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Environmental Assessment

Brokenshire

Almanor Ranger District, Lassen National Forest
Tehama County, California



Photos taken by E. Fudge

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Introduction

Document Structure

The Forest Service has prepared this Environmental Assessment in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This Environmental Assessment discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives.

Background

The proposed Brokenshire Project area provides recreation opportunities such as picnicking, fishing, and dispersed camping. Additionally, there are recreation residences and an organization camp under special use permits with the Lassen National Forest within the project area. Portions of the Morgan Springs South grazing allotment are also within the proposed project area.

The Lassen National Forest (LNF), Almanor Ranger District (ALRD) is proposing a project intended to enhance recreation opportunities for Forest visitors and improve defensible space for the residents and users of the Summit Springs Recreational Tract and Camp Tehama Organizational Camp.

In addition the proposed project would contribute to the preservation of Mill Creek's anadromous fish habitat. Mill Creek, both adjacent to and downstream of the proposed project area, is accessible to and occupied by federally-listed Central Valley (CV) steelhead trout and CV spring-run Chinook salmon. Mill Creek is designated as critical habitat (DCH) for both salmonids (NFMS 2005).

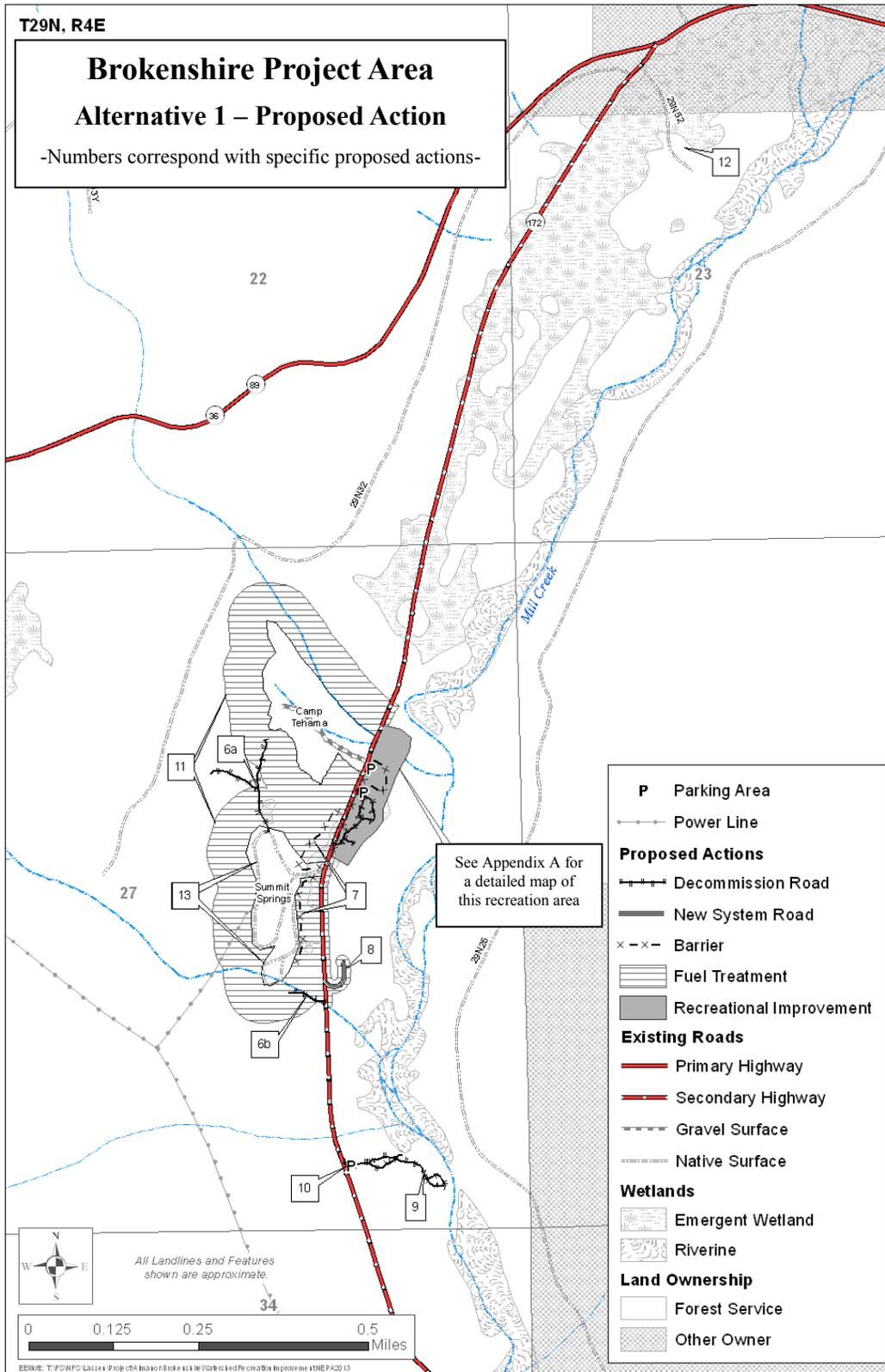
Anadromous - Anadromous fishes spend all or part of their adult life in salt water and return to freshwater streams and rivers to spawn.

The proposed Brokenshire Project is within Management Area 27 (Upper Mill Creek) southeast of Mineral, Tehama County, California. The legal description is sec. 23, 27 & 34 of T. 29 N., R. 4 E., MDM.

The proposed project area is mainly along a one-half mile strip of State Highway 172, south of State Highway 36. On the west side of State Highway 172, work is proposed around the Summit Springs Recreation Residence Tract and Camp Tehama Organization Camp, both of which are under special use permit with the LNF. On the east side of State Highway 172, work is proposed between the highway and Mill Creek, in and adjacent to the current Brokenshire picnic area and dispersed campsites located within the Riparian Habitat Conservation Area (RHCA) of Mill Creek.

Riparian Habitat Conservation Area (RHCA) - Riparian habitat conservation areas may include active channels, inner gorges, floodplains, riparian vegetation, perennial and intermittent streams, wetlands, fens, ponds, lakes, reservoirs, and landslide areas. Primary management emphasis is on protecting and where necessary, restoring the condition of these riparian and aquatic habitats.

The proposed project would include recreation site improvement and expansion, route decommissioning, parking area improvements, riparian and soil resource protection measures, road work and fuels reduction.



Purpose and Need for Action

The purpose of this project is to:

- Accommodate and enhance visitors' recreation experience;
- Decrease the risk of wildfire occurring within the project area with potential impacts to Forest users, property, riparian vegetation, and Mill Creek's anadromous habitat;
- Reduce the risk of sediment production to Mill Creek related to management and recreation activities within the RHCA and maintain and protect habitat for federally listed anadromous fishes.

The following addresses need for action by affected resource:

Recreation

There is a need to improve and enhance recreation site facilities to accommodate current and anticipated recreation use, and to protect riparian vegetation and resources. Within the project area, heavy and unmanaged visitor use, inadequate parking, and open access have resulted in unintended impacts. Several user-created foot trails and roads are located within riparian areas. Unmanaged camping and picnicking areas, and the associated parking and vehicle access, have contributed to increased soil compaction and affected small spring channels in the riparian area.

The current Brokenshire picnic area is located in a riparian area that is being negatively affected by existing vehicle access routes. The restroom facility at the site has been used beyond capacity, posing a threat of leaking sewage, which could negatively impact water quality. There is a need to remove this outdated restroom facility and provide a new restroom facility at the proposed picnic area expansion. There is also a need to provide educational information to help visitors understand the natural and cultural resources of Mill Creek and the management actions to balance visitor access and resource protection.

There is a need to define and improve vehicle parking and to provide visitor access to the Brokenshire picnic area. The design and location of parking areas need to be such that visitor use and administrative maintenance impacts to the riparian areas and Mill Creek are minimal. Designated parking areas need to be defined with boundary indicators to manage vehicle access and prevent vehicles from accessing riparian areas. Use is expected to be concentrated in and around parking areas; therefore special surfaces are necessary to reduce rutting and sediment production. Additionally, there is a need to add foot trails and improve existing foot trails to provide defined access to recreation sites.

The current Brokenshire picnic area is not compliant with the Architectural Barriers Act (1968) requirement for accessibility (ABA). Management actions proposed within the project would alter existing sites, thereby triggering a need to bring them into compliance. Forest Service Manual (FSM) states, "All new or altered facilities and associated constructed features at recreation sites must comply with the technical provisions of the Forest Service Outdoor Recreation Accessibility Guidelines (FSORAG), rather than only a certain percentage of those facilities" (FSORAG 2006).

Fuels

The Summit Springs Recreation Tract, Camp Tehama Organization Camp, and surrounding recreation sites experience high visitor use. This use, coupled with the existing timber stand conditions, increases the potential of a human caused fire to originate within this area. Live fuels surrounding Summit Springs Recreation Residences and Camp Tehama Special Use Area have a low canopy base height and a relatively continuous canopy closure. Surface fuels are continuous, with areas of heavy fuel concentrations occurring throughout the area. Existing ladder fuels and low canopy base heights increase the risk that fire could be transferred into tree crowns, increasing the probability of sustained crown fire and creating potentially unsafe conditions for forest users and firefighters. There is a need to reduce the fuels in this area to decrease potential adverse fire behavior.

Canopy Base Height - The lowest height above the ground above which there is sufficient canopy fuel to propagate fire vertically.

Management intent from the Pacific Southwest Region Lassen National Forest Fire Management Plan (2012) is to protect communities from wildfire and prevent the loss of life and property. Management objectives are to create defensible space near communities, and provide a safe and effective area for firefighters to suppress fire. The area proposed for thinning treatment under this project is considered a Wildland Urban Interface (WUI) Defense Zone. According to the Sierra Nevada Forest Plan Amendment Record of Decision (SNFPA ROD), the desired condition of these areas should be fairly open and dominated by larger, fire tolerant trees and surface and ladder fuel conditions should be such that crown fire ignition is highly unlikely.

Ladder Fuels - Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

At the time of the development of the Brokenshire project, the Herger-Feinstein Quincy Library Group (HFQLG) pilot project was still in effect and the project area was classified as 'deferred' (App M, (c) (4)), restricting commercial timber sale activity. A proposed action was developed that addressed the need for fuels treatment utilizing other available methods for meeting the identified purpose and need for the project in a timely manner. While the HFQLG Forest Recovery Act expired in October of 2012 and the classification of the 'deferred' land base restriction no longer affects this area, re-initiating the project to address the change in HFQLG restrictions would result in substantial delays in alleviating the hazardous fuels conditions that currently exist in the project area.

In the event of a wildfire in the project area, State Highway 172 could be utilized by fire suppression personnel as a control line. Currently, there is vegetation directly adjacent to the east side of Highway 172 that would negatively affect the effectiveness of the highway as a fuel break. There is a need to remove ladder fuels within 50 feet of the highway to decrease potential fire behavior. This would enhance State Highway 172 as an effective fuel break for safe access by fire suppression personnel and safe evacuation egress for residents and Forest visitors.

Watershed

Current direction for this management area includes managing for enhancement opportunities for anadromous fish habitat (such as stabilizing stream banks and revegetating floodplains) and restricting disturbance of floodplain vegetation.

To prevent further impacts to DCH for anadromous fish, there is a need to decommission five unneeded unauthorized routes and two system roads in the project area. The unauthorized routes were not added to the National Forest Transportation System described in the LNF Motorized Travel Management (MTM) ROD, and are prohibited for use by motorized vehicles.

Unauthorized routes and segments of Forest Service Road 29N41 are located within the RHCA of Mill Creek and allow vehicles access onto the Mill Creek floodplain, divert ephemeral drainages, and impact watershed resources such as riparian vegetation and stream banks. There is evidence that past vehicle use of some unauthorized routes contributed to the crossing of Mill Creek and may have affected DCH occupied by federally listed fish species. Attempts have also been made to drive up an unstable stream bank on the east side of Mill Creek. Additionally, Forest Service Road 29N52 bisects part of a meadow. Currently, the road and a plugged culvert are affecting the natural flow of water in this area.

There is a need to add one needed unauthorized route to the system. This road accesses a dispersed camping area that is proposed for improvement as part of this project. The unauthorized route added to the system would be improved to meet Best Management Practices and added to the Forest Service maintenance schedule. These actions would improve management consistency with the LNF MTM ROD by prohibiting cross country travel and preventing resource damage caused by unmanaged motor vehicle use by the public.

The access road to the Summit Springs Recreation Residences has been recognized as needed for continued use and requires upgrading and improvement to meet Forest Service Level 2 road standards and minimize road-related watershed impacts.

Collection of Materials for Cultural Use

There is a need to provide opportunities for local federally recognized tribes to collect timber products for the traditional and cultural purposes pursuant to section 8105 of the Food, Conservation, and Energy Act of 2008, Public Law 110-246, § 8 105, 122 Stat. 1651 (2008).

Proposed Action

This project proposes to expand and improve the Brokenshire picnic area, decommission unauthorized roads and OHV trails, implement protection measures for wet areas and define current dispersed campsites. One road will be removed from the system but maintained by the area livestock permittee in accordance with Best Management Practices for authorized use through the permit. Additional work includes fuels reduction around Summit Springs Recreation Residences, Camp Tehama Special Use Area and recreation areas within this project area. Finally,

the road system accessing Summit Springs Recreation Residences would be improved to meet Forest Service Level 2 road standards and a special use permit would be issued for its use and maintenance. See the Alternatives section for a detailed description of the Proposed Action.

Decision Framework

Given the purpose and need, the deciding official reviews the proposed action and the other alternatives in order to make the following decisions:

- 1) Whether or not to implement the Proposed Action as described above
- 2) Whether the No Action Alternative should be selected.

The Forest Service Deciding Official will issue a decision based on this Environmental Assessment consistent with their authority and applicable laws, regulations, and policies.

Public Involvement

The proposal was listed in the Schedule of Proposed Actions (SOPA) on January 1, 2010 as a Categorical Exclusion. Upon further development of the proposal, on April 1, 2010 Brokenshire was changed to an Environmental Analysis on the SOPA.

The proposal was provided to the public and other agencies for comment during scoping from February 29 through March 21, 2012. In addition, as part of the public involvement process, a legal notice was published in the local paper (Chester Progressive) on February 29, 2012. Also, packets that included copies of the Proposed Action, project maps and pictures of affected areas were mailed to 24 potentially interested parties.

In accordance with section 104(e) of the Healthy Forest Restoration Act (HFRA), the agency hosted a public meeting to review this and two other projects on Thursday, March 8, 2012, from 4-6:00 p.m. The meeting was advertised in the form of a press release on March 1, 2012. Access to project maps and the proposed action was provided at the meeting. This meeting was held for multiple projects on the Almanor Ranger District. Four attendees expressed specific interest in the Brokenshire project.

Two letters were received in support of the Brokenshire project.

One letter was received expressing concern over the proposed decommissioning of Forest Road 29N52.

One additional letter was received from QLG Forester Frank Stewart that addressed QLG specific direction.

Issues were identified from concerns expressed in public meetings, scoping comments, and/or by the interdisciplinary team, as described in the next section.

Issues

The Forest Service separated the issues into two groups: significant and non-significant issues. Significant issues were defined as those directly or indirectly caused by implementing the

proposed action. Non-significant issues were identified as those: 1) outside the scope of the proposed action; 2) already decided by law, regulation, Forest Plan, or other higher level decision; 3) irrelevant to the decision to be made; or 4) conjectural and not supported by scientific or factual evidence. The Council on Environmental Quality (CEQ) NEPA regulations require this delineation in Sec. 1501.7, "...identify and eliminate from detailed study the issues which are not significant or which have been covered by prior environmental review (Sec. 1506.3)..." A list of non-significant issues and reasons regarding their categorization as non-significant may be found at the Almanor Ranger District office in the project record. The following significant issue was identified from the public scoping comments:

Decommissioning FR29N52 may impact the administration and utilization of the Morgan Springs South Allotment by eliminating the sole access to a fenced field and adjacent private lands utilized as part of grazing operations.

In addition, the interdisciplinary team identified the following issue:

Continued degradation of the Summit Springs access road may impact local watershed characteristics, and hinder access to the Summit Springs recreation residence tract.

In response to the issues and to address additional concerns, the Proposed Action was slightly modified, and Mitigation and Design Features were added. The issues are analyzed in the Environmental Consequences section.

Alternatives, including the Proposed Action

This chapter describes and compares the alternatives considered for the Brokenshire project. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public.

Alternatives

Alternative 1

The Proposed Action

These actions respond to the goals and objectives outlined in the Lassen National Forest Land and Resource Management Plan, and helps move the project area towards desired conditions described in that plan (Land and Resource Management Plan, Lassen National Forest, 1992 as amended by SNFPA ROD).

The following is a detailed list of proposed actions (see page 4 of this document for map with corresponding item numbers):

Changes from the original Proposed Action are written in italics

Expand current Brokenshire Picnic Area (map item number 1):

- Expand Brokenshire picnic area by constructing new ABA compliant picnic sites across Highway 172 from Camp Tehama, approximately 0.1 mile north of the

existing Brokenshire picnic area. The expansion would have up to 6 new picnic sites with ABA compliant picnic tables, bear-proof trash cans, recycle bins, and grills. Up to ten trees ranging in size from 8 to 29.9 inches dbh may be removed to facilitate construction of this site and the new parking area (map item 2). Felled trees would be limbed; limbs would be piled and burned. Stumps may be ground out if necessary. Boles from felled material would be strategically placed to define parking areas.

- Install an ABA compliant vault toilet.
- Define the picnic area by cedar rail fencing and/or large woody debris along the picnic area perimeter.
- Construct an ABA compliant trail into the site from the new parking area (2).
- Install interpretive signs.

Parking area for Brokenshire Picnic Area expansion (map item 2):

- Construct new parking area with one ABA compliant parking space and three standard parking spaces. Parking area would be surfaced with aggregate or paved.

Extra vehicle parking area improvement (map item 3):

- Existing extra vehicle parking lot would be surfaced with aggregate or paved.
- The perimeter of the parking lot would be defined using large woody debris, cedar rail fencing, and/or large inset boulders.

Existing foot trail to Mill Creek (map item 4):

- Add the existing foot trail that accesses the edge of Mill Creek to the Lassen National Forest Transportation System.
- Install interpretive signs at the trail entrance.

Current Brokenshire Picnic Area (map item 5):

- The current Brokenshire Picnic Area would be converted to a walk-in site. Management activities would include removal of fire pits and the expired toilet.
- Decommission approximately 0.1 miles of system road (29N41) and approximately 0.1 miles of unauthorized road associated with the site. Decommissioning would require sub-soiling approximately 0.2 miles of road, spreading native seed and certified weed-free rice straw on disturbed soils, and blocking vehicle access with large woody debris, large inset boulders, and/or cedar rail fencing.
- Block vehicle access from the east side of Highway 172 to approximately three acres of wet meadow using cedar rail fencing, large woody debris, and/or large inset boulders.
- Construct a short foot trail with a boardwalk crossing seasonally wet areas in the footprint of the existing unauthorized road to provide access to the picnic site from the extra vehicle parking lot (3). 0.1 miles of trail would be added to the Lassen National Forest Transportation System.

- Bear-proof garbage cans would be installed at the picnic site.

Unauthorized roads and OHV trails (map items 6a and 6b):

- Decommission two unauthorized roads and OHV trails (approximately 0.3 miles) around the Summit Springs Recreation Residence Tract. Decommissioning activities would include sub-soiling compacted areas, recontouring slopes if needed, spreading native seed and certified weed-free straw on disturbed soils, and blocking vehicle access with large woody debris, large inset boulders, and/or cedar rail fencing.

Wet meadow between Summit Springs and Highway 172 (map item 7):

- Block vehicle access to approximately four acres of wet meadow located east of Summit Springs Recreation Residence Tract and west of Highway 172 with cedar rail fencing, large woody debris, and/or large inset boulders.

Dispersed camping (map item 8):

- Three to four campsites would be defined. Campfire rings would be added at each campsite. Interpretive and information signs would be installed.
- Dead and down fuels surrounding the area would be treated through hand piling and the piles would be burned. Trees that have been identified as ‘danger trees’ in accordance with the Roadside/Facility Hazard Tree Identification Guidelines for the Lassen, Plumas, Modoc and Tahoe National Forests, (February 2008) would be felled.
- Additionally, up to fifteen trees ranging in size from 8 to 29.9 inches dbh may be removed to facilitate construction of this site.
- All felled trees would be limbed; limbs would be piled and burned. Stumps may be ground out if necessary. Boles from felled material would be strategically placed to block a small meadow area from vehicle use.
- The existing 0.1 mile of unauthorized route to the campsites would be added to the Forest Transportation system and defined.

Mill Creek dispersed campsite (map item 9):

- Decommission and block motorized access to the 0.4 miles of user-created, unauthorized routes (UBB 707 and 707A, B & C; identified during Travel Management) accessing dispersed campsites adjacent to Mill Creek, approximately 0.7 miles south of the Brokenshire picnic area on Highway 172. Vehicle access would be blocked with large inset boulders or other effective barriers. A seasonal stream that is currently being diverted down the road surface of the main access road to the campsites would be reconstructed to drain into the natural channel.

- A foot trail would replace the decommissioned unauthorized routes that access dispersed campsites near Mill Creek. 0.4 miles of non-motorized trail would be added to the Forest Transportation System.
- These dispersed campsites would be improved with the installation of designated fire rings and interpretive and informational signs.

Existing parking area for Mill Creek dispersed camping area (map item 10):

- The existing parking area would be defined with boulders or other boundary markers. Trash cans and recycle bins would be installed. An informational and educational kiosk would be installed at the parking area.

Fuels activities (map item 11):

- Fuels treatments are proposed for approximately 53 acres within the Brokenshire project area. Treatment would occur in four areas;
 - 1) within 300 feet of the Summit Springs Recreation Residence Tract and Camp Tehama Organizational Camp boundaries;
 - On the west side of Highway 172, around Summit Springs and Camp Tehama, trees ***up to 10 inches dbh*** and brush where they create a fuel ladder would be hand thinned and then *grapple piled*.
 - ***All snags would be hand felled and grapple piled.***
 - Existing surface fuels including downed logs would be ***grapple piled***.
 - All piles would be burned.
 - 2) within 50 feet of the Brokenshire Picnic Area (current and proposed expansion);
 - 3) within 50 feet of the dispersed camping area (map item 8), and
 - 4) within a 50 foot strip along a half mile of the east side of Highway 172.

The following treatments would occur within areas 2, 3 and 4:

- Activities would include hand thinning and piling of trees measuring up to eight inches diameter at breast height (dbh). Snags measuring 14.9 inches dbh and under would be hand thinned.
- Existing surface fuels would be hand piled.
- Thinned materials and surface fuels would be hand piled.
- All piles would be burned.

Forest road 29N52 (map item 12):

- *The Lassen National Forest would change the route from a Maintenance Level 2 to a Maintenance Level 1 for administrative use. The grazing permit would be modified to authorize use of the route and include maintenance of the route following Forest Service Best Management Practices (BMPs), at the permittee's expense.*

Summit Springs access road (map item 13):

- *Improve to meet Forest Service Level 2 road standards and BMPs. This work will include: improve and install road drainage structures (dips, lead-out ditches, ditch relief culverts, outsloping), relocate diverted stream flow into original channels (2 crossings), surface rocking of identified locations, designation of one way traffic flow with directional signage, and have inter-visible turn outs, and street signs. A special use permit would be issued for use and maintenance of this access road within the Summit Springs Recreation Residences Tract.*

Redding Rancheria cedar collection (item 14– all within map area 11):

- *Redding Rancheria will collect up to 250 small diameter cedar poles (3" to 10" in diameter; felled by the Forest Service as part of the fuels reduction effort of this project) for bark house poles and up to 10 cords of cedar bark that can be found from downed cedar trees within the project area. Up to six large down cedar logs may be collected for use in dugout canoe construction. Additionally, if large cedar snags are designated as needing to be removed as part of the fuels reduction effort to meet objectives, they will be felled by the Forest Service and up to three may be collected by the Redding Rancheria. This timber collection falls under the 2008 Farm Bill which authorizes federally recognized tribes to collect timber products for the traditional and cultural purposes pursuant to section 8105 of the Food, Conservation, and Energy Act of 2008, Public Law 110-246, § 8 105, 122 Stat. 1651 (2008).*

Table 1 - Summary of Proposed Actions

Item #	Proposed Action	Area Affected (approximate)
1	Expand Brokenshire picnic area to include ABA compliant picnic sites, vault toilet and path of travel.	1.0 acre
2	Construct new parking area for use with Brokenshire picnic area.	0.25 acres
3	Improve existing extra vehicle parking area.	0.25 acres
4	Add the existing foot trail that goes from area (1) to the edge of Mill Creek to the Forest Transportation System	0.1 mile
5	Convert current Brokenshire picnic area to a walk-in picnic site, decommission expired toilet.	0.5 acre

	Block vehicle access from highway to wet meadow.	3 acres
	Decommission System Road 29N41 and the unauthorized route leading to the current picnic area.	0.1 mile system road
	Replace unauthorized route with a foot trail.	0.1 mile unauthorized route
6 a&b	Decommission two unauthorized routes around Summit Springs Recreation Tract.	0.3 mile unauthorized route
7	Block vehicle access to wet meadow.	4 acres
8	Improve existing dispersed campsite & treat surrounding fuels; Add current access road to system	2 acres 0.1 mile road
9	Decommission unauthorized routes UBB 707 and 707A, B & C (identified during Travel Management), which access Mill Creek dispersed campsites; Replace with foot trails.	0.4 mile
10	Improve existing parking area for accessing proposed foot trail to Mill Creek dispersed campsites.	0.25 acre
11	Hand thin, pile and burn created piles around Summit Springs Recreation Residence Tract, Camp Tehama Organizational Camp, recreation sites and 50 foot buffer along east side State Highway 172.	53 acres
12	<i>Change Forest Road 29N52 to Maintenance Level one for administrative use; transfer responsibility of route maintenance to grazing permittee</i>	.1 mile
*13	<i>Upgrade Summit Springs access route to meet Forest Service Level 2 road standards and improve usability; issue special use permit for use and maintenance.</i>	.7
*14	<i>Redding Rancheria will collect small diameter cedar poles, cedar bark from downed cedar trees, and large downed and/or felled cedar logs from within the project area.</i>	n/a
		Total Approximate Miles
Routes & Roads Decommissioned**		.9
Roads Added		.1
Road Improvement with Special Use Authorization		.7
Trails Added		.6

*action added after Proposed Action scoping ended

**Unauthorized routes decommissioned: .8 miles; System routes decommissioned: .1 mile

Integrated Design Features for the Proposed Action

The following integrated design features were developed to minimize potential impacts from implementation of the Proposed Action.

1. Silviculture

The California Fivespined Ips:

The California Fivespined Ips is a bark beetle that can cause widespread mortality and top-kill in pine trees. Slash and boles from pine trees provide potential breeding material for this insect until desiccated.

1. Within hand thinning areas, cut pine tree boles, limbs, and tops that are 4 inches in diameter or larger into lengths that don't exceed 3 feet. Ideally, slash should be scattered. If slash is piled for burning, pile in a manner that maximizes exposure to sun. Preferably, work within hand treated areas would be completed July 15 through December 31 to avoid potential attacks in pine slash in the early part of the year when the likelihood of attack is highest. If slash is created before June 30, reduce the bucked length of boles >8 inches to 2' in length.

2. Range

1. Consultation with the District Rangeland Specialist and the allotment permittee would be conducted to coordinate project operations, including timing of livestock trailing and Highway 172 access.

3. Recreation/Special Uses

1. Keep unaffected roads, trails, and dispersed camping sites within the project open and free of debris.
2. Keep road accessing the Summit Spring Recreation Residence Tract, and the Camp Tehama Organizational Camp open and passable to emergency equipment at all times.
3. Restrict equipment operations to the hours of 7 AM to 7 PM in the vicinity of the Summit Springs Recreation Residence Tract and the Camp Tehama Organizational Camp.
4. 30 days in advance of operations in the Brokenshire project area notify the Permit holders at Summit Springs and Camp Tehama of expected operations and duration.

4. Wildlife

Northern Goshawk and Spotted Owl:

1. Currently, there are no goshawk PACs (Protected Activity Centers) within ¼ mile of the proposed actions. However, a limited operating period (LOP) from February 15 through September 15 would apply to fuel treatment units if a northern goshawk nest

is located within ¼ mile of the project activity. If an active nest site is found during project implementation or within a treatment unit a new PAC would be created to encompass the best available habitat around the nest location. If a new nest is found within a treatment unit, mechanical treatment will be prohibited within a 500 foot radius buffer around the nest site.

Implement Limited Operating Periods (LOP) within 1/4 mile of any active goshawk nest;

Northern Goshawk LOP	Feb. 15 – September 15
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2. A California spotted owl PAC is located within ¼ mile of the Summit Springs WUI unit. If a nesting pair is confirmed in this PAC an LOP from March 1 to August 15 would apply to any fuels treatment areas that fall within ¼ mile of the nest location. If an active nest site is found during project implementation or within a treatment unit a new PAC would be created to encompass the best available habitat around the nest location. If a new nest is found within a treatment unit, mechanical treatment will be prohibited within a 500 foot radius buffer around the nest site.

Implement Limited Operating Periods (LOP) within 1/4 mile of any active owl nest;

Spotted Owl LOP	March 1 – August 15
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Fringed Myotis:

1. The timing for demolition of the old toilet would occur between September 1 and May 1, preferably in September/October. Forest biologist will complete a pre-work visual inspection a few days prior to demolition work to determine if the structure is currently being used by bats. If bats are actively using the structure, lighting or noise could be used in the building to discourage the bats from returning to the structure. Alternatively, contractor may gently rip the roof off right at dusk when the bats would be leaving.

Western Bumble Bee:

1. Outside of the fuels treatment areas leave occasional logs where bumble bees can find nesting and overwintering sites.

Shrubs:

1. To the extent feasible, protect large shrubs and hardwoods (i.e. dogwood, willow, aspen) during operations.

Down Logs:

1. Outside of the 300 foot fuels reduction buffer around Summit Springs Recreational Residences and Camp Tehama Organizational Camp ten to 15 tons per acre of logs would be retained. Logs would be of various decomposition classes and the largest diameter available. A log approximately 20 feet in length and 26 inches diameter is approximately 1 ton.

Snags:

Outside of the 300 foot fuels reduction buffer around Summit Springs Recreational Residences and Camp Tehama Organizational Camp the following snag retention guidelines would be implemented:

1. Within the limits of safety and operability retain all snags greater than 15 in dbh.
2. All oak snags greater than 3” dbh would be protected within the limits of safety and operability.
3. Retain snags with existing wildlife use regardless of stage, size, or species where feasible. Examples of wildlife use are;
 - Large Stick Nests
 - Large Cavities (> 3”)
 - Small Cavities
 - Woodpecker excavations

5. Botany***Threatened, Endangered, Sensitive (TES) Plant Species:***

1. Though no Region 5 Sensitive Plant species were found within the Brokenshire Project area, potential habitat for four Sensitive Plant species (*Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum*) does occur. New occurrences of TES plant species discovered before or during ground-disturbing activities would be protected through flag and avoid methods.
2. Live incense cedar trees would not be cut within 25 feet of seasonal channels, wetlands, and meadows.

Noxious Weeds:

1. All off-road equipment would be weed-free prior to entering Lassen National Forest. Staging of equipment would be done in weed-free areas.
2. Known infestations of *Hypericum perforatum* (Klamathweed) would be identified, flagged, and mapped for this project. Locations would be displayed on contract maps. Identified noxious weed sites within or adjacent to the project area containing isolated patches with small plant numbers would be treated (hand pulled or dug) by forest botany staff prior to project implementation. Any larger or unpullable infestations would be avoided by harvesting equipment to prevent spreading weeds within the project.
3. New small infestations of priority weed species identified prior to or during project implementation would be treated and avoided by project activities. If larger infestations are identified, they would be isolated and avoided by equipment, or equipment used would be washed after leaving the infested area and before entering an uninfested area.

4. Post-project monitoring for implementation and effectiveness of weed treatments and control of new infestations would be conducted as soon as possible and for a period of two years after completion of the project.
5. If project implementation calls for mulches or fill, they would be certified weed-free. Seed mixes used for revegetation of disturbed sites would consist of locally-adapted native plant materials to the extent practicable.

6. Watershed and Soil

Riparian Habitat Conservation Areas (RHCA)s:

Guidelines from the Long-term Strategy for Anadromous Fish-producing Watersheds in the Lassen National Forest would be implemented (Appendix I-Part 4 of the Sierra Nevada Forest Plan Amendment). Management actions are not excluded from these areas, but rather are tailored to maintain or enhance riparian management objectives (RMOs). Treatments would be applied to reduce the potential for undesirable high intensity fire within RHCA)s. Additionally, treatments would be designed to meet riparian management objectives; prescriptions vary by habitat type. In addition to the following integrated design features (IDFs), all applicable best management practices (BMPs) would be implemented. BMPs are described in: Water Quality Management for Forest System Lands in California, Best Management Practices (USDA FS, 2000a) and SNFPA Record of Decision, 2004.

Measures for the protection of RHCA)s would include:

Width:

1. Perennial Channels: Perennial channel RHCA)s shall extend 300 feet slope distance on either side of the active stream channel. RHCA widths may be altered to include sensitive habitat areas and/or landforms.
2. Wetlands more than one acre: RHCA)s shall extend 150 feet slope distance on either side of the wetland area. RHCA widths may be altered to include sensitive habitat areas and/or landforms.
3. Seasonal Channels, wetlands and meadows less than one acre: RHCA)s shall extend 150 feet slope distance on either side of the active stream channel or edge of wetland area. RHCA widths may be altered to include sensitive habitat areas and/or landforms.
4. Hand thinning would be allowed within RHCA)s; however, trees over 8 inches DBH with root masses contributing to bank stability of the channel or inner gorge and all hardwoods and riparian species would be retained.
5. All machine-piling would be completed using low-ground pressure rated equipment.
6. Machine-piling would not occur on the east side of Highway 172. On the west side of Highway 172, machine piling would not occur within 50 feet of a meadow, wetland,

- stream, or scour channel. The exception would be the perennial stream southwest of Summit Springs, which would have a mechanical equipment exclusion zone of 25 feet.
7. Hand piles across the project area would not be placed within 25 feet of meadows, wetlands, stream, or scour channels.
 8. Only one-third of piles within 150 feet of perennial stream channels would be ignited per calendar year.
 9. There will be no crossings of stream channels by mechanical equipment off existing roads. Seasonal stream crossings, if needed, will be designated by a hydrologist, fish biologist or soil scientist before implementation.

Soils:

1. Soil moisture conditions in treatment areas located outside of RHCAs would be evaluated using Forest established visual indicators before equipment operations proceed;
2. Areal extent of detrimental soil disturbance would not exceed 15 percent of the area dedicated to growing vegetation;
3. Lassen National Forest *Wet Weather Operations* would be followed during project operations;
4. In RHCAs the following would be applied:
 - soils would be dry at the 12-inch depth (15-bars of tension) before mechanical equipment can operate;
 - conifers would be piled with low-ground-pressure rated equipment

7. Heritage Resources

Federal laws, regulations and the Region 5 Programmatic Agreement for Section 106 Compliance (RPA) will be strictly followed for the protection of cultural resources. Historic properties within the Brokenshire project area of potential effects (APE) will be protected during project implementation utilizing the following standard resource protection measures (SRPMs) listed below:

1. The boundary of all historic properties (i.e., eligible or potentially eligible properties) within the project area will be defined on the ground with permanent metal tags. No ground disturbing project activities including fuels treatments; decommissioning of existing roads, structures and features; or new construction of trails will be allowed within site boundaries until National Register eligibility is determined in consultation with the *State Historic Preservation Office (SHPO)*.

2. Historic properties located within the project APE but not in close proximity to identified treatment areas shall be protected from indirect project impacts such as use of sites for staging equipment or vehicles or any other activities.
3. Forest Service project manager will be apprised of all site locations to insure protection from direct as well as indirect effects.
4. Sites would be monitored during project implementation and after project completion.
5. If heritage resources are identified during project implementation (unanticipated discovery) all work will cease immediately in that area until the situation is reviewed and an assessment and mitigation plan instituted to insure protection of the site.

8. Engineering

The proposed restroom is considered a septic tank by Tehama County and must adhere to the following regulations:

1. Placement of the vault restroom shall be located no closer than 25 feet from drainage ditches, 50 feet from intermittent streams and 100 feet from continuously running streams per Tehama County regulations.

9. Fuels

1. Hand and machine piles shall not be piled under or near trees that would result in the mortality of surrounding trees when ignited.
2. All burning will be completed under a current approved District Pile Burn Plan.
3. All burning of hand piles will be in compliance with California Ambient Air Quality Standards (CAAQS).

Alternative 2

No Action

Under the No Action alternative, no road decommissioning, road improvement, trail work, recreation area improvement/construction, or fuels treatment would be implemented. Current management practices such as road maintenance and fire suppression would continue.

Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

Table 2 – Comparison of Alternatives

Purpose and Need for Action	Alternative 1 – Proposed Action	Alternative 2 – No Action
<i>Recreation</i>		
Accommodate and enhance visitors' recreation experience	Meets	Does not meet
Improve and enhance recreation site facilities to accommodate current and anticipated recreation use, and to protect riparian vegetation and resources.	Meets	Does not meet
Remove outdated restroom facility and provide a new restroom facility at the proposed picnic area expansion	Meets	Does not meet
Provide educational information to help visitors understand the natural and cultural resources of Mill Creek and the management actions to balance visitor access and resource protection.	Interpretive signs would be installed at the existing foot trail to Mill Creek, the expansion of the current Brokenshire Picnic Area and at the Mill Creek dispersed campsite.	No new educational information provided for visitors to the proposed project area.
Define and improve vehicle parking to provide visitor access to recreation opportunities within the Brokenshire project area, and minimize impacts to riparian areas and Mill Creek.	Three parking areas would be defined and improved	Existing parking areas would remain as they currently are, further impacting riparian resources.
Add foot trails to provide defined access to recreation sites.	.6 miles of foot trails added	No new foot trails
Bring the current Brokenshire picnic area in compliance with the Architectural Barriers Act requirement for accessibility (ABA).	Brokenshire expansion would include the following ABA compliant features: access path, picnic sites and vault toilet	Brokenshire remains noncompliant with ABA requirements
<i>Fuels</i>		
Reduce the fuels in this area to decrease potential adverse fire behavior	Surface fuels 0 - 3 inch diameter reduced to 2.4 tons/acre Surface fuels >3 inch diameter reduced to 15.5 tons/acre	Surface fuels 0 - 3 inch diameter 4.8 tons/acre Surface fuels >3 inch diameter 43.1 tons/acre

	Predicted fire type under 90 th percentile weather conditions : Surface fire	Predicted fire type under 90 th percentile weather conditions : Active crown fire
Create defensible space near communities, and provide a safe and effective area for firefighters to suppress fire.	Predicted flame lengths under 90 th percentile weather conditions : 2.6 feet*	Predicted flame lengths under 90 th percentile weather conditions : 8 ft*
	* Per the NWCG Fireline Handbook, Appendix B, "Fires with flamelengths greater than 4 feet are too intense for direct attack on the head by persons using hand tools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft would be required for suppression."	
In the Wildland Urban Interface (WUI) Defense Zone, (according to the SNFPA ROD) the desired condition should be fairly open and dominated by larger, fire tolerant trees and surface and ladder fuel conditions should be such that crown fire ignition is highly unlikely.	Table 5 of the Fuels Report shows that the estimated CBH following thinning would be 42 feet. The result of a more open canopy and raised canopy base heights would greatly reduce the ladder fuels that currently exist. Under 90 th percentile weather conditions, the predicted fire type would be surface.	The relatively low average CBH of 7 feet (Table 3 of the Fuels Report) is a primary component of a hazardous fuel ladder where surface fires would easily transition into crowns of trees under 90 th percentile weather conditions.
Remove ladder fuels within 50 feet of the highway to decrease potential fire behavior to enhance State Highway 172 as an effective fuel break for safe access by fire suppression personnel and safe evacuation egress for residents and Forest visitors.	Under 90 th percentile weather conditions, the predicted fire type would be surface.	Surface fires would easily transition into crowns of trees under 90 th percentile weather conditions.
<i>Watershed</i>		
Decommission five unneeded unauthorized routes and one system road in the project area.	.8 miles of unauthorized routes will be decommissioned; .1 mile of system road will be decommissioned	No roads will be decommissioned. Unauthorized and unneeded routes will remain on the landscape.

Add one needed unauthorized route to the system. This road accesses a dispersed camping area that is proposed for improvement as part of this project	.1 mile of road will be added to the Forest road system	No road added to system
Upgrade and improve the access road to the Summit Springs Recreation Residences to meet Forest Service Level 2 road standards to allow for continued use.	.7 miles of road improved to Level 2 standards	Summit Springs road remains in current state
Reduce the risk of sediment production to Mill Creek related to management and recreation activities within the RHCA and maintain and protect habitat for federally listed anadromous fishes	Meets	Does not meet

Environmental Consequences

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

The following documents are hereby incorporated by reference into this assessment and are summarized throughout this section:

- Brokenshire Silviculture Report
- Brokenshire Project Recreation Report
- Brokenshire Project Rangeland Resources Report
- Biological Evaluation and Assessment for R5 Forest Service Sensitive and Federally Listed Plant Species – Brokenshire Project
- Brokenshire Project, Noxious Weed Risk Assessment
- Brokenshire Cultural Resource Report
- Brokenshire Project Watershed and Soils Specialist Report
- Brokenshire Fire and Fuels Report
- Brokenshire Project Biological Evaluation and Biological Assessment for Terrestrial Wildlife
- Project Management Indicator Species Report –Brokenshire Project
- Biological Evaluation for Listed Anadromous Salmonids - Brokenshire Project

Silviculture

Alternative 1

Direct Effects of Hand Thinning and Piling of Surface Fuels

Only trees in the suppressed and intermediate crown position 10 inches or less than DBH would be removed as the project objective for hand thinning is to reduce ladder fuels. Hand felling and piling trees larger than 10 inches DBH would not be effective due to the size and weight of trees. By concentrating conifer removal to trees less than 10 inches DBH that are located under the canopy of larger trees and retaining the best trees less than 10 inches DBH where they do not create a fuel ladder treatment would not reduce crown closure. The quadratic mean diameter (QMD) would increase in most of the treated stands post treatment. Proposed hand thinning would have minimal effect on short term and long term stand health, since the post treatment stand densities within the larger diameter trees (>10 inches DBH) would continue to be at, or near, thresholds that can sustain endemic bark beetle populations and could lead to epidemic populations of beetles and tree mortality.

Proposed hand treatments would remove smaller trees from underneath larger trees (thin from below) retaining some of the healthy small trees where they do not create a fuel ladder. Retention of small trees would occur primarily in small overstory openings that are few in number and scattered in proposed thinning areas. Hand treatments would have minimal effect on overall stand structure, crown closure and species composition. Treatments would reduce ladder fuels and raise crown base heights by reducing numbers of small suppressed and intermediate position trees in the understory of larger trees greater than 10 inches DBH. Thinning would retain approximately 100 to 110 trees per acre (approximately 20 feet by 20 feet average spacing). Trees less than 10 inches DBH that do not create a fuel ladder preferably with the best live crown ratio would be retained. Table 3 below projects stand conditions if **all** conifers less than 10 inches DBH were to be removed by hand thinning.

Table 3- Projected Stand Conditions Post-thinning

Plot #	Pre-CWHR	Pre-Treatment				Post Treatment				Post CWHR
		TPA	BA/Ac.	CC%	QMD	TPA	BA/Ac.	CC%	QMD	
1.1	SMC6	495	206.64	64.9	8.74	130	190.06	62.8	16.37	SMC6
1.2	SMC6	400	367.46	119.9	12.97	110	359.8	118.9	24.48	SMC6
1.3	SMC6	140	275.01	90.9	18.97	60	261.67	86.5	28.27	SMC6
2.3	SMC6	195	115.23	36.4	10.4	25	91.37	30.2	25.88	SMC6
Tot/Ave	13 Ac.	307.5	241.1	78.0	12.8	81.3	225.7	74.6	23.8	SMC6
Plot #	Pre-CWHR	Pre-Treatment				Post Treatment				Post CWHR
		TPA	BA/Ac.	CC%	QMD	TPA	BA/Ac.	CC%	QMD	
2.1	SMC4M	50	117.3	40	20.73	30	113.34	37.5	26.31	SMC4M
2.2	SMC4M	115	104.49	43.7	14.48	75	97.59	43.2	15.44	SMC4M
2.4	SMC4M	160	206	68.1	15.3	120	189.53	62.6	17.01	SMC4M
2.5	SMC4M	305	186.24	60.2	10.58	100	228.7	50.7	17.21	SMC4M
2.6	SMC4M	170	206.52	66.9	14.92	50	187.05	61.8	25.4	SMC4M
Tot/Ave	34 Ac.	150	140.6	47.8	11.1	69.0	140.6	43.7	15.0	SMC4M

The table above was developed from stand exam data and field reconnaissance.

Removal of small trees would raise crown base heights and grapple piling would reduce surface fuels. The effect of this treatment would be a reduction of surface and ladder fuels which would in turn reduce risk for damage or loss from a stand replacing wildfire.

Due to the retention of all trees greater than 10 inches DBH, thinned areas would remain near or above maximum desired densities for stand health. Inter-tree competition for resources would remain high and would not be reduced enough to improve forest health leaving stands at risk of epidemic levels of tree mortality immediately post treatment.

Treated stands would generally meet the minimum tree spacing range of approximately 16-20 feet necessary for mechanical fuels treatment. However, some stands would have average residual tree spacing less than the 16 feet minimum necessary for mechanical equipment and would have higher risk of residual tree damage.

Indirect Effects of Thinning and Piling of Surface Fuels

Inter-tree competition for resources would be reduced by thinning, particularly in areas with low to moderate stocking, but would remain high overall due to the retention of all trees 10 inches DBH and greater. Overall tree density would not be reduced enough to improve forest health leaving most stands at risk of epidemic levels of tree mortality that would increase with time until eventual mortality reduces stand density. Typically, widespread bark beetle attacks occur in dense stands in conjunction with drought conditions when trees are already under stress. Over time dead trees would fall to the ground increasing surface and ladder fuels. The potential would remain high for extensive canopy cover loss from epidemic insect mortality.

Thinning would favor the removal of unhealthy, damaged and diseased trees less than 10 inches DBH. Unhealthy, damaged and diseased trees larger than 10 inches would all remain and would continue to serve as a source for infection of residual uninfected trees.

Due to high residual canopy cover post treatment there would be little change from existing in shade intolerant brush regrowth. Additionally, any conifer regeneration would consist primarily of shade tolerant white fir and incense cedar.

There is the potential to cause basal wound damage to residual trees during mechanical treatment. These types of injuries, when small in size and numbers, would generally not increase a stands susceptibility to bark beetle attack. In areas (pockets) where tree spacing is too close for mechanical equipment to operate the area would be treated with a smaller machine (i.e. Bobcat) or treated by hand to minimize damage to residual trees.

Thinning treatments could increase populations of the pine engraver beetle. Large populations commonly infest slash. When populations are low, the beetle may kill widely scattered single trees or small groups of trees. However, if large populations build, mortality of live trees can be extensive. Proper slash treatments such as piling and burning, and timing of treatments should minimize slash and downed logs that serve as suitable habitat and maintain populations at endemic levels.

Heart rot is most common in old trees, especially red and white fir. Mechanical piling is likely to cause damage such as bark scrapes and broken limbs, to a minor component of residual trees. These injuries can provide points of entry for heart rot disease. New infections of heart rot would likely develop as a result of tree injuries.

Within the picnic area there is potential to increase annosus root disease through freshly cut stumps 14 inches diameter and larger at ground level. Stump infection would be minimized by treating freshly cut stumps with a light coating of EPA approved and state registered borate compound.

Economic Effects

Based on similar projects hand thinning and piling would cost approximately \$400 per acre or \$21,000. Burning of piles would cost \$50 per acre or \$2,650. Contract grapple piling would cost \$400 per acre or \$21,000. Total estimated cost to implement the proposed project is \$45,050.

A negative return would be realized as proposed treatments do not include removal of forest products. The project would rely on appropriated money to accomplish. Hand thinning, piling and pile burning would be accomplished by agency crews. There would be economic return of money to the community resulting from the \$21,000 grapple pile service contract.

Cumulative Effects of Thinning

The area considered for silvicultural cumulative effects is the proposed project area. Management activities and events prior to this are considered in this analysis in so far as they have shaped current stand structure conditions. The existing stand conditions are the result of past management and treatments that include logging, fuelwood harvest and fire suppression.

Fire suppression has resulted in an increase in the number of small diameter trees. Periodic wildfires, which could have consumed some of the small trees and surface fuels, have been suppressed leading not only to an increase in surface fuels but also increased ladder fuels consisting primarily of shade-tolerant conifers such as white fir and incense cedar that have increased in the forest understory.

Logging disturbance also creates canopy openings and scarifies the soil, which has also led to seedling establishment.

Proposed hand thinning would have minimal effects on short term and long term stand health, since post treatment stand densities within larger diameter trees (>10 inches DBH) would continue to be at or near thresholds that can sustain endemic bark beetle populations and could lead to epidemic populations of beetles and density induced tree mortality. Treatments would focus on breaking up undesirable dense pockets of trees and removing ladder fuels growing underneath overstory.

Proposed treatment would not change the CWHR type, size or density class of stands. Canopy would remain as existing unless reduced by density related tree mortality 10, 20 years or more in the future as a result of not improving overall health by thinning trees 10 inches DBH and larger.

Annosus root disease is expected to remain near current levels. It is speculated that annosus root disease levels may be higher than what existed prior to timber harvesting in past decades, because of past cutting practices and increasing stand densification. Borate compounds have been shown to be effective in preventing the infection of freshly cut stumps. Stands of mixed species, where root-to-root contact alternates between host and non-host trees, are less prone to the spread of annosus root disease.

Alternative 2

Direct Effects

Small suppressed and intermediate crown position trees would remain in the understory as ladder fuel. Crown base heights would not be increased from existing. There would be no mechanical reduction of surface and ladder fuels. Current risk for damage or loss to stand replacing fire would remain.

Existing species composition, size and density would remain the same as described in the Existing Condition section. Existing stand structures would remain unchanged and would promote low light environments that favor regeneration of shade-tolerant species such as white fir, incense cedar, and to a lesser extent Douglas-fir. Risk of loss to wildfire would remain unchanged.

Due to the existing number of trees per acre in stands density induced mortality would create high fuel loading further jeopardizing the development of stands due to the threat of total loss to wildfire.

Direct Economic Effects

Critical fuel loading would not be reduced. No additional employment opportunities or wages paid to primary and service industry employees would be circulated through the local economy.

Indirect and Cumulative Effects

CWHR density would slowly increase but only where site resources could support these densities. Mortality of understory trees due to competition, insects, or disease, and growth of residual overstory trees would increase size class; however, selective bark beetle mortality of large diameter trees could cancel this affect and reduce the size class of stands. As stands reach and persist at maximum densities, they would remain at high risk of widespread mortality from insect and disease outbreaks. There would be an increase of large and small surface fuels as density induced mortality and self-pruning increase due to overstocked conditions further increasing risk of total loss to wildfire.

Pine would become increasingly susceptible to mortality as stand densities increase and stands would continue to shift to an increasing composition of shade tolerant species that are more adapted to persist at high densities.

Levels of heart and root rot, and white pine blister rust would be expected to remain fairly constant with no treatment.

The No Action alternative would result in a negative effect on local industries that depend on service contracts or a steady supply of forest products. These local industries currently lack opportunities related to fuels reduction, site preparation, and timber harvest activities. Throughout northern California cumulative years of reduced timber harvesting activities and associated service contracts, particularly on federal lands, have resulted in the loss of infrastructure to complete such activities. The loss of such infrastructure could significantly reduce or eliminate future economic and environmental opportunities from National Forest System lands. The continuation of current conditions under the No Action alternative would preclude opportunities for rural community stability because fuel reduction activities would not occur.

Should wildfire occur, costs incurred from potential fire fighter fatalities/injuries, loss of facilities, and post-fire rehabilitation costs would also likely be higher than under the action alternative.

Recreation

Alternative 1

Summary of Effects

Brokenshire Picnic Area would be upgraded to meet ABA requirements with a new restroom building, and picnic table along with a path of travel from an accessible parking area. Public use and enjoyment of this facility would be increased. Closure of identified unauthorized routes within the project area would eliminate cross country travel in and around the Summit Springs Recreation Residences, Camp Tehama Organization Camp and in wet meadows around dispersed camping sites. Improving the Summit Springs Recreation Residence Tract access roads to the Maintenance Level 2 standards would improve ingress to and egress from the tract. Visual quality objectives would be retained in the Retention designation in and around the Summit Springs Tract and at Camp Tehama; however, the immediate visual impacts of ladder fuel removal around these communities may be noticeable as viewed from Highway 172.

Direct and Indirect Effects

ABA requirements would be met and accessible opportunities for picnicking and day use would be available. These improvements would enhance all visitors' use and enjoyment of the area. Unauthorized routes would be closed to motorized vehicle travel, improving water quality within the Mill Creek drainage while implementing the Travel Management ROD. Protection of communities and dispersed campsites would be enhanced in the establishment of a fuel break by removing ladder fuels and eliminating concentrations of surface fuels. Upgrades proposed to the Brokenshire Picnic Area would have an initial visual effect. The improvements would be noticeable and significant during construction and immediately after. It is expected that once all activities are complete the resulting change would be visually pleasing.

Alternative 2

Summary of Direct and Indirect Effects

The no-action alternative would result in no immediate or foreseeable change to existing dispersed or developed recreation activities and visitors use of the roads and trails. With no fuels reduction adjacent to communities within proximity to the project area the potential risk of wildfire is increased. The intensity of fire without fuels treatment as proposed could cause valuable structures to be lost and would result in the loss of existing recreation opportunities, both developed and dispersed. Without proposed upgrades to existing facilities (restroom/parking/picnic area) Architectural Barriers Act (ABA) requirements would continue to hinder access for persons with disabilities. Unauthorized routes identified for closure in the Motorized Travel Management ROD would remain on the landscape with continued access to vehicle traffic through wet meadows. No action would result in the absence of any immediate, discernible change to the visual resource and little perceived change for years. If no disturbance events occur over the next 20 to 30 years, the mixed conifer and fir communities would continue to dominate the landscape and increase in density, reducing scenic variety and diversity.

Cumulative Effects

With no reduction in the risk of wildfire to this forest area, effects on all types of recreation activities would take place if a large scale wildfire, resulting from continued buildup of debris, brush and ladder fuels, were to occur. Depending on the scale of the wildfire, it could cause some temporary or long term closures and inconvenience to the recreation user, damage to personal property/structures and impacts to Special Use permit holders. In the worst case, fire damage to the forest could be extreme and take several decades to recover. In this scenario, a significant number of visitors would be displaced, and visual impacts would be substantial.

Range

Issue Indicators

The analysis indicators for range resources include forage availability, livestock distribution, range improvements, and permittee access.

Alternative 1

Direct Effects

The proposal could positively affect short term range conditions in the area, through recreation site improvement and riparian and soil resource protection measures.

Within the active Morgan Springs South Allotment, there would not be any temporary loss of forage during the treatment and recovery period due to project activities because grazing management does not include use of the Brokenshire Picnic area, summer residences or camp areas. Grazing takes place within the fenced Hwy 172 pasture, and it is expected that livestock distribution would not need to be controlled (i.e., placing salt/supplements, or other protection methods) near treatment areas. Current trailing practices along Highway 172 are expected to be continued and any trailing or grazing management adjustments would be developed in coordination with the allotment permittees.

There are no range improvements in the project area on the Morgan Springs South Allotment. The highway 172 pasture fence is located north of the proposed project activities and the fence is not expected to be affected.

The key areas and other areas on the allotment would continue to be monitored to ensure standards and guidelines are being met and to provide a basis for any adjustments that were necessary. Protocols can be found in the Region's Rangeland Analysis and Planning Guide, 1997 (R5-EM-TP-004). There are no expected distribution effects from the treatments.

The permittee would continue to complete maintenance of the Item 12 road (private portion) and would assume maintenance of the 29N52 portion which is being continued as Maintenance Level one road for administrative use for necessary access and livestock operations within the Hwy 172 pasture.

Indirect Effects

Forage availability is not expected to be impacted even though some long-term availability of forage could be increased due to riparian and soil resource protection measures, and fuels reduction in these areas from reduced competition from shrubs and trees, increased soil nutrient availability, and increased sunlight as a result of treatments.

Regeneration is not expected to be affected by livestock. New areas of transitory range could be opened up but are not expected to result in changes in cattle distribution since livestock graze within the fenced highway 172 Pasture or are trailed along the paved highway or shoulder.

Treatments could result in openings in areas that may have been previously inaccessible to livestock. There could be a potential for livestock to attempt to access these areas along the trailing route which could require additional herding efforts by the permittee to keep livestock out of these areas.

Monitoring of grazing standards and guidelines would be implemented in grazing use areas. Additional monitoring may be added if changes in cattle distribution result from treatment activities.

Cumulative Effects

The cumulative effects analysis boundary for Range resources is the Morgan Springs South Allotment. In the past, livestock grazing management in this area included different land owners, allotment boundaries, and management systems. Private lands associated with the allotment prior to land exchange may have been grazed with utilization levels above Forest Plan Standards (over 40 or 50%). Drift problems were also noted in this area from a previously permitted allotment (Tehama) up until the 1990s, and some cattle were known to enter Mill Creek tract and camp areas around that time. These past grazing activities may have cumulatively contributed to conditions of the Mill Creek area.

Currently, low and/or limited livestock trailing use of the 38A Brokenshire Unit within the Morgan Springs South Allotment is not expected to cause any additional effects to the main Brokenshire project area. The FS route 29N52 (Item 12) component of the project within the 38B Highway 172 Unit of the allotment would include maintenance as described in the IDFs.

Continued use of the fenced Highway 172 pasture, paved road and shoulder including turnouts, wide spots etc. in the vicinity of the Brokenshire project area is expected to continue in association with Morgan Springs South Allotment livestock management activities. There are no existing plans to expand the allotment or increase the numbers of permitted animals. The allotment would continue to be managed according to the 2012 Allotment Management Plan. With implementation of the Proposed Action, there are no expected negative cumulative effects.

Alternative 2

Direct Effects - No overall short-term impact to range resources is expected. Current grazing practices would continue on active allotments under the No Action Alternative. Livestock grazing would continue to be managed and authorized under current operational direction and management plans. Current grazing management on the allotments is described in the affected environment. There would be no risk of damaging range improvements in allotments and no

short-term negative effects to the permittee that might occur from possible deferments or disruption of trailing practices.

Indirect Effects - Livestock grazing would continue to be managed and authorized under appropriate management plans, regulations, and other policies. Current grazing management on the allotment is described in the affected environment.

Forage availability under the No Action alternative would remain the same or may decrease due to increased plant competition that occurs when overstory shading increases. Decreases in forage availability would not affect livestock distribution within the active allotment, as transitory range reverts to brush fields or timber, because the project activities are not proposed in livestock use areas.

No recreation site improvement and expansion, improvements, riparian and soil resource protection measures would occur with this alternative, allowing current conditions related to recreation management activities to continue. Some minor clearing of downed logs may be required as the transitory range ages near the project area (Brokenshire picnic, summer residences and camps) next to Highway 172 where livestock trail along the road and shoulder area.

A potential adverse impact to grazing as a result of not implementing the project could come from a wildland fire. Treatment of the fuel condition to reduce the risk and hazard associated with a wildland fire would not be implemented making the area vulnerable to loss of soil and water quality, should a wildland fire occur.

Cumulative Effects

Previous harvest and thinning activities in the area have generally had a positive impact on all range resources by reducing the overstory and allowing forage species to thrive. Cumulative effects of past and present projects would not share an association with the proposed No Action alternative and there are some expected negative cumulative effects.

Livestock presence in some areas (trailing) could continue to contribute to soil conditions that favor conifer seedling establishment.

Botany

Alternative 1 (Proposed Action)

Direct Effects

Though no occurrences of *Botrychium* species are known to the project area, there is the potential for direct effects to potential habitat and unidentified occurrences of *Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum* or *Botrychium pendunculatum*. If new occurrences of these *Botrychium* species are found before or during ground disturbing activities, an IDF specifies that they would be protected by flag and avoid methods. Any new occurrences of these species would likely be located within the inner zones of RHCAs (Riparian Habitat Conservation Areas) associated with perennial channels, seasonal channels, wetlands and meadows. Integrated Design Features specify that mechanical equipment would be excluded from the inner zones of RHCAs. In addition, machine piling would not occur

within 50 feet of meadows, wetlands, stream or scour channels, hand piles would not be placed within 25 feet of these features, and live incense cedar trees would not be cut within 25 feet of these features. These IDF's would further reduce potential direct effects to unidentified occurrences of *Botrychium* species.

Indirect Effects

As no occurrences of *Botrychiums* are known to areas where project activities would occur, indirect effects would be restricted to unidentified potential habitat for *Botrychium* species within the project area.

Changes to tree species composition may include the removal of incense cedar trees during fuels treatment activities. Because incense cedar trees are presumed to establish connections with mycorrhizal fungi which may also support *Botrychium* species, this activity may affect potential habitat for *Botrychium* species. Because any unidentified *Botrychium* habitat would most likely occur immediately adjacent to small seeps or springs, IDF's for the inner zones of RHCAs would limit this potential effect by specifying that trees over 8 inches DBH with root masses contributing to bank stability of the channel or inner gorge would be retained. An additional IDF specifies that live incense cedar trees would not be cut within 25 feet of these features. This potential indirect effect to *Botrychium* species would therefore be negligible with the incorporation of IDF's for RHCAs and TES plants.

Indirect effects to *Botrychium* habitat could also occur if the hydrology of associated meadows, springs, or streams were to be altered by project activities. Project activities could compact or disturb soils adjacent to small seeps and springs that constitute potential habitat for *Botrychium* species. However, these potential impacts would be reduced with the incorporation of IDF's for RHCAs that specify the exclusion of mechanical equipment within 50 feet of these features. As a result, any potential for changes to hydrologic conditions in unidentified *Botrychium* habitat would be mitigated by IDF's associated with RHCAs.

Another potential indirect effect to all TES plant species is an increase in noxious weeds or other undesirable non-native species as a result of project activities. The Brokenshire Project Noxious Weed Risk Assessment reports an overall moderate risk of weed spread associated with the implementation of Alternative 1. *Cirsium vulgare* and *Hypericum perforatum* occurs within and adjacent to areas that would be disturbed by project activities, including wet areas that also constitute potential habitat for *Botrychium* species. The IDF's for RHCAs as described above, however, will reduce the potential for ground-disturbance that may facilitate the spread of *C.vulgare* and *H. perforatum* within *Botrychium* habitat. As additional Integrated Design Features would further reduce the risk of weed establishment and spread, TES plant species are not expected to sustain project-related indirect effects from noxious weeds.

Cumulative Effects

The project area was chosen as the cumulative effects analysis area for *Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum* and *Botrychium pendunculolum* because the historical range and specific habitat requirements are unknown for these species, and it is assumed that if the Brokenshire Project would not affect the viability of these species within the project area, it would not affect their viability outside of the project area.

Past Actions

Current inventories of *Botrychium* species capture the aggregate impact of past human actions and natural events that have led to the current distribution of these species within the project area (CEQ 2005). Past actions are therefore implicit within existing conditions and are addressed within the Existing Environment section of the Biological Evaluation, hereby incorporated by reference. See Appendix B for descriptions of past actions within the Brokenshire Project area.

Ongoing Actions

Ongoing actions with potential effects to *Botrychium* species include range management activities, and recreational use of the Summit Springs Recreation Residence tract, Camp Tehama Organization Camp, Mill Creek, and the Brokenshire Picnic Area.

Ongoing range management activities within the Morgan Springs allotment could have potential effects to *Botrychium* species with potential habitat within the project area. The tolerance of *Botrychiums* to habitat disturbance and potential small-scale changes to hydrologic conditions from livestock hoof punches and trampling is currently poorly understood, and may have adverse effects to these species.

There are also potential effects to *Botrychium* species from ongoing recreation management activities. Recreational activities within the project area have the potential to spread noxious weeds through associated high levels of motorized vehicle traffic and ground disturbance at recreational sites and residence tracts. Noxious weeds may cause permanent habitat degradation and can compete with TES plants, making the habitat less suitable for them and other desirable species. While noxious weed risk that is associated with project activities is addressed through IDFs, risk associated with ongoing recreational activities is not and would continue in absence of the proposed action.

These potential adverse effects from ongoing range management and recreational activities would add cumulatively to the minor adverse indirect effects of Alternative 1.

Future Foreseeable Actions

Future projects would have similar effects to Sensitive plants as the Brokenshire project, since all projects would be surveyed to similar standards prior to implementation. As a result, foreseeable future projects should not add cumulatively to the indirect effects described above.

In summary, no direct effects are anticipated to *Botrychium* species because there are no known occurrences within the project area, and IDFs for TES plants and RHCA's further minimize potential direct effects to any unidentified occurrences. Indirect adverse effects to potential habitat associated with changes in tree species composition would be negligible. While these effects would add cumulatively to past, ongoing and future actions, including the effects of range management activities and recreational and residential activities, the implementation of Alternative 1 is not expected to affect the viability of *Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum* or *Botrychium pendunculolum* within the Brokenshire Project area or across the forest for at least the next 20 years.

Alternative 2 (No Action)

Direct, Indirect and Cumulative Effects

As there would be no direct or indirect effects to *Botrychium* species with the implementation of Alternative 2, it follows that there would be no cumulative effects to these species under Alternative 2. Overall, the viabilities of *Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum* and *Botrychium pedunculatum* are expected to be maintained under Alternative 2 for at least the next 20 years.

Determination

With implementation of project Integrated Design Features, I have determined that Alternative 1 of the Brokenshire Project may affect potential habitat for *Botrychium ascendens*, *Botrychium crenulatum*, *Botrychium minganense*, *Botrychium montanum* and *Botrychium pendunculatum*, but is not likely to result in a trend toward Federal listing as Threatened or Endangered or loss of viability for these species.

Heritage Resources

Effects of All Alternatives

Seven cultural resource sites have been identified within the APE of the Brokenshire project; one site has gone through the evaluation process to determine eligibility to the National Register of Historic Places (NRHP). The Brokenshire picnic facility (FS#05065101102/CA-Teh-2399H) was recorded and evaluated for eligibility to the National Register in 2012. The site did not meet any NRHP criteria for eligibility and therefore, CA-Teh-2399H did not qualify for listing on the National Register (Gutierrez 2012). Five of the remaining six sites (FS0506510447, --904, --029, --553 and --1057) are located within the proposed Brokenshire project boundary but situated well away from planned treatments or activities and therefore will have no project-related direct or indirect effects. The prehistoric site, FS05065100351, located adjacent Camp Tehama is the only historic property that could be effected by this project as it lies in close proximity to an area slated for fuels reduction. Standard resource protection measures (SRPMs) will be used to protect this site as well as all other historic properties (potentially eligible sites) from project effects.

None of the proposed alternatives will adversely affect historic properties upon implementation of protection measures discussed in this document. The removal of surface and ladder fuels generally has a beneficial effect on historic properties as this helps prevent catastrophic wildfire which can cause devastating impacts to historic properties. Fire suppression efforts and the effects of high intensity burns can seriously compromise the structural integrity of a site as well as scientific and cultural value of these properties.

Cumulative Effects

The cumulative effects analysis boundary for Heritage resources is the Brokenshire APE. Cultural resource inventory reports and recent site condition assessments of sites in this area, suggest that prior logging operations, road building, recreation activities (camping/OHV) and looting have

caused damage to several sites in the in the project area. The Proposed Action for the Brokenshire project will not cause any additional damage or effects to these sites as all historic properties will be protected from project-related impacts through SRPM's and site specific protection measures as described in the IDFs.

Hydrology

Alternative 1: Proposed Action

Direct and Indirect Effects

Soils

The primary direct effects to soils that are of concern for hydrologic resources are compaction and organic matter removal.

Compaction: Risk of compaction from Alternative 1 proposed activities is considered negligible. Firstly, the expansion of the picnic site would cause compaction at the parking and picnic area (location 2) but implementation of the project would protect sensitive soils within the blocked meadows and prevent further compaction related to unmanaged motorized use. Secondly, all mechanical equipment operations would utilize low ground pressure rated tracked equipment and turning would be kept to a minimum. Thirdly, dry soil conditions required during mechanical equipment operations would reduce risks of soil compaction.

Organic matter removal: Risks to soils from organic matter removal are considered negligible because of post implementation cover requirements and treatment types (hand piling and grapple piling).

Sediment

The proposed action has an overall negligible risk of increases to existing sediment delivery to streams. This assessment is based on several factors including: decreases in long-term sediment production through road improvements, road closures and decommissioning (Table 4), BMP implementation during all project activities, soil moisture and groundcover requirements, and RHCA treatment restrictions. Ultimately, because there is a negligible risk of sediment delivery to streams, there would be a negligible risk of a change in percent pool tail fines, embeddedness, or residual pool depths of Mill Creek tributaries or mainstem related to project activities. It is unlikely any change in sediment related to the proposed action would be measureable at the watershed scale.

Hydrology

The risk of a measureable change in hydrology due to fuels treatments is negligible. Measureable changes in flow cannot be reliably detected without removal of at least 20% of vegetative cover within a watershed (Stednick, 1996). The implementation of BMPs and inherent soil properties should prevent project related compaction that could alter hydrology.

The objective of expanding the Brokenshire picnic site and decommissioning the existing access roads is to restore the meadow and maintain some level of water retention at the site scale that may have been affected by the rutted roads and associated compaction. Any change to hydrology would be localized and not measurable at the watershed scale.

Water Quality (Chemical)

The proposed action would not result in a measurable change to chemical constituents of water quality. The removal of the existing toilet facility should prevent any risks the expired facility currently poses to water quality. Overall, there would be no detectable change in hydrology that would affect water quality.

Water Quality (Temperature)

The proposed action would not result in a measurable change in water temperature of either Mill Creek tributaries or the mainstem. Although there would be some thinning of trees of Mill Creek tributaries, conifers over 10 inches dbh would remain in sufficient numbers to provide stream channel shade. In locations where riparian hardwoods are present, it is likely stream channel shade may increase slightly as riparian vegetation expands in response to conifer removal.

Large Woody Debris (in-channel)

The proposed action would minimally affect in-channel large woody debris of the Mill Creek tributaries in the project area and would not affect in-channel large woody debris of the mainstem of Mill Creek. In tributary channels, the project may reduce the amount of conifer wood resulting from the thinned age class; however, in the long term, conifer wood available for tributary channels would be larger and riparian hardwoods more numerous.

Bank Stability, Bank Angle, and Width to Depth Ratio:

The proposed action would not cause a decrease in bank stability or bank angle, or an increase in width to depth ratios of channels in Mill Creek tributaries or mainstem. IDFs and BMP implementation during fuels treatment and project construction activities would protect bank stability trees, sensitive soils, and reduce risks of changes in hydrology that could negatively affect bank stability, bank angle, and width to depth ratios.

Cumulative Watershed Effects

The Past, Present and Reasonably Foreseeable Future Actions (PORFA) for the Brokenshire Project (Appendix B) includes a list of activities that were considered in the cumulative watershed effects analysis.

Table 4 - ERA values at subwatershed and RHCA scale from proposed action.

Scale	Acres	TOC ¹ or Negligible Risk Threshold ²	Existing ERA	Change in ERA from PA	ERA with addition of PA
Subwatershed	4034.9	12% ¹	4.5%	0.06%	4.6%
RHCA	927.8	5% ²	4.6%	-0.08%	4.5%

Percentages and acres are approximate.

Equivalent Roded Acres (ERA)

A cumulative watershed effects (CWE) analysis was conducted for Mill Creek subwatershed. CWEs or overall disturbance (from past, present, project and foreseeable future actions) is evaluated using *Equivalent Roded Acres* (ERA) as described by the Region 5 methodology contained within Chapter 20 of Forest Service handbook (FSH) 2509.22.

Overall, risk of cumulative watershed effects (from past, present, project and foreseeable future actions) as characterized by *Equivalent Roded Acres* (ERAs) is negligible and remains well below the TOC (Table 4). There are no future Forest Service activities currently within the planning process except for additional road improvement work planned on FS road 29N48 (PORFA, USDA, 2013 (c)) expected to be completed in fiscal year 2013. These road improvements would not affect the ERA; however, they would contribute to decreasing road related sediment.

Riparian Habitat Conservation Area (RHCA) Equivalent Roded Acres (ERA)

With the addition of the proposed action, Mill Creek subwatershed would have a negligible risk of cumulative watershed effects within the RHCA (Table 4). The fuels treatment should improve watershed, riparian, and aquatic resources by thinning out encroaching conifers and releasing riparian vegetation in the RHCA. Not reflected in the ERA is the blocking of meadows to vehicles and reducing risks to water quality by decommissioning the old toilet. Because these actions are not included in the ERA model, the ERA value provides a conservative estimate of risk that may be higher than the risk actually posed by the project.

Foreseeable cumulative watershed effects should decrease as activities are expected to recover and there are no planned activities within the RHCA in the next five years.

Water Quality and Beneficial Uses

As with indirect effects, the greatest potential for cumulative watershed effects would be from increased delivery of sediment from project activities, in addition to sediment from past, ongoing or future land disturbance activities. Our assessment is that risks of increases in sediment related to project activities is negligible and would not be measureable at the subwatershed scale. This assessment is based on the percentage of acres treated, types of treatment, transportation activities related to the project, and implementation of mitigations during treatments (BMPs).

Connectivity

Road crossings of streams are commonly barriers to passage of aquatic organisms. No new stream crossings are proposed under Alternative 1. However, one seasonal stream crossing is proposed for removal from the landscape and two seasonal stream crossings are proposed for upgrades. Removal of the crossing would result in increased connectivity for organisms to access aquatic habitats upstream of the crossing.

Soils

Overall, Alternative 1 would pose a negligible risk of cumulative effects to soils and would not be measureable at the subwatershed scale.

The risk of compaction increases when soil moisture is high and can be further increased with multiple equipment entries. The use of grapple and hand piling would protect organic soil and ground cover, and reduce risks to soil productivity while still meeting project objectives.

Alternative 2: No Action

Direct and Indirect Effects

Soils

Under the “No Action” alternative there would be no direct effects to soil resources as fuels management activities by means of mechanical equipment would not occur. Areas currently experiencing rutting, compaction and impacts to soils, such as the project area meadows, Mill Creek floodplain, and roaded areas proposed for decommissioning, would continue to be impacted by use and potentially degrade further over time.

Sediment, Hydrology, Water Quality (chemical), Water Temperature, Large Wood and Bank Stability

Because no fuels treatments, road decommissioning or improvement to recreation facilities and roads would occur under this alternative, existing trends in conditions in relation to sediment, hydrology, water quality (chemical), water temperature, large wood and bank stability would continue and/or potentially degrade.

The transportation system would remain the same, there would be no road decommissioning, and roads proposed for treatment with the proposed action would continue to be a constant sediment source. Meadows proposed for fencing/blocking would have the potential for continued motor vehicle access impacts, resulting in compaction and decreased soil productivity. Despite continued or potential sediment influxes, the mainstem and tributaries of Mill Creek are not expected to have a measureable change in percent pool tail fines, embeddedness, percent <2mm sized particles, or residual pool depths.

Trends in hydrology would remain the same or degrade over time as meadows would continue to be affected by unmanaged recreation and related compaction. As meadow soils continue to be compacted, water holding capacity may be reduced, affecting the timing of available water for riparian vegetation.

The toilet at the existing location would continue to degrade and risks to local water quality (chemical) would increase over time as the facility continued to age. There would be no change in water quality at the subwatershed scale.

Trends in water temperature would remain the same as no vegetation would be removed in the RHCA.

The amount of large woody debris (in-channel) available to tributary streams within the project area would remain unchanged; however, the size of the wood may decrease over time as trees are impacted by high densities and fewer resources. There would be no change in the amount of large woody debris available to the mainstem of Mill Creek.

Bank stability of Mill Creek tributaries would remain the same as there would be no risk of compaction or changes in hydrology from mechanical equipment. Bank stability along Mill Creek mainstem that is currently being affected by unmanaged motorized recreation would remain the same or potentially degrade depending on use.

Perennial and seasonal channels, meadows and springs in the project area would continue to function under current conditions. Riparian vegetation and meadows that are located within the project area would continue to be impacted by encroaching conifer species and unmanaged recreation, potentially resulting in decreased available soil moisture, direct sunlight, and soil productivity.

Cumulative Watershed Effects

Cumulative watershed effects and cumulative effects to soils within the project affected subwatershed and RHCA would continue along the same trends as under current management. Despite continued degradation by current land use trends in the project area, it is unlikely there would be any measureable effect at the watershed scale. The largest risk of cumulative watershed effects would result from an increase in risk of high severity wildfire initiated within or near the recreation sites. High severity wildfire would have a high risk of impacting beneficial uses and water quality within and downstream of the project area.

Connectivity between aquatic habitats would remain unchanged from pre-project conditions.

Fuels

The fuels and vegetation profile in this WUI can be described as a moderately dense conifer stand that has a relatively continuous canopy closure and disproportionately heavy surface fuel loads. The natural role of fire in this part of the forest ecosystem has been subdued for over 100 years due to the successful fire suppression efforts. Subsequently, the ingrowth (invasion) of undesirable, shade-tolerant tree species (white fir) has changed the structure and composition of this stand. This stand has a relatively low canopy base height (CBH). Surface fuels are continuous, with areas of heavy concentrations occurring throughout the project area. Overall, surface and ladder fuels are vertically and horizontally connected throughout the WUI and have developed into a hazardous fuels complex. The implication is that under extreme fire weather conditions, wildfire would burn with relatively high flame lengths and could initiate passive or active crown fire.

Alternative 1 – Proposed Action

Direct and Indirect Effects

Wildland Urban Interface (WUI)

A direct effect would be reduction of surface and ladder fuels in the WUI defense zone. The indirect effect would be the decrease of potential fire in the defense zone. The WUI conifer stand would be less dense with trees, have a higher canopy base height, a reduced load of surface fuels, and diminished potential for crown fire initiation and spread.

Fuel Loading

With this alternative, small fuels would be reduced following hand thinning, piling and burning the majority of surface fuel mass (Tables 5 and 7). Table 7 shows estimated surface fuel loads of down woody material under the current stand condition. Table 5 shows estimated surface fuel loads of down woody material in the same stand following treatment. Tables 5 and 7 show that the load of small surface fuels (0-3 diameter class) would be reduced from 4.8 down to 2.4 tons/acre. Tables 5 and 7 also show that the load of larger surface fuels (>3 inch diameter) would be reduced from 43.1 down to 15.5 tons/acre.

Table 5 - Small diameter down woody material surface fuel loads within the Brokenshire WUI project area following Alternative 1 piling and burning treatments.

Surface Fuels 0 - 3 inch diameter (tons/acre)	Surface Fuels >3 inch diameter avg. (tons/acre)
2.4	15.5

Source: Forest Vegetation Simulator (FVS) model outputs based on Almanor Ranger District stand exam record inputs for the Brokenshire project.

Ladder Fuels and Canopy Base Height

With this alternative, CBH would be increased following thinning from below of most small trees (1-10 inches dbh with 15 percent leave-tree retention). Table 6 shows that the estimated CBH following thinning would be 42 feet. The result of a more open canopy and raised canopy base heights would greatly reduce the ladder fuels that currently exist.

Table 6 - Predicted fire type (90th percentile fire weather), average flame length, and canopy base height (CBH) within the Brokenshire WUI project following Alternative 1 treatments.

Fire Type	Average Flame length (feet)	Average CBH (feet)
Surface Fire	2.6	42

Source: Forest Vegetation Simulator (FVS) model outputs based on Almanor Ranger District stand exam record inputs for the Brokenshire project.

Flame Length and Fire Type

Under 90th percentile fire weather, predicted flame lengths average 2.6 feet following thinning and surface fuel treatments (Table 6). This would meet the NWCG standard for allowing firefighters on the ground to directly attack wildfire, and exceeds SNFPA ROD direction to achieve an average of 4 foot flame lengths following fuels reduction treatments in conifer forest types (SNFPA ROD appx. A). Table 6 also demonstrates that wildfire occurring under 90th percentile fire weather conditions would result in surface fire, which would meet SNFPA ROD direction to thin the crowns to result in less than 20 percent chance of initiation of crown fire under 90th percentile conditions.

Cumulative Effects

A 100 year history of fire suppression has resulted in an increase of ladder, surface and crown fuels within and around the project area. The implementation of Alternative 1 would benefit the Brokenshire project area by reducing these fuels accumulations. Potential fire behavior under 90th percentile weather conditions would be moderated to levels that could enable firefighters to

perform direct attack tactics in the event of a wildfire, thus improving the safety of firefighters as well as the defensibility of the communities within the Brokenshire project area.

Alternative 2 – No action

Direct and Indirect Effects

Wildland Urban Interface/Intermix (WUI)

In Alternative 2, none of the designated WUI in the Brokenshire project area would undergo any fuels treatment that would enhance Brokenshire WUI defense zones. The WUI currently exists as a hazardous wildfire environment that could not be safely defended by direct attack of wildfire using ground forces during 90th percentile fire weather conditions (Table 8).

Fuel Loading

Surface fuels are the down woody debris on the forest floor that are available to burn and initiate fire spread into ladder fuels and into the crown of trees. Table 7 shows surface fuel loads of down woody material as they currently exist. They are expressed in tons-per-acre by size class. For this analysis, surface fuels are broken into two size classes and are shown in Table 7:

Table 7 - Small and large diameter down woody material surface fuel loads within the Brokenshire WUI project area under current conditions.

Surface Fuels 0 - 3 inch diameter (tons/acre)	Surface Fuels >3 inch diameter avg. (tons/acre)
4.8	43.1

Source: Forest Vegetation Simulator (FVS) model outputs based on Almanor Ranger District stand exam record inputs for the Brokenshire project.

Table 7 shows that the load of small surface fuels (0-3 inch diameter) is relatively high, averaging 4.8 tons/acre. This table also shows that the load of larger surface fuels (>3 inch diameter) is extremely high, averaging 43.1 tons/acre. With no action, a continual increase in the small and large surface fuel loading would occur across the project area over time. If no treatments are done and fire continues to be excluded from the project area, down woody material would be added to the forest floor annually at a rate that is greater than decomposition. The amount of small-sized woody material would provide enough fuel to propagate wildfire into the ladder fuels and crowns of trees under severe fire weather based on the combination of low canopy base height and predicted flame lengths shown in Table 8.

Absence of thinning would allow ingrowth of undesirable, shade-tolerant trees to continue. As stands become increasingly dense with understory ingrowth, trees and shrubs become stressed. As a result, mortality increases. As the understory and canopy vegetation begins to die, fuel loading on the forest floor begins to increase. Dead brush and trees that are left standing can serve as ladder fuels. These factors, individually and combined, would cause an increase in the risk of stand replacement in the event of a wildfire during 90th percentile fire weather.

Ladder Fuels and Canopy Base Height (CBH)

Ladder fuels are those fuels that enable fire to transition from the surface fuel profile up into the tree crowns and canopy of trees. The relatively low average CBH of 7 feet (Table 8) is a primary component of a hazardous fuel ladder where surface fires would easily transition into crowns of trees.

Table 8 - Predicted fire type (90th percentile fire weather), average flame length, and canopy base height (CBH) within the Brokenshire WUI project area under current conditions.

Fire Type	Average Flame length (feet)	Average CBH (feet)
Active Crown Fire	8.0	7

The dense canopies and low canopy base heights are indicative of a hazardous fire environment that would be highly susceptible to crown fire initiation and spread during 90th percentile fire weather. Left untreated, canopy base height values would continue to decrease with the projected in-growth of conifers.

Flame Length and Fire Type

Under 90th percentile fire weather, predicted flame lengths in the treatment area average 8.0 feet (Table 3). Cross referencing the average lengths of 8.0 feet with the Fire Suppression Interpretations Table in appendix B of the NWCG Fireline Handbook (NWCG 2006) states:

“Fires with flamelengths greater than 4 feet are too intense for direct attack on the head by persons using hand tools. Handline cannot be relied on to hold fire. Equipment such as dozers, engines, and retardant aircraft would be required for suppression.”

In areas where torching occurs, flame lengths and associated fire behavior would be much higher. Table 8 also demonstrates that wildfire occurring under severe fire weather conditions in the project area could result in active crown fire. Fires occurring under hotter and drier conditions would be likely to result in higher fire intensities.

Over time, as surface and ladder fuels continue to increase, fire hazard in the area would increase and the risk of large and intense fires that are difficult to control would also increase. Such a situation could allow fires to become considerably larger and potentially hazardous for firefighters and the communities of Summit Springs and Camp Tehama. Active crown fire would also put natural resource values in jeopardy. Associated smoke from intense, severe wildfires would create both a nuisance and health concerns in these communities for considerable durations (days or weeks).

Cumulative Effects

Surface, ladder and crown fuels would continue to increase as they have done over the past 100 years. The predicted fire behavior under 90th percentile conditions would continue to intensify, which would make firefighting efforts increasingly difficult in the event of a wildfire. The defensibility of the communities within the Brokenshire project area would continue to deteriorate.

Terrestrial Wildlife

Species of Concern

This analysis addresses federally listed endangered and threatened species or those proposed for listing under the Endangered Species Act and species listed by the Regional Forester, Pacific Southwest Region as Forest Service Sensitive Species that may occur on the Lassen National Forest, and their occurrence and potential for impacts from the project.

Category 1

This section contains species whose habitat is not in or adjacent to the project area and would not be affected by the project.

The project area is outside the known range for the following species: Northern Spotted Owl, Valley Elderberry Longhorn Beetle, California Wolverine, Pacific Fisher, Northwestern Pond Turtle, and Shasta Hesperian Snail.

Due to a lack of suitable ponded, marsh habitat within the proposed project footprint, the proposed project will have no effect on Yellow Rail.

The proposed Brokenshire project will have no effect on Shasta Hesperian Snail based on the following: 1) Extensive, focused mollusk surveys conducted in 2001, including upper Mill Creek, did not disclose occurrence of this riparian-obligate species within the Lassen National Forest (Brim Box, et al, 2005, with updates by Furnish in 2013). 2) All known populations of this snail are located within the Shasta-Trinity National Forest, up to 3,000 ft elevation. The proposed project is located at approximately 4,750 feet to 4,850 feet in elevation - above the known occurrence of this species. The Shasta Hesperian snail has been found in moist bottom lands, such as riparian zones, springs, seeps, marshes, and in the mouths of caves (Furnish 2013).

Category 2

The following are species whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.

Gray Wolf: It is anticipated that the proposed project would have no effect on the Gray Wolf based on the following:

- 1) Due to the wolf's already established habit of traversing an average of over 15 miles per day, his ability to circumnavigate and avoid any project activities would be easily accomplished.
- 2) Based on the wolf's ability to utilize and traverse a very wide range of habitat types, any modifications of the landscape resulting from the actions of the proposed project would not impair or prevent the wolf from successfully traversing the project area and would not prevent him from successfully hunting within his normal daily travels.
- 3) Due to the absence of a female mate, there would be no breeding or denning activities affected by the proposed action; therefore, no reproduction would be affected.
- 4) In recent history (within the past 89 years) OR-7 is the only documented wolf to enter the state of California.
- 5) As of mid-March 2013, OR-7 returned to Oregon and is currently no longer in California nor within the vicinity of the proposed project. There are currently no other known wolves within California nor within the vicinity of the proposed project area.

Bald Eagle: The project area lacks the lakes and large rivers preferred by this species for reproduction and there are no known nesting occurrences of bald eagles in the project area. Bald eagles may utilize riparian areas within the project area for opportunistic foraging outside of the breeding season. The only possible impacts to bald eagles may be removal of a potential roost site through the parking area improvement but this will not change habitat suitability in the Brokenshire project area.

Greater Sandhill Crane, Great Gray Owl: While there is suitable meadow habitat within and adjacent to the project area, these meadows are not known to support species such as Greater Sandhill Crane and Great Gray Owl. There are no known nest sites or occurrences for either species within the project area. The Brokenshire project may improve the habitat value of the meadows in the project area over time through road decommissioning and blocking vehicle access to the meadow.

Willow Flycatcher: The meadows and riparian areas affected by the project activities do not contain willow habitat suitable for willow flycatcher nesting. Surveys by Almanor RD personnel and Point Reyes Bird Observatory employees have never detected breeding Willow Flycatchers in this area, (R. Burnett, pers. comm.). The project area is not likely to become suitable willow flycatcher habitat due to the fast moving, rocky waters of Mill Creek. Willow Flycatchers generally prefer less rocky areas, with more standing water and dense understory vegetation.

American Marten: There is moderately suitable reproductive and foraging habitat affected by the project activities. However, carnivore camera surveys have not detected marten within the project area. The closest detection was greater than 2 miles away, in higher elevation red fir habitat. Individual martens may use the project area for foraging but are unlikely to den in the area due to the high recreational use of the site. The LOPs implemented for spotted owls may help minimize disturbance to individuals occurring in the area.

Sierra Nevada Red Fox: The proposed action will not affect red fox as individuals are thought to occur in higher elevations during project implementation time frame (summer/fall) and nearest detections of red fox are greater than 1 mile from the proposed activity locations. These detections occurred in the winter months (Jan-March) when red fox are thought to utilize lower elevation habitats.

Pallid Bat: Acoustical and mist-netting survey efforts in 2010 and 2011 did not detect pallid bats on the Almanor Ranger District. Surveys on the Eagle Lake Ranger District detected 112 pallid bat individuals out of 2,613 trapped bats (~4%). Additionally, 13 pallid bat maternity roosts were located using radio telemetry. The smallest diameter roost site was 12.7" dbh, with an average diameter of 30.3". The Brokenshire project will only be removing trees up to 10" dbh, so it is highly unlikely a maternity roost site would be affected by this project.

Townsend's Big-eared Bat: The only potential effect to Townsend's Big-eared Bats could be the removal of the old restroom if it were being used as a roost site. It is unknown whether or not the site is currently used by Townsend's Big-eared bats, although it is highly unlikely as very few Townsend's Big-eared bats have been detected on the Lassen National Forest. Surveys on Eagle Lake RD in 2001-2004 detected only three individuals out of 2,613 individual bats captured. Additionally, bat survey data from the Almanor RD which included acoustical and mist-netting efforts between 2010 and 2012, including one survey conducted within the proposed project site in 2012, did not detect any Townsend's Big-eared bats.

Category 3

This section discusses species whose habitat would be either directly or indirectly affected by the project.

California Spotted Owl

Alternative 1 – Proposed Action

Direct Effects

There would be no direct effects to spotted owls as a result of the Brokenshire project. There are no PACs within the project area. The nearest territory is the Little Round Valley owl PAC, which is approximately ¼ mile from the Summit Springs fuels treatment unit. If surveys confirm nesting owls within this PAC, an LOP from March 1 to August 15 would apply to any fuels treatment areas that fall within ¼ mile of the nest location. If an active nest site is found during project implementation or within a treatment unit, a new PAC would be created to encompass the best available habitat around the nest location and a LOP would be put into place to prevent noise disturbance to nesting owls as a result of project activities. If a new nest is found within a treatment unit, mechanical treatment will be prohibited within a 500 foot radius buffer around the nest site. There is a risk of noise disturbance to non-nesting owls but this is considered minimal as owls would likely move away from project activities if disturbed.

In summary, there would be no direct effects to California spotted owl as a result of the Brokenshire project. LOPs would mitigate potential noise disturbance to nesting spotted owls and should a new nest site be discovered during project implementation, a PAC would be created around the nest site. There would be no treatment within a minimum of 500 feet of a newly discovered owl nest.

Indirect Effects

There are no indirect effects to spotted owls expected as a result of the Brokenshire project. The following treatments would occur within suitable foraging and/or nesting spotted owl habitat:

Table 9 - Brokenshire project activities occurring within suitable spotted owl habitat

<i>CWHR stand type</i>	<i>Habitat Suitability¹</i>	<i>Area affected</i>	<i>Project Activity</i>
SMC4M	Foraging-Moderate	32 acres	Hand thin, pile and burn
	Nesting- Low	Approx. 300 feet	Decommission road
SMC4D	Foraging-Moderate	3 acres	Hand thin, pile and burn
	Nesting- Low		
SMC6	Foraging-High	13 acres	Hand thin, pile and burn
	Nesting- High		

¹ From CWHR version 8.2 Accessed April 2, 2012

While fuels treatment would occur in suitable owl habitat, (48 total acres within CWHR SMC4M, 4D and 6) treatment is limited to hand thinning of trees under 10" dbh and machine piling of fuels. Therefore, CWHR stand types would not change following treatment and there would be no gain or loss of suitable habitat for spotted owls. The fuels hand treatment may help to protect suitable habitat in the event of a wildfire. The recreational site improvement and associated project activities are not expected to affect spotted owls as it would occur outside of suitable foraging and reproductive habitat.

In summary, the Brokenshire project would not have indirect effects to California spotted owls because there would be no change in suitable nesting or foraging habitat.

Alternative 2 (No Action)

Direct and Indirect Effects

There are no California spotted owl PACs within the project area. Therefore, there would be no effect to California Spotted Owl PACS.

The continued use of unauthorized roads and OHV trails (total of approximately 0.8 miles) around Summit Springs Recreation Residence Tract and within the proposed project area would continue to degrade the existing habitat and would continue to cause noise and disturbance from vehicle use.

In the absence of 53 acres of proposed fuels treatments, small mammal prey abundance would continue at current levels. In the long-term, the risk from wildfire would continue to increase, resulting in increased threat to nearby California spotted owls and California spotted owl PACs.

While there are consequences of inaction, Alternative 2 would not affect spotted owls or their habitat. No direct or indirect effects would occur as a result of Alternative 2.

Cumulative Effects

This project would not combine with other past, present or future projects to result in any negative cumulative effects to California spotted owl, or their habitats. There are no direct or indirect effects expected to California spotted owl. Therefore there would be no cumulative effects to this species. Localized disturbance may occur with other projects or recreational activities in the area; however this effect is limited to individuals and should not have a measurable adverse cumulative effect on California spotted owl or their habitats.

Northern Goshawk

Alternative 1 – Proposed Action

Direct Effects

There are not any direct effects expected to the Northern Goshawk as a result of the Brokenshire proposed action. The closest goshawk PAC is over 0.42 miles away from any project activity and nearest known nest location is greater than 0.70 miles from any project activity. A limited operating period (LOP) from February 15 through September 15 would apply to treatment areas if a newly discovered northern goshawk nest is located within ¼ mile of any project activity. If a new nest is found within a treatment unit, the nest site would be protected with a 500 foot radius no treatment buffer centered on the nest tree.

In summary, there would be no direct effects to Northern Goshawk as a result of the Brokenshire project. There are no known goshawk territories within the project area and any newly discovered nest site would be protected with a 500 foot no treatment buffer and implementation of an LOP to eliminate noise disturbance to nesting goshawks as a result of project activities.

Indirect Effects

There are minimal indirect effects to Northern goshawks as a result of the Brokenshire project. The following table shows project activities within suitable goshawk habitat:

Table 10 - Brokenshire project activities occurring within suitable Northern goshawk habitat

<i>CWHR stand type</i>	<i>Habitat Suitability¹</i>	<i>Area affected</i>	<i>Project Activity</i>
MRI4P	Foraging-Moderate	4 acres	Hand thin, pile and burn
		4 acres	Recreational site improvement
		0.36 miles	Decommission routes/roads
SMC4M	Foraging-High	32 acres	Hand thin, pile and burn
	Nesting- High	Approx. 300 feet	Decommission road
SMC4D	Foraging-High	3 acres	Hand thin, pile and burn
	Nesting- High		
SMC6	Foraging-High	13 acres	Hand thin, pile and burn
	Nesting- High		

¹ From CWHR version 8.2 Accessed April 2, 2012

There are a total of 86 acres of suitable nesting and foraging goshawk habitat affected by the proposed treatment. Of this, approximately 1.5 acres (1.7% of acres affected by the project) of MRI4P (moderate foraging habitat) would become unsuitable after the parking areas for the Brokenshire recreational sites are constructed. However, goshawks could likely continue to utilize these areas for foraging of small mammals and birds despite the cover type change. The remaining 84.5 acres would remain suitable goshawk habitat following treatment as there would be no change from the existing CWHR stand types. The proposed fuels treatments may improve the affected stands for foraging by goshawks in the short term through the creation of a more open understory which is preferred by goshawks. Additionally, the fuels treatment may help to protect suitable habitat in the event of a wildfire.

In summary, there would be a negligible amount (1.5 acres) of moderately suitable goshawk foraging habitat lost as the result of the Brokenshire project. This is considered a low risk as the majority of the currently suitable habitat would remain suitable following project implementation.

Cumulative Effects

This project would not combine with other past, present or future projects to result in any negative cumulative effects to goshawk or its habitat. There are no direct effects to northern goshawk and indirect effects to northern goshawk are considered minimal and very low risk. Therefore the cumulative effects would be insignificant. Localized disturbance may occur with

other projects or recreational activities in the area; however this effect is limited to individuals and should not have a measurable adverse cumulative effect on Northern goshawk or its habitats.

Alternative 2 (No Action)

Direct and Indirect Effects There are no goshawk PACs within the project area. Therefore, there would be no effect to northern goshawk PACs.

The continued use of unauthorized roads and OHV trails (total of approximately 0.8 miles) around Summit Springs Recreation Residence Tract and within the proposed project area would continue to degrade the existing habitat and would continue to cause noise and disturbance from vehicle use.

In the absence of 53 acres of proposed fuels treatments, goshawk prey abundance would continue at current levels. In the long-term, the risk from wildfire would continue to increase, resulting in increased threat to nearby northern goshawks and northern goshawk PACs.

While there are consequences of inaction, Alternative 2 would not affect northern goshawks or their habitat. No direct or indirect effects would occur as a result of Alternative 2.

Cumulative effects

No direct or indirect effects would occur to northern goshawk. Therefore, no cumulative effects would occur to this species.

Fringed Myotis

Alternative 1 – Proposed Action

Direct Effects

Fringed Myotis are known to use caves, mines, buildings and rock crevices for roost sites. During the rearing of young, females form separate colonies for themselves and their young. Adult males are absent from maternity colonies. It is possible the proposed project area is used by Fringed Myotis bats for foraging and possibly for roosting (in the old bathroom structure). In 2010 bat surveys a single female Fringed Bat was captured less than 3 miles southwest from the proposed project. In 2012, two Fringed Myotis (one female and one male) were caught approximately 5 miles southeast of the proposed project. However, this species was not detected on surveys conducted within the proposed project area in 2012.

Potential direct effects to Fringed Myotis could result from the removal of the old restroom if it were being used as a maternity roost site. Young could die if the roost is disturbed or destroyed during the rearing stage of the developing young. However, direct effects will be avoided by scheduling the demolition of the old bathroom to between September 1 and May 1.

Indirect Effects

It is possible that Fringed Myotis could become disturbed from the extra noise and commotion associated with the implementation of the proposed project. However, apart from the possibility of a maternity colony being established within the old bathroom structure, if male bats were found to occupy the old bathroom, upon disturbance, they could leave the area and find other nearby suitable roosting habitat. Bats frequently utilize multiple roosts, some for daytime use and

some for more sporadic, temporary, nighttime use. Therefore, it is possible that there will be minimal indirect effects from the proposed project.

Cumulative Effects

This project would not combine with other past, present or future projects to result in any negative cumulative effects to fringed myotis or their habitats. Possible direct and indirect effects expected to Fringed Myotis are considered minimal and very low risk. Therefore the cumulative effects would be insignificant. Localized disturbance may occur with recreational activities in the area; however this effect is limited to individuals and should not have a measurable adverse cumulative effect on Fringed Myotis or their habitats.

Alternative 2 (No Action)

Direct and Indirect Effects

The continued use of unauthorized roads and OHV trails (total of approximately 0.8 miles) around Summit Springs Recreation Residence Tract and within the proposed project area would continue to degrade the existing habitat and would continue to cause noise and disturbance from vehicle use.

By not demolishing the existing bathroom structure, fringed myotis could potentially use it for roosting habitat.

In the long term, in the absence of 53 acres of proposed fuels treatments, the risk from wildfire would continue to increase, resulting in increased threat to nearby fringed myotis.

While there are consequences of inaction, Alternative 2 would not affect fringed myotis or their habitat. No direct or indirect effects would occur as a result of Alternative 2.

Cumulative effects

No direct or indirect effects would occur to fringed myotis. Therