tier 1 projects describes several methods and techniques that would also apply to the Tier 2 and Tier 3 projects identified in this plan. Other projects in this plan could also be implemented; however, would require an additional planning process to better define the projects and to conduct the environmental review.

Chapter 3 also identifies large areas of opportunity for prescribed fire across multiple land ownerships. Prescribed fire is a land management tool that can be used to:

- Restore fire to the landscape, simulating prior natural processes,
- Reduce unnaturally high accumulations of vegetation,
- Decrease the risk and severity of unwanted wildland fires in the future,
- Lessen the potential loss of life and property,
- Control many undesirable plant species, plant diseases, and pest insects,
- Create and enhance wildlife habitat and increase availability of forage,
- Promote the growth of native trees, wildflowers and other plants, and
- Expose mineral-rich soil and recycle plant nutrients back to the soil.

Prescribed fire activities could be implemented in accordance with a pre-written plan (Burn Plan) that identifies land management goals and specific fire use strategies to safely achieve those goals, with prior approval by the applicable regulatory agencies. Burn Plans address characteristics of the land being treated (like topography and vegetation type) and include carefully defined and required parameters to initiate a prescribed fire for temperature, humidity, wind, moisture of the vegetation, and conditions for the dispersal of smoke. The Burn Plans also specify how the fire will be applied, by whom, and what fire control people and equipment must be on-scene before the burn can commence. After the Burn Plan is complete and conditions are right, a prescribed burn can proceed under the supervision of a qualified Burn Boss. Low intensity fire is skillfully applied to selectively burn fuels like dead wood, brush, forest understories, and grassland. Prescribed burning project may also require environmental review either under CEQA, NEPA, or both.

4.7.2 Development of Future Projects

Table 4-5 defines the general procedure the County would use to determine the prioritization, size and scope of future projects completed under the WRMP. Participation from private landowners is vital to the success of future projects, and is discussed in detail in Section 4.7.3.

Table 4-5 Development of Future Projects

Phase	Description
1. **Prioritize Future Projects**	The County will prioritize future projects based on wildfire risk as well as the level of property owner engagement and likely participation in the project activities. Private landowner participation is essential to the viability of many Tier 2 and Tier 3 projects because the majority of land to be treated occurs on privately owned parcels. If two projects have a similar level of wildfire risk, the amount of private landowner participation will influence the County's prioritization of the projects.
2. **Define Project Boundaries**	Project treatment areas and boundaries will be developed based on project funding, the vegetation type and density, and participation of landowners.
3. **Complete Environmental Resource Surveys**	The County will hire experienced biological and cultural resource consultants to complete resource assessments within the project areas. Resource assessments will include records searches, literature reviews, agency and tribal consultation, and surveys of the project areas by personnel on foot. Right of entry to private parcels will be critical for completing this phase of project implementation.
4. **Refine Project Boundaries to Avoid Environmentally Sensitive Areas**	The County will refine the project boundaries based on information obtained during the records searches, literature reviews, agency and tribal consultation, and surveys. Areas where resources may be negatively affected by project activities would be avoided during project implementation.
5. **Define Location of Specific Treatment Methods within Project Boundary**	The County will develop a plan that identifies treatment methods to be used within the project boundary. Treatment methods will be determined in consideration of project-specific objectives, as well as site conditions, including topography, accessibility, vegetation community and habitat type, and residential density. The plan will be discussed with all participating landowners and agreements will be documented with a memorandum of understanding or similar agreement between the County and landowners.
6. **Ensure Consistency with WRMP CEQA Documentation**	The County will complete an Initial Study checklist to determine if the impacts considered in the WRMP Initial Study/Mitigated Negative Declaration and required mitigation measures adequately address and mitigate impacts of the future project to a less than significant level. If the future project does not result in new effects or require new mitigation measures, the County can approve the activity as being within the scope of the project covered by the WRMP Initial Study/Mitigated Negative Declaration and no new environmental document would be required (CEQA Guidelines, Section 15168). If the future project is not consistent with the WRMP Initial Study/Mitigated Negative Declaration, then the County may consider other CEQA compliance options identified in Table 4-1 of this WRMP.

4.7.3 Community Participation in Tier 2 and Tier 3 Projects

Overview of Outreach Efforts

The County completed significant outreach and coordination efforts with private landowners within the Tier 1 project boundaries. Private landowner participation was required to obtain right-of-entry onto private parcels to conduct biological and cultural resource surveys. Future Tier 2 and Tier 3 projects will require similar participation from private landowners, as many of the Tier 2 and Tier 3 projects occur on private land. A community outreach procedure has been

defined Table 4-6 and will be used to complete landowner outreach within Tier 2 and Tier 3 project areas.

Landowner Participation During Environmental Review

The County has prepared an environmental compliance document pursuant to CEQA for this WRMP. Biological and cultural resource surveys must be completed on all land that would be treated as part of the WRMP, as described in Phase 3 in Table 4-5. Surveys were completed for the Tier 1 projects during the preparation of the WRMP. Biological and cultural resource surveys would be required during the definition of future projects (e.g., Tier 2 and Tier 3 projects). Private landowners must opt-in to future projects and agree to have their land surveyed for resources.

The County and Steering Committee, particularly members from local non-governmental organizations, will be the main parties responsible for outreach to private landowners. The County has developed a Right of Entry Agreement and Frequently Asked Questions (FAQ) sheet to help educate landowners about the project activities that would be conducted on private property during the environmental review phase of the project. Table 4-6 identifies the County's outreach actions toward obtaining right-of-entry onto private landowners' parcels and the timing of each action. The optimal time to conduct biological surveys within Alpine County is from late June to late August, depending on snow melt and late spring precipitation conditions. The timing in Table 4-6 is developed with the assumption that a target survey date is July 1.

Landowner Participation in Definition of Treatment Methods

The County would meet with landowners to discuss the potential treatment methods that landowners would approve for use on their property, as described in Phase 5 in Table 4-5. The goal of public outreach would be to obtain agreements with private landowners to complete vegetation treatment activities on 100 percent of the landowners' parcel that opted into the environmental resource survey phase of the projects. Outreach for the purpose of defining the treatment methods could be completed at the same time as the environmental resource survey phase (Phase 3, described above).

If landowner outreach for the purpose of defining treatment methods is completed after the environmental resource survey phase (Phase 3), the County would conduct the outreach via community workshop or meeting, email or phone conversations, or one-on-one discussions with landowners.

Treatment methods that are approved on each parcel would be documented through a memorandum of understanding or similar agreement between the County and landowner.

Table 4-6 Outreach Actions and Timing

Action	Responsibility	Timing
Environmental Review/Surveys		
Mail Right of Entry Agreement and FAQ Mail the outreach letter, FAQ and Right of Entry Agreement to landowners within the project boundary using first class mail.	County	January
Activate Phone Trees Activate phone trees within the project area communities to try to get landowner participation up to 80 percent.	County and Steering Committee	May
Target Specific Landowners Lean on Kris Hartnett, Michael Barton, and Terry Woodrow to spread the word to targeted landowners through the Alpine Fire Safe Council, Alpine Biomass Collaborative, and Bear Valley Incorporated Homeowners Association.	Steering Committee	May 15 -June 1
Certified Mail to Large Landowners Mail the Right of Entry Agreement and FAQ via certified mail to large landowners within project areas who are unresponsive to previous outreach attempts.	County	June 1
Definition of Treatment Methods per Parcel		
Community Workshop or Meeting The County will hold a community workshop with landowners within a specific project area to be treated. The workshop/meeting would be held in person or via web conference platform (e.g., Zoom). Email and first class mail correspondence would be used to inform landowners of the workshop/meeting.	County and Steering Committee	Concurrently with outreach actions above, or prior to Phase 6
Targeted Phone Calls and Emails The County would conduct targeted outreach to landowners that were present at the Community Workshop/Meeting. One-on-one meetings may be necessary to discuss parcel-specific treatment methods.	County and Steering Committee	Concurrently with outreach actions above, or prior to Phase 6

5 Community Access Risk Assessment

5.1 Ingress/Egress and Community Evacuation Area Identification

Alpine County's population is focused in the five communities of Woodfords, Hung-A-Lel-Ti, Markleeville, Kirkwood, and Bear Valley. During the HRVA characterization and analysis, Alpine County officials helped identify and designate primary ingress and egress routes, secondary ingress and egress routes, and community evacuation areas or refuge areas. As part of the risk assessment completed for the WRMP, the County reviewed constraints to access and adequate evacuation areas for vulnerable communities.

5.1.1 Ingress/Egress

Primary ingress and egress routes are generally major highways and roadways that can facilitate the movement of many emergency vehicles into an incident while moving much of the public out of harm's way. Secondary routes are generally understood as alternate routes if primary routes become inundated with traffic or access is blocked. It should be noted that traffic flow modeling was not performed to determine ingress/egress capacity. Designation was performed by County staff with knowledge of the County highway and road system and what those routes could most likely support during an incident.

Figure 5-1 highlights where ingress and egress routes have been designated by Alpine County officials. Figure 5-2 focuses on access in Woodfords as an example of what these emergency assets look like at a smaller scale. Grover Hot Springs, Shay Creek, and Markleevillage share Hot Springs Road as a single ingress/egress route; however, options for feasible secondary evacuation routes are constrained by terrain and significant distances to a higher functional class route. Similarly, the Sherman Acres, Old and New Bear Valley subdivisions, and Bear Valley Mountain Resort have single access to the State highway system. All of the communities discussed above are surrounded by mountainous terrain. The most feasible secondary access alternatives would need to parallel the primary evacuation route, due to site constraints, and would not create safer evacuation conditions.

Since establishing secondary ingress and egress to vulnerable communities is not feasible, due to site constraints, the recommended mitigation action to provide emergency egress is to ensure adequate vegetation setbacks from roads are established and maintained. Vegetation management along access routes is discussed further in Section 5.2.

Figure 5-1 Designated Safety Zones and Areas in Alpine County

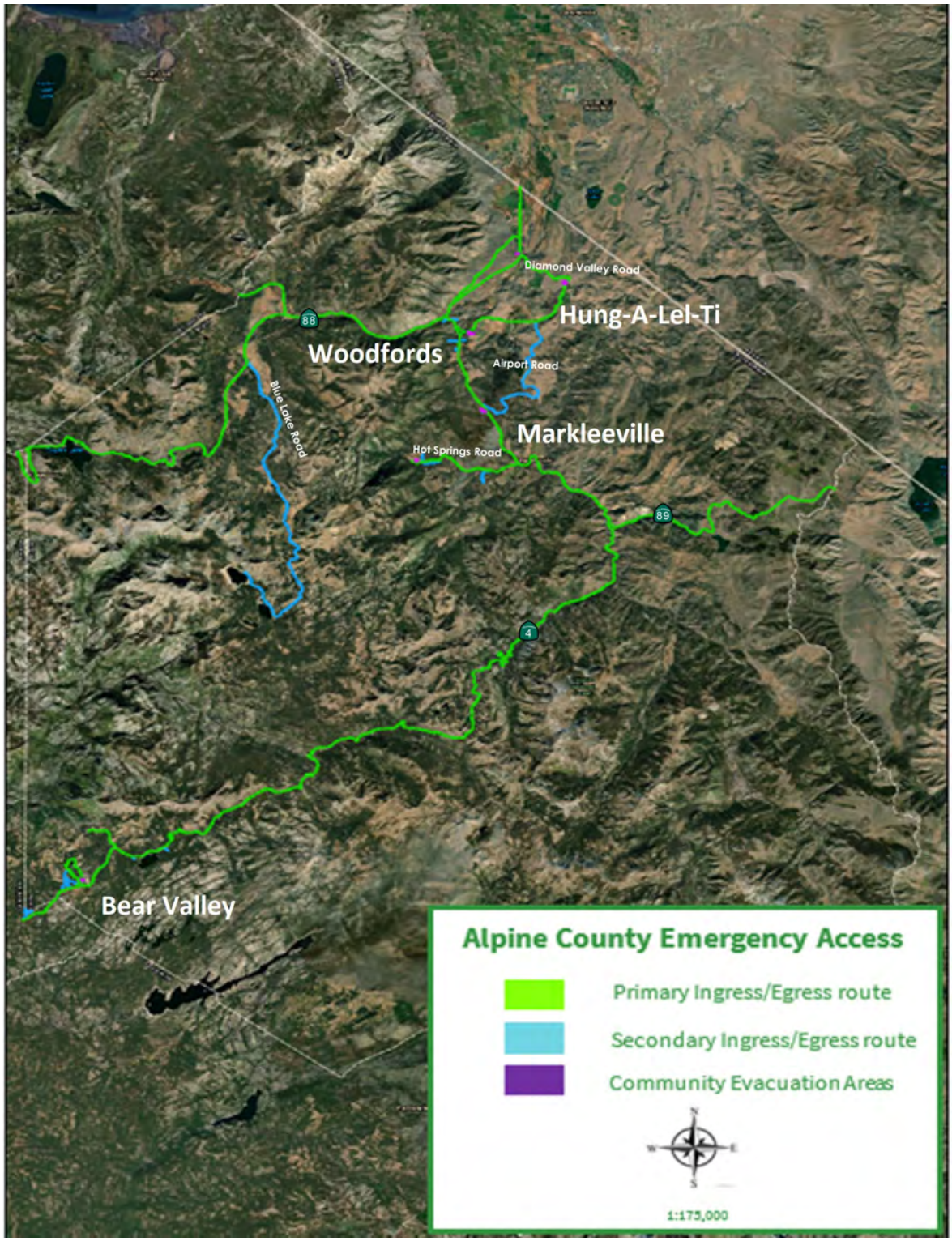
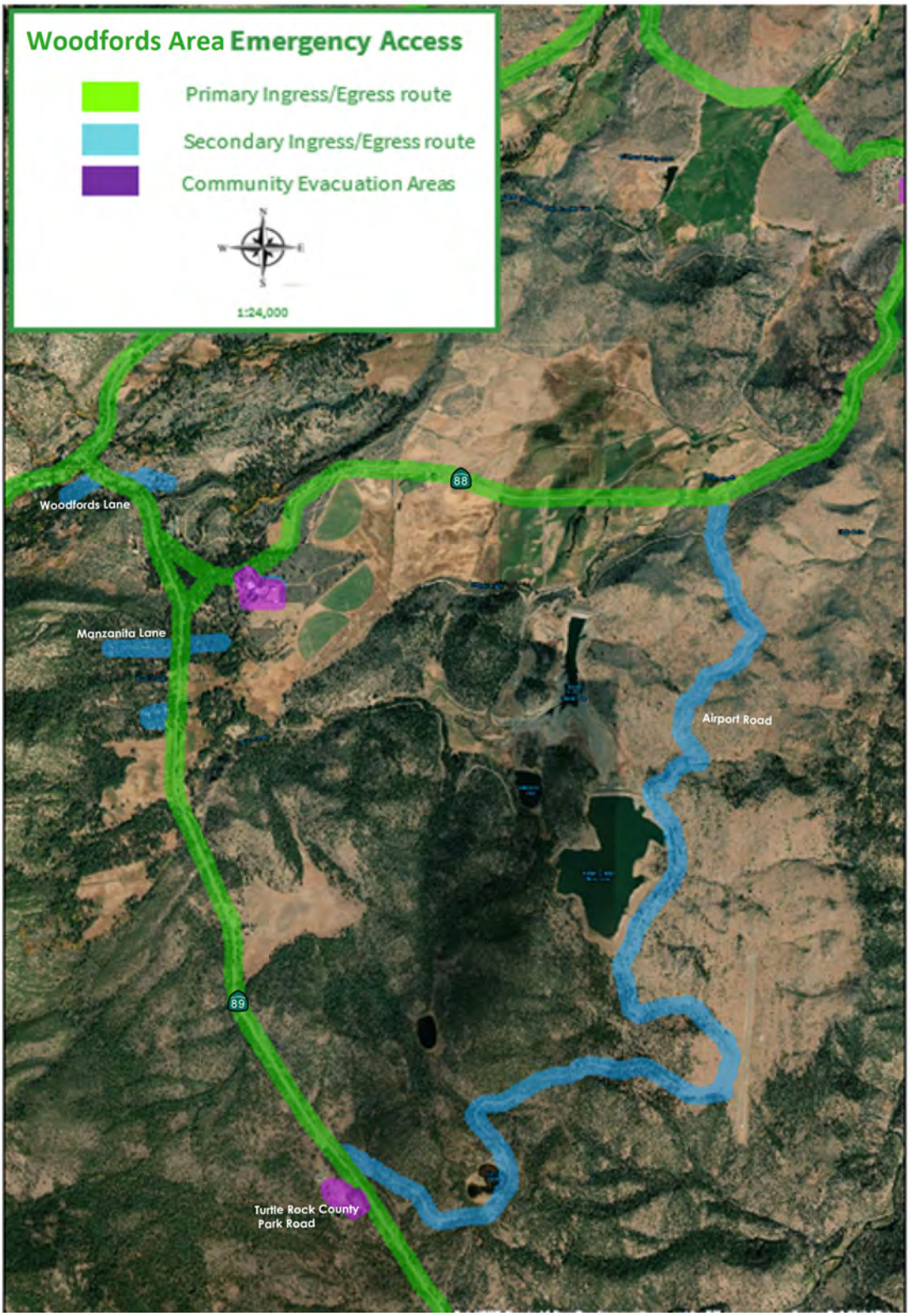


Figure 5-2 Woodfords Area Designated Safety Zones



5.1.2 Community Evacuation Areas

Community evacuation areas are zones where emergency service vehicles and personnel can stage for an incident. These zones can also serve as a rendezvous point for the public. There is a possibility these areas can be used as a safety zone from fire when egress is compromised; however, it is important to recognize that dynamic fire conditions may render these areas unsafe at times of an incident for some or all vehicles and people that occupy that space. Table 5-1 shows the latest safety zone rules from the Joint Fire Science Program (Butler, 2014).

Table 5-1 Safety Zone Rules for Safe Separation Distances

Calculating a Safe Separation Distance (SSD) SSD = 8 * Slope wind Factor * Height of the surrounding vegetation			
	SLOPE-WIND FACTOR		
Wind Speed	Flat 0% Slope	20% Slope	>30% Slope
Light 0-10 mph	1	2	3
Moderate 11-20 mph	2	3	5
Strong > 20 mph	3	5	6

Notes
1. For a 20-person crew, add 10 feet of radius and for a vehicle add another 5 feet of radius.
2. The area in red requires large natural openings or construction by mechanized equipment.
3. The proposed rule is to be used for flat ground rather than the existing flame height rule.
4. Also consider additional lookouts on the ground and in the air to monitor fire activity with early egress to escape routes and safety zones.
5. At 30% or greater slopes, hot gases tend to stay close to the ground.

As an example of how the Safe Separation Distance calculation works on a community evacuation area, the Turtle Rock Park evacuation area, at almost 9 acres (with HVRA buffer), has flat slopes and surrounding vegetation heights of about less than 2 feet. Calculating with 97th percentile winds averaging 14 mph, the area could safely hold up to approximately 60 people and 30 vehicles if centered in the safety zone near one another. If winds increased or vegetation was higher at the time of the scenario, the amount of people that could safely take refuge there would be many fewer. Establishing evacuation zones is a critical component of a larger fire response strategy. These zones provide the public important pre-incident preparation information, ensure non-local emergency response units are using known and approved road systems during an emergency, and help focus limited fuel reduction resources on making and maintaining low severity fire conditions surrounding strategic roadways and safety zones.

Evacuation zones are even more important in areas where ingress/egress infrastructure is limited. The Hot Springs Road corridor, Sherman Acres, Old and New Bear Valley subdivisions, and Bear Valley Mountain Resort are lacking secondary access routes. Since establishing secondary ingress and egress to vulnerable communities is not feasible, as stated above, establishment of pre-incident evacuation zones that meet the minimum safe separation distances is recommended. Potential evacuation zones identified as HVRAs during the wildfire hazard and risk assessments include:

- Turtle Rock Park;
- Diamond Valley Elementary School;

- Grover Hot Springs State Park; and
- Bear Valley Library and parking lot.

Vegetation conditions near the potential evacuation zones should be reviewed regularly by the County and appropriate safe separation distances should be maintained around the zones.

5.2 Community Access Risk Report

Analysis shows that about 832 acres surrounding major ingress and egress routes are at risk. This means that during a critical wildfire incident, portions of the major emergency routes do not have the appropriate clearance of vegetation and fuels around the road for traffic to safely pass if fire impacted those areas during critical fire weather. About 1,868 acres surrounding minor ingress and egress routes are shown to have at least some risk. Like major routes, this means that areas do not have sufficient vegetation and fuel clearance adjacent to routes so that traffic can safely pass. Finally, community evacuation areas might be vegetation and fuels free within the zone, but analysis shows that about 150 acres surrounding those areas exhibit high enough fire hazard that, during a critical wildfire incident, fire could compromise the effectiveness of those evacuation areas. Vegetation management efforts focused on treatment of the area surrounding major emergency routes and evacuation areas are recommended. To triage the highest risk areas surrounding emergency routes and evacuation areas, Table 5-2 identifies the land ownership that is in the 50 percentile highest risk categories for a specified emergency access area.

Table 5-2 Acreages of the Highest 50th Percentile Risk around Ingress and Egress Routes

Land Ownership	Major Emergency Routes	Minor Emergency Routes	Community Evacuation Areas	Total
United States Forest Service	21.2 acres	149.3 acres	2.5 acres	173.0 acres
Bureau of Land Management	1.4 acres	303.3 acres	0 acres	304.7 acres
Bureau of Indian Affairs	65.4 acres	0 acres	20.3 acres	85.7 acres
Alpine County	22.3 acres	42.8 acres	21.4 acres	86.5 acres
NGO/Service Districts/Pacific Gas & Electric	28.2 acres	6.8 acres	4.2 acres	39.2 acres
State of California	3.4 acres	3.1 acres	0 acres	6.5 acres
Private	285.6 acres	456.0 acres	16.4 acres	758.0 acres
Unknown	0 acres	0 acres	0 acres	0 acres
Totals	**427.5 acres**	**961.3 acres**	**64.8 acres**	**1,453.6 acres**

Figure 5-3 through Figure 5-5 show how areas of high wildfire risk overlap with emergency assets for the communities of Markleeville, Bear Valley, and Hung-A-Lel-Ti. Figure 5-3 to Figure 5-5 show example areas where the highest risk overlaps with emergency access routes and safety zones. [3] The Tier 1 Markleevillage project would partially address the fuel loading that occurs along Hot Springs Road. Additional fuels reduction along Hot Springs Road and other critical access routes within the county could be completed as future projects. Environmental review for these projects may be streamlined by using the CalVTP or CEQA Statutory[4] or Categorical Exemptions.[5]

[3] To effectively evaluate and apply the emergency access dataset it is imperative to work with the spatial data in a GIS and not solely rely on map products.

[4] Section 15269(b) of the CEQA Guidelines specifies that the Emergency Projects exemption applies to "*emergency repairs to publicly or privately-owned service facilities necessary to maintain service essential to the public health, safety or welfare*." Section 15269(c) of the CEQA Guidelines specifies that the CEQA statutory exemption for emergency projects exempts specific actions necessary to prevent or mitigate an emergency, including where "*fire or catastrophic risk mitigation or modifications to improve facility integrity are proposed for existing facilities in response to an emergency at a similar existing facility*."
Class 1 Categorical Exemption under Article 19 (Categorical Exemptions) of the State CEQA Guidelines.

[5] *15301 Existing Facilities. Class 1 consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of existing or former use. The types of "existing facilities" itemized below are not intended to be all-inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of use.*
15301(c) consists of "Existing highways and streets, sidewalks, gutters, bicycle and pedestrian trails, and similar facilities (this includes road grading for the purpose of public safety, and other alterations such as the addition of bicycle facilities, including but not limited to bicycle parking, bicycle-share facilities and bicycle lanes, transit improvements such as bus lanes, pedestrian crossings, street trees, and other similar alterations that do not create additional automobile lanes). Under this exemption, maintenance of existing streets is authorized for the purpose of public safety.

Figure 5-3 Locations in Markleeville Where Highest Risk Overlaps with Emergency Access Routes and Safety

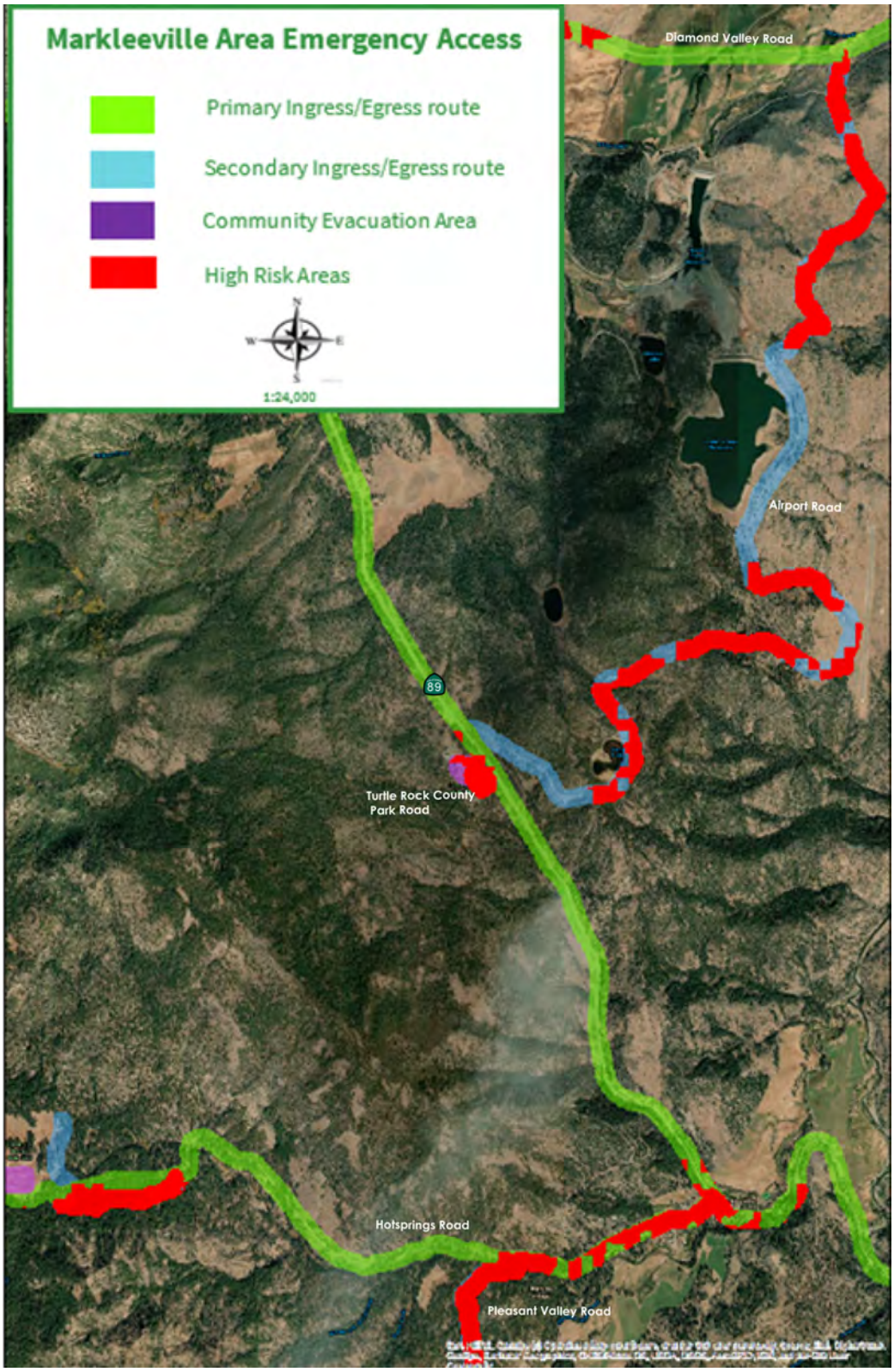


Figure 5-4 Locations in Bear Valley Where Highest Risk Overlaps with Emergency Access Routes and Safety

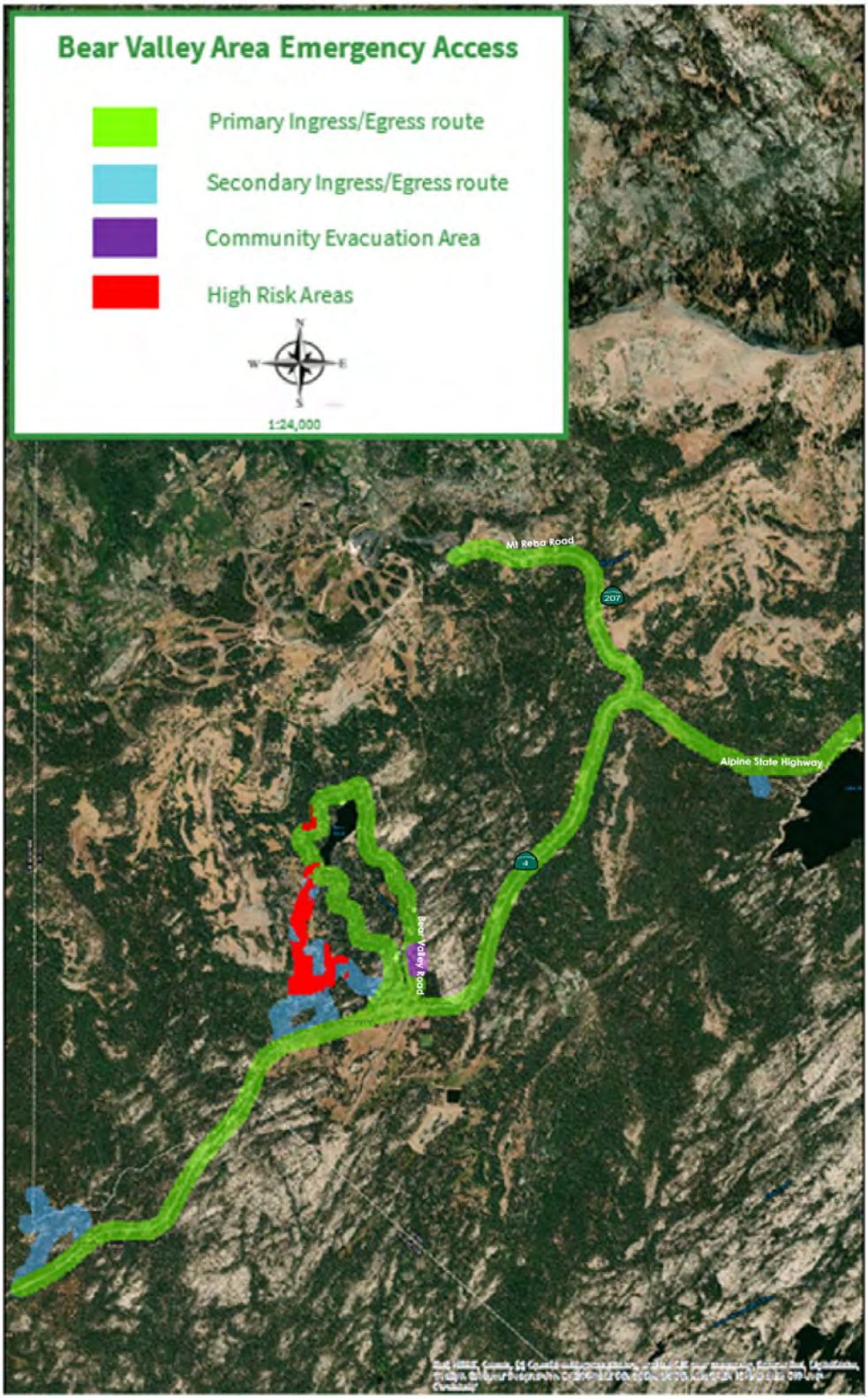
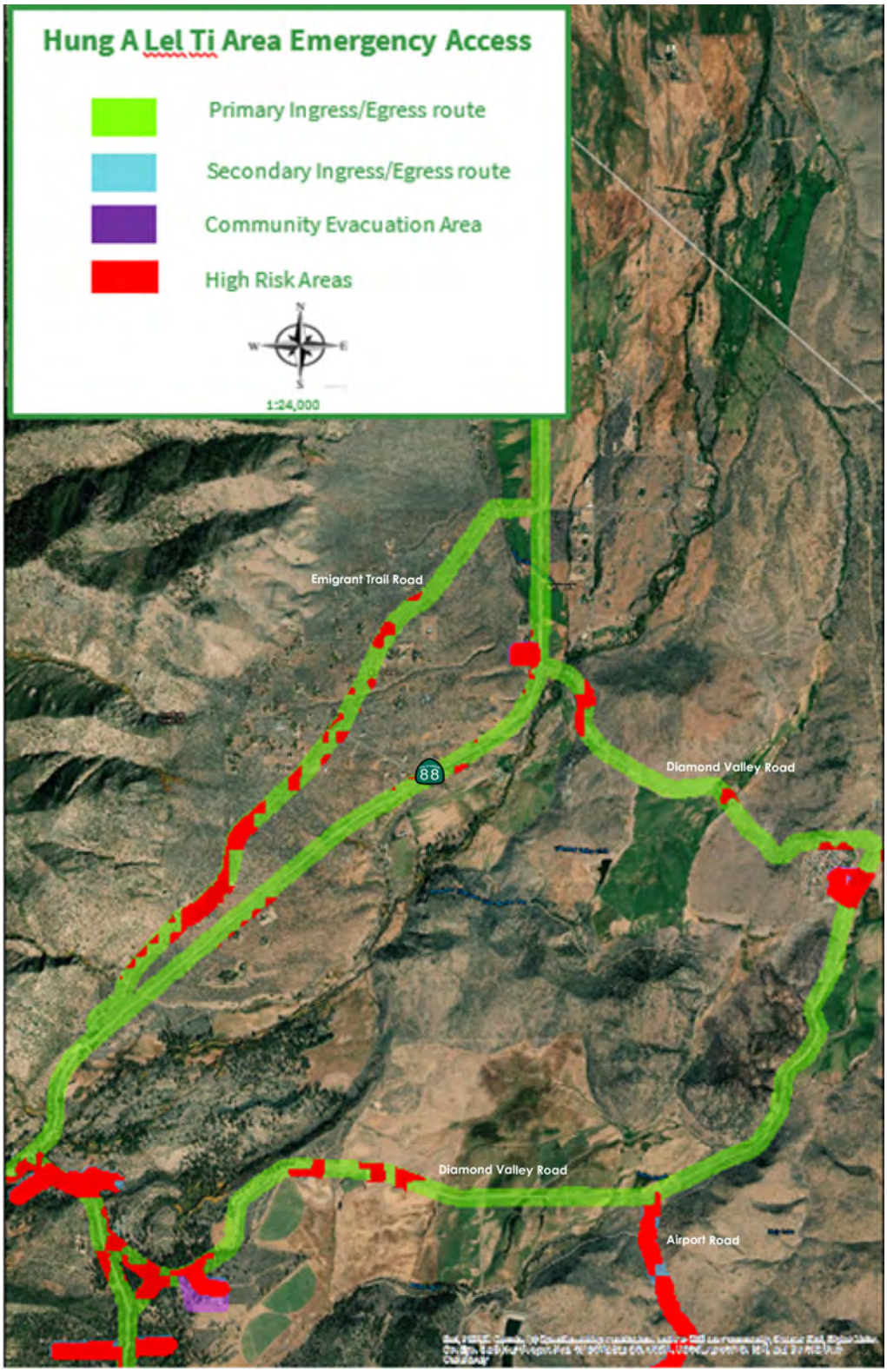


Figure 5-5 Locations in Hung-A-Lel-Ti Where Highest Risk Overlaps with Emergency Access Routes and Safety



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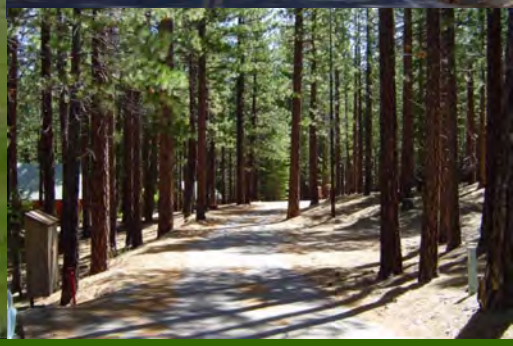
APPENDICES

APPENDIX A

Community and Stakeholder Input Report



Alpine County

Wildfire Risk Mitigation Plan
Community and Stakeholder Input Report

June 2020

717 Market Street, Suite 650
San Francisco, CA 94103
650-373-1200
www.panoramaenv.com

PANORAMA
ENVIRONMENTAL, INC.

Alpine County
Wildfire Risk Mitigation Plan
Community and Stakeholder Input Report

June 2020

Prepared for:
Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120
530-694-1361
bpeters@alpinecountyca.gov

Prepared by:
Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, CA 94103
650-373-1200
tania.treis@panoramaenv.com

PANORAMA ENVIRONMENTAL, INC.

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1 Introduction

1.1 Overview of the Alpine County Wildfire Risk Mitigation Plan

Alpine County is located between Mono, Tuolumne, and El Dorado counties in the Sierra Nevada in northern California. The northeastern boundary of Alpine County shares its border with the state of Nevada. Fuels reduction projects to reduce the risk of wildland fire are a high priority in Alpine County (County) and several have been undertaken or are ongoing, including neighborhood fire breaks and larger scale fuels reduction projects on federal lands. Approximately 1,780 residential units are in the County; over 1,200 of these are in high or very high wildfire hazard severity zones. Key planning areas include Woodford, Markleeville, Bear Valley, and Kirkwood. A Community Wildfire Protection Plan (CWPP) was completed for the east and west slope communities in Alpine County in 2018.

Alpine County has prepared a Wildfire Risk Mitigation Plan (WRMP or plan), under a Fire Prevention Grant received from the California Department of Forestry and Fire Protection (CAL FIRE). The WRMP is a county-wide plan that will build off existing fire hardening efforts in the County and expedite the process of implementing projects to protect communities. The purpose of the WRMP is to enable the County to implement activities that address the risk of wildfire and that can reduce wildfires that could impact communities.

The WRMP was prepared by:

- Identifying the important resources and assets within the County,
- Identifying the high fire hazard areas using modeling techniques, and
- Defining and prioritizing projects to implement that will protect the most at-risk resources.

The County evaluated eight candidate fuel treatment projects during development of the WRMP. The Bear Valley, Manzanita, and Markleevillage project areas were identified as the top three priority fuel treatment projects and have been prioritized for environmental review in 2020-2021. The Bear Valley project would impact approximately 130 acres; the Manzanita project would impact approximately 430 acres; and the Markleevillage project would impact approximately 300 acres. Several types of fuel treatment methods may be implemented in the project areas, including mechanical methods, hand thinning, and prescribed burn. Fuel treatments implemented within each priority project area will be given a higher priority if they:

- Are within initial attack areas of local fire stations or relevant air tanker bases,
- Can be safely accessed via road,
- Provide an enhancement of rate of fireline construction or fire-retardant penetration through the canopy, and

- Provide measurable direct and in-direct benefit to resources at risk such as structures, infrastructure, water resources, and other important features.

Locating treatments where they may be utilized strategically during extended suppression efforts will also be considered.

1.2 Purpose of this Community and Stakeholder Input Report

The County prepared a detailed Community and Stakeholder Public Involvement Plan (CSPIP) prior to preparing the WRMP. The CSPIP defined the procedures that the County would implement to provide community members, agencies, jurisdictions, organizations, and other stakeholders with a valuable opportunity to participate in the creation of the WRMP, particularly in the locations and types of treatments that were identified for the three projects, and the analysis of the WRMP through environmental review process.

This Community and Stakeholder Input Report (CSIR or report) summarizes the public and stakeholder outreach that was conducted throughout development of the WRMP. This report includes a description of the public outreach process and activities, the participants, and the outreach materials. A summary of the comments and concerns raised during the WRMP public workshops and integration of public input is included in section 4.

2 Outreach Process

2.1 Public Meetings/Workshops

The County emphasized the importance of public involvement throughout the development of the WRMP and provided several opportunities for the public and key stakeholders to provide input. The County held two initial public workshops in February to introduce the public to the need for the WRMP, areas of wildfire risk, and how the WRMP would be developed. One meeting was held in Markleeville (eastern Alpine County) and one meeting was held in Bear Valley (western Alpine County) to ensure all interested parties had the opportunity to participate in the workshops and provide feedback. The County held an additional web-based public workshop in April via Zoom meeting to present the results of the planning effort.

2.1.1 Notification

In order to involve the public in the development of the WRMP, appropriate notice of the public workshops was provided through several outreach methods. The County established an initial project mailing list with key stakeholders identified in the CSPIP. Notification postcards were distributed to all interested parties on the project mailing list to announce the public workshops for the WRMP. The postcards were generally mailed 2-3 weeks prior to each public workshop. The County included notification of the February and April public workshops online on the plan webpage. Prior to the second workshop in April, a reminder message was also sent via email to previous workshop attendees who signed up for the email list.

2.1.2 Workshop Format and Content

The February public workshops included a presentation from the County followed by an open house where attendees could look at poster boards on various topics associated with wildland fire and ask questions. Online access to the workshops was also available through the virtual conferencing tool GoToMeeting. This discussion-based workshop format encouraged public participation and provided opportunities for feedback. The first public workshops in February provided an introduction to the public on the need for wildfire mitigation work and areas of wildfire risk (education on wildfire), the background on the grant, and why and how the WRMP would be developed.

The second public workshop was held in April using an online web-meeting platform due to public health concerns and state-wide restrictions on public gatherings as a result of COVID-19. The April public workshop was held online via Zoom and included a virtual presentation with an open question and answer session at the end of the meeting. The April workshop summarized the candidate project locations, the results of the planning effort, and the three

priority projects that the County identified. Discussion topics from the February and April public workshops are summarized in Section 4.

2.2 Outreach Materials

The County prepared various public outreach materials to inform the public of the project and ways of participating in the project. Outreach materials are briefly described below and the printed outreach materials are provided in the appendices attached to this report. The following outreach materials were developed to inform and engage the public during the development of the WRMP and public workshops:

- **Project webpage**. The County created a project webpage to provide information about the WRMP and public involvement opportunities. All outreach and informational materials were posted on the plan webpage. The WRMP webpage can be viewed here: http://www.alpinecountyca.gov/index.aspx?NID=504&ART=1744&ADMIN=1
- **Public workshop #1 flyer (Appendix A)**. The County developed and distributed a notification flyer for the February public workshops.
- **Information sheets (Appendix B)**. The County developed two information sheets with key, concise information about the WRMP that were distributed during the public workshops. The first information sheet was developed and distributed for the February public workshops, and the second sheet was revised for the second public workshop in April.

3 Participants

3.1 Key Stakeholders

The County identified key stakeholders who may be interested in the development of the WRMP when preparing the CSPIP. These stakeholders received the public workshop notification postcards and a reminder message via email prior to the April public workshop. The key stakeholders who participated in the public workshops are identified in Table 1.

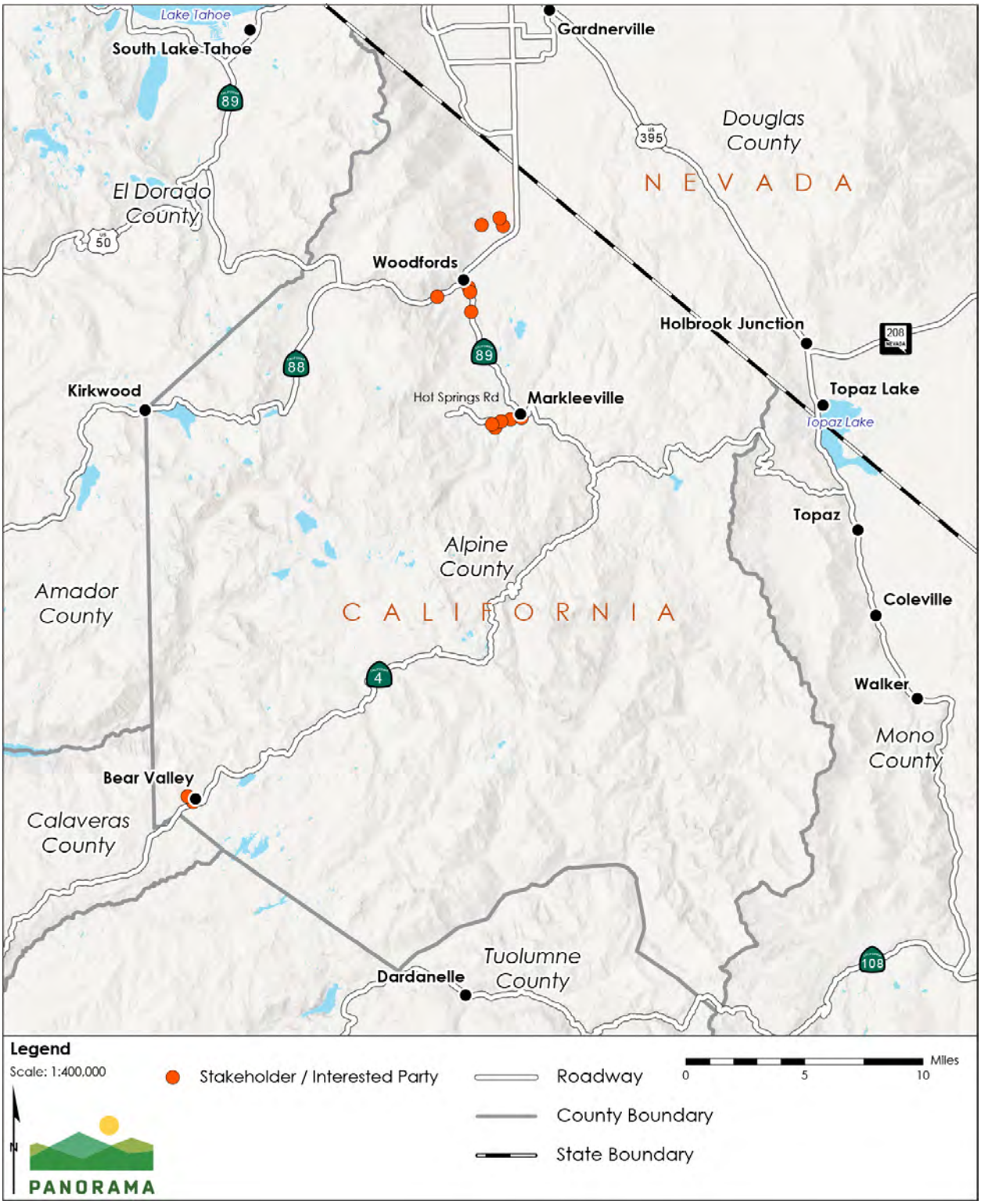
Table 1 Key Stakeholders

Stakeholder Name	Contact Name, Position
CAL FIRE Amador El Dorado Unit	Mike Deacon, Battalion Chief
Humboldt-Toiyabe National Forest	Mike Wilde, Fire Management Officer
Bureau of Land Management	Keith Barker, Fire Ecologist
Alpine County Board of Supervisors	Don Jardin, Supervisor District 1 Terry Woodrow – Vice Chair, Supervisor District 4 David Griffith, Supervisor District 5
Alpine County Fire Safe Council	Kris Hartnett, Chair
Alpine Biomass Collaborative	Michael Barton
Bear Valley Public Safety	Tim Bottomley, Battalion Chief
East Alpine Fire and Rescue	Terry Hughes, Administrator

3.2 Stakeholder Map

Upon identification of key stakeholders in the WRMP, the County developed a stakeholder map based on the locations of the stakeholders as well as participants from the public workshops (Figure 1). The stakeholder map identifies the areas of the County where the majority of participants and commenters on the WRMP reside to determine key geographic areas of interest in the County. Data from the initial project mailing list and comment tracking sheet were used to develop the stakeholder map.

Figure 1 Stakeholder Map



4 Public and Stakeholder Input

4.1 Key Input

Workshop participants raised various questions and comments during the public workshops in February and April 2020. All comments received during the public workshops were documented in a web-based comment tracking system using Google Sheets. The comment tracking system was used to ensure that public and stakeholder comments were incorporated into the plan or environmental review. A total of 35 comments were received during the meetings. Several comments addressed the sources of funding for project implementation, landowner responsibilities and home hardening techniques, and methods used to identify and prioritize projects. Table 2 summarizes the questions and comments from the public workshops.

Table 2 Summary of Comments

Date Received	Topic	Comment Summary
		February Workshops
2/25/2020	Funding/Approval	• Commenter expressed concern about other groups that may be applying for grants that could compete with Alpine County • Question about which grants will be used for the project implementation and impact with federal agencies • Commenter inquired about other uses of the grant funding
2/25/2020	Support Project	• Comments supporting effort to evaluate projects at the landscape level and prioritize project areas • Support for Markeleevillage project
2/25/2020	WRMP Development	• Question about how evacuation routes play into the WRMP development and factor into the prioritization • Various comments about future projects and prioritization • Commenter expressed interest in learning more about prescribed fire statistics in future plans and presentations
2/25/2020	Home Hardening	• Questions about fuels treatment and home hardening techniques for individual landowners • Questions about funding for landowners
2/25/2020	Fire Modeling	• Question regarding helicopters and fire suppression capabilities • Questions about wind and weather-related factors taken into consideration in fire hazard modeling • Questions about additional implications of the fire hazard and risk modeling results

Date Received	Topic	Comment Summary
2/25/2020	State Parks	• Comments about current work and visitation in nearby State Parks
2/26/2020	Other Fuels Work	• Comments that Caltrans has been doing a lot of roadside fuel reduction work state-wide • Commenter provided a recommendation to review the Bear Valley Stickers Report
	April Workshop	
4/28/2020	Project Implementation	• Several commenters inquired about project schedule and timing of environmental review • Commenter asked about process for acquiring landowner permission prior to project implementation
4/28/2020	WRMP Development	• Commenter inquired about candidate project rankings
4/28/2020	Support Project	• Several members of the public expressed gratitude for the project and the team's efforts on the WRMP
4/28/2020	Other Fuels Work	• Commenter asked about coordination with BLM and their fuels work in the area

4.2 Integration of Input

Questions and comments received during the public workshops were addressed by the County during the workshops and documented for comment tracking purposes. The County's public involvement effort allowed public input to be received and integrated during the development of the WRMP. All comments will be considered by the County Board when making a decision on whether to approve the WRMP. Additionally, all comments related to environmental concerns or California Environmental Quality Act (CEQA) topics will be addressed in the CEQA document prepared for the WRMP.

APPENDICES

APPENDIX A

Public Workshop #1 Flyer

Alpine County Wildfire Risk Mitigation Plan (WRMP)

PLAN HIGHLIGHTS

The process of preparing the WRMP includes:

- Identifying the important resources and assets within the County,
- Identifying the high fire hazard areas using modeling techniques, and
- Defining and prioritizing projects that will protect the most at-risk resources.

OVERVIEW Alpine County is preparing a Wildfire Risk Mitigation Plan (WRMP) under a Fire Prevention Grant received from the California Department of Forestry and Fire Protection (CAL FIRE). The WRMP will enable the County to implement activities that address the risk of wildfire and that can reduce wildfires that could impact communities. The top three priority on-the-ground fuel treatment projects will be identified. For each project, a general fuel treatment and an initial set of mechanical (saw-log removal, biomass removal, mastication, chipping, or hand thinning) or prescribed fire (under burning or pile burning) treatments will be defined in the WRMP.

PUBLIC WORKSHOPS The County is holding workshops in February to introduce the public to the need for the WRMP, areas of wildfire risk, and how the WRMP is being developed. The February workshops will include two meetings, one in eastern Alpine County and one in Bear Valley. A single follow-up workshop will be held in April to present the results of the planning effort and up to three priority projects defined in the WRMP. Remote (web-based) access will be available for all workshops. Online attendees will be able to view and participate in the workshops on a computer, tablet, or mobile device. Visit the webpage below for more information about online meeting attendance.

February 25, 2020 **Alpine County Administration Building** **99 Water Street** **Markleeville** **5:00 PM**	**February 26, 2020** **Bear Valley Library** **367 Creekside Drive** **Bear Valley** **4:00 PM**

For more information about the WRMP, please visit: http://www.alpinecountyca.gov/index.aspx?NID=504

Submit any questions or comments on the WRMP to: zwood@alpinecountyca.gov

APPENDIX B

Information Sheets

Alpine County Wildfire Risk Mitigation Plan

Information Sheet

SUMMARY & OBJECTIVES

Alpine County is preparing a Wildfire Risk Mitigation Plan (WRMP) to reduce wildfire risk throughout the County. The WRMP is a County-wide effort that encompasses all communities within Alpine County. The goal of the WRMP is to reduce wildfire risks and protect important resources throughout the County. It will enable the County to implement activities that address the risk of wildfire and that can reduce wildfires that could impact communities.

The WRMP will be prepared by:

- Identifying the important resources and assets within the County,
- Identifying the high fire hazard areas using modeling techniques, and
- Defining and prioritizing projects to implement that will protect the most at-risk resources.

The WRMP will identify three priority fuel treatment projects based on the level of fire hazard and the risk to important resources within the County (see types of fuel treatment methods on the other side of this page). For each project, a general fuel treatment and an initial set of mechanical or prescribed fire treatments will be defined.

WILDFIRE DEFINITIONS

Hazard: A process, a phenomenon or a human activity that may cause loss of life, injury, or other health impacts, property damage, social and economic disruption, or environmental degradation.

Wildfire hazard: Computed as potential fire behavior or fuel physical and chemical properties.

Wildfire risk: The likelihood of wildfire occurring, associated fire behavior, and impacts of the fire.

Risk mitigation: Risk mitigation is achieved when any of the wildfire risk parameters (likelihood, behavior and/or impacts) are reduced.

For more information, please visit: http://www.alpinecountyca.gov/index.aspx?NID=504

Submit any questions or comments on the WRMP to: zwood@alpinecountyca.gov

Alpine County Wildfire Risk Mitigation Plan

Information Sheet

CURRENT PLANNING EFFORTS

Fuel reduction projects to reduce the risk of wildfire are a high priority in Alpine County and the WRMP will build off of established projects and plans in the County. Several fuel reduction projects have been undertaken or are ongoing throughout the County, including neighborhood fire breaks and larger scale fuels reduction projects on federal lands. Alpine Biomass Collaborative, U.S. Forest Service, and other organizations currently implement fuel reduction projects in Alpine County.

ASSETS & WILDFIRE RISK MODELING

The County identified important resources, environmental concerns, and High Valued Resources and Assets (HVRAs) to protect in the WRMP. The County used data from LANDFIRE and the fire modeling tool FLAMMAP to model fire hazards, and then mapped the proximity of high fire hazard areas to important resources.

The relative risk to any residents, infrastructure, or other assets within the County will be determined by combining outputs from the fire modeling and the economic and ecological values of each identified at-risk asset. The results of this risk assessment will help determine the priority projects that will be defined in the WRMP and possibly implemented.

NEXT STEPS

The County will incorporate public and stakeholder feedback and use the results of the risk analysis assessment to identify the priority fuel treatment projects. A follow-up workshop will be held in April to present the results.

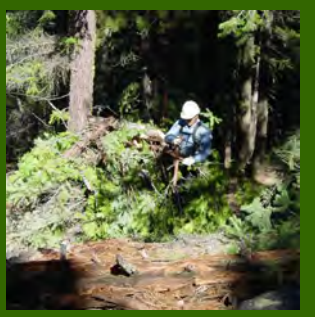
FUEL TREATMENT METHODS

MECHANICAL

- Used for larger scale vegetation removal projects and maintenance tasks
- Requires heavy machinery
- Only used in areas with a slope up to 35%
- Two Main Types:
  - ⇒ Mechanical thinning/ whole-tree harvest
  - ⇒ Mastication

HAND THINNING

- Used for thinning stands of small-diameter trees and shrubs
- Can be used in areas with up to 80% slope
- Requires hand tools
  - ⇒ Powered: chainsaws and brush cutters
  - ⇒ Non-powered: loppers, hand saws



PRESCRIBED BURN

- Burning of ladder fuels in a predetermined area under the supervision of trained fire personnel

Alpine County Wildfire Risk Mitigation Plan

Priority Projects

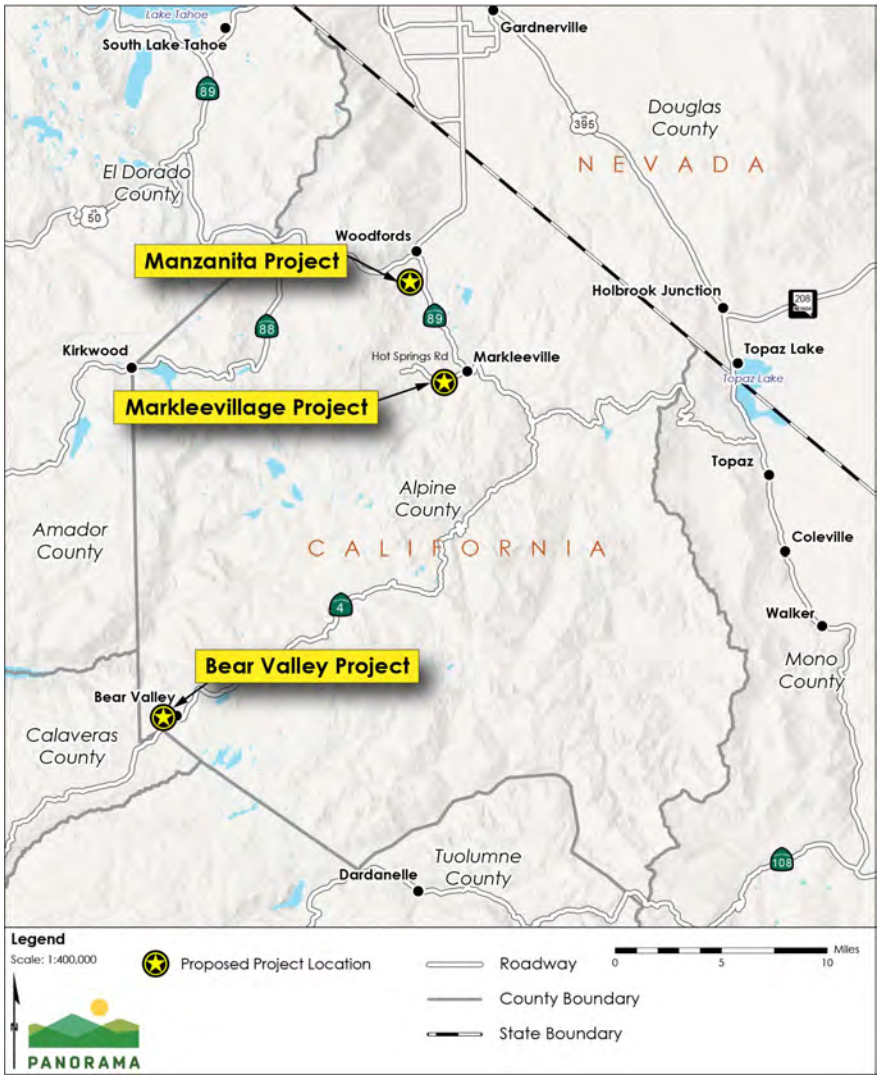
Alpine County is preparing a Wildfire Risk Mitigation Plan (WRMP) to reduce wildfire risk throughout the county. The WRMP is a county-wide effort that encompasses all communities within Alpine County.

The goal of the WRMP is to reduce wildfire risks and protect important resources throughout the county. It will enable the County to implement activities that address the risk of wildfire and that can reduce wildfires that could impact communities.

Preparation of the WRMP includes:

- Identifying important resources and assets within the county
- Identifying the high fire hazard areas using modeling techniques
- Defining and prioritizing projects to implement that will protect the most at-risk resources

PROPOSED PRIORITY PROJECT LOCATIONS



Three fuel treatment projects identified in the WRMP have been prioritized for environmental review in 2020-2021. The projects were prioritized based on the level of fire hazard and risk to important resources and assets within Alpine County. The County will define fuel treatments for each proposed priority project in Spring 2020 and conduct the environmental review of the priority projects in Summer—Fall 2020.

The priority project boundaries and types of fuel treatment methods that may be implemented in the project areas are described on the other side of this flyer.

For more information, please visit: http://www.alpinecountyca.gov/index.aspx?NID=504

Submit any questions or comments on the WRMP to: zwood@alpinecountyca.gov

Alpine County Wildfire Risk Mitigation Plan

Priority Projects

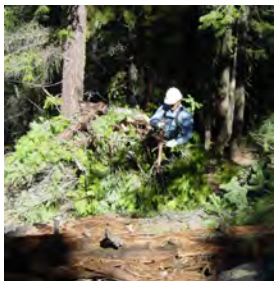
POTENTIAL FUEL TREATMENT METHODS

Several fuel treatment methods may be implemented in the three priority project areas (right). All proposed treatment methods would be discussed with nearby landowners prior to implementation as part of the project definition.

Mechanical:

- Used for larger scale vegetation removal projects and maintenance tasks
- Requires heavy machinery
- Only used in areas with a slope up to 35%
- Two Main Types:
  - ⇒ Mechanical thinning/ whole-tree harvest
  - ⇒ Mastication

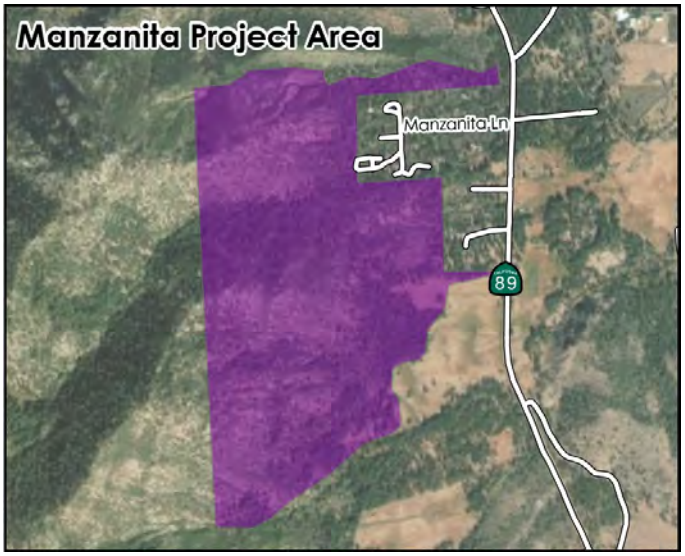
Hand Thinning:

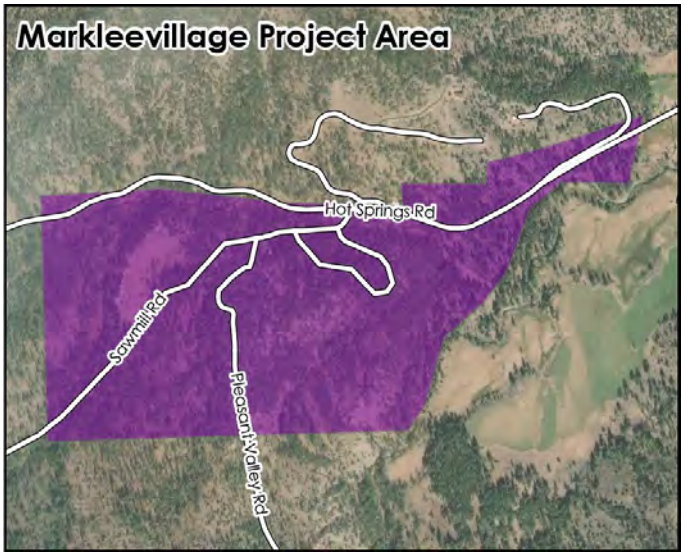


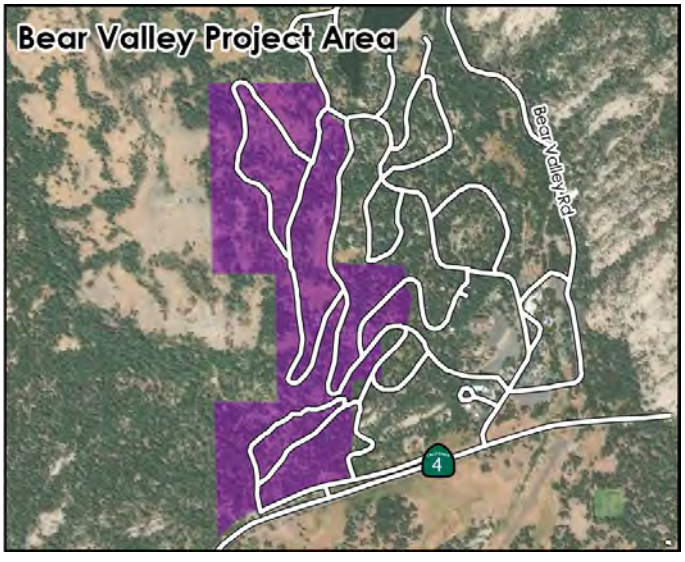
- Used for thinning stands of small-diameter trees and shrubs
- Can be used in areas with up to 80% slope
- Requires hand tools
  - ⇒ Powered: chainsaws and brush cutters
  - ⇒ Non-powered: loppers, hand saws

Prescribed Burn:

- Burning of ladder fuels or slash piles in a predetermined area under the supervision of trained fire personnel
- Prescribed burn is not appropriate to implement in close proximity to residences







APPENDIX B

IFTDSS Current Conditions Report

Report: Auto97th
Landfire Version: LANDFIRE 2016
Landscape Name: AC_2016
Landscape Acres: 774,723

Prepared for: Scott Conway
10/6/2020, 11:02:12 AM

Model Parameters

Run Name: AC_2016 - Auto97th

Model Type: Landscape Fire Behavior

Run Date: Jan 30, 2020 3:22:34 PM

Wind Type: Gridded Winds

Wind Speed: 14 mph

Wind Direction: 225 deg

Crown Fire Method: Scott/Reinhardt

Foliar Moisture: 100

Conditioning: On - Extreme - Northern Sierra Nevada

Conditioning start: , NaN/NaN/NaN

Days conditioned:

Conditioning start: 1300, 8/11/2012

Conditioning end:1500, 8/17/2012

Station Name: MARKLEEVILLE

Station Observation Start Date: May 13, 1985 12:00:00 AM

Station Observation End Date: Oct 4, 2016 12:00:00 AM

Station Elevation: 5501

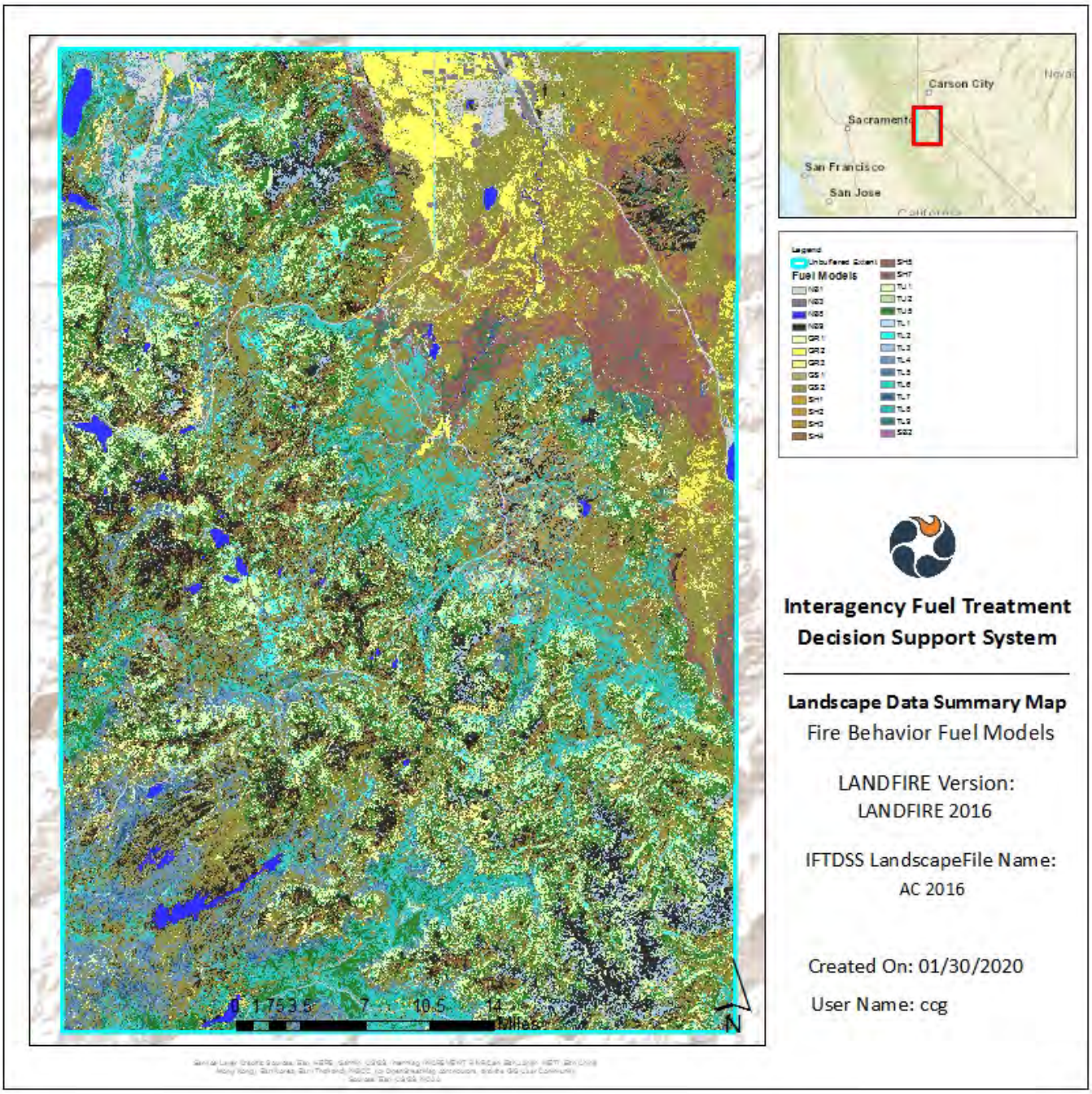
Station Aspect: 8

Station Latitude: 38.6849999

Station Longitude: 119.7683333

Fuel Model	1 Hr Fuel Moisture	10 Hr Fuel Moisture	100 Hr Fuel Moisture	Live Herbaceous Fuel Moisture	Live Woody Fuel Moisture
All	2	2	4	78	101

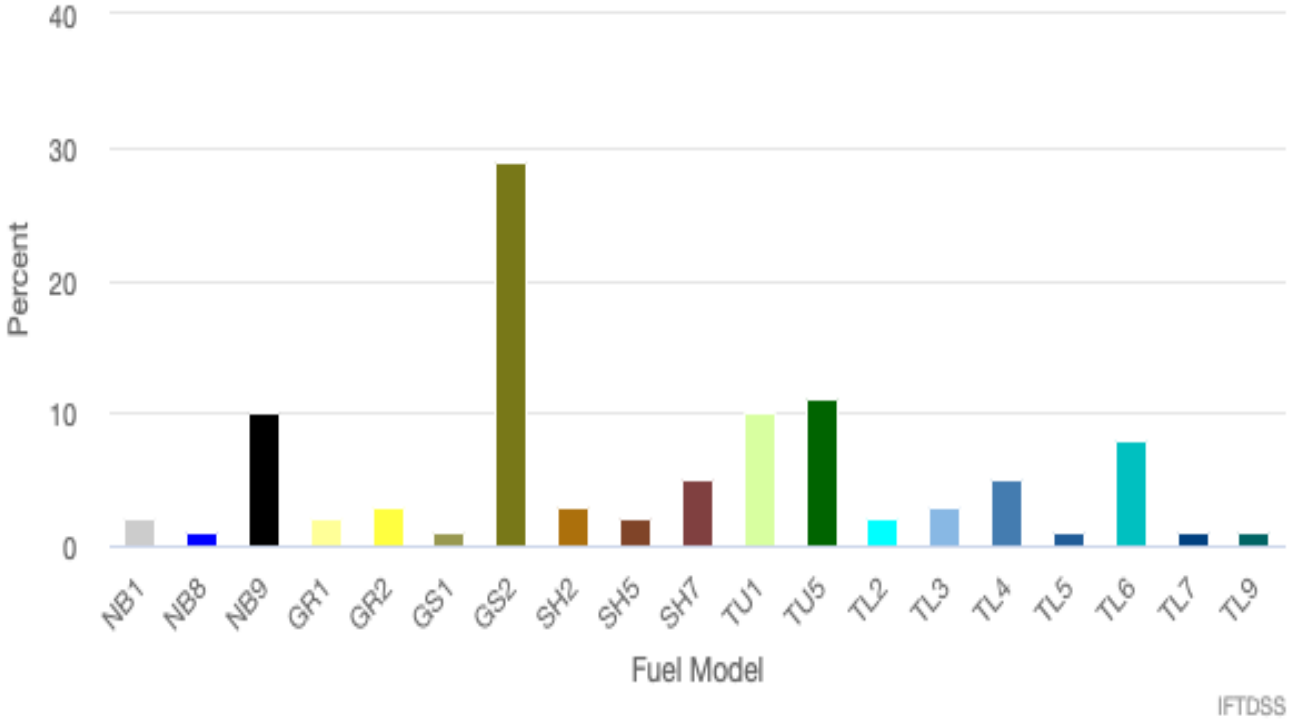
Fuel Model (FBFM)



Fuel Model (FBFM)

Fuel Model Data Summary within "AC_2016" Landscape

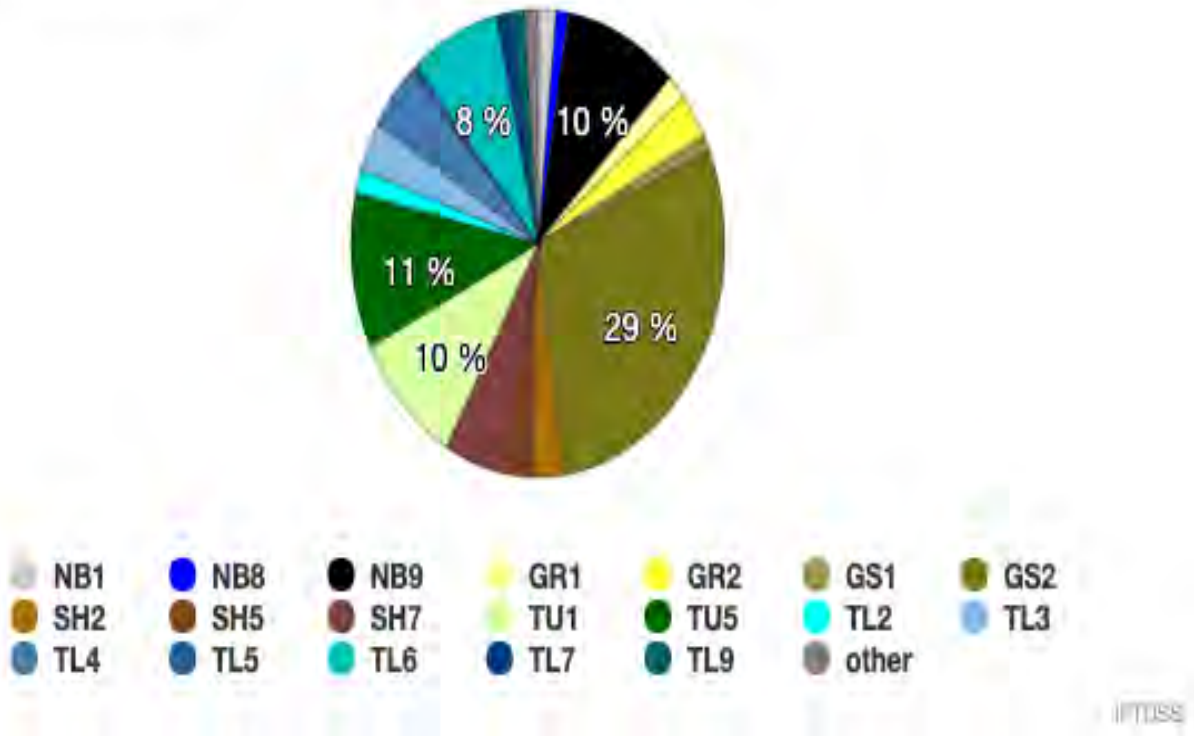
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th
Distribution under 1% not shown



Fuel Model (FBFM)

Fuel Model Data Summary within "AC_2016" Landscape

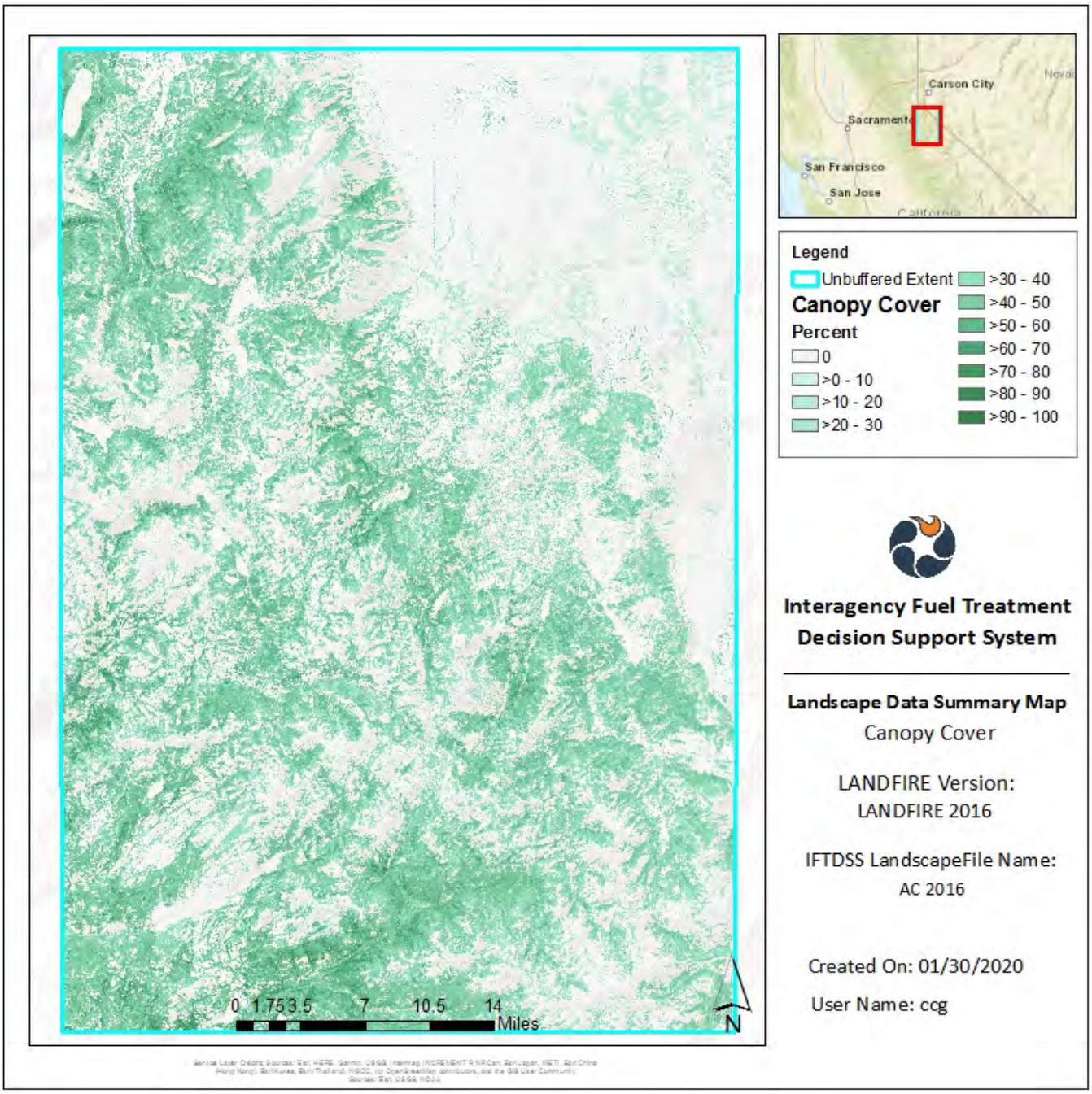
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Fuel Model (FBFM)

Fuel Model	Pixel Count (freq)	Acres In LCP	Percent In LCP
NB1 (91)	55163	12268	2
NB3 (93)	9392	2089	0
NB8 (98)	36399	8095	1
NB9 (99)	343258	76339	10
GR1 (101)	62005	13790	2
GR2 (102)	108524	24135	3
GR3 (103)	1960	436	0
GS1 (121)	39862	8865	1
GS2 (122)	1019306	226688	29
SH1 (141)	3302	734	0
SH2 (142)	92115	20486	3
SH3 (143)	14	3	0
SH4 (144)	6205	1380	0
SH5 (145)	86964	19340	2
SH7 (147)	182990	40696	5
TU1 (161)	331715	73772	10
TU2 (162)	1	0	0
TU5 (165)	377034	83850	11
TL1 (181)	3110	692	0
TL2 (182)	57381	12761	2
TL3 (183)	119214	26513	3
TL4 (184)	160409	35674	5
TL5 (185)	20577	4576	1
TL6 (186)	266424	59251	8
TL7 (187)	44653	9931	1
TL8 (188)	15514	3450	0
TL9 (189)	39955	8886	1
SB2 (202)	100	22	0

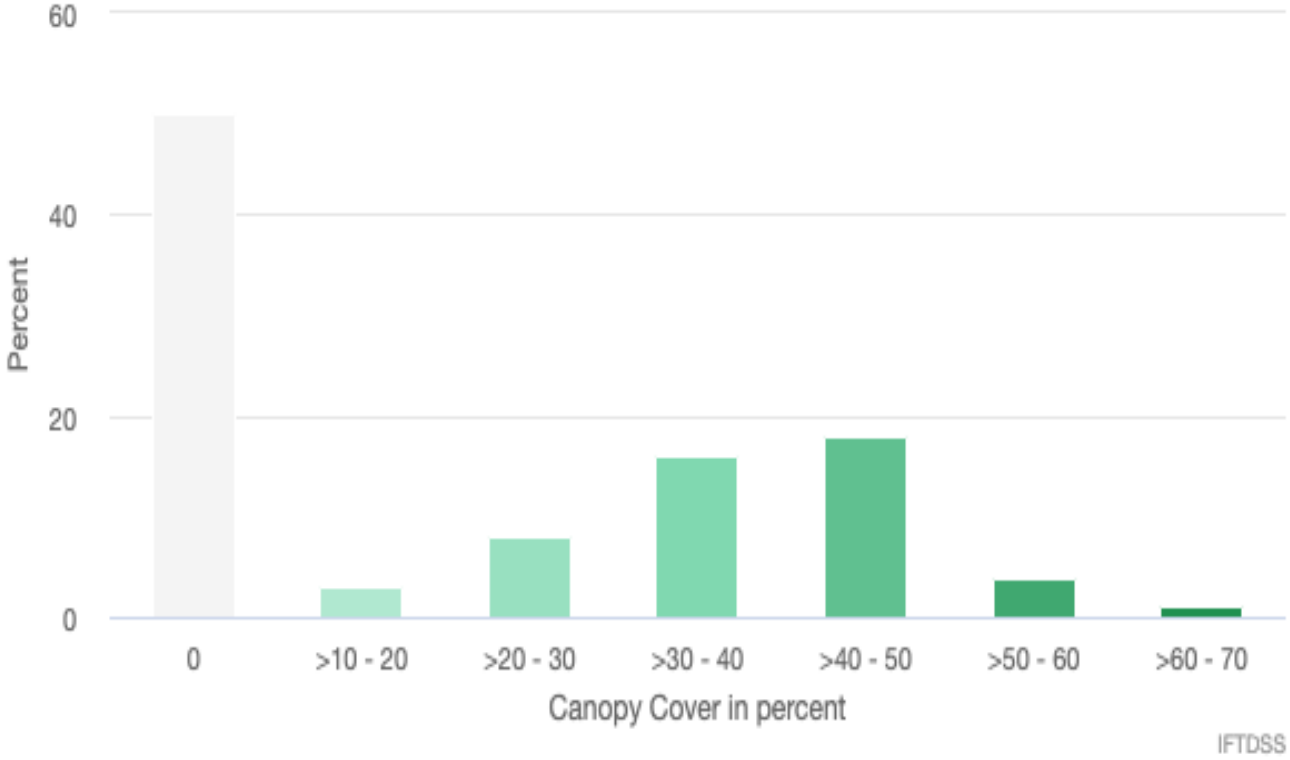
Canopy Cover



Canopy Cover

Canopy Cover (percent) Data Summary within "AC_2016" Landscape

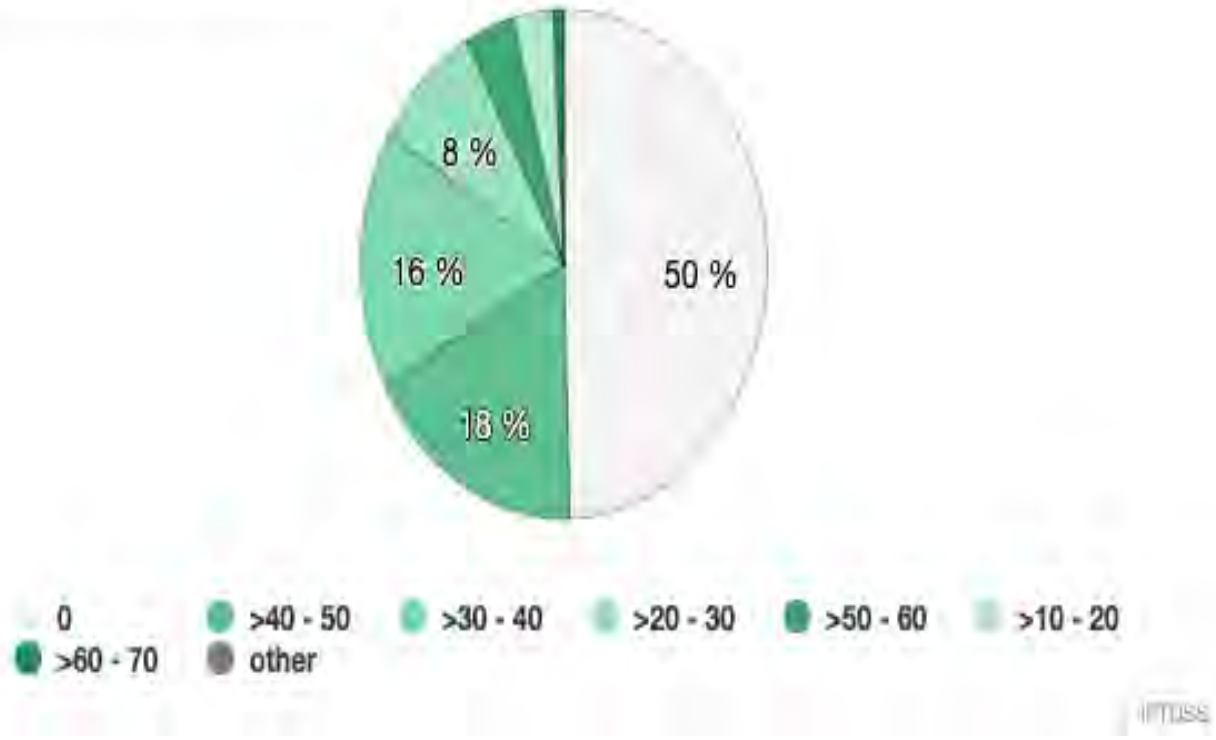
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Cover

Canopy Cover (percent) Data Summary within "AC_2016" Landscape

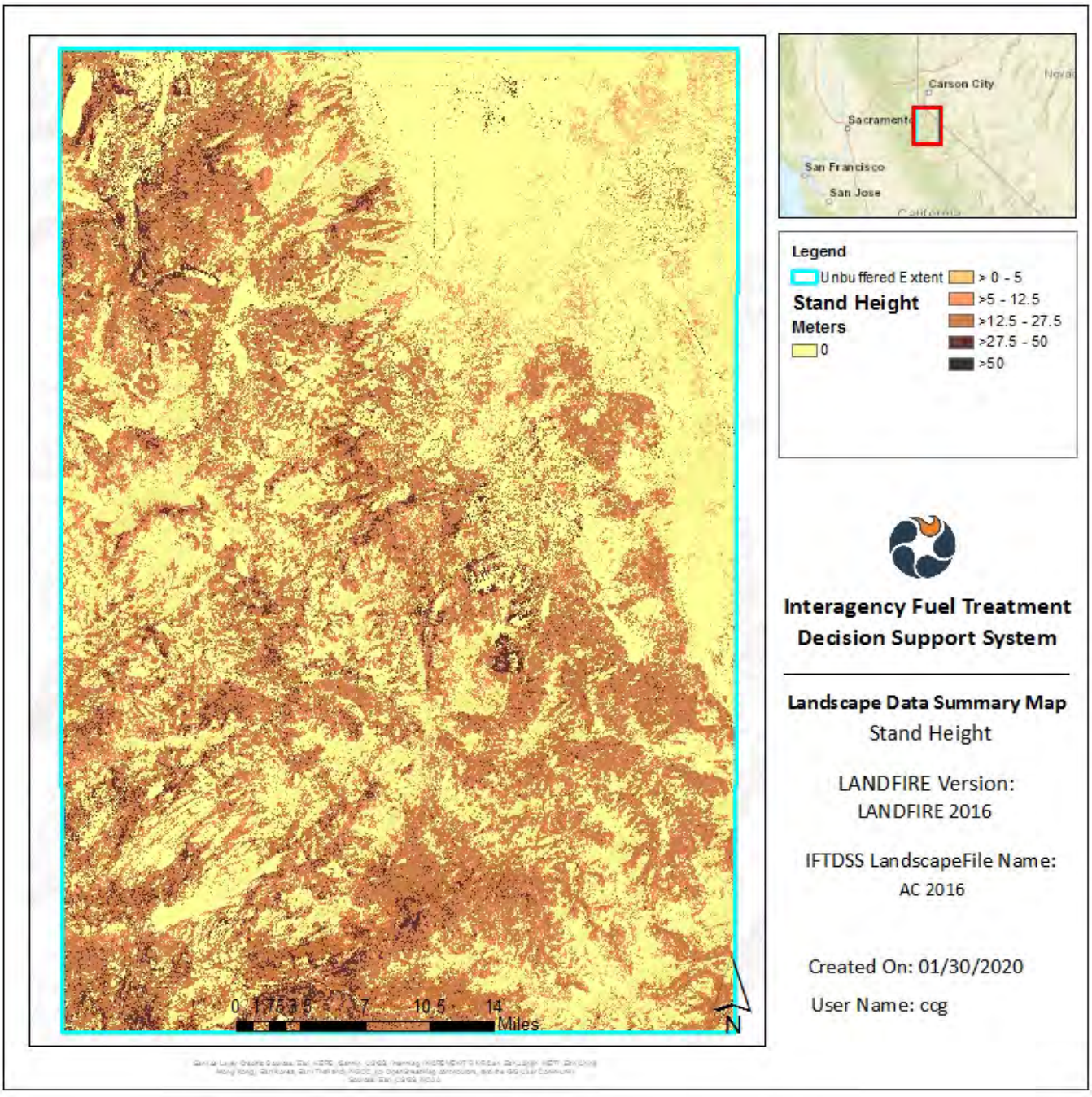
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Cover

Canopy Cover (percent)	Pixel Count (freq)	Acres In LCP	Percent In LCP
0 (non-forested)	1726090	383874	50
>10 - 20	109902	24442	3
>20 - 30	294327	65457	8
>30 - 40	574707	127812	16
>40 - 50	612288	136170	18
>50 - 60	137332	30542	4
>60 - 70	27021	6009	1
>70 - 80	1879	418	0

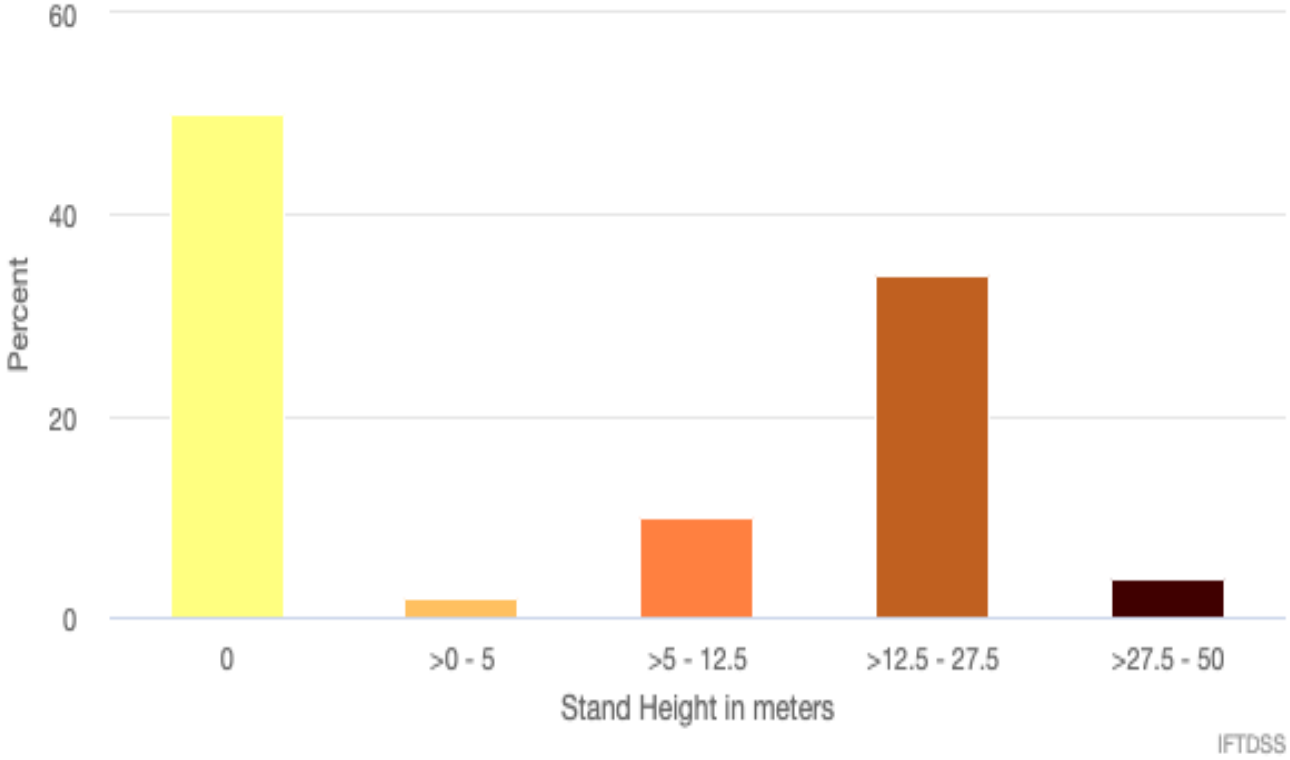
Stand Height



Stand Height

Stand Height (meters) Data Summary within "AC_2016" Landscape

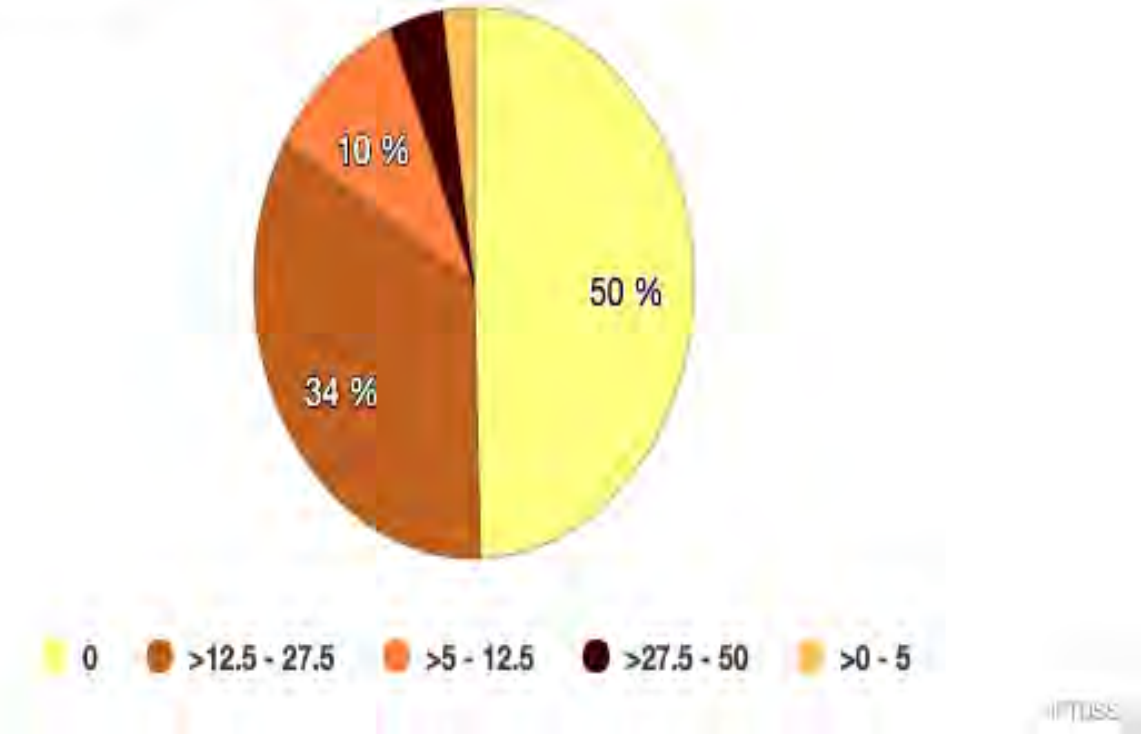
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Stand Height

Stand Height (meters) Data Summary within "AC_2016" Landscape

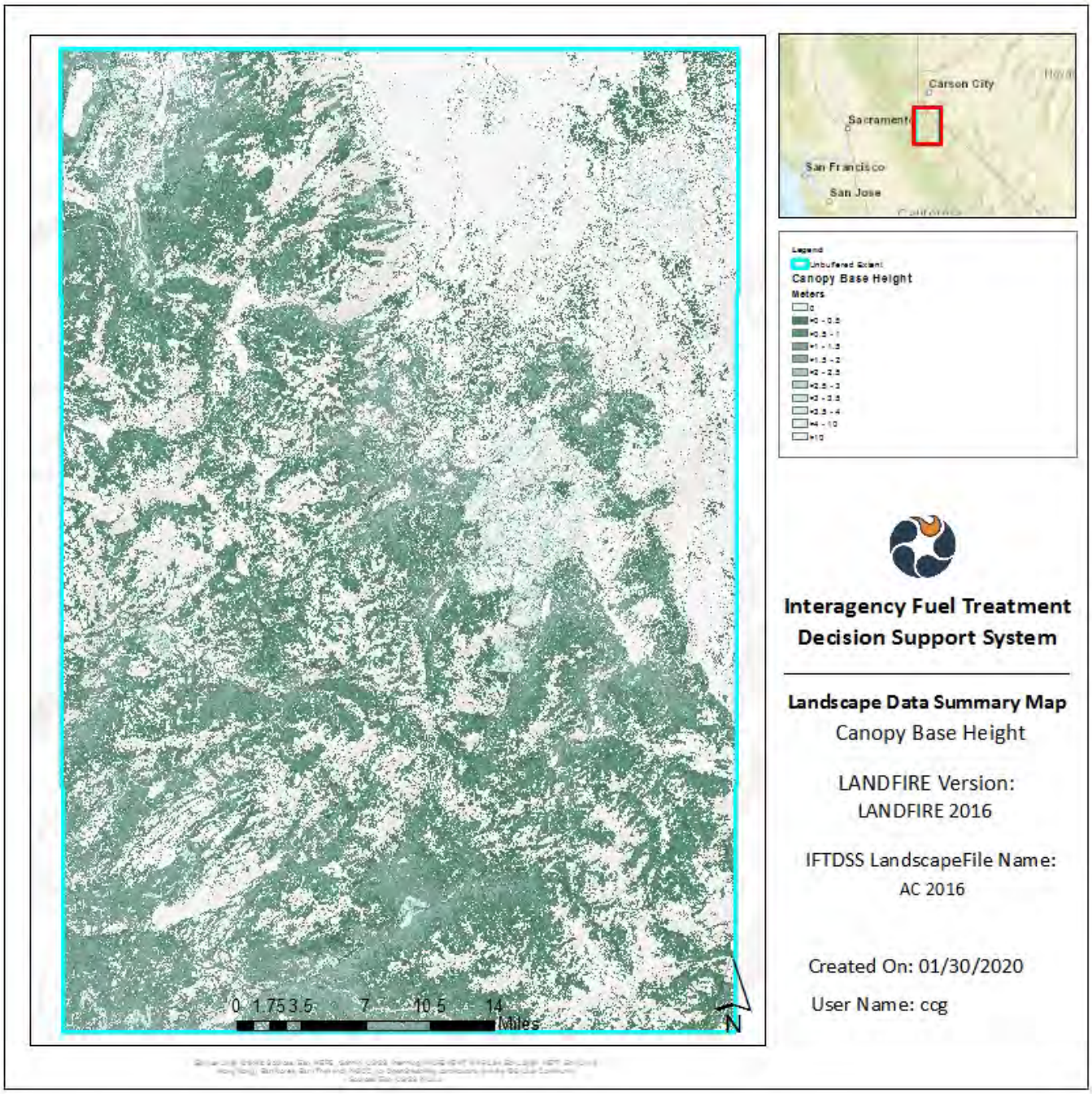
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Stand Height

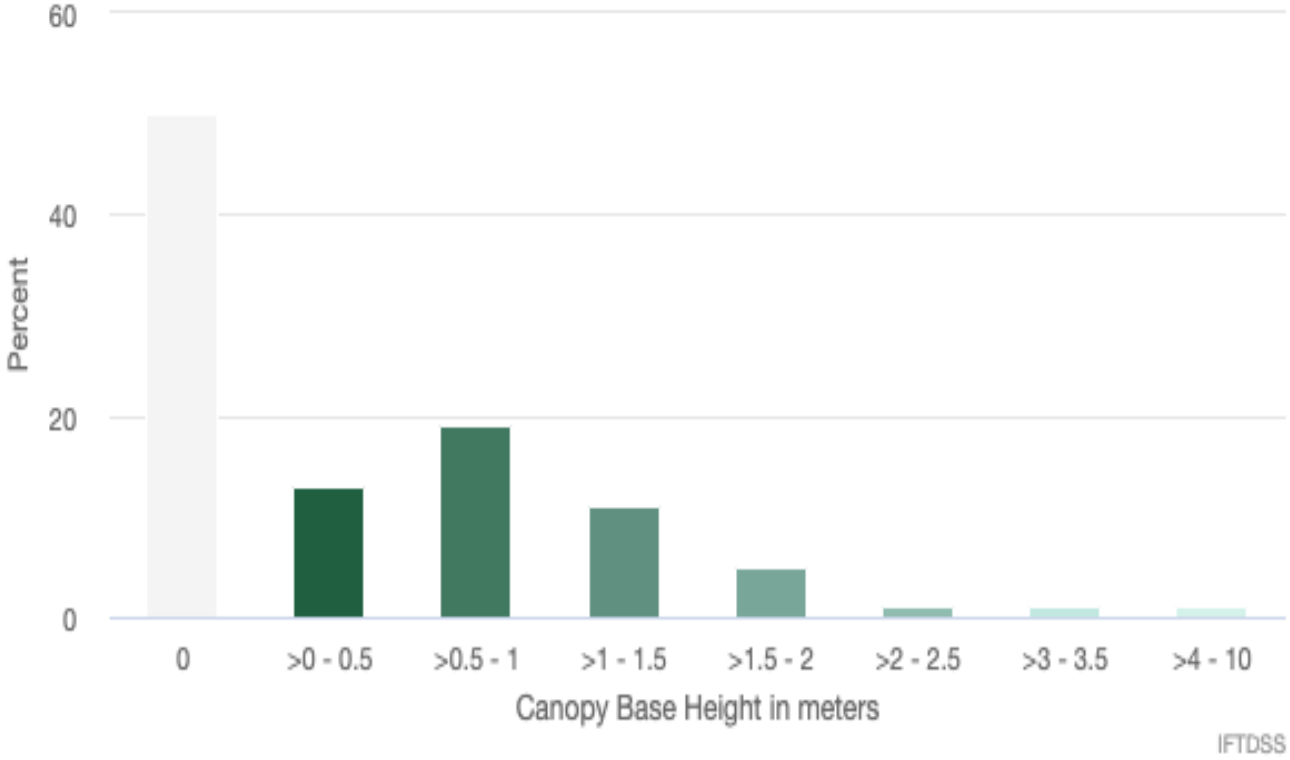
Stand Height (meters)	Pixel Count (freq)	Acres In LCP	Percent In LCP
0 (non-forested)	1726090	383874	50
>0 - 5	79420	17663	2
>5 - 12.5	355430	79046	10
>12.5 - 27.5	1186934	263968	34
>27.5 - 50	135672	30173	4

Canopy Base Height



Canopy Base Height (meters) Data Summary within "AC_2016" Landscape

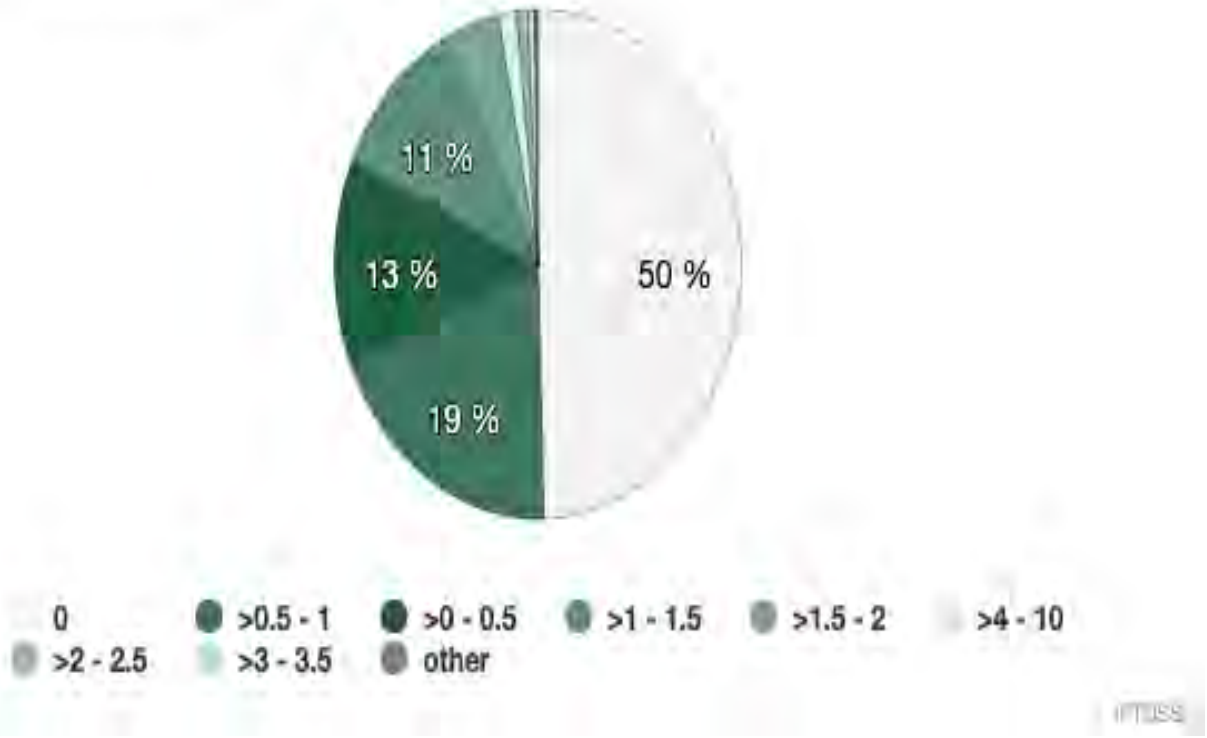
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Base Height

Canopy Base Height (meters) Data Summary within "AC_2016" Landscape

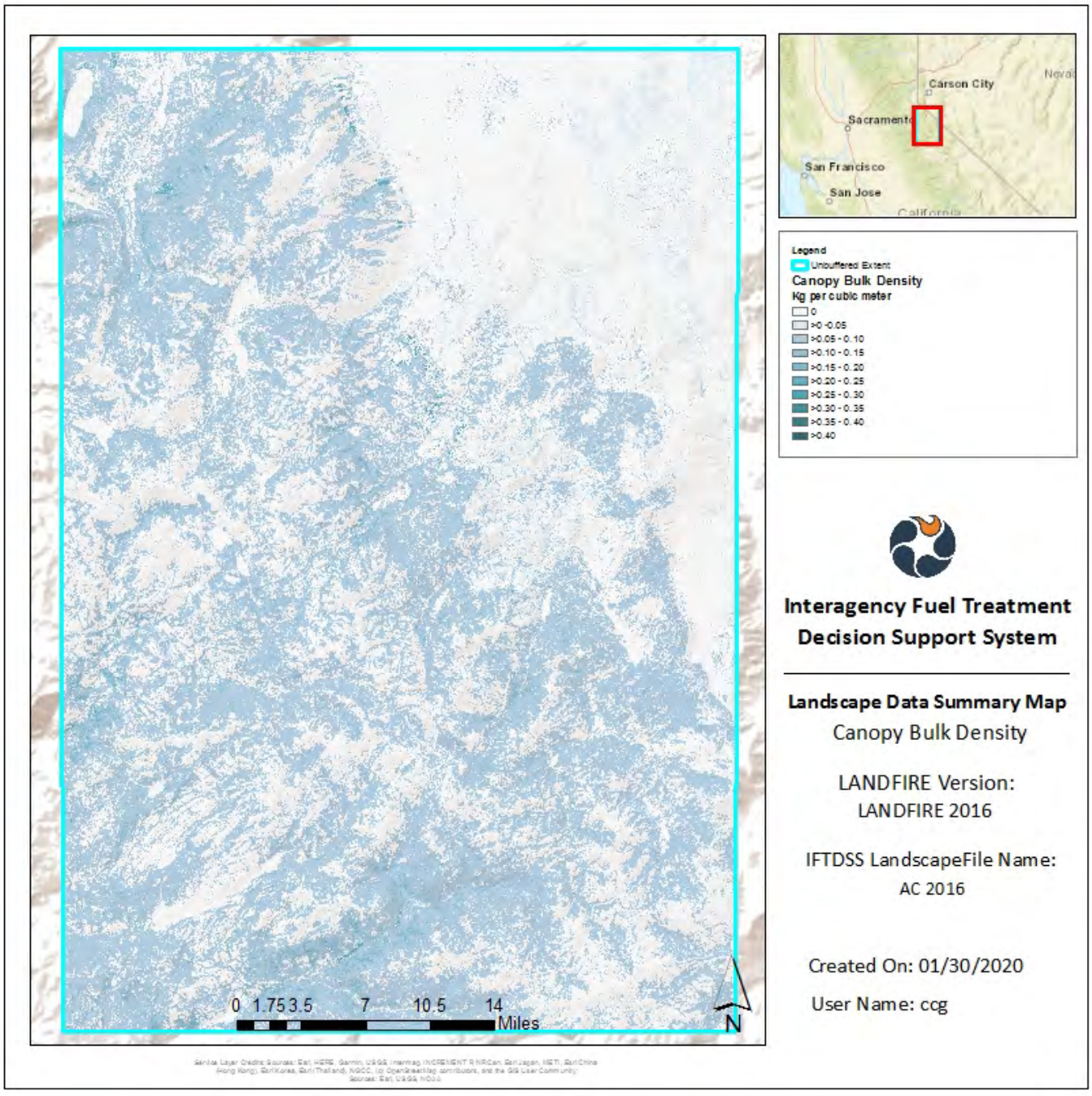
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Base Height

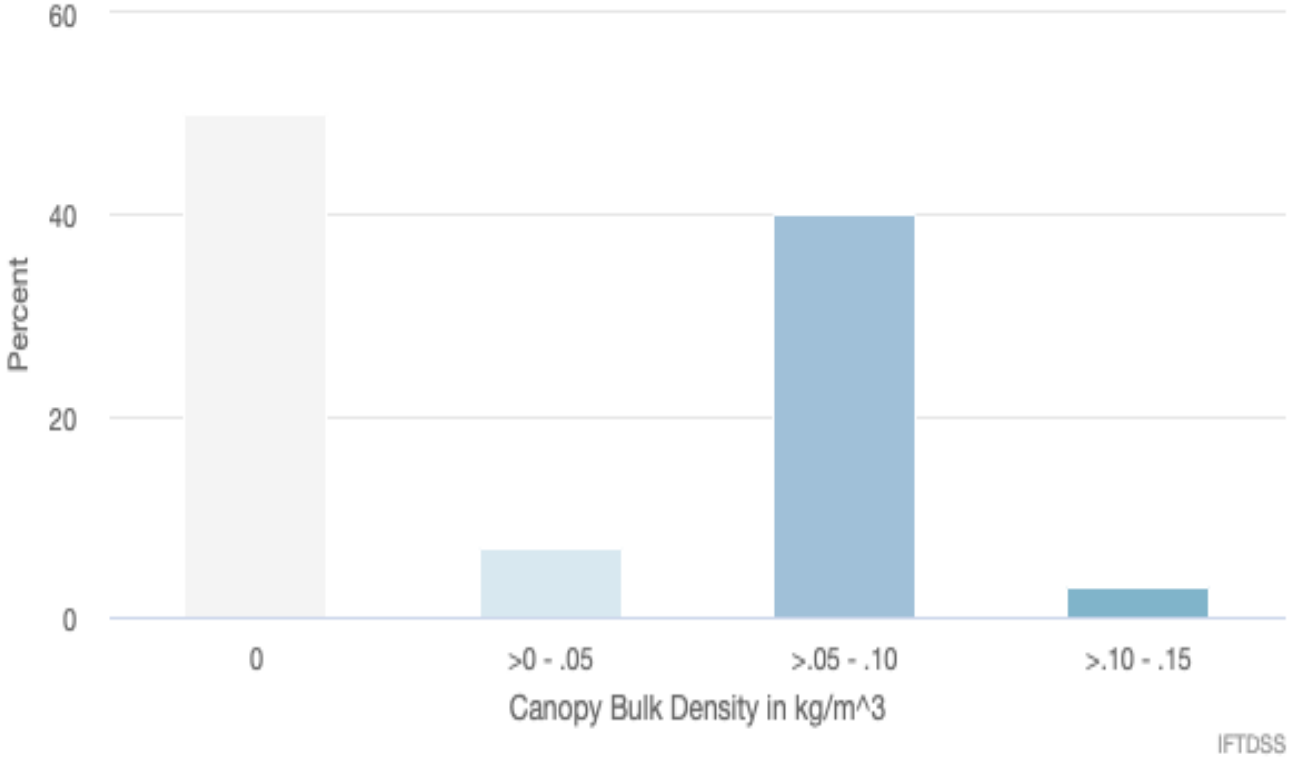
Canopy Base Height (meters)	Pixel Count (freq)	Acres In LCP	Percent In LCP
0 (non-forested)	1726090	383874	50
>0 - 0.5	457662	101782	13
>0.5 - 1	659782	146732	19
>1 - 1.5	374634	83317	11
>1.5 - 2	157121	34943	5
>2 - 2.5	30045	6682	1
>2.5 - 3	7504	1669	0
>3 - 3.5	18127	4031	1
>3.5 - 4	1985	441	0
>4 - 10	50596	11252	1

Canopy Bulk Density



Canopy Bulk Density (kg/m^3) Data Summary within "AC_2016" Landscape

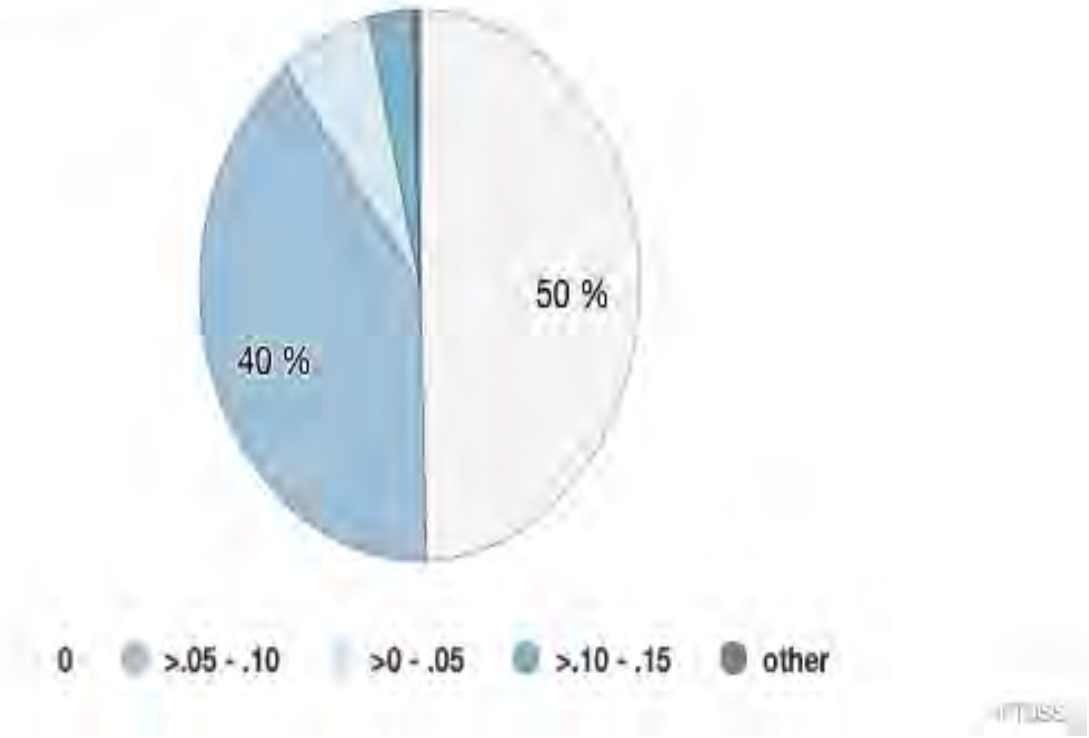
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Bulk Density

Canopy Bulk Density (kg/m^3) Data Summary within "AC_2016" Landscape

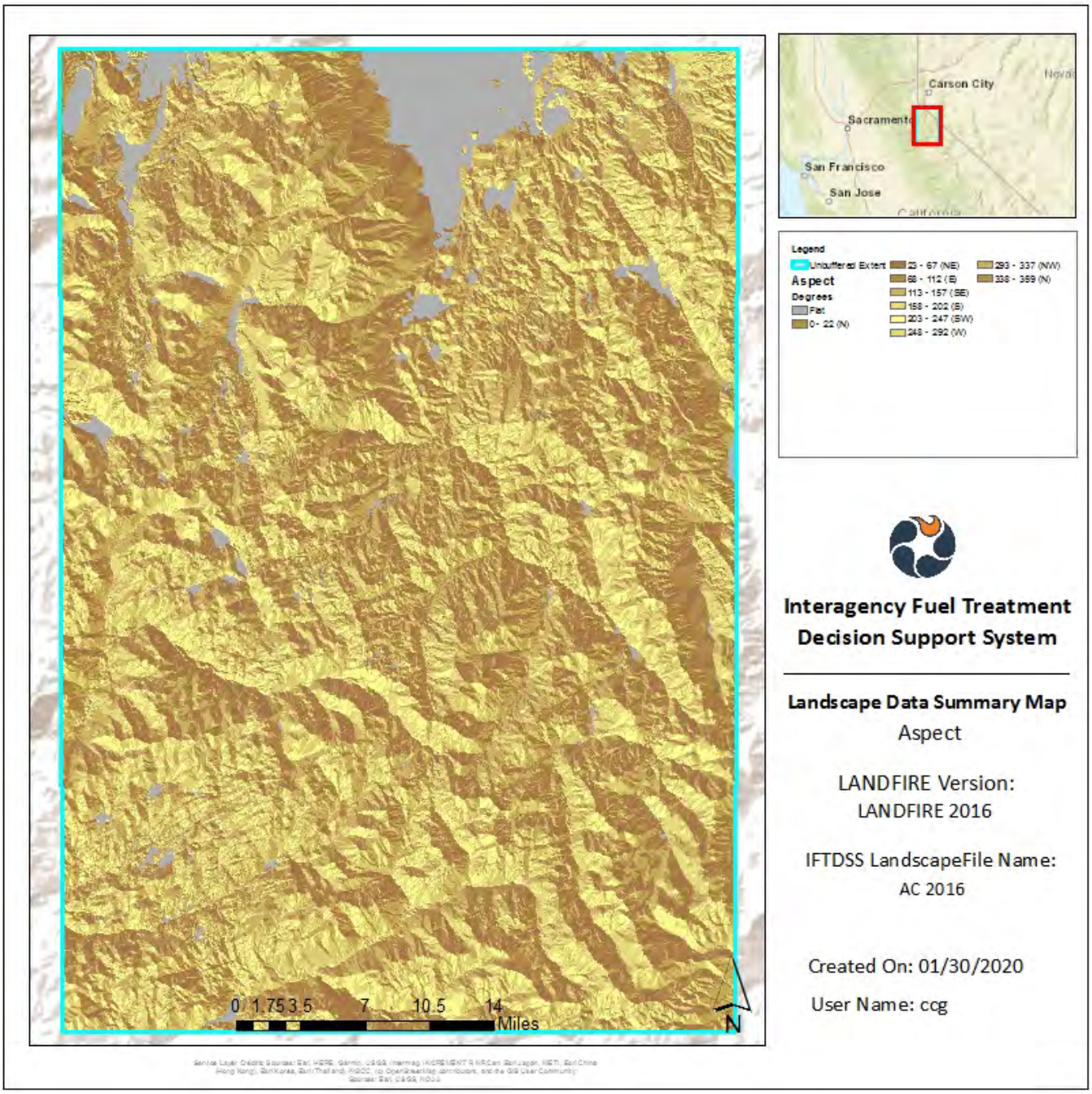
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Canopy Bulk Density

Canopy Bulk Density (kg/m^3)	Pixel Count (freq)	Acres In LCP	Percent In LCP
0 (non-forested)	1726090	383874	50
>0 - .05	233868	52011	7
>.05 - .10	1392311	309643	40
>.10 - .15	113629	25271	3
>.15 - .20	12470	2773	0
>.20 - .25	5137	1142	0
>.25 - .30	20	4	0
>.30 - .35	18	4	0
>.35 - .40	3	1	0

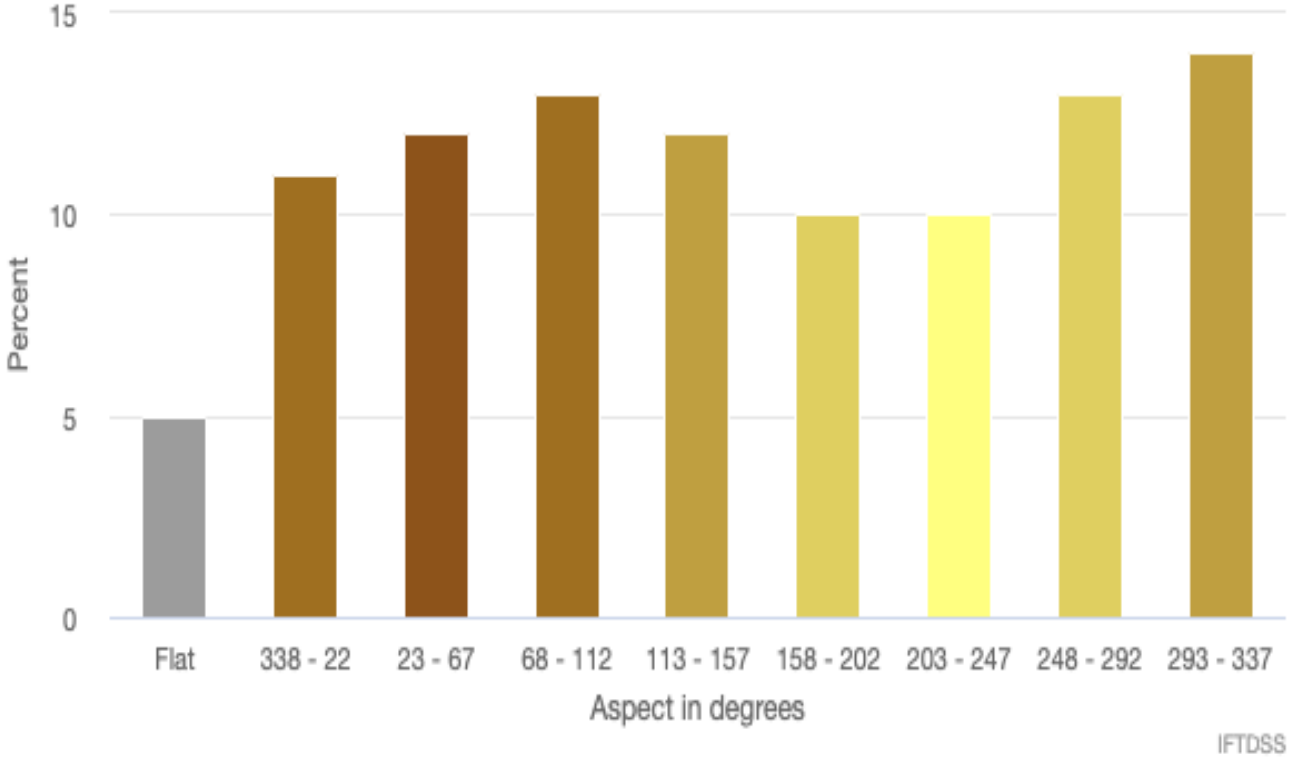
Aspect


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Aspect
Degrees
Flat
0 - 22 (N)
23 - 67 (NE)
68 - 112 (E)
113 - 157 (SE)
158 - 202 (S)
203 - 247 (SW)
248 - 292 (W)
293 - 337 (NW)
338 - 359 (N)
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Aspect
LANDFIRE Version:
LANDFIRE 2016
IFTDSS LandscapeFile Name:
AC 2016
Created On: 01/30/2020
User Name: ccg
0 1.75 3.5 7 10.5 14
Miles
N

Aspect

Aspect (degrees) Data Summary within "AC_2016" Landscape

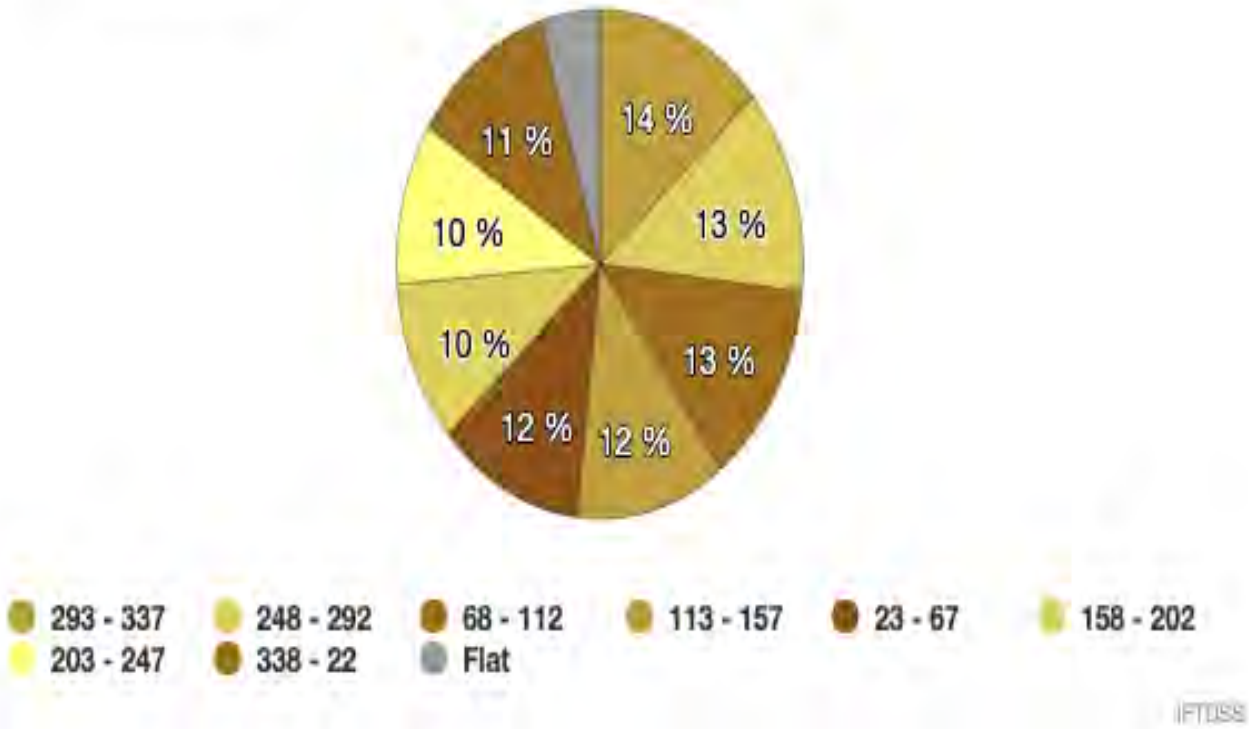
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Aspect

Aspect (degrees) Data Summary within "AC_2016" Landscape

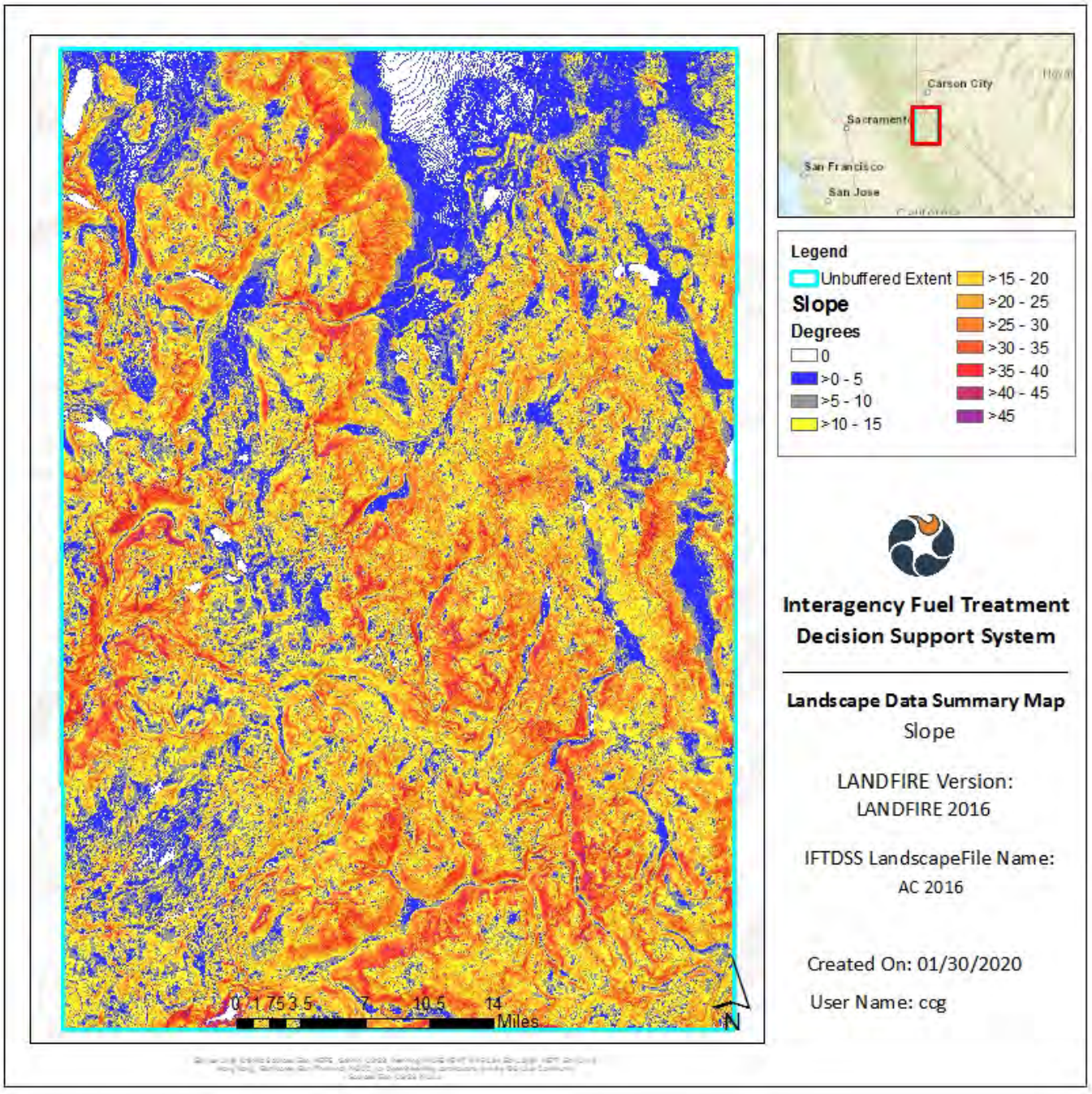
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Aspect

Aspect (degrees)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Flat	165635	36836	5
338 - 22 (N)	388675	86439	11
23 - 67 (NE)	401336	89255	12
68 - 112 (E)	457953	101846	13
113 - 157 (SE)	415840	92481	12
158 - 202 (S)	362311	80576	10
203 - 247 (SW)	359756	80008	10
248 - 292 (W)	460085	102321	13
293 - 337 (NW)	471955	104960	14

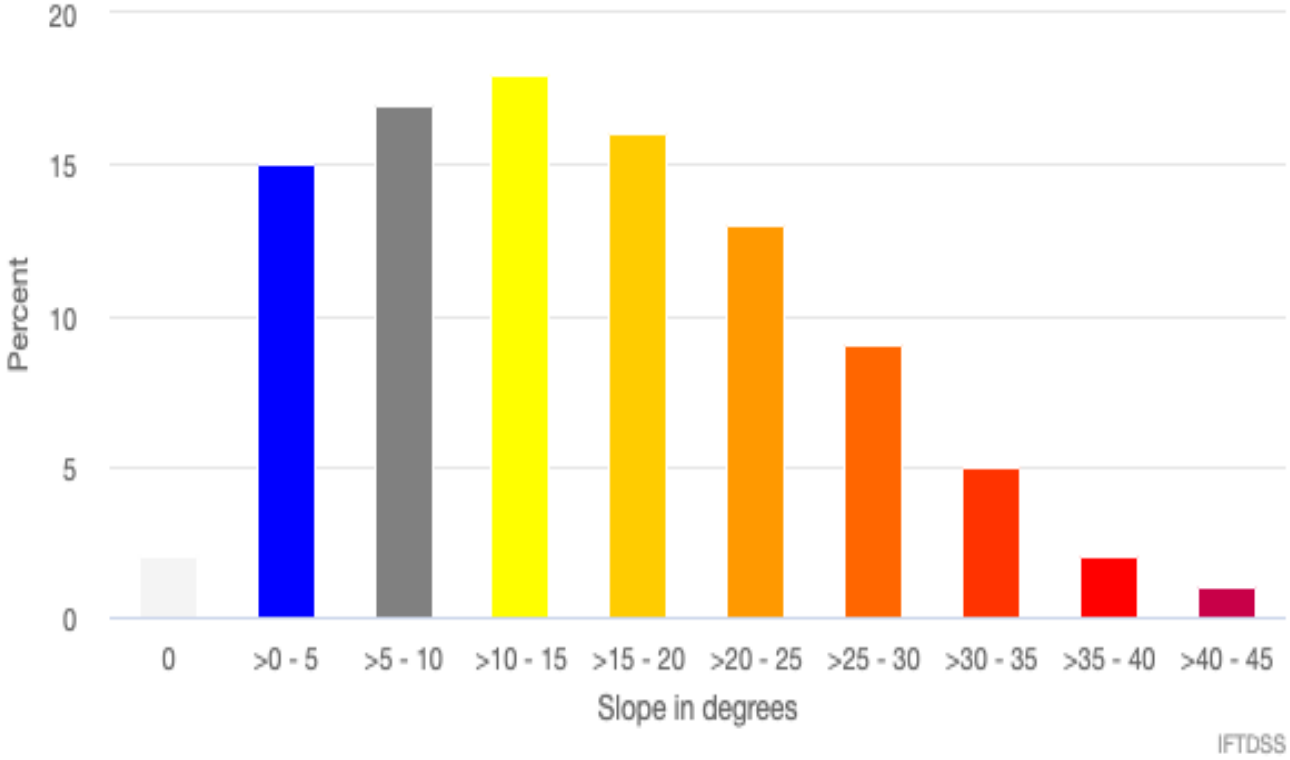
Slope


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Slope
Degrees
0
>0 - 5
>5 - 10
>10 - 15
>15 - 20
>20 - 25
>25 - 30
>30 - 35
>35 - 40
>40 - 45
>45
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Slope
LANDFIRE Version:
LANDFIRE 2016
IFTDSS LandscapeFile Name:
AC 2016
Created On: 01/30/2020
User Name: ccg

Slope

Slope (degrees) Data Summary within "AC_2016" Landscape

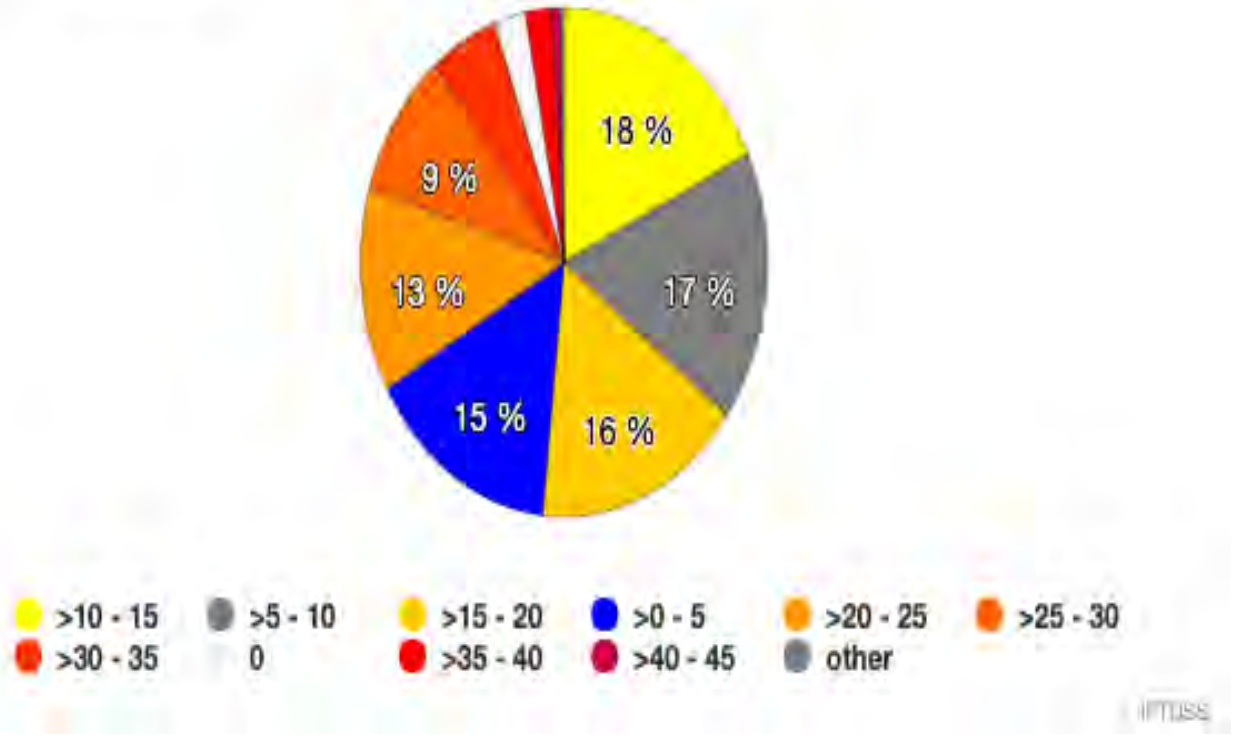
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Slope

Slope (degrees) Data Summary within "AC_2016" Landscape

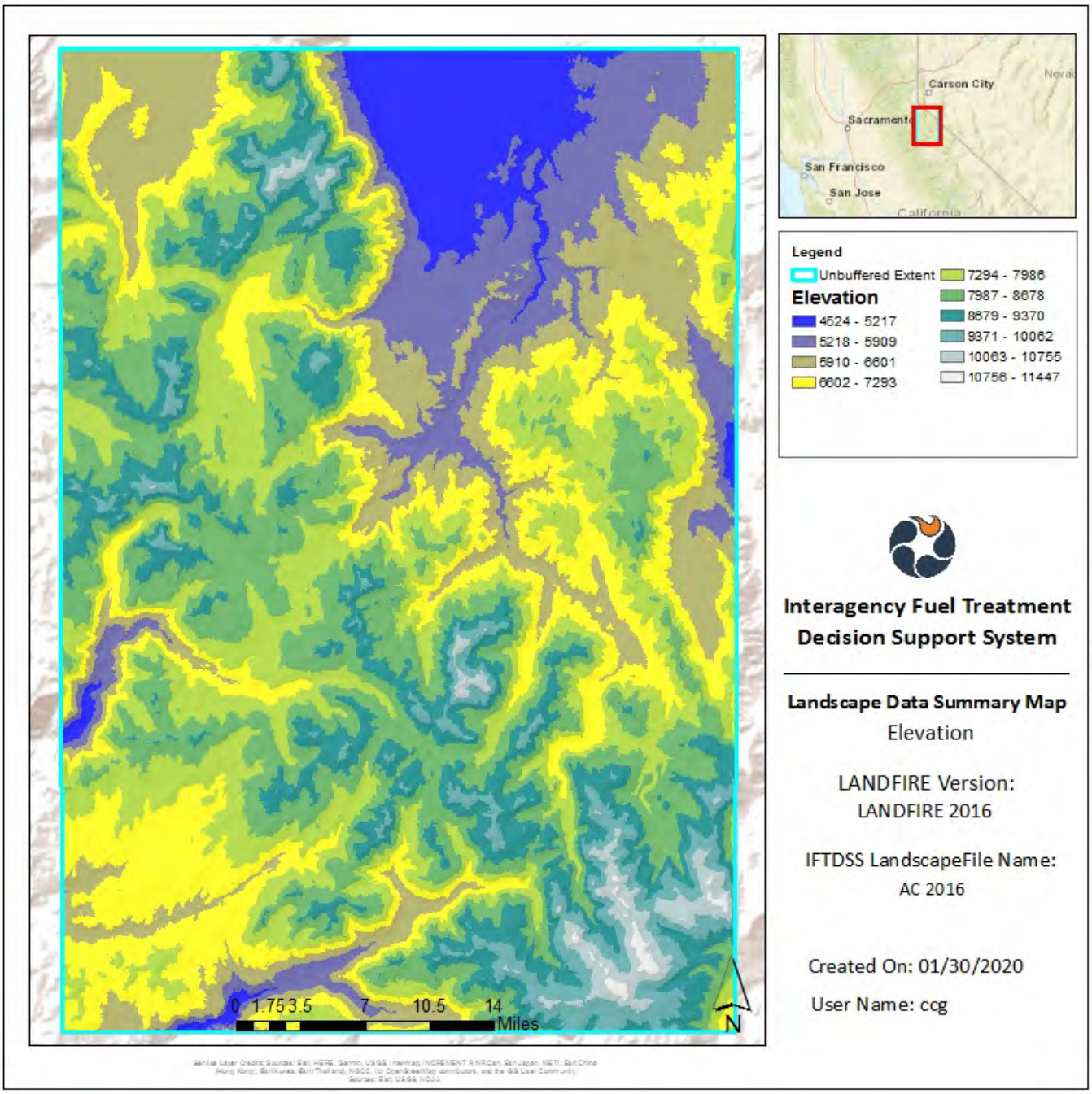
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Slope

Slope (degrees)	Pixel Count (freq)	Acres In LCP	Percent In LCP
0	86934	19334	2
>0 - 5	525433	116854	15
>5 - 10	599359	133294	17
>10 - 15	628477	139770	18
>15 - 20	572551	127332	16
>20 - 25	453255	100802	13
>25 - 30	325151	72312	9
>30 - 35	186822	41548	5
>35 - 40	73579	16364	2
>40 - 45	22344	4969	1
>45	9641	2144	0

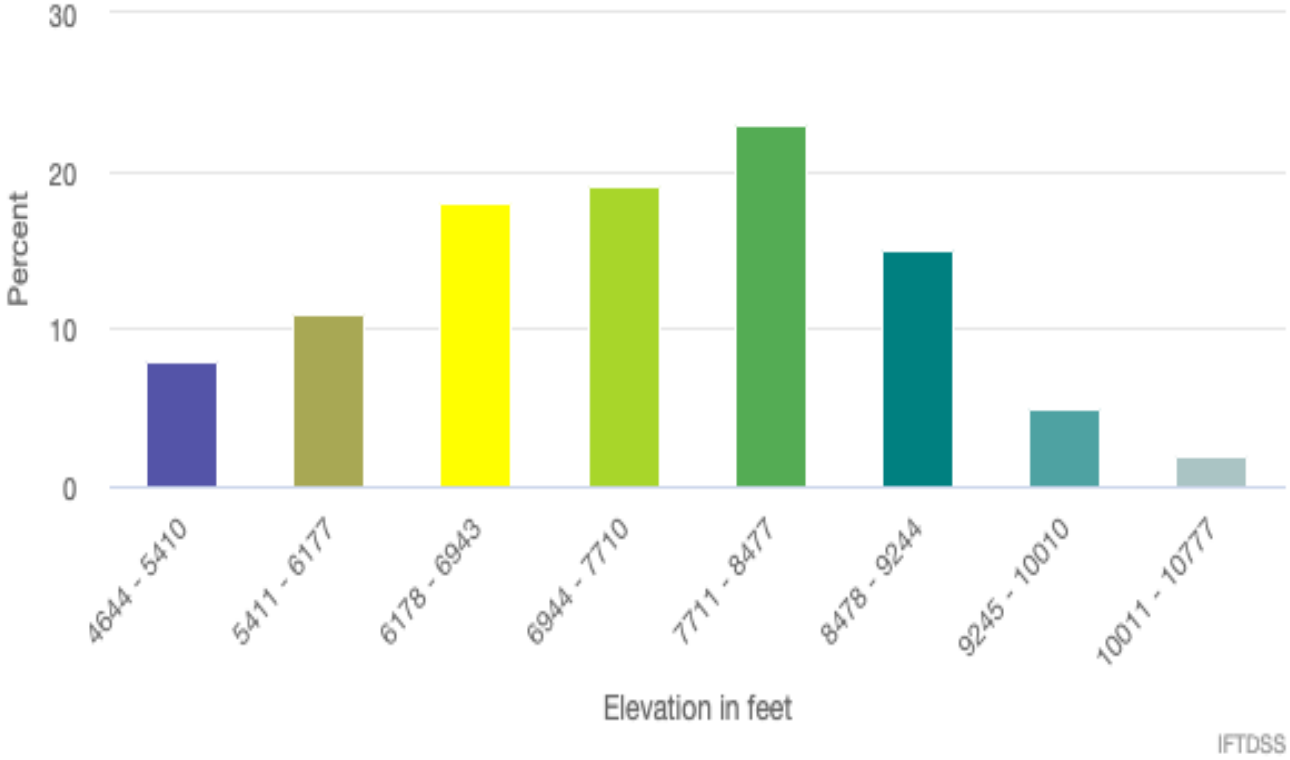
Elevation


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Elevation
4524 - 5217
5218 - 5909
5910 - 6601
6602 - 7293
7294 - 7986
7987 - 8678
8679 - 9370
9371 - 10062
10063 - 10755
10756 - 11447
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment Decision Support System
Landscape Data Summary Map
Elevation
LANDFIRE Version:
LANDFIRE 2016
IFTDSS LandscapeFile Name:
AC 2016
Created On: 01/30/2020
User Name: ccg

Elevation

Elevation (feet) Data Summary within "AC_2016" Landscape

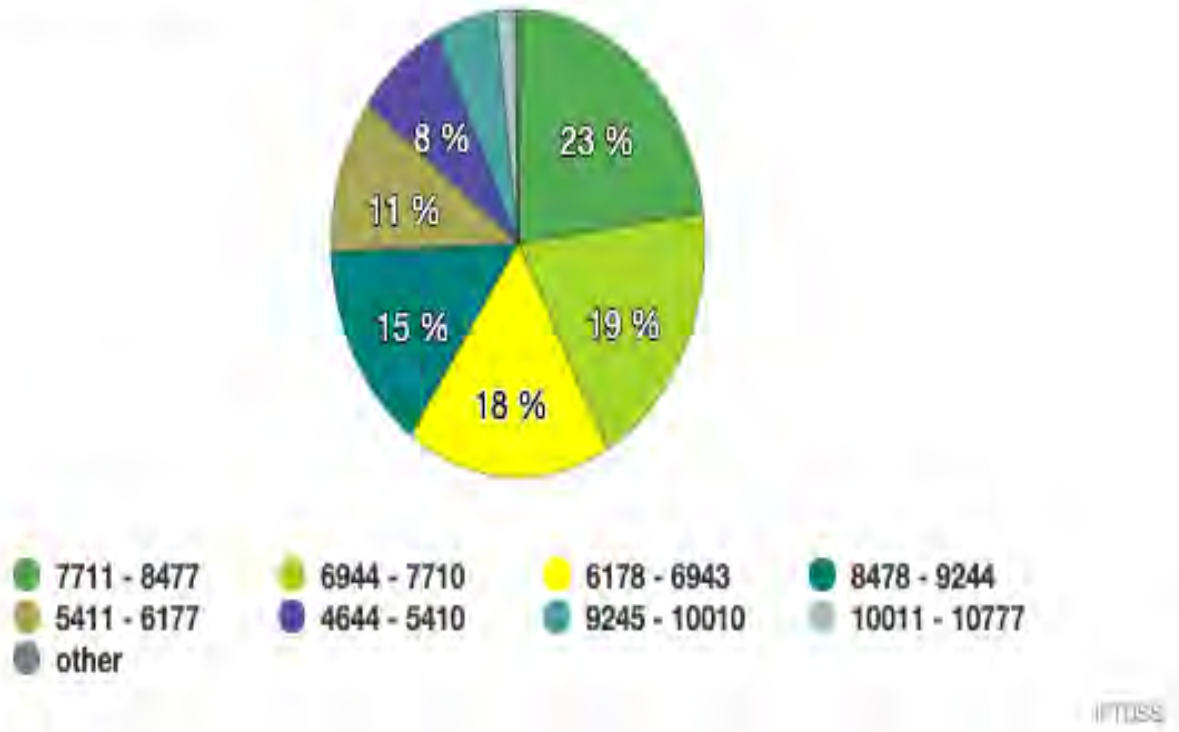
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Elevation

Elevation (feet) Data Summary within "AC_2016" Landscape

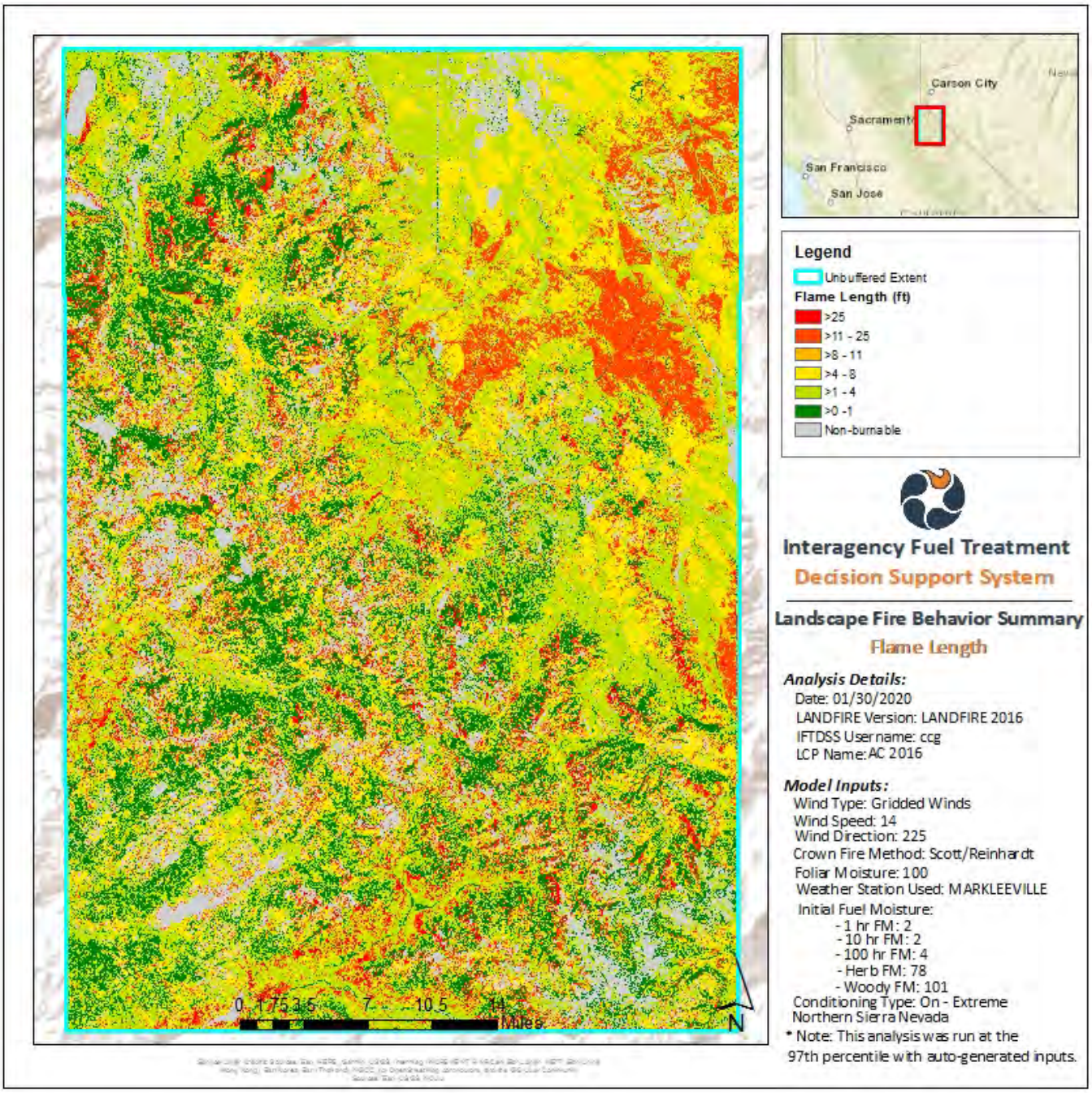
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Elevation

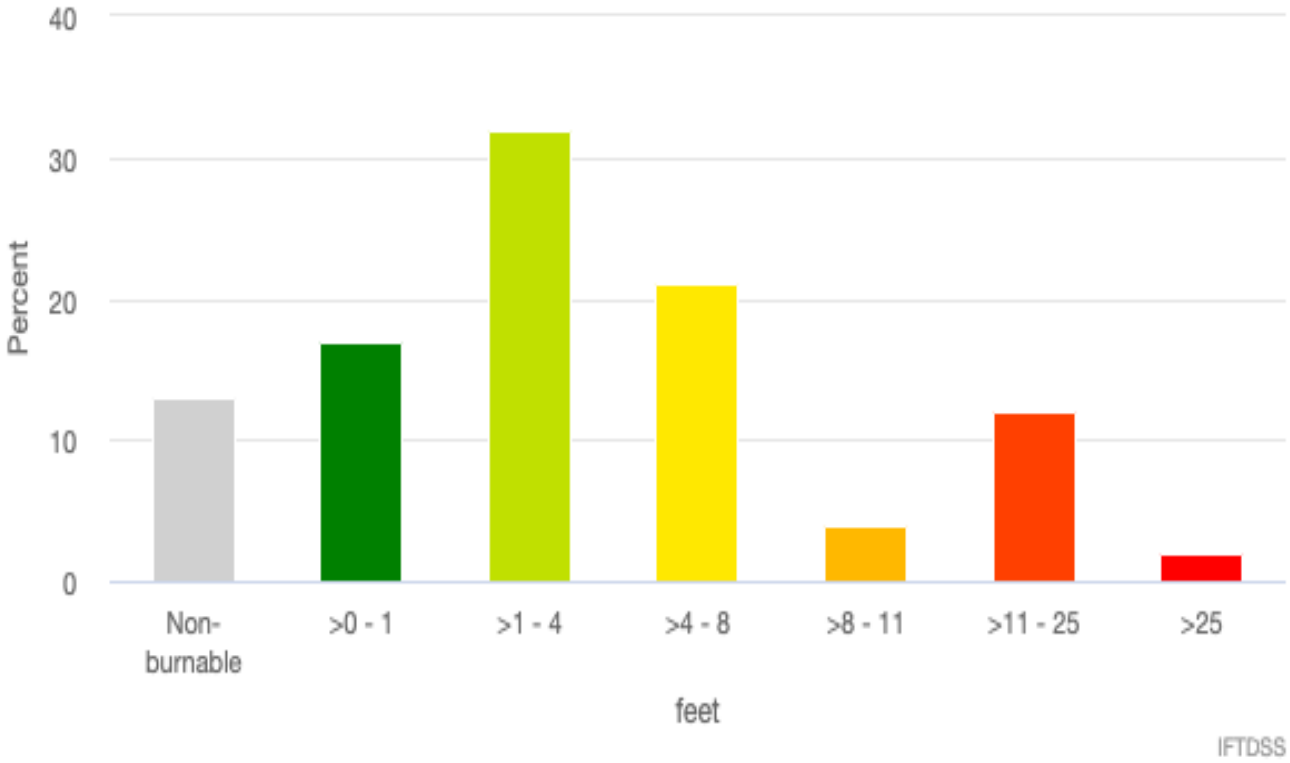
Elevation (feet)	Pixel Count (freq)	Acres In LCP	Percent In LCP
3877 - 4643	196	44	0
4644 - 5410	265138	58965	8
5411 - 6177	373086	82972	11
6178 - 6943	614850	136739	18
6944 - 7710	668601	148693	19
7711 - 8477	798651	177616	23
8478 - 9244	511693	113798	15
9245 - 10010	186841	41552	5
10011 - 10777	58153	12933	2
10778 - 11546	6337	1409	0

Flame Length



Flame Length (feet) Data Summary within "AC_2016" Landscape

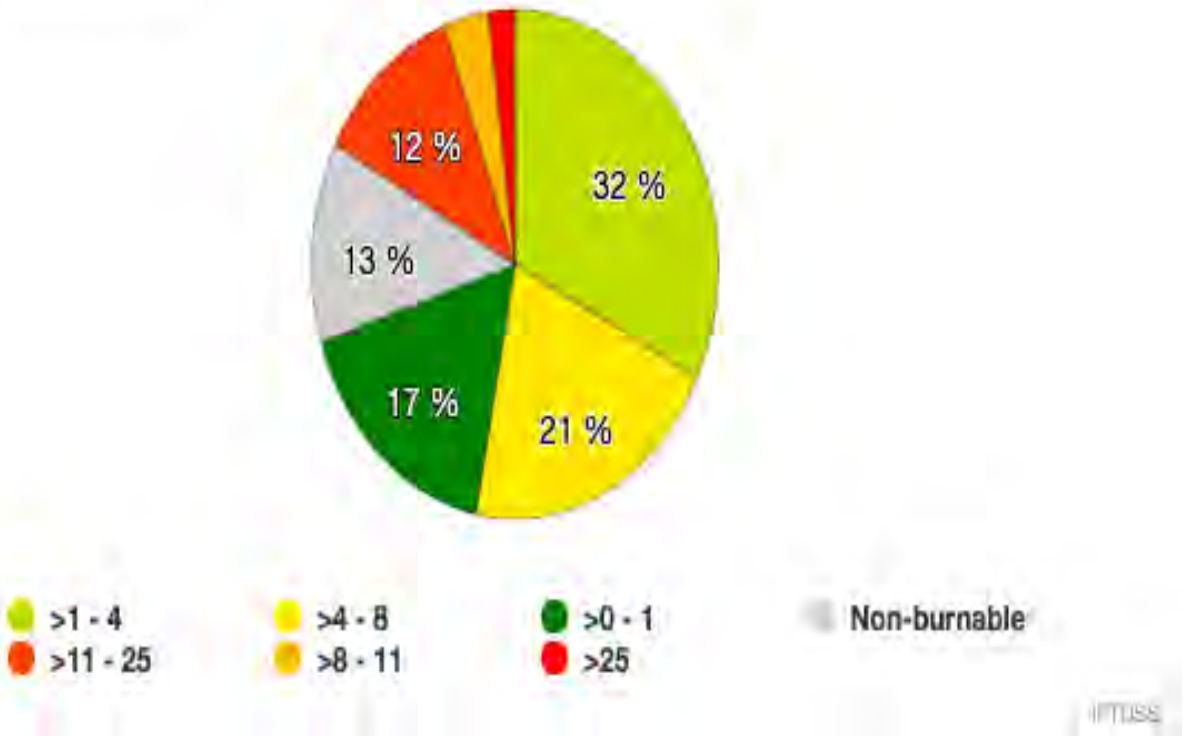
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Flame Length

Flame Length (feet) Data Summary within "AC_2016" Landscape

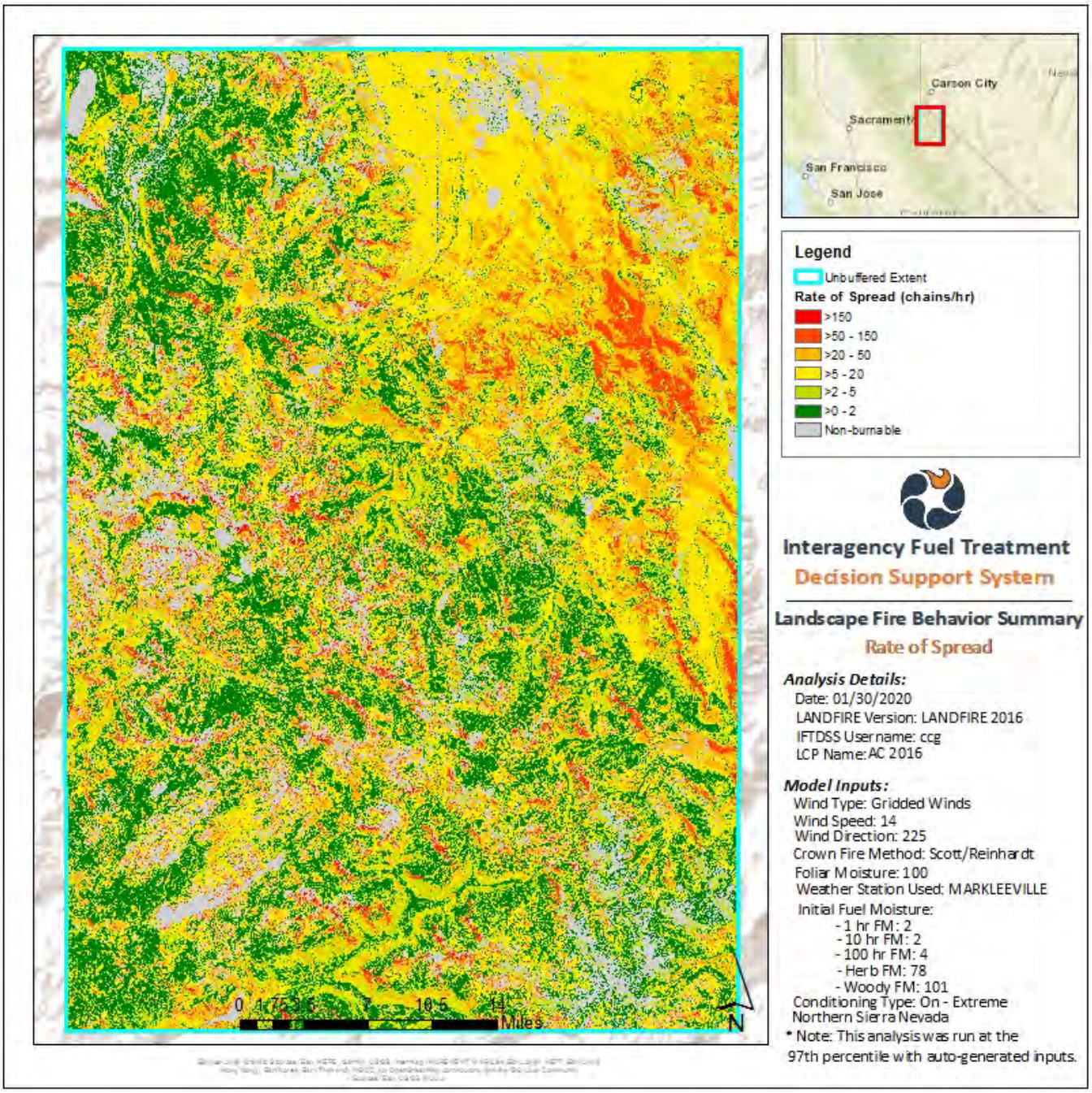
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Flame Length

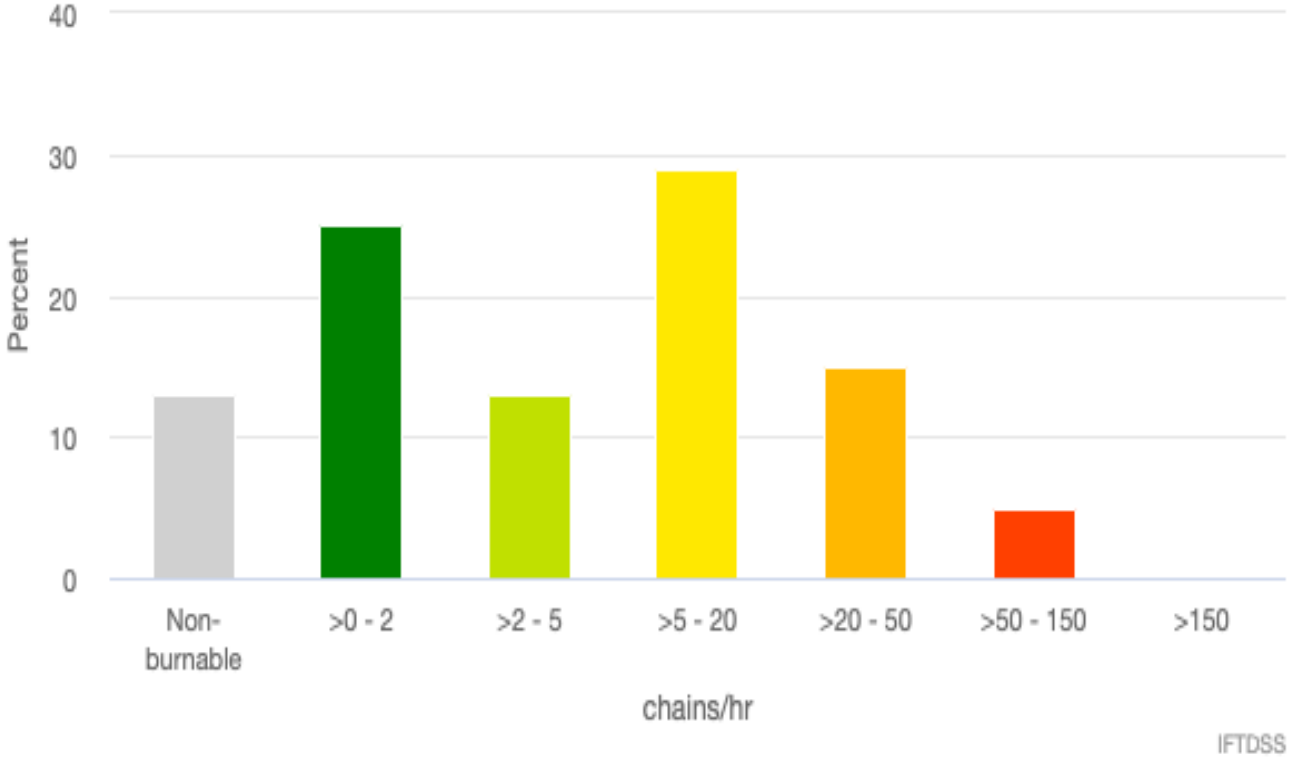
Flame Length (feet)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	444212	98790	13
>0 - 1	591253	131492	17
>1 - 4	1124821	250154	32
>4 - 8	724736	161178	21
>8 - 11	123169	27392	4
>11 - 25	402831	89588	12
>25	72524	16129	2

Spread Rate


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Rate of Spread (chains/hr)
>150
>50 - 150
>20 - 50
>5 - 20
>2 - 5
>0 - 2
Non-burnable
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment
Decision Support System
Landscape Fire Behavior Summary
Rate of Spread
Analysis Details:
Date: 01/30/2020
LANDFIRE Version: LANDFIRE 2016
IFTDSS Username: ccg
LCP Name: AC 2016
Model Inputs:
Wind Type: Gridded Winds
Wind Speed: 14
Wind Direction: 225
Crown Fire Method: Scott/Reinhardt
Foliar Moisture: 100
Weather Station Used: MARKLEEVILLE
Initial Fuel Moisture:
- 1 hr FM: 2
- 10 hr FM: 2
- 100 hr FM: 4
- Herb FM: 78
- Woody FM: 101
Conditioning Type: On - Extreme Northern Sierra Nevada
* Note: This analysis was run at the 97th percentile with auto-generated inputs.

Rate of Spread (chains/hr) Data Summary within "AC_2016" Landscape

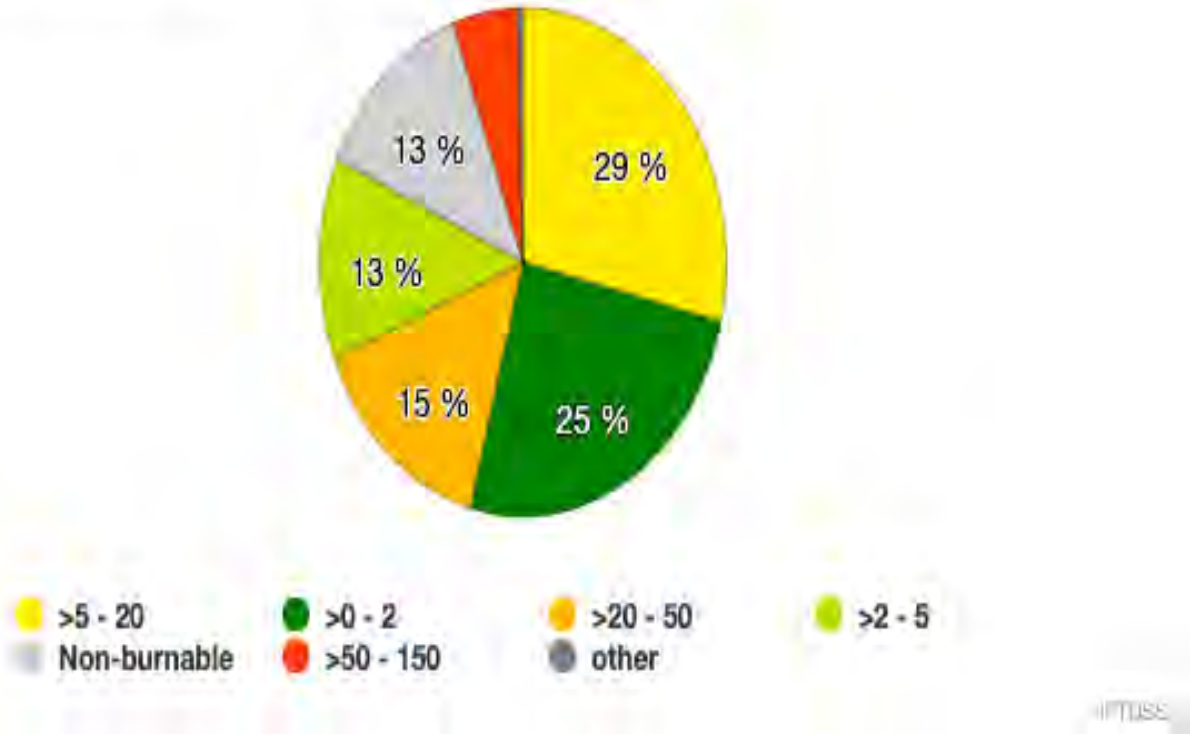
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Spread Rate

Rate of Spread (chains/hr) Data Summary within "AC_2016" Landscape

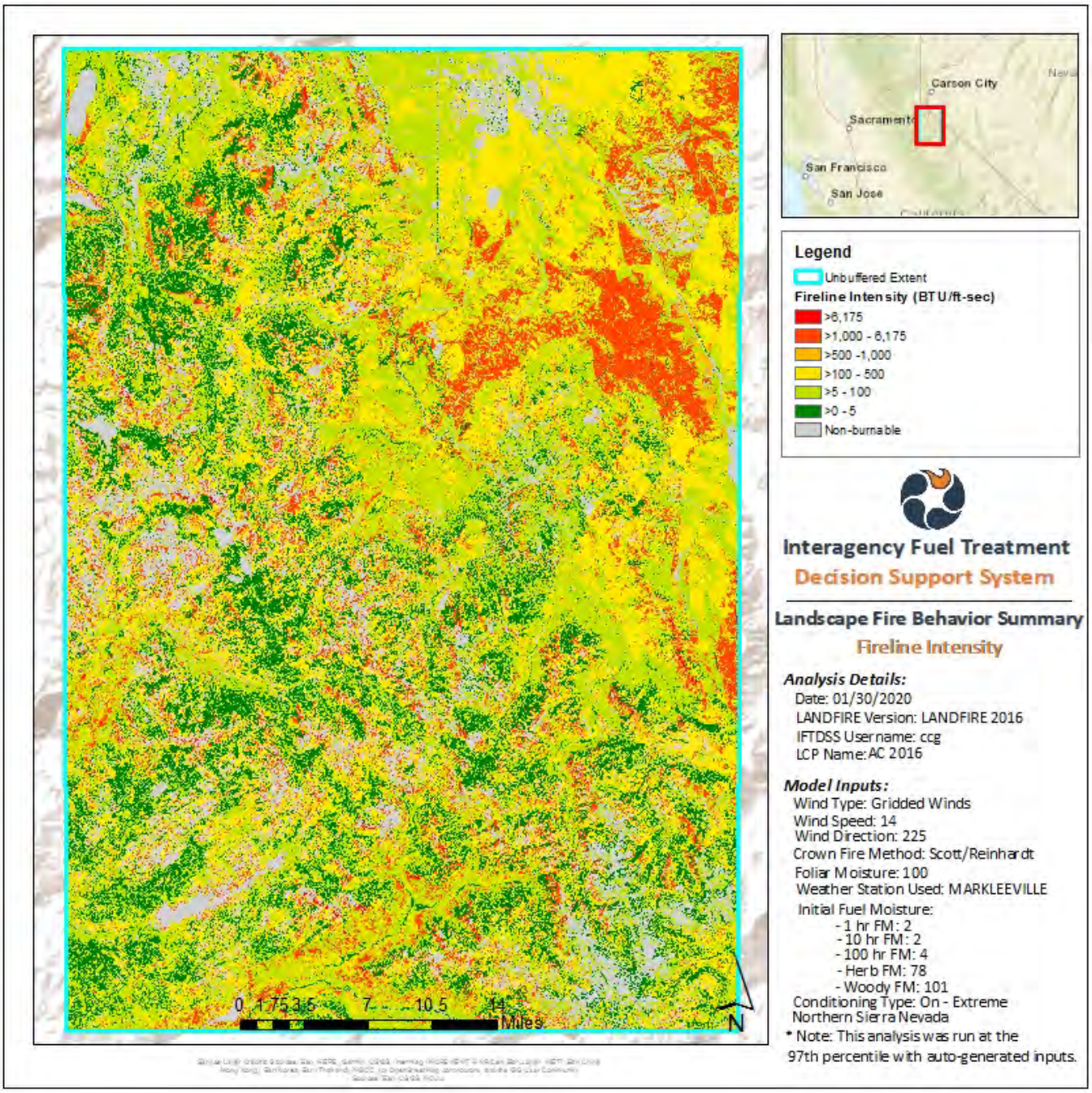
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Spread Rate

Rate of Spread (chains/hr)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	444212	98790	13
>0 - 2	886310	197111	25
>2 - 5	447767	99581	13
>5 - 20	1002066	222854	29
>20 - 50	509198	113243	15
>50 - 150	179151	39842	5
>150	14842	3301	0

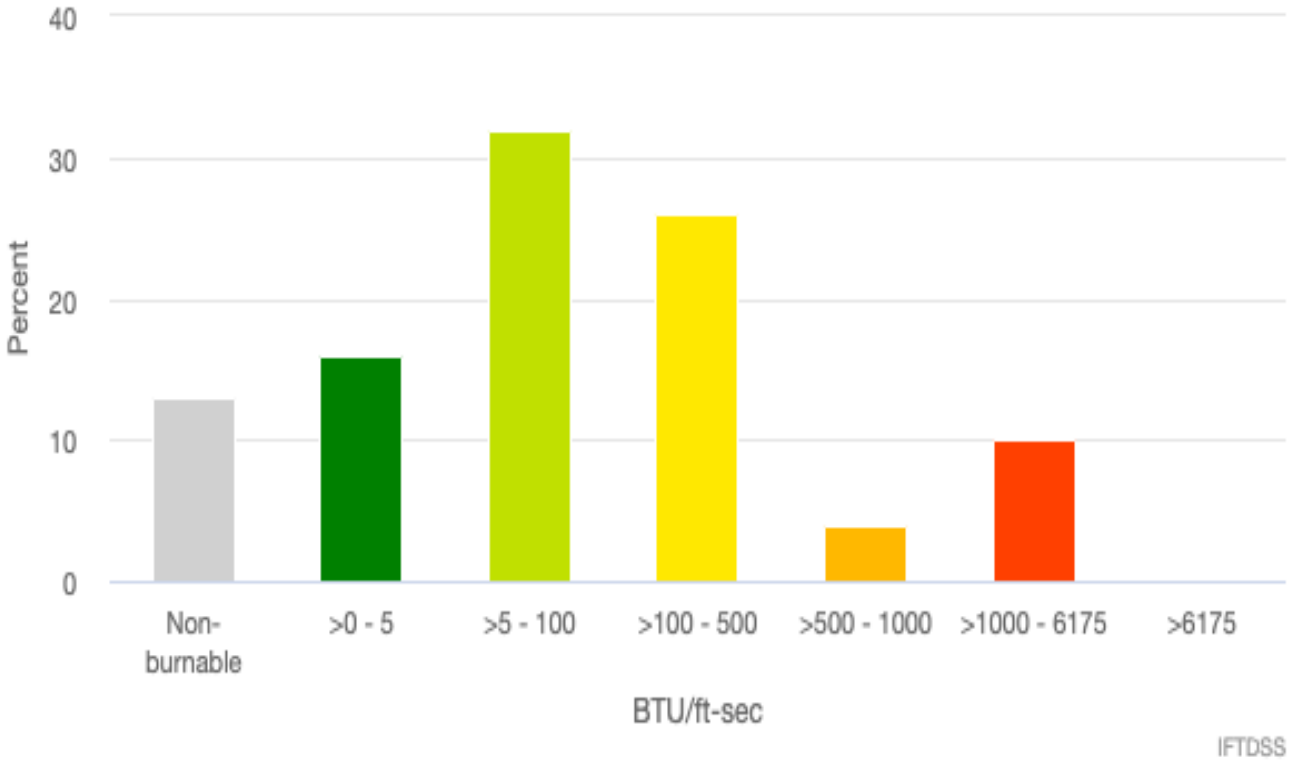
Intensity


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Fireline Intensity (BTU/ft-sec)
>6,175
>1,000 - 6,175
>500 -1,000
>100 - 500
>5 - 100
>0 - 5
Non-burnable
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment
Decision Support System
Landscape Fire Behavior Summary
Fireline Intensity
Analysis Details:
Date: 01/30/2020
LANDFIRE Version: LANDFIRE 2016
IFTDSS Username: ccg
LCP Name: AC 2016
Model Inputs:
Wind Type: Gridded Winds
Wind Speed: 14
Wind Direction: 225
Crown Fire Method: Scott/Reinhardt
Foliar Moisture: 100
Weather Station Used: MARKLEEVILLE
Initial Fuel Moisture:
- 1 hr FM: 2
- 10 hr FM: 2
- 100 hr FM: 4
- Herb FM: 78
- Woody FM: 101
Conditioning Type: On - Extreme Northern Sierra Nevada
* Note: This analysis was run at the 97th percentile with auto-generated inputs.

Intensity

Fireline Intensity (BTU/ft-sec) Data Summary within "AC_2016" Landscape

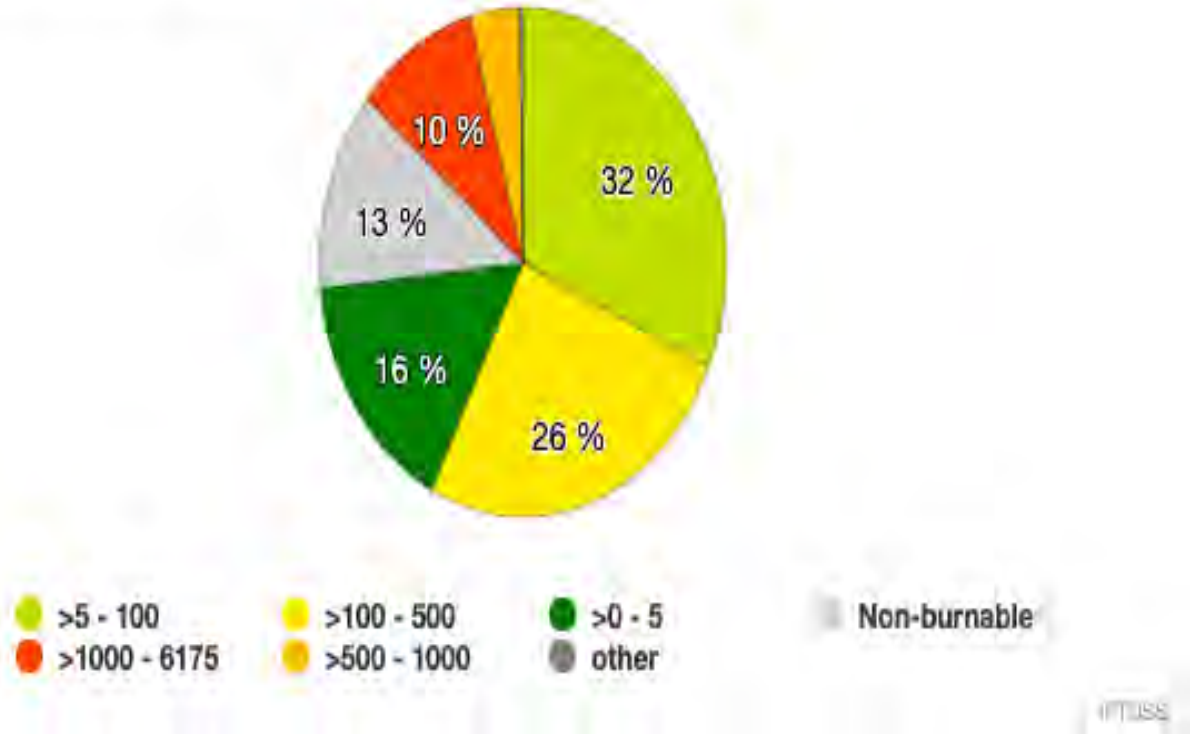
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Intensity

Fireline Intensity (BTU/ft-sec) Data Summary within "AC_2016" Landscape

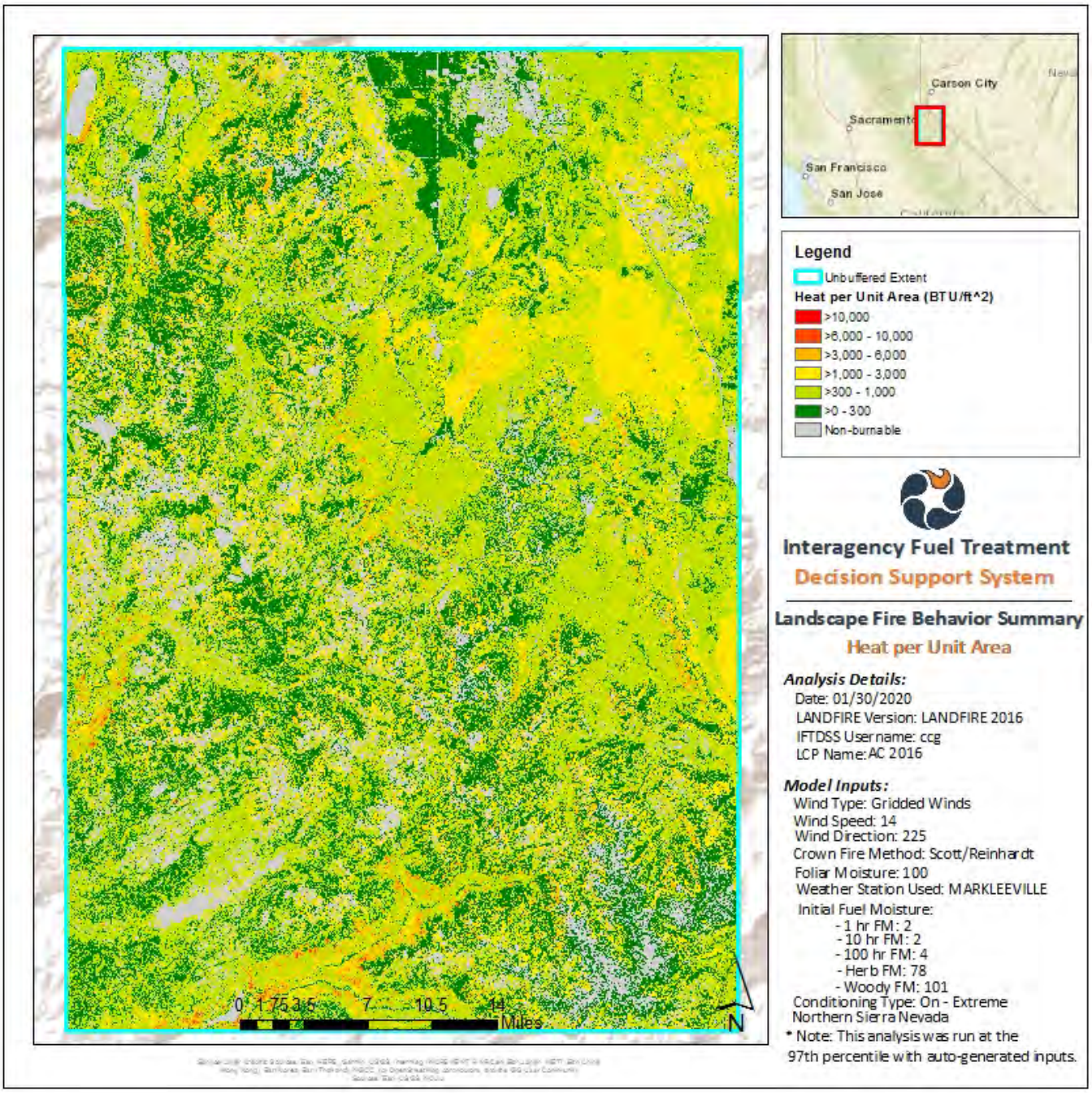
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Intensity

Fireline Intensity (BTU/ft-sec)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	444212	98790	13
>0 - 5	554791	123383	16
>5 - 100	1108968	246629	32
>100 - 500	892306	198444	26
>500 - 1,000	139210	30960	4
>1,000 - 6,175	336389	74811	10
>6,175	7670	1706	0

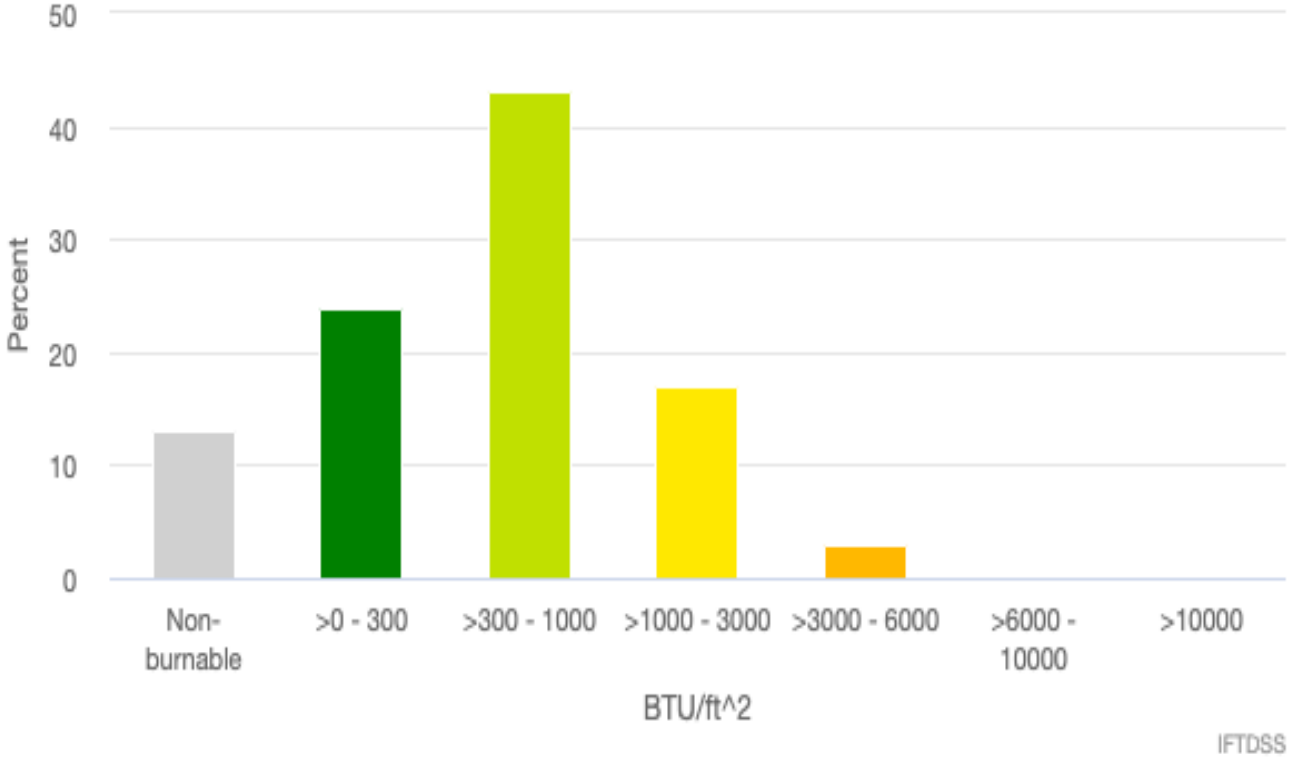
Heat/Area


Carson City
Sacramento
San Francisco
San Jose
Legend
Unbuffered Extent
Heat per Unit Area (BTU/ft^2)
>10,000
>6,000 - 10,000
>3,000 - 6,000
>1,000 - 3,000
>300 - 1,000
>0 - 300
Non-burnable
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment
Decision Support System
Landscape Fire Behavior Summary
Heat per Unit Area
Analysis Details:
Date: 01/30/2020
LANDFIRE Version: LANDFIRE 2016
IFTDSS Username: ccg
LCP Name: AC 2016
Model Inputs:
Wind Type: Gridded Winds
Wind Speed: 14
Wind Direction: 225
Crown Fire Method: Scott/Reinhardt
Foliar Moisture: 100
Weather Station Used: MARKLEEVILLE
Initial Fuel Moisture:
- 1 hr FM: 2
- 10 hr FM: 2
- 100 hr FM: 4
- Herb FM: 78
- Woody FM: 101
Conditioning Type: On - Extreme Northern Sierra Nevada
* Note: This analysis was run at the 97th percentile with auto-generated inputs.

Heat/Area

Heat per Unit Area (BTU/ft^2) Data Summary within "AC_2016" Landscape

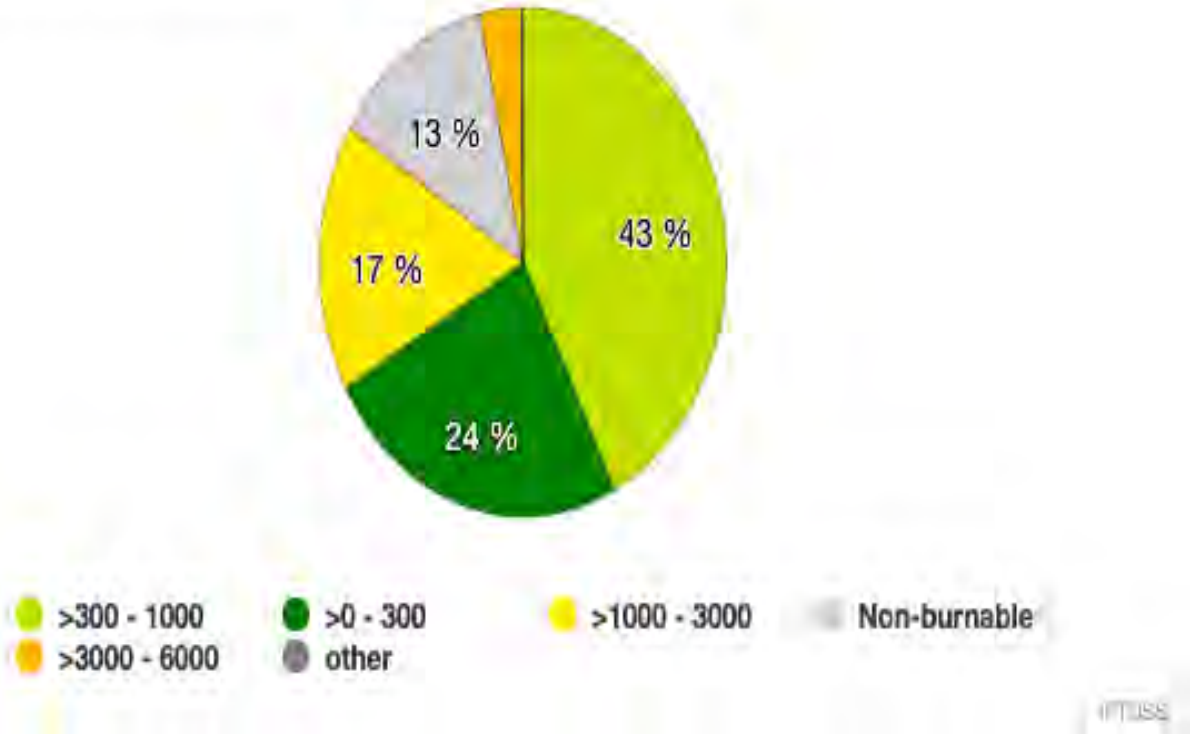
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Heat/Area

Heat per Unit Area (BTU/ft^2) Data Summary within "AC_2016" Landscape

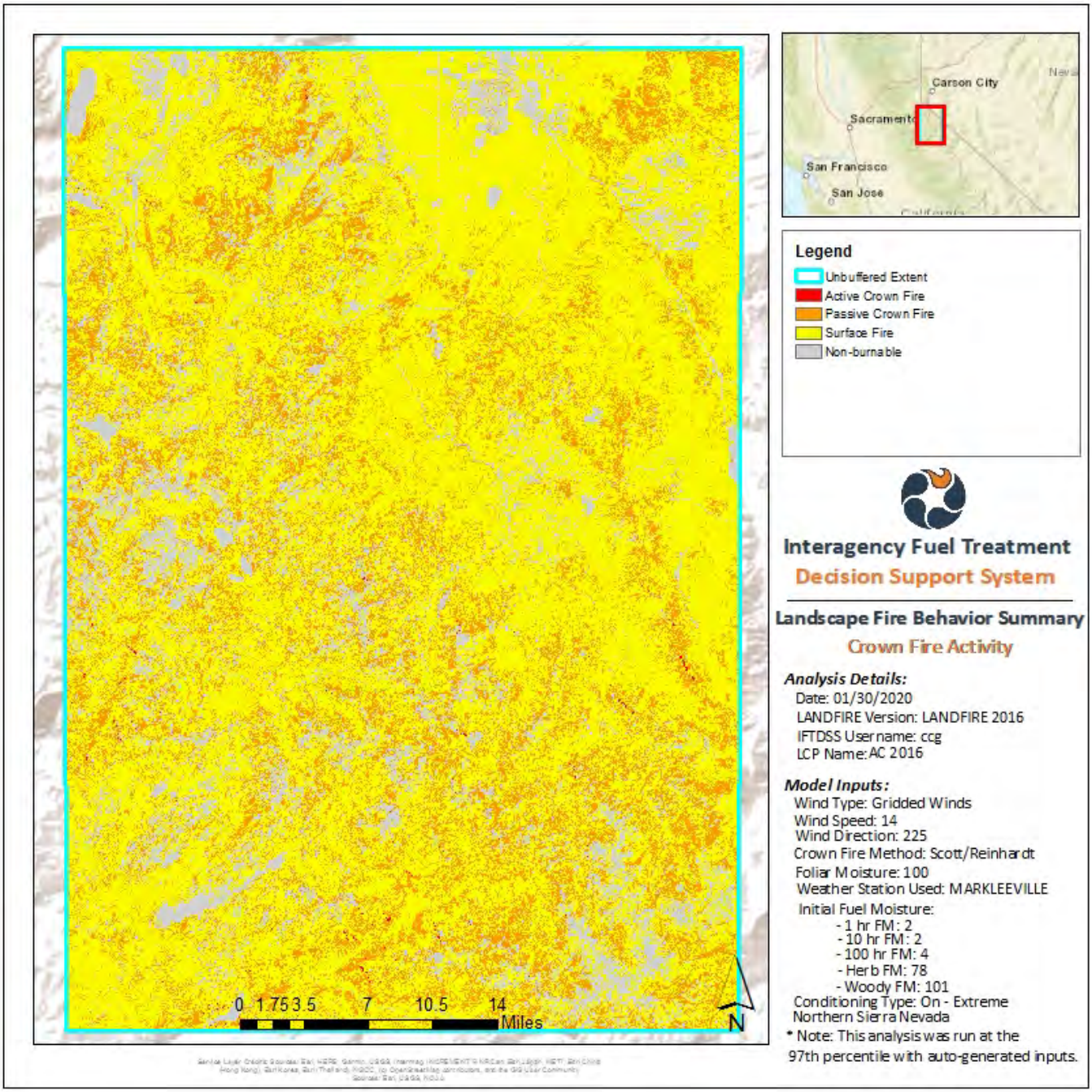
Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Heat/Area

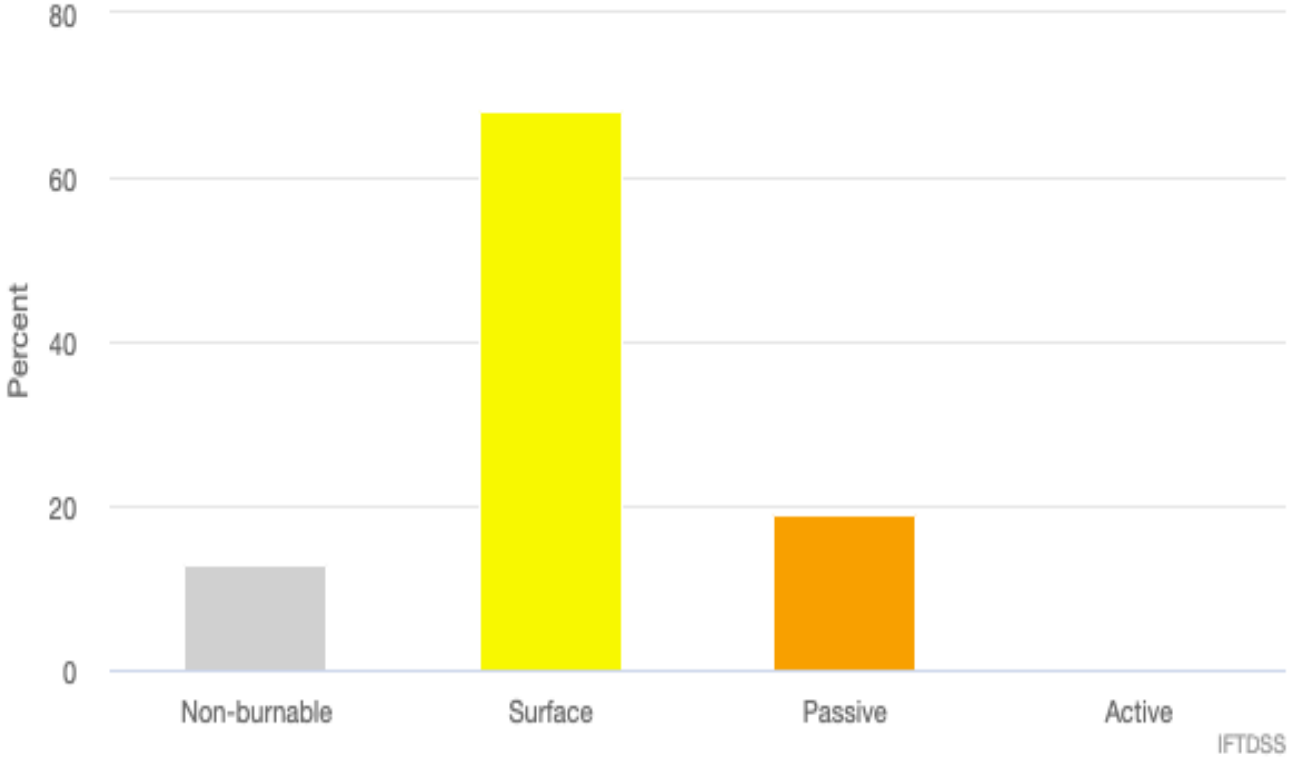
Heat per Unit Area (BTU/ft^2)	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	444212	98790	13
>0 - 300	842213	187304	24
>300 - 1,000	1485136	330287	43
>1,000 - 3,000	593536	131999	17
>3,000 - 6,000	114324	25425	3
>6,000 - 10,000	4040	898	0
>10,000	85	19	0

Crown Fire


Carson City
Sacramento
San Francisco
San Jose
Legend
Unburned Extent
Active Crown Fire
Passive Crown Fire
Surface Fire
Non-burnable
0 1.75 3.5 7 10.5 14
Miles
N
Interagency Fuel Treatment
Decision Support System
Landscape Fire Behavior Summary
Crown Fire Activity
Analysis Details:
Date: 01/30/2020
LANDFIRE Version: LANDFIRE 2016
IFTDSS Username: ccg
LCP Name: AC 2016
Model Inputs:
Wind Type: Gridded Winds
Wind Speed: 14
Wind Direction: 225
Crown Fire Method: Scott/Reinhardt
Foliar Moisture: 100
Weather Station Used: MARKLEEVILLE
Initial Fuel Moisture:
- 1 hr FM: 2
- 10 hr FM: 2
- 100 hr FM: 4
- Herb FM: 78
- Woody FM: 101
Conditioning Type: On - Extreme Northern Sierra Nevada
* Note: This analysis was run at the 97th percentile with auto-generated inputs.

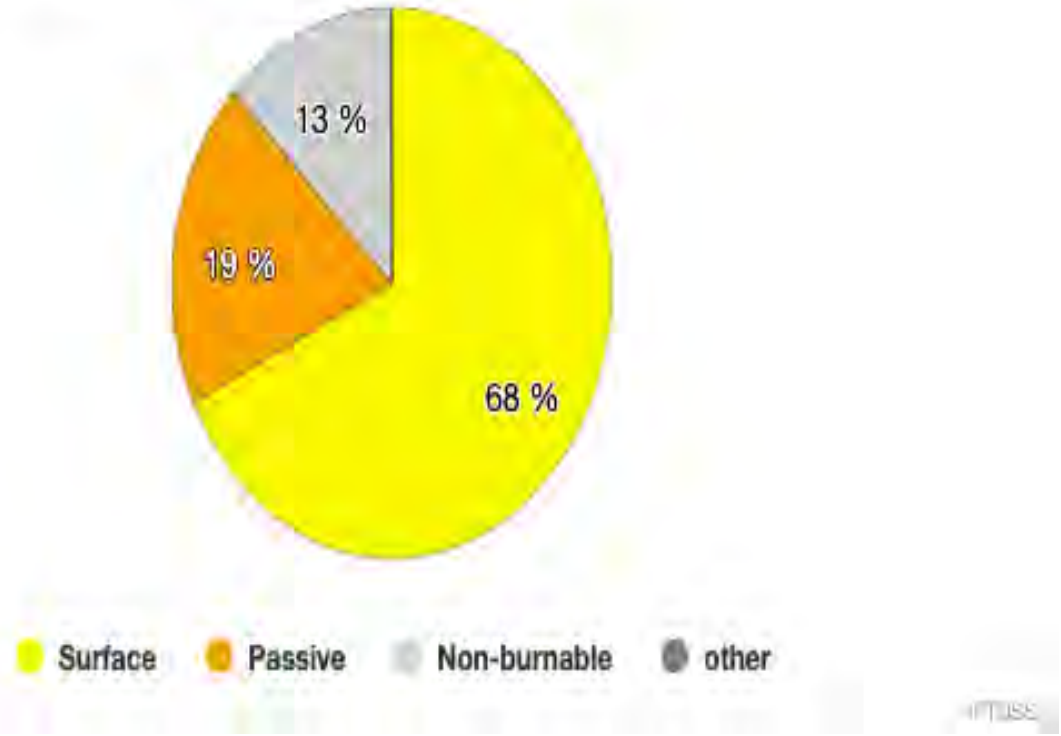
Crown Fire Activity Data Summary within "AC_2016" Landscape

Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Crown Fire Activity Data Summary within "AC_2016" Landscape

Source Landscape Name: AC_2016
Landfire Version: LANDFIRE 2016
Source Landscape Acres: 774,723
Model Name: AC_2016 - Auto97th



Crown Fire

Crown Fire Activity	Pixel Count (freq)	Acres In LCP	Percent In LCP
Non-burnable	444212	98790	13
Surface Fire	2364604	525876	68
Passive Fire	672856	149640	19
Active Fire	1874	417	0

APPENDIX C

Response Function Survey

Highly Valued Resources and Assets (HVRA) Response Function Characterization Survey – Alpine County

In this survey, we ask survey participants to assign a "response function" or fire effects value to each of the HRVAs that have been identified for the project area. For each combination of HVRA and flame length, we ask that you determine whether a flame length category would be relatively:

· “beneficial” (+1 [slightly] to +3 [extremely]);

· “neutral” (0); or

· “detrimental” (-1 [slightly] to -3 [extremely]) to a HVRA

For the purposes of this survey, fire severity is defined as the amount of live vegetation killed in a fire. Low severity is generally <25% mortality, moderate is from 25-90% mortality, and high severity is >90% mortality. Examples of fire behavior are given for forested vegetation, but the general gradient applies to other vegetation types as well. We are using flame length as surrogate to fire intensity as follows:

Flame Length (ft)	Description of general fire behavior and effects
0-2	Scorch height 5-20'; typically, low severity; ground/surface fire in low fuel load and/or mild conditions. Fire burns surface fuels, small shrubs or seedlings.
2-4	Scorch height 10-40'; typically, low-to-moderate severity; ground/surface fire, moderate fuel load and/or moderate conditions. Fire burns surface fuels, shrubs and smaller trees.
4-6	Scorch height 20-60'; typically, moderate severity; ground/surface fire in moderate fuel and moderate-to-severe conditions. Fire burns surface fuels, shrubs and smaller trees, as well as individual mature trees.
6-8	Scorch height 30-80'; typically, moderate-to-high severity; some ground/surface fire transitioning to canopy fire in moderate-to-heavy fuel and moderate-to-severe conditions. Fire burns surface fuels, shrubs and smaller trees, and some smaller clumps of mature trees.
8-12	Scorch height 50-100'; typically, high severity; some ground/surface fire transitioning to canopy fire in moderate-to-heavy fuel load and moderate-to-severe conditions. Fire burns

	burns very hot, killing larger clumps of mature trees as well as consuming under-story and surface fuels.
>12	Scorch height exceeds tree height; high severity; crown/canopy fire in heavy fuel in moderate-to-severe conditions. Fire burns very hot, killing nearly all mature trees in a wider area, as well as consuming under-story and surface fuels.

For questions about this survey, please contact Scott Conway at: sconway@sig-gis.com

* 1. Your Name (Optional)

* 2. Agency or Institution

* 3. Position Description

4. Please use dropdowns to score each HVRA listed below in terms of their 'response function' (i.e., expected fire effects) to different flame length/fire intensities.

Description of response function scoring scheme

-3	Highly detrimental to HVRA
-2	Moderately detrimental to HVRA
-1	Slightly detrimental to HVRA
0	No beneficial or detrimental effect HVRA
1	Slightly beneficial to HVRA
2	Moderately beneficial to HVRA
3	Highly beneficial to HVRA
N/A	Unsure

For example, the result of your responses for each HVRA should look something like this - where a response function value is inserted for each combination of HVRA and fire severity level:

	Fire Severity						
HVRA:Sub-HVRA	**Low: Flame**	**Low: Flame**	**Moderate: Flame**	**Moderate: Flame**	**Extreme: Flame**	**Extreme: Flame**	**Don't Know/Unsure**

	Length 0-2ft	Length 2-4ft	Length 4-6ft	Length 6-8ft	Length 8-12ft	Length 12+ft	
Natural Resources/Open Space: Watersheds of Special Significance	3	2	0	-1	-3	-3	
Infrastructure/Utilities: Major Evacuation Corridors	0	-1	-2	-3	-3	-3	

	Low - Flame Length 0-2 ft.	Low - Flame Length 2-4 ft.	Moderate - Flame Length 4-6 ft.	Moderate - Flame Length 6-8 ft.	Extreme - Flame Length 8-12 ft.	Extreme - Flame Length 12+ ft.	Don't Know/Unsure
Community Structures: Residential Structures							
Community Structures: Education facilities (e.g., daycare/schools/colleges)							
Community Structures: Recreational Facilities – campgrounds, RV parks (non-ski)							
Community Structures: Health and elder care facilities							
Community Structures: Business and Public structures							
Community Structures: Places of Worship							
Community Structures: High-hazard Buildings							
Community Structures: Non-Habitable/Unknown Structures (barns/sheds)							
Infrastructure/Utilities: Communication Infrastructure (cell towers, microwave towers, etc)							
Infrastructure/Utilities: Potable water storage (e.g., tanks); snow making infrastructure							
Infrastructure/Utilities: Airport							
Infrastructure/Utilities: Major Evacuation Corridors (ingress and egress routes)							

	Low - Flame Length 0-2 ft.	Low - Flame Length 2-4 ft.	Moderate - Flame Length 4-6 ft.	Moderate - Flame Length 6-8 ft.	Extreme - Flame Length 8-12 ft.	Extreme - Flame Length 12+ ft.	Don't Know/Unsure
Infrastructure/Utilities: Minor Evacuation Corridors (ingress and egress routes)							
Infrastructure/Utilities: Community Evacuation/Refuge/Safe Zones/Areas							
Cultural/Historic Resources: Cemeteries or significant resource buildings, areas							
Natural Resources/Open Space - Watersheds of special significance							
Natural Resources/Open Space - Wildland Urban Interface - Defense							
Natural Resources/Open Space - Ski Area Terrain							

Add Any Notes Regarding Responses Here

Done

APPENDIX D

Relative Importance Survey

Highly Valued Resources and Assets (HVRA) Relative Importance Characterization Survey – Alpine County

Alpine County is applying “A Wildfire Risk Assessment Framework” (Scott et al. 2013 – USDA RMRS-GTR-315) across the County to help prioritize the implementation of forest fuels treatments. One of the steps in the process is to identify and rank the relative importance of a landscape’s 'Highly Valued Resources and Assets' (HVRA). Resources and assets are deemed ‘highly valued’ based on their utility in driving fire management decision making. For example, above-ground electrical utilities can be identified as a HVRA because this ‘infrastructure’ can be a source of wildfire ignitions, and their loss due to wildfire, could impact the power supply to a community.

For this step in the process, a HVRA scoring system has been designed to help you assign the ‘relative importance’ of different HVRAs identified by stakeholders for Alpine County (i.e., the project area). Four criteria are used to aid in assigning relative importance, including:

Uniqueness/Rarity/Endemism - a rating of the commonness or uniqueness of a HVRA to the project area.

Replaceability - rating of how quickly an HVRA can be recovered, be replaced or restored after a wildfire disturbance.

Importance for safety or as critical infrastructure – a rating of systems and assets, whether physical or virtual, when incapacitated or destroyed would have a debilitating impact on security, economic security, public health or safety, or any combination thereof.

Participants are asked to score each HVRA from 1 to 5, for each of the above described criterion. If you are unsure of the relative importance of HVRA, select the "Don't Know/Unsure" option. After the survey has been completed by all participants, scores for each HVRA will be tallied, then ranked to determine their relative importance across survey participants. This survey will take approximately 10 to 15 minutes to complete.

Please contact Scott Conway (sconway@sig-gis.com) if you have questions about the survey.

Thank you for your participation.

* 1. Please enter your name (optional)

2. Agency, Institution, or Affiliation

* 3. Position Description

* 4. ***Please score the Uniqueness/Rarity/Endemism of the following HVRA at the project area***

Score	Description
5	**Only occurs within the project area** - The resource or asset only occurs within the project area and nowhere else on. The asset's function, character, or architecture is unique to project area and nowhere else in the world.
4	**Unique** - A large proportion of the resource, or asset's function, character, or architecture, occurs within project area boundaries, with a smaller proportion represented outside the project area's boundaries, but within same region of the Sierra Nevada (e.g., within 50 miles of the project area boundary).
3	**Moderately Unique** - The resource or asset's function, character, or architecture, occurs within project area boundaries and occurs outside the boundaries, but is contained within the Sierra Nevada ecoregion.
2	**Common** - The resource or asset's function, character, or architecture, is within the project area boundaries and is common throughout California.
1	**Very Common** - The resource or asset's function, character, or architecture, is within the project area boundaries and is common throughout the United States.

	1 - Very common	2 - Common	3 - Moderately unique	4 - Unique	5 - Only at Project Area	Don't Know/Unsure
Community Structures: Business and Public structures	○	○	○	○	○	○
Community Structures: Residential Structures	○	○	○	○	○	○

	1 - Very common	2 - Common	3 - Moderately unique	4 - Unique	5 - Only at Project Area	Don't Know/Unsure
Community Structures: Education Facilities (Daycare/Schools/Colleges)	○	○	○	○	○	○
Community Structures: Recreational Facilities – campgrounds, RV parks (non-ski)	○	○	○	○	○	○
Community Structures: Places of Worship	○	○	○	○	○	○
Community Structures: Non-Habitable/Unknown Structures (barns/sheds)	○	○	○	○	○	○
Community Structures: Health and Elder Care Facilities	○	○	○	○	○	○
Community Structures: High Hazard Buildings	○	○	○	○	○	○
Infrastructure/Utilities: Potable water storage (e.g., tanks); snow making infrastructure	○	○	○	○	○	○
Infrastructure/Utilities: Airport	○	○	○	○	○	○
Infrastructure/Utilities: Communication infrastructure (cell towers, microwave towers, etc)	○	○	○	○	○	○
Infrastructure/Utilities: Major Evacuation corridors (ingress and egress routes)	○	○	○	○	○	○
Infrastructure/Utilities: Minor Evacuation corridors (ingress and egress routes)	○	○	○	○	○	○
Infrastructure/Utilities: Community Evacuation/Refuge/Safe Zones/Areas	○	○	○	○	○	○
Cultural/Historic Resources: Cemeteries or significant resource buildings, areas	○	○	○	○	○	○
Natural Resources/Open Space - Ski Area Terrain	○	○	○	○	○	○
Natural Resources/Open Space - Wildland Urban Interface - Defense	○	○	○	○	○	○
Natural Resources/Open Space - Watersheds of special significance	○	○	○	○	○	○

* 5. ***Please score the Replaceability of the following HVRA at the project area***

Score	Description
5	**Extremely difficult to replace or restore** - The asset can be rebuilt at significant cost (>$2 million), or resource is not replaceable (e.g., cultural), or will not likely recover (regardless of management intervention) to its pre-fire condition within 20 years.
4	**Difficult to replace or restore** - The asset can be rebuilt at substantial cost ($500,000 to <$2 million), or resource will likely recover with management intervention to its pre-fire condition within 15 years of fire.
3	**Moderately difficult to replace or restore** - The asset can be rebuilt at a cost of $200,000 to <$500,000, or resource will likely recover with some management intervention to its pre-fire condition within 10 years of fire.
2	**Reasonably replaced or restored** - The asset can be rebuilt at a cost of $50,000 to <$200,000, or resource will likely recover with little or no management intervention to its pre-fire condition within 5 years of fire.
1	**Easily replaced or restored** - The asset can be rebuilt at a cost of <$50,000, or resource will likely recover with little or no management intervention to its pre-fire condition within 1 year of fire.

	1 - Easily replaced/restored	2 - Reasonably replaced/restored	3 - Moderately difficult to replace/restore	4 - Difficult to replace/restore	5 - Extremely difficult to replace or restore	Don't Know/Unsure
Community Structures: Business and Public structures	◯	◯	◯	◯	◯	◯
Community Structures: Residential Structures	◯	◯	◯	◯	◯	◯
Community Structures: Education facilities (e.g., daycare/schools/colleges)	◯	◯	◯	◯	◯	◯
Community Structures: High-hazard Buildings	◯	◯	◯	◯	◯	◯
Community Structures: Health and elder care facilities	◯	◯	◯	◯	◯	◯

	1 - Easily replaced/restored	2 - Reasonably replaced/restored	3 - Moderately difficult to replace/restore	4 - Difficult to replace/restore	5 - Extremely difficult to replace or restore	Don't Know/Unsure
Community Structures: Non-Habitable/Unknown Structures (barns/sheds)	○	○	○	○	○	○
Community Structures: Recreational Facilities – campgrounds, RV parks (non-ski)	○	○	○	○	○	○
Community Structures: Places of Worship	○	○	○	○	○	○
Infrastructure/Utilities: Airport	○	○	○	○	○	○
Infrastructure/Utilities: Communication infrastructure (cell towers, microwave towers, etc)	○	○	○	○	○	○
Infrastructure/Utilities: Potable water storage (e.g., tanks); snow making infrastructure	○	○	○	○	○	○
Infrastructure/Utilities: Major Evacuation corridors (ingress and egress routes)	○	○	○	○	○	○
Infrastructure/Utilities: Minor Evacuation corridors (ingress and egress routes)	○	○	○	○	○	○
Infrastructure/Utilities: Community Evacuation/Refuge/Safe Zones/Areas	○	○	○	○	○	○
Cultural/Historic Resources: Cemeteries or significant resource buildings, areas	○	○	○	○	○	○
Natural Resources/Open Space - Wildland Urban Interface - Defense	○	○	○	○	○	○
Natural Resources/Open Space - Watersheds of special significance	○	○	○	○	○	○
Natural Resources/Open Space - Ski Area Terrain	○	○	○	○	○	○

* 6. ***For the Community Structures and Infrastructure/Utilities , please score each HVRA for its importance for public safety or as critical infrastructure within the project area.***

Score	Description
5	**Highest safety or infrastructure value** - Asset is defined as 'Critical Infrastructure' Per 42 U.S. Code § 5195c. 'Critical Infrastructure' is defined per 42 U.S. Code § 5195c as "systems and assets, whether physical or virtual, so vital to the United States that the incapacity or destruction of such systems and assets would have a debilitating impact on security,

	national economic security, national public health or safety, or any combination of those matters.”
4	**Elevated safety or infrastructure value** - Asset is not defined as ‘Critical Infrastructure’ Per 42 U.S. Code § 5195c but is critical to the project areas public safety and operations.
3	**Moderate safety or infrastructure value** - Asset is not defined as ‘Critical Infrastructure’ 42 U.S. Code § 5195c but is important to public safety and city government mission.
2	**Low safety or infrastructure value** - Asset has temporary or readily replaceable infrastructure value.
1	**Little if any safety or infrastructure value** - Asset has limited or no infrastructure value.

	1 - Little or no	2 - Low	3 - Moderately	4 - Elevated	5 - High	Don't Know/Unsure
Community Structures: Business and Public structures	◯	◯	◯	◯	◯	◯
Community Structures: Residential Structures	◯	◯	◯	◯	◯	◯
Community Structures: High Hazard Buildings	◯	◯	◯	◯	◯	◯
Community Structures: Health and elder care facilities	◯	◯	◯	◯	◯	◯
Community Structures: Non-Habitable/Unknown Structures (barns/sheds)	◯	◯	◯	◯	◯	◯
Community Structures: Recreational Facilities – campgrounds, RV parks (non-ski)	◯	◯	◯	◯	◯	◯
Community Structures: Education Facilities (Daycare/Schools/Colleges)	◯	◯	◯	◯	◯	◯
Community Structures: Places of Worship	◯	◯	◯	◯	◯	◯
Infrastructure/Utilities: Airport	◯	◯	◯	◯	◯	◯
Infrastructure/Utilities: Communication infrastructure (cell towers, microwave towers, etc)	◯	◯	◯	◯	◯	◯
Infrastructure/Utilities: Potable water storage (e.g., tanks); snow making infrastructure	◯	◯	◯	◯	◯	◯
Infrastructure/Utilities: Major Evacuation corridors (ingress and egress routes)	◯	◯	◯	◯	◯	◯

	1 - Little or no	2 - Low	3 - Moderately	4 - Elevated	5 - High	Don't Know/Unsure
Infrastructure/Utilities: Minor Evacuation corridors (ingress and egress routes)	◯	◯	◯	◯	◯	◯
Infrastructure/Utilities: Community Evacuation/Refuge/Safe Zones/Areas	◯	◯	◯	◯	◯	◯

Done

APPENDIX B

Biological Resources Assessment Report

Biological Assessment: Alpine County Wildfire Risk Mitigation Plan

October, 2020

prepared by:

Jim Paulus, Ph.D.
consulting biologist
P.O. Box 2657
Oakhurst, CA 93644

prepared for:

Brian Peters
Alpine County Community Development Department
50 Diamond Valley Road
Markleeville, CA 96120

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October, 2020

1 Introduction

Priority areas at the Alpine County wildland-urban interface have been chosen for wildfire fuel reduction treatment funded by an April 2019 California Department of Forestry and Fire Protection (Calfire) Local Fire Prevention Grant, at 1) a satellite housing area west of the Markleeville urban center ("Markleevillage"), 2) the development fringe where housing meets steeply rising slopes of the Sierra Nevada range at Woodfords ("Manzanita"), and 3) the western portion of Bear Valley, a higher-elevation resort-based community ("Bear Valley"). This report documents biological resources as they occurred within the Markleevillage, Manzanita, and Bear Valley fuel reduction project areas in July-August 2020, as well as the potential for forestry practices that the project will employ to negatively impact sensitive plants, animals, and habitats. Potential project-level and site-specific measures that can be taken to avoid or minimize those potential environmental impacts of the project are identified to aid further development of appropriate mitigations to be included in the project planning document, "Alpine County Wildfire Risk Mitigation Plan" (Alpine County Community Development Department, *in prep.*) and/or California Environmental Quality Act (CEQA) environmental review document (Alpine County Community Development Department, *in prep.*).

The Markleevillage and Manzanita project areas are located similarly on the eastern flank of the Sierra Nevada, west of the East Fork Carson River where it exits mountainous terrain (Figure 1). They occur within four miles of each other, at elevations lower than the Bear Valley area (Table 1). The climate at Markleevillage and Manzanita is relatively xeric, due to the rain shadow effect caused by high mountains to the immediate west, yet both areas feature perennial stream flows that are tributary to the East Fork Carson River. Upland forest and scrub plant communities at each are interrupted briefly at scattered seeps and springs that seasonally to perennially flow on the surface and recharge local shallow groundwater. Correspondingly, the Markleevillage and Manzanita habitats and native species that will be affected by the project are often alike, as are the steps that can be taken to minimize adverse impact. But there are also important differences in characteristics of the habitats that are available, non-native plant prominence, and historical land use that warrant a separate analysis approach.

The Bear Valley site (Figure 1) is situated west of the Sierra Nevada crest, near the headwaters of Bear Creek. Winter precipitation is abundant and reliable enough to support a nearby ski resort operation. However, in contrast to Markleevillage and Manzanita, no perennial streams occur within the Bear Valley project limits. Steeply falling channels that cross through Bear Valley conduct snowmelt flows that while energetic, are ephemeral to at most weakly seasonal at the beginning of the growing season for plants. There are few areas where seeps and springs provide surface flows, and these flows are small and rarely perennial. Based upon the review of available literature, and on-site study in July – August 2020, Bear Valley clearly differs from Markleevillage and Manzanita with regard to the potential for harboring special status plant and animal populations, and the risk of project-induced non-native plant population spread.

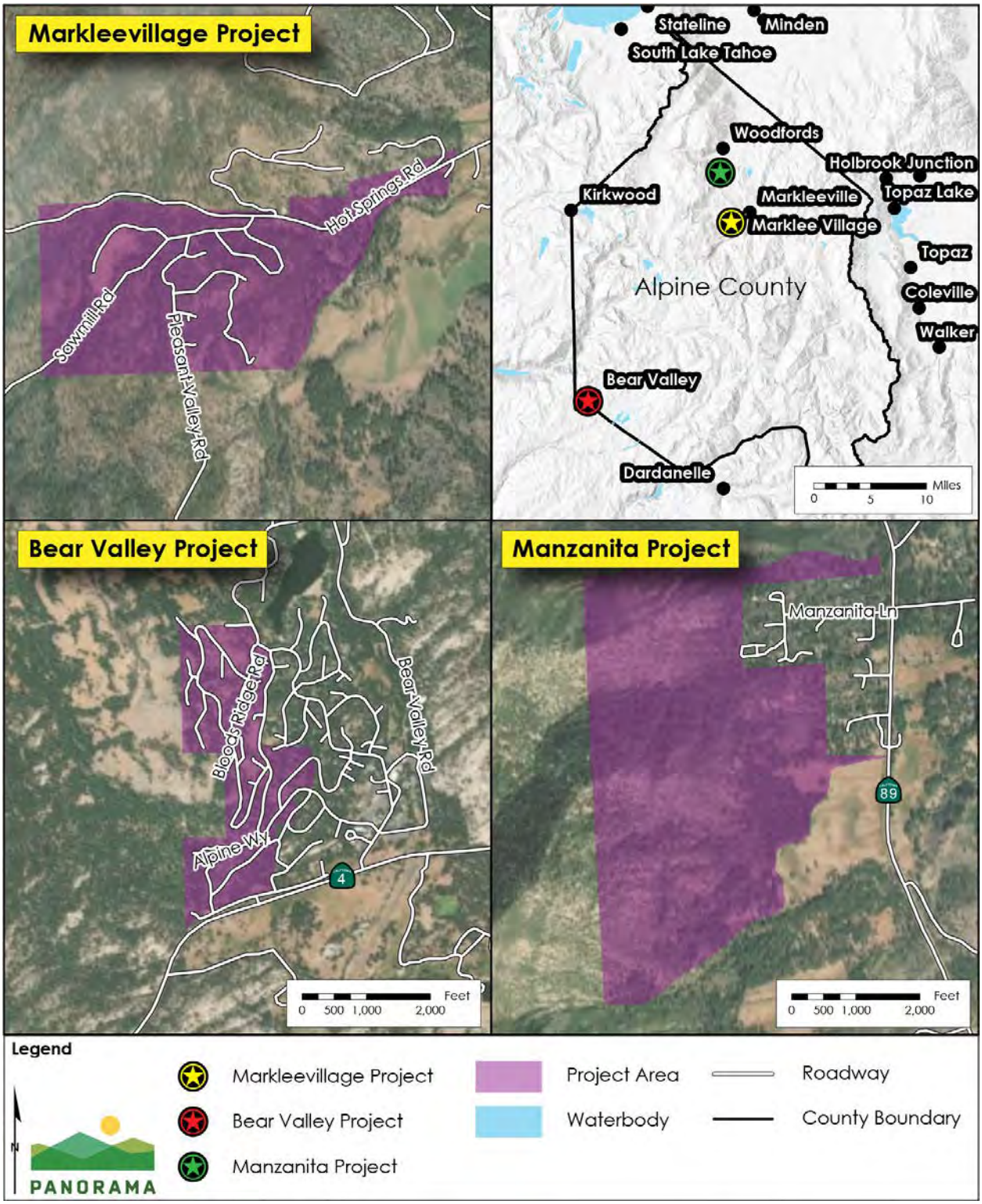

Figure 1. Markleevillage, Manzanita, and Bear Valley biological resource project areas. Studies were performed at each area in 2020 in support of development of the Alpine County Wildfire Risk Mitigation Plan.

2 Methods

2.1 Habitat Characterization

Vegetation types present within the project area were inventoried during visits to each site during the months of July and August 2020. Vegetation types provided the primary basis for developing characterizations of the habitats available for potentially occurring special status plants and animals. Site visits also provided an opportunity to directly search for sensitive plant community occurrence. A total of 890 acres within populated and adjacent marginal areas of Alpine County were inventoried (Table 1).

Table 1. Project area names used in this report. Approximate total area and elevation of each project area is given.

2020 Study Area	Acres	Elevation Range (feet)
Markleevillage	300	5600 - 5850
Manzanita	460	5750 - 6950
Bear Valley	130	7170 - 7700

Based upon initial visits to the study areas in July 2020, community boundaries were mapped onto aerial imagery (Sept. 2019, color with 1-meter resolution), generating 273 community type polygons. In August 2020, 260 (95%) of tentatively assigned vegetation type polygons were subsequently visited to ground-truth vegetation community boundaries. The most prominent native plant species were identified, in order to classify the dominant alliances. The survey was frequently limited to viewing from public roads and adjoining public lands; however. access for more thorough characterizations were allowed at many representative polygons for each plant community type at each project area. While suitable for recording visual estimates of the dominant species' relative frequencies in each vegetation stratum, this level of survey does not meet U.S. Fish and Wildlife Service (USFWS) or California Department of Fish and Wildlife (CDFW) rigor standards for determining rare species presence or absence (USFWS, 1996, CDFW, 2018). Similarly, rigorous inventory of occurring non-native plant species was possible throughout the occurring plant community types in some but not the majority of the privately owned parcels included in the study.

Occurring plant species were identified using nomenclature that is presented by Baldwin, *et al.*, (2012), as updated by Jepson Flora Project (2020). Vegetation was assigned to community type using the naming system developed by Holland (1986) and Sawyer, *et al.*, (2009), a classification system that uses physiographic landscape position in part to distinguish types. The occurring alliance types, as defined by CDFW (2019), were identified in order to more precisely distinguish site-specific habitats by dominant plant species. At this level of classification, the presence of relatively specific physiographic features can be inferred from the habitat requirements of alliance dominants, and CDFW (2019) community status as "Sensitive" can be determined.

The plant lists that were developed for each study area (Appendix A) are records of the prominent species, including the canopy or sward dominant species that were used for alliance type assignments, and non-native presence late in the 2020 growing season. Lack of access at some large Manzanita site properties would allow for plant community mis-assignment error, as there may be subtle transitions in species dominance, or small, embedded plant communities that were not visible from roadways or clearly depicted on the aerial imagery. As mapped, habitat extents (and the reported acreages) were in some places subject to interpretation of where to draw boundaries between broadly grading communities. Within the three Alpine County project areas, broad ecotones are most commonly indicated at boundaries between upland plant community types. Those between potential wetlands and the adjacent uplands vegetation types consistently proved to be relatively abrupt and visually distinct.

2.2 Potentially Occurring Special Status Species

Lists of special status plant and animal species that potentially could occur at the three project areas were compiled. Literature describing the life histories of each species was reviewed in order to highlight those species that potentially could use the habitats available at the project. These species lists (Appendix B) were produced by reviewing regional data (California Native Plant Society (CNPS) 2001, 2020, CalFlora 2020, CDFW 2020a-d, Consortium of California Herbaria, 2020), regional floras (Baldwin, *et al.,* 2012, Jepson Flora Project, 2020), reporting of biological resource surveys in preparation of local environmental documents (Cardo-Entrix, 2014, BLM, 2020), and personal communications with local agency biologists. In addition, July 2020 searches of the California Natural Diversity Database (CNDDB) records (CDFW, 2020e-g) for nine quadrangles surrounding each project area (Table 2) were conducted.

Table 2. USGS quadrangles included in a July 2020 query of the CNDDB.

Project Area	USGS Quads
Markleevillage	Markleeville, Woodfords, Freel Peak, Carson Pass, Pacific Valley, Ebbetts Pass, Wolf Creek, Heenan Lake, Carters Station
Manzanita	Woodfords, Minden, South Lake Tahoe, Freel Peak, Carson Pass, Markleeville, Heenan Lake, Carters Station
Bear Valley	Tamarack, Mokelumne Peak, Bear River Reservoir, Calaveras Dome, Boards Crossing, Liberty Hill, Donnell Lake, Spicer Meadows Reservoir, Pacific Valley

Potentially occurring species were considered to be “Special Status” if they

- have state or federal status as rare, threatened or endangered (CDFW 2020a, 2020c),
- are listed in the CNDDB lists of special plants and wildlife (CDFW 2020b, 2020d),
- meet the definitions of rare or endangered wildlife species under the California Environmental Quality Act (Section 15380 CEQA Guidelines),

- are listed by CNPS in their inventory of sensitive California plants (CNPS 2001, 2020), or
- are included in the most recent sensitive plant lists or watch lists prepared by U.S. Forest Service – Stanislaus and Humboldt-Toiyabe National Forests (USFS, 2013), or Bureau of Land Management, Mother Lode Office sensitive species lists (BLM, 2015).

3 Potentially Occurring Special Status Plants and Animals

3.1 Overview

No plant species listed by USFWS as Endangered or Threatened under the federal Endangered Species Act (FESA) are known to occur within 20 miles of these study areas (Appendix B). Tahoe yellow cress (*Rorippa subumbellata*), an aquatic plant whose known distribution is confined to shoreline habitat at Lake Tahoe (CDFW, 2020f, Jepson Flora Project, 2020), is the only plant species that is listed under the California Endangered Species Act (CESA) and known to occur within 20 miles. Tahoe yellow cress occurrence within the project is considered very unlikely because no habitats there resemble Lake Tahoe shorelines (Appendix B2). Potential project impacts upon special status plants would be limited to populations of species that are currently regarded by USFS, BLM, or CDFW as regionally rare or sensitive (Table 3), but not listed under FESA or CESA. It is possible that populations of one or more of these species is entirely encompassed by the project, for example populations whose distributions or viable seed banks are restricted to the smallest wetlands and potential wetlands habitat occurrences. Isolated special status plants with populations so limited to scattered, very small habitats may be at risk of extirpation due to project forestry practices, specifically practices associated with mechanized, self-propelled mastication and piling, and pile burning, which could locally disturb the soil profile, change the seasonal moisture regime in the rooting zone, substantially reduce overcanopy shading, or cause the introduction of invasive non-native plants. Specific impacts that for each species could unintentionally result in extirpation of a population are discussed below in the separate contexts of the project areas.

Table 3. Special status lichen, bryophyte and vascular plant species that potentially occur in habitats that were mapped within the Markleevillage (MV), Manzanita (MZ), and Bear Valley (BV) project areas are indicated (√). Hydrophytic status and growth habit are given, codes defined below.

Family	Species	Status	Habit	MV	MZ	BV
Peltigeraceae	*Peltigera gowardii*		lichen			√
Bruchiaceae	*Bruchia bolanderi*		bryophyte		√	
Meesiaceae	*Meesia uliginosa*		bryophyte		√	
Helodiaceae	*Helodium blandowii*		bryophyte	√	√	
Ophioglossaceae	*Botrychium ascendens*	FAC	fern/PH	√	√	√
	Botrychium crenulatum	FACW	fern/PH		√	√
	Botrychium minganense	FAC	fern/PH		√	√
	Botrychium montanum	FAC	fern/PH			√
Apiaceae	*Lomatium stebbinsii*	UPL	PH			√
Asteraceae	*Crepis runcinata*[1]	FACU	PH	√	√	

Family	Species	Status	Habit	MV	MZ	BV
Boraginaceae	*Cryptantha crymophila*	UPL	PH			√
Brassicaceae	*Draba praealta*	FAC	PH			√
Montiaceae	*Claytonia umbellata*	UPL	PH	√	√	
Onagraceae	*Epilobium howellii*	FACW	PH	√	√	
	Epilobium palustre	OBL	PH	√	√	
Phrymaceae	*Erythranthe carsonensis*	FAC	AH	√	√	
Polygonaceae	*Eriogonum luteolum*	UPL	AH	√	√	
Violaceae	*Viola purpurea* ssp. *aurea*	UPL	PH	√	√	
Alliaceae	*Allium tribracteatum*	UPL	PGL			√
Cyperaceae	*Carex davyi*	FACW	PGL	√	√	√
	Carex hystericina	OBL	PGL	√		
	Carex petasata	FAC	PGL	√	√	
	Carex vallicola	FAC	PGL	√	√	
	Schoenoplectus subterminalis	OBL	PGL	√		
Poaceae	*Agrostis humilis*	FACW	PG	√	√	
Potamogetonaceae	*Potamogeton robbinsii*	OBL	PH	√		

1. syn. *Crepis runcinata* ssp. *hallii*

Growth habit codes: A = annual species, P = perennial, G = grass, GL = grass-like growth, H = herbaceous growth

Hydrophytic Status Codes (USACE, 2012 Arid West Region, NRCS, 2014):

Code	Status	Designation	Comment
OBL	Obligate Wetland	Hydrophyte	Almost always occur in wetlands
FACW	Facultative Wetland	Hydrophyte	Usually occur in wetlands, but may occur in non-wetlands
FAC	Facultative	Hydrophyte	Occur in wetlands and non-wetlands
FACU	Facultative Upland	Nonhydrophyte	Usually occur in non-wetlands, but may occur in wetlands
UPL	Obligate Upland	Nonhydrophyte	Almost never occur in wetlands

There exists some possibility that the maintenance of one or more local special status wildlife populations (Table 4) may be substantially dependent on the continued presence of habitats that are available where the project will be implemented. Occurring individuals may reside, pass or migrate through, forage, roost, den, breed, nest, or raise their young in the available habitats. They may rely on this habitat availability perennially, seasonally, during migration, or during one critical stage of their lives. An example of the latter would be a (long-lived) bald eagle (*Haliaeetus leucocephalus*) pair that loyally returns to a specific nest tree within their breeding habitat. Bald eagle and willow flycatcher (*Empidonax trailii*) are listed as Endangered by the State of California under CESA. The rarely seen Sierra Nevada Red Fox (*Vulpes necator necator*) is listed as Threatened under CESA. Western bumblebee (*Bombus occidentalis*) has been rapidly declining across its range in recent years, and is now a Candidate for listing under CESA. There are no critical habitat designations that currently intersect the project.

Bald eagle, willow flycatcher, and most other birds are further protected when nesting. The breeding period for birds is reasonably defined at Markleevillage and Manzanita as occurring March 1 through August 31, and at Bear Valley as April 1 through August 31. Migratory Bird Treaty Act (MBTA) provisions prohibit direct destruction of nests or project activities that indirectly would threaten nesting success. Active nests are protected resources under Fish and Game Code Sections 3503, 3503.5, 3511, and 3513, and raptor nests may be protected from destruction even when inactive. If work must be initiated during the breeding period, potential negative impacts would be direct, associated with mechanized vegetation treatments, and with standing tree, snag, or downed bole removal, regardless of habitat type. Possible indirect impacts are discussed separately (see below) for each project area.

Table 4. Sensitive wildlife species that potentially occur in the habitats mapped within the Markleevillage (MV), Manzanita (MZ), and Bear Valley (BV) project areas in August 2020 are indicated (√). The specific habitats where these species may potentially occur are summarized separately in the analyses for each project area.

Taxonomic Group	Species		MV	MZ	BV
Insects	*Bombus occidentalis*	Western bumblebee	√	√	
	Euphydryas editha monoensis	Mono checkerspot butterfly	√	√	
Fish	*Catostomus platyrhynchus*	mountain sucker	√	√	
	Prosopium williamsoni	mountain whitefish	√	√	
Amphibians	*Ambystoma macrodactylum sigillatum*	southern long-toed salamander	√	√	√
Birds	*Accipiter striatus* (nesting)	sharp-shinned hawk			√
	Empidonax traillii (nesting)	willow flycatcher	√		
	Haliaeetus leucocephalus (nesting)	bald eagle	√	√	
	Pandion haliaetus (nesting)	osprey			√
Mammals	*Aplodontia rufa californica*	Sierra Nevada mountain beaver	√	√	
	Lepus townsendii townsendii	western white-tailed jackrabbit	√	√	
	Taxidea taxus	American badger	√	√	√
	Vulpes vulpes necator	Sierra Nevada red fox	√	√	

3.2 Habitats for Special Status Plants and Wildlife

Available habitats at each project area are can be broadly grouped into 1) uplands, 2) disturbed or ruderal (recovering), and 3) wetlands including flowing streams and springs and adjacent seasonally to perennially wetted zones. Most of the potentially occurring special status plant and animal species, if present within the project, would be expected to occur within one of these broad habitat groupings and not in all. As described in detail in Chapter 4, below, community mapping that was performed in 2020 demonstrated that there is currently a substantially greater habitat availability within each project area for potentially occurring special status species that are adapted to upland habitats.

3.2.1 Habitats for Plants

Upland Habitats

Upland habitat extents in the project area are defined by their predominantly non-hydrophytic vegetation types. Upland forest and shrublands soils are seasonally moistened by snowmelt and rainfall during the February to May period (Markleevillage and Manzanita) or March to May period (Bear Valley). Uplands soils can be ephemerally moistened during the July-September annual summer drought by less dependable monsoonal thunderstorm activity. Among the 26 plant species that have some possibility of occurring (Table 3), only seven (both of the annual species, and five perennial species) have some likelihood of being found in project uplands.

The potentially occurring special status perennials of upland habitats would be generally expected only in areas with relic or fairly intact native vegetation (CDFW, 2020e-g, Jepson Flora Project, 2020). None are shrubs or trees; rather, these species are low-growing, relatively inconspicuous herbs that will not be directly targeted during project vegetation treatments. Three-bracted onion (*Allium tribracteatum*), which arises from an underground bulb, could conceivably survive episodic aboveground devegetation, but it is unlikely that Stebbins' lomatium (*Lomatium stebbinsii*), subalpine cryptantha (*Cryptantha crymophila*), Great Basin claytonia (*Claytonia umbellata*), or golden violet (*Viola purpurea* ssp. *aurea*) individuals would persist at project areas where the native vegetation has been substantially, repeatedly, or permanently removed. In contrast to the project's disturbed habitats, and the consistently small and scattered waters, wetlands, and potential wetland habitats that are discussed below, upland habitats are extensive and interconnected. Correspondingly, if special status annual or perennial plants do occur at the project, their uplands populations would be expected to be relatively diffuse and spread over greater areas of available upland habitat. It is unlikely that the project will result in loss of uplands populations, because the scales of limited project areas where the native vegetation may be substantially, repeatedly, or permanently removed (for example, firebreaks, burn piles) will not approach the much greater extents of the available uplands habitats.

Disturbed Habitats

Presence of Carson Valley monkeyflower (*Erythranthe carsonensis*) and Jack's wild buckwheat (*Eriogonum luteolum var. saltuarium*), species that exhibit a relatively ephemeral, annual growth habit (Table 3), may be restricted to the seed bank in some years. Furthermore, populations of these plants are the only that might occur entirely within roadsides, devegetated lots, and other ruderal settings (CDFW, 2020e, 2020f, Jepson Flora Project, 2020). Direct, mechanical Impacts that would substantially

threaten or remove a population of these annual species would be unlikely, unless the topsoil seed bank (where their viable seeds reside) is eliminated. The project does not include topsoil removal, but small habitats could be sterilized by pile burning. Also, small areas presumably at roadsides may be intensively and repeatedly used to store and stage equipment and transfer materials. Annual populations narrowly adapted to such roadside strips, if any occur, may be lost if seed bank restocking is prevented.

Waters, Wetlands and Potential Wetland Habitats

Wetlands and potential wetlands are dependent upon seep zones and perennial springs, or narrowly follow riparian corridors. Despite being minor site components in terms of extent, potential wetland habitats throughout the project area clearly function to support relatively higher diversity of plants (Appendix A) and presumably wildlife occurrence and population maintenance. Wetland habitats and their seasonally drying margins provide relatively greater suitability for the majority of potentially occurring special status plant populations, compared to upland settings, in all three of the project areas. Among the 22 higher plant taxa highlighted as potentially occurring, 15 are considered hydrophytes that are unlikely or very unlikely to occur unless the soil habitat's condition is dependably moist, wet or submerged during a substantial portion or all of the growing season (Table 3). Potentially occurring special status lichen and bryophyte species similarly would be restricted to relatively wet habitats (Appendix B).

Fiddleleaf hawksbeard (*Crepis runcinata*), a FACU species in the Arid West Region (USACE, 2012), occurs near Markleevillage at a seasonally drying meadow (Cardno-Entrix, 2014), and regionally is known only from meadows and other potential wetland areas (CDFW, 2020c, *pers. obs.*). Based upon descriptions of known populations (CDFW, 2020e-g, CNPS, 2020, Consortium of California Herbaria, 2020), it is believed that this species and all other potentially occurring FAC, FACW, and OBL wetlands-adapted, special status plants (Table 3) would be restricted to "waters", "riparian", and "wetlands and potential wetlands" portions of the project areas. Specific riparian, wetlands, and potential wetlands plant communities that possibly provide suitable habitats were identified for each species, throughout the Markleeville, Manzanita, and Bear Valley areas (see maps and discussions below for each project site). It is very unlikely that populations of any of these could occur in project upland habitats.

Project activities associated with mechanized, self-propelled mastication and piling, and pile burning, could locally disturb the soil profile, change the seasonal moisture regime in the rooting zone, substantially reduce overcanopy shading, or cause the introduction of invasive non-native plants. If implemented within any waters (riparian), wetlands, or and potential wetlands plant community types, these activities have some potential to negatively affect aquatic felt lichen (*Peltigera gowardii*), the bryophytes Blandow's bog moss (*Bruchia bolanderi*), broad-nerved hump moss (*Meesia uliginosa*), Blandow's bog moss (*Helodium blandowii*), and plant species Carson Valley monkeyflower, fiddleleaf hawksbeard, upswept moonwort (*Botrychium ascendens*), scalloped moonwort (*B. crenulatum*), Mingan moonwort (*B. minganense*), western goblin (*B. montanum*), tall draba (*Draba praealta*), subalpine fireweed (*Epilobium howellii*), marsh willowherb (*E. palustre*), Davy's sedge (*Carex davyi*), porcupine sedge (*C. hystericina*), Liddon's sedge (*C. petasata*), western valley sedge (*C. vallicola*), water bulrush (*Schoenoplectus subterminalis*), mountain bent grass (*Agrostis humilis*), and Robbins' pondweed

(*Potamogeton robbinsii*). Loss of wetland-dependent populations should be considered a significant impact due to the increased threat of species extinction.

3.2.2 Habitats for Wildlife

Upland and Disturbed Habitats

Based upon published habitat requirements and CNDDB descriptions of current or historically known occurrences within 20 miles of the project area (Appendix B), it is possible that the occupied ranges of up to 13 special status wildlife species currently extend into available project area habitats (Table 4). Western bumblebee (*Bombus occidentalis*), Mono checkerspot butterfly (Euphydryas editha monoensis), sharp-shinned hawk (*Accipiter striatus*), bald eagle, osprey (*Pandion haliaetus*), western white-tailed jackrabbit (*Lepus townsendii townsendii*), American badger (*Taxidea taxus*), and Sierra Nevada red fox may nest or den in the upland habitats where project treatments will be implemented. Specific upland forest and shrubland plant communities that possibly provide suitable habitats were identified for each species, throughout the Markleeville, Manzanita, and Bear Valley areas (see maps and discussions below for each project site). Project uplands generally have developed or retained a high degree of natural character. They provide quiet, often unlighted connectivity to the surrounding landscape, tree and shrub canopy shading, and resources for wildlife foraging and concealment.

Conversion to roads and single-family housing has occurred almost exclusively in uplands; however, widespread upland habitats loss and fragmentation due to development was mapped in 2020 at Bear Valley only. Within the 130-acre Bear Valley, conversion was mapped at 34 acres (26%), with an even distribution. Development at Markleevillage (10%) and Manzanita (1%) has been in contrast focused or concentrated, so that large undeveloped tracts of upland forest and shrublands remain in a relatively undisturbed condition that resembles adjacent forest and shrublands administered by Humboldt-Toiyabe National Forest. Siting of roads and fences that function as linear barriers to wildlife movement, and other losses of habitat connectivity, were widely observed only among the developed housing tracts in August 2020. Overall, should special status wildlife occur within the Markleeville, Manzanita, and Bear Valley project areas, the potential for sustained population maintenance likely remains very good at upland habitats.

The developed portions of each project area include habitat characteristics that are potentially attractive to wildlife. Landscaping vegetation and irrigation, canals and flowing ditches, and common behaviors such as careless handling of trash, provision of bird feeders, and other deliberate feeding to attract wildlife contribute to the overall carrying capacity for some species, including predators that were once considered relatively uncommon in Alpine County (*e.g.*, ravens). These and other presumable habitat alterations in the urbanized portion of the project area, including long-term loss of surface and groundwater quality, mortality due to domestic pets, subsidized predators and introduced trout, and nuisance removal of individuals, would likely diminish historically occurring special status populations.

Waters, Wetlands and Potential Wetland Habitats

Naturally occurring surface waters at Bear Valley are less prominent and more seasonal compared to those occurring at Markleevillage and Manzanita. The riparian corridors supported by

Markleevillage and Manzanita perennial streams, canals, and springs are associated with assemblages that are primarily native in character and plant species composition. They have retained connectivity to the surrounding landscape, stratified canopies, and ecotonal vegetation transitions – particularly upland to riparian community type transitions – that maintain the highest plant species diversity and cover resources for wildlife foraging and concealment found anywhere in the project area. There is some likelihood that relic, and possibly isolated populations requiring wetland habitats are present, including special status species, given the overall low disturbance that was found in 2020 at riparian and spring-fed areas where vegetation types dominated by hydrophytes, in all three project areas.

Project activities associated with mechanized, self-propelled mastication and piling, and pile burning, could locally disturb the soil profile, directly trample individuals or trample shut occupied dens and neonatal nests, substantially reduce overcanopy shading, or degrade surface water quality. If implemented within any waters, riparian, wetlands, or and potential wetlands plant community types, these activities have some potential to negatively affect southern long-toed salamander (*Ambystoma macrodactylum sigillatum*), mountain sucker (*Catostomus platyrhychus*), mountain whitefish (*Prosopium williamsoni*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), nesting willow flycatcher, or nesting bald eagle.

Avoidance of significant impacts to occurring special status wildlife, including nesting birds, is practical only by avoiding the habitats in which they occur, or by planning based upon the result of surveys conducted by qualified biologists at a time just prior to the start of work. A similar reasoning applies to smaller, isolated populations of special status plants, should any occur. Habitat avoidance, which is restricting all entry by project personnel or in some cases requiring that hand crews rather than machinery be employed, could be adopted as part of the project at wetlands and potential wetlands, which altogether comprise 70 of 820 acres (8%) of the project area. Exclusion of these habitats would reasonably assure avoidance of impacts to special status species including 15 of 22 potentially occurring plants, all potentially occurring lichen and bryophytes, and five of 13 potentially occurring wildlife species. In addition, the exclusion of these habitats abrogates any responsibility to perform pre-disturbance investigations into the extents that these habitats qualify as federal or state jurisdictional waters and wetlands under Clean Water Act legislation, and avoid potential delay associated with agency permitting of project treatments in those areas.

4 Risk of Non-Native Plant Population Spread

Prominent invasions by non-native plant species were observed at each project area during the 2020 reconnaissance-level surveys. While the results were not floristically exhaustive, these surveys did include walking nearly all disturbed roadsides, and crossing repeatedly through many representative examples of each community type. Populations of 28 non-native species (“weeds”) were found within the project limits, and there was substantially greater assemblage loading apparent at Markleevillage and Manzanita (Table 5). Cheat grass (*Bromus tectorum*) is rated by California Invasive Plant Council (Cal-IPC) as High with regard to invasiveness. Cal-IPC recognizes several other occurring annual herbs and grasses, and three wetlands-adapted perennials as Moderate or Limited (Table 5), signifying that they are invasive and ecologically damaging, but to a lesser degree.

Perennial herb and grass species (Table 5) appear to be limited to colonizing potential wetland habitats throughout the project area, with few exceptions. Yellow salsify (*Tragopogon dubius*), curlycup gumweed (*Grindelia squarrosa*), sheep fescue (*Festuca trachyphylla*), and bulbous bluegrass (*Poa bulbifera* ssp. *vivipara*) were the only species found to have populations extending into or completely encompassed by upland habitat types (Appendix A). Yellow salsify and sheep fescue are consistently the most widespread perennial weeds in upland habitats, and among the most prominent in the project in regards to total area already infested. They currently can be found in widely scattered distributions at all disturbed and relatively undisturbed upland forest and shrublands, and at roadsides. Both are similarly pervasive in wetlands and potential wetland habitats, especially at their seasonally drying margins. Project activities will not further spread of yellow salsify or sheep fescue as they currently are locally naturalized everywhere. Curlycup gumweed and bulbous bluegrass population extents were not found beyond the roadsides where they currently occur. Disturbed/maintained road edges have been patchily colonized by curlycup gumweed at State Hwy 89 (Manzanita) and Hot Springs Rd (Markleevillage), and by bulbous bluegrass at Pleasant Valley Road (Markleevillage). The likely greatest potential for project-related spread of perennial weeds, specifically curlycup gumweed and bulbous bluegrass, into treated uplands environments will be realized if disturbed soil habitat is created using equipment that has been staged or has crossed through infested road shoulders at Markleevillage and Manzanita.

Table 5. Non-native plant population observed at the Markleevillage (MV), Manzanita (MZ), and Bear Valley (BV) project areas in August 2020 are indicated (√). Cal-IPC weed ratings are defined below.

Species		Cal-IPC	MV	MZ	BV
Herbaceous Perennials					
Grindelia squarrosa	curlycup gumplant			√	
Hypericum perforatum	Klamathweed				√
Plantago major	common plantain			√	
Rumex acetosella	sheep sorrel				√
Tragopogon dubius	yellow salsify		√	√	√
Trifolium repens	white clover		√	√	
Herbaceous Annuals					
Capsella bursa-pastoris	Shepherd's purse		√		
Lactuca serriola	prickly lettuce		√		
Melilotus albus[1]	white sweetclover		√	√	
Melilotus officinalis[1]	yellow sweetclover		√		
Ranunculus testiculatus	tubercled buttercup		√		
Salsola tragus	Russian thistle	Limited	√	√	
Sisymbrium altissimum[1]	tumble mustard		√		
Spergularia rubra	red sand spurrey				√
Verbascum thapsus[1]	woolly mullein	Limited	√	√	

Species		Cal-IPC	MV	MZ	BV
Perennial Grasses					
Agrostis gigantea	redtop bentgrass		√	√	√
Dactylis glomerata	orchard grass	Limited	√	√	√
Elymus hispidus	intermediate wheatgrass		√		
Elymus repens	quackgrass		√		
Festuca trachyphylla	sheep fescue		√	√	
Holcus lanatus	common velvet grass	Moderate		√	
Phleum pratense	common timothy		√	√	
Poa bulbosa var. *vivipara*	bulbous bluegrass		√		
Poa pratensis ssp. *pratensis*	Kentucky bluegrass	Limited	√	√	
Annual Grasses					
Bromus commutatus	hairy chess				√
Bromus hordeaceus	soft chess	Limited	√		
Bromus tectorum	cheat grass	High	√	√	
Hordeum murinum ssp. *glaucum*	smooth barley	Moderate	√		

Cal-IPC weed ratings (California Invasive Plant Council, 2020):

High – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.

Moderate – These species have substantial and apparent-but generally not severe-ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.

Limited – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Annual weeds in contrast are more prominent and present greater risk of invasive spread into upland species assemblages. Mitigating the risk of annual weed spread into suitable habitat for species that have not already established ubiquitous presence is likely to be difficult, given these species' adaptations to rapidly increase abundance at habitats where the soil has been mechanically disturbed. Cheat grass (*Bromus tectorum*), the only annual found to have current established presence throughout entire project areas (Markleevillage and Manzanita), is also the most undesirable species in regards to future fire dynamics where it occurs. Cheat grass is an effective competitor for soil moisture (Sawyer, *et al.*, 2009). Its presence increases the likelihood and frequency of wildfire and facilitates burning with greater intensity and uniformity (Cal-IPC, 2020). While cheat grass swards were never encountered, it has established a pervasive population presence between shrubland canopies and within and near forest canopy gaps that cannot be avoided by the project. There is a high risk that newly devegetated treatment areas, especially areas where the soil organic horizon is removed or where the integrity of the accumulated duff (leaf fall mulch) has been highly disrupted (*e.g.*, at large burn piles), will soon develop flammable cheatgrass-dominated swards. Local abundance can be minimized wherever masticated

material is spread as mulch rather than gathered and burned. Practices that will minimize the likelihood that the project will encourage higher local abundances of cheat grass are based upon treading lightly - using low ground pressure equipment while taking care to minimize disruption of the existing mulch, and raking available mulch back onto any soils bared by equipment access and turning.

There is moderate risk that the established populations of the annual weeds sow thistle (*Lactuca serriola*), tubercled buttercup (*Ranunculus testiculatus*), Russian thistle (*Salsola tragus*), tumble mustard (*Sisymbrium altissimum*), white sweetclover (*Melilotus albus*, locally sometimes biennial/perennial), soft chess (*Bromus hordeaceus*), and smooth barley (*Hordeum murinum*) will become more widespread in upland habitats at Markleevillage or Manzanita due to project activities. Populations of these species are currently small in extent. They occur in upland habitats, typically at roadsides or adjacent to housing and other areas of greater human use. In particular, treatments that utilize machinery or other vehicles, and to a lesser degree hand tools, could distribute seed or other propagules. Spread can be affected unless equipment and tools are cleaned and are free of soil before they are moved from weed-infested to weed-free areas within the project. In 2020, populations at Markleevillage and Manzanita were found only as occasional patches, but avoidance at the time when seed is available could be assured only after botanical survey to delineate population boundaries.

The overall risk that project treatments will increase weediness is reduced at Bear Valley, in comparison to Markleevillage and Manzanita. Cheat grass was not found at Bear Valley. Non-native perennials (Table 5) are wetlands-adapted (Appendix A2), and excepting yellow salsify they were found only in small areas of potential wetlands. With the exceptions of sand spurrey (*Spergularia rubra*) and hairy chess (*Bromus commutatus*), the current distributions of non-native annual (-biennial) herbs and grasses at Bear Valley are similarly restricted to discreet wetlands and potential wetlands community assemblages, rather than being widespread. Red sand spurrey, a relatively inconspicuous and low-growing herb, was found only in very limited areas of either xeric or seasonally wet roadside habitat. Hairy chess occurs at but is not restricted to roadsides at Bear Valley. Like red sand spurrey, hairy chess was found in low abundances in 2020, always at less than 7300 feet elevation. It was very occasionally found at the ecotonal margins that occur between areas mapped as potential wetland and upland forest and shrublands. The published upper elevation limit for this species in California is 7200 feet (Jepson Flora Project, 2020), which is below nearly all of the 7170-7700 feet elevation range of the planned work. While hairy chess could be spread to new soil disturbance in upland road and wetland margins, self-sustaining and ecologically damaging invasion into new habitat is considered unlikely because the disturbance will occur above the upper limits of the species' known elevation range.

Project inclusion of areas mapped here as wetlands and potential wetlands greatly increases the risk that occurring non-native species will be spread, especially at Markleevillage and Manzanita. Among the 28 weed species that were detected within the project area in 2020, 17 were found only in those relatively uncommon habitats. Use of machinery, vehicles, and hand tools could distribute seed or other propagules from infested wetlands and potential wetlands, unless cleaned free of soil before they are moved from there to weed-free areas within the project. Avoidance of these populations would include avoiding staging or turning equipment at limited forest and shrubland canopy gaps where wetlands and potential wetland habitats occur, including the drying edges classified here as Dry Montane Meadow. All

other project-related entry including slash piling and burning would also be prohibited. As has been concluded for avoidance of potentially occurring sensitive plants and wildlife, avoiding project-related weed spread and creation of densely weedy treated areas would be substantial benefits of excluding these small, relatively wet areas from treatments anywhere they occur within the project.

5 Project Areas: Sensitive Habitats and Special Status Species

5.1 Markleevillage Project Area

5.1.1 Markleevillage – Waters, Wetlands and Potential Wetland Habitats

The Markleevillage project area includes subalpine, montane valley bottoms and adjacent slopes in the area where Hot Springs Creek first converges with Spratt Creek, and then at the eastern edge of the project area with Pleasant Valley Creek. The name of the drainage changes to Markleeville Creek downstream from the confluence with Pleasant Valley Creek. Markleeville Creek is recognized as a "major tributary" to East Fork Carson River (Department of Water Resources, 1991). The apparently perennial surface flows in Spratt Creek and Pleasant Valley Creek are considered relatively permanent tributaries to Hot Springs Creek. Markleeville Creek then functions as a relatively permanent tributary to the off-site East Fork Carson River, a major local waterway that under Clean Water Act regulations may be considered a navigable interstate waterway. Any project activities that would alter the banks, introduce sediment or fill material, or plan to alter the corridor-like, largely native, riparian forest and scrub vegetation that is supported by the on-site perennial streams (Table 6), will require prior completion of Clean Water Act Section 404 and Section 401, and California Fish and Game Code Section 1600 permitting.

The Markleevillage project area (Figure 2a-b) includes the area known as Lower Thornburg Canyon, where diversion of a portion of the surface flow of Hot Springs Creek causes watering of a small, unlined canal. It is likely that this ditch-like conveyance has been flowing uninterrupted for more than 100 years (M. Drews, personal communication). The canal crosses and then parallels Hot Springs Road, supporting a narrowly vegetated corridor, consisting generally of native vegetation to a width averaging 10-20 feet at the immediate water's edge and at the downslope bank and berm. The entire length of the canal alignment within the project area is associated with downslope seep zones and flowing springs. Often resembling the Markleevillage riparian corridor stands, vegetation at these springs has developed as multi-stratum, potential wetlands communities with high diversity. This suggests that the spring flow-dependent habitats there are similarly long-standing.

It is very likely that project activity that would alter the canal banks, introduce sediment or fill material, or plan to alter the supported vegetation, or significantly affect the ecological functions and values provided by its conveyed flows (for example, the maintenance of local species diversity), will be subject to Clean Water Act permitting. On-site return flows to Hot Spring Creek and Markleeville Creek will likely be treated similarly by federal and state regulators. Upper profiles of soils at the dependent wet meadow and dry meadow plant communities located downslope from the canal likely have had sufficient time to develop hydric indicators. These limited areas, which total 1.7 acres, are scattered amid clearly uplands Jeffrey Pine Forest (Figure 2b). Each zonal assemblage is dominated by plants that

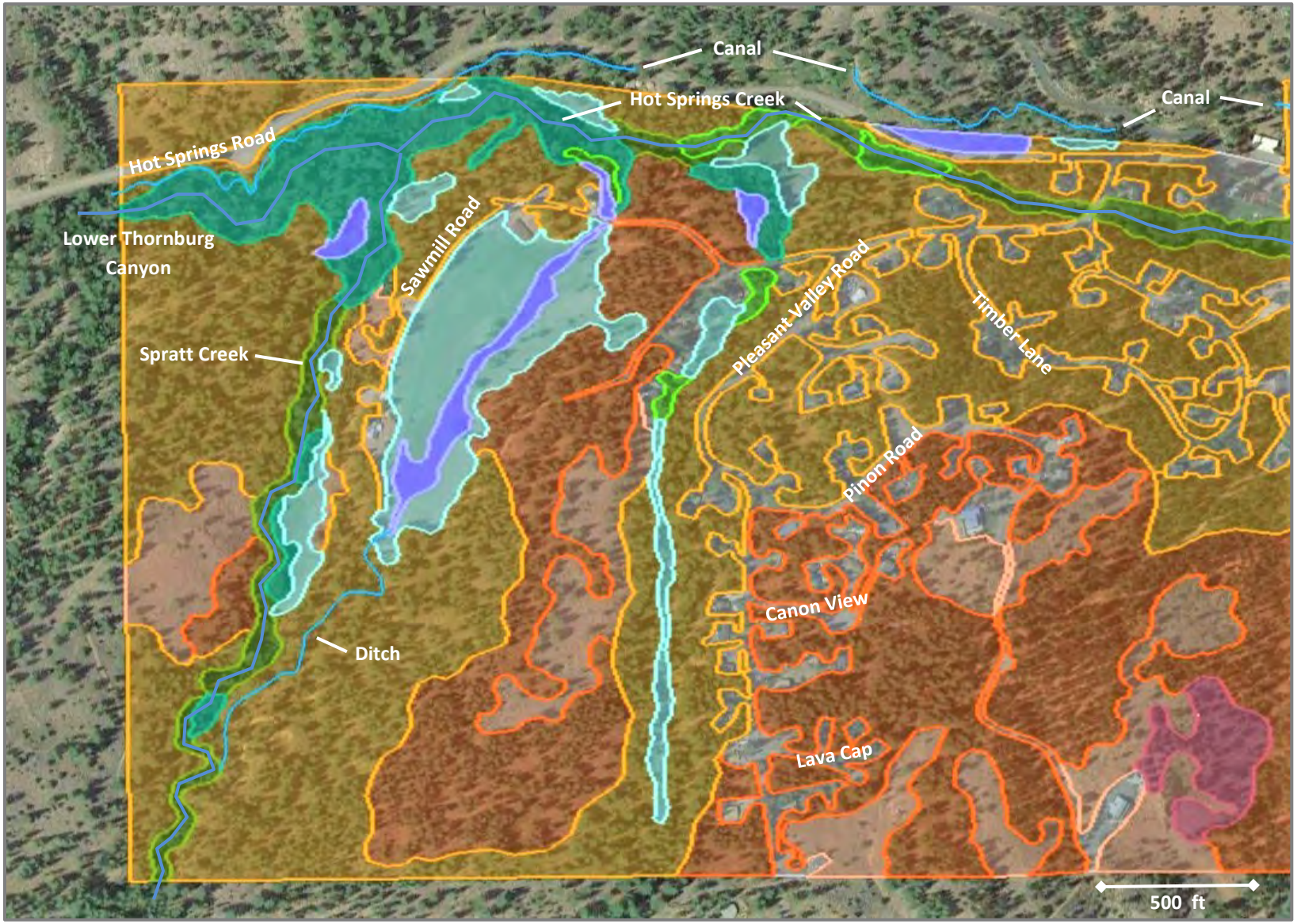

Figure 2a. Markleevillage project area, western half. Plant community occurrences mapped in August 2020 are shown. Base image date is August 2019.

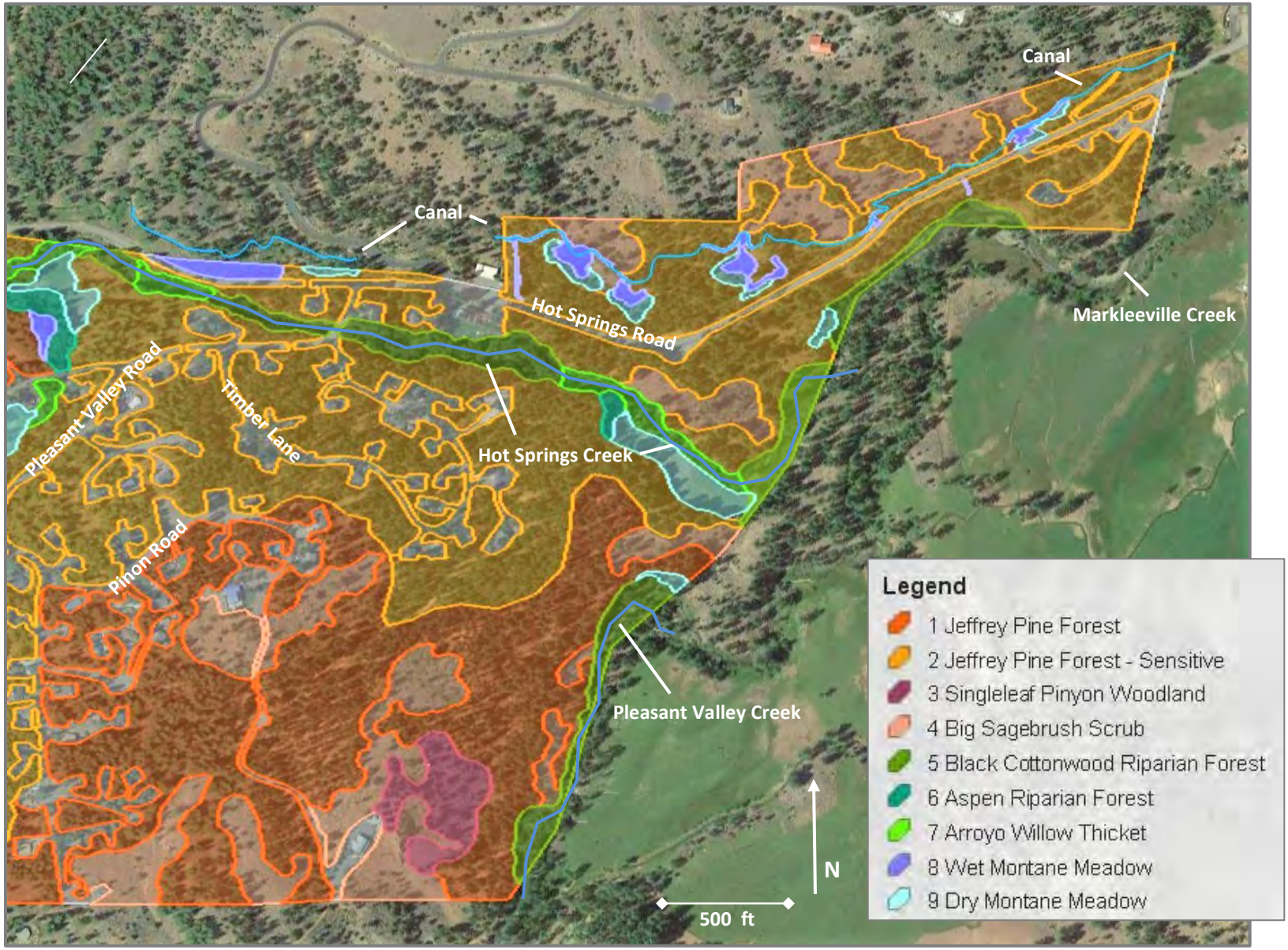

Figure 2b. Markleevillage project area, eastern half.

are dependent upon wetland habitat conditions. Being in positions adjacent to the presumably jurisdictional canal, they all may be similarly regulated as being both federal and state protected wetlands

Table 6. Plant communities that were mapped within the 300-acre Markleevillage project area in 2020. Markleevillage includes 33 acres that have been converted to houses, roads and other impervious or devegetated surfaces. Plant community names (after Holland, 1986) are cross-referenced to their Alliance names (Sawyer, *et al.*, 2009), as currently classified by CDFW. * indicates plant communities that are designated "sensitive" (CDFW, 2019).

Holland Community Name and CDFW Association Number	CNDDB Alliance Name and Primary Association	Acreage in Study Area
Upland Communities		
Jeffrey Pine Forest	Jeffrey Pine	
87.020.07	*Pinus jeffreyi*	65.4
87.020.21*	*Pinus jeffreyi-Purshia tridentata*	123
Singleleaf Piñon Woodland	Singleleaf Pinyon	
87.040.00	*Pinus monophylla-Artemisia tridentata*	3.0
Big Sagebrush Scrub	Mountain Big Sagebrush	
35.111.00	*Artemisia tridentata-Purshia tridentata*	30.1
Wetland and Potential Wetland Communities		
Montane Black Cottonwood Riparian Forest	Black Cottonwood	
61.120.03*	*Populus trichocarpa-Pinus jeffreyi*	12.2
Aspen Riparian Forest	Aspen Grove (S3.2)	
61.111.09*	*Populus tremuloides-Pinus jeffreyi*	10.2
61.111.20*	*Populus tremuloides-Poa pratensis*	0.4
61.111.00*	*Populus tremuloides-Prunus virginiana*	0.2
Modoc-Great Basin Riparian Scrub	Arroyo Willow Thicket	
61.201.00	*Salix lasiolepis-Alnus incana-Salix* spp.	3.0
Wet Montane Meadow	(Narrow-leaved Sedge)	
45.000.00	*Carex angustata*-herbaceous	4.1
Dry Montane Meadow	Kentucky Bluegrass Turf	
42.060.00	*Poa pratensis*-herbaceous	8.6
45.106.00	*Agrostis gigantea-Poa pratensis*	4.0
Dry Montane Meadow	Creeping Ryegrass Turf	
41.080.01*	*Elymus triticoides*-herbaceous	2.8

Dry Montane Meadow

Dry Montane Meadow plant community types occur either zonally at seasonally drying wet meadow margins, or at the outer edge of the riparian corridors supported by Markleevillage's perennial streams (Figure 2a-b). These seasonally drying areas are ecotonal, appearing as broad transitions between riparian forest, riparian scrub, or wet montane meadows community types and upland forest or shrublands types. Dry Montane Meadows are notable where mapped as dependent upon the canal, due to the degree that they are being densely invaded by young conifers. The sapling stands are even-aged, the stems averaging about six inches diameter at breast height, suggesting that this colonization by upland conifers occurred episodically during the most recent period of drought. Dry montane meadow habitat associated with the canal totals 0.9 acres. The interrupted, 10-20 feet wide corridor at the seasonal channel paralleling west of Pleasant Valley Road (Figure 2a) is patchily becoming filled with small trees, and similarly may merit project treatments. Occurrences of Dry Montane Meadow mapped adjacent to streams, in contrast, are sparsely treed, typically only by clonally spreading stems of quaking aspen (*Populus tremuloides*).

Streambanks, riparian corridors, and wet meadows include surface flows and ponding of soils that are perennially wet to saturated. Areas classified as Dry Montane Meadow, in contrast, exhibit no evidences of surface flows or ponding, except within narrow and seasonally dried discharge pathways. If hydric soil conditions have over historical time developed within Dry Montane Meadow, it would be due to annual elevation of local shallow water tables into the soil rooting zone of wetlands-adapted plants. Therefore, for a substantial portion or all of the growing season, uses of heavy equipment or other entry by vehicles have strong potential to negatively impact potential wetlands habitat soil and hydrology. Such impacts would likely require prior permitting under federal and state Clean Water Act regulations. Any area that is mapped here as wetlands or potential wetlands, including Dry Montane Meadow, could be negatively impacted if soils are not confirmed to be well dried prior to entry.

Community-scale portions of some Dry Montane Meadows were observed to be dominated by creeping wildrye (*Elymus triticoides*). Contiguous Creeping Wildrye Alliance occurrences larger than 0.1 acres that occur adjacent to the riparian zones at Spratt Creek, Hot Springs Creek and Markleeville Creek would be considered Sensitive as defined by CDFW (2019). Drying margins at these occurrences support a high diversity of plant species, including some that have adaptations to soils burdened with evaporative saline deposits. The special status perennial herb fiddleleaf hawksbeard, which has been documented as occurring in nearby similar habitat (Appendix B1), has some likelihood of occurrence at project area riparian-adjacent meadow margins. If the project includes mechanized equipment entry into Dry Montane Meadow at Spratt Creek, Hot Springs Creek and Markleeville Creek, or practices that would substantially disturb the herbaceous stratum there, then pre-treatment surveys should be performed at the proper time of year (Table 7), in order to avoid negative impact to isolated populations of fiddleleaf hawksbeard.

Wet Montane Meadow

Markleevillage Wet Montane Meadows feature dense herbaceous vegetation. The dominant cover is often provided by species considered to be obligately restricted in the Arid West Region to

growth in wetland habitats. In August, small surface flows and surface ponding were evident at all occurrences, and it is assumed that Wet Montane Meadow as mapped perennially provide aquatic resources for wildlife use. Services provided by these habitats include maintenance of local diversity, groundwater storage, and surface water purification. The large irrigated meadow adjacent to Sawmill Road comprises 40% of the total project area acreage for this type, while 11 other sites average 0.1-0.2 acres. The green edge that demarcates wet meadow areas is stark during the growing season, including the May-November period when adjacent upland soil surfaces would be dried to a firmness accessible for project-related treatment. None of the plants that grow in this community are targeted for project treatment. It will be feasible for crews working in adjacent uplands to visually identify and avoid direct impacts to Wet Montane Meadow habitat. If larger vegetation such as trees must be removed very near Wet Montane Meadow, effective avoidance would include restricting edge work to hand crews. Also, trees should be felled into the uplands direction only. Burn pile locations should be restricted to upland areas where Jeffrey pine (*Pinus jeffreyi*) or big sagebrush (*Artemisia tridentata*) are canopy dominants.

Riparian Forest and Scrub

Riparian vegetation occurs as corridors adjacent to the Markleevillage project area's perennial streams (Figure 2). Riparian communities (Table 6) total 25.4 acres at Markleevillage. At their greatest development, four distinct vegetative strata are present: an herbaceous layer that is sparse except at streamside seeps and springs, a shrubby substory canopy of mainly willows (*Salix lasiolepis*, *S. exigua*, and others) with mountain alder (*Alnus incana* ssp. *tenuifolia*), a mid-canopy 20-40 ft in height and dominated by quaking aspen, and a black cottonwood (*Populus trichocarpa*) overstory canopy to 80 feet height. The black cottonwood canopy is mixed with robustly growing Jeffrey pine and white fir (*Abies concolor*), and sometimes replaced by large conifers that arise from the outer riparian corridor edges. Reaches where black cottonwood drops out of the overstory and is infrequent in the middle and lower canopy layers were most commonly classified as Aspen Riparian Forest, and less commonly as Arroyo Willow Thicket (a Willow Riparian Scrub type). Regardless of community type, Markleville's riparian corridors currently are remarkably uninterrupted, averaging about 80 feet width. CDFW streambed alteration permitting requirements would likely extend to the outermost riparian corridor edges at all occurrences.

Table 7. Markleevillage project area plant community types that are available for each special status plant species that could potentially occur. Reasons for species inclusion are described in Appendix B1. Flowering period is taken from CNPS (2020). Rank/Status codes are defined below.

Scientific Name Common Name Life Form	Rank or Status[1]		Flowering Period	Communities Some Potential for Occurrence
	CNPS	CNDDB		
Agrostis humilis mountain bentgrass herbaceous perennial	2B.3	S2	July-Aug.	Jeffrey Pine Forest Singleleaf Pinyon Woodland Big Sagebrush Scrub Dry Montane Meadow

Scientific Name Common Name Life Form	Rank or Status[1] CNPS	 CNDDB	Flowering Period	Communities Some Potential for Occurrence
Botrychium ascendens upswept moonwort rhizomatous perennial	2B.3	S2	sporangia June-Sept.	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Carex davyi Davy's sedge herbaceous perennial	1B.3	S3	June-Sept.	Jeffrey Pine Forest Singleleaf Pinyon Woodland Big Sagebrush Scrub Dry Montane Meadow
Carex hystericina porcupine sedge herbaceous perennial	2B.1	S2	May-June	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Carex petasata Liddon's sedge herbaceous perennial	2B.3	S3	June-July	Jeffrey Pine Forest Singleleaf Pinyon Woodland Big Sagebrush Scrub Dry Montane Meadow
Carex vallicola western valley sedge herbaceous perennial	2B.3	S2	July-Aug.	Jeffrey Pine Forest Singleleaf Pinyon Woodland Big Sagebrush Scrub Dry Montane Meadow
Claytonia umbellata Great Basin claytonia herbaceous perennial	2B.3	S1	May-Aug.	Jeffrey Pine Forest Singleleaf Pinyon Woodland
Crepis runcinata fiddleleaf hawksbeard herbaceous perennial	2B.2	S3	July-Aug.	Dry Montane Meadow
Epilobium howellii subalpine fireweed herbaceous perennial	4.3	S4	July-Aug.	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Epilobium palustre marsh willowherb herbaceous perennial	2B.3	S2	July-Sept.	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Eriogonum luteolum var. saltuarium Jack's wild buckwheat herbaceous annual	1B.2	S1	July-Sept.	Jeffrey Pine Forest Singleleaf Pinyon Woodland Disturbed/Devegetated

Scientific Name Common Name Life Form	Rank or Status[1] CNPS	 CNDDB	Flowering Period	Communities Some Potential for Occurrence
Erythranthe carsonensis Carson Valley monkeyflower herbaceous annual	1B.1	S1	April-June	Big Sagebrush Scrub Disturbed/Devegetated
Helodium blandowii Blandow's bog moss bryophyte	2B.3	S2	-	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Potamogeton robbinsii Robbins' pondweed rhizomatous perennial	2B.3	S3	Aug.-Sept.	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Schoenoplectus subterminalis water bulrush herbaceous perennial	2B.3	S3	June-Sept.	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Viola purpurea ssp. *aurea* golden violet herbaceous perennial	2B.2	S2	April-June	Jeffrey Pine Forest Singleleaf Pinyon Woodland Big Sagebrush Scrub Dry Montane Meadow

1. Rank or status, by agency:

CNPS = California Native Plant Society listings (CNPS, 2020)
- 1B = rare and endangered in California and elsewhere,
- 2B = rare, threatened or endangered in California, but more common elsewhere,
- 4 = plants of limited distribution in California – watchlist species.

Threat Code extensions:
- .1 is Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat)
- .2 is Fairly endangered in California (20-80% of occurrences threatened)
- .3 is Not very endangered in California (< 20% of occurrences threatened or no current threats known).

CNDDB = California Natural Diversity Data Base rankings (CDFW, 2020b)
- S1 is Critically Imperiled: often 5 or fewer populations, or steep rate of decline,
- S2 is Imperiled: often 20 or fewer populations, steep decline, or very restricted range,
- S3 is Vulnerable: often 80 or fewer populations, declining or restricted range,
- S4 = Apparently Secure: uncommon but not rare in California.

All riparian corridor vegetation alliances that are supported by the project area's perennial streams are regionally rare. Montane Black Cottonwood Riparian Forest and Aspen Riparian Forest alliances are considered sensitive by CDFW (2019). Like spring and seep-driven wet/dry meadow complexes at Markleevillage, riparian corridor occurrences support a high diversity of native plant species, and also function to support local wildlife diversity. The layered vegetation creates shading of the habitat, including the aquatic habitat where two special status fish populations are known to occur

(Table 8). Shading is an important function of the occurring plant communities, creating additional species niches for both plant and wildlife assemblage, as well as sheltering the surface flows from solar heating beyond the tolerance of occurring aquatic wildlife. The corridors provide dense cover along intact pathways for terrestrial wildlife day-to-day use and migratory movements. Species diversity, layered structures, and wildlife use of the plant communities that are naturally supported within and adjacent to the riverine environment, or similarly created and maintained by the unlined canal adjacent to Hot Springs Road, impart much to the attractiveness of this area to residents and visitors.

Nearly the entire length of each riparian corridor was walked in August 2020. Seemingly few standing dead trees were encountered, and passage was generally easy due to relatively low deadfall accumulation. Project treatments extended into riparian communities at Markleevillage could negatively impact their function to maintain biological diversity, including special status species, if overcanopy shading is substantially reduced or if large canopy gaps are created. The occurring riparian habitats are visually well-defined, their edges identifiable where black cottonwood, quaking aspen, or willows abruptly transition to the upland-adapted species that define Jeffrey Pine Forest or Big Sagebrush Scrub. Avoiding impacts and associated permitting is possible if access strictly uses existing bridges; no stream crossings should be attempted elsewhere when moving powered equipment. If larger vegetation must be removed very near riparian corridors, effective avoidance would include restricting edge work to hand crews. Also, trees should be felled into the uplands direction only. Burn pile locations should be restricted to upland areas where Jeffrey pine or big sagebrush are canopy dominants.

Markleevillage Special Status Plants – Waters, Wetlands and Potential Wetland Habitats

The special status bryophyte Blandow's bog moss, and plant species upswept moonwort, porcupine sedge, subalpine fireweed, marsh willowherb, Robbins' pondweed, and water bulrush have some potential to be found at riparian and spring-fed forest, scrub and wet meadow habitats that occur within the Markleevillage project area (Table 7). All of these species exhibit adaptations to seasonal or perennial saturation of root zone soils (FAC, FACW and OBL species as listed in Table 3), and would be unlikely to occur in Markleevillage's upland forest and scrub community types. The emergent species Robbins' pondweed and water bulrush would be threatened by changes in soil hydrology and infiltration capacity due to project disturbance of saturated or wet soils. Blandow's bog moss, upswept moonwort, porcupine sedge, subalpine fireweed, and marsh willowherb, species of shaded, perennially moist to wet streambank and meadow habitats, would be negatively impacted by soil disturbance and also by project-related changes to the density of one or more shading overcanopy layers.

If the project treatments must include mechanized thinning or other vehicular entry, or substantial overcanopy reduction, possible negative impacts to populations of these species could be avoided only if pre-treatment surveys using intensive CDFW (2018) methodology are completed. Multiple surveys may be needed, as the time of year when flowers and fruits/sporangia are available for reliable identification vary widely among these species (Table 7). If any area mapped as Dry Montane Meadow is similarly included in the project, or will be used to turn equipment or burn piles, then pre-work surveying should include searches for small and isolated populations of fiddleleaf hawksbeard, mountain bentgrass, Davy's sedge, Liddon's sedge, western valley sedge, and golden violet.

Markleevillage Special Status Wildlife – Waters, Wetlands and Potential Wetland Habitats

Waters, wetlands, and potential wetland habitats that occur within the Markleevillage project area (Table 6) may harbor individuals or crucial habitat of the regionally occurring special status wildlife species mountain sucker, mountain whitefish, Southern long-toed salamander, willow flycatcher, bald eagle, and Sierra Nevada mountain beaver. While most of these species are regionally known only from rather distant historical reports (Appendix B), mountain sucker and mountain whitefish have been recently reported in East Fork Carson River and its tributaries including both Hot Springs Creek and Markleeville Creek near the project area (Cardno-Entrix, 2014, CDFW, 2020e). Only non-native trout were observed in August 2020, but it is reasonable to assume that mountain sucker and mountain whitefish currently occupy all perennial riverine habitats in the project area, including the canal.

Table 8. Sensitive wildlife species that could potentially occur within the Markleevillage project area. Key to status codes (CDFW, 2020c, 2000d) is given below.

Species	Status[1] CDFW	Status[1] State ranking	Communities Some Potential for Occurrence
Insects			
Bombus occidentalis Western bumble bee	Candidate Endangered	S1	Big Sagebrush Scrub Dry Montane Meadow
Euphydryas editha monoensis Mono checkerspot butterfly	-	S1S2	Big Sagebrush Scrub Dry Montane Meadow
Fish			
Catostomus platyrhynchus mountain sucker	SSC	S3	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub
Prosopium williamsoni mountain whitefish	SSC	S3	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub
Amphibians			
Ambystoma macrodactylum sigillatum Southern long-toed salamander	SSC	S3	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Birds			
Empidonax traillii (nesting) willow flycatcher	Endangered	S1S2	Black Cottonwood Riparian Forest Willow Riparian Scrub
Haliaeetus leucocephalus (nesting) bald eagle	Endangered FP	S3	Jeffrey Pine Forest Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest

Species	Status[1] CDFW	State ranking	Communities Some Potential for Occurrence
Mammals			
Aplodontia rufa californica Sierra Nevada mountain beaver	SSC	S2S3	Black Cottonwood Riparian Forest Quaking Aspen Riparian Forest Willow Riparian Scrub Wet Montane Meadow
Lepus townsendii townsendii western white-tailed jackrabbit	SSC	S3?	Jeffrey Pine Forest forms in Singleleaf Pinyon Woodland forms in Big Sagebrush Scrub
Taxidea taxus American badger	SSC	S3	Jeffrey Pine Forest burrows in Singleleaf Pinyon Woodland burrows in Big Sagebrush Scrub
Vulpes vulpes necator Sierra Nevada red fox	Threatened	S1	Jeffrey Pine Forest Singleleaf Pinyon Woodland burrows in Big Sagebrush Scrub

1. Rank or status, by agency:
CDFW = State of California under the California Endangered Species Act (CDFW, 2020c)
SSC = Species of Special Concern (CDFW, 2020d),
FP = Fully Protected (take cannot be authorized except for recovery-related activities, CDFW, 2020d).
State ranking = CNDDB State Conservation Ranking as reported by CDFW (2020d)
S1 is Critically Imperiled: often 5 or fewer populations, or steep rate of decline,
S2 is Imperiled: often 20 or fewer populations, steep decline, or very restricted range,
S3 is Vulnerable: often 80 or fewer populations, declining or restricted range,
? indicates CNDDB uncertainty in assigning rank.

Special Status Fish

Mountain sucker is an omnivorous bottom-feeder that is most often found in quiet streams of good water quality. Under recent (likely current) conditions, the Hot Springs Creek fishery within and near the project area has been considered an example of ongoing stable and relatively high populations of mountain sucker (Center for Watershed Studies, 2020). Eastern Sierra Nevada populations are isolated from the more extensive Rocky Mountains population base. Mountain whitefish is primarily a bottom-feeder, but consumes a variety of benthic invertebrates (Ellison, 1980). Within the project limits, Spratt Creek, Pleasant Valley Creek, Hot Springs Creek, Markleeville Creek, and the unlined canal provide potentially suitable spawning habitat for mountain sucker during the period early July to late August, and for mountain whitefish during the period middle October to early December. Both reportedly spawn at night. Eggs are loosely scattered on riverine gravels, hatching in early spring. Stream characteristics such as clean water, shading, invertebrate diversity and abundance, and slow gradients with deep pools that support algal growth, all promote population maintenance for both fish species. In order to avoid project impacts to special status fish, crews should be instructed to avoid incursions that would directly disrupt spawning beds or cause changes in sediment load, and treatments that will substantially reduce

aquatic habitat shading and overhanging cover in pool areas. Use of machines or other vehicles near riparian corridors and at the canal should be done with care to avoid spills that could enter the flows.

Southern Long-toed Salamander

As adults, Southern long-toed salamanders are carnivorous, living cryptically and remaining unseen for most of the year in burrows of small mammals, or underground in loose, moist soil and heavy duff. They are visible and perhaps most vulnerable to direct impacts of forestry machinery and practices as they migrate aboveground between habitats to reach nearby breeding ponds. Migration occurs during the period between snow/ice melt in early April and about June 1. Larval salamanders, which hatch from eggs in middle to late summer, may transform to terrestrial adults prior to winter or may remain in the pond as untransformed larvae for up to one year. Larval survivorship is dependent upon stable, productive pond conditions where crustaceans or tadpoles are present as prey (Stebbins, *et al.*, 2012). Potential breeding ponds occur only at habitats mapped here as Wet Montane Meadow in the area between the canal and Hot Springs Road (Figure 2b). Possible machinery-related mortality of migrating individuals during the April 1 to June 1 period can very likely be avoided if a survey of ponds in the area between the canal and Hot Springs Road contemporaneously finds that breeding Southern long-toed salamanders are not present.

Willow Flycatcher

Flowing streams are considered "an essential physical feature of willow flycatcher habitat" (USFWS, 2013). Annual migrants may meet their critical foraging needs while passing through the area's riparian and wet meadow habitats. Pairs potentially could establish breeding territories at two larger-scale portions of the on-site Hot Springs Creek riparian corridor (Figure 3a-b), where willow-dominated scrub and more open meadow habitats border on each other. Each potential nesting habitat block is about 4 acres in size. "Typical" nesting habitats occupied by regional migrants, such as those found in Charity Valley at the nearest known willow flycatcher breeding habitat (13 miles west) feature more extensive willow patches scattered within a much larger, streamside wet meadow complex. It is possible that project vegetation treatments and burning of slash piles could cause nest abandonment if implemented during the May-July period within 100 feet of either of these areas (the approximate line-of-sight distance to the highly travelled Hot Springs Road), due to sudden increases in noise and human activity. In order to avoid negative impacts to willow flycatcher, an intensive survey protocol should be completed on specific dates during the May-July period (Bombay, *et al.*, 2003), to determine whether willow flycatcher breeding territories have been established in the adjacent riparian area.

Bald Eagle

Bald eagle nests are generally found within one mile of larger rivers or lakes. As bald eagle range expands in California, it has been found that new nest sites are more commonly established in forested areas of human habitation and relatively greater disturbance than has been characteristic of long-established nest sites. Nest success in urbanized situations is actually higher than at remote sites (Airola, 2007). A breeding bald eagle pair, if present, is likely to choose to nest in a distinctively tall conifer. The project must avoid disrupting nest structures that are attributable to eagles and other raptors, as nests are protected under CDFW code even when inactive (*i.e.*, all year).

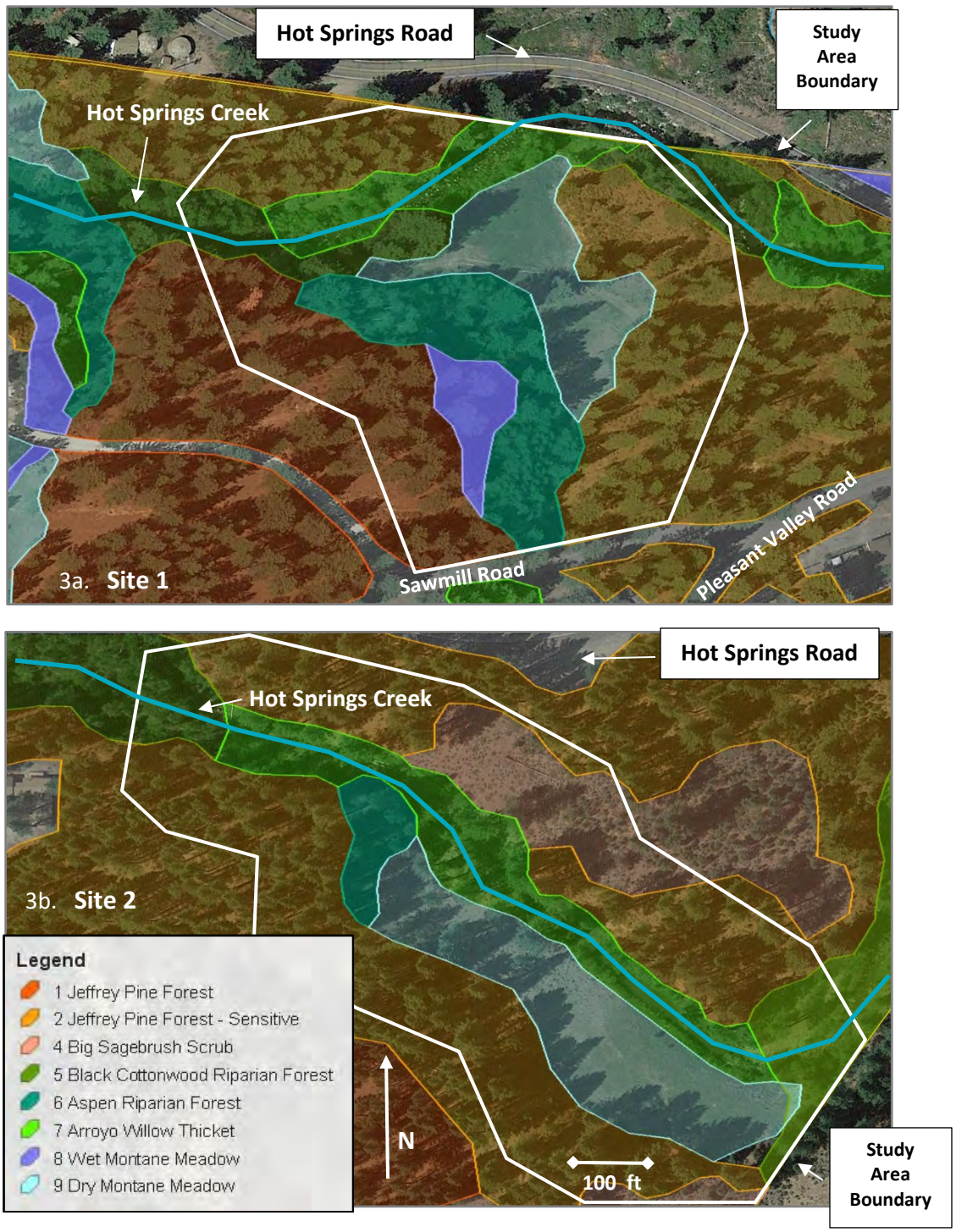

Figure 3. Two habitat blocks within the Markleevillage project area that have some potential to serve as breeding habitat for willow flycatcher. Suggested 100 feet buffering is shown (white outline).

Searching for large stick nest structures should be included in any pre-work nesting bird surveys. When performed immediately prior to the start of project-related activities that could destroy active nests or cause nest abandonment, a survey is the best available method for minimizing such impacts.

Nest discovery should be followed by buffering, or ceasing noisy and active work, until the young have left the nest. Appropriate project no-work buffering for active passerine nests would generally be about 50 feet; however, eagle and other raptor nest buffering should be determined in consultation with CDFW (N. Buckmaster, *pers. comm.*). Buffering of active eagle nests typically is 1/2 mile or more.

Sierra Nevada Mountain Beaver

While the Markleevillage project area elevation is somewhat lower than recent sightings of Sierra Nevada mountain beaver reported in CNDDB (CDFW, 2020e), there exists some possibility that riparian habitats at perennial streams and the canal are suitable for their dispersal and denning. The relatively continuous riparian areas are sometimes densely vegetated and have not been subject to trampling by livestock in recent decades. Relatively undisturbed streambank microhabitats with dense growth and large downed tree boles that could be used for denning were frequently encountered at Hot Springs Creek. Rapidly growing mid-canopy willows and taller quaking aspen can generate substantial deadwood at their bases, however, project treatment to remove these woody accumulations where they occur directly within the banks of perennial streams, or at springs and streamside willow patch habitat associated with the unlined canal, could destroy occupied burrow systems or could increase predation upon mountain beavers due to loss of concealing cover (Steele, 1989). Project activities that will disturb areas mapped as riparian or spring-driven forest, scrub or wet meadow (Table 6), can be implemented without direct impacts to Sierra Nevada mountain beaver individuals and dens if prior surveys are performed to detect the often extensive burrow systems that they create.

5.1.2 Markleevillage – Upland Habitats

Development at Markleevillage has been for the most part to provide single family housing. During recent decades, the buildable landscape has been filled to a relatively high degree of completion immediately adjacent to paved roads, including Pleasant Valley Road, Sawmill Rd., Pinon Rd., Timber Lane, and Ox Bow, Canon View, and Lava Cap Courts (Figures 2a-b). However, in addition to 45 acres of wetlands and potential wetland habitats, 222 of the 300 acres within the project area continue to support native, relatively undisturbed coniferous forest and sagebrush scrub communities in an upland setting (Table 6). Jeffrey Pine Forest is the most widespread type, as it currently occupies 71% of the 267 acres classified here as undeveloped.

Jeffrey Pine Forest

Jeffrey Pine Forest occupies rolling hillsides, as well as valley bottoms adjacent to riparian, canal, and spring-driven potential wetlands community types. Jeffrey pine is the only tree in the canopy, or less commonly there is a sub-dominant presence (less than 10% relative frequency) of quaking aspen or white fir (*Abies concolor*). Forest canopy gaps are dominated by big sagebrush, and the forest generally transitions into community-scale Big Sagebrush Scrub at ridgelines. Trees that are central to the stands are even-aged, with larger conifers and denser stocking generally at riparian corridor margins. Very large trees (having bole diameters greater than 40 inches at breast height) are rare, and indications of old growth forest were not found. Currently, upland forests have only rarely achieved densities that exceed 40% tree canopy closure, and 10-20% closure is more typical.

The Jeffrey Pine Forest understory is generally sparse, consisting of scattered low shrubs and grasses totaling less than 5% total cover. Bitterbrush (*Purshia tridentata*) often is the most abundant shrub in areas where the understory becomes more prominent. Occurrences of this forest type where Jeffrey pine and bitterbrush are clearly dominant in their respective canopy layers (50-90% relative frequencies) were mapped as *Pinus jeffreyi-Purshia tridentata* alliance (Figure 2), which is considered Sensitive by CDFW (2019). Limited areas that have developed as much as 50% bitterbrush canopy cover were encountered. Project-related reductions of shrub density will not substantially alter the forest character or species composition, unless new invasive non-native plants are introduced. Incorporation of methods to prevent weed spread into project treatments (discussed above) would be sufficient to mitigate the potential project-related negative impacts upon sensitive upland community types at Markleevillage. The induced changes to tree and shrub canopy density will not cause any reduction in the on-site extent or ecological function of *Pinus jeffreyi-Purshia tridentata* alliance occurrences. Upland community types (Table 6) otherwise are commonly present at undeveloped areas of Alpine County, and are widespread in the Eastern Sierra Nevada (Sawyer, *et al.* 2009).

Big Sagebrush Scrub

The Big Sagebrush Scrub canopy is mainly big sagebrush (*Artemisia tridentata*), with bitterbrush at varying subdominant frequencies, and relatively minor contributions by several xerophyllic evergreen shrubs (Appendix A1). Occurrences are often at rocky hilltops and slopes. All include 10-50% total cover provided by native shrubs and 1-10% overcanopy cover provided by upland trees such as Jeffrey pine. One assemblage at steeply sloping habitat was classified as Singleleaf Pinyon Woodland (Figure 2b). This area, where sparse big sagebrush is joined by an equal cover provided by bush penstemon (*Penstemon newberryi*) and singleleaf pinyon (*Pinus monophylla*), is perhaps the only slope in the Markleevillage upland habitats that would be too steep for safe mechanized treatment.

Markleevillage Special Status Plants – Uplands

The special status plant species Jack's wild buckwheat, Carson Valley monkeyflower, mountain bentgrass, Davy's sedge, Liddon's sedge, western valley sedge, golden violet, and Great Basin claytonia, occur at similar upland habitats within 20 miles of the Markleevillage project area. Jack's wild buckwheat and Carson Valley monkeyflower may be present in the seedbank only, at least during years of below normal winter and spring precipitation. All of these species grow to very low stature, and would be present diffusely (but not necessarily widespread) within the large upland habitat blocks that are available at Markleevillage. Diffuse plant populations with diminutive growth habits will not be targeted for project treatments, and it is very unlikely that the limited, scattered areas of trampling and pile burning will threaten the continued existence of any special status plant population occurring in upland habitats.

Planned roadside staging areas should be rejected for project use if pre-treatment survey determines that either Jack's wild buckwheat and Carson Valley monkeyflower is present there. Should mechanized treatment, staging, or pile burning be unavoidable in the upland ecotonal areas that are classified as Dry Montane Meadow, including the small occurrences supported by the canal, negative impacts to potentially occurring mountain bentgrass, Davy's sedge, Liddon's sedge, western valley

sedge, fiddleleaf hawksbeard, or golden violet can be avoided by performing surveys prior to the start of work (CDFW, 2018), during the period when flowers and fruits are available for reliable identifications (Table 7).

Markleevillage Special Status Wildlife – Uplands

The special status wildlife species bald eagle, Western bumble bee, Mono checkerspot butterfly, western white-tailed jackrabbit (*Lepus townsendii townsendii*), American badger, and Sierra Nevada red fox have some potential to occur within the project area's upland habitats (Table 8). The mid-sized mammals western white-tailed jackrabbit, American badger, and Sierra Nevada red fox as adults would be mobile enough to individually escape direct impacts from project-related vegetation removal, however, they become vulnerable to being killed when day-denning or raising young in burrows that could be closed permanently during mechanized clearing. Special status western bumblebee colonies may similarly be negatively impacted by project implementation only at their burrow nest sites. Mono checkerspot butterfly may be significantly impacted at plant populations that serve as hosts for the larval stage. No documented occurrences of any special status animals at upland habitats within the project limits were uncovered as a result of the July 2020 literature review.

Special Status Insects

Potentially affected western bumble bee occurrences would be at underground colony nest sites. This species' nest site selection is limited to upland habitats near wildflower pollen and nectar sources. The nest hole is adopted from a rodent or other ground-burrowing animal, usually in sagebrush scrub, but they have also been found in dry meadows and forest/meadow ecotone habitats (Koch, *et al.*, 2012). Colonies will be active aboveground and thereby discoverable during the entire growing season (early April – late October). Mono checkerspot butterfly, a subspecies of the more widely distributed Edith's checkerspot butterfly, is regarded as Sensitive by USFS (CDFW, 2020d). One of the largest known extant population centers is in the Carson River Valley in nearby Nevada. The only CNDDB occurrence is from Hope Valley in 1948. Plants of the genera *Castilleja* (paintbrushes) and *Penstemon* (beardtongues) are generally recognized as larval host plants (Pohl, *et al.*, 2016), however, the Carson River Valley population likely is using *Collinsia parviflora* as the main host (NatureServe, 2020). Members of each of these three genera of plants were confirmed as occurring in Big Sagebrush Scrub or Dry Montane Meadow habitat in 2020 (Appendix A1).

Habitat modifications that potentially could cause local extirpation of these insects, should they occur, can be avoided using worker education prior to the start of treatment in Big Sagebrush Scrub or Dry Montane Meadow community types. Nests of ground-dwelling bees will be readily apparent during treatment, if any occur. Workers can flag nests to be avoided when using heavy equipment and burning piles. While removal of herbaceous vegetation is not a project treatment, trampling of host plant swards that potentially support Edith's checkerspot butterfly is possible. Workers can flag densely herbaceous, meadow-like (not shrubby) vegetation that is being visited by butterflies for avoidance when using heavy equipment and burning piles.

Western White-tailed Jackrabbit

Western white-tailed jackrabbits inhabit a variety of upland montane habitats in the Eastern Sierra Nevada, including Big Sagebrush Scrub and coniferous forests that provide a substantial shrub cover. Individuals do not congregate, and are mainly nocturnal when foraging. One or more litters may be raised in shallowly depressed "form" nests during the period May-July (Lim, 1987). Occupied forms would be most likely to be found in areas that support the densest sagebrush (Duke and Hoeffler, 1988). Project-related destruction of occupied neonatal rabbit forms, or of the occupied dens of any other occurring Species of Special Concern (Table 8), would constitute incidental take of individuals. Such an impact to nesting western white-tailed jackrabbit potentially may occur within 33 acres of Big Sagebrush Scrub or Singleleaf Pinyon Woodland (Figure 2) at Markleevillage, which is a very small area compared to the species' known regional range. If a clearing treatment must be implemented in Big Sagebrush Scrub and Singleleaf Pinyon Woodland during during the period May-July, the potential impacts to individuals can be avoided by conducting a survey for occupied forms prior to starting treatment.

American Badger

American badger are predators that characteristically excavate and enlarge the burrows of small mammalian prey. Typical prey species include Beechey ground squirrel (*Otospermophilus beecheyi*), a species that was found in August 2020 to be present at Markleevillage in Big Sagebrush Scrub and Singleleaf Pinyon Woodland. American badgers are considered active all year; however, they spend long periods in resting torpor underground, and also raise litters in underground dens (Helgen and Reid, 2016). The holes and excavated dirt piles created by badgers are large and conspicuous. Direct impacts to aboveground individuals would be unlikely due to their mobility, but badgers that are day-denning or raising litters in enlarged rodent burrows may be buried as an unintended consequence of mechanized vegetation clearing and piling. Surveys for potentially active burrows of large diameter could be conducted within 33 acres mapped as Big Sagebrush Scrub and Singleleaf Pinyon Woodland (Figure 2) immediately prior to the start of soil disturbance in order to avoid burial of denning badgers.

Sierra Nevada Red Fox

Sierra Nevada red fox are considered to be very rare animals restricted to high elevations, generally much higher than the 5700 feet average project elevation (CDFW, 2020e). CNDDB records near the project area are from sightings from at least 45 years in the past, however, more recent collections (road kills) from Mono County suggests that lower elevation habitats may be used in the Eastern Sierra Nevada. Sierra Nevada red fox may move through or forage within any of the available habitats, but the level of human disturbance at least centrally among existing developments is not consistent with the general habitat requirements of this seldom seen animal. Den establishment within the project would have some likelihood only at the outlying, less fragmented upland scrub and wetland fringe areas. Denning has been documented in rock fall settings and other open, unforested upland habitats (CDFW, 2020e). It is possible that the poorly understood Sierra Nevada red fox sometimes uses enlarged rodent or coyote burrows. In order to avoid unintended burial of foxes that are day-denning or raising young pups, which potentially could occur during mechanized project treatments, pre-work surveys for active burrows of large diameter could be completed immediately prior to the start of soil disturbance within the 33 acres mapped as Big Sagebrush Scrub and Singleleaf Pinyon Woodland (Figure 2).

5.2 Manzanita Project Area

5.2.1 Manzanita – Waters, Wetlands and Potential Wetland Habitats

The Manzanita project area occurs 3.9 miles to the north of the Markleevillage project area. Terrain at Manzanita is similarly positioned in the regional landscape, where slopes of the eastern Sierra Nevada flank meet the lowlands associated with the Carson River. However, Manzanita encompasses a larger elevation range (Table 1) and features much steeper slopes. Scott Creek steeply and narrowly falls west to east through the central part of the project area. Scott Creek flows perennially at Manzanita, as do numerous isolated outflows from perennial springs. The primarily upland habitats of the project area are otherwise interrupted only at the eastern and southern project limits, where small spreading ditches are seasonally to perennially watered to maintain a large (off-site) meadow (Figure 4).

Manzanita's perennial springs appear to be aligned within the steeply sloping 6200-6500 feet contour. Artesian flows issue along a north to south trend within the southern half of the project area. Springs that occur to the north of Scott Creek likely produce surface flows briefly, or at most seasonally, under normal climate conditions. Drying downslope soils at spring-driven habitats sometimes include saline habitat indicators such as evaporite deposits on vegetation and thin episalic crusts. All of these spring flows end well to the west of State Highway 89, and none were observed to be tributary to Scott Creek or Indian Creek in August 2020. Scott Creek, on the other hand, is a relatively permanent tributary to Indian Creek, which is a relatively permanent tributary to East Fork Carson River. Scott Creek in the project area thereby is very likely a resource that qualifies as a jurisdictional Water of the U.S. and Water of the State of California under their respective Clean Water Acts. Further investigation and permitting would need to be completed prior to starting any work in the Scott Creek riparian corridor, pursuant to compliance with federal Clean Water Act Section 404 and Section 401, and California Fish and Game Code Section 1600 regulations.

It is not clear at this level of investigation whether some of the water spreading ditches and other constructed, unlined and sometimes rather natural appearing, creek-like conveyances at the southern and eastern edges of Manzanita would similarly qualify as jurisdictional Waters. These specific areas (Figure 4b) are watered by diversions of relatively strong, perennial spring outflows that occur near and just beyond the southern project boundary. It is possible that these flows historically were tributary to Scott Creek or Indian Creek, as evidenced by several relic, slightly incised channels in the downslope meadow, and the meadow drainage culverts that have been installed at State Highway 89. Diverted springs may maintain one or more hydrological connections to the Carson River watershed as tributaries to Scott Creek or to Indian Creek when "excess" flows are generated during ephemeral to seasonal runoff events. In lieu of Arid West Region delineation research to identify jurisdictional status (U.S. Army Corps of Engineers, 1987, 2008), the project could routinely avoid machine or vehicle entry into these ditches. Any potential for changes to existing ditch bed and banks that would be caused by machine crossings, or by incursions for treatment of associated riparian vegetation, would thereby be completely avoided.

Table 9. Plant communities that were mapped within the 460-acre Manzanita project area in 2020. Manzanita includes 3.5 acres that have been converted to houses, roads and other impervious or devegetated surfaces. Community names (after Holland, 1986) are cross-referenced to Alliance names (Sawyer, *et al.*, 2009), as currently classified by CDFW. * indicates plant communities that are designated "sensitive" (CDFW, 2019).

Holland Community Name and CDFW Association Number	CNDDB Alliance Name and Primary Association	Acreage in Study Area
Upland Communities		
Jeffrey Pine Forest 87.020.36	Jeffrey Pine *Pinus jeffreyi-Ceanothus cordulatus-Artemisia tridentata*	146
Aspen Forest 61.111.06*	Aspen Grove (S3.2) *Populus tremuloides-Artemisia tridentata*	1.5
Montane Manzanita Chaparral 37.303.02	Greenleaf Manzanita Chaparral *Arctostaphylos patula-Quercus vacciniifolia*	251
Big Sagebrush Scrub 35.111.00	Mountain Big Sagebrush *Artemisia tridentata-Purshia tridentata*	20.1
Wetland and Potential Wetland Communities		
Montane Riparian Scrub 61.210.00*	Mountain Alder Thicket *Alnus incana-Salix* spp.	4.3
Modoc-Great Basin Riparian Scrub 61.201.00	Arroyo Willow Thicket *Salix lasiolepis-Prunus virginiana*	22.1
Wet Montane Meadow 45.000.00	(Narrow-leaved Sedge) *Carex angustata*-herbaceous	0.5
Dry Montane Meadow 42.060.00	Kentucky Bluegrass Turf *Poa pratensis*-herbaceous	11.0

Riparian Scrub

Riparian corridor vegetation at Scott Creek is sharply bounded and visually distinctive, which facilitates avoidance by the project. It crosses narrowly through xeric upland forest and shrubland communities (Table 9). The deeply shaded understory habitat is very rocky and the herbaceous stratum is generally sparse. The subcanopy is composed of various willows (Appendix A1), Sierra coffeeberry (*Frangula rubra*), Utah serviceberry (*Amelanchier utahensis*), redstem dogwood (*Cornus sericea*), and western chokecherry (*Prunus virginiana* var. *demissa*), and is for the most part classified as Mountain Alder Thicket. Its middle canopy averages 40 feet height and is dominated by mountain alder (*Alnus incana* spp. *tenuifolia*). Quaking aspen occurs patchily at less than 10% relative frequency. Dense Jeffrey

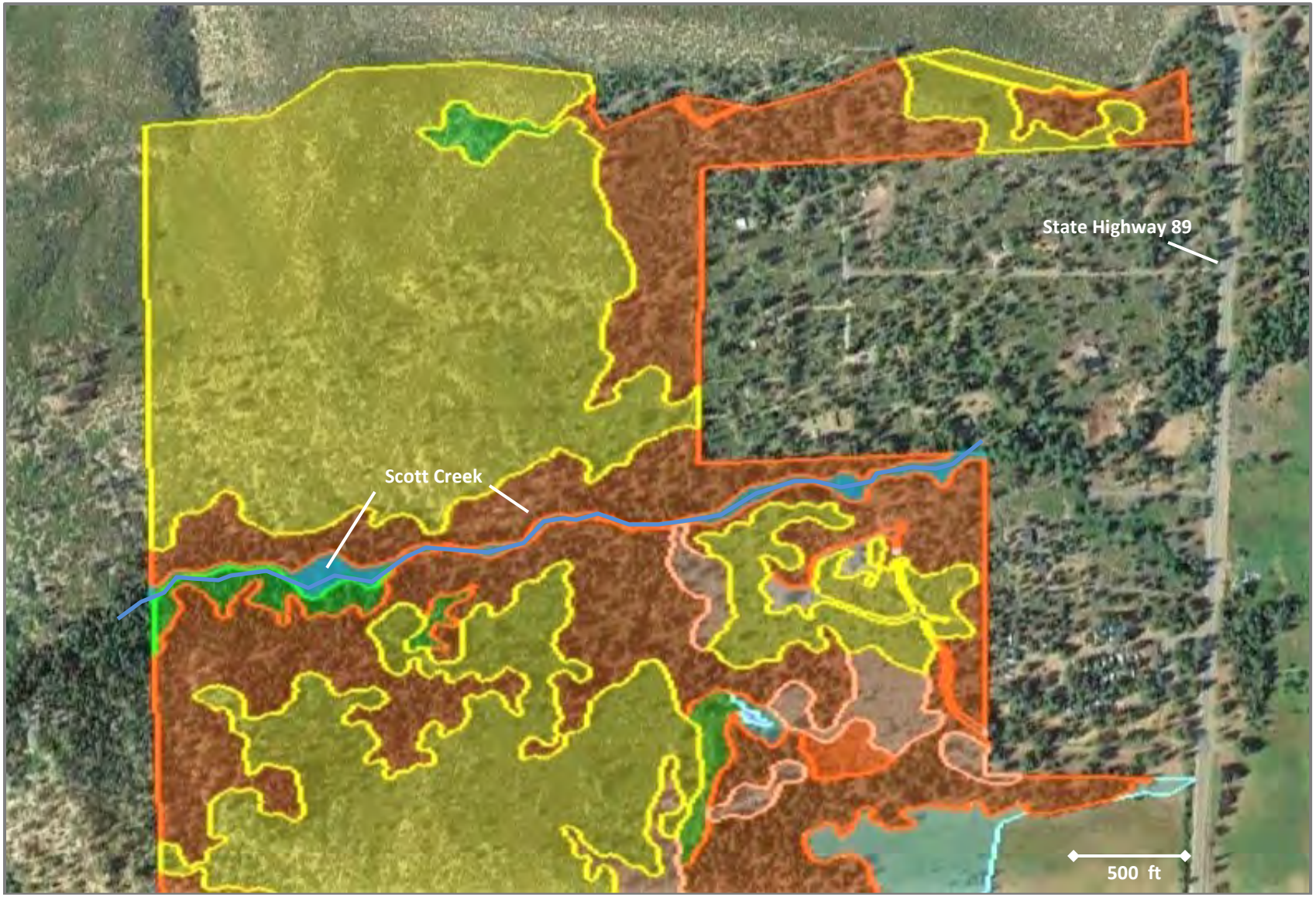

Figure 4a. Manzanita project area, northern half. Plant community occurrences mapped in August 2020 are shown. Base image date is August 2019.

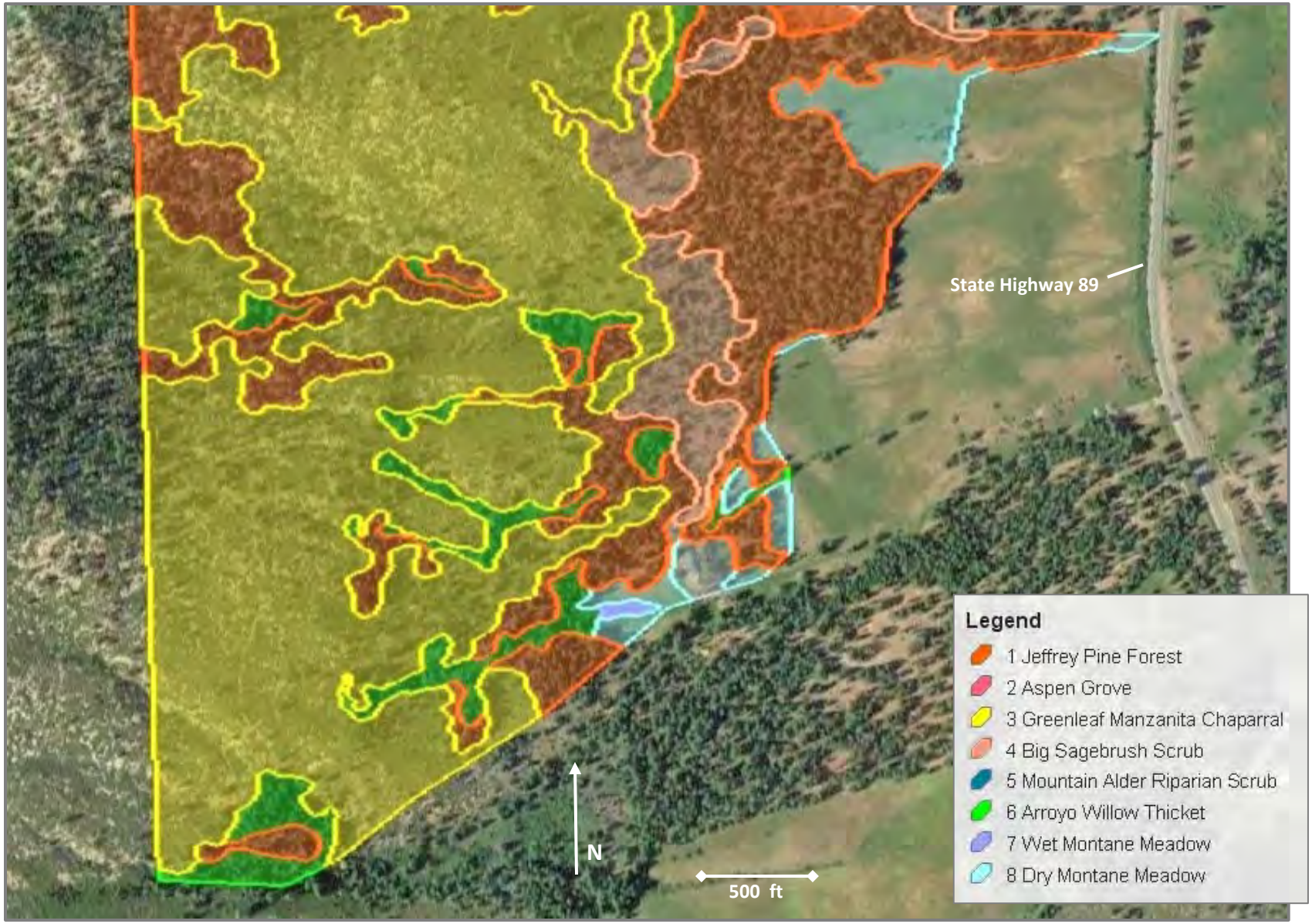

Figure 4b. Manzanita project area, southern half.

pine and white fir to 100 feet height provide a continuous overcanopy. Standing dead trees were not prominent in 2020. Arroyo Willow Thicket was mapped where mountain alder becomes subdominant (Figure 4a). Corridor vegetation near Scott Creek was found to be ungrazed and relatively undisturbed, with much natural character. Mountain Alder Thicket is considered Sensitive by CDFW (2019).

A total of 22.6 acres of vegetation having a predominance of hydrophytic shrub and herbaceous layer plant species was mapped in association with flowing artesian springs. Springfed habitats generally support 1-4 acres of elevated shallow groundwater and zonal Arroyo Willow Thicket. Two of the smallest spring outflows that support 100% cover provided by herbaceous species alone were mapped as Wet Montane Meadow (Figure 4). Shrubby willow thickets to 20 feet height, composed of mainly arroyo willow (*Salix lasiolepis*) and Scouler's willow (*S. scouleri*), occur centrally, while outer edge canopies are mainly Sierra coffeeberry, Utah serviceberry, and Western chokecherry. This vegetation typically is impassably dense. Transitions to upland shrubland types (Table 9) are very abrupt, while transitions to Jeffrey Pine Forest at lower project area elevations are more gradual. Manzanita's springfed habitats are grazed by livestock, but have not become devegetated by current uses. They currently support the highest plant diversity observed in the project area (Appendix A1). Access for wildlife use remains quiet and concealed. Tracks indicating holding mule deer were abundant in August 2020, and trails leading upslope from on-site springfed habitats suggest that these forage opportunities, and their dense cover and surface waters, provide an important resource for migrating deer of the Carson River Deer Herd.

Table 10. Manzanita project area plant community types that are available for each special status plant species that could potentially occur. Reasons for species inclusion are described in Appendix B2. Flowering period is taken from CNPS (2020). Rank/Status codes are defined below.

Scientific Name **Common Name** **Life Form**	**Rank or Status**[1]		**Flowering Period**	**Communities** **Some Potential for Occurrence**
	CNPS	**CNDDB**		
Agrostis humilis mountain bentgrass herbaceous perennial	2B.3	S2	July-Aug.	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub Dry Montane Meadow
Botrychium ascendens upswept moonwort rhizomatous perennial	2B.3	S2	sporangia June-Sept.	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Botrychium crenulatum scalloped moonwort rhizomatous perennial	2B.2	S3	sporangia June-Sept.	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Botrychium minganense Mingan moonwort rhizomatous perennial	2B.2	S3	sporangia June-Sept.	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow

Scientific Name Common Name Life Form	Rank or Status[1] CNPS	 CNDDB	Flowering Period	Communities Some Potential for Occurrence
Bruchia bolanderi Bolander's candlemoss bryophyte	4.2	S3	-	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Carex davyi Davy's sedge herbaceous perennial	1B.3	S3	June-Sept.	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub Dry Montane Meadow
Carex petasata Liddon's sedge herbaceous perennial	2B.3	S3	June-July	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub Dry Montane Meadow
Carex vallicola western valley sedge herbaceous perennial	2B.3	S2	July-Aug.	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub Dry Montane Meadow
Claytonia umbellata Great Basin claytonia herbaceous perennial	2B.3	S1	May-Aug.	Jeffrey Pine Forest Aspen Grove
Crepis runcinata fiddleleaf hawksbeard herbaceous perennial	2B.2	S3	July-Aug.	Dry Montane Meadow
Epilobium howellii subalpine fireweed herbaceous perennial	4.3	S4	July-Aug.	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Epilobium palustre marsh willowherb herbaceous perennial	2B.3	S2	July-Sept	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Eriogonum luteolum var. *saltuarium* Jack's wild buckwheat herbaceous annual	1B.2	S1	July-Sept	Jeffrey Pine Forest Aspen Grove Disturbed/Devegetated
Erythranthe carsonensis Carson Valley monkeyflower herbaceous annual	1B.1	S1	April-June	Greenleaf Manzanita Chaparral Big Sagebrush Scrub Disturbed/Devegetated

Scientific Name Common Name Life Form	Rank or Status[1] CNPS	 CNDDB	Flowering Period	Communities Some Potential for Occurrence
Helodium blandowii Blandow's bog moss bryophyte	2B.3	S2	-	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Meesia uliginosa broad-nerved hump moss bryophyte	2B.2	S3	-	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Viola purpurea ssp. *aurea* golden violet herbaceous perennial	2B.2	S2	April-June	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub Dry Montane Meadow

1. Rank or status, by agency:

CNPS = California Native Plant Society listings (CNPS, 2020)
- 1B = rare and endangered in California and elsewhere,
- 2B = rare, threatened or endangered in California, but more common elsewhere,
- 4 = plants of limited distribution in California – watchlist species.

Threat Code extensions:
- .1 is Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat
- .2 is Fairly endangered in California (20-80% of occurrences threatened)
- .3 is Not very endangered in California (< 20% of occurrences threatened or no current threats known).

CNDDB = California Natural Diversity Data Base rankings (CDFW, 2020b)
- S1 is Critically Imperiled: often 5 or fewer populations, or steep rate of decline,
- S2 is Imperiled: often 20 or fewer populations, steep decline, or very restricted range,
- S3 is Vulnerable: often 80 or fewer populations, declining or restricted range,
- S4 = Apparently Secure: uncommon but not rare in California.

Dry Montane Meadow

Vegetated drying margins at two springs situated south of Scott Creek were classified as Dry Montane Meadow (Figure 4). These small areas support a high diversity of plant species, including some that have adaptations to saline soils. The special status perennial herbs fiddleleaf hawksbeard and golden violet have some potential to occur in this habitat type, especially at meadow-upland margins. The special status perennial herb golden violet may occur at this same habitat. These meadows margins should be avoided when operating equipment in the adjacent uplands forest and scrub, and should not be used to burn piles. If vehicular entry or implementation of project treatments is unavoidable, then pre-treatment surveys of Dry Montane Meadow should be performed and any occurring populations should be flagged, in order to avoid trampling of fiddleleaf hawksbeard or golden violet populations. Survey results are most reliable if the field work is properly timed when flowers and fruits are available (Table 10).

Riparian and Springfed Habitats

The occurring riparian and springfed wetlands and potential wetland habitats are usually well-defined when viewed from within the site's expansive Jeffrey Pine Forest and Greenleaf Manzanita Chaparral. Their edges with upland vegetation types (Figure 4) are readily identifiable where willows, Sierra coffeeberry, Utah serviceberry, and Western chokecherry abruptly transition to Jeffrey pine, big sagebrush, huckleberry oak (*Quercus vacciniifolia*), and greenleaf manzanita (*Arctostaphylos patula*). Shading is an important function of the occurring Mountain Alder Thicket and Arroyo Willow Thicket plant communities, creating additional species niches for both plant and wildlife assemblages, as well as sheltering the surface flows from solar heating beyond the tolerance of occurring aquatic wildlife. Avoidance is feasible, especially at the Scott Creek riparian corridor. Mechanized crew leads should arrange project treatment area entry at access points both to the north and to the south of the flowing channel. No crossings of perennial flows or seasonally dried channels bearing evidence of annual flows (scour, deposition, prevalence of riparian scrub vegetation) at Scott Creek and area spring outflows should be attempted when equipment is moved.

The wettest springfed habitats and at least some of the outflow channels from springs near the southern edge of the Manzanita project area have some likelihood of having a legal nexus to Clean Water Act federal regulations, and/or may be Waters of the State under jurisdiction of the Regional Water Board. The small, herb-dominated Wet Montane Meadows at Manzanita do not support plants that are targeted for project treatments, and the impact avoidance reasoning that is appropriate at Markleevillage (see above) can also be applied at Manzanita. Prior investigation to more precisely determine federal and state agency jurisdictional limits is needed if the project includes these limited wetlands and potential wetland habitats (Table 9). Potentially jurisdictional areas will be avoided completely if there is no mechanized entry, treatment, or burning implemented Wet Montane Meadow, Dry Montane Meadow, or anywhere arroyo willow, Sierra coffeeberry, Utah serviceberry, and Western chokecherry alone or in combination exceed 25% absolute cover.

Manzanita Special Status Plants – Waters, Wetlands and Potential Wetland Habitats

Populations of the special status bryophytes Blandow's bog moss, Bolander's candlemoss, and broad-nerved hump moss, three species of moonworts (*Botrychium ascendens*, *B. crenulatum*, and *B. minganense*), and the herbaceous plants subalpine fireweed and marsh willowherb have some potential to occur at riparian and spring-fed thicket and wet meadow habitats of the Manzanita project area (Table 10). All of these species exhibit characteristic adaptations to the wetlands pattern of seasonal or perennial saturation of root zone soils (FAC, FACW and OBL in Table 3), and would be unlikely to occur in Manzanita's upland forest and scrub. The special status plants fiddleleaf hawksbeard, golden violet, mountain bentgrass and three sedges (*Carex davyi*, *C. petasata*, and *C. vallicola*) have some potential to occur at spring-fed Dry Montane Meadow.

If the project treatments must include mechanized thinning or other vehicular entry (*e.g.*, to access difficult terrain), or substantial overcanopy reduction, possible negative impacts to populations of these species could be avoided only if pre-treatment surveys using intensive CDFW (2018) methodology are completed. Multiple surveys may be needed, as the time of year when flowers and fruits/sporangia

are available for reliable identification vary widely among these species (Table 10). If any area mapped as Dry Montane Meadow is similarly included in the project, or will be used to turn equipment or burn piles, then pre-work surveying should include searches for small and isolated populations of fiddleleaf hawksbeard, mountain bentgrass, Davy's sedge, Liddon's sedge, western valley sedge, and golden violet during the period May-July (Table 10).

Manzanita Special Status Wildlife – Waters, Wetlands and Potential Wetland Habitats

There exists some possibility that mountain sucker (*Catostomus platyrhynchus*) and mountain whitefish (*Prosopium williamsoni*) populations extend to Scott Creek. Non-native trout were observed at the eastern edge of the project area, implying a pathway for movement from known populations in the East Fork Carson River watershed. Scott Creek stream characteristics such as clean water, shading, and deep pools would support population maintenance for both fish species. However, the slow gradients that characterize much of the available stream habitat at Markleevillage were not observed within the Manzanita survey limits; it appears to be unlikely that spawning beds could be affected by the project. Impacts to potentially occurring special status fish will be avoided if incursions that would cause changes in the bed and bank structures and treatments that will substantially reduce aquatic habitat shading are excluded from the project. Use of machines or other vehicles near riparian corridors and at the canal should be done with care to avoid spills that could enter the flows.

Manzanita's wetland and potential wetland habitats more generally could harbor populations of the special status wildlife species Southern long-toed salamander, and Sierra Nevada mountain beaver (Table 11). These two species also have been identified as potentially occurring at riparian or springfed habitats of the Markleevillage project area. Aquatic habitat availability and connectivity, however, is lower overall at Manzanita. Potentially suitable nesting habitats for special status willow flycatcher and yellow-headed blackbirds (*Xanthocephalus xanthocephalus*) are not available at springs, Scott Creek, or elsewhere within the Manzanita project area. Modifications to the project and available mitigations that were highlighted in order to avoid substantial negative impacts to Southern long-toed salamander and Sierra Nevada mountain beaver at Markleevillage's wetland and potential wetland communities (see above) are sufficient and reasonably applicable to the analogous work that is to be performed at Manzanita.

Table 11. Sensitive wildlife species that could potentially occur within the Manzanita project area. Key to status codes (CDFW, 2020c, 2020d) is given below.

Species	status[1] CDFW	State ranking	Communities Some Potential for Occurrence
Insects			
Bombus occidentalis Western bumble bee	Candidate Endangered	S1	Big Sagebrush Scrub Dry Montane Meadow
Euphydryas editha monoensis Mono checkerspot butterfly	-	S1S2	Big Sagebrush Scrub Dry Montane Meadow

Species	status[1] CDFW	State ranking	Communities Some Potential for Occurrence
Fish			
Catostomus platyrhynchus mountain sucker	SSC	S3	Mountain Alder Thicket
Prosopium williamsoni mountain whitefish	SSC	S3	Mountain Alder Thicket
Amphibians			
Ambystoma macrodactylum sigillatum Southern long-toed salamander	SSC	S3	Mountain Alder Thicket Arroyo Willow Thicket Wet Montane Meadow
Birds			
Haliaeetus leucocephalus (nesting) bald eagle	Endangered FP	S3	Jeffrey Pine Forest Aspen Grove Greenleaf Manzanita Chaparral Big Sagebrush Scrub
Mammals			
Aplodontia rufa californica Sierra Nevada mountain beaver	SSC	S2S3	Mountain Alder Thicket Arroyo Willow Thicket
Lepus townsendii townsendii western white-tailed jackrabbit	SSC	S3?	Jeffrey Pine Forest forms in Aspen Grove, forms in Greenleaf Manzanita Chaparral forms in Big Sagebrush Scrub
Taxidea taxus American badger	SSC	S3	Jeffrey Pine Forest burrows in Aspen Grove, burrows in Greenleaf Manzanita Chaparral burrows in Big Sagebrush Scrub
Vulpes vulpes necator Sierra Nevada red fox	Threatened	S1	Jeffrey Pine Forest burrows in Aspen Grove, burrows in Greenleaf Manzanita Chaparral burrows in Big Sagebrush Scrub

1. Rank or status, by agency:

CDFW = State of California under the California Endangered Species Act (CDFW, 2020d)
SSC = Species of Special Concern (CDFW, 2020d),
FP = Fully Protected (take cannot be authorized except for recovery-related activities, CDFW, 2020d).

State ranking = CNDDB State Conservation Ranking as reported by CDFW (2020d)
S1 is Critically Imperiled: often 5 or fewer populations, or steep rate of decline,
S2 is Imperiled: often 20 or fewer populations, steep decline, or very restricted range,
S3 is Vulnerable: often 80 or fewer populations, declining or restricted range,
? indicates CNDDB uncertainty in assigning rank.

5.2.2 Manzanita – Upland Habitats

Development has displaced or converted Manzanita's native vegetation at the eastern and southeastern edges only (Figure 4). In comparison to the observed 33 acres of development (15%) in uplands, and overall moderate fragmentation observed at Markleevillage, upland habitat development at Manzanita totals only 3.5 acres (less than 1%). No obvious signs of ecological fragmentation (*i.e.*, imposed barriers to wildlife resource use, migration, and in the larger sense barriers to gene flow to and from habitats) were observed in the uplands at Manzanita. In all, 419 of the 460 acres within the project area currently support relatively undisturbed coniferous forest, manzanita chaparral, and sagebrush scrub plant communities in an upland setting (Table 9). Greenleaf Manzanita Chaparral dominates on steep slopes that rise nearly 1000 feet to the west within the project area, encompassing 56% of the 460-acre project area. Jeffrey Pine Forest meanwhile is the most widespread type near Scott Creek, and across the more gently rising terrain at the base of these slopes (Figure 4).

Jeffrey Pine Forest

Jeffrey pine forms nearly pure stands throughout most of the Jeffrey Pine Forest mapped at Manzanita. Near the Scott Creek riparian corridor, up to 20% of the tree canopy is provided by white fir. Tree canopy closure averages 10-30%. The understory is currently sparse near the large meadow at the eastern project area boundary. Meanwhile, a variable shrub stratum comprised of big sagebrush, greenleaf manzanita, or mountain whitethorn (*Ceanothus cuneatus*) provides up to 40% total cover in Jeffrey Pine Forest more widely. The densest shrub subcanopies occur wherever overstory conifer canopy closure is less than 20%. As observed at Markleevillage, sapling-sized pine and fir sometimes are densely colonizing the margins of Big Sagebrush Scrub where that community abuts Jeffrey Pine Forest.

About 100 acres of the mapped Jeffrey Pine Forest community occurs on rolling hillsides and small flats where mechanized treatments as contemplated by the project would be feasible. All of the upland acres mapped as Big Sagebrush Scrub or Aspen Grove are similarly accessible. However, the densest uplands vegetation was consistently found on steep to very steep, rocky slopes in dense assemblages mapped as Montane Manzanita Chaparral. It is estimated that 70% of Jeffrey Pine Forest is accessible for mechanized treatment methods, but that less than 10% of the Montane Manzanita Chaparral is safely accessible for mechanized treatments.

Montane Manzanita Chaparral

Montane Manzanita Chaparral averages 60% cover by stiffly intertwined shrubs of 5-8 feet average height. The shrub canopy at its average density is impassable to humans and larger wildlife species. Virtually all work in this type will be performed by hand crews, due to slope severity. The understory is generally sparse, consisting of scattered low shrubs and grasses totaling less than 5% total cover. Non-native cheat grass (*Bromus tectorum*) has widely invaded all slopes, but has not currently established swards or local densities greater than 5% absolute cover. Scattered Jeffrey pines that emerge from the shrub canopy are sometimes joined by singleleaf pinyon, but local tree canopy closure never exceeds 10%. Greenleaf manzanita grow to 10 feet. Manzanita dominance declines with increasing elevation, so that huckleberry oak or less commonly tobacco brush (*Ceanothus velutinus*) patchily attain higher relative frequencies at the project area's upper elevations. Dominant plants in this

community type are known for their ability to survive wildfires at 10 to 50-year intervals (Sawyer, et al., 2009). Adaptation include vigorous post-fire stump-sprouting. Nearly every crown of these shrubs was observed to be sprouting in 2020 at areas that recently had been mechanically cleared for defensive space around houses, even though stems had been pruned to ground level.

Aspen Grove

Aspen Grove was mapped where quaking aspen provides a tree canopy layer of greater than 10% cover amid more extensive Big Sagebrush Scrub. As in Big Sagebrush Scrub, the shrub canopy is composed mainly of big sagebrush and bitterbrush. Shrub cover averages 40%. Clonal regrowth of quaking aspen can be expected if the project includes removing stems. Deadwood accumulation is notable in this community. The single occurrence of Aspen Grove (Table 9) is the only uplands community that is considered Sensitive by CDFW (2019). Project-related reduction of tree or shrub density will not substantially alter the character or species composition, unless new invasive non-native plants are introduced. Incorporation of methods to prevent weed spread into project treatments (discussed above) would be sufficient to mitigate the potential project-related negative impacts upon sensitive upland community types at Manzanita. Changes to tree and shrub canopy density will not cause any reduction in the on-site extent or ecological function of the *Populus tremuloides-Artemisia tridentata* alliance occurrence. Upland community types (Table 9) otherwise are commonly present at undeveloped areas of Alpine County, and are widespread in the Eastern Sierra Nevada (Sawyer, *et al.* 2009).

Manzanita Special Status Plants – Upland Habitats

The special status plant species mountain bentgrass, Davy's sedge, Liddon's sedge, western valley sedge, Great Basin claytonia, Jack's wild buckwheat, Carson Valley monkeyflower, and golden violet have some potential to occur at Manzanita area upland habitats. Jack's wild buckwheat and Carson Valley monkeyflower may be present in the seedbank only in some years. They are the only species that could persist at recent clearings, roadsides, and other disturbed areas that could be conveniently used for project equipment or materials staging. All other potentially occurring (perennial) special status species grow to very low stature, and would be present diffusely (and possibly but not necessarily widespread) within the large upland habitat blocks that are available at Manzanita. Diffuse plant populations with diminutive growth habits will not be targeted for project treatments, and it is very unlikely that limited, scattered areas of trampling and pile burning will threaten the continued existence of any special status plant population occurring in upland habitats.

Avoidance of small populations of Jack's wild buckwheat and Carson Valley monkeyflower could be assured by completing pre-treatment surveys for populations at each intensive use area where equipment staging or materials storage is planned. Should soil disturbance or substantial vegetation mastication be unavoidable at either of the upland ecotonal areas that were classified as Dry Montane Meadow, pre-disturbance surveys should be extended to the small habitat occurrences there in order to determine whether isolated populations of mountain bentgrass, Davy's sedge, Liddon's sedge, western valley sedge, fiddleleaf hawksbeard, or golden violet are present, so that they can be avoided.

Manzanita Special Status Wildlife – Upland Habitats

The special status wildlife species Western bumble bee, Mono checkerspot butterfly, bald eagle, western white-tailed jackrabbit, American badger, and Sierra Nevada red fox have some potential to occur within the available upland habitats at Manzanita (Table 11). These same species have potential to occur within the Markleevillage project area also, 3.9 miles to the south in upland habitats that bear resemblance to those at Manzanita. As described for Markleevillage, western white-tailed jackrabbit, American badger, and Sierra Nevada red fox as adults would be mobile enough to individually escape direct impacts from project-related vegetation removal. But they become vulnerable to being killed when day-denning or raising young in burrows that could be closed permanently during mechanized clearing. Western bumblebee colonies may similarly be negatively impacted by project implementation only at their adopted burrow nest sites. The Mono checkerspot butterfly life cycle may be negatively impacted by unintended removal of herbaceous plant populations that serve as hosts for the larval stage. The project modifications and available mitigations that were highlighted in order to avoid substantial negative impacts these species at Markleevillage's uplands communities (see above) are sufficient and reasonably applicable to the analogous work that is to be performed at Manzanita.

5.3 Bear Valley Project Area

5.3.1 Bear Valley – Waters, Wetlands and Potential Wetland Habitats

The Bear Valley project area is at a relatively high elevation on the western slope of the Sierra Nevada range (Figure 1). Its location is more than 20 miles to the southwest and its elevation averages 1000-1700 feet higher than the average elevations of the eastern slope Markleevillage and Manzanita project areas (Table 1). The climate at Bear Valley is wetter, with annual precipitation principally falling as snow. The average frost-free growing season for plants is about one month shorter. While perennial streams and springs provide significant habitat variation at Markleevillage and Manzanita, Bear Valley's surface flows are strictly seasonal or ephemeral in duration. Surface flows at Bear Valley occur mainly after snow that has accumulated during the December to April winter period begins to melt. Small areas of remnant snow and wet soil surfaces were observed in early July. It is likely that the upper soil profile at shaded upland habitats, and all habitats on slopes north-facing aspect, will be susceptible to possibly substantial, patchy disturbance and compaction if mechanized project treatments are implemented prior to middle-late July. The upper soil profiles of upland habitats likely will have dried completely and will not be substantially affected under normal conditions if work is started after August 1, or following an inspection for appropriate dryness.

No perennial streams were found within the 130-acre Bear Valley project area. Quick checks of the nearby "blue line" streambeds (none cross through the project) found that surface flows had ceased there as of late July in 2020. The nearest dependable surface water is at the 15-acre Bear Lake impoundment, which closely approaches the northeastern project limits (Figure 5). Within the boundaries of the project area, snowmelt conveyances are narrow, steeply falling, and often have been diverted at one or more reaches for provision of drainage around the existing developments. There are no canals, but the widely dispersed roadside habitats generally include ditches wherever slopes greater than 5% are traversed. Small portions of the ditches lining the upslope edges of Snowshoe Road, Bloods

Ridge Road, and Quaking Aspen Road are intermittently vegetated with distinctive species that are adapted to wetlands root zone habitats. It was determined that seasonal watering by snowmelt is augmented by seep zone recharge, the latter persisting at least into August, wherever wetlands-adapted plants suddenly become prevalent in and near roadside ditches. While wetlands and potential wetland habitats are similarly signaled by sudden vegetation shifts at scattered locations along relatively undisturbed portions of the site's ephemeral stream channels, seasonally drying surface flows were found only rarely in settings away from roads. Outside of what may be provided at human residences, the overall dry season availability of surface waters for use by wildlife is at best sparse in the northern half of the project area and none in the southern half.

At this level of study, it was not possible to determine whether any or all wetlands and potential wetland habitat occurrences would be protected under Clean Water Act regulation or Fish and Game Code Section 1600 regulations. Agencies would have some likelihood of asserting jurisdiction based upon the bed and bank structures, ordinary high-water marks, and signs of deposition and scour that were found to be present at stream courses where wetlands-adapted Bitter Cherry Shrubland, Blue Wildrye Montane Meadow, and Kentucky Bluegrass Turf dominants are patchily distributed. Project vehicular entry or implementation of treatments within Bitter Cherry Shrubland, Blue Wildrye Montane Meadow, and Kentucky Bluegrass Turf at seasonal streambed settings would be delayed until the completion of technical investigations into whether or not the individual sites occur "isolated above the headwaters" of jurisdictional Waters.

Mapped community-scale wetlands and potential wetland habitats are situated at lower project elevations amid relatively dense housing, often at short sections of roadside ditch (Figure 5). They total only 1.7 acres in extent (Table 12). Community composition is primarily shrub-statured willows (*Salix lasiolepis*, *S. scouleriana*), bitter cherry (*Prunus emarginata*) and cascara (*Frangula purshiana*) to ten feet height, and verdant, densely carpeted spots of diverse wetlands-adapted herbs (FAC, FACW and OBL in Appendix A2). Patch-scale examples of these vegetation types occasionally will be encountered along stream courses amid uplands Lodgepole Pine Forest and Dry Montane Meadow. Wet Montane Meadow is regionally uncommon, and most occurring assemblages would be considered Sensitive by CDFW (2019). All occurrences appear in stark contrast to the surrounding upland vegetation types, so routine project avoidance is feasible.

Project treatments extended into these communities at Bear Valley could negatively impact their function to maintain biological diversity, including special status species, if overcanopy shading is substantially reduced or if large canopy gaps are created. Avoiding impacts and associated permitting is possible if access to adjacent upland treatment areas strictly uses existing bridges; no seasonal streambed crossings should be attempted elsewhere when moving powered equipment if bed and bank structures are present. If larger vegetation must be removed very near these streambeds or associated Mixed Montane Chaparral and Wet Montane Meadow, effective avoidance would include restricting edge work to hand crews. Trees should be felled into the uplands direction. Burn pile locations should be restricted to upland areas where Lodgepole pine, Jeffrey pine, white fir, big sagebrush, or mountain whitethorn are canopy dominants.

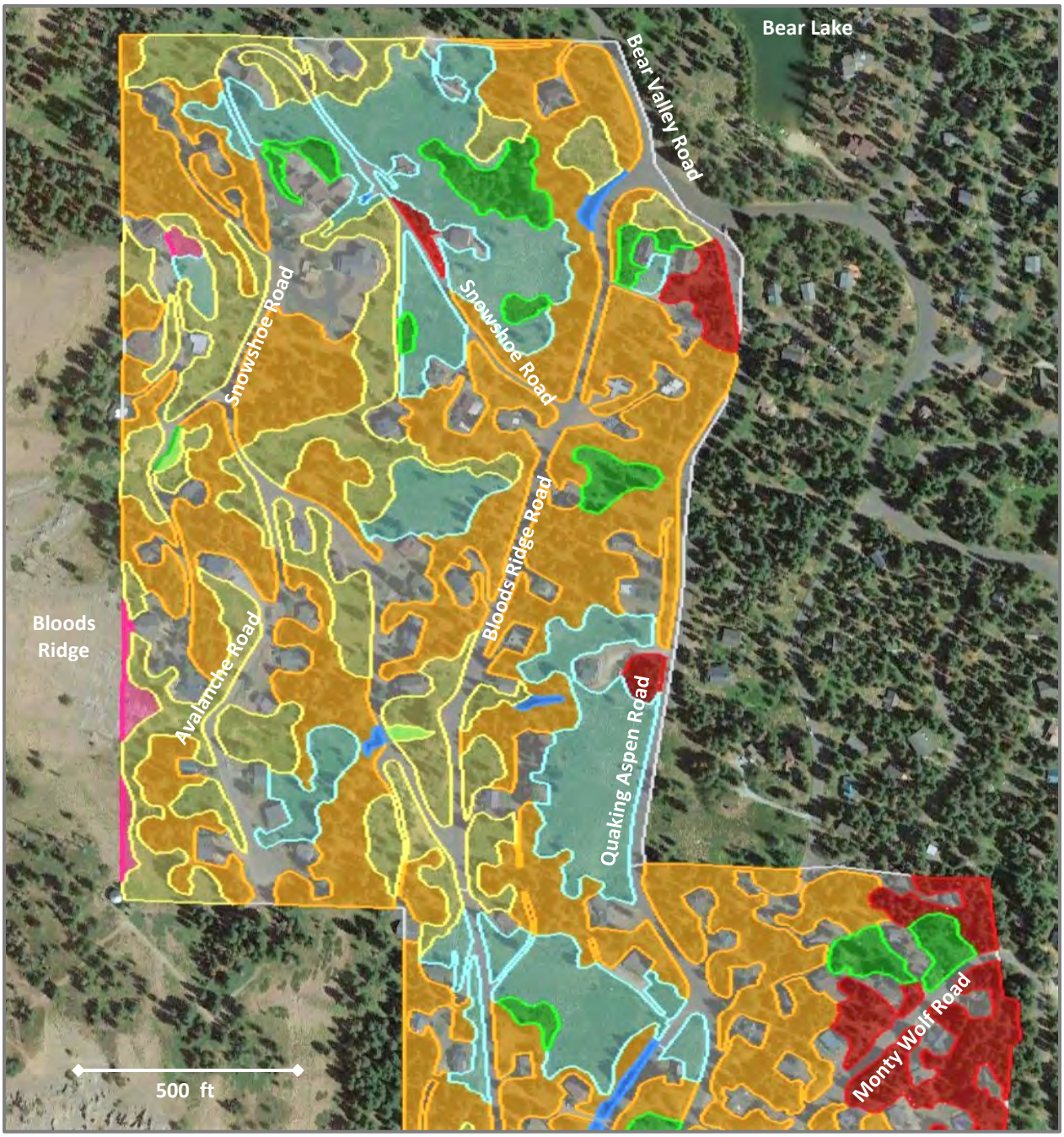

Figure 5a. Bear Valley project area, northern half. Plant community occurrences mapped in August 2020 are shown. Base image date is August 2019.

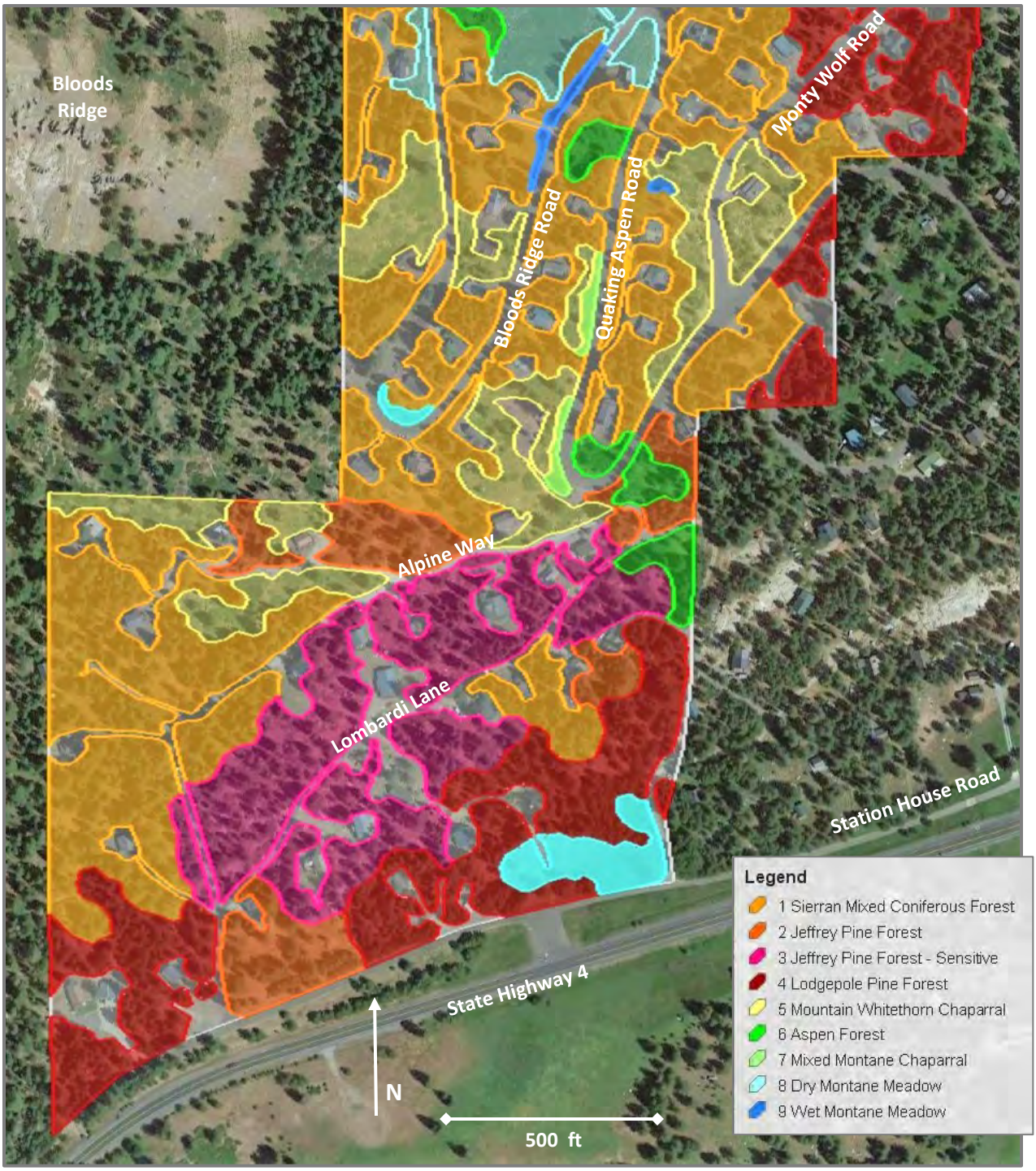

Figure 5b. Bear Valley project area, southern half.

Table 12. Plant communities that were mapped within the 130-acre Bear Valley project area in 2020. Bear Valley includes 0.4 acres of essentially unvegetated lava cap habitat, and a total of 33.7 acres that have been converted to houses, roads and other impervious or devegetated surfaces. Plant community names (after Holland, 1986) are cross-referenced to their Alliance names (Sawyer, *et al.*, 2009), as currently classified by CDFW. * indicates plant communities that are designated "sensitive" (CDFW, 2019).

Community Name and CDFW Classification Number	Alliance Name and Primary Association	Acreage in Study Area
Upland Communities		
Sierran Mixed Coniferous Forest 88.500.00	White Fir *Abies concolor-Pinus jeffreyi-A.magnifica*	40.6
Jeffrey Pine Forest 87.020.30 87.020.10*	Jeffrey Pine *Pinus jeffreyi-Abies concolor* *Pinus jeffreyi-Ceanothus cordulatus*	 3.5 7.4
Lodgepole Pine Forest 87.080.00	Lodgepole Pine *Pinus contorta* ssp. *murrayana*	10.4
Aspen Forest 61.111.04* 61.111.16*	Aspen Grove (S3.2) *Populus tremuloides*-upland *P. tremuloides-Symphoricarpos rotundifolius*	 1.9 1.6
Mountain Whitethorn Chaparral 37.209.00	Mountain Whitethorn *Ceanothus cordulatus-Quercus vacciniifolia*	16.9
Dry Montane Meadow - -	(Arrowleaf Balsamroot) *Balsamorhiza sagitata*-herbaceous	11.9
Wetland and Potential Wetland Communities		
Mixed Montane Chaparral 37.970.00	Bitter Cherry Shrubland *Prunus emarginata-Frangula purshiana-Salix* spp.	0.4
Wet Montane Meadow 41.640.00*	Blue Wildrye Montane Meadow *Elymus glaucus-herbaceous*	0.3
Wet Montane Meadow 42.060.00	Kentucky Bluegrass Turf *Poa pratensis-herbaceous*	1.0

Bear Valley Special Status Plants – Waters, Wetlands and Potential Wetland Habitats

The seasonally moist to perennially wet Mixed Montane Chaparral and Wet Montane Meadow habitats associated with the small springs scattered in the northern half of the Bear Valley project area (none were found within the southern half) have some potential to support the special status aquatic felt lichen, four special status ferns of the genus *Botrychium* – upswept moonwort, scalloped moonwort, Mingan moonwort, and western goblin – and the special status higher plant tall draba. Rooting zones in

the upper soil profiles of these habitats remain wet during the normal growing season at least until late July, and it appears that some stay wet the entire frost-free period under normal conditions. The lichen and moonworts would have likelihood to occur only where these habitats are dependably shaded. Like the available habitats, special status populations that depend upon these conditions would be small and isolated, making them vulnerable to loss due to mechanized trampling and habitat alteration.

Table 13. Bear Valley project area plant community types that are available for each special status plant species that could potentially occur. Reasons for species inclusion are described in Appendix B3. Flowering period is taken from CNPS (2020). Rank/Status codes are defined below.

Scientific Name **Common Name** **Life Form**	**Rank or Status**[1]		**Flowering Period**	**Communities** **Some Potential for Occurrence**
	CNPS	**CNDDB**		
Allium tribracteatum three-bracted onion herbaceous perennial, bulb	1B.2	S2	March-May	Dry Montane Meadow (at Lava Cap habitat only)
Botrychium ascendens upswept moonwort rhizomatous perennial	2B.3	S2	sporangia June-Sept.	Mixed Montane Chaparral Wet Montane Meadow
Botrychium crenulatum scalloped moonwort rhizomatous perennial	2B.2	S3	sporangia June-Sept.	Mixed Montane Chaparral Wet Montane Meadow
Botrychium minganense Mingan moonwort rhizomatous perennial	2B.2	S3	sporangia June-Sept.	Mixed Montane Chaparral Wet Montane Meadow
Botrychium montanum western goblin rhizomatous perennial	2B.1	S2	sporangia June-Sept.	Mixed Montane Chaparral Wet Montane Meadow
Carex davyi Davy's sedge herbaceous perennial	1B.3	S3	June-Sept.	Sierran Mixed Coniferous Forest Jeffrey Pine Forest Lodgepole Pine Forest Aspen Forest Mountain Whitethorn Chaparral Dry Montane Meadow
Cryptantha crymophila subalpine cryptantha herbaceous perennial	1B.3	S3	July-Aug.	Dry Montane Meadow (at Lava Cap habitat only)
Draba praealta tall draba herbaceous perennial	2B.3	S3	June-Aug.	Mixed Montane Chaparral Wet Montane Meadow

Scientific Name Common Name Life Form	Rank or Status[1] CNPS	 CNDDB	Flowering Period	Communities Some Potential for Occurrence
Lomatium stebbinsii Stebbins' lomatium herbaceous perennial	2B.3	S3	June-Aug.	Sierran Mixed Coniferous Forest Jeffrey Pine Forest Aspen Forest Mountain Whitethorn Chaparral Dry Montane Meadow
Peltigera gowardii aquatic felt lichen lichen	4.2	S3	-	Mixed Montane Chaparral Wet Montane Meadow

1. Rank or status, by agency:

CNPS = California Native Plant Society listings (CNPS, 2020)
- 1B = rare and endangered in California and elsewhere,
- 2B = rare, threatened or endangered in California, but more common elsewhere,
- 4 = plants of limited distribution in California – watchlist species.

Threat Code extensions:
- .1 is Seriously endangered in California (over 80% of occurrences threatened / high degree and immediacy of threat
- .2 is Fairly endangered in California (20-80% of occurrences threatened)
- .3 is Not very endangered in California (< 20% of occurrences threatened or no current threats known).

CNDDB = California Natural Diversity Data Base rankings (CDFW, 2020b):
- S2 is Imperiled: often 20 or fewer populations, steep decline, or very restricted range,
- S3 is Vulnerable: often 80 or fewer populations, declining or restricted range.

Impacts that could result in loss of small, isolated populations of aquatic felt lichen, upswept moonwort, scalloped moonwort, Mingan moonwort, western goblin, and tall draba can be avoided if the project avoids vehicular entry and mechanized thinning activities that would disrupt the root zone soil structure, mulching and hydrologic regime, and avoids treatments that substantially reduce habitat shading at Mixed Montane Chaparral and Wet Montane Meadow occurrences. Effective avoidance would include specifying that the very limited patches that feature willows, bitter cherry, cascara, and/or verdant, or densely carpeted spots of diverse wetlands-adapted species at stream courses are to be routinely avoided when working in adjacent Sierran Mixed Coniferous Forest, Lodgepole Pine Forest, and Dry Montane Meadow.

Bear Valley Special Status Wildlife – Waters, Wetlands and Potential Wetland Habitats

The number of potentially occurring special status wildlife species at Bear Valley is relatively few in comparison to Markleevillage and Manzanita. Project activities that disturb soil or vegetation at the limited areas of wetlands and potential wetlands, or activities that disturb patch-sized occurrences of perennially moist habitat within channels that exhibit bed and bank structures could negatively impact small, isolated populations of southern long-toed salamander (Table 11). Any vehicular entry for project treatments would disrupt the accumulated mulch and reduce habitat concealing cover and shading that area important for population maintenance. Potential breeding ponds were not found at Bear Valley in August. Practical avoidance of this species, in lieu of performing pre-project surveys for population

presence, is feasible at Bear Valley if Mixed Montane Chaparral, Wet Montane Meadow, Dry Montane Meadow, and patches of analogous vegetation assembled in seasonal channels that cross through forested habitats are avoided by the project. Effective avoidance would include restricting mechanized treatments and other vehicular entry to upland habitats only at Bear Valley.

Table 14. Sensitive wildlife species that could potentially occur within the Bear Valley project area. Key to status codes (CDFW, 2020c) is given below.

Species	Status[1] CDFW	State ranking	Communities Some Potential for Occurrence
Amphibians			
Ambystoma macrodactylum sigillatum Southern long-toed salamander	SSC	S3	Mixed Montane Chaparral Wet Montane Meadow
Birds			
Accipiter striatus (nesting) sharp-shinned hawk	WL	S4	Sierran Mixed Coniferous Forest Jeffrey Pine Forest Lodgepole Pine Forest
Pandion haliaetus (nesting) osprey	WL	S4	Sierran Mixed Coniferous Forest Jeffrey Pine Forest Lodgepole Pine Forest
Mammals			
Taxidea taxus American badger	SSC	S3	Sierran Mixed Coniferous Forest Jeffrey Pine Forest Lodgepole Pine Forest burrows in Aspen Forest, Mountain Whitethorn Chaparral, and Dry Montane Meadow

1. Rank or status, by agency:
CDFW = State of California under the California Endangered Species Act (CDFW, 2020d)
SSC = Species of Special Concern
WL = Watchlist species of limited distribution or recent decline
State ranking = CNDDB State Conservation Ranking as reported by CDFW (2020d)
S3 is Vulnerable: often 80 or fewer populations, declining or restricted range,
S4 is Apparently Secure: uncommon but not rare in California,

5.3.1 Bear Valley – Upland Habitats

Nearly the entire 130-acre landscape encompassed by the Bear Valley project area has become ecologically fragmented by development to provide single-family housing and roads, and by constant human activity, subsidies (feeders, unsecured trash), and unrestrained domestic pets. Nearly all of the undeveloped area (98%) supports upland forest, shrublands and dry meadow vegetation (Table 12).

Upland forest types appear to be ordered along the project area's 7170-7700 feet elevation gradient, with lodgepole pine (*Pinus contorta* ssp. *murrayana*) the most abundantly occurring tree at the lowermost forested slopes and flats, Jeffrey pine assuming clear canopy dominance at middle elevations, and white fir attaining up to 90% relative frequency in the tree canopy on the steepest, uppermost slopes (Figure 5). Indications of old growth forest were not found. Xeric, thorny scrub occurs in forest canopy gaps and community-sized openings, interrupting mid-slope Jeffrey Pine Forest stands and upper-slope Sierran Mixed Coniferous Forest. Smaller occurrences of Dry Montane Meadow and Aspen grove occupy a similar landscape position.

Sierran Mixed Coniferous Forest

Sierran Mixed Coniferous Forest canopy closure averages 20% and does not exceed 40% even though the trees are frequently clumped. Understory disturbance appears to vary widely, as it is absent and sapling trees have been thinned out at some lots, while other areas including the steepest project area slopes have comparatively native character including shrubs to 60% total cover, downed tree boles and deadwood accumulation, sapling trees (subcanopy stands of mainly white fir), and standing dead trees. The shrub layer is generally mountain whitethorn, but diverse perennial herbs (Appendix A2) are present where clearing has been less intensely practiced. Densely tangled, scrambling perennial herbs and low subshrubs such as bitter dogbane (*Apocynum androsaemifolium*), gooseberry (*Ribes* spp.) and coyote mint (*Monardella odoritissima*) attain 30-40% ground cover where the mixed pine canopy has exceeded 20% closure. Patches of unusually dense growth or frequency shifts to prevalence by wetland-adapted plant species were not found in areas mapped as Sierran Mixed Coniferous Forest.

Jeffrey Pine Forest

Jeffrey Pine Forest occurs as two separable alliance types, which are Jeffrey pine – white fir and Jeffrey pine – mountain whitethorn. The former was mapped where Jeffrey pine relative frequency passes 50% as white fir becomes subdominant with decreasing elevation. The understory is diverse where not already thoroughly disturbed to increase fire safety or for other land uses. However, at 7.4 acres where Jeffrey pine clearly dominates the tree canopy, and the understory layer is mainly (>50%) mountain whitethorn, separate Jeffrey pine – mountain whitethorn classification was warranted as the alliance is considered Sensitive by CDFW (2019). This type occurs among houses near Lombardi Lane and Alpine Way. Total cover by whitethorn currently is as high as 80% in untreated areas. Watercourses through Jeffrey Pine Forest may be incised, but none support riparian corridors of potential wetlands plants, and flowing springs were not found. Project-related work anywhere within Jeffrey Pine Forest, including mechanized removal of a substantial portion of the shrub layer, is very unlikely to change the overall extent of occurring sensitive Jeffrey pine – mountain whitethorn alliance, unless new populations of invasive non-native plants are introduced. Significant impact to the sensitive community can be avoided if care is taken to avoid introducing weed seed, and disturbed soil and mulch is replaced (see Non-Native Plants, above).

Lodgepole Pine Forest

Lodgepole pine is sparsely present in the tree canopy throughout Bear Valley. It attains higher relative frequencies and greater tree canopy closure at the lower elevations and relatively flat terrain

along the eastern edge of the project limits (Figure 5). Lodgepole pine is a species that is recognized for facultative adaptation to wetland habitats (USACE, 2012); however, it is likely that Lodgepole Pine Forest at Bear Valley is uplands habitat as defined in federal wetlands delineation guidance, given the co-occurrence of strictly uplands-adapted Jeffrey pine and white fir, and predominance of uplands plants in the understory layers. Uplands Dry Montane Meadow assemblages similarly include at least a few wetlands-adapted species. Both Lodgepole Pine Forest and Dry Montane Meadow are mapped here as uplands because the necessary predominance of wetland species appears to be lacking throughout nearly all of their extents. Dry Montane Meadow generally is an herbaceous, sometimes also grassy vegetation type of moderate to steep slopes that is dominated by northwest balsamroot (*Balsamorhiza deltoidea*) clumps. The distinct exceptions discussed above (see Waters, Wetlands and Potential Wetlands) are small, likely spring-driven zones in lower elevation watercourses, where typical shrubs and herbs of Mixed Montane Chaparral and Wet Montane Meadow are briefly and densely supported.

Bear Valley Special Status Plants – Upland Habitats

The special status plant species Davy's sedge, three-bracted onion, subalpine cryptantha, and Stebbins' lomatium have some potential to occur in upland habitats that are available within the Bear Valley project area. All are low-growing perennial herbs that would be most likely to establish populations diffusely in the relatively large upland vegetation blocks (Table 13). Three-bracted onion and subalpine cryptantha are regionally known to occur more specifically in upland forest gaps at geological features known as "lava caps". Bloods Ridge is a feature of this type that is immediately upslope from the western edge of the project area. Three-bracted onion and subalpine cryptantha likely would be restricted to 0.4 acres of semi-barren lava cap habitat that intersects the western project area edge (Figure 5a).

Diffuse populations of low-growing plants such as Davy's sedge and Stebbins' lomatium will not be targeted by project treatments, and it is very unlikely that limited areas of trampling and pile burning will substantially impact the continued existence of any occurring population. Project-related soil disturbance may negatively impact individuals, but local population extirpation due to implemented treatments is very unlikely. Potential negative impacts to small populations of three-bracted onion and subalpine cryptantha that would be caused by mechanized trampling, turning of equipment, and piling and burning slash, will be completely avoided if the project does not enter into areas mapped as lava cap (Figure 5).

Bear Valley Special Status Wildlife – Upland Habitats

American badger as adults would be mobile enough to individually escape direct impacts from project-related vegetation removal, however, they become vulnerable to being killed when day-denning or raising young in burrows that could be closed permanently during mechanized clearing. Burrowing attributable to badgers was not observed within the Bear Valley project area, but ground-burrowing prey rodents were noted as sometimes densely colonizing Dry Montane Meadow, and rockier areas of Aspen Forest and Mountain Whitethorn Chaparral. The project modifications and available mitigations that were highlighted in order to avoid negative impacts to American badger at Markleevillages's upland communities (see above) are sufficient and reasonably applicable to the analogous work that is to be performed at Bear Valley.

Sharp-Shinned Hawk and Osprey

Sharp-shinned hawk (*Accipiter striatus*) and osprey (*Pandion haliaetus*) may choose to nest in tall living pines or fir (sharp-shinned hawk), or standing dead pines or fir (osprey) in Mixed Coniferous Forest, Jeffrey Pine Forest, and Lodgepole Pine Forest. Sharp-shinned hawks build and maintain large stick nests, but the sites they choose for nesting are generally more remote and less subject to residential disturbances. Osprey nests in montane settings are always located near or at lakes, and it is not unknown for pairs to choose large standing snags among resort and residential homes (Paulus, 2018). Surveys for large stick nest structures should be conducted at Mixed Coniferous Forest, Jeffrey Pine Forest, and Lodgepole Pine Forest when the project is implemented there during the nesting season. If active raptor nests are found, no-work buffers should be established in consultation with CDFW. Inactive stick nests, if any occur, should be avoided during tree thinning operations; these nest structures are protected even when not in use.

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Appendix A1. List of plant species that were observed in August 2020 to occur at the Markleeville (MV) and Manzanita (MZ) portions of the Alpine County Wildfire Risk Mitigation Plan project. Presence within the available upland and lowland habitat types is indicated. Growth form (Habit) and likelihood of wetland occurrence (Status) codes are defined in Appendix B2.

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Gnetophyta					
Dennstaedtiaceae					
Pteridium aquilinum	Northern bracken fern	NPH	FACU		MV, MZ
Equisitaceae					
Equisetum arvense		NAH	FAC		MV, MZ
Equisetum laevigatum		NAH	FACW		MV, MZ
Cupressaceae					
Calocedrus decurrens	incense cedar	NT		MV	MV, MZ
Juniperus grandis	Sierra juniper	NT		MV, MZ	MV, MZ
Pinaceae					
Abies concolor	white fir	NT		MV, MZ	MV, MZ
Pinus contorta ssp. *murrayana*	lodgepole pine	NT	FAC		MV, MZ
Pinus jeffreyi	Jeffrey pine	NT		MV, MZ	MV, MZ
Pinus monophylla	singleleaf pinyon	NT		MV, MZ	
Anthophyta (Dicotyledones)					
Adoxaceae					
Sambucus nigra ssp. *caerulea*	blue elderberry	NS	FAC	MV, MZ	MV, MZ
Apiaceae					
Angelica capitellatum	ranger's buttons	NPH	FACW		MV, MZ
Cicuta douglasii	water hemlock	NPH	OBL		MV
Osmorhiza berteroi	mountain sweet cicely	NPH	FACU	MV	MV
Perideridia lemmonii	Lemmon's yampah	NPH	FAC		MZ
Apocynaceae					
Apocymum androsaemifolium	bitter dogbane	NPH	UPL	MV, MZ	MV, MZ
Asclepias fascicularis	narrow-leaved milkweed	NPH	FAC	MV	MV
Asclepias speciosa	showy milkweed	NPH	FAC	MV, MZ	
Asteraceae					
Achillea millefolium	yarrow	NPH	FACU		MV, MZ
Agoseris grandiflora	grassland agoseris	NPH		MV, MZ	
Agoseris retrorsa	spear-leaved agoseris	NPH		MV	
Artemisia douglasiana	mugwort	NPH	FAC		MV, MZ

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Asteraceae (cont.)					
Artemisia dracunculus	tarragon	NPH			MV
Artemisia ludoviciana ssp. *incompta*	silver wormwood	NPH	FACU		MV
Artemisia spiciformis	snowfield sagebrush	NS	FACU		MZ
Artemisia tridentata	big sagebrush	NS		MV, MZ	
Balsamorhiza sagittata	arrow-leaved balsamroot	NPH		MV, MZ	MV, MZ
Chaenactis douglasii	dusty maidens	NPH		MV, MZ	
Chrysothamnus viscidiflorus	curl-leaf rabbitbrush	NS		MV	
Cirsium sp.	thistle	NBH			MV
Crepis acuminata	long-leaved hawksbeard	NPH		MV, MZ	
Dieteria canescens var. *canescens*	hoary aster	NPH	UPL	MV, MZ	
Ericameria nauseosus	rubber rabbitbrush	NS		MV, MZ	
Erigeron divergens	spreading fleabane	NBH		MV	
Eriophyllum lanatum var. *croceum*	common woolly sunflower	NPH		MV	
Grindelia squarrosa var. *serrulata*	curly-cup gumplant	IBH	FACU	MZ	
Hieracium albiflorum	white hawkweed	NPH		MV, MZ	
Lactuca serriola	prickly lettuce	IAH	FACU	MV	
Madia elegans	common madia	NAH			MZ
Packera streptanthifolia	Rocky Mtns. groundsel	NPH	FACU	MV	
Solidago elongata	Canada goldenrod	NPH	FACU		MV, MZ
Solidago spectabilis	showy goldenrod	NPH	FACW		MV
Stephanomeria lactucina	woodland wirelettuce	NPH		MZ	
Symphotrichium campestre	Western meadow aster	NPH			MV, MZ
Symphotrichium foliaceum var. *parryi*	alpine leafy-bract aster	NPH	UPL	MV, MZ	
Symphotrichium spathulatum var. *spathulatum*	Western mountain aster	NPH	FAC		MV
Tragopogon dubius	yellow salsify	IPH		MV, MZ	MV, MZ
Betulaceae					
Alnus incana ssp. *tenuifolia*	mountain alder	NT	FACW		MV, MZ
Boraginaceae					
Cryptantha sp.	cryptantha	NAH		MV, MZ	
Phacelia hastata var. *hastata*	lance-leaved phacelia	NPH		MV, MZ	
Plagiobothrys torreyi	Sierra popcornflower	NAH		MV	
Brassicaceae					
Boechera sp.	rockcress	NPH		MV, MZ	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Brassicaceae (cont.)					
Capsella bursa-pastoris	shepherd's purse	IAH	FACU		MV
Descurainia californica	California tansy mustard	NAH			MV
Erysimum perenne	Sierra wallflower	NPH		MV, MZ	
Lepidium campestre	field pepperweed	IAH			MV
Lepidium virginicum ssp. *virginicum*	annual peppergrass	NAH	FACU	MV, MZ	MV, MZ
Sisymbrium altissimum	tumble mustard	IBH	FACU	MV	
Caprifoliaceae					
Symphoricarpos mollis	creeping snowberry	NS		MV, MZ	MV, MZ
Caryophyllaceae					
Silene verecunda	San Francisco campion	NPH			MZ
Chenopodiaceae					
Salsola tragus	Russia thistle	IAH	FACU	MV, MZ	
Cornaceae					
Cornus sericea ssp. *sericea*	redstem dogwood	NS	FACW		MV, MZ
Ericaceae					
Arctostaphylos patula	greenleaf manzanita	NS		MV, MZ	
Sarcodes sanguinea	snow plant	NPH$		MZ	
Fabaceae					
Acmispon parviflorus	small-flowered deervetch	NAH		MV, MZ	
Astragalus purshii	Pursh's milkvetch	NPH		MV, MZ	
Astragalus webberi	Webber's milkvetch	NAH	FAC		MV
Hosackia oblongifolia var. *oblongifolia*	stream lotus	NPH	OBL		MV, MZ
Lupinus argenteus var. *argenteus*	silvery lupine	NPH		MV, MZ	
Lupinus lepidus var. *confertus*	dwarf lupine	NPH		MV, MZ	MV, MZ
Melilotus albus	white sweetclover	IBH	FACU	MV	MV, MZ
Melilotus officinalis	yellow sweetclover	IBH	FACU		MV
Trifolium repens	white clover	IPH	FACU		MV, MZ
Trifolium variegatum var. *major*	large variegated clover	NAH	FAC		MZ
Vicia americana ssp. *americana*	American vetch	NPH	FAC		MV, MZ
Fagaceae					
Chrysolepis sempervirens	bush chinquapin	NS		MZ	
Quercus vacciniifolia	huckleberry oak	NS		MV, MZ	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Grossulariaceae					
Ribes nevadense	mountain pink currant	NS	FAC	MZ	MV, MZ
Ribes velutinum	desert gooseberry	NS		MV	
Hypericaceae					
Hypericum scouleri	Scouler's St John's wort	NPH	FACW		MV, MZ
Lamiaceae					
Agastache urticifolia	nettle-leaf horsemint	NPH	FACU		MV, MZ
Monardella breweri ssp. *lanceolata*	mustang mint	NAH		MV, MZ	
Monardella odoritissima	coyote mint	NHS	FACU	MV, MZ	MV
Stachys rigida var. *rigida*	rigid hedge nettle	NPH	FACW		MV, MZ
Loasaceae					
Mentzelia congesta	congested blazing star	NAH		MZ	
Malvaceae					
Sidalcea oregana ssp. *spicata*	Oregon checker mallow	NPH	FACW		MV
Onagraceae					
Gayophytum diffusum ssp. *parviflorum*	summer snowflakes	NAH		MV, MZ	
Oenothera elata ssp. *hirsutissima*	Hooker's evening primrose	NBH	FACW		MV
Orobanchaceae					
Castilleja applegatei ssp. *pinetorum*	Applegate's paintbrush	NPH		MV, MZ	
Phrymaceae					
Erythranthe moschata	musk monkeyflower	NPH	FACW		MV
Plantaginaceae					
Keckiella breviflora	bush penstemon	NS		MV, MZ	
Penstemon newberryi var. *newberryi*	Newberry's beardtongue	NPH		MV, MZ	
Plantago major	common plantain	IPH	FAC		MZ
Polemoniaceae					
Allophyllum gilioides ssp. *violaceum*	dense false gilia	NAH		MV	
Collomia grandiflora	large-flowered collomia	NAH		MV, MZ	MV, MZ
Microsteris gracilis	slender annual phlox	NAH	FACU	MV, MZ	
Phlox hoodii ssp. *canescens*	Hood's spiny phlox	NPH		MV, MZ	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Polygonaceae					
Eriogonum elatum	tall woolly buckwheat	NPH		MZ	
Eriogonum nudum var. *deductum*	naked wild buckwheat	NPH		MV, MZ	
Eriogonum wrightii var. *subscaposum*	short-stemmed buckwheat	NHS		MV, MZ	
Polygonum douglasii	Douglas' knotweed	NAH	FACU		MV
Ranunculaceae					
Aquilegia formosa	crimson columbine	NPH	FAC		MV, MZ
Ranunculus testiculatus	tubercled buttercup	IAH		MV	
Thalictrum fendleri var. *fendleri*	Fendler's meadow rue	NPH	FAC		MV, MZ
Rhamnaceae					
Ceanothus cordulatus	mountain whitethorn	NS		MV, MZ	
Ceanothus velutinus	tobacco brush	NS		MV, MZ	
Frangula rubra ssp. *rubra*	Sierra coffeeberry	NS	FACU	MV, MZ	MV, MZ
Rosaceae					
Amelanchier utahensis	Utah serviceberry	NS	FACU	MV, MZ	MV, MZ
Cercocarpus ledifolius var. *intermontanus*	curl-leaf mountain mahogany	NS		MZ	
Potentilla gracilis var. *fastigiata*	graceful cinquefoil	NPH	FAC		MV, MZ
Prunus andersonii	desert peach	NS		MV, MZ	
Prunus virginiana var. *demissa*	western chokecherry	NS	FAC		MV, MZ
Purshia tridentata	bitterbrush	NS		MV, MZ	
Rosa woodsii var. *ultramontana*	Wood's wild rose	NS	FACU	MV, MZ	MV, MZ
Rubiaceae					
Kellogia galioides		NPH		MV, MZ	
Salicaceae					
Populus tremuloides	quaking aspen	NT	FACU	MV, MZ	MV, MZ
Populus trichocarpa	black cottonwood	NT	FACU	MV, MZ	MV, MZ
Salix exigua	narrow-leaved willow	NS	FACW		MV, MZ
Salix geyeriana	Geyer's willow	NT	OBL		MV
Salix lasiandra	Pacific willow	NT	FACW		MV, MZ
Salix lasiolepis	arroyo willow	NT	FACW		MV, MZ
Salix scouleriana	Scouler's mountain willow	NS	FAC		MV, MZ

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Scrophulariaceae					
Verbascum thapsus	woolly mullein	IBH	FACU		MV, MZ
Solanaceae					
Nicotiana attenuata	wild coyote tobacco	NAH	FACU	MZ	
Violaceae					
Viola glabella	stream violet	NPH	FAC		MZ
Viola nephrophylla	Leconte violet	NPH	FACW		MV
Anthophyta (Monocotyledones)					
Alliaceae					
Allium sp.	onion	NPH		MV, MZ	
Cyperaceae					
Carex angustata	narrow-leaved sedge	NPGL	FACW		MV, MZ
Carex fracta	fragile-sheathed sedge	NPGL	FAC	MV	MV
Eleocharis sp.	spikerush	NPGL	OBL		MV
Juncaceae					
Juncus balticus ssp. *ater*	Baltic rush	NPGL	FACW		MV, MZ
Juncus nevadensis	Sierran rush	NPGL	FACW		MV, MZ
Juncus orthophyllus	straight-leaved rush	NPGL	FACW		MV, MZ
Scirpus microcarpus	panicled bulrush	NPGL	OBL		MV, MZ
Liliaceae					
Calochortus leichtlinii	smoky mariposa lily	NPGL		MV, MZ	
Lilium parvum	Sierra tiger lily	NPH	OBL		MV
Poaceae					
Agrostis gigantea	redtop bent grass	IPG	FACW		MV, MZ
Agrostis pallens	dune bent grass	NPG	FACU		MV
Agrostis scabra	rough bent grass	NPG	FAC		MV, MZ
Agrostis stolonifera	bent grass	NPG	FACW		MV, MZ
Bromus carinatus var. *marginatus*	mountain brome	NPG		MV, MZ	
Bromus hordeaceus	soft chess	IAG	FACU	MV	MV
Bromus laevipes	woodland brome	NPG		MV, MZ	MV, MZ
Bromus tectorum	cheat grass	IAG		MV, MZ	MV, MZ
Dactylis glomerata	orchard grass	IPG	FACU		MV, MZ
Elymus elymoides	squirreltail grass	NPG	FACU	MV, MZ	MV, MZ
Elymus repens	quackgrass	IPG	FAC		MV
Elymus triticoides	creeping wildrye	NPG	FAC		MV, MZ
Festuca rubra	red fescue	NPG		MV, MZ	
Festuca trachyphylla	sheep fescue	IPG	UPL	MV, MZ	MV, MZ
Holcus lanatus	common velvet grass	IPG	FAC		MZ

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Poaceae (cont.)					
Hordeum brachyantherum	Northern barley	NPG	FACW		MV, MZ
Hordeum murinum ssp. *glaucum*	smooth barley	IAG	FACU	MV	
Muhlenbergia richardsonis	mat muhly	NPG	FAC		MV, MZ
Phleum pratense	common timothy	IPG	FACU		MV, MZ
Poa bulbosa ssp. *vivipara*	bulbous bluegrass	IPG		MV	
Poa fendleriana ssp. *longiligula*		NPG		MV, MZ	
Poa pratensis ssp. *pratensis*	Kentucky blue grass	IPG	FAC		MV, MZ
Stipa comata	needle and thread grass	NPG		MV	
Stipa nelsoni var. *dorei*		NPG	FACU		MZ
Stipa nevadensis		NPG		MV	
Stipa occidentalis ssp. *californica*	western needle grass	NPG		MV, MZ	MV, MZ
Stipa occidentalis ssp. *pubescens*	western needle grass	NPG		MV, MZ	
Stipa thurberiana	Thurber's needlegrass	NPG		MV	MV
Ruscaceae					
Maianthemum stellatum	false Solomon's seal	NPH	FACU		MV, MZ
Typhaceae					
Typha latifolia		NPH	OBL		MV

Habit: A = annual; B = biennial; G = grass; GL = grass-like; H = herb; I = introduced; N = native; P = perennial; T = tree; $ = parasitic

Appendix A2. List of plant species that were observed to occur at the Bear Valley portion of the Alpine County Wildfire Risk Mitigation Plan project in August 2020. Presence at each occurring available habitat type is indicated (BV). Growth form (Habit) and likelihood of wetland occurrence (Status) codes are defined below.

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Gnetophyta					
Dryopteridaceae					
Polystichum cf. *lemmonii*	Lemmon's sword fern	NPH	FAC		BV
Cupressaceae					
Juniperus grandis	Sierra juniper	NT		BV	BV
Pinaceae					
Abies concolor	white fir	NT		BV	
Abies magnifica	red fir	NT		BV	
Pinus contorta ssp. *murrayana*	lodgepole pine	NT	FAC	BV	BV
Pinus jeffreyi	Jeffrey pine	NT		BV	BV
Pseudotsuga menziesii var. *menziesii*	Douglas fir	NT	FACU	BV	BV
Anthophyta (Dicotyledones)					
Adoxaceae					
Sambucus racemosa var. *racemosa*	red elderberry	NS	FACU	BV	
Apiaceae					
Angelica capitellatum	ranger's buttons	NPH	FACW		BV
Ligusticum grayi	Gray's licorice root	NPH	FAC		BV
Osmorhiza berteroi	mountain sweet cicely	NPH	FACU	BV	BV
Osmorhiza occidentalis	western sweet cicely	NPH		BV	BV
Perideridia lemmonii	Lemmon's yampah	NPH	FAC		BV
Perideridia parishii ssp. *latifolia*	Parish's yampah	NPH	FAC	BV	
Apocynaceae					
Asclepias speciosa	showy milkweed	NPH	FAC		BV
Apocynum androsaemifolium	bitter dogbane	NPH	UPL	BV	BV
Asteraceae					
Achillea millefolium	yarrow	NPH	FACU		BV
Agoseris monticola	Sierra Nevada agoseris	NPH	FAC	BV	BV
Anaphalis margaritacea	pearly everlasting	NPH		BV	
Artemisia douglasiana	mugwort	NPH	FAC		BV
Balsamorhiza deltoidea	Northwest balsamroot	NPH		BV	BV
Cirsium cymosum var. *cymosum*	peregrine thistle	NBH		BV	BV

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Asteraceae (cont.)					
Cirsium occidentale var. *venustum*	Venus thistle	NPH		BV	BV
Dieteria canescens var. *shastensis*	hoary aster	NPH	UPL	BV	
Hazardia whitneyi	Whitney's goldenbush	NHS		BV	
Hieracium albiflorum	white hawkweed	NPH		BV	
Madia glomerata	mountain tarweed	NAH	FACU	BV	BV
Packera streptanthifolia	Rocky Mtns. groundsel	NPH	FACU	BV	BV
Symphotrichium campestre	Western meadow aster	NPH		BV	BV
Symphotrichium foliaceum var. *parryi*	alpine leafy-bract aster	NPH	UPL	BV	
Symphotrichium spathulatum var. *intermedium*	Western mountain aster	NPH	FAC		BV
Tragopogon dubius	yellow salsify	IPH		BV	BV
Boraginaceae					
Mertensia ciliata var. *stomatechoides*	streamside bluebells	NPH	FACW		BV
Phacelia ramosissima	branching phacelia	NPH	FACU	BV	
Brassicaceae					
Arabis eschscholziana	hairy rockcress	NBH		BV	
Boechera davidsonii	Davidson's rockcress	NPH		BV	
Boechera pinetorum	pine rockcress	NPH	FACU	BV	
Boechera platysperma	pioneer rockcress	NPH		BV	
Descurainia californica	California tansy mustard	NAH		BV	BV
Erysimum capitatum var. *capitatum*	Douglas' wallflower	NPH		BV	
Lepidium virginicum ssp. *virginicum*	annual peppergrass	NAH	FACU	BV	BV
Caprifoliaceae					
Symphoricarpos mollis	creeping snowberry	NS		BV	BV
Symphoricarpos rotundifolius	roundleaf snowberry	NS		BV	
Caryophyllaceae					
Silene bernardina	Palmer's catchfly	NPH		BV	
Spergularia rubra	red sand spurrey	IAH	FAC	BV	BV
Cornaceae					
Cornus sericea ssp. *sericea*	redstem dogwood	NS	FACW		BV
Ericaceae					
Arctostaphylos nevadensis	pinemat manzanita	NS		BV	
Arctostaphylos cf. *patula*	greenleaf manzanita	NS		BV	
Sarcodes sanguinea	Sierra snow plant	NPH$		BV	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Fabaceae					
Acmispon americanus var. *americanus*	American bird's-foot trefoil	NAH		BV	BV
Hosackia oblongifolia var. *oblongifolia*	stream lotus	NPH	OBL		BV
Lupinus andersonii	Anderson's lupine	NPH		BV	
Lupinus lepidus var. *confertus*	dwarf lupine	NPH		BV	BV
Lupinus polyphyllus var. *burkei*	many-leaved lupine	NPH	FAC	BV	BV
Trifolium monanthum ssp. *parvum*	small carpet clover	NPH	FAC		BV
Fagaceae					
Quercus vaccinifolia	huckleberry oak	NS		BV	
Grossulariaceae					
Ribes cereum var. *cereum*	wax currant	NS		BV	
Ribes montigenum	prickly gooseberry	NS		BV	
Ribes visciosissimum	sticky gooseberry	NS	FAC	BV	BV
Hypericaceae					
Hypericum perforatum	klamathweed	IPH	FACU	BV	
Lamiaceae					
Agastache urticifolia	nettle-leaf horsemint	NPH	FACU		BV
Monardella odoritissima ssp. *pallida*	coyote mint	NHS	FACU	BV	BV
Malvaceae					
Sidalcea glaucescens	waxy checkerbloom	NPH		BV	BV
Melanthiaceae					
Veratrum californicum	corn lily	NPH	FACW		BV
Onagraceae					
Chamerion angustifolium ssp. *circumvagum*	narrow-leaved fireweed	NPH	FACU		BV
Epilobium brachycarpum	tall annual willowherb	NAH		BV	
Gayophytum diffusum ssp. *parviflorum*	summer snowflakes	NAH		BV	BV
Gayophytum eriospermum	Colville's gayophytum	NAH		BV	BV
Orobanchaceae					
Castilleja applegatei ssp. *pallida*	Applegate's paintbrush	NPH		BV	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Orobanchaceae (cont.)					
Cordylanthus tenuis ssp. tenuis	slender bird's-beak	NAH		BV	
Orthocarpus cuspidatus ssp. *cryptanthus*	toothed owl's-clover	NAH		BV	
Pedicularis semibarbata	pinewoods lousewort	NPH		BV	
Phrymaceae					
Erythranthe moschata	musk monkeyflower	NPH	FACW		BV
Plantaginaceae					
Penstemon newberryi var. *newberryi*	Newberry's beardtongue	NPH		BV	
Penstemon speciosus	blue penstemon	NPH	FACW		BV
Polemoniaceae					
Collomia grandiflora	large-flowered collomia	NAH		BV	BV
Ipomopsis aggregata ssp. *aggregata*	western scarlet gilia	NPH		BV	
Microsteris gracilis	slender annual phlox	NAH	FACU	BV	BV
Polygonaceae					
Eriogonum nudum var. *nudum*	naked wild buckwheat	NPH		BV	
Eriogonum umbellatum var. *furcosum*	Sierra Nevada sulphur flower	NHS		BV	
Polygonum douglasii	Douglas' knotweed	NAH	FACU		BV
Polygonum minimum	little mountain knotweed	NAH	FACU		BV
Rumex acetosella	sheep sorrel	IPH	FACU		BV
Ranunculaceae					
Delphinium cf. *depauperatum*	blue mountain larkspur	NPH			BV
Thalictrum fendleri var. *fendleri*	meadow rue	NPH	FAC		BV
Rhamnaceae					
Ceanothus cordulatus	mountain whitethorn	NS		BV	
Frangula purshiana	cascara	NS	FACU	BV	BV
Rosaceae					
Amelanchier utahensis	Utah serviceberry	NS	FACU	BV	BV
Geum macrophyllum	large-leaved avens	NPH	FACW		BV
Potentilla gracilis var. *fastigiata*	graceful cinquefoil	NPH	FAC		BV
Prunus emarginata	bitter cherry	NS	FACU	BV	BV
Spirea splendens	subalpine meadowsweet	NS		BV	

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Salicaceae					
Populus tremuloides	quaking aspen	NT	FACU	BV	BV
Salix lasiolepis	arroyo willow	NS	FACW		BV
Salix scouleriana	Scouler's mountain willow	NS	FAC		BV
Violaceae					
Viola glabella	stream violet	NPH	FAC		BV
Viola purpurea	purple-leaved violet	NPH		BV	
Anthophyta (Monocotyledones)					
Alliaceae					
Allium bisceptrum	twin-crested onion	NPH	FACU	BV	
Cyperaceae					
Carex fracta	fragile-sheathed sedge	NPGL	FAC		BV
Carex specifica	narrow-fruited sedge	NPGL		BV	
Juncaceae					
Luzula subcongesta	wood rush	NPGL	FACW		BV
Liliaceae					
Lilium parvum	Sierra tiger lily	NPH	OBL		BV
Poaceae					
Agrostis gigantea	redtop bent grass	IPG	FACW		BV
Agrostis variabilis	mountain bent grass	NPG		BV	
Bromus commutatus	hairy chess	IAG		BV	BV
Bromus laevipes	woodland brome	NPG		BV	
Dactylis glomerata	orchard grass	IPG	FACU		BV
Deschampsia danthonioides	annual hair grass	NAG	FACW		BV
Elymus elymoides	squirreltail grass	NPG	FACU	BV	BV
Elymus glaucus	Western wildrye	NPG	FACU	BV	BV
Elymus hispidus	intermediate wheatgrass	IPG		BV	
Elymus repens	quackgrass	IPG	FAC	BV	BV
Phleum alpinum	mountain timothy	NPG	FAC		BV
Stipa occidentalis ssp. *pubescens*	western needle grass	NPG		BV	BV
Stipa pinetorum	pinewoods needle grass	NPG		BV	
Trisetum canescens	tall false oat	NPG	FACU		BV
Ruscaceae					
Maianthemum stellatum	false Solomon's seal	NPH	FACU	BV	BV
Themidaceae					

Plant Families and Species		Habit	Status	Habitat Type	
				UPL	LOWL
Triteleia ixoides ssp. *scabra*	golden triteleia	NPGL	FAC		BV

Habit: A = annual; B = biennial; G = grass; GL = grass-like; H = herb; HS = half-shrub; I = introduced; N = native; P = perennial; S = shrub; T = tree; $ = parasitic

Status: Wetland occurrence status describes the probability for each identified plant species to occur in habitats that qualify as wetlands in the Arid West Region (NRCS, 2014). Status codes are defined:

Code	Status	Designation	Comment
OBL	Obligate Wetland	Hydrophyte	Almost always occur in wetlands
FACW	Facultative Wetland	Hydrophyte	Usually occur in wetlands, but may occur in non-wetlands
FAC	Facultative	Hydrophyte	Occur in wetlands and non-wetlands
FACU	Facultative Upland	Nonhydrophyte	Usually occur in non-wetlands, but may occur in wetlands
UPL	Obligate Upland	Nonhydrophyte	Almost never occur in wetlands

APPENDIX C

Cultural Resources Assessment Report

Cultural Resource Assessment for the Manzanita, Markleevillage & Bear Valley Wildland-Urban Interface Fuels Reduction Projects, Alpine County, California

Prepared By:

Tucker Orvald & Mike Drews
Great Basin Consulting Group, LLC
200 Winters Drive
Carson City, Nevada 89703

Prepared For:

Panorama Environmental, Inc.
717 Market Street, Suite 650
San Francisco, California 94103

&

Alpine County Community Development
50 Diamond Valley Road
Markleeville, CA 96120

October 2020

Great Basin Consulting Group, LLC

MANAGEMENT SUMMARY

The Alpine County Community Development Department is preparing a Wildfire Risk Mitigation Plan (WRMP) and associated environmental review, pursuant to the California Environmental Quality Act (CEQA). The goal of the project is to reduce wildfire risk for throughout the Alpine County, California. The WRMP includes three priority projects: Manzanita, Markleevillage, and Bear Valley. As part of the environmental review process, Alpine County is conducting cultural resource surveys within the priority project areas.

To assist Alpine County in complying with requirements of the California Environmental Quality Act (CEQA), Great Basin Consulting Group, LLC, (GBCG) completed a cultural resource assessment for the three priority project areas. Panorama Environmental, Inc., contracted GBCG to complete the assessment, which included California Office of Historic Preservation archival review, background research, Native American coordination, archaeological survey, cultural resource documentation/evaluation, and technical reporting.

At GBCG's request, a record search was conducted at the Central California Information Center (CCIC). The record search request included GIS datasets for the cultural resource components; cultural resource reports and resources, GLO plats and historic maps within a one-mile radius of each project location. CCIC results were returned on June 4, 2020. A similar search was requested for Bureau of Land Management, Carson City District, USDA Humboldt-Toiyabe National Forest, and USDA Stanislaus National Forest records. Results of the record search including Resource and Report Maps were provided to Darrel Cruz, Washoe Tribe of Nevada and California, Tribal Historic Preservation Officer prior to the field visit.

Between August 17 and 21, 2020, previously un-surveyed portions of the three project areas were investigated for cultural resources; all previously recorded site locations within the project areas were visited, although one site could not be found. Five new archaeological sites and two isolated finds were identified and recorded during the survey. DPR 523 forms for these resources, as well as updated site forms for five previously recorded resources (CA-ALP-238, -269, -270, -271, and -272H), as well as all digital geo-spatial data, were submitted to the CCIC to update the state database.

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1.0 INTRODUCTION

Forest fire suppression, residential development in the wildland-urban interface (WUI), and climate change have resulted in wildfire-prone conditions for communities throughout the Sierra Nevada of California. In an effort to address this hazard, the Alpine County Community Development Department prepared a Wildfire Risk Mitigation Plan (WRMP) with a California Department of Forestry and Fire Protection (Cal Fire) Fire Prevention Grant. The WRMP's purpose is to implement forest fuels treatment projects to mitigate wildfire risk by reducing wildfire potential for at-risk communities throughout the county. The WRMP identifies, assesses, and prioritizes candidate fuels reduction projects in designated WUI lands. Three priority fuel treatment areas, all on private land, have been prioritized for environmental review and implementation.

To assist Alpine County in complying with requirements of the California Environmental Quality Act (CEQA), Great Basin Consulting Group, LLC, (GBCG) completed a cultural resource assessment for the three priority project areas. Panorama Environmental, Inc., contracted GBCG to complete the assessment, which included California Office of Historic Preservation archival review, background research, Native American coordination, archaeological survey, cultural resource documentation/evaluation, and technical reporting.

In this document, GBCG presents the findings of the cultural resource inventory for the three prioritized project areas. GBCG Principal, Mike Drews, managed the project, completed and all GPS/GIS cartography, and acted as Field Director. Tucker Orvald, M.S., RPA served as Principal Investigator. Mr. Orvald meets the Secretary of the Interior's (SOI) Historic Preservation Professional Qualifications Standards for Archaeology and is listed on the Register of Professional Archaeologists (RPA). Professional resumes for these key personnel are found in Appendix A. GBCG completed archival research in June of 2020 and pedestrian survey and archaeological resource documentation between August 17 and 21, 2020.

1.1 PROJECT DESCRIPTION

Alpine County selected three priority candidate fuels reduction projects in WUI-designated private land referred to as the *Manzanita*, *Markleevillage*, and *Bear Valley* fuels treatment projects. These project-ready fuels treatment areas are within mountainous rural land of Alpine County in the Sierra Nevada Mountain Range (Figure 1).

Located in east-central California, Alpine County straddles the crest of the Sierra Nevada extending westward in the High Sierra and eastward to the Sierran Front and the western limits of the Great Basin. A mosaic of public and private forest land, largely within the Stanislaus, Eldorado national forests, comprises the county. The eastern portion of the county is public land managed by the Humboldt-Toiyabe National Forest. California State Route (SR-4), State Route 88 (SR-88), and State Highway 89 (Hwy-89) provide regional and local access. Residential areas nearest the project areas include the unincorporated community of Woodfords on SR-88 and two census-designate places – Markleeville, on Hwy. 89 and the county seat, and Bear Valley, on SR-4.

Fuel treatment strategies to be implemented in the three project areas require combinations of fuel reduction methods depending on individual project area location, facility access, slope, and vegetation type. Based on these considerations, Alpine County, in consultation with a Registered Professional Forester, has developed an approach to reducing fuel loads. Fuel reduction treatment methods to be implemented will entail hand thinning and mechanical mastication. Pile burn and chipping may be implemented as fuels disposal methods. Timber harvesting for economic gain is not currently proposed under any of the three projects.

1.2 FUEL TREATMENT AREAS

Alpine County has prioritized three specific project locations for priority vegetation treatment under the WRMP. Two priority treatment areas, four miles apart, are located in the north-central county along the Sierra Nevada

Front, while the third is approximately 20 miles to the southwest, in the High Sierra (Figure 2). Approximately 903 acres of privately-owned land comprises the total project footprint within the following individual project areas: 1) Manzanita – 469 acres; 2) Markleevillage – 296 acres; and 3) Bear Valley – 138 acres. We describe the locations and settings of each of the priority project locations in the following sections.

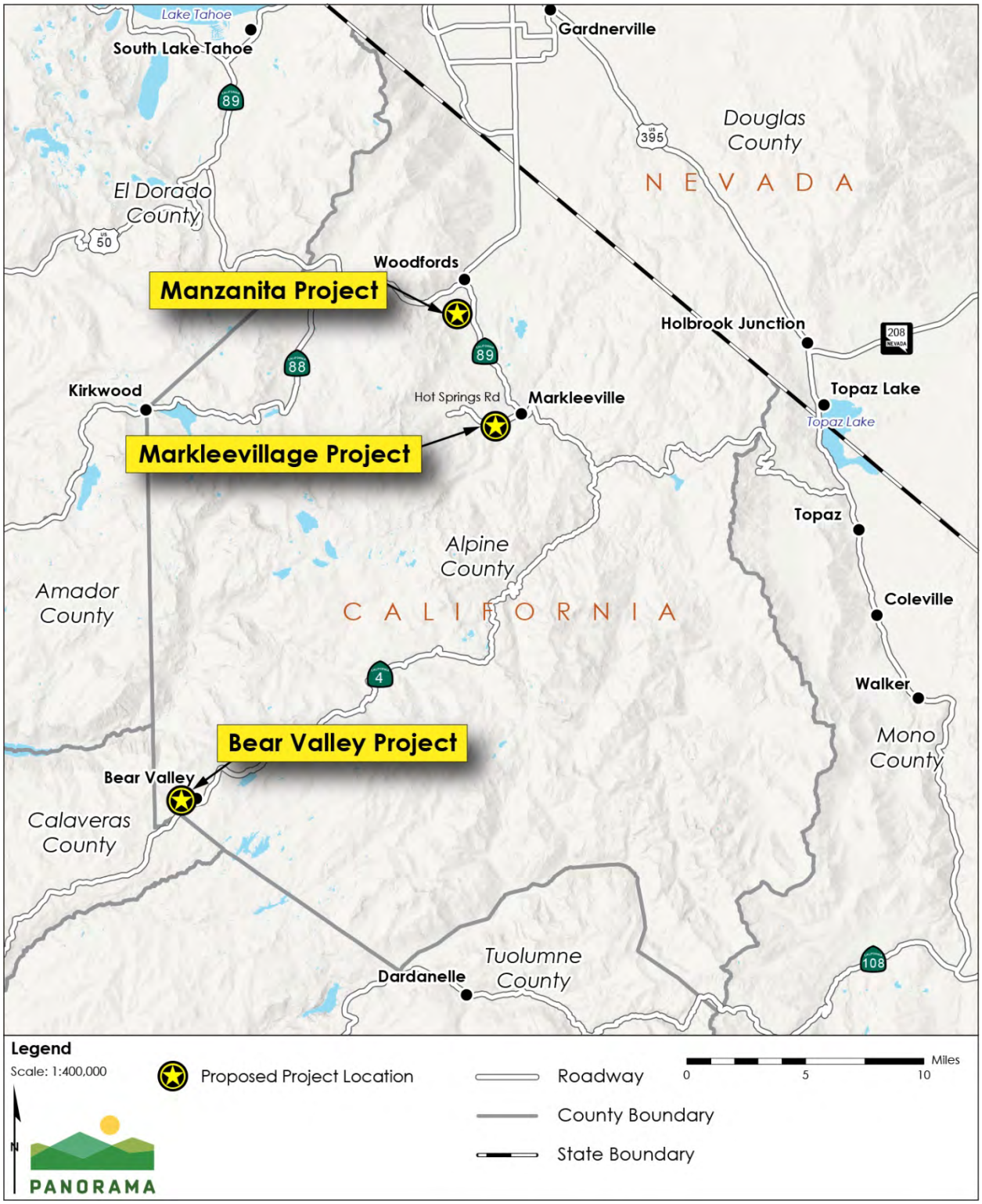

Figure 1. Alpine County priority fuels reduction project location map.

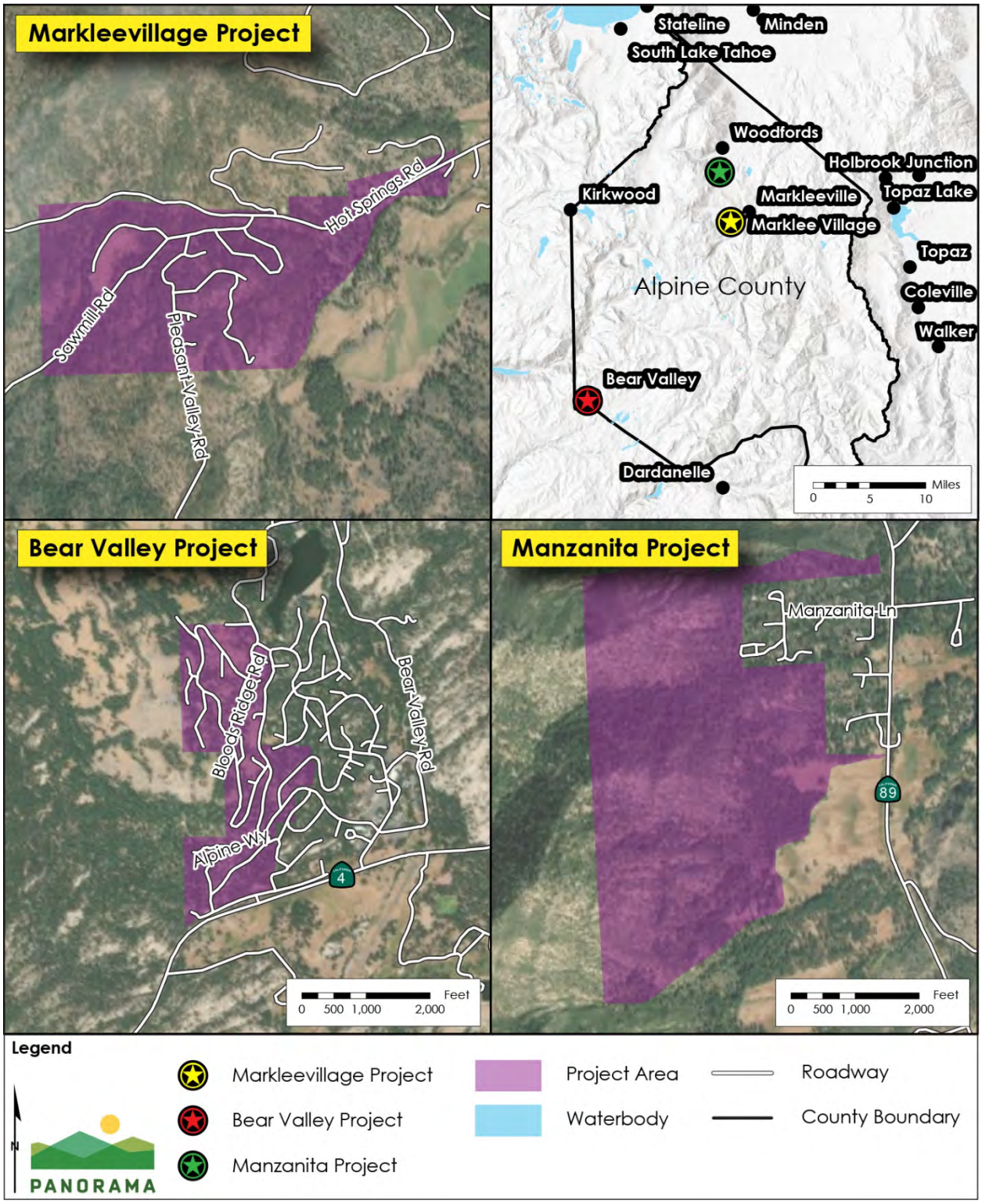

Figure 2. Alpine County project location and individual project areas.

1.3.1 MANZANITA

The Manzanita treatment unit is an irregularly shaped 469-acre area located in central-north Alpine County at the lower flank of the Sierran Front one mile south of the Carson River's West Fork, SR-88, and the small historic

community of Woodfords. The unit may be found west of Hwy. 89 on the Woodfords and Markleeville 7.5' U.S. Geological Survey (USGS 1979) quadrangles in Township 10 North, Range 20 East, in parts of several lots of Section 6, Mount Diablo Base Meridian (MDBM) (Figures 3 and 4). Private land, including a former ranch property and several smaller residential parcels, accounts for most the Manzanita unit, and the Sierra Pines Mobile Home Park lies beyond its northeast corner, adjacent to Hwy. 89.

Elevation ranges from a high of 6,616 feet above mean sea level (amsl) to a low of 5,833 feet, and averages 6,206 feet. Slope in the Manzanita unit ranges from 3° to 34° and averages 13°. A mix of forest (47%), shrub (44%), and wetland (8%) comprises land cover. Open dry meadows, irrigated as pasture land, characterize the eastern portion of the project area, and steep slopes define the western portion. Approximately 100 acres at the northern end, comprising some 20% of the unit, burned in 1988. This area, as well as others in the unit, is heavily overgrown with robust manzanita.

1.3.2 MARKLEEVILLAGE

The Markleevillage treatment unit is an irregularly shaped 296-acre area located in central-north Alpine County at the lower flank of the Sierra Nevada between 0.35 and 1.6 miles west of the community of Markleeville and Hwy. 89, largely south of Hot Springs Road and Markleeville/Hot Springs Creek (Figures 5 and 6). The unit encompasses all of the densely forested Markleevillage subdivision off Pleasant Valley Road. A large agricultural parcel (APN 002-340-001-0) lies west of Markleevillage and four undeveloped or lightly developed parcels lie to the east. Humboldt-Toiyabe National Forest land borders the unit's western and southern boundaries.

The unit may be found on the Markleeville 7.5' quadrangle (USGS 1979) in Township 10 North, Range 20 East, in all or parts of Section 20: SE ¼ SE ¼; Section 21: SE ¼ SW ¼ and SW ¼ SW ¼; Section 28: NW ¼ NW ¼, NE ¼ NW ¼, SW ¼ NW ¼; and Section 29: NE ¼ and NE ¼ NW ¼ and SE ¼ NW ¼, MDBM. Elevation ranges from a high of 5,850 feet amsl to a low of 5,555 feet, and averages 5,691 feet. Slope in the Markleevillage unit ranges from 0° to 30° and averages 8°. A mix of forest (62%), shrub (35%), and wetland (4%) comprises land cover in the unit.

1.3.3 BEAR VALLEY

The Bear Valley treatment unit is an irregularly shaped 138-acre area in the far-southwest corner of Alpine County on the upper west slope of the Sierra near the North Fork of the Stanislaus River watershed's northern boundary (Figures 7 and 8). The crest of the Sierra and Ebbetts Pass on SR-4 are 14 miles to the northeast. The project area includes 269 platted lots, most of which have homesites, and comprises the western half of the skiing and summer recreation community of Bear Valley. Primarily a "second-home community," Bear valley offers seasonal attractions – winter sports at the Bear Valley Resort and snow parks at Lake Alpine and Spicer Reservoir and summer campground, lakes, and trails recreation. Stanislaus National Forest land encompasses the entire Bear Valley unit.

The unit may be found on the Tamarack, California 7.5' quadrangle (USGS 2001) in Township 7 North, Range 17 East, in parts of Section 12: NE ¼ NE ¼ and SE ¼ SE ¼ and Section 13: NE ¼ NE ¼, SE ¼ NE ¼, and NE ¼ SE ¼; as well as in Township 7 North, Range 18 East, in parts of Lot 3 and Lot 4 in Section 7 and parts of Lot 1 and Lot 2 in Section 18, MDBM. Elevation ranges from a high of 7,681 feet amsl to a low of 7,063 feet, and averages 7,291 feet. Slope in the Markleevillage unit ranges from 1° to 35° and averages 13°. A mix of forest (30%), shrub (33%), and developed area (37%) comprises land cover in the Bear Valley unit. A substantial open meadow area, Bloods Meadow, borders the southern boundary of the Bear Valley unit.

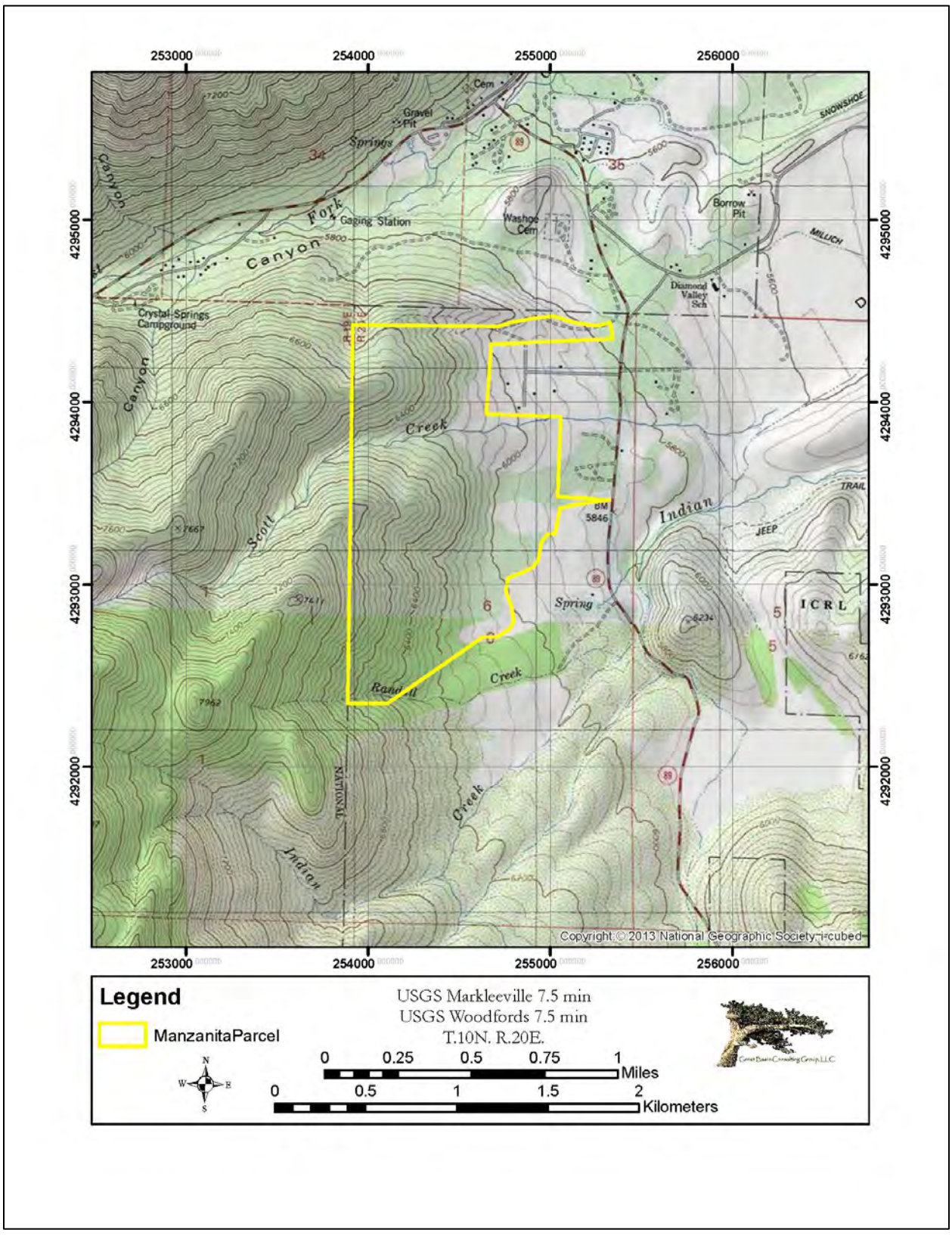

Figure 3. Manzanita project area location.

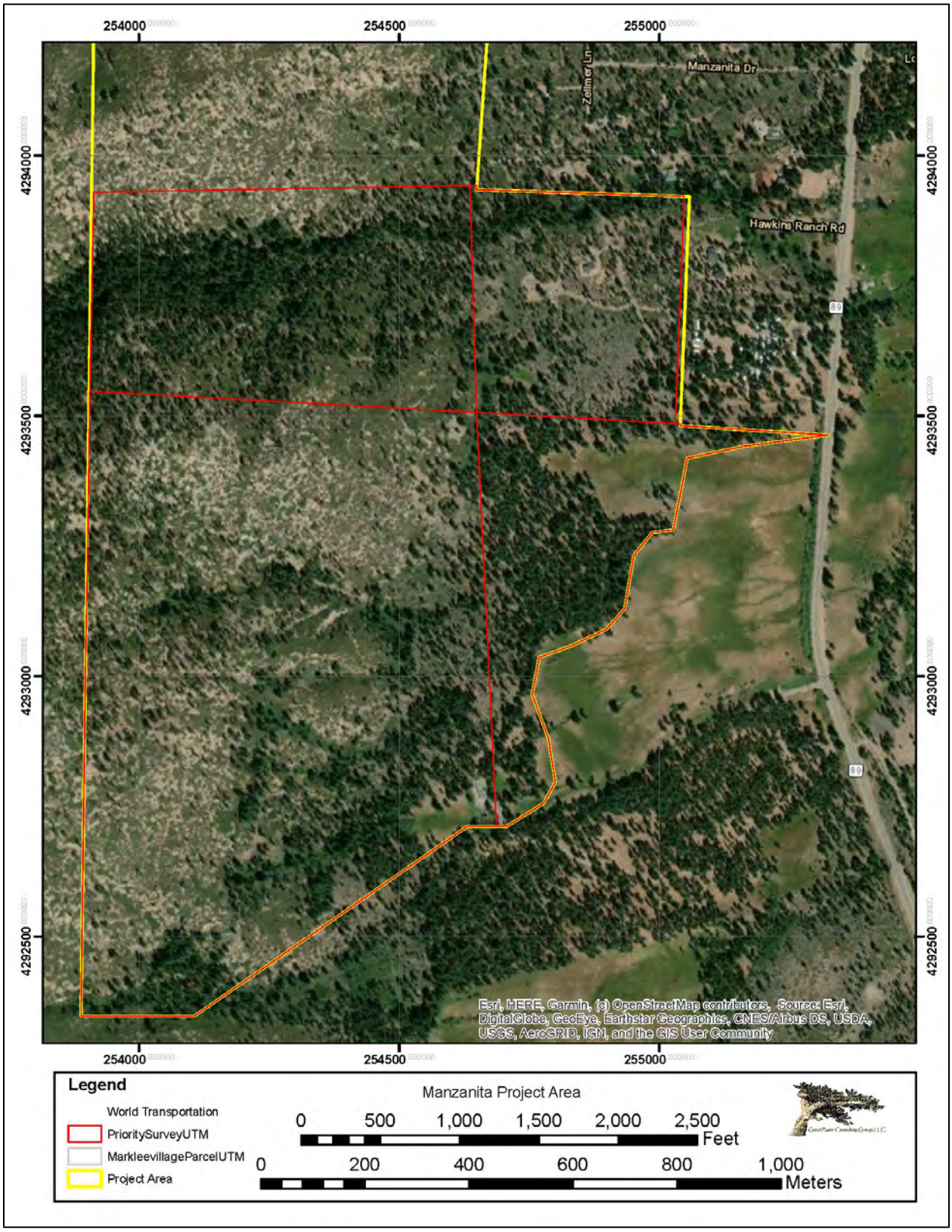

Figure 4. Aerial imagery of the Manzanita project survey area.

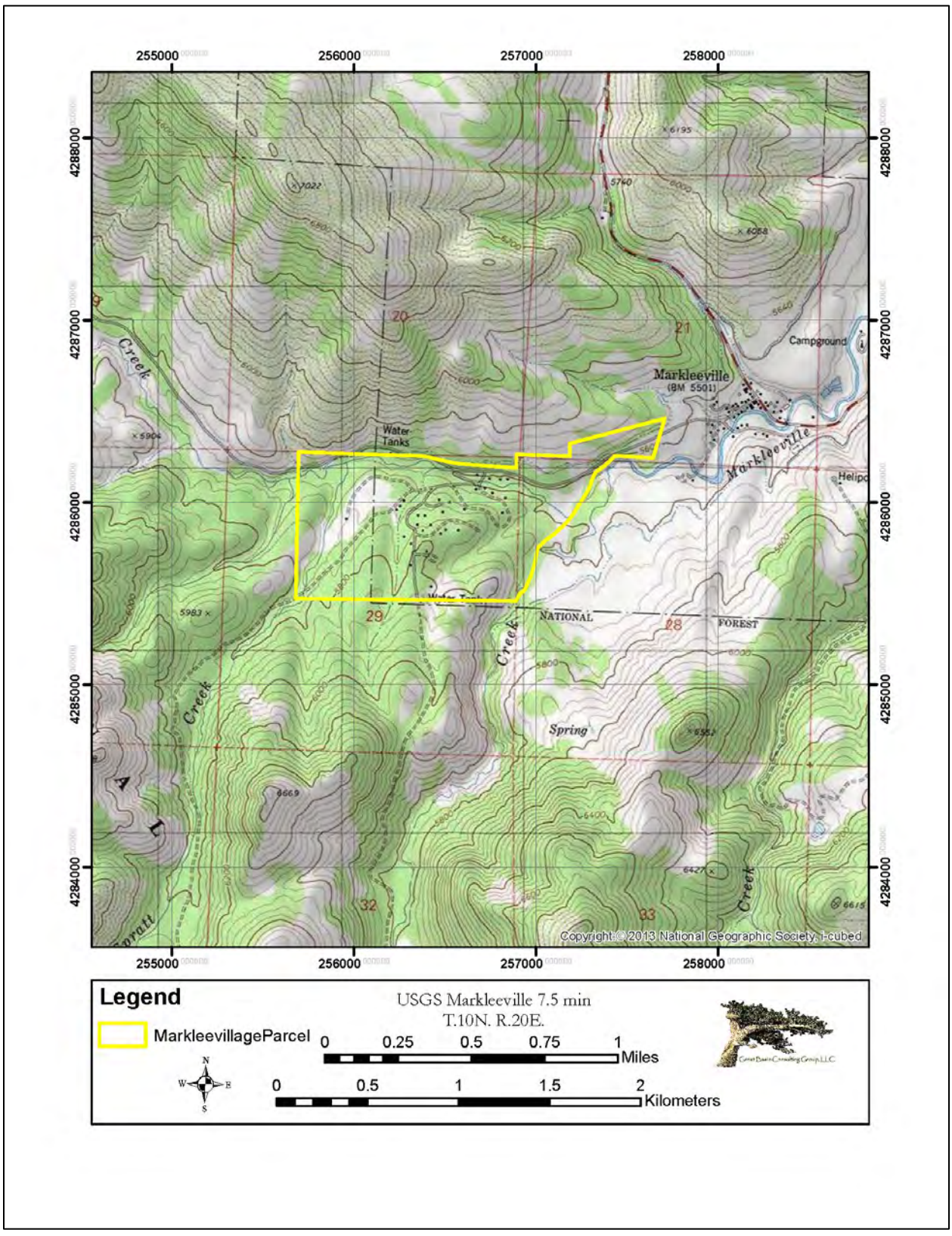

Figure 5. Markleevillage project area location.

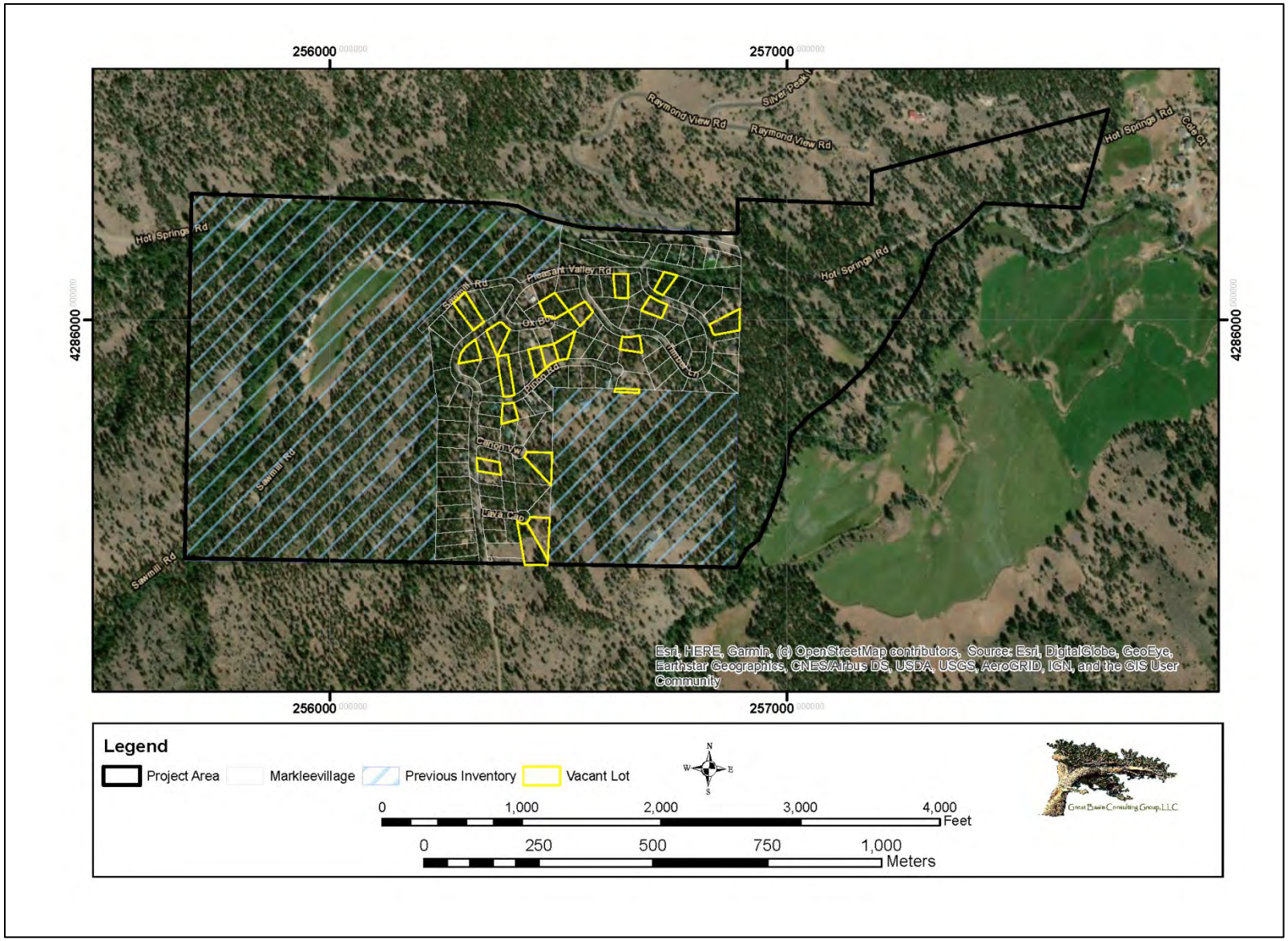

Figure 6. Aerial imagery of the Markleevillage project survey area.

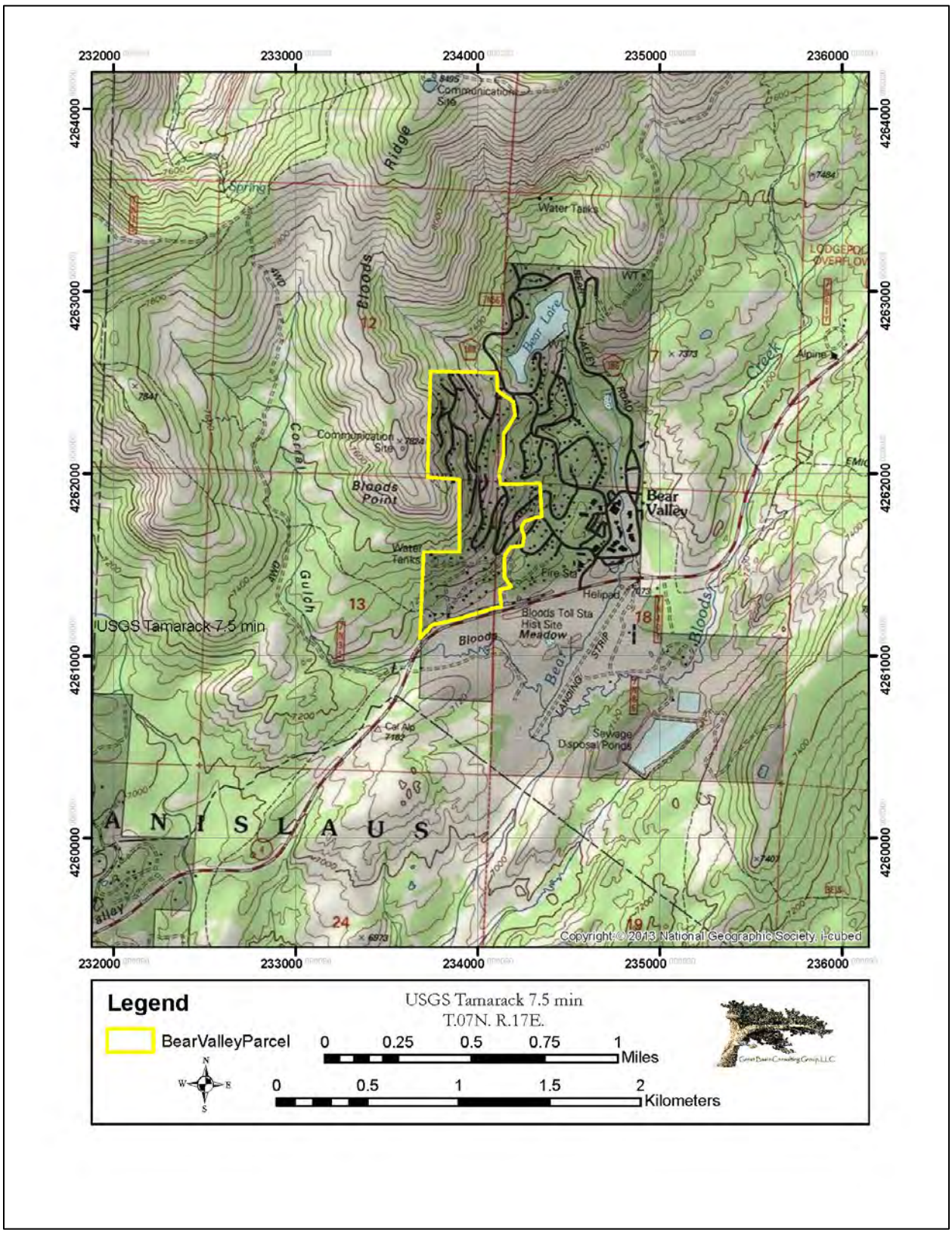

Figure 7. Bear Valley project area location.

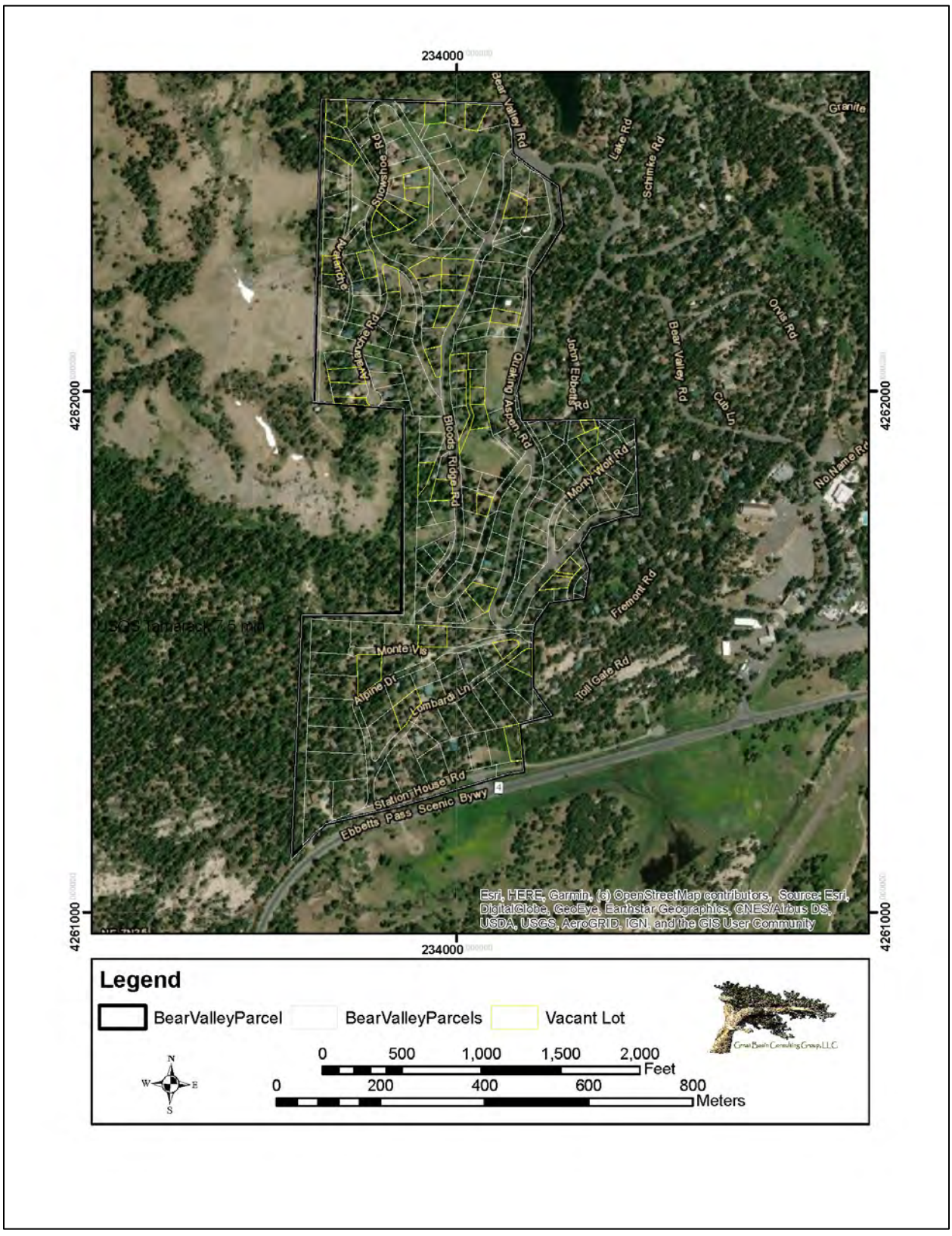

Figure 8. Aerial imagery of the Bear Valley project survey area.

1.3 AREA OF POTENTIAL EFFECTS

The Area of Potential Effects (APE) for cultural resources is defined as the footprint of potential ground disturbance and any property or any portion thereof that will be physically altered or destroyed by a given undertaking. The horizontal APE is defined as the extent of each fuels-reduction area wherein selective tree and understory vegetation will be cut down and masticated. The vertical APE is assumed to be less than one foot below the ground surface, as the only anticipated subsurface impacts will be from off-road vehicle traffic and felling, winching, and dragging felled trees and underbrush.

1.3.1 MANZANITA

Fuel treatment in the Manzanita project area includes fuel treatment on 469 acres of open space east of Manzanita Lane and south of Zellmer Lane. Treatment methods will include a combination of mechanical mastication and hand thinning throughout the unit. Live and dead target vegetation less than 10 inches dbh would be cut, and approximately 90 percent of shrubs will be treated. Mechanical mastication will occur in the northern portion of the unit on trees and brush less than 10 inches diameter at breast height (dbh) on slopes up to 30 percent (i.e., 27°). Chipping may be implemented where feasible, otherwise cut vegetation will be dispersed by lopping and scattering; small hand piles will be burned.

1.3.2 MARKLEEVILLAGE

Fuel treatment in the Markleevillage project area includes fuel treatment on 296 acres south of Hot Springs Road centered on the densely developed subdivision along Sawmill and Pleasant Valley roads as well as on various neighborhood roads. Treatment methods will include a combination of mechanical mastication and hand thinning throughout the unit. Live and dead target vegetation less than 10 inches dbh would be cut, and approximately 90 percent of shrub land will be treated. A crew will conduct mastication on trees and brush less than 10 inches dbh in the majority of the unit, including on slopes up to 30 percent (27°). Hand thinning will occur in the central portion of the unit surrounding Pleasant Valley Road. Chipping may be implemented where feasible, otherwise cut vegetation will be dispersed by lopping and scattering, or small hand piles will be burned.

1.3.3 BEAR VALLEY

The Bear Valley project will build on previous fuel treatment work that has been completed on neighboring land by the U.S. Forest Service (USFS). Fuel treatment in the Bear Valley project area will include hand thinning methods within the entire 130-acre unit surrounding Quaking Aspen Road, Bloods Ridge Road, and Alpine Way. Hand crews conduct all work in the Bear Valley treatment area by due to slope and terrain inaccessibility. Treatment activities will target areas where excess fuel buildup and non-native invasive plants occur. Subdivision and residential landscaping will not be altered. Live and dead target vegetation less than 10 inches dbh would be cut, and approximately 90 percent of the shrubs would be removed. Chipping may be implemented where feasible, otherwise cut vegetation will be dispersed by lopping and scattering, or small hand piles will be burned.

1.5 REGULATORY FRAMEWORK

As required for discretionary projects under CEQA, an intensive cultural resources inventory (i.e., Class-III pedestrian survey) of the three project areas is called for in the regulatory process of environmental compliance for county permitting. CEQA established that historical and archaeological resources are afforded consideration and protection (14 CCR Section 21083.2, 14 CCR Section 15064), and guidelines define significant cultural resources under two regulatory designations: historical resources and unique archaeological resources.

Under CEQA, a cultural resource is generally considered historically significant if it meets the criteria for listing in the CRHR. A resource must meet at least one of the following significance criteria (PRC 5024.1; 14 CCR Section 15064.5[a][3]):

> 1. The resource is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage. Title 14, CCR Section 4852(b)(1) adds, "is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States."
>
> 2. The resource is associated with the lives of persons important in our past. Title 14, CCR Section 4852(b)(2) adds, "is associated with the lives of persons important to local, California, or national history."
>
> 3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction; or represents the work of an important creative individual; or possesses high artistic values. Title 14, CCR 4852(b)(3) allows a resource to be CRHR eligible if it represents the work of a master.
>
> 4. The resource has yielded, or may be likely to yield, information important in prehistory or history. Title 14, CCR 4852(b)(4) specifies that importance in prehistory or history can be defined at the scale of "the local area, California, or the nation."

Title 14, CCR 4852(b)(4) specifies that importance in prehistory or history can be defined at the scale of "the local area, California, or the nation." An archaeological artifact, object, or site can meet CEQA's definition of a unique archaeological resource even if it does not qualify as a historical resource (PRC 21083.2[g]; 14 CCR 15064.5[c][3]). An archaeological artifact, object, or site is considered a unique archaeological resource if "it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria (PRC 21083.2[g]):

> • It contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
>
> • It has a special and particular quality such as being the oldest of its type or the best available example of its type;
>
> • It directly is associated with a scientifically recognized important prehistoric or historic event or person.

Historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (14 CCR 4852[c]). Integrity is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. It must also be judged with reference to the particular criteria under which a resource is proposed for eligibility.

CEQA defines a historical resource as a "resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historic Resources" (CRHR); or "a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code"; or "any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural

annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (14 CCR Section 15064.5[a][3]).

While Traditional Cultural Properties (TCPs) and cultural landscapes are not directly identified by category in the state definitions of historical resources, TCPs correspond to "places" in CEQA and cultural landscapes correspond to "areas" in CEQA. Places and areas can be types of historical resources. Historical resources automatically listed in the CRHR include historic properties listed in or formally determined eligible for the National Register of Historic Places (NRHP) and California Registered Historical Landmarks from No. 770 onward (PRC 5024.1[d]). Locally listed resources are entitled to a presumption of significance unless a prevalence of evidence in the record indicates otherwise.

1.5.1 NATIVE AMERICAN REMAINS

Also applicable are Section 7052 of the Health and Safety Code and Section 5097 of the Public Resources Code, which provide for the protection of Native American remains and identify special procedures to be followed when Native American burials are found. When human remains are found, the Alpine County coroner and the Native American Heritage Commission (NAHC) will be notified. The NAHC provides guidance concerning the most likely Native American descendant and the treatment of human remains and any associated artifacts.

2.0 ENVIRONMENTAL SETTING

The three project areas are located in the Sierra Nevada, a 50- to 80-mile-wide mountain range that extends for more than 400 miles along eastern California and part of western Nevada, from the Mojave Desert in the south to the Cascade Range at the north (Bateman and Wahrhaftig 1966:107). The range is asymmetrical in cross-section, with a broad, gradually rising western slope and a short, steep fault-block escarpment to the east, known as the Sierra Front. Uplift and glacial erosion have exposed granitic and volcanic bedrock over large areas of the High Sierra. At lower elevations, the western slope is characterized by steep ridges and rolling foothills that grade into nearly level valleys. In the Sierra Front, steep-gradient, V-shaped valleys debouch into basin floors of the western Great Basin. The Manzanita and Markleevillage survey areas are located in the eastern Sierra Front, while Bear Valley is on the upper western slope of the High Sierra.

2.1 HYDROLOLOGY

The Manzanita and Markleevillage survey areas are located in the eastern Sierran Front, in the Carson River Watershed, which drains into the Carson Sink within the Great Basin. Both Manzanita and Markleevillage lie in the catchment of the East Fork of the Carson River. Glacial erosion in the Pleistocene has affected all three areas, either by direct erosion of exposed granitic bedrock or by deposition of glacial moraines, glacial outwash, and attendant alluvial fans.

Manzanita is located on the alluvial fan apron below the eastern slopes of Hawkins Peak, drained by Scott Creek at the north and Randal Creek at the south. Both creeks are tributaries of Indian Creek, which drains into the East Fork of the Carson River below Diamond Valley. Numerous groundwater discharge zones, including seeps, springs, and spring brooks, contribute to these lesser creeks, which enter Diamond Valley below the project area.

The Markleevillage survey area is a located in the relatively short valley drained by Hot Springs Creek (at its upper end where Grover Hot Springs are located), which takes the name Markleeville Creek just before town. Spratt Creek and Pleasant Valley Creek cross the survey area to meet Markleeville Creek within the survey area. Markleeville Creek in turn drains into the East Fork of the Carson River approximately one mile northeast of Markleeville.

The Bear Valley survey area is in the High Sierra near the northern limits of the North Fork of the Stanislaus River watershed, itself a tributary of the San Joaquin River. Bear Valley is in the Bear Creek drainage, a tributary of Bloods Creek, which drops some 1,000 feet in three miles to the Stanislaus River to the south.

2.2 GEOLOGY

Beginning in the Miocene, rapid uplift and westward tilting of large fault blocks accompanied the emplacement of the large plutonic batholiths that now form the Sierra Nevada crest (Bateman 1992; Huber 1981). Widespread volcanism during the Pliocene and Quaternary periods resulted in the accumulation of andesite and basalt flows, breccias, volcaniclastic sediments, and tephra on the upper eastern and western slopes. Increased uplift and continued weathering during the late Quaternary created extensive erosion, dissection of existing deposits, and the entrenchment of stream and river channels within deep bedrock canyons (Clark 1970:5; Huber 1981:11). Much of the material eroded from the western slope of the Sierra was deposited on the eastern and central floor of the San Joaquin Valley during the Pleistocene and Holocene eras.

Geology in the Manzanita project area largely consists of dissected Pleistocene and Holocene alluvial fan deposits bounded to the north, south, and west by Upper Cretaceous Freel Peak granodiorite (Armin et al. 1983, 1984). Five miles to the south in the Markleevillage project area, bedrock geology includes interbedded Miocene-age volcanic rock, including andesite and basalt flows, breccias, and lahars, surrounding Pleistocene-aged glacial moraine and outwash deposits on the valley floor of Markleeville Creek (Armin et al. 1984). Exposed bedrock geology in the Bear Valley area consists of granitic outcrops of the Sierra Nevada batholith and a sequence of sandstone, conglomerate, and claystone beds of the Miocene and Pliocene Mehrton Formation (State of California 1987).

2.3 NATURAL ENVIRONEMNT

Hot weather and summer sunshine, moderate to heavy winter precipitation, and wide temperature ranges characterize Alpine County weather. Summer precipitation is generally limited to a few scattered thunderstorms over the summer months. The historical annual average total precipitation is approximately 20 inches, and annual average total snowfall averages 83 inches (Western Regional Climate Center 2004). Temperatures throughout the county range from warm in the summer to cold in the winter, with an average temperature of 85 degrees Fahrenheit in July and average low temperature of 18° in January (U.S. Climate Data 2020).

2.3.1 FLORA AND FAUNA

The Varied geology, relief, and physiography of the Sierra Nevada produce a diverse array of gradient-driven habitats that correspond to differences in elevation, precipitation, soils, and temperature, creating a series of distinctive ecological zones with a variety of plant and animal communities. Located between 5,500 feet amsl and 7,700 feet, the three project areas are mostly within the Lower Montane Forest of the Sierra; the Bear Valley project area lies in the transition zone with the Upper Montane Forest.

The Markleevillage survey unit is confined to a narrow upland canyon northeast of Thornburg Peak, south of Hawkins Peak, and west of Markleeville in the eastern Sierra Front. The relatively level valley-floor settings along Markleeville Creek, Pleasant Valley, and the meadows around Grover Hot Springs border the study area to the east, southeast, and west. The meadow southeast of the project area supports a riparian vegetation community within a lower-montane mixed-conifer forest. Riparian vegetation includes cottonwood (*Populus fremontii*) and aspen (*Populus tremuloides*) groves, willows (*Salix* sp.), and wild rose (*Rosa acicularis*). The slopes adjacent to the riparian corridor near the creek zone support Jeffrey pine (*Pinus jeffreyi*), with the occasional incense cedar (*Calocedrus decurrens*) and piñon pine (*Pinus monophylla*), and an understory of sagebrush (*Artemisia tridentata*),

desert peach (*Prunus andersonii*), bitterbrush (*Purshia tridentata*), mountain mahogany (*Cercocarpus ledifolius*), and mules ear (*Wyethia angustifolia*).

Vegetation in the Manzanita project area includes Jeffrey pine (*Pinus jeffreyi*), Ponderosa pine (*Pinus ponderosa*), and an understory of robust manzanita (*Arctostaphylos manzanita*), sagebrush (*Artemisia tridentata*), bitterbrush (*Purshia tridentata*), mountain mahogany (*Cercocarpus ledifolius*), and mules ear (*Wyethia angustifolia*). Riparian vegetation includes cottonwood (*Populus fremontii*) and aspen (*Populus tremuloides*) groves, willows (*Salix* sp.), and wild rose (*Rosa acicularis*). Various grasses and forbs are found in the seeps, dry meadows, and areas historical cleared of forest.

The Bear Valley project area is in the central high Sierra in the upper North Fork Stanislaus River watershed. The biological environment includes mixed-conifer montane conifer forest and riparian stream corridors with associated wet meadows, including nearby Blood Meadow (Allen 1988; Ratliff 1985). Forest vegetation includes red fir (*Abies magnifica*), Jeffrey (*Pinus jeffreyi*), lodgepole pine (*Pinus contorta*), hemlock (*Tsuga mertensiana*), green manzanita (*Arctostaphylus* sp.). Along creeks and in wet meadows, aspen (*Populus tremuloides*), willow (*Salix* sp.), and various forbs and grasses thrive.

Mammals common to all three projects areas include mule deer (*Odocoileus hemionus*), black bear (*Ursus americanus*), beaver (*Castor canadensis*), rabbit (*Sylvilagus* spp.), ground squirrels (*Spermophilus* spp.), gray squirrels (*Sciurus griseus*), martens (*Martes americana*), and weasels (*Mustela frenata*), and the pocket gopher (*Thomomys bottae*). Grizzly bear (*Ursus arctos horrilibus*) and wolverine (*Gulo gulo*) formerly were prevalent throughout the Sierra Nevada. Resident avian species include mountain quail (*Oreortyx pictus*), several species of owls, thrushes, and warblers. Migratory species include duck (*Anas* spp.) and goose (*Branta canadensis*). Three species of trout (*Oncorhynchus* spp.) are native to Sierran streams.

3.0 CULTURAL SETTING

The project area includes the eastern Sierra Nevada Front (Manzanita and Markleeville) and the central High Sierra Nevada (Bear valley) in the upper North Fork of the Stanislaus River watershed. This region has a long history of Native-American land use and subsequent Euro-American emigrant appropriation and extractive industry land-use, including historically important early emigrant trails and wagon roads that cross the central Sierra Nevada.

3.1 PREHISTORY

The project area lies near the interface of three overlapping cultural-historical areas, the Tahoe-Truckee region, the western Great Basin, and the west-central Sierra Nevada western slope. No integrative archaeological framework directly encompassing the three project areas has been developed, as each project area lies at the upper end of resource gradients focused on lower elevations. The present review of prehistory must rely on investigations accomplished in the north central Sierra Nevada, the western Great Basin, and along drainage systems in the central Sierra's western slope and foothills, particularly the Stanislaus River.

The prehistory of the Tahoe-Truckee area, extending into the western Great Basin, is relatively well understood and has been outlined by Elston (1971, 1982, 1986), Elston et al. (1977, 1994). The Tahoe-Truckee sequence, with its connections to the western Great Basin, is emphasized here. Young (2014) provides a cogent review of the Sierra Front that in part captures the Manzanita and Markleevillage project areas.

Developed for the Sonora region, the Sonora Sequence is the current, wide-ranging culture history for the west-central Sierra Nevada foothills and adjacent mid-elevation areas (Rosenthal 2008, 2011). While the applicability of this chronology in the central High Sierra is unknown, it is used here as a convenient organizing framework to facilitate the discussion of prehistory local to the Bear Valley survey area within a larger regional context.

3.1.1 TAHOE-TRUCKEE/WESTERN GREAT BASIN

The archaeological records of the Tahoe-Truckee region and the western Great Basin are intertwined due to cultural connections and resource corridors along the Truckee, Carson, and Walker rivers, which connect the two areas (Young 2014). Sequences on the eastern slopes of the Sierra Nevada and on the western margin of the Great Basin traditionally have been cited, but little integration has been accomplished with the exception of the Tahoe-Truckee region. In the north-central Sierra Nevada and the western Great Basin, the primary cultural sequence was originally developed by Heizer and Elsasser (1953), Elston (1971, 1986), Elston et al. (1977), and Elsasser and Gortner (1992).

TAHOE REACH PHASE

A Pre-Archaic occupation, the Tahoe Reach Phase, was suggested by Elston (1986) and Elston et al. (1977), which was tentatively defined on the basis of Parman-like stemmed points and a date of 8000 Before Present (BP). Elston (1971) further suggested an early (ca. 7000-4000 B.P.) occupation predating the Martis Complex. This Early Archaic period, which Elston called the Spooner Complex, was characterized by deposition of projectile points in the Pinto and Humboldt series at residential camps and larger field camps, many of which also had a Martis component (Elston 1986).

MARTIS COMPLEX

Drawn from a study of sites in the vicinity of Lake Tahoe, Heizer and Elsasser's (1953) scheme proposed the Martis Complex (from ca. 4000-2000 BP) wherein subsistence systems focused on big game hunting and to a lesser extent on resource gathering. Characteristic artifacts included large, heavy projectile points and bifaces, flake scrapers, handstone and millingstones, drills, and gravers. The primary flaked stone material was fine-grained volcanic rock, including basalt, andesite, and rhyolite.

Elston (1986) described the Middle Archaic period as marking the fluorescence of the Martis Complex, with dates from about 4000 to 1900 years BP. The ephemeral sites and assemblages of the Martis Complex at high elevations on both sides of the Sierra were proposed to represent seasonal (spring/summer) big game hunting and seed gathering adaptation. Denser site complexes at lower elevations and generally near hot springs included pit houses with hearths, cache pits and occasional burials (Elston 1986).

The putative 1000 year gap between Martis and King's Beach, which Heizer posited, was disputed by Elston, who also identified a division of the King's Beach Complex into periods whose diagnostic markers were the Eastgate and Rose Spring point series (i.e., Rosegate) followed by Desert Side-notched and Cottonwood series, and eventually at about 600 BP, brownware pottery. Subsistence was based on seeds, small game, and intensive exploitation of piñon nuts. Settlements were less dense, more scattered, and contained smaller houses than recorded for Martis peoples. A climatic warming, as well as population stress on resources, has been suggested as causal factors in this pattern (Elston 1986).

KINGS BEACH PHASE

The subsequent King's Beach Phase commencing at ca. 1000 BP appeared to be more oriented toward fishing and consisted of an assemblage with obsidian flaked stone, small projectile points, including the Desert Side-notched type, and bedrock mortars and cobble pestles.

3.1.2 SONORA SEQUENCE

Rosenthal's (2008, 2011) culture history for the Stanislaus, Mokelumne, Calaveras, and Tuolumne watersheds is based on a consideration of chronological information from more than 100 excavated archaeological sites. This

research included the spatial and stratigraphic analyses of more than 200 radiocarbon dates, 4,000 source-specific obsidian hydration readings, nearly 900 projectile points, and some 600 diagnostic shell beads. Rosenthal assembled a database to define five prehistoric culture-history periods: Early Archaic, Middle Archaic, Late Archaic, Recent Prehistoric I, and Recent Prehistoric II. This new chronology, referred to as the Sonora Sequence, substantially revises earlier works of Moratto (2002) and Moratto et al. (1988).

EARLY ARCHAIC (11,500-7000 CAL BP)

Early Archaic components have been identified at two sites to the north of Yosemite: Skyrocket (CA-CAL-629/630) in Salt Springs Valley and Clarks Flat (CA-CAL-342) located upstream from New Melones Reservoir along the Stanislaus River. Both of these sites were discovered in buried stratigraphic contexts and include large numbers of wide-stem and large-stemmed dart points, as well as very small numbers of other notched and stemmed projectile points. The Early Archaic stratum at the Skyrocket site included hundreds of handstones and millingslabs, as well as a variety of cobble-core tools, large percussion-flaked "greenstone" bifaces, and obsidian from the Bodie Hills and Casa Diablo sources located east of the Sierra Nevada in Mono County.

Plant macrofossil assemblages recovered from Skyrocket were dominated by gray pine and acorn nutshell and included few, if any, small seeds or other spring- and summer-ripening plant foods. The large accumulation of ground stone in the early Holocene stratum at the Skyrocket site probably represents the residue of repeated seasonal occupations over many millennia. This pattern of repeated occupation may indicate that land use in the western Sierra was seasonally structured and not the wide-ranging, mobile lifestyle often believed to characterize the Early Archaic throughout the Intermountain West. This is further supported by the almost exclusive use of local toolstone for the manufacture of bifaces and projectile points at both the Skyrocket and Clarks Flat sites.

MIDDLE ARCHAIC (7000-3000 CAL BP)

Moratto et al. (1988) suggest that deposits from this time period are rare in the region. The absence of the early record is due in part to misunderstanding of the timing of corner-notched dart points, such as Elko points, on the western slope of the Sierra. Previous researchers have suggested that either broad-stem points, such as the Stanislaus Broad Stem, or Pinto and Humboldt Concave points were diagnostic of this period (Moratto 2002; Moratto et al. 1988, 1991; Peak and Crew 1990). Recent excavations at several well-dated and stratified Middle Archaic sites suggest that corner-notched dart points were prevalent in the foothill region between the Tuolumne and Mokelumne rivers from about 7,000 to 1,100 years ago (Rosenthal 2011). Other notched and stemmed dart point forms have been found at Middle Archaic sites north of the Tuolumne River, but to a lesser degree.

Like the Early Archaic, known Middle Archaic deposits in the north-central Sierra are identified in buried stratigraphic contexts. The earliest known house structures on the western slope were identified in a Middle Archaic stratum at the Edgemont Knoll site near Sonora, in association with large subterranean storage pits (Meyer 2008). A diverse assemblage of flaked, ground, and battered stone tools, along with comparatively high densities of dietary debris (plant remains and faunal bone), suggest that the Edgemont Knoll site served as a seasonal residential encampment. Archaeobotanical remains, dominated by gray pine and acorn nutshell, indicate that landform use occurred primarily in fall and winter when pine and acorn mast was stored in subterranean storage pits. Faunal assemblages from Middle Archaic sites are dominated by large mammal remains, a pattern that continued throughout the remainder of the period. According to (Jones and Mikkelsen 2008), soapstone vessels first appeared in the local record during the Middle Archaic along with various stone pendants, incised slate, and stone beads. Atlatl weights and spurs in these deposits indicate that the dart thrower was a primary hunting weapon.

LATE ARCHAIC (3000-1100 CAL BP)

Late Archaic deposits are among the most common on the western slope north of the Tuolumne River. Late Archaic settlement, subsistence patterns, and technology were mirrored those of Middle Archaic, although the use of imported obsidian increased. Handstones and millingslabs dominate ground stone implements, just as corner-notched dart points were the dominant projectile point type. Expedient cobble-core tools, battered cobbles, and other heavily used flake-based implements are common in Late Archaic deposits from the foothills. These heavy processing tools likely are associated with pine nut collection. Faunal assemblages from Late Archaic sites continue to be dominated by large mammal bone, and the atlatl and dart remained the primary hunting technology.

Mirroring increased quarry production at east of the Sierra, use of imported obsidian peaked during the Late Archaic, averaging half of the debitage found in deposits from the lower montane forest/upper foothills and nearly a quarter from sites in the lower foothills. Soapstone vessels remain more or less common in the Late Archaic, as do various stone ornaments and pendants. Imported shell beads and other ornaments remain nearly non-existent at sites in foothill and higher elevations deposits of the Sierra Nevada, but are common in Late Archaic Central Valley sites (Bennyhoff and Hughes 1987).

RECENT PREHISTORIC I & II (1100-100 CAL BP)

Adoption of the bow and arrow at about 1100 cal BP is a hallmark of change in the archeological record for the western slope of the central Sierra. This technological shift evident in the predominance of corner-notched and stemmed arrow points Recent Prehistoric I Period (1100-610 cal BP) deposits. Although it is unknown whether bedrock milling features were first used during this initial sub-period, their occurrence at Recent Prehistoric II (610-100 cal BP) sites indicates they had become an important milling technology by some 600 years ago.

Recent Prehistoric II Period (610-100 cal BP) site components provide compelling evidence for changes in subsistence economies across the lower- to mid-elevation west slope of the Sierra. Bedrock milling features became fixtures across the landscape near residential deposits and as isolated features. The occurrence of these facilities above and below the oak zone suggests that a variety of gathered resources, beyond acorns, were being processed. Subsistence remains in foothill deposits include a greater amount of spring/summer grass seeds and fruit/berry pits than Archaic deposits, indicating lengthier seasonal occupation or possibly, storage locales at or below the snowline. Settlement pattern variability appears to have been greater during Recent Prehistoric II time, with house-depressions at residential sites and special-use localities solely consisting of bedrock milling features.

As with Archaic sites in the region, large mammal remains make up a substantial portion of faunal assemblages from both high- and low-elevation sites. Many more specialized technologies are associated with the Recent Prehistoric II Period than were evident during the Archaic, including stone drills and the common occurrence of bone awls, suggesting that basketry may have taken on a new importance. The Desert Side-notched arrow point was first introduced on the west slope at about 610 cal BP, diffused from the Great Basin. Circular, perforated stone shaft-straighteners are common in these sites, consistent with use of the b**o**w and arrow. Imported shell beads from coastal California first appear in appreciable amounts in Recent Prehistoric II village sites (Bennyhoff and Hughes 1987).

3.2 ETHNOGRAPHIC SETTING

The project area is located within the region that the Washoe and Sierra Miwok people claim as traditional territory. Barrett (1917) and Kroeber (1925) place portions of the upper reaches of the Mokelumne and Stanislaus Rivers in the territory of the Washoe. Kroeber's map places the boundary between the Washoe and the Miwok in the Dorrington-Camp Connell area. D'Azevedo (1986) and Levy (1978) follow these earlier authorities in the placement of the ethnographic boundary. Several authorities have discussed the travels of the Washoe across the Sierra crest to the vicinity of Big Trees in the upper Stanislaus drainage (Barrett 1906, 1908:347, 1917:6; D'Azevedo 1966:331) where they camped among the Miwok and harvested acorns. Washoe individuals and

families sometimes wintered over with the Sierra Miwok in the vicinity of Big Trees when there was a good harvest and relations were cordial (D'Azevedo 1986:472). It is fairly clear from all sources that neither the Miwok nor the Washoe had permanent settlements between Dorrington and Ebbetts Pass and that both groups made use of this area in summer and fall.

Prior to the disease and disruption brought by Euro-Americans in the early- to mid-nineteenth century, the Washoe and Miwok occupied permanent villages and temporary seasonal camps and subsisted by hunting, fishing, and plant-food gathering. This way of life abruptly changed with the arrival of non-native gold and silver miners, settlers, ranchers, and entrepreneurs, who spread disease, claimed and decimated traditional lands, and indiscriminately murdered native people. Despite major disruptions from the Mission Period, European diseases, gold mining, and non-native settlement, the Sierra Miwok and the neighboring Washoe have managed to persist, maintaining attachment to the central Sierra Nevada, from the west slope to the Sierran Front and the western Great Basin.

3.2.1 WASHOE

This section largely is excerpted from Meredith "Penny" Rucks' ethnographic summary of the Washoe (Waechter et al. 2003). Prior to contact and disruption by Euro-American appropriation and encroachment (ca. 1850), Washoe territory straddled a the Sierra Nevada north and south of Lake Tahoe, from the southern shore of Honey Lake south through Antelope Valley and the West Fork of the Walker River in the western Great Basin. Washoe traditional homeland is subdivided into three regions defined as areas of "most frequent" interaction and cooperation among neighboring communities (D'Azevedo 1986:469). Overlapping resource areas, cooperation in defense, and collaborative harvests and festivals occurred most consistently among neighbors within one of three regions: the *wélmelti* ("northerners"), the *pá:wa lu* ("valley dwellers"), and the *há alelti* ("southerners"). However, affiliation with any one of these areas was (and continues to be) transcended by identity with and access to the entirety of the "Washoe world," "within which one could move freely by exploiting a lore of common origin and hospitality accorded distant or putative kin" (D'Azevedo 1986:485).

The *há alelti* band of the Washoe lived in the area of Woodfords and Markleeville, while also extending southward toward Topaz Lake and Antelope Valley. The *pá:wa lu* band occupied Carson Valley, often wintering in the Pine Nut Hills. The *há alelti* of the Woodfords-Markleeville region, between the east and west forks of the Carson River, have always been strongly associated with "the mountains," i.e., the Sierra Nevada, and with neighboring California Indians, with whom they interacted and shared many traditions. So strong was this association, that they were often referred to as *tá lel i*, "westerners," "a term also applied to the Miwok and Maidu or any Washoe people who might be living among them; the term became synonymous with 'California side'" (D'Azevedo 1984:25). D'Azevedo (1986:470) states that others regarded them "as less like real Washoe and more like the Miwok to their west with whom they had longstanding relations." Bertha Holbrook gave *tániw melé:we*, "Miwok jumping on the ground" as a nickname once used for the Woodfords-area residents (Jacobsen 1955), probably in reference to the Miwok-style roundhouse constructed there for ceremonial dances (D'Azevedo 1956:15–16, 1986:481). Identification with the Sierra and as "California Indians" is maintained today by a tendency to refer to the Woodfords Washoe as "those California Indians" and to plants known to them as "from California" or "from the mountains." The West Fork of the Carson River provides a prominent geographic connection between Washoe and Miwok.

The traditional economy was based on seasonally available resources from catchments tethered to camps where "first use" rights and accessibility were maintained by priority of use. Key among these resources was fish and pinyon pine nuts. Investigators have described their seasonal movements in terms of spring and fall fish runs and fall pinyon harvests from September to October (D'Azevedo 1955; Siskin 1990; Wright 1990).

Access to key resources and exotic goods was maintained through complex and multi-layered social networks that exceeded linguistically defined "territories." "Sharing" rather than "trade" best describes the exchange that facilitated resource allocation and exchange. Some commodities were indeed traded; for instance, at the end of the 1800s, Susie Dick reported that one deer hide could bring enough pinenuts for the winter (Dangberg 1920s, in Price 1980). But access to specific resource areas is described in terms of visiting relations and bringing gifts. Roasted pinyon nuts or salt from Topaz Lake were often taken to Miwok relations and hosts in acorn country.

Acorn was gathered by populations throughout Washoe territory as a valued supplemental staple and celebration food, and as a contingent staple in the event the pine-nut harvest failed. Families with Miwok connections trekked to the western foothills "outside" their core area for acorn, and often stopped "outside" (east) of areas habitually harvested by the Miwok. Frank Morgan recounted to D'Azevedo that a camp at Kyburz (at the junction of the Silver Fork and the South Fork of the American River) was a Washoe area where people could go without encountering anybody, and if there was enough acorn, they would stop there. Alternatively, if the acorn harvest at Kyburz was insufficient or if people wanted to visit, they would continue west to Camino (D'Azevedo 1955). Some of d'Azevedo's consultants related that they rarely encountered Miwok even as far as Camino in the fall, but that they were wary and would stay only a "few days" to pick acorn; they were never bothered by the Miwok, "except once when some came and chased after them…"

As D'Azevedo (1984:23) states, boundaries "ventilated by corridors of tolerated access," incorporated areas of joint or overlapping land use and the South Fork of the American River, and perhaps the Mokelumne River as well, appear to have been just such corridors of mutual tolerance as long as exclusive-use areas and rules of exchange were observed. Knowledge about claimed resources owned by individuals of specific groups, such as Eagle's Nest near Strawberry and the salt deposit near Riverton, were recognized and transmitted by stories or traditions. Washoe tradition indicates they were aware that Miwok and Maidu people from the Sacramento and San Joaquin valleys were pushing upslope, higher into the foothills, fleeing forced labor in Spanish missions and mines, and that they were affected by Spanish-borne disease (D'Azevedo 1986).

3.2.2 SIERRA MIWOK

Barrett and Gifford (1933), Davis-King (2003, 2007), and Levy (1978) present Sierra Miwok ethnography. At the time of non-native contact, Sierra Miwok territory stretched from the Cosumnes River to the north to the Fresno River at the south and included the central Sierran foothills up into the mountains as far as Yosemite and the headwaters of the Merced River (Levy 1978:400). This sizable region provided them access to a range of plant and animal resources, accessed on a seasonal basis. Tragically, Sierra Miwok territory included the Mother Lode, which resulted in a massive influx of miners, settlers, and capitalists during the California Gold Rush of the 1840s though the 1860s. Spanish "mission-ization" of Native Californians previously had impacted Miwok people, including those from villages at the Mokelumne and Cosumnes rivers, at Mission San Jose as early as 1817 (Cook 1954).

3.3 HISTORICAL SETTING

Historical events in the western Great Basin, the Sierra Front, and across the central High Sierra and west slope entail early exploration, emigrant and mining-related travel, transportation and communication, extractive industries (mining and timber harvesting), settlement, and recreation (Orvald and Young 2014). The West Fork of the Carson River and Ebbetts Pass were important travel routes from pre-contact time through westward California Gold Rush and eastward Comstock periods and into the modern highway-recreation era. Although the study area is south of the Carson River's West Fork, historic-era events, including exploration by John C. Frémont, use of the Mormon-Carson and Emigrant Trail, construction and use of the Carson-Amador Stage Route, and the construction of SR-88, SR-4, and State Highway 89have undoubtedly helped shape Woodfords, Markleeville, Bear Valley, and Alpine County.

3.3.1 EXPLORATION

Detailed discussions of the early explorers and travelers in the project vicinity, including Frémont, Carson, Ebbetts, the Mormon Battalion, and scores of settlers and gold seekers, can be found in a variety of documents (Bennyhoff et al. 1982; Crystal Range Associates 1997; Jones & Stokes Associates 1997; Owens 1989, 1992; Supernowicz 1983).

JOHN C. FRÉMONT

John C. Frémont led the first Euro-American incursion into the region and the project area as part of a US government-sponsored exploration party. During his second exploration survey for the US Topographic Engineers in 1843, Frémont led a party of around 40 men, including Kit Carson and Joseph Walker, from the Oregon territory southward into the northeastern portion of the Great Basin. Frémont continued southward to the Carson River and the Carson Sink, where he then turned westward after a short stay in Carson Valley (McBride 2002). During the winter of 1844, his westward route crossed through the project area, where he noted Grover Hot Springs. The party then crossed the snowy Sierra Nevada near Carson Pass, and, from a distance, was one of the first Americans to view Lake Tahoe (Garrotto 2010; McBride 2002).

3.3.2 TRANSPORTATION

Euro-American settlement of California immediately followed the Treaty of Hidalgo with Mexico and the discovery of gold at Sutter's Mill in 1848. The Gold Rush sparked instant demand for transportation and communication networks across the Sierra Nevada. A network of routes, including trails, wagon and stage roads, telegraph lines, and ultimately, the transcontinental railroad, soon rapidly evolved to connect California with the rest of the country. As mining activity declined in California, news of the 1859 discovery of the Comstock Lode resulted in the "Rush to Washoe," which essentially reversed the westward flow of miners and those intending to do business supporting them.

One consequence of the reversal manifested itself in a heavily used and rapidly changing web of stage and freight routes with supporting way station nodes along the transportation corridors (Orvald and Young 2014:55). As a new industrial landscape emerged in the region, the need for forest products resulted in a local transportation network for timber and milled wood, including timber harvesting trails, roads, and flumes.

The primary routes into California across the eastern Sierra Nevada consisted of trails and roads used by emigrants and would-be miners to access the farmlands and the gold fields of the western foothills. It was inevitable that modifications to the original routes would occur after the region was better known, and following the development of more settlements in Truckee Meadows, Eagle Valley, Carson Valley, and in the Lake Tahoe Basin.

The silver rush to Washoe, as the mining district centered on Virginia City was known, was a great stimulus to the pace of road development in the central Sierra. The rush to Washoe began late in the fall of 1859 and resumed with renewed force in the spring of 1860. Greatly increased traffic over the mountains stimulated road entrepreneurs to supplement the efforts of state and local government in creating faster, more efficient stage and freight routes. In response to the demand for improved transportation, California and the Territory of Nevada allowed private toll roads to be constructed on public land alongside existing roads such as the "Day Route" between Placerville and Carson Valley and the Kingsbury-McDonald Toll Road (Howard 1998). Entrepreneurship, ingenuity, and the desire for more efficient routes over the Sierra and throughout the region resulted in a widely splayed eastern end of the trunk road between the Sierra foothills of California and the Territory of Nevada, which soon became the state of Nevada.

Most trans-Sierran wagon traffic was eliminated in 1868 upon completion of the Sacramento-to- Reno reach of the Central Pacific Railroad over the mountains, and much of the stage and freight wagon road network was converted to local use. By the early twentieth century, the speedy incorporation of the automobile into American life for

commerce and private use led to realignments and improvements (including graveling and paving) to the former wagon roads.

Many of the early emigrant trails evolved over time into wagon roads and paved highways. Portions of the Mormon-Carson route are now part of SR 88 and Mormon Emigrant Trail/Iron Mountain Road. Both are major travel routes through the Eldorado National Forest.

Another route, now abandoned or subsumed into SR 88 and other modern roads, was the Old Alpine Highway (cultural resource nos. CA-ALP-196H/AMA-382H/ELD-949H). In 1911, the California state government formally established the Alpine State Highway, defining its route as follows:

> Calaveras big tree grove, located in Calaveras County, thence running to Dorrington…then easterly following what is known as the Big Trees and Carson Valley Turnpike, to Mount Bullion, in Alpine County; thence along county road to Markleeville, in Alpine County; thence along that certain road via Kirkwood, Silver Lake, Pine Grove and Irishtown to Jackson in Amador County (California Division of Highways 1934:167-168 in Psota and Newland 2001:7).

According to Psota and Newland (2001:14), this became an important trans-Sierran road linking California's Central Valley to eastern California and western Nevada and the most direct route between Stockton and Lake Tahoe. Besides linking the valley with the east side, the road brought recreational traffic to Plasse's Resort at Silver Lake, Boy Scout and Girl Scout camps at Twin Lake (also Caples Lake) and Kirkwood Lake, and public campgrounds at several locations on the National Forest. The highway was not plowed or otherwise maintained in winter, making it a seasonal route.

MORMON-CARSON EMIGRANT TRAIL

Conducted on behalf of the Eldorado National Forest, the Bennyhoff et al. (1982) report provides substantial context for what is now called the Mormon-Carson Emigrant Trail, which locally runs along the West Fork of Carson River approximately five miles north of the current study area. Archaeologists and historians have documented well-preserved features of this trail dating to the 1850s between Woodfords and Sorensens.

Until 1848, the Truckee-Donner route was the only established segment of the California Trail crossing the Sierra. This route was a difficult one, involving navigating the Truckee River Canyon and a high mountain pass. In July 1848, a group of Mormon Battalion veterans heading home to Salt Lake City from California blazed an easier route. They began in Pleasant Valley and followed the ridge between the American and Cosumnes River drainages, clearing a roadway as they went, ultimately navigating the West Fork of the Carson River eastward (Owens 1992). Over the next two years, the Mormon-Carson Emigrant Trail would become the most heavily traveled wagon route over the northern Sierra; in 1850, it carried "an estimated ninety-five percent of the total overland migrants to California" (Owens 1992:16). The discovery of gold in California resulted in even heavier use (Bennyhoff et al. 1982:100).

Arriving at Mormon Station (modern-day Genoa, Nevada) in the Carson Valley, travelers from the east rested and re-fueled for the final push westward over the mountains. However, as the number of emigrants and associated livestock increased along the trails, hardships increased as forage and supplies were reduced (Bennyhoff et al. 1982:108). Early season caravans often fared better than late-season stragglers, but productive forage was never guaranteed. At times, conditions deteriorated to such an extent that relief parties were organized in the central valley to assist suffering travelers (Bennyhoff et al. 1982:109).

Soon traders from the west began to take advantage of commercial possibilities by transporting hay and general goods into the mountains. Trading stops were often ephemeral tent camps, but others grew into significant settlements. Mormon Station had log buildings as early as 1849 (Langworth 1855:155, cited in Bennyhoff et al.

1982:110). The developing commercial interests at Mormon Station, along with its logical rest-stop on the Mormon-Carson Emigrant Trail, resulted in one of Nevada's first Euro-American settlement, which would later become Genoa, Nevada.

Intensive use of the Mormon-Carson route was short-lived. In 1850, between 45,000 and 60,000 emigrants plied the trail (Bennyhoff et al. 1982:109). Gaining a reputation as relatively easy passage, use of the route increased significantly as travel along the more arduous routes (depending on the rumor of the day) dropped. Between 1850 and 1852, the "Emigrant Summit Trail" was a major artery of the Overland Trail, crossing the western half of the United States (Bennyhoff et al. 1982:99).

By the end of the 1850s, the mountainous sections of the Mormon-Carson route were mostly abandoned; nevertheless, the older route remained popular as a high-elevation summer grazing area for sheep and cattle. According to the 1854 stock register, more than 30,000 head of cattle and 8,550 sheep traveled the route in that year (Deal n.d.:7). With the discovery of gold and silver on the Comstock Lode in western Nevada in 1859, the Mormon- Comstock route may have seen significant use in an easterly direction—reverse emigration to the slopes of Mount Davidson and Virginia City.

BIG TREE-CARSON VALLEY TRAIL – EBBETT'S PASS

The present SR-4 alignment follows the approximate route of an early emigrant trail over the Sierra Nevada that was improved in 1855 and 1856 and known as the Big Tree Road and in the early 1860s as the Big Tree and Carson Valley Turnpike. Originally a free trail, it became a toll road from 1864 through 1910, and then a free county road in 1911. It was accepted into the state highway system in 1926 and portions were paved in the 1930s. The road was realigned in the mid-1960s when the Bear Valley Ski Resort was opened, making it an all-weather highway.

3.3.2 SETTLEMENT

Following exploration of the area by John C. Frémont, Kit Carson, and Joseph Walker in 1844, the entrance of Euro-Americans in the eastern Sierra progressed rapidly. This was in response to three significant historical developments: 1) the 1848 Treaty of Hidalgo, wherein Mexico ceded half a million square miles of western land, including California, to the U.S.; 2) the discovery of gold in the western Sierra foothills; 3) emigration to the attractive farmland of California; and 4) Silver Mountain ore deposit near Ebbetts Pass in 1858 and the 1859 discovery of the Comstock Lode. Although these events occurred outside of the local sphere of the project area, they had an impact on the influx of emigrants, would-be miners, and entrepreneurs through Ebbetts Pass and the Mormon-Carson Emigrant Road through the Woodfords-Markleeville area, and what was to become Alpine County.

WOODFORDS

Woodfords is a small town located at the lower end of the canyon of the West Fork of the Carson River at the SR-88/SR-89 junction. The town is located approximately 30 miles southeast of Lake Tahoe and eight miles west of the California- Nevada border near the West Fork of the Carson River. The town site of present-day Woodfords was first settled in 1847 by Euro-Americans as a temporary supply outpost when noted Mormon pioneer, Samuel Brannan, left a small contingent of men there to winter while he led a large group overland to Salt Lake City. Although Brannan did not return to the site of Woodfords, the place took the name "Brannan's Springs." The route used by Brannan became popular among overland travelers, leading to the construction of the first permanent building, a hotel built by Daniel Woodford in 1849. In 1860, Brannan's Springs became a Pony Express station, and later in that decade, the name changed to Woodfords when a post office was established.

During the Comstock Lode silver rush of the 1860s, the road through Woodfords was among the most heavily traveled routes from California to the Carson Valley. Although located on a popular trans- Sierra wagon road, very

few people settled in Woodfords, and it did not become a large community. At its peak, it only had a few commercial buildings and houses. After the exhaustion the Comstock Lode, activity in Woodfords slowed considerably, but its location on a main road prevented it from disappearing completely (Centennial Book Committee 1964:13, 19; Kyle 1990:26).

Woodfords has remained a very small community in the twentieth century. Its main commercial activity centers on its role as a roadside stop at the junction of SR 88 and SR 89, and its commercial livelihood relies largely on the travelers and tourists that pass by. Current commercial businesses include a small motel, general store, and a café. The community has experienced some very modest residential construction in the post-World War II era with the establishment of the Sierra Pines Mobile Home Park and a small group of homes known as Alpine Village. Woodfords' position at the crossroads of two main Sierra highways also contributed to the decision to build an elementary school for the community.

MARKLEEVILLE

Markleeville originated following the discovery of ore in 1860 at Silver Mountain just east of Ebbetts Pass. Miners from Carson Valley had to pass through the area, which inspired Jacob J. Marklee to claim a 160-acre tract in 1861 and build a toll bridge across Millberry Creek. Marklee hoped to prosper from freight and miner transport to the mining camps, but was killed in a gunfight in 1863. His residence soon had houses and commercial buildings and the name Markleeville. The settlement initially served as a way station on the "Road from Woodfords" as depicted on the 1865 General Land Office (GLO) Plat for T.10N.-R.20E., a wagon route that connected Genoa with Woodfords, Silver Mountain City, and points further west via Ebbetts Pass (BLM 2020). By 1864, Markleeville had 168 houses, a population of 2,620, a spur of the transcontinental telegraph line from Genoa, a post office, and soon thereafter, a Wells Fargo Express Office and an armory with a company of Union troops (Maule 1938:88).

As the mining boom faded in the 1870s, so did the population of Markleeville, as most of the miners left the region (Centennial Book Committee 1964:19; Kyle 1990:26). Due to falling silver prices, the area saw an exodus of people and the county's primary economy shifted to farming, ranching, and logging. By 1875, the year in which the county seat was moved to Markleeville, the population had decreased to 172, largely due to the demonetization of silver.

In its heyday, Markleeville supported a wide range of businesses, including a 15-stamp mill and lumber mills (Garrotto 2010). The confluence of Markleeville Creek and the West Fork of the Carson River was a starting point for sawn logs to be transported to the mills of the Carson area, which supplied the Comstock. Initially, Markleeville was within Amador County, but due to relative isolation, the residents petitioned the State of California to create the county of Alpine and make Markleeville the county seat. Despite the petition, Silver Mountain City became the county seat, and remained so until voters selected Markleeville in 1875. Markleeville has served as the commercial center for nearby ranchers, farmers, and loggers. By the 1920s, Markleeville declined in population to around 200, its approximate population today. As World War II ended, tourism began its ascension as the primary economic driver in Markleeville, and Alpine County as a whole. Post-war tourism dramatically increased as California's thriving economy provided Americans with expendable income and more leisure time.

Tourism in the Markleeville area received another boost in the post-war era. The US Forest Service (USFS) had a long history in the region, dating back to the early-twentieth century with the establishment of what today is the Humboldt-Toiyabe National Forest. After World War II, the USFS expanded its long- established practice of building campgrounds, picnic areas, trails, and other accommodations to attract visitors. The USFS also continued its recreational residence program, which the agency started in the early-twentieth century to permit individuals to build private recreation cabins on National Forest land, usually in clusters, or tracts (Lux et al. 2000). By the 1920s, dozens of tracts had been developed and the program continued into the 1960s. One such tract, the Shay Creek Tract, was developed west of town near Grover Hot Springs. Surveyed in 1947, the 47-acre property originally had about 35 single-family cabins occupied as vacation residences during the summer (USFS 1947, 1988).

GROVER HOT SPRINGS

John C. Frémont noted Grover Hot Springs during his 1844 expedition, and Markleeville later became known for access to thermal waters. Early records note the hot springs became the property of John Hawkins, who leased land to C. H. Kilgore in 1854 to operate a dairy business (Garrotto 2010). The two entered into a partnership and later Hawkins took over the lease and improved the hot springs bathhouse and pool. During the 1870s, Hawkins entered into a partnership with A. M. Grover, who further developed the springs, which eventually were named after him (Garrotto 2010). Later, Grover's widow would charge visitors to bathe in the hot springs and pitch their tents nearby. By 1908, Charles Scossa, a local rancher, became the owner of the hot springs, and in 1935, he improved the pool and built a cabin that stands today. A tourist and health-seeker destination since the nineteenth century, California State Parks bought Grover Hot Springs in 1959 and developed it into a resort.

3.3.3 SIERRA NEVADA LOGGING

Timber was a critical resource for pioneers settling land, for mining and related industrial activity in the Comstock, and for the railroads. Timber harvesting operations ranked among the first major industrial activities in the region. The close proximity of the Carson Range, Lake Tahoe Basin, and the Sierran Front offered large reserve of timber that was readily exploited throughout the mid- to late-nineteenth century. Timber supplied firewood for domestic use, lumber for railroad ties, and the construction materials for domestic and commercial structures. Following the Comstock Lode strikes, the forests of the Sierra Nevada supplied lumber for commercial buildings, mills, telegraph poles, and thousands of support timbers lining the tunnels of the mines. Steam power in the region, either for industrial operations or transportation relied on cordwood for boiler fuel.

Wood was abundant on the eastern slope of the Sierras, and early logging enterprises quickly developed techniques for extracting it for milling in sawmills along the range front, from Verdi south to the upper reaches of the Carson River. Timber was initially transported from stump to mill using animal-power and log chutes, skidways of parallel logs notched together at the ends, slabbed on the inside faces, and greased. Timber and milled lumber was transported by small teams, steam donkeys, shortline railroads, steamers on Lake Tahoe, flumes, and via large drives on the Carson River. Lumber demands associated with the Comstock mining industry and related commercial endeavors, nearby communities, and regional mining districts were met by teams on developed roadways, flumes, inclines, and eventually, the Virginia and Truckee Railroad. The Sierra rapidly became the setting for intensive logging, milling, and lumber and cordwood transportation activities.

Mining and railroad enterprises were among the greatest customers for wood products of Sierra Nevada forests, and in catering to them, two boom periods in the lumber industry are generally recognized (Chung 2003). The first occurred during the initial boom of the Comstock in 1859 until its bust in 1877. The second began with construction of the Central Pacific Railroad through the state between 1867 and 1869 and associated short lines throughout the western Great Basin between 1864 and the early 1900s. By the early 1900s, the combination of improved extraction technology (including transportation systems), declining demand by railroads, mining interests, and deforestation resulted in a bust in lumbering activity (Goodwin 1971; Wilson 1992).

Timber harvesting resumed in the Sierras in the 1940s and 1950s by the Placerville Lumber Company and the Clover Valley Lumber Company (Lindström 1996, 2008). Local stands were harvested again in the 1960s and 1970s as the USFS engaged in timber sales throughout much of the Humboldt-Toiyabe and the Eldorado National Forests (Supernowicz 1983). Over the last 40 years, logging activities in the Sierra Nevada, including in and near the project areas, has consisted of forest health projects, including fuel reduction and erosion control projects.

3.3.4 RECREATION

By the early-twentieth century, land in the Tahoe Basin and surrounding area became increasingly valuable for residential, recreational, and commercial purposes. Previous use of the Sierra for timber harvesting and grazing gave way to new resource values, as outdoor recreation and associated services became the major forces governing growth. The new recreation economy accelerated the rate of development and increased permanent and seasonal residence in the Sierra Nevada, including seasonal residences in the Shay Creek Summer Home area along Hot Springs Road and in the High Sierra. This trend escalated with the establishment in the 1930s of a regional network of engineered roads throughout the montane environment.

As the Tahoe Basin and the Carson Range attracted more interest and more tourists, resorts appeared. Increasingly, tourists from all over the country joined members of the Bay Area's elite, and the wealthy mining and related business interests of the Comstock at the area's best hotels. People of modest means camped or vacationed at rustic motels and cottages. Recreational pursuits, aided by automobile transportation, filled the backcountry with swimmers, hikers, campers, and increasingly, skiers.

In the wake of the 1960 Winter Olympics at Squaw Valley, the first to be televised, an irreversible trend to a new era of upland land use was established with a demand for year-round residency and supporting infrastructure. Thereafter, the ski industry assumed a prominent position in the Tahoe Basin, the Carson Range, and the High Sierra and the USFS became the primary agency for public land management in the area.

4.0 RECORDS SEARCH

Archival research and literature review preceded field investigation to determine what could predicatively be said about built-environment and prehistoric/historic-period archaeological sensitivities in the three survey areas prior to fieldwork. GBCG reviewed site and report records maintained by the California Office of Historic Preservation's (OHP) California Historical Resources Information System (CHRIS), the National Register of Historic Places (NPS 2020), and relevant historical literature, historical maps, and General Land Office (GLO) records. A similar search was requested for Bureau of Land Management, Carson City District, USDA Humboldt-Toiyabe National Forest, and USDA Stanislaus National Forest records. To supplement this effort, GBCG completed additional research using available "gray literature" cultural resource reports and archaeological sites within and near the search area.

4.1 CENTRAL CALIFORNIA INFORMATION CENTER

Initial resource identification efforts for the project included pre-fieldwork record and historical document searches conducted by the Central California Information Center (CCIC). The purpose of research was the identification of previous cultural resource inventories and documented resources in and within a one-mile radius of each of the three study areas, identification of resources expected to occur, and development of historic contexts for potential cultural resource evaluation.

GBCG submitted a records search request to the Central California Information Center (CCIC) at California State University, Stanislaus on November 1, 2016. Staff at the CCIC completed the request on June 4, 2020, CCIC File #11413K (Appendix C). Results of the record search including Resource and Report Maps were provided to Darrel Cruz, Washoe Tribe of Nevada and California, Tribal Historic Preservation Officer prior to the field visit. Historic-period resources include Emigrant trails, roads and highways, ditches, grazing camps, refuse/debris scatters, and standing structures. Prehistoric sites include bedrock milling stations, lithic scatters, milling stations with flaked stone, and isolated finds (e.g., flaked-stone bifaces and projectile points). Table 1 summarizes the record search results for all three study areas. Map results and tables summarizing cultural resources and previous investigations for each project area's one-mile-radius search area are provided in Appendices D through F.

Table 1. Cultural Resource Inventories and Resources within One Mile of the Project Areas.

Project Area	Previous Inventories (1-mile radius)	Previous Inventories (Project Area)	Inventoried Acres (Project Area)	Recorded Resources (1-mile radius)	Recorded Resources (Project Area)
Manzanita; 469 acres	12	3	107 acres	53	0
Markleevillage; 296 acres	27	7	140 acres	80	7
Bear Valley; 138 acres	62	11	138 acres	42	0

4.1.1 MANZANITA RECORDS SEARCH

The CCIC records review indicates 51 previous studies and 30 recorded cultural resources in the one-mile-radius Manzanita treatment unit search area; with previous six studies and two archaeological isolates documented within the limits of the survey area (Table 2; Appendix D). Two projects conducted in the northern end project area (AP-21 and AP-6083) reduce necessary pedestrian survey coverage by approximately 107 acres (see map in Appendix D). Isolated finds are categorically not eligible for the National Register of Historic Places, and they do not qualify as important archaeological resources (with exceptions) under CEQA statutes and guidelines.

Table 2. Manzanita Survey Area Records Search Summary.

Resources in Survey Area	2	P-02-705, -707
Resources in 1-mile Radius	51	See Appendix D
Studies in Survey Area	6	AP-21, -5498*, 5501*, 5507*, 6083, 9146*
Studies in 1-mile Radius	30	See Appendix D

*Duplicate reports from other areas; table from CCIC.

ISOLATED FIND (P-02-705)

Resource P-02-705 is an isolated find, a hand-applied, olive-green glass bottle finish that Summit Envirosolutions documented on private land just within the northern boundary of the Manzanita unit (Bowers 2005a).

DEBRIS SCATTER ISOLATE (P-02-707)

Resource P-02-705 is a small post-1950 historic debris scatter that Bowers (2005b) documented just within the northern boundary of the Manzanita unit. Located within a bulldozer push pile presumably from a wildfire 1988, the scatter includes a toy wagon wheel, a kerosene can, a meat cleaver blade, and fragments of clear glass. Bowers (2005b) documented the find as an isolated find, as the artifacts were interpreted to post-date 1950.

4.1.2 MARKLEEVILLAGE RECORD SEARCH

The CCIC records review identified a small number of studies and a large number of resources documented in the Markleevillage search area (Table 3 Appendix E). Previous studies include inventories for highway improvement, electrical transmission lines, land exchanges, and timber stand management projects. Two projects conducted in the project area (AP-36 and AP-1487) reduce necessary survey coverage by 140 acres (see map in Appendix E).

Table 3. Markleevillage Survey Area Records Search Summary.

Resources in Survey Area	8	P-02-346, -347, -348, -349, -548, -658, -1056, -1057
Resources in 1-mile Radius	72	See Appendix E
Studies in Survey Area	10	AP-2, -4, -20, -36, -1477, -1478, 3050*, -4310, -4734, -8743
Studies in 1-mile Radius	17	See Appendix E

*Duplicate reports from other areas; table from CCIC.

THORNBURG SITE (P-02-346)

Native American archaeological resource P-02-346/CA-ALP-269 is a smallish "Bedrock mortar/occupation site" located at the bulldozer-disturbed confluence of Markleeville and Spratt creeks at the northwestern corner of the survey unit (Napton et al. 1990a). Two low, flat granitic boulders exhibited a total of four "grinding cups," and portable artifacts include a handstone and scattered chert and quartz debitage 50 feet southeast of the milling station (Napton et al. 1990).

CHAVARIN SITE (P-02-347)

Native American archaeological resource P-02-347/CA-ALP-270 is a bedrock milling feature, a massive granitic boulder, with two pestles and five pieces of debitage (three obsidian and two CCS) located on the southern roadcut of Sawmill Road within the Markleevillage subdivision. Napton and Greathouse (1990a) documented seven "cups" on the boulder; the two pestles were found in the duff beside the boulder and debitage was observed in the roadcut itself.

LITHIC SCATTER (P-02-348)

Native American archaeological resource P-02-348/CA-ALP-271 is a small lithic scatter located at the northwestern corner of the survey unit south of Markleeville Creek and west of lower Spratt Creek in a logging roadcut. Napton and Greathouse (1990b) documented 10 pieces of obsidian exposed in the roadbed and rill channels in a 90-x-60-meter area approximately 800 feet southwest of the Thornburg Site.

LITHIC SCATTER (P-02-349)

Napton et al. (1990b) recorded historic-period archaeological resource P-02-349/CA-ALP-272H as a small "Refuse dump/tin can scatter" consisting of discarded 1930s-vintage household goods on the Thornburg Ranch in the southwest corner of the Markleevillage survey unit approximately 140 meters east of Spratt Creek. The dump is composed of milk cans, motor oil cans, paint cans, oxidized glass fragments, a ceramic tureen lid, and a child's wagon.

ISOLATED FIND (P-02-548)

Resource P-02-548 is an isolated hand-soldered rectangular can that Hutchins (2001) documented on private land on the south-facing slope north of Markleeville Creek near Markleeville Town Ditch. Isolated finds are categorically not eligible for the National Register of Historic Places, and they do not qualify as important archaeological resources (with exceptions) under CEQA statutes and guidelines.

MARKLEEVILLE TOWN DITCH (P-02-658)

Historic-period linear resource P-02-659/ALP-512H is a segment of Markleeville Town Ditch, an open, earthen water conveyance feature located north of Markleeville Creek along parts of the northern margin of the Markleevillage survey unit (Garner et al. 2017). Depicted on the 1877 GLO, this ditch originates near the northwest corner of the survey unit and irrigates agricultural land north of Markleeville before debouching into Millberry Creek. The segment of the ditch within the project area is not eligible for the CRHR based on previous survey evaluation (Orvald et al. 2018).

HOT SPRINGS ROAD (P-02-1056)

Historic-period linear resource P-02-1056/ALP-779H is a segment of Hot Springs Road, the historical alignment of the road that appears on the 1889 Markleeville 1:250,000 map connecting Markleeville with Grover Hot Springs (Garner and Hartman 2016). The segment of the modern, paved road within the project area is not eligible for the CRHR based on previous survey evaluation (Orvald et al. 2018).

MULLER 1296 CIRCUIT (P-02-1057)

Historic-period linear resource P-02-1057/ALP-780H is a 17-mile segment of Liberty Utilities' Muller 1296 Circuit, an overhead, wooden-pole electrical transmission line in Alpine County constructed in 1947. The segment of the modern transmission line within the project area is not eligible for the National Register of Historic Places or the CRHR based on previous survey evaluation (Martin 2018).

4.1.3 BEAR VALLEY RECORDS SEARCH

The CCIC records review indicates a fair number of previous studies and recorded cultural resources in the Bear Valley search area; 11 previous studies and two archaeological sites are documented within the limits of the survey area (Table 4; Appendix F). Previous studies include inventories for highway improvement projects, hazard tree removal for electrical transmission lines, and timber stand management/harvest projects. Projects conducted in the project area reduce account for approximately all 137 acres (see map in Appendix F). Resources documented within the limits of the survey area include a sizable Native American archaeological site (P-02-182) and a segment of the Big Trees Route/Big Trees-Carson Valley Turnpike (P-02-364), both of which occur along the southern end of the unit.

Table 4. Bear Valley Survey Area Records Search Summary.

Resources in Survey Area	2	P-02-182, -364
Resources in 1-mile Radius	40	See Appendix F
Studies in Survey Area	11	AP-34, -168*, 169*, -1683*, -1787, -1935, -3324, 3510, 5527, -5748, -9146*
Studies in 1-mile Radius	49	See Appendix F

*Also reported on in Calaveras County with the same number; table from CCIC.

BLOODS MEADOW SITE (P-02-182)

Known also as the Bloods Meadows Site (Bryan 1961), archaeological resource P-02-182/APL-101 is scantily documented as a sizable Native-American site with "Bedrock Mortars in granite and many arrowheads and flint" with "Arrowheads (cigar box full) and [sic] (cliff Lombardo) pestle" on both sides of SR-4, 300 meters east of the county boundary marks. Informed with anecdotal evidence, Bryan (1961) notes the site consists of two to three camps that blend into one large site across the meadow area and includes bedrock milling features on granitic knolls, one of which is on the north side of the meadow. The site record indicates two localities: 1) an 800-x-200-foot southern area; and 2) a 400-x-200-foot northern area. Accurate location information is lacking in the site record, although the CCIC indicates the resource extends into the Bear Valley survey area.

CARSON VALLEY TO MURPHYS EMIGRANT TRAIL (P-02-364)

Archaeological and built-environment resource P-02-364/APL-288H documents Emigrant Trail segments crossing the Sierra via Ebbetts Pass, including the Big Trees Route (1856) and the Big Trees-Carson Valley Turnpike (1862-1864). A segment of this linear resource is documented along State Route 4. A across the southern end of the Bear Valley survey area. A 0.3-mile paved segment of the historical alignment of the trail and turnpike lies at the extreme southern end of the survey area, paralleling the highway. Much of the turnpike was constructed in 1862 and closely parallels or is built upon the earlier Carson Valley to Murphy's Emigrant Trail. This resource, also known as the Ebbetts Pass Route (No. 318), is one of several California Historical Landmarks in Alpine County. Early cattleman Harvey Blood collected tolls at a station just east of the project area between 1864 and 1910.

5.0 RESEARCH DESIGN

The objective of this cultural resource assessment was to identify archaeological, built-environment, and architectural resources that might be present in the project survey areas and any significant historical resources (i.e., cultural resources eligible for the CRHR) located within the project APE.

Following California BLM standards and California OHP guidelines, GBCG completed pedestrian survey in each of the three project areas. The goals of the inventory were: 1) to identify and document known and unidentified resources present within the survey areas; 2) to evaluate resources for CRHR eligibility as necessary; and 3) assess and potential adverse effects to any resources that may occur within the footprint each project area. An additional objective entailed an assessment of potential adverse impacts to identified historical resources and recommendations for avoidance.

5.1 FIELD METHODS

GBCG employed Class-III pedestrian survey as defined by the California BLM Guidelines for a Cultural Resources Inventory (BLM 2009). Five procedural rules guided the survey portion of the inventory (Table 5). As this inventory focuses on pieces of real estate, rather than at problem-oriented archaeological research, spatial control is key.

Table 5. Procedural rules for systematic pedestrian survey (Dancey 1974).

Rule 1.	Inspect the surface for artifacts and features.
Rule 2.	Sample the environmental diversity of the survey area.
Rule 3.	Work within explicitly defined units.
Rule 4.	Cover the ground in a patterned course.
Rule 5.	Record exact locations of artifacts and features in as many cases as possible.

GBCG used a global positioning system (GPS) receiver with sub-meter accuracy to locate survey area boundaries and to maintain survey accuracy for resource mapping. Individual survey transect spacing was maintained using a recreational Garmin GPS unit and Universal Transverse Mercator coordinates to achieve transit precision. Field data was recorded on a GPS receiver with sub-meter accuracy. GBCG collected all data necessary on newly identified cultural resources to complete the appropriate State of California Department of Parks and Recreation (DPR) Series 523 site forms. Digital images of the survey area, artifacts, features, and resource overviews, were taken with a Ricoh WG-4 16-megapixel digital camera with a 4.5-18mm lens, five feet above the ground surface.

6.0 RESULTS

Between August 17 and 21, 2020, previously un-surveyed portions of the three project areas were investigated for cultural resources; all previously recorded site locations within the project areas were visited, although one site could not be found (Table 6). Five new archaeological sites and two isolated finds were identified and recorded during the survey (see survey results maps in Appendix B). DPR 523 forms for these resources, as well as updated site forms for five previously recorded resources (CA-ALP-238, -269, -270, -271, and -272H) are presented in Appendix H. GBCG submitted all DPR 523 resources forms, as well as all digital geo-spatial data (GIS) to the CCIC to update the state CHRIS database.

Table 6. Archaeological resources identified in the Manzanita, Markleevillage, and Bear Valley project areas.

Project Area	State No.	Primary No.	Field No.	Age	Description	Resource Attribute & Code	Preliminary CRHR Status
Manzanita			ALP-1	H	Historic debris at spring on Davis Property	Stock Grazing Camp AH16	Not Eligible

Project Area	State No.	Primary No.	Field No.	Age	Description	Resource Attribute & Code	Preliminary CRHR Status
Manzanita			ALP-2	H	Possible Road on Davis Property	Roads-Trails-RR AH7	Not Eligible
Manzanita			ALP-3	H	Irrigation ditch on Davis Property	Water Conveyance Feature AH6	Not Eligible
Manzanita			ALP-4	H	Olympia Church-Key opened Can	Isolate/Other AH16	Not Eligible
Markleevillage Outside APE	**CA-ALP-238**	**P-02-315**	**ALP-5**	**B**	**Lithic Scatter on Markleeville Creek Terrace**	**Lithic Scatter - AP2, Trash Scatter - AH4**	**Eligible;** *Update DPR 523*
Markleevillage			**ALP-6**	**B**	**Lithic Scatter on Markleeville Creek Terrace**	**Lithic Scatter - AP2; Trash Scatter - AH4**	**Eligible**
Markleevillage *Outside APE*			ALP-7	B	Lithic Scatter at Miller Property	Lithic Scatter - AP2; Trash Scatter - AH4	Not Eligible
Markleevillage			ALP-8	H	Evaporated milk can	Isolate/Other AH16	Not Eligible
Markleevillage	CA-ALP-269	P-02-346	Thornburg	P	Bedrock Milling Feature	Bedrock Milling Feature AP4	Not Eligible; *Update DPR 523*
Markleevillage	**CA-ALP-270**	**P-02-347**	**Chavarin**	**P**	**Bedrock Milling Feature**	**Bedrock Milling Feature AP4**	**Eligible; *Update DPR 523***
Markleevillage	CA-ALP-271	P-02-348		P	Lithic Scatter; *unable to re-locate*	Lithic Scatter AP2	Not Eligible; *Update DPR 523*
Markleevillage	CA-ALP-272H	P-02-349		H	Can Dump; Mis-plotted	Dump/Trash Scatter AH4	Not Eligible; *Update DPR 523*
Markleevillage	CA-ALP-512	P-02-0658		H	Markleeville Town Ditch	Water conveyance Feature AH06	Not Eligible; *DPR adequate*
Markleevillage	CA-ALP-779	P-02-1056		H	Hot Springs Road	Roads, Trails, RR AH07	Not Eligible; *DPR adequate*
Markleevillage	CA-ALP-780	P-02-1057		H	Muller 1296 Circuit Transmission Line	Public Utility/Building HP09; Engineering Structure HP11	Not Eligible; *DPR adequate*

BOLD: resource is eligible for the California Register of Historic Resources; P: Prehistoric, H: Historic, B: Historic & Prehistoric

6.1 MANZANITA UNIT RESULTS

The Manzanita project area lies along the west side of Hwy. 89 just south of Woodfords, California. The northern quarter of the project area has been inventoried previously, and pedestrian access was denied. Open meadows characterize the eastern portion of the project area, and steep slopes define the western edge. No archaeological sites or built-environment resources were previously recorded within the unit. The record search showed that most prehistoric sites or contact period Native American sites occur along meadow margins or at the forest/meadow interface. Historic trash dumps parallel Hwy. 89 and the historic "Road to Woodfords".

Three sites and one isolated find were identified during the Manzanita archaeological survey (see map in Appendix B). ALP-1 consists of scattered historic debris and possible tent platform or dugout adjacent to a spring in the

southwest corner of Alpine County parcel APN 002-230-040-0, the Davis Property. One brown stoneware sherd is in the vicinity and cast iron stove parts are present. A shallow, rectangular 10-x-20-foot platform is excavated into the hill slope. Split rail fence posts with cut nails are present on site. ALP-1 contains few artifacts and is not considered eligible to the California Register of Historic Resources.

ALP-2 consists of a 10-foot-wide road or trail trace that trends northeasterly through on the Davis property in APN 002-230-050-0 and APN 002-230-048-0. The road alignment is discernible for approximately 240 feet yards before it disappears into a forested area with heavy duff. Slight berms and cut banks were noted where the road is discernible, and it is heavily utilized by cattle. The site is not is not considered eligible to the CRHR.

ALP-3 is a shallow, inactive irrigation ditch that generally follows the meadow edge in parcel APN 002-230-048-0. The ditch is 18 inches deep and four feet wide from berm to berm at its maximum. Banks are heavily slumped, and the ditch does not appear to have been recently used. ALP3 is not is not considered eligible to the CRHR.

ALP-4 is an isolated find single, steel, key opened Olympia beer can. It roughly dates to the 1950s or early 1960s. This isolated historic-period artifact is not considered eligible for the CRHR.

6.1.1 MANZANITA UNIT RECOMMENDATIONS

None of the resources identified within the Manzanita project area are considered eligible to the California Register of Historic Resources. Proposed fuel treatment activities will have no effect on historic resources within the fuel treatment unit.

Given poor ground surface visibility and dense vegetation encountered during fieldwork, archaeological, paleontological, and historical features could be encountered during any of the ground disturbance associated with the proposed projects. As always, if any human burials are encountered, work in that area must cease and the immediate area secured, so that the lead agency can contact the county coroner and, if appropriate, interested Tribes and the Native American Heritage Commission.

6.2 MARKLEEVILLAGE UNIT RESULTS

The Markleevillage project area is located south of Hot Springs Road 0.25 to 1.5 miles southwest of Markleeville. Scattered homesites characterize the core of Markleevillage. A large agricultural parcel, APN 002-340-001-0, lies west of Markleevillage and four undeveloped or lightly parcels lie to the east. Approximately 300 acres within and surrounding Markleevillage will be treated. Both APN 002-340- 001-0 and APN002-340-011-0 (160 acres) were previously inventoried for cultural resources. Seven previously recorded resources occur within the project area (see map in Appendix B). The sites within the project area were re-visited and resource documentation was updated, as necessary.

One dual-component site (ALP-238/P-02-315) lies just outside of the project area but was visited due to its proximity to proposed fuels reduction activities. That site along with CA-ALP-270/P-02-347, contains bedrock milling features, and lithic waste materials. Both sites retain integrity however, CA-ALP-270 lies just off Sawmill Road and no pestles or lithic materials were observed in the vicinity of the bedrock mortars, as indicated in the original site from. Both sites are considered eligible to the CRHR.

ALP-269/P-02-346 was originally recorded in 1990 and contained milling features along with a sparse lithic scatter. When revisited, the site location was re-mapped within an area 250 feet southeast of its original recording. Lithic materials were not observed and the bedrock grinding feature locations were not consistent with the site sketch map. The location was verified based upon the site location narrative, a standing water pipe, and utility pole depicted on the site sketch map. Slight grinding surfaces were present on the sides of two boulders. Water pipe

fragments were present in the vicinity, and light surface disturbance was present suggesting that the site may have been disturbed since its 1990 recording. The lack of site integrity suggests that ALP-269 is no longer eligible to the CRHR.

Based upon descriptions in the site record, ALP-272H/P-02-349 was re-located approximately 565 feet northeast of its mapped location. The site is a domestic refuse dump dating from the late 1930s to the 1940s. The site description is consistent with the 1990 site record; however the "bed spring" is actually springs from a car or truck seat. ALP272H is not eligible to the CRHR. The road bisecting ALP-271H/P-02-348 was walked from Markleeville Creek to the ridgetop in an attempt to relocate that site. No lithic materials were noted anywhere along the road as described in the 1990 site record. The site could not be re-evaluated.

Three linear cultural resources have previously been documented and evaluated along Hot Springs Road (Orvald et al. 2018). They consist of the Hot Springs Road alignment (ALP-779/P-02- 1056), the Muller 1296 Circuit Transmission Line (ALP-780/P-02-1057), and Markleeville Town Ditch (ALP-512/P-02-0658). Segments of each linear feature bisect portions of the Markleevillage project area. These historic resources were recorded/updated and evaluated in 2018. None meet the eligibility requirements of the CRHR.

Two new archaeological sites were located within the Markleevillage project area. ALP-6 consists of a dispersed scatter of debitage, glass, and ceramic fragments located on a terrace between Hot Springs Road and an along Markleeville Creek. The site contains two distinct concentration areas. No temporally diagnostic tools or groundstone are present. It is confined to a 270 sq. meter area along an open, southwest side of the low ridge. CA-ALP-238/P-02-315 lies atop another terrace 100 meters southeast of ALP-6. Additional research at ALP-6 could address pertinent research questions relating to ethno-historic land use within the eastern Sierra (CRHR Consideration D). Site ALP-6 is considered eligible to the CRHR.

Archaeological ALP-7 consists of a very small lithic scatter and tin cans located outside of the project area just south of APN 002-250-015-0 above a bend in Markleeville Creek. No temporally diagnostic tools or groundstone were observed at the site. Cultural materials appear to be confined to the site surface. Site ALP-7 is not considered eligible to the CRHR.

Resource ALP-8 consists of a single hole-in-top evaporated milk can located at the eastern edge of parcel APN 002-250-015-0. The isolated artifact not considered eligible for the CRHR.

Markleevillage subdivision proper consists of 136 parcels ranging in size from 0.27 to 5.0 acres. Nineteen of these parcels are undeveloped/vacant lots (see parcel map in Appendix G). Occupied lots were not surveyed for cultural resources. Vacant lots were photographed from adjacent streets and if potential resources (bedrock mortar stations, historic structures, etc.) were visible, they were physically inspected. No cultural resources were apparent on vacant lots within the Markleevillage subdivision.

6.2.1 MARKLEEVILLAGE UNIT RECOMMENDATIONS

Two previously recorded sites and one newly recorded site are considered eligible the CRHR within the Markleevillage project area. Site ALP-238/P-02-315 and ALP-270/P-02-347 contain bedrock grinding features and a surface archaeological component. ALP-6 is a lithic scatter with a historic component that may address important research questions. CA-ALP-269 consists of a disturbed milling station. While the site lacks integrity, it may be of cultural significance to the Washoe Tribe and should be treated as a significant resource.

Treatment activities within a 100-foot radius of each site boundary should be limited to hand thinning. Prior to initiation of fuels management activities, the buffered area surrounding the sites should be flagged for avoidance.

Mechanical thinning, access roads, skid trails, and staging should not be permitted within the buffered site boundary. Pile burning should not be conducted within the flagged boundaries.

ALP-238/P-02-315 lies just south of the Markleevillage project boundary. All fuels treatment activities should be restricted to the project boundaries to avoid adverse effects to this site. Adherence to the avoidance measures will result in no adverse effects to known cultural resources.

Given poor ground surface visibility and dense vegetation encountered during fieldwork, archaeological, paleontological, and historical features could be encountered during any of the ground disturbance associated with the proposed projects. As always, if any human burials are encountered, work in that area must cease and the immediate area secured, so that the lead agency can contact the county coroner and, if appropriate, interested Tribes and the Native American Heritage Commission.

6.3 BEAR VALLEY UNIT RESULTS

The Bear Valley project area is located within the western half of the Bear Valley Community in western Alpine County. It is bordered by Stanislaus Forest managed lands that have been previously treated. The project area covers approximately 130 acres, comprising 269 platted lots. The entire Bear Valley project area and its periphery have been previously inventoried for cultural resources. Four prehistoric archaeological sites have been recorded in or near the Bear Valley Community. While outside of the project area, they are a concern of the Washoe Tribe.

Of the 269 platted lots within the Bear Valley project area, 34 are undeveloped/vacant lots. Occupied lots were not surveyed for cultural resources. Vacant lots were photographed from adjacent streets and if potential resources (bedrock mortars, historic structures, etc.) were visible, they were physically inspected. An open meadow adjacent to SR-4 in the southeast corner of the project area was traversed at 15-meter intervals. Approximately 0.78 acres were inspected. No cultural resources were apparent on vacant lots within the Bear Valley project area.

6.3.1 BEAR VALLEY UNIT RECOMMENDATIONS

Hand thinning and community collection sites are prescribed for the Bear Valley project area. No cultural resources are located within the project boundaries. Proposed fuel treatment activities will have no effect on cultural resources within the Manzanita project area.

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APPENDIX A – KEY PERSONNEL RESUMES

Michael Drews

Great Basin Consulting Group, LLC

Education: B.A. Anthropology, University of San Francisco

Professional Experience

Great Basin Consulting Group, LLC - Carson City, Nevada, April 2014 to present

Director: Michael Drews created Great Basin Consulting Group, LLC (GBCG) in April 2014 after a long tenure with Gnomon, Inc. GBCG specializes in cultural resource consulting, inventory, and predictive modeling for Section 106, NEPA, and CEQA regulatory compliance for federal, state, and municipal governments; private industry and development; the military; and the scientific community in the western United States. Mr. Drews has over 40 years of experience conducting archaeological research with 13 years of experience developing and implementing cultural resource models using Geographic Information Systems (GIS).

Mr. Drews has provided expertise for a wide range of cultural resource management projects in the Great Basin, California, and the Pacific Northwest, including archaeological survey/testing/data recovery; geomorphology; faunal analysis; collections management; public outreach; built-environment assessment; and National Register of Historic Places (NRHP) and California Register of Historic Resources (CRHR) resource evaluation. Mr. Drews is proficient with ESRI software and GPS mapping systems, and Total Station survey. Mr. Drews has been listed as Principal Investigator in Prehistoric and Historic archaeology on BLM Nevada, Oregon, and Washington Cultural Resource Permits.

Gnomon, Inc., Carson City, Nevada, 2000 – March 2014
Cultural Resource Project Manager: Michael Drews managed cultural resource related projects for Gnomon, specializing in creation of cultural resource management systems, cultural resource inventories, predictive models, and NRHP evaluation.

Nevada Department of Transportation, Carson City, Nevada, 1991 – 2000
Archaeologist II: Nevada Department of Transportation, Carson City. Plan, coordinate, and supervise archaeological field projects related to development of highway right-of-way and materials sources.

Intermountain Research, Silver City, Nevada, 1982 – 1991
Staff Archaeologist: Coordinated and supervised field projects, mapping, drafting, and graphics department.

Ancient Enterprises, Santa Monica, California, 1978 – 1982
Staff Archaeologist: Supervised archaeological field projects in the Great Basin and Chumash cultural area of Southern California. Responsible for project budget, logistics, and report preparation.

ARCHEOTEC, Inc., Oakland California, 1976 – 1978
Archaeologist: Testing & monitoring for historic-period sites and cargo ship remains in San Francisco.

Appointments

Carson City Historic Resources Commission, 1989 – Present
Appointed to the Carson City Historic Resources Commission by the Carson City Board of Supervisors. Advises Board of Supervisors on matters concerning identification, designation, preservation and enhancement of sites and structures of historic significance. Elected Commission chairman 2004-2013 and 2016.

Preserve Nevada, 2015 – present
Preserve Nevada is a statewide nonprofit organization dedicated to the preservation of Nevada's cultural, historical, and archeological heritage. In partnership with the University of Nevada and the National Trust for Historic Preservation, Preserve Nevada's purpose is to help identify and meet the special needs of the state's preservation community - Member of Board of Directors.

Sierra Front, Northwest Great Basin Resource Advisory Council, 2009 – 2012
Appointed to the Sierra Front/Northwest Great Basin Resource Advisory Council (RAC) by the Secretary of the Interior. RAC recommendations address public land issues, including: land-use planning, recreation, noxious weeds, and wild horse and burro herd management.

Carson River Advisory Committee, 1994 – 1997
Appointed to the Carson River Advisory Committee representing Cultural Resource, Native American and Virginia & Truckee Railroad (V&T) issues. Development and implementation of the Carson River Master Plan.

Select Cultural Resource Projects

2014-2019: Conducted various Cultural Resource Inventory, Cultural Resource Monitoring, Cultural Resource Sensitivity Modeling, GIS development and spatial analysis projects for Great Basin Consulting Group, LLC. Clients included engineering firms, local governments, mining companies, and public utilities.

2000-2014: Cultural Resource Inventory projects, Cultural Resource Information System Development and Cultural Resource Sensitivity Modeling for Gnomon, Inc. GIS/database programming and spatial analysis.

2007: Data conversion of selected archival records and maps at the Northwest Information Center and North Coastal Information Center/ California Office of Historic Preservation for Natural Resource Conservation Service.

2005: Examination of Fire Effects on Prehistoric Period Cultural Resources in Nevada. With MACTEC Engineering, conducted a study on the effects of fire on selected classes of cultural resources for the Nevada Bureau of Land Management.

2004: Cultural Resources Predictive Modeling for the Humboldt Toiyabe National Forest. Created an environmental based cultural resource model for fire management and grazing on Forest Service lands.

2004-1979: Principal Investigator, Field Supervisor and Crew Chief for various cultural resource inventory and mitigation projects in Nevada, California, Oregon, and Wyoming.

Professional Affiliations

Great Basin Archaeological Association
Society for California Archaeology
Society for Historic Archaeology
Society for American Archaeology

Tucker Orvald, M.S., RPA

Great Basin Consulting Group, LLC

Education

M.S., Cultural Resource Management, Central Washington University (CWU), Ellensburg
B.A. Anthropology, University Washington, Seattle

Professional Profile

Tucker Orvald is a Secretary-of-Interior (SOI) Qualified Archaeologist with proven skill developing and implementing effective cultural resource regulatory compliance strategies for a wide range of undertakings. Mr. Orvald has 25+ years experience in professional archaeology with focus on prehistory, contextual history, pedestrian survey, Section-106 assessment, technical reporting, editing, and mapping systems. He has served as faculty research associate and as professional archaeologist for several consulting shops and has with sound experience working in Nevada, California, Washington, Oregon, Utah, and Idaho. He is author, co-author, and editor of more than 250 technical reports.

Tucker has a broad knowledge base in North American archaeology, cultural resource management (CRM), and the rigors of conducting fieldwork across the Intermountain West. He has proficiency conducting cultural resource investigations for compliance with Sections 106 and 110 of the National Historic Preservation Act, CEQA, Washington's State Environmental Quality Act (SEPA), and NEPA team experience. He has operated as a professional archaeologist conducting records searches, pedestrian surveys, testing, treatment plan formulation, data recovery, and monitoring projects under review of the Bureau of Land Management (BLM), National Park Service, Bureau of Reclamation, Army Corps of Engineers, Forest Service, Department of Defense, and the FCC. He also has completed 100 Section 106/NEPA telecom projects.

Work History

Principal Investigator - Great Basin Consulting Group, Carson City, Nevada, April 2020 – Present
Principal Investigator - Trileaf Corporation, Carson City, Nevada, 2019-2020
Principal Investigator - Farwestern Anthropological Research Group, Carson City, Nevada, 2013-2018
Principal Investigator - ASM Affiliates, Reno, Nevada, 2011-2012
Co-Director Central Washington Archaeological Survey & Faculty Research Associate - CWU, 2005-2011
Principal - Northwest Geocultural Consulting, Ellensburg, Washington, 2006-2013
Field Director - Tetra Tech FW, Bothell, Washington, 2004-2005
Field Director & GPS Mapping Specialist - Earth Imaging Associates, Ellensburg, Washington, 2000-2004
GIS Technician - Yakima County GIS Department, 1999-2001
Archaeologist - Archaeological & Historical Services, Cheney, Washington, 1996-1999
Crew Chief & Cartographer - Far Western, Davis, California, 1993-1996
Lead Archaeological Field Technician - InfoTech Research, Eugene, Oregon, 1991-1992
Archaeological Technician - Mendocino National Forest, Stonyford, California, 1989-1990 (summers)

Certifications & Affiliations

Register of Professional Archaeologists (RPA No. 9089383)
State of Nevada Antiquities Permit: Principal Investigator/Field Director
BLM Nevada Permitted Principal Investigator (statewide prehistoric & historic archaeology)
BLM California Permitted Principal Investigator
State of Utah Permitted Principal Investigator (No. 316)
Oregon Qualified Archaeologist (ORS 390.235
Washington State Department of Archaeology & Historic Preservation WISAARD access
Barrick Gold Courageous Leadership Training, Elko, Nevada
Mine Safety & Health Administration (MSHA) surface miner training certificate
Earthwatch Institute Research Project Training, Ipswich Massachusetts

APPENDIX B – INVENTORY RESULTS MAPS

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APPENDIX C – CCIC RECORDS SEARCH LETTER

CENTRAL CALIFORNIA INFORMATION CENTER
California Historical Resources Information System
Department of Anthropology – California State University, Stanislaus
One University Circle, Turlock, California 95382
(209) 667-3307

Alpine, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus & Tuolumne Counties

Date: 6/11/2020

Records Search File No.: 11413K
Access Agreement: #281
Project: Alpine County Wildland Urban Interface Fuels Management Project: Bear Valley, Manzanita, Markleevillage Project Areas

Michael Drews
Great Basin Consulting Group, LLC
200 Winters Drive
Carson City, Nevada 89703 mdrews@greatbasingroup.com
775-560-5807

Dear Mr. Drews:

The Central California Information Center received your record search request for the project areas and radii referenced above, located on the Markleeville, Tamarack and Woodfords 7.5' quadrangles in Alpine County and Calaveras County. The following reflects the results of the records search for the project study area and radius:

As per data currently available at the CCaIC, the locations of resources/reports are provided in the following format: ☐ custom GIS maps ☒ shape files ☐ hand-drawn maps

Summary Data: Bear Valley

Resources within the project area:	2: P-02-000182, 364
Resources within the 1-mile radius:	40: See Resource Database List and Excel Spreadsheet
Reports within the project area:	11: AP-00034, 168*, 169* 1683*, 1787, 1935, 3324, 3510, 5527, 5748, 9146* *Also reported on in Calaveras County with the same number; duplicate reports not sent
Reports within the 1-mile radius:	49: See Report Database List and Excel Spreadsheet

(See Bear Valley folder for copy of Reply letter)

Summary Data: Manzanita

Resources within the project area:	2: P-02-000705, 707
Resources within the 1-mile radius:	51: : See Resource Database List and Excel Spreadsheet
Reports within the project area:	6: AP-00021, 5498*, 5501*, 5507*, 6083, 9146* *Duplicate reports for other areas, copy sent only once
Reports within the 1-mile radius:	30: See Report Database List and Excel Spreadsheet

Summary Data: Markleevillage

Resources within the project area:	8: P-02-000346, 347, 348, 349, 548, 658, 1056, 1057
Resources within the 1-mile radius:	72: : See Resource Database List and Excel Spreadsheet
Reports within the project area:	10: AP-000002, 4, 20, 36, 1477, 1478, 3050*, 4310, 4734, 8743 *Duplicate report for other area, copy sent only once
Reports within the 1-mile radius:	17: See Report Database List and Excel Spreadsheet

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database Records:	☒ enclosed	☐ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☒ enclosed	☐ not requested	☐ nothing listed

OHP Historic Properties Directory: New Excel File: Built Environment Resource Directory (BERD)

Dated 12/17/2019 (no charge)	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☒ enclosed	☐ not requested	☐ nothing listed
CA Inventory of Historic Resources (1976):	☒ enclosed	☐ not requested	☐ nothing listed

Complete Alpine County information for the three data-sets above is provided for your use in determining if any of the resources are listed in your project areas/radii**. See Bear Valley folder.**

Caltrans Bridge Survey:	☐ enclosed	☐ not requested	☐ nothing listed
Ethnographic Information:	☒ enclosed	☐ not requested	☐ nothing listed
See data in reports			
Historical Literature:	☒ enclosed	☐ not requested	☐ nothing listed
See data in reports			

Historical Maps: ☐ enclosed ☐ not requested ☐ nothing listed
Data not available at this time
Local Inventories: ☐ enclosed ☐ not requested ☒ nothing listed
GLO and/or Rancho Plat Maps: ☒ enclosed ☐ not requested ☐ nothing listed
T7N R17E 1879
T10N R20E 1877
See Bear Valley folder.

Shipwreck Inventory: ☒ not available at CCIC; please go to
http://shipwrecks.slc.ca.gov/ShipwrecksDatabase/Shipwrecks_Database.asp
Soil Survey Maps: ☒ not available at CCIC; please go to
http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Requests made after initial invoicing will result in the preparation of a separate invoice.

Thank you for using the California Historical Resources Information System (CHRIS).

Note: Billing will be transmitted separately via email by our Financial Services office *($4797.88), payable within 60 days of receipt of the invoice.

If you wish to include payment by Credit Card, you must wait to receive the official invoice from Financial Services so that you can reference the CMP # (Invoice Number), and then

contact the link below:

https://commerce.cashnet.com/ANTHROPOLOGY

Sincerely,

E. A. Greathouse

E. A. Greathouse, Coordinator
Central California Information Center
California Historical Resources Information System

* Invoice Request sent to: Laurie Marroquin CSU Stanislaus Financial Services
lamarroquin@csustan.edu

APPENDIX D – MANZANITA RECORDS SEARCH

PREVIOUSLY RECORDED CULTURAL RESOURCES

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MANZANITA RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000100	CA-ALP-000404H	TY-4158; Old Alpine State Highway	Historic	AH07	AP-02933, -05498, -05501, -05507, CA-05498	-
P-02-000101	CA-ALP-000405H	-	Historic	AH04; AH05; AH06; AH11	AP-02933, -05498, -05501, -05507, CA-05498	-
P-02-000102	CA-ALP-000406H	-	Historic	AH07	AP-02933, -05498, -05501, -05507, -08916, CA-05498	-
P-02-000108	CA-ALP-000006	-	Prehistoric	AP14	AP-01441	-
P-02-000110	CA-ALP-000008	Votaw 1	Prehistoric, Proto-historic, Historic	AH16; AP16	AP-01441	-
P-02-000115	CA-ALP-000013	-	Prehistoric	AP02; AP16	-	-
P-02-000116	CA-ALP-000014	-	Prehistoric	AP02; AP04; AP16	-	-
P-02-000158	CA-ALP-000056	-	Prehistoric	AP04; AP16	AP-00013	-
P-02-000165	CA-ALP-000063	-	Prehistoric	AP02; AP04	AP-00013, -00022, -01480, -03016, -07055	-
P-02-000186	CA-ALP-000105	-	Prehistoric	AP02; AP15	AP-00005, -01481, -05498, -05501, -05507, CA-05498	-
P-02-000202	CA-ALP-000121H	-	Historic	AH04	AP-00039	-
P-02-000203	CA-ALP-000122H	JS-SLT-3; Combined with P-02-000408 under that number	Historic	AH02	AP-00039, -03016	-
P-02-000204	CA-ALP-000123H	-	Historic	AH04	AP-00039	-

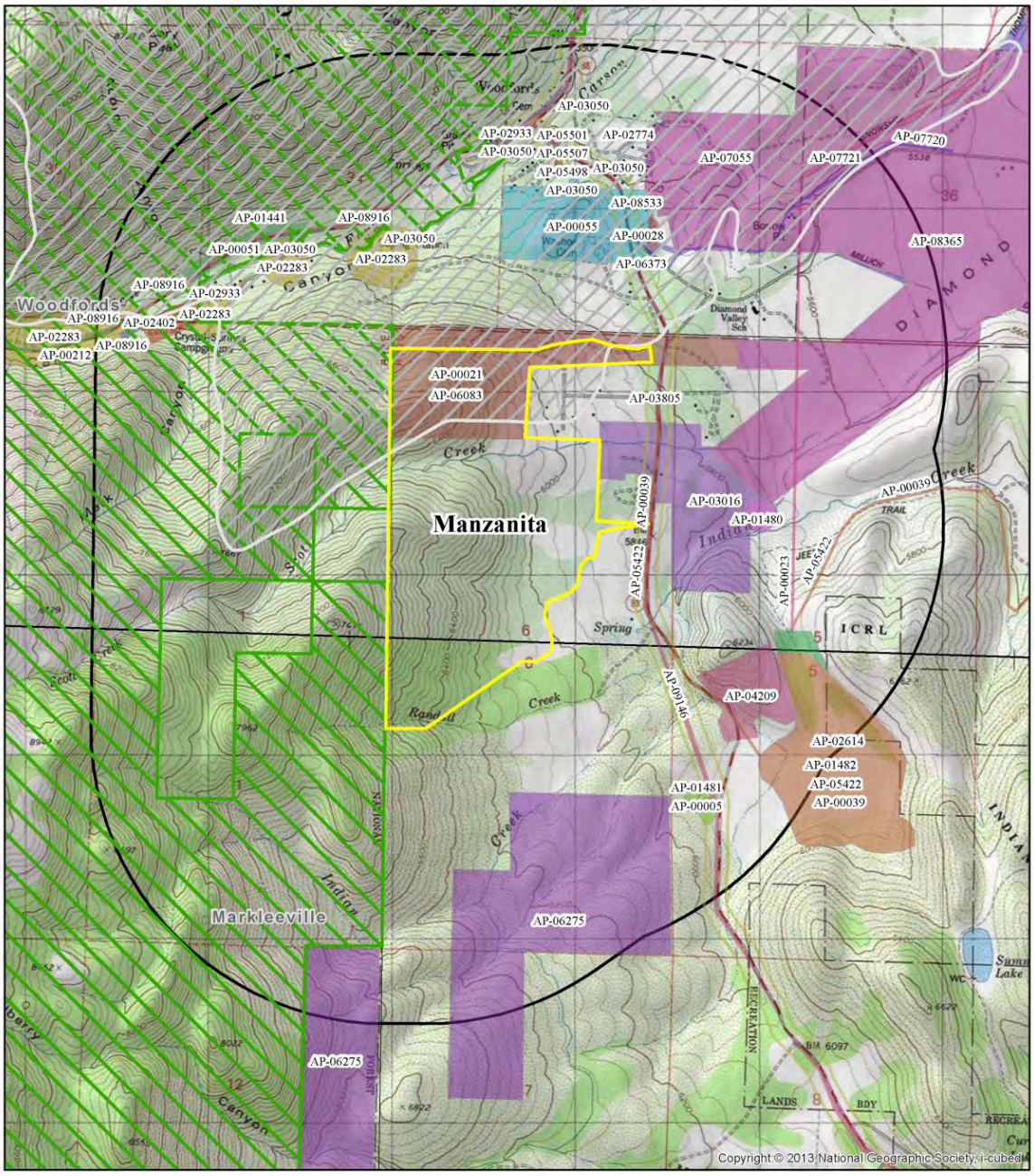
MANZANITA RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000205	CA-ALP-000124	JS-SLT-5	Prehistoric	AP02	AP-00039, -03016, AP-07055	-
P-02-000228	CA-ALP-000147	-	Prehistoric	AP02; AP05; AP15		-
P-02-000277	CA-ALP-000196H	Mormon-Carson Emigrant Trail; Carson Pass Emigrant Road; Old Emigrant Road; CHL No. 661	Historic	AH07; HP37	AP-00014, -00025, -00037, -00038, -03465, -05498, -05501, -05507, -07409, -07430, CA-05498	-
P-02-000332	CA-ALP-000255H	Woodfords Washoe Tribe Cemetery	Historic	AH12; HP40	AP-00055, -05498, -05501, -05507, CA-05498	-
P-02-000337	CA-ALP-000260/H	Fowler Site	Prehistoric, Historic	AH04; AH16; AP02; AP04	AP-00021, -05498, -05501, -05507, CA-05498	-
P-02-000407	CA-ALP-000407/H	HR-1	Prehistoric, Historic	AH04; AP04	AP-03016	-
P-02-000408	CA-ALP-000408H	HR-2; Combined Sites CA-ALP-408H & -122H	Historic	AH02; AH03; AH04; AH05; AH06; AH07; AH11	AP-03016, -05498, -05501, -05507, CA-05498	-
P-02-000409	CA-ALP-000409H	Hawkins Ranch; Milberry Home	Historic	HP02; HP04; HP33	AP-03016, -05498, AP-05501, -05507, CA-05498	-
P-02-000486	-	Pony Express Remount Station at Woodfords; CHL 805	Historic	HP26	-	-
P-02-000531	CA-ALP-000482/H	WQ-1	Prehistoric, Historic	AH04; AP02; AP04	AP-04209, AP-05507	-

MANZANITA RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000532	CA-ALP-000483H	JR-6 / Old Highway 89	Historic	AH04; HP19; HP37	AP-04209, -05431, -05498, -05501, -05507, -08101, CA-05498	-
P-02-000533	-	WQ-FL-1	Historic	HP46	AP-04209, -05498, -05501, -05507, CA-05498	-
P-02-000534	-	WQ-LF-2	Historic	HP46	AP-04209	-
P-02-000535	-	WQ-IF-1	Prehistoric	AP02	AP-04209	-
P-02-000536	-	WQ-IF-2	Prehistoric	AP02	AP-04209	-
P-02-000537	-	WQ-IF-3	Prehistoric	AP02	AP-04209	-
P-02-000538	-	WQ-IF-4	Prehistoric	AP02	AP-04209	-
P-02-000539	-	WQ-IF-5	Prehistoric	AP02	AP-04209	-
P-02-000612	CA-ALP-000716	FL-104; 4170613366	Prehistoric	AP02; AP04	AP-05498, -05507	-
P-02-000704	CA-ALP-000531H	RB-1	Historic	AH04; AH07	AP-06083	-
P-02-000705	-	ISO-1	Historic	AH16	AP-06083	**Yes; *Isolated Find***
P-02-000706	-	ISO-2	Prehistoric	AP02	AP-06083	-
P-02-000707	-	ISO-3	Historic	AH04	AP-06083	**Yes; *Isolated Find***
P-02-000712	-	-	Prehistoric	AP04	-	-
P-02-000716	CA-ALP-000539H	RKL-4	Historic	HP20	AP-06275	-

MANZANITA RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000720	CA-ALP-000543H	RKL-8	Historic	AH04	AP-06275	-
P-02-000721	CA-ALP-000544H	RKL-9	Historic	AH04; AH10	AP-06275	-
P-02-000738	-	Iso-O	Prehistoric	AP16	AP-06275	-
P-02-000739	-	Iso-P	Prehistoric	AH16	AP-06275	-
P-02-000740	-	Iso-Q	Prehistoric	AH16	AP-06275	-
P-02-000741	-	Iso-R	Prehistoric	AH15	AP-06275	-
P-02-000742	-	Iso-S	Prehistoric	AH16	AP-06275	-
P-02-000743	-	Iso-T	Prehistoric	AP16	AP-06275	-
P-02-000821	CA-ALP-000584H	04170107097	Historic	AH04; HP30	AP-06948	-
P-02-000838	CA-ALP-000599/H	PA-07-G58	Prehistoric, Historic	AH03; AP04; HP02	AP-07055	-
P-02-000956	CA-ALP-000709H	4170613367; Irrigation Ditch 1	Historic	AH06	-	-
P-02-000957	CA-ALP-000710	4170613368; BRM 1	Prehistoric	AP04	-	-
P-02-000958	CA-ALP-000711H	4170613369; Meadow Debris	Historic	AH04	-	-
P-02-001043	CA-ALP-000769H	Alpine County Road House, Road Commissioner's House	Historic	AH04; HP01; HP02	AP-08533	-
P-02-001057	CA-ALP-000780H	Muller 1296 Circuit Transmission Line	Historic	HP09; HP11	AP-08743, -08916	-

BOLD: Resource is located in the survey area.

MANZANITA SURVEY AREA – PREVIOUS STUDIES



USGS Woodfords, USGS Markleeeville 7..5 min
T.11N. R.19E., T.10N. R.20E., T.10N. R.21E.

Legend

- Project Area
- Record Search Buffer
- NV_Fires_1910_1999
- BasicOwnershipR4_HTNF_20180924

Report Number

AP-00005, AP-00021, AP-00028, AP-00039, AP-00051, AP-00055, AP-00212, AP-01441, AP-01480, AP-01481, AP-01482, AP-02283, AP-02402, AP-02614, AP-02774, AP-02933, AP-03016, AP-03050, AP-04209, AP-05422, AP-05498, AP-05501, AP-05507, AP-06083, AP-06275, AP-06373, AP-07055, AP-07564, AP-07721, AP-08365, AP-08533, AP-08916, AP-03805, AP-00023, AP-00039, AP-03059, AP-05422, AP-07720, AP-09146

N W E S

0 0.25 0.5 0.75 1 Miles

0 0.5 1 1.5 2 Kilometers

MANZANITA RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	REPORT TITLE	YEAR	AUTHOR(S)	AFFILIATION	OTHER IDS.
AP-00005	*Final Report: Phase II Archaeological Investigations at 4-ALP-105 on Highway 89 Between Woodfords and Markleeville, California*	1976	Cook, R. A.	Office of Environmental Planning	NADB-R-1360010
AP-00021	*Fowler Fire Salvage Timber Sale, Cultural Resources Survey Report*	1989	Hardy, K. D.	Kathryn D. Hardy, Archaeologist; for James Oden, RPF, for CDF project	NADB-R-1360033
AP-00023	*Cultural Resources Report Addendum: Alpine County, California, An Archaeological Survey of Proposed Wastewater Facilities Modifications, Diamond Valley, Alpine County, California (IMR #442A)*	1983	Elston, R. G., and C. Callaway	Intermountain Research	NADB-R-1360020
AP-00028	*A Cultural Resources Reconnaissance of the Fire Station at the Public Works Complex, Woodfords, Alpine County, California*	1984	Lindstrom, S. G.	Susan G. Lindstrom, Archaeological Consultant; for Alpine County	NADB-R-1360051
AP-00039	*Cultural Resource Assessment of the Proposed South Lake Tahoe Public Utilities District Wastewater Treatment Facilities, Phase II*	1978	Peak, A. S.	Ann S. Peak and Associates, Consulting Archaeology; for South Lake Tahoe Public Utilities District	NADB-R-1360061
AP-00051	*Negative Archaeological Survey Report; 10-Alpine-88; PM 17.9/18.3*	1990	Schulte, J. L.	Department of Transportation	NADB-R-1360078
AP-00055	*Cultural Resources Report; Woodfords Land Exchange; Report TY-87-451; Carson Ranger District*	1987	Turner, A. L.	Carson Ranger District, Toiyabe National Forest; USDA USFS	NADB-R-1360081; TY-87-451
AP-00212	*Cultural Resources Scoping on Alp-88, P.M. R16.3/17.3*	1991	Nissen, K.	Karen Nissen, Dist. 6, Environmental Analysis Branch B	NADB-R-1360057
AP-01441	*Some Archaeological Sites and Cultures of the Central Sierra Nevada [EXCERPT]. Reports of the University of California Archaeological Survey No. 21:8-9*	1953	Heizer, R. F., and A. B. Elsasser	University of California Berkeley Dept. of Anthropology	NADB-R-1360038
AP-01480	*Test Excavation of 4-ALP-63, Alpine County, California*	1985	Zeier, C. D., C. Callaway, R. Clerico, and D. Zerga	Intermountain Research	NADB-R-1360085

MANZANITA RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	REPORT TITLE	YEAR	AUTHOR(S)	AFFILIATION	OTHER IDS.
AP-01481	*Draft Report: Phase II Archaeological Investigations at 4-ALP-105 on Highway 89 Between Woodfords and Markleeville, California*	1975	Cook, R. A.	Office of Environmental Planning	NADB-R-1360008
AP-01482	*Cultural Resources Assessment for the Tahoe Regional Environmental Evaluation Study*	1979	Desgrandchamp, C., and D. Chavez	Sedway/Cooke, Urban and Environmental Planners and Designers	NADB-R-1360013
AP-02283	*A Cultural Resources Inventory Report of the Woodfords Salvage Timber Sale Alpine County, California, USFS Report No.TY-93-774*	1993	Lang, S., D. Lanner, and R. Palmer	Carson Ranger District, Toiyabe National Forest; for USDA USFS	NADB-R-1361110
AP-02402	*Toiyabe National Forest Cultural Resource Narrative Report; Crystal Springs and Silver Creek Campground Maintenance Project*	1994	Baldrice, M.	Toiyabe National Forest	NADB-R-1361023
AP-02614	*Cultural Resources Assessment for the Tahoe Regional Environmental Evaluation Study*	1979	Desgrandchamp, C., and D. Chavez	Cindy Desgrandchamp and David Chavez	NADB-R-1361991
AP-02774	*Archaeological Survey of the Proposed Flora James Homesite in Woodfords, Alpine County, California*	1996	Stornetta, S.	Intermountain Research; for Washoe Tribe of Nevada and California	NADB-R-1362396
AP-02933	*South Tahoe Public Utility District C-Line Emergency Pipline Replacement Project, Cultural Resources Investigation*	1996	Brown, J. L. M. A.	Harland Bartholomew & Associates; for STPUD and USDA USFS Toiyabe National Forest	NADB-R-1362445
AP-03016	*Cultural Resources Investigations of Hawkins Ranch Near Woodsfords, Alpine County, California*	1997	Shapiro, L. A.	Pacific Legacy & Foothill Resource; for R.O. Anderson Engineering	NADB-R-1363617
AP-03050	*Cultural Resources Worksheet for Use if Activity is an Intrusive Undertaking (Cat. A or B) [various projects for repair and stabilization of fluvial damage]*	1997	Durham, G.	NRCS, US Department of Agriculture	NADB-R-1362503
AP-03059	*Historic Property Survey Report (No Effect) for a Proposed Truck Climbing Lane on Highway 88, Alpine County, California; 10-ALP-88 PM 16.5/17.3, EA 351800*	1995	Page, S. E.	Environmental Branch "B" Department of Transportation District 10	NADB-R-1362859

MANZANITA RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-03805	*Department of Transportation Negative Archaeological Report 10-ALP-89 PM 20.1 10-170, 10-926932*	1999	Hibbard, C.	Caltrans District 10	NADB-R-1363806
AP-04209	*Heritage Resource Inventory, Woodsfords Quarry, 40 Acres near Woodsfords, California, Alpine County*	1998	Lindstrom, S.	Susan Lindstrom, Consulting Archaeologist	NADB-R-1364097
AP-05422	*South Lake Tahoe Public Utility District Wastewater Disposal, El Dorado and Alpine Counties, California; Phase I*	1978	Peak and Associates, Inc.	Ann S. Peak & Associates, Consulting Archeology; for South Lake Tahoe Public Utilities District	NADB-R-1365306
AP-05498	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume I: Summary of Methods and Findings*	2004	Leach-Palm, L., P. Mikkelsen, J. King, J. Hatch, and B. Larson	Far Western	NADB-R-1366177
AP-05501	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume III: Geoarchaeological Study*	2004	Rosenthal, J. S. and J. Meyer	Far Western	NADB-R-1365435
AP-05507	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume II A: Alpine County*	2004	Leach-Palm, L., J. King, J. Hatch, and B. Larson	Far Western	NADB-R-1365429
AP-06083	*A Class III Cultural Resources Inventory of 148 Acres for the Granite Ridge Development Project, Alpine County, California (DRAFT)*	2006	Bowers, R. J.	Summit Envirosolutions; for Greg Painter, Genoa, NV	NADB-R-1365986
AP-06275	*A Class III Cultural Resources Survey of 800 Acres Between Woodfords and Markleeville, Alpine County, California*	2006	Bowers, R. F.	Summit Envirosolutions	NADB-R-1366501
AP-06373	*Cultural Resources Inventory Negative Report, Alpine County Health and Human Services Building Expansion and Woodfords Fire Department Water Tank Survey.*	2007	Hall, S.	Summit Envirosolutions; for Alpine County and Woodfords Fire Dept.	NADB-R-1366598

MANZANITA RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-07055	*Determination of Eligibility and Effect for the South Tahoe Public Utilities District Recycled Water Facilities Master Plan, Diamond Valley, Alpine County, California.*	2008	Peak & Associates. Inc.	Peak & Associates; for Stantec Consulting	NADB-R-1367364
AP-07564	*Figuroa Masonry Stone Collection Sites in Cloudburst Canyon and Crystal Springs, R2012041702179, Humboldt-Toiyabe National Forests, Cultural Resource Narrative Report, Negative Inventory, Alpine County, CA*	2011	Garotto, J.	Carson Ranger District	NADB-R-1367924; USFS - R2012041702179
AP-07720	*Determination of Eligibility and Effect for the Diamond Valley Ranch Pipeline Project, Alpine County, California*	2011	Peak & Associates, Inc.	Peak & Associates; for SLTPUD	NADB-R-1368094
AP-07721	*Determination of Eligibility and Effect for the Diamond Valley Ranch Pipeline Project, Alpine County, California.*	2010	Peak & Associates, Inc.	Peak & Associates; for Hauge Brueck Associates	NADB-R-1368095
AP-08365	*Determination of Eligibility and Effect for the Diamond Valley Irrigation Improvements Project, South Tahoe Public Utilities District Recycled Water Facilities Revised Phase I Project Area, Diamond Valley, Alpine County, California; Clean Water State Revolving Fund (CWSRF) No. 5608-110.*	2013	Peak, M.A., and Gerry, R.A.	Peak & Associates; for Hauge Brueck Associates & South Tahoe Public Utility District	-
AP-08533	*A Cultural Resource Inventory and Architectural Evaluation for the Proposed Alpine County Behavioral Health Center, nar Woodfords, Alpine County, California*	2016	Schmitter, M. and M. Drews	Great Basin Consulting Group; for Alpine Co. Community Development	-
AP-08916	*Cultural Resources Inventory of State Routes 4, 88, and 89 in Humboldt-Toiyabe National Forest, Alpine County, California*	2018	Higgins, C., A. Whitaker, A. McCabe, S. Waechter, K. Colligan, and M. Sanchez	Far Western	USFS - R2018041702755
AP-09146	*Archaeological Survey Report, 2018 Hazard Tree Removal Project, State Routes 4, 26, 88, 89, and 207, Caltrans District 10, Alpine, Amador and Calaveras Counties, California*	2019	Waechter, S.	Far Western	-

BOLD: Previous study footprint located within the survey area.

APPENDIX E – MARKLEEVILLAGE RECORDS SEARCH

MARKLEEVILLAGE SURVEY AREA – PREVIOUSLY RECORDED CULTURAL RESOURCES

CONFIDENTIAL - Portions Redacted for Public Review

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000111	CA-ALP-000009	-	Prehistoric	AP02	AP-01441	-
P-02-000200	CA-ALP-000119/H	Mose Joe Place; Simpson Joe Place	Prehistoric, Historic	AH04; AH16; AP02; AP04; AP09; AP16	AP-00020	-
P-02-000311	CA-ALP-000234	Prehistoric #7	Prehistoric	AP02; AP12	-	-
P-02-000314	CA-ALP-000237/H	#60-Gigli Hill Site	Prehistoric, Historic	AH16; AP02; AP15; AP16	AP-02785	-
P-02-000315	CA-ALP-000238	#20-Ted Bacon Forest Site	Prehistoric	AP15	AP-02785	-
P-02-000316	CA-ALP-000239	Mortar Rock-2 (PVCr)	Prehistoric	AP04	AP-02785	-
P-02-000317	CA-ALP-000240	Gigli Mortar Rock	Prehistoric	AP04	AP-02785	-
P-02-000318	CA-ALP-000241	Mortar Rock-1 (PVCr)	Prehistoric	AP04	AP-02785	-
P-02-000319	CA-ALP-000242/H	#10-Ted Bacon Camp Site	Prehistoric, Historic	AH04; AP15	AP-02785	-
P-02-000320	CA-ALP-000243	#40-Hot Springs Roadside Site	Prehistoric	AP02	AP-02785	-
P-02-000321	CA-ALP-000244	#140-Ditch Site	Prehistoric	AP02	AP-02785	-
P-02-000322	CA-ALP-000245	#30-Three Bead Site	Prehistoric	AP15	AP-02785	-
P-02-000323	CA-ALP-000246/H	#170-Susie Site	Prehistoric, Historic	AH16; AP15	AP-02785	-
P-02-000324	CA-ALP-000247	Peninsula Site	Prehistoric	AP02; AP15	AP-02785	-
P-02-000346	CA-ALP-000269	Thornburg	Prehistoric	AP02; AP04	AP-00036	**Yes**

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000347	CA-ALP-000270	Chavarin	Prehistoric	AP02; AP04; AP15	AP-00036	**Yes**
P-02-000348	CA-ALP-000271	-	Prehistoric	AP02	AP-00036	**Yes**
P-02-000349	CA-ALP-000272	-	Historic	AH04	AP-00036	**Yes**
P-02-000350	CA-ALP-000273/H	Alpine County Museum (site)	Prehistoric, Historic	AH04; AH15; AP04	AP-00052, -05498, -05501, -05507, CA-05498	-
P-02-000448	CA-ALP-000439H	Big Trees-Carson Valley Turnpike (Big Trees Road); FS # TY-4080; TY-4080; 04170115028	Historic	AH07; HP11; HP37; HP46	AP-03275, -05498, -05501, -05507, -06848, -08916, -09146, CA-05498	-
P-02-000462	-	Alpine County Library	Historic	HP15	AP-02212	-
P-02-000463	-	Alpine County Courthouse	Historic	HP14	AP-02212, -05498, -05501, -05507, CA-05498	-
P-02-000464	-	6120-0007-0000, on Main St.	Historic	HP02	AP-02212	-
P-02-000465	-	Alpine Hotel / Cutthroat Saloon / Hot Springs Hotel	Historic	HP05	AP-02212	-
P-02-000466	-	Markleeville General Store	Historic	HP06	AP-02212	-
P-02-000467	-	6120-0010-0000, 39 Montgomery St.	Historic	HP02	AP-02212	-
P-02-000468	-	6120-0011-0000, 41 Montgomery St.	Historic	HP02	AP-02212, -05431	-
P-02-000469	-	6120-0012-0000, 43 / 45 Montgomery St.	Historic	HP02	AP-02212, -05431	-
P-02-000470	-	6120-0013-0000, 47 Montgomery St.	Historic	HP02	AP-02212, -05431	-

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000471	-	New Webster School House	Historic	HP15	AP-02212	-
P-02-000473	-	Bridge 31-0002 (SR 89 at Markleeville Creek)	Historic	HP19	-	-
P-02-000474	-	Old Log Jail	Historic	HP14	AP-00052, -02212, -05498, -05501, -05507, CA-05498	-
P-02-000475	-	Old Webster Schoolhouse	Historic	HP15	AP-00052, -02212	-
P-02-000476	-	Historical Complex (Old Log Jail, Old Webster Schoolhouse, and the modern museum)	Historic	HP14; HP15; HP39	AP-00052, -02212	-
P-02-000488	-	Markleeville Guard Station; Alpine Ranger Station; FS # TY-4425	Historic	HP14; HP35	AP-03453, -05498, -05501, -05507, CA-05498	-
P-02-000547	-	AP 4310-1	Prehistoric	AP02	AP-04310	-
P-02-000548	-	AP 4301-2	Prehistoric	AP02; AP08	AP-04310	**Yes**
P-02-000549	-	AP 4301-3	Prehistoric	AP02; AP08	AP-04310	-
P-02-000550	-	AP 4301-4	Prehistoric	AP16	AP-04310	-
P-02-000597	-	I-1	Prehistoric	AH16	AP-04734	-
P-02-000598	-	I-2	Prehistoric	AP16	AP-04734	-
P-02-000599	-	I-3	Prehistoric	AP16	AP-04734	-
P-02-000600	-	I-4	Prehistoric	AP16	AP-04734	-
P-02-000601	-	I-5	Historic	AH16	AP-04734	-

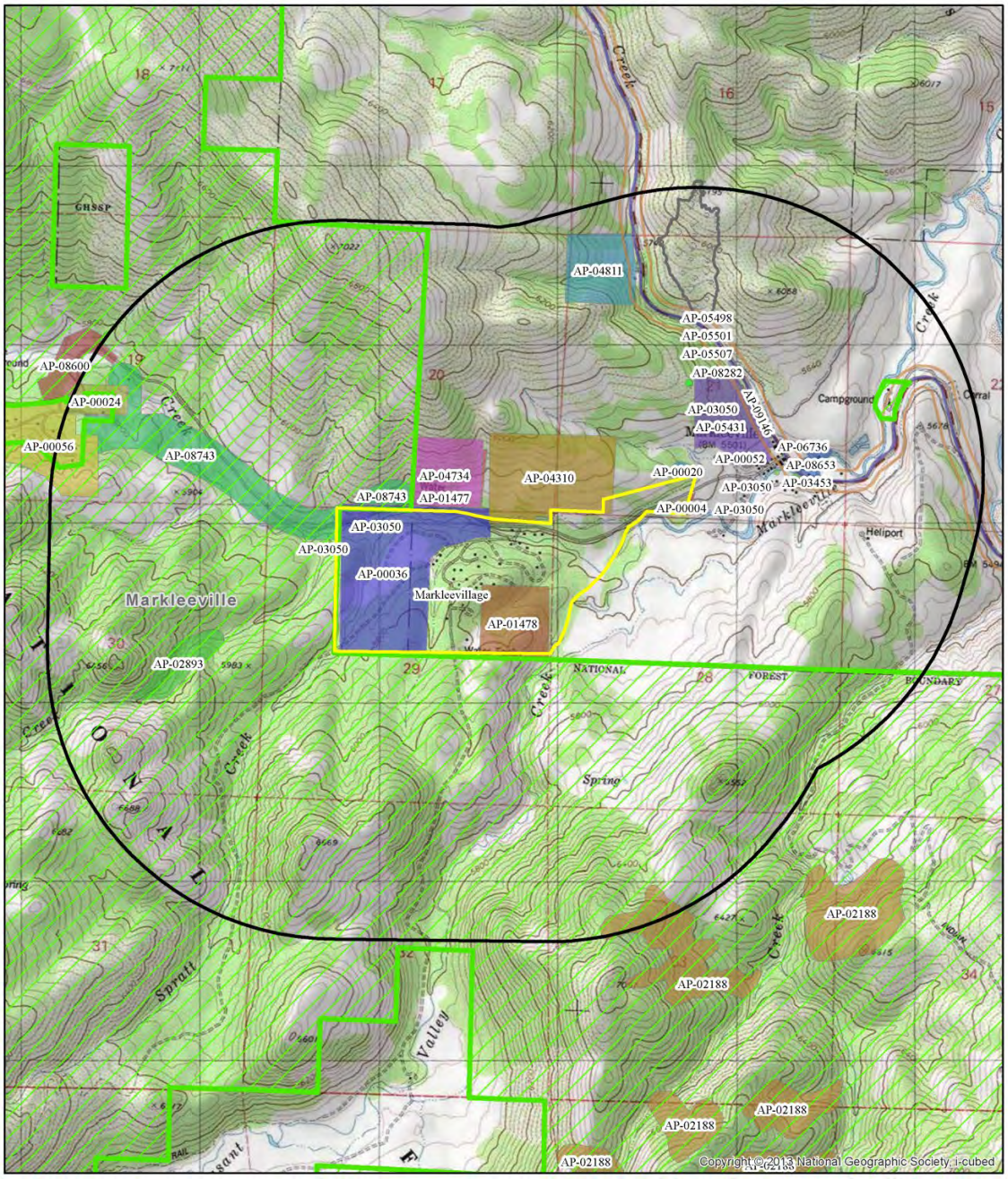
MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	**TRINOMIAL**	**NAME/OTHER NO.**	**AGE**	**SITE ATTRIBUTE CODE(S)**	**ASSOCIATED REPORT(S)**	**RESOURCE IN SURVEY AREA**
P-02-000602	-	Red House THP Site 1-Historic Camp Site	Historic	HP27	AP-04811	-
P-02-000647	CA-ALP-000506H	JL-45; Mayo Ditch	Historic	AH06; HP20	AP-05507	-
P-02-000648	CA-ALP-000507H	JL-47	Historic	AH06; HP11	AP-05431, -05507, -07474, CA-07474	-
P-02-000655	CA-ALP-000509/H	JR-2	Prehistoric, Historic	AH04; AH09; AP02	AP-05431, -08101	-
P-02-000656	CA-ALP-000510/H	JR-3	Prehistoric, Historic	AH04; AH16; AP04	AP-05431, -08101	-
P-02-000657	CA-ALP-000511H	JR-4	Historic	AH01; AH04	AP-05431, -08101	-
P-02-000658	CA-ALP-000512H	JR-5; Old Markleeville Town Ditch	Historic	AH06	AP-05431, -08101, -08743	**Yes**
P-02-000659	CA-ALP-000513/H	JR-1	Prehistoric, Historic	AH02; AH04; AH06; AH15; AP02; AP04; HP09; HP20	AP-05431, -08101	-
P-02-000862	CA-ALP-000621	BLM # CrNV-03-6835; Pacific Legacy # ALP-A22	Prehistoric	AP02	AP-07349	-
P-02-000863	CA-ALP-000622H	BLM # CrNV-03-6836; Pacific Legacy # ALP-A23	Historic	AH04; AH11	AP-07349	-
P-02-000864	CA-ALP-000623	BLM # CrNV-03-6837; Pacific Legacy # ALP-A24	Prehistoric	AP02	AP-07349	-
P-02-000865	CA-ALP-000624H	BLM # CrNV-03-6838; Pacific Legacy # ALP-A25	Historic	AH04	AP-07349	-

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000866	CA-ALP-000625H	Markleeville Toll Road and Road from Woodfords"; Pacific Legacy # ALP-A26	Historic	AH07	AP-07349	-
P-02-000867	CA-ALP-000626	BLM # CrNV-03-6840; Pacific Legacy #ALP-A27	Prehistoric	AP02	AP-07349	-
P-02-000868	CA-ALP-000627	BLM # CrNV-03-2841; Pacific Legacy # ALP-A28	Prehistoric	AP02	AP-07349	-
P-02-000869	CA-ALP-000628H	BLM # CrNV-03-6842; Pacific Legacy # ALP-A29	Historic	AH11	AP-07349	-
P-02-000870	CA-ALP-000629	BLM # CrNV-03-6843; Pacific Legacy # ALP-A30	Prehistoric	AP02	AP-07349	-
P-02-000871	CA-ALP-000630H	BLM # CrNV-03-6844; Pacific Legacy # ALP-A31	Historic	AH09	AP-07349	-
P-02-000873	CA-ALP-000632H	BLM # CrNV-03-6847; Pacific Legacy # ALP-A34	Historic	AH06	AP-07349	-
P-02-000914	CA-ALP-000673H	BLM # CrNV-03-6882; Pacific Legacy # ALP-B35	Historic	AH04	AP-07349	-
P-02-000915	CA-ALP-000674	BLM # CrNV-03-6883; Pacific Legacy # ALP-B36	Prehistoric	AP02	AP-07349	-
P-02-000916	CA-ALP-000675	BLM # CrNV-03-6884; Pacific Legacy # ALP-B37	Prehistoric	AP02	AP-07349	-
P-02-000917	CA-ALP-000676/H	BLM # CrNV-03-6885; Pacific Legacy # ALP-B38	Prehistoric, Historic	AH04; AP02	AP-07349	-
P-02-000918	CA-ALP-000677/H	BLM # CrNV-03-6886; Pacific Legacy # ALP-B39	Prehistoric, Historic	AH04; AP02	AP-07349	-

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000919	CA-ALP-000678	BLM # CrNV-03-6887; Pacific Legacy # ALP-B40	Prehistoric	AP02	AP-07349	-
P-02-000920	CA-ALP-000679H	BLM # CrNV-03-6888; Pacific Legacy # ALP-B41	Historic	AH04	AP-07349	-
P-02-000921	CA-ALP-000680/H	BLM # CrNV-03-6889; Pacific Legacy # ALP-B42	Prehistoric, Historic	AH04; AP02	AP-07349	-
P-02-000922	CA-ALP-000681H	BLM # CrNV-03-6890; Pacific Legacy # ALP-B43	Historic	AH07	AP-07349	-
P-02-000925	-	BLM # CrNV-03-5965; Pacific Legacy # PB-2	Prehistoric	AP02; AP12	AP-07349	-
P-02-000926	-	BLM # CrNV-03-5971; Pacific Legacy # PB-8	Historic	AH06	AP-07349	-
P-02-000927	-	BLM # CrNV-03-1363; Fremont Trail	Historic	AH07	AP-07349, -07368	-
P-02-000928	-	Shay Creek Isolated Mano	Prehistoric	AH16	AP-07368	-
P-02-001032	-	Site A	Historic	AH02; AH04	AP-08101	-
P-02-001056	CA-ALP-000779H	HSC-1, FS #04170114725, Hot Springs Road	Historic	AH04; AH07; AH16	AP-08600, -08743	**Yes**
P-02-001057	CA-ALP-000780H	Muller 1296 Circuit Transmission Line	Historic	HP09; HP11	AP-08743, A08916	**Yes**
P-02-001058	CA-ALP-000781H	FS #04170114727; LM-03; Shay Creek Tract Lot 1 Cabin; Fell Cabin	Historic	AH06; AH15; HP02; HP04	AP-08743	-

BOLD: Resource is located in the survey area.

MARKLEEVILLAGE SURVEY AREA – PREVIOUS STUDIES



USGS Markleeville 7.5 min
T.10N. R.20E.

Legend

- Project Area
- Record Search Buffer
- BasicOwnershipR4_HTNF_20180924
- NV_Fires_2000_2013

Report Number

AP-00002, AP-00004, AP-00020, AP-00024, AP-00036, AP-00052, AP-00056, AP-01477, AP-01478, AP-02188, AP-02893, AP-03050, AP-03453, AP-04310, AP-04734, AP-04811, AP-05431, AP-05498, AP-05501, AP-05507, AP-06736, AP-08600, AP-08653, AP-08743, AP-09146, AP-08282

N W E S

0 0.25 0.5 0.75 1 Miles

0 0.5 1 1.5 2 Kilometers

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-00002	***Cultural Resources Short Report; Kirk Properties, Markleeville***	**1980**	**Budy, E.**	**Nevada State Museum**	**NADB-R-1360005**
AP-00004	***Cultural Resource Inventory Report; Angus Fuelwood Sale***	**1989**	**Colston, D.**	**Stanislaus National Forest**	**NADB-R-1360007**
AP-00020	***Archaeological Reconnaissance of THP 4-79-172/Al-1***	**1979**	**Foster, J. W.**	**California Department of Forestry and Fire Protection**	**NADB-R-1360028**
AP-00024	*Observations: Cultural Resources; United States Department of Agriculture, Forest Service, Nevada Zone, Region 4: Grover Hot Springs Land Exchange*	1980	Johnson, F., P. Stearns, and R. J. Fitzwater	Toiyabe National Forest	NADB-R-1360043
AP-00036	***Cultural Resource Investigation of the Thornburg CFIP Project Area (100 acres), Alpine County, California***	**1990**	**Napton, L. K., and E. A. Greathouse**	**Institute for Archaeological Research, CSUS**	**NADB-R-1360056**
AP-00052	*Archeological Survey of the Alpine County Museum Site*	1990	Slaymaker, C., and S. Griset	C. Slaymaker, PhD & S. Griset; for Alpine County Dept. of Public Works	NADB-R-1360079
AP-00056	*Cultural Resources Short Report and Encoding Form; Intermountain Region; Report TY-88-0504; Shay Creek Summer Homes Land Exchange*	1988	Turner, A. L.	Carson District, Toiyabe National Forest	NADB-R-1360082
AP-01477	***United States Department of the Interior, Bureau of Land Management: Cultural Resources Report No. 3-1315(N); CA-25680, Trust for Public Lands - Proposed Exchange of Lands in Bagley Valley for Public Lands Near Markleeville***	**1989**	**Hatoff, B. W., S. Weiss, and R. Dunn**	**Bureau of Land Management**	**NADB-R-1360035**
AP-01478	***United States Department of the Interior, Bureau of Land Management: Cultural Resources Report No. 3-1133(N); Thornburg Timber Sale***	**1987**	**Hatoff, B. W., and M. McGinty**	**Bureau of Land Management**	**NADB-R-1360034**
AP-02188	*Upper Poor Boy Project, Cultural Resources Survey Report # TY-93-772*	1993		Carson District, Toiyabe National Forest	NADB-R-1361152; Other-TY-93-772
AP-02893	*Cultural Resources Short Report, TY-92- 0762, Musser-Jarvis Water Shed*	1992	Milner, Kathy	US Forest Service, Toiyabe National Forest	NADB-R-1362331

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-03050	***Cultural Resources Worksheet for Use if Activity is an Intrusive Undertaking (Cat. A or B) [various projects for repair and stabilization of fluvial damage]***	**1997**	**Durham, Gail**	**NRCS, US Department of Agriculture**	**NADB-R-1362503**
AP-03453	*Markleeville Guard Station Narrative Report and Evaluation; Heritage Resource Report TY-98-1258.*	1998	Kumiega, K.	Carson City Ranger District, HTNF, USDA FS	NADB-R-1363464
AP-04310	***Letter Report: Cultural Resources Inventory Survey of a 70-acre Parcel in Markleeville, California***	**2001**	**Hutchins, J.**	**Kautz Environmental Consultants**	**NADB-R-1364221**
AP-04734	***Cultural Resources Inventory Report, Department of the Interior, Bureau of Land Management, Carson City Field Office, Survey Project No: CR 3-2089, Markleeville Fuels Treatment Project***	**2002**	**McCabe, S.**	**Bureau of Land Management**	**NADB-R-1364643**
AP-04811	*Confidential Archaeological Addendum for Timber Operations on Non-Federal Lands in California: Red House THP (4-02-52/ALP-1)*	2002	Kral, James	Progressive Forestry	NADB-R-1364727
AP-05431	*A Class III Inventory of a 33.98 Acre Parcel for the Markleeville Village Development*	2004	Brown, B. C. et al.	Summit Envirosolutions; for CSCON	NADB-R-1365362
AP-05498	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; District 10 Rural Conventional Highways; Volume l: Summary of Methods and Findings*	2004	Leach-Palm, L., P. Mikkelsen, J. King, J. Hatch, and B. Larson	Far Western Anthropological Research Group	NADB-R-1366177
AP-05501	*Cultural Resources Inventory of Caltrans*	2004	Rosenthal, J. S., and J.	Far Western	NADB-R-1365435
AP-05507	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume II A: Alpine County*	2004	Leach-Palm, L.., J. King, J. Hatch, and B. Larson	Far Western	NADB-R-1365429
AP-06736	*Archaeological Monitoring of Sierra Pacific Power Company's Markleeville Over/Under Conversion, Alpine County, California*	2008	Bloomer, W., and D. C. Young	Lithic Arts & Far Western for Sierra Pacific Power Company and Caltrans District 10	NADB-R-1366969

MARKLEEVILLAGE RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-08282	*Archaeological Survey Report Markleeville/Ensite #25569 (314163) CA-89 S Markleeville, Alpine County, California, 96120 NE 1/4, SW 1/4 S21 T10N R20E EBI Project No. 6115002750*	2015	Etheridge, J. and M. Cornelius	EnviroBusiness, Inc. for Verizon Wireless	-
AP-08600	*Historic Property Survey Report, 10-ALP- BRLS-5931(030), Hot Springs Road over Hot Springs Creek*	2016	Starkey, A.	California Department of Transportation	-
AP-08600A	*Hot Springs Road Bridge (31C-0005) Replacement Project, Archaeological Survey Report, Alpine County, California, Federal Aid No. BRLS 5931 (030), 7.5' USGS Quadrangle: Markleeville, California (1979), Archaeological APE Acreage = 4.0+-Acres*	2016	Starkey, A.	California Department of Transportation	-
AP-08653	*Toiyabe National Forest Cultural Resource Narrative Report, Markleeville Campground Water System, TY-00-1329, Alpine County, CA*	1999	Kumiega, K.	U.S. Forest Service, Toiyabe National Forest	USFS - TY-00-1329
AP-08743	***Cultural Resource Inventory for Liberty Utilities' Muller Circuit Pole Replacement Project, Alpine County, California***	**2018**	**Orvald, T., A. Garner, and S. Melvin**	**Far Western & JRP Historical Consulting; for Liberty Utilities**	**-**
AP-09146	*Archaeological Survey Report, 2018 Hazard Tree Removal Project, State Routes 4, 26, 88, 89, and 207, Caltrans District 10, Alpine, Amador and Calaveras Counties, California*	2019	Waechter, S.	Far Western	Extends into another county as CA-09146

BOLD: Previous study footprint located within the survey area.

APPENDIX F – BEAR VALLEY RECORDS SEARCH

BEAR VALLEY SURVEY AREA – CULTURAL RESOURCES

CONFIDENTIAL - Portions Redacted for Public Review

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000015	-	Isolate 2018-1	Prehistoric	AP16	AP-01935	-
P-02-000016	-	Isolate 2018-2	Prehistoric	AP16	AP-01935	-
P-02-000017	-	Isolate 2018-3	Prehistoric	AP16	AP-01935	-
P-02-000018	-	Isolate 2019-1	Prehistoric	AP02	AP-01936	-
P-02-000023	CA-ALP-000339	FS 05-16-52-826	Prehistoric	AP02; AP04; AP15; AP16	AP-02276, -03510	-
P-02-000024	CA-ALP-000340	FS 05-16-52-953	Prehistoric	AP02; AP04; AP15; AP16	AP-02276, -03510	-
P-02-000025	CA-ALP-000341	FS 05-16-52-954	Prehistoric	AP02; AP04	AP-02276, -03510	-
P-02-000026	CA-ALP-000287/H	FS 05-16-52-39	Prehistoric, Protohistoric, Historic	AH16; AP02; AP04; AP16	AP-01683, -02279, -05498, -05501, -05507, CA-01683, CA-02279, CA-05498	-
P-02-000096	CA-ALP-000401	Single Cup	Prehistoric	AP02; AP04	AP-02867	-
P-02-000181	CA-ALP-000100	Blood Site	Prehistoric	AP04; AP16	-	-
P-02-000182	CA-ALP-000101	Blood Meadow Site	Prehistoric	AP02; AP04	-	**Yes:** ***Along the southern boundary***
P-02-000208	CA-ALP-000127	-	Prehistoric	AP16	AP-00007, -03832	-
P-02-000210	CA-ALP-000129	-	Prehistoric	AP02	AP-00007, -03832	-
P-02-000212	CA-ALP-000131	-	Prehistoric	AP16	AP-00007, -03832	-
P-02-000215	CA-ALP-000134	-	Prehistoric	AP16	AP-00007, -03832	-

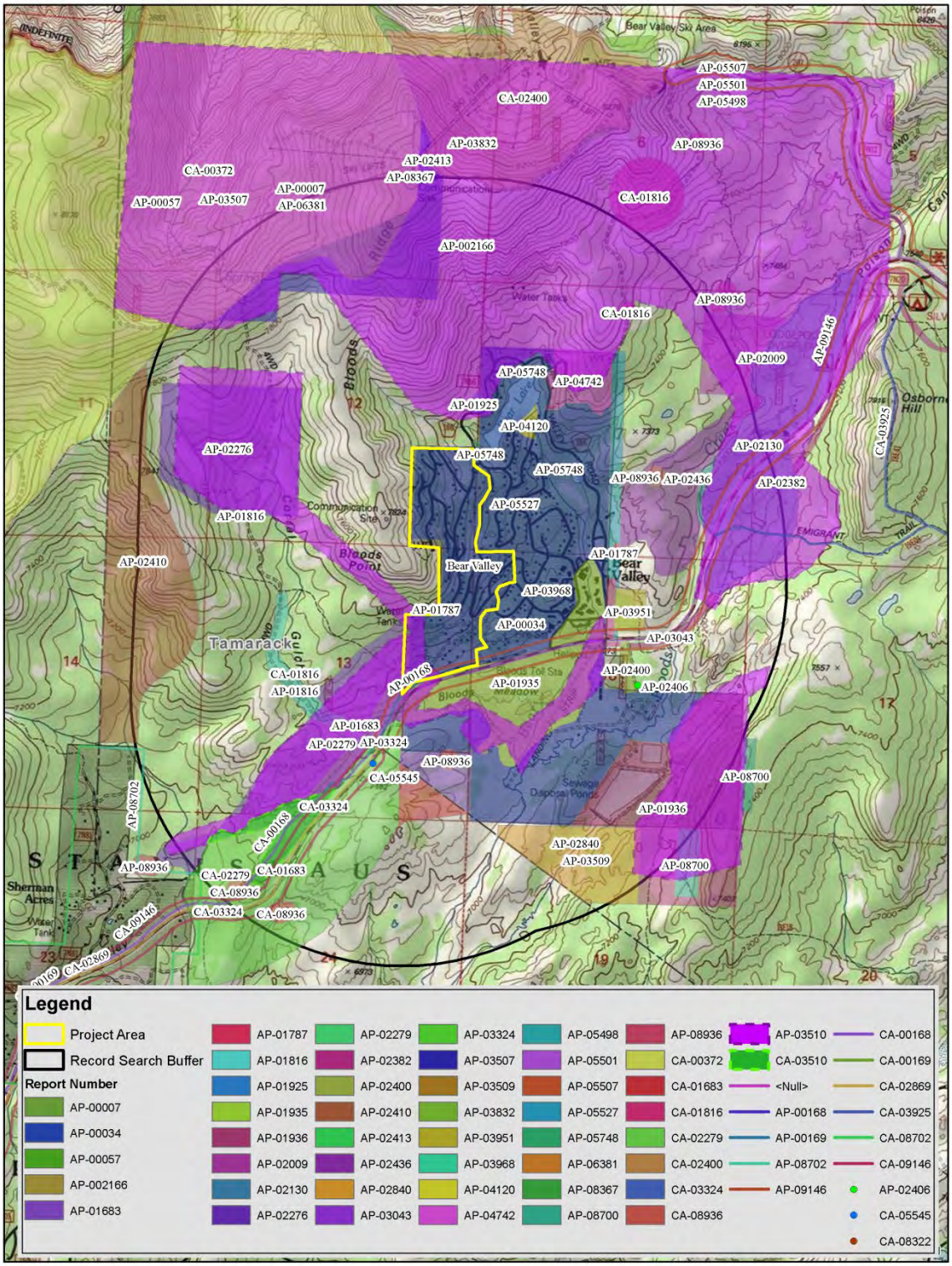
BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES

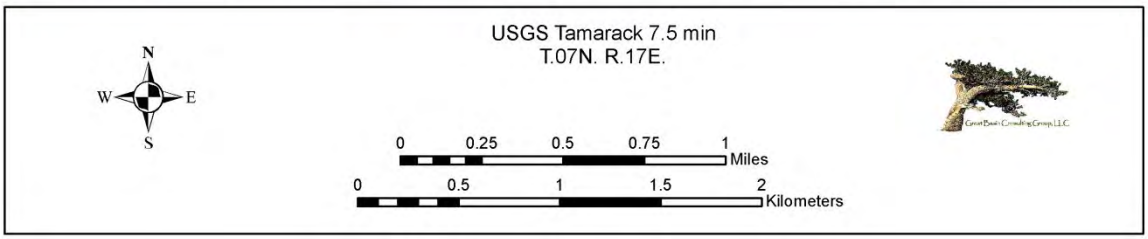
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000216	CA-ALP-000135	-	Prehistoric	AP16	AP-00007, -03832	-
P-02-000218	CA-ALP-000137/H	-	Historic	AH16	AP-00007, -03832	-
P-02-000219	CA-ALP-000138	-	Prehistoric	AP02; AP04	AP-00034, -03968	-
P-02-000220	CA-ALP-000139	-	Prehistoric	AP02	AP-00034, -01935	-
P-02-000221	CA-ALP-000140	-	Prehistoric	AP02	AP-00034	-
P-02-000222	CA-ALP-000141	-	Prehistoric	AP02; AP04	AP-00034	-
P-02-000223	CA-ALP-000142	-	Prehistoric	AP02	AP-00034	-
P-02-000224	CA-ALP-000143	-	Prehistoric	AP02	AP-00034	-
P-02-000225	CA-ALP-000144	Site #7	Prehistoric	AP16	AP-00034	-
P-02-000226	CA-ALP-000145H	05-16-52-0528; Site #8	Historic	AH02; AH11	AP-00034, -02382, -02400, -05498, -05501, -05507, -09146, CA-02400, CA-05498, TO-02400	-
P-02-000364	CA-ALP-000288H	Emigrant Trail and Turnpike Segments A thru M	Historic	AH07; HP37	AP-01683, -02279, -02382, -05498, -05501, -05507, -07172, -08701, CA-01683, CA-02279, CA-05498	**Yes;** ***Along the southern boundary***
P-02-000366	CA-ALP-000290	-	Prehistoric	AP02	AP-00216, -03510	-
P-02-000391	CA-ALP-000316	-	Prehistoric	AP04; AP08	AP-01936	-
P-02-000392	CA-ALP-000317		Prehistoric	AP02; AP08	AP-01936	-
P-02-000393	CA-ALP-000318	-	Prehistoric	AP02	AP-01936	-

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUSLY RECORDED CULTURAL RESOURCES						
PRIMARY NO.	TRINOMIAL (26-)	NAME/OTHER NO.	AGE	SITE ATTRIBUTE CODE(S)	ASSOCIATED REPORT(S)	RESOURCE IN SURVEY AREA
P-02-000394	CA-ALP-000319	-	Prehistoric	AP02	AP-01936	-
P-02-000401	CA-ALP-000328	FS 05-16-52-037/111	Prehistoric	AP02; AP04; AP08	AP-02382, -03043, -05498, -05501, -05507, -09146, CA-05498	-
P-02-000478	-	Ebbetts Pass Route, CHL 318	Historic	AP16; HP26	AP-05498, -05501, -05507, CA-05498	-
P-02-000603	-	FL-1	Prehistoric	AP02	AP-05507	-
P-02-000604	-	05-16-52-0213; FL-2	Prehistoric	AP04	AP-05507, -09146	-
P-02-000758	CA-ALP-000563	FS 05-16-52-884	Prehistoric	AP02; AP04	AP-06381	-
P-02-001164	CA-ALP-000844H	2488-SJN-711-01	Historic	AH04	AP-09146	-
P-02-001167	CA-ALP-000847/H	2488-STM-711-01	Prehistoric, Historic	AH04; AP02	AP-09146	-
P-02-001168	CA-ALP-000848	2488-STM-711-02	Prehistoric	AP04	AP-09146	-
P-05-001632	CA-CAL-001320H	FS 05-16-52-577	Historic	AH04	AP-01683, -05501, CA-01683, CA-02869, CA-05498, CA-05501, CA-05506, CA-05545, CA-09146, MP-05545, TO-05545	-
P-05-003552	-	Ebbetts Pass Route, CHL #318 (# filed in Alpine Co.)	Historic	AH07; HP37	CA-08747, CA-08891, CA-08934, CA-09146	-
P-05-003872	CA-CAL-002279H	2488-STA-710-01	Historic	AH04	CA-09146	-

BOLD: Resource is located in the survey area.

BEAR VALLEY SURVEY AREA – PREVIOUS STUDIES





BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-00007	*Archaeological Reconnaissance Report for Mt. Reba Winter Sports Development*	1974	Daniels, E.	Stanislaus National Forest	NADB-R-1360011
AP-00034	*Archaeological Survey of Bear Valley, Alpine County*	1978	McGuire, K.	Consultant for Western Planning and Research	NADB-R-1360055
AP-00057	*Stanislaus National Forest Winter Sports Development, Environmental Analysis Report, Public Review Draft Expansion of Mt. Reba Ski Area into Grouse Valley Bowl*	1975	Cargill, G. E.	G. E. Cargill, Forest Supervisor	NADB-R-1360083
AP-00168	*Cultural Resources Inventory Report for the Pacific Bell Buried Cable Project, Arnold to Bear Valley, Calaveras and Alpine Counties, California*	1990	Heipel, S.	PAR Environmental Services,	NADB-R-1367037
AP-00169	*Addendum Report: Cultural Resources Inventory Report for the Pacific Bell Buried Cable Project, Arnold to Bear Valley, Calaveras and Alpine Counties, California, Final*	1990	Heipel, S.	PAR Environmental Services	NADB-R-1365786
AP-00216	*An Archaeological Survey of Proposed Snow Making Line Routes Within the Bear Valley Sports Area Expansion, Alpine County, California*	1991	Dougherty, J. W., and R. H. Werner	Archaeological Services	NADB-R - 1360015
AP-01683	*Cultural Resource Survey of the Proposed Red Blood Insect Salvage Sale; Cultural Resource Management Report 05-16-0446 in Calaveras and Alpine Counties, California*	1992	Dreyer, C., and W. Wulzen	Stanislaus National Forest	NADB-R-1360016
AP-01787	*Cultural Resource Survey of the Proposed Calaveras Water Project; Cultural Resource Management Report 05-16-0783 in Calaveras and Alpine Counties, California*	1992	Asquith, H.	Stanislaus National Forest, Calaveras Ranger District	NADB-R-1360002
AP-01816	*Cultural Resource Survey of the Proposed Soil Mapping Pits Project; Cultural Resource Management Report 05-16-0796 in Alpine and Calaveras Counties, California*	1992	Asquith, H. E.	Stanislaus National Forest	NADB-R-1360003

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-01925	*Cultural Resource Survey of the Proposed Bear Valley Lodge Fuelwood Sale; Cultural Resource Management Report 05-16-2015 in Alpine County, California*	1993	Deis, R. W.	Stanislaus National Forest	NADB-R-1360460
AP-01935	*Cultural Resource Survey of the Proposed Bear Valley Hayrides; Cultural Resource Management Report 05-16-2018 in Alpine County, California*	1993	Deis, R. W.	Stanislaus National Forest, Calaveras Ranger District	NADB-R-1360464
AP-01936	*Cultural Resource Survey of the Proposed Bear Valley Sewage Spray Expansion; Cultural Resource Management Report 05-16-2019 in Alpine County in Alpine County, California*	1993	Deis, R. W.	Stanislaus National Forest	NADB-R-1360465
AP-02009	*Cultural Resource Survey of the Proposed Overflow Campground Water Drilling; Cultural Resource Management Report 05-16-2023 in Alpine County, California*	1993	Punter, L.	Calaveras Ranger District, Duck Compartment	NADB-R-1360624
AP-02130	*Cultural Resource Survey of the Proposed Overflow Insect Salvage Sale CRMR 05-16-494 in Alpine County, California*	1992	Punter, L.	Stanislaus National Forest	NADB-R-1361171
AP-02276	*Cultural Resource Survey of the Proposed Corral Gulch OHV Trail Obliteration Project CRMR 05-16-2004, in Alpine County, California*	1993	Punter, L.	Stanislaus National Forest	NADB-R-1361170
AP-02279	*Cultural Resource Survey of the Proposed Red Blood Insect Salvage Timber Sale Add On, CRMR 05-16-2026 in Alpine and Calaveras Counties*	1993	Anderson, P.	Stanislaus National Forest	NADB-R-1361022
AP-02382	*Cultural Resource Survey of the Proposed Bear Valley to Lake Alpine Recreation Trail in Alpine County, California*	1994	Abernathie, J.	Stanislaus National Forest, Calaveras Ranger District	NADB-R-1360992
AP-02400	*Cultural Resource Survey of the Proposed 1993 Hazard Tree Removal Sales CRMR 05-16-2053 in Alpine, Calaveras and Tuolumne Counties, California*	1994	Abernathie, J.	Stanislaus National Forest	NADB-R-1361008

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-02406	*Short Form CRMR 05-16-2049, Soil Studies Pits (Ecological Unit Inventory)*	1994	Abernathie, J.	Stanislaus National Forest	NADB-R-1360998
AP-02410	*Cultural Resource Survey of the Proposed Del Orto Fence Relocation Project CRMR 05-16-2060 in Alpine and Calaveras Counties, California*	1994	Deis, R.	Stanislaus National Forest	NADB-R-1361045
AP-02413	*Short Form Cultural Resource Management Report. Tuck's Run Obstacle Removal Program. CRMR 05-16-2069*	1994	Abernathie, J.	Stanislaus National Forest	NADB-R-1361002
AP-02436	*Cultural Resource Survey of the Proposed Bear Boogie Motorcycle Trails and Snowmobile Routes. CRMR 05-16-2051 Alpine County, California*	1994	Abernathie, J.	Stanislaus National Forest, Calaveras Ranger District	NADB-R-1361009
AP-02840	*Bear Valley Sewer Spray Expansion (Addendum), An Addendum to CRMR 05-16-2019 "Cultural Resource Survey of the Proposed Bear Valley Sewage Spray Expansion," Cultural Resource Management Report 05-16-2080 in Alpine County, California*	1995	Goldsmith, Eric	Calaveras Ranger District	NADB-R - 1362250
AP-03043	*Cultural Resource Testing of Two Sites Along the Proposed Bear Valley to Lake Alpine Recreation Trail, CA-ALP-104 and CA-ALP-328, Cultural Resource Management Report 05-16-2061*	1994	Robinson, M., R. Dies, and J. Abernathie	Robinson, M.	NADB-R-1363239
AP-03324	*Cultural Resource Management Report, Highway 4 Projects, 1995, Highway 4 Hazard Tree Removal, Daylighting, CAL/PG&E Settlement Sale, Cultural Resource Management Report 05-16-2084 in Calaveras and Alpine Counties, California*	1995	Goldsmith, E.	Stanislaus National Forest District	NADB-R-1363406
AP-03507	*Stanislaus National Forest, Heritage Resources 1996 Sierra Nevada Programmatic Agreement Project Certification: Bear Valley Ski Area Run Widening*	1997	Balen, B.	Stanislaus National Forest	NADB-R-1363242

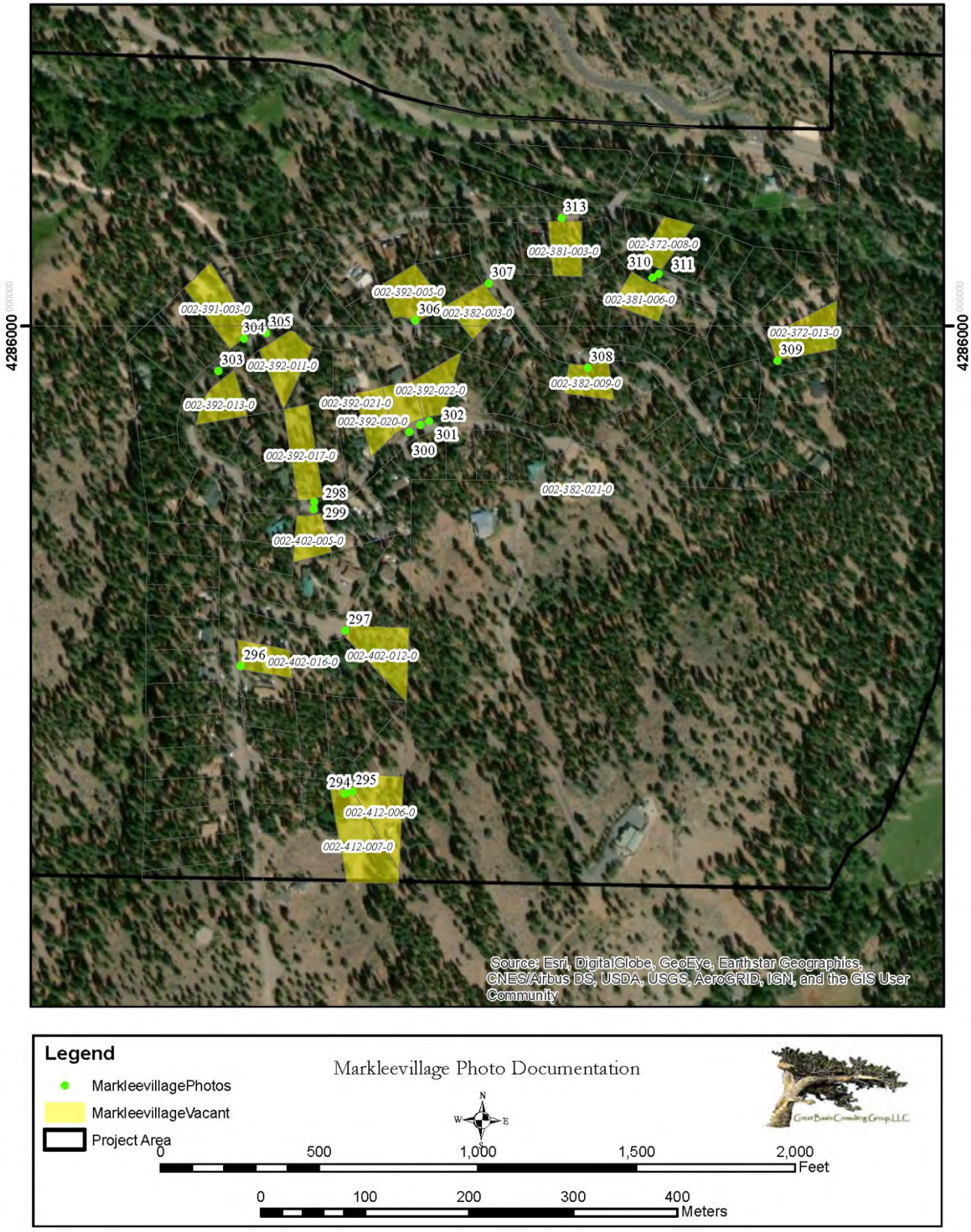
BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-03509	*Bear Valley Sewer Spray Expansion (Addendum), An Addendum to CRMR 05-16-2019 "Cultural Resource Survey of the Proposed Bear Valley Sewage Spray Expansion", Cultural Resource Management Report 05-16-2080 in Alpine County, California*	1995	Goldsmith, E.	Stanislaus National Forest	NADB-R-1363408
AP-03510	*Cultural Resource Survey of the Proposed Alpine Water Co. Water System, Cultural Resource Management Report 05-16-2112 in Alpine County, California*	1996	Dean, M.	Merideth Dean	NADB-R-1363319
AP-03832	*Cultural Resource Survey of the Proposed Bear Valley Ski Area Timber Settlement Sale, Cultural Resource Management Report 05-16-2085 in Alpine County, California, October 16, 1995*	1995	Davis, P. H.	Stanislaus National Forest	NADB-R - 1363762
AP-03951	*Stanislaus National Forest, Heritage Resources 1996 Sierra Nevada Programmatic Agreement Project Certification: Alpine County Service Yard (05-16-2135)*	1999	Montgomery, B.	Stanislaus National Forest, Calaveras Ranger District	NADB-R-1363938
AP-03968	*Pine Tree Village Condominium Project, Alpine County, California*	2000	Davis-King, S.	Davis-King & Associates	NADB-R-1363772
AP-04120	*Archaeological Survey Report for Lake Alpine Water Company (Bear Valley) Treatment Plant Upgrade, California Department of Health Services, Safe Drinking Water State Revolving Fund Project No. 0210001-01*	2000	Wilcox, S.	Susan Wilcox	NADB-R-1363854
AP-04742	*Cultural Resource Assessment, Bear Valley Tract 9 - Bear Paw Ridge Units 2 & 3, Alpine County, California*	2002	Francis, C. M.	C. M. Francis	NADB-R-1364658
AP-05498	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume I: Summary of Methods and Findings*	2004	Leach-Palm, L., P. Mikkelsen, J. King, J. Hatch, and B. Larson	Far Western	NADB-R-1366177
AP-05501	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume III: Geoarchaeological Study*	2004	Rosenthal, J. S., and J. Meyer	Far Western	NADB-R-1365435

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-05507	*Cultural Resources Inventory of Caltrans District 10 Rural Conventional Highways; Volume II A: Alpine County*	2004	Leach-Palm, L., J. King, J. Hatch, and B. Larson	Far Western	NADB-R-1365429
AP-05527	*Emergency Notice Confidential Archaeological Letter: Fuel Hazard Reduction, Bear Valley, Alpine County*	2004	Stikkers, D.	RPF for Cal Fire	NADB-R-1365400
AP-05748	*An Archaeological Survey Report for the Bear Valley Timber Harvest Plan, Alpine County, California. 4-05-4/ALP-1*	2005	Stikkers, D.	RPF for Cal Fire	NADB-R-1365630
AP-06381	*Archaeological Survey, Evaluation, and Finding of Effects for Sites 05-16-52-484, 05-16-52-487, 05-16-52-488, 04-1652-884, Bear Valley Ski Lift Tower Replacement Project, Alpine County, California*	2007	Dougherty, J. W.	Par Environmental Services	NADB-R-1366611
AP-08367	*New Tower ("NT") Submission Packet FCC Form 620 Project Name: MT. Reba Project Number: CNU6314B, Bear Valley Ski Resort, Bear Valley, Alpine County, CA*	2015	Billat, L., and D. Supernowicz	EarthTouch; for AT&T	-
AP-08700	*Stanislaus National Forest, Heritage Resources 2013 Regional Programmatic Agreement Project Certification, Bear Valley Water District Sprayfields and HTR CRMR 05-16-2335 (Alpine County)*	2017	Strain, K.	USFS Stanislaus National Forest	USFS-CRMR 05-16-2335
AP-08702	*Stanislaus National Forest, Heritage Resources 2013 Regional Programmatic Agreement Project Certification, Tamarck/Sherman Acres Wildland Urban Interface (WUI) Fuelbreak, CRMR 05-16-2302 (Alpine and Calaveras Counties)*	2015	Stevenot, A., and K. Strain	USFS Stanislaus National Forest	USFS CRMR 05-16-2302
AP-08936	*Cultural Resources Constraints Report, Salt Springs 2101 17kV Routine Stanislaus National Forest EP 2018-158566*	2018	Crumpton, Brooke	Blue Rock Services	-

BEAR VALLEY RECORDS SEARCH RESULTS – PREVIOUS STUDIES					
REPORT NO.	**REPORT TITLE**	**YEAR**	**AUTHOR(S)**	**AFFILIATION**	**OTHER IDS.**
AP-09146	*Archaeological Survey Report, 2018 Hazard Tree Removal Project, State Routes 4, 26, 88, 89, and 207, Caltrans District 10, Alpine, Amador and Calaveras Counties, California*	2019	Waechter, S.	Far Western	-

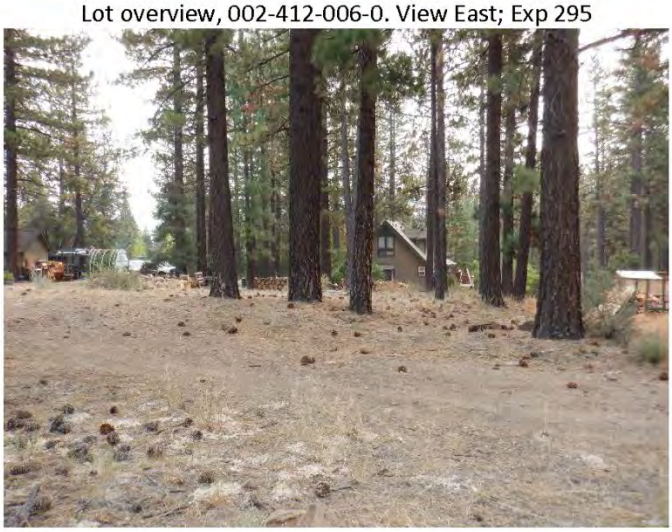
BOLD: Previous study footprint located within the survey area.

APPENDIX G – MARKLEEVILLAGE & BEAR VALLEY PARCELS



Lot overview, 002-412-007-0. View Southeast; Exp 294

Lot overview, 002-412-006-0. View East; Exp 295



Lot overview, 002-402-016-0. View East; Exp 296

Lot overview, 002-402-012-0. View East; Exp 297

Lot overview, 002-392-017-0. View North; Exp 298

Lot overview, 002-392-005-0. View South; Exp 299

Lot overview, 002-392-021-0. View North; Exp 300

Lot overview, 002-392-020-0. View Northeast; Exp 301

Lot overview, 002-392-022-0. View North; Exp 302

Lot overview, 002-392-013-0. View South; Exp 303

Lot overview, 002-391-003-0. View North; Exp 304

Lot overview, 002-392-011-0. View South; Exp 305

Lot overview, 002-392-005-0. View North; Exp 306

Lot overview, 002-382-003-0. View Southwest; Exp 307

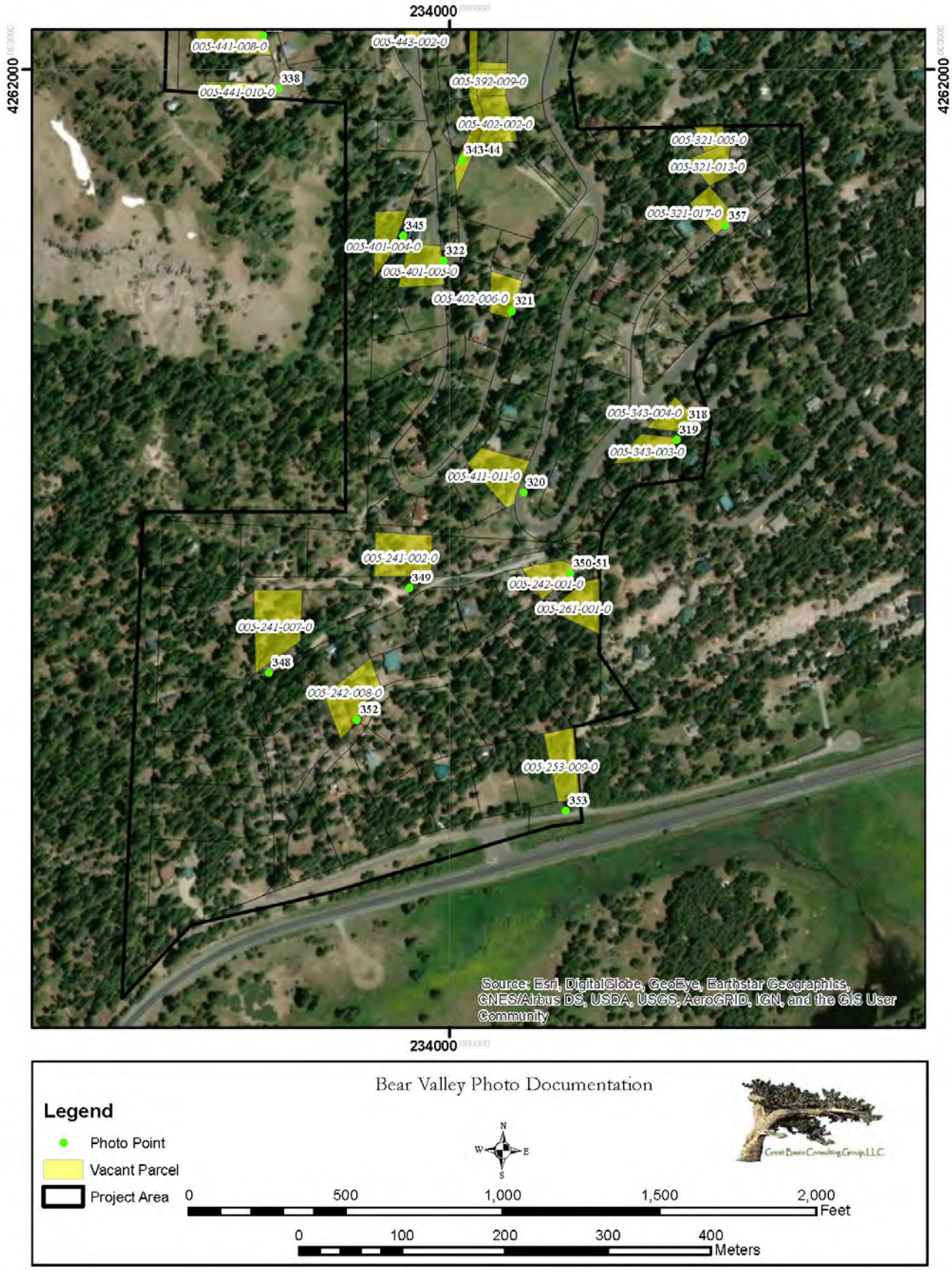
Lot overview, 002-382-009-0. View Southeast; Exp 308

Lot overview, 002-372-013-0. View East; Exp 309

Lot overview, 002-372-008-0. View North; Exp 310

Lot overview, 002-381-006-0. View South; Exp 311

Lot overview, 002-381-003-0. View South; Exp 313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4262000
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005-443-002-0
338
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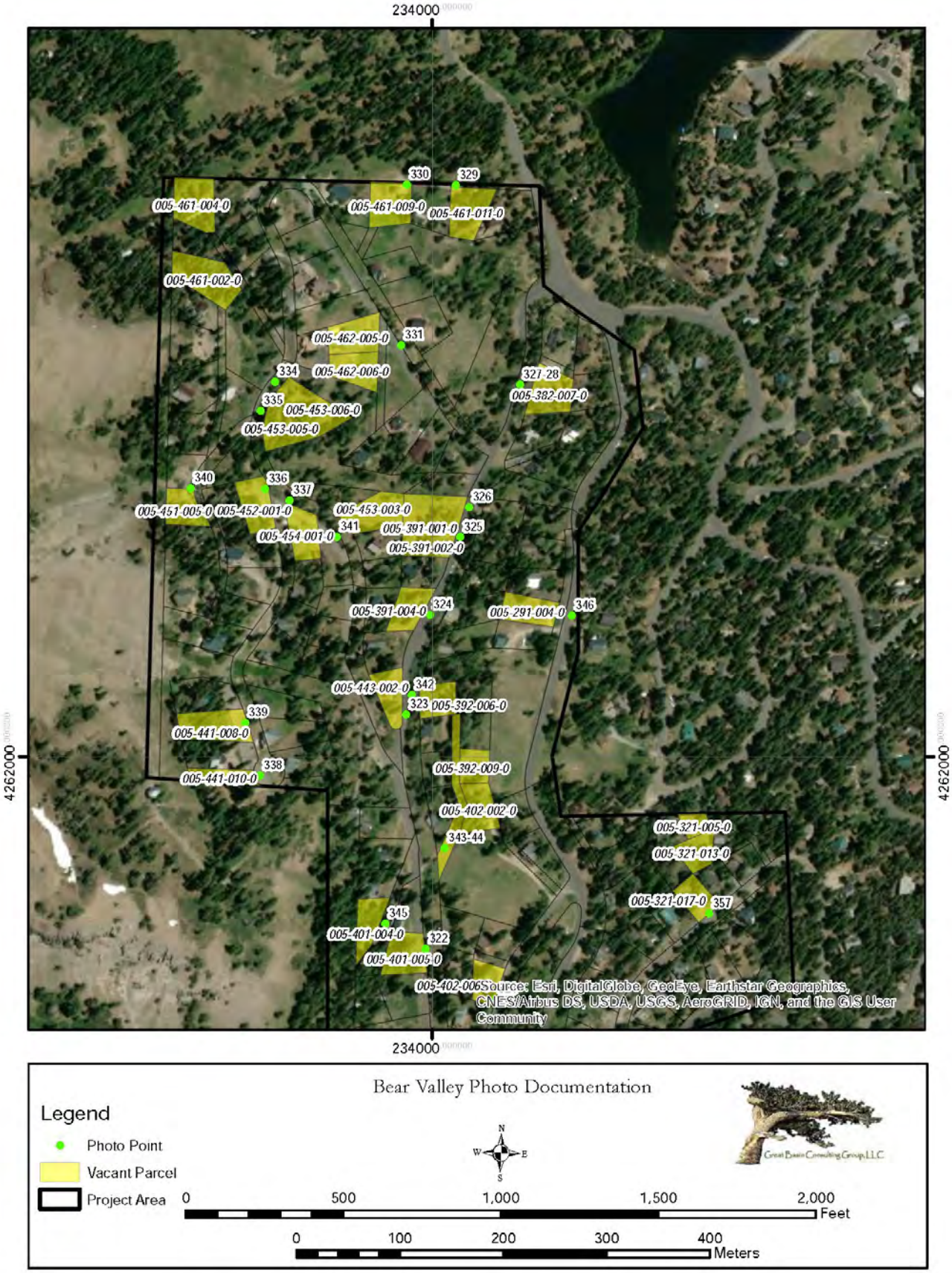
005-392-009-0
005-402-002-0
343-44
005-321-005-0
005-321-013-0
005-321-017-0
357
345
005-401-004-0
322
005-401-005-0
005-402-006-0
321
005-343-004-0
318
319
005-343-003-0
005-411-011-0
320
005-241-002-0
349
350-51
005-242-001-0
005-261-001-0
005-241-007-0
348
005-242-008-0
352
005-253-009-0
353
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
234000
4262000
Bear Valley Photo Documentation
Legend
Photo Point
Vacant Parcel
Project Area
N
W
E
S
0
500
1,000
1,500
2,000
Feet
0
100
200
300
400
Meters
Great Basin Consulting Group, LLC


234000
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330
329
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334
005-462-006-0
321-28
005-382-007-0
335
005-453-006-0
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340
336
337
326
005-451-005-0
005-452-001-0
005-453-003-0
341
005-391-001-0
325
005-454-001-0
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324
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346
005-443-002-0
342
323
005-392-006-0
339
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338
005-441-010-0
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343-44
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357
345
005-401-004-0
322
005-401-005-0
005-402-005
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Bear Valley Photo Documentation
Legend
Photo Point
Vacant Parcel
Project Area
N
W
E
S
Great Basin Consulting Group, LLC
0
500
1,000
1,500
2,000
Feet
0
100
200
300
400
Meters

Lot Overview, 005-343-004-0. View Northwest; Exp 318

Lot Overview, 005-343-003-0. View West; Exp 319

Lot Overview, 005-411-011-0. View West; Exp 320

Lot Overview, 005-402-006-0. View West; Exp 321

Lot Overview, 005-401-005-0. View West; Exp 322

Lot Overview, 005-443-002-0. View Northwest; Exp 323

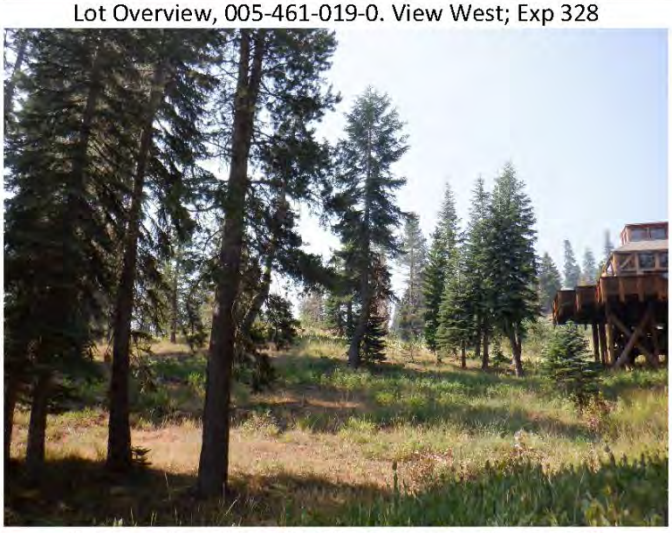
Lot Overview, 005-391-004-0. View West; Exp 324

Lot Overview, 005-391-002-0. View West; Exp 325

Lot Overview, 005-391-001-0. View West; Exp 326

Lot Overview, 005-382-007-0. View East; Exp 327

Lot Overview, 005-461-019-0. View West; Exp 328



Lot Overview, 005-461-011-0. View South; Exp 329

Lot Overview, 005-461-009-0. View Southwest; Exp 330

Lot Overview, 005-462-005-0. View West; Exp 331

Lot Overview, 005-453-006-0. View East; Exp 334

Lot Overview, 005-453-005-0. View East; Exp 335

Lot Overview, 005-452-001-0. View Southwest; Exp 336

Lot Overview, 005-454-001-0. View Northeast; Exp 337

Lot Overview, 005-441-010-0. View West; Exp 338

Lot Overview, 005-441-008-0. View West; Exp 339

Lot Overview, 005-451-005-0. View Southwest; Exp 340

Lot Overview, 005-453-003-0. View East; Exp 341

Lot Overview, 005-392-006-0. View Northeast; Exp 342

Lot Overview, 005-402-002-0. View Northeast; Exp 343

Lot Overview, 005-392-009-0. View Northeast; Exp 344

Lot Overview, 005-401-004-0. View West; Exp 345

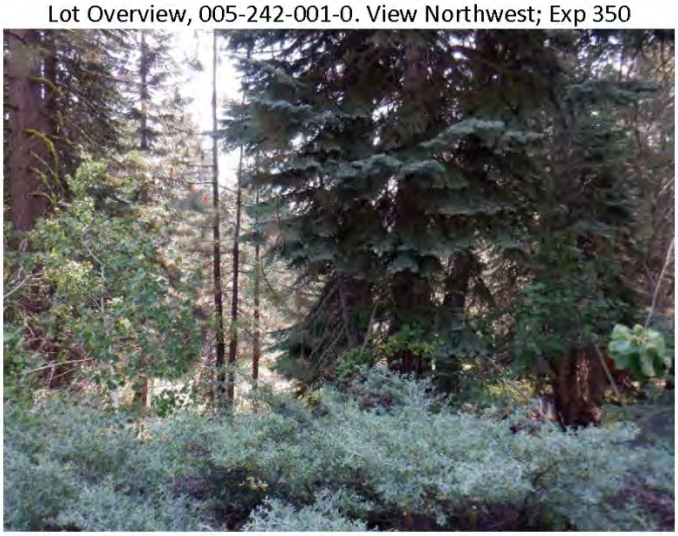
Lot Overview, 005-291-004-0. View West; Exp 346

Lot Overview, 005-321-017-0. View Northwest; Exp 357

Lot Overview, 005-241-007-0. View Northwest; Exp 348

Lot Overview, 005-241-002-0. View North; Exp 349

Lot Overview, 005-242-001-0. View Northwest; Exp 350



Lot Overview, 005-261-001-0. View Southeast; Exp 351

Lot Overview, 005-242-008-0. View Northwest; Exp 352

Lot Overview, 005-253-009-0. View North; Exp 353

APPENDIX H – DPR 523 SITE FORMS

CONFIDENTIAL - Portions Redacted for Public Review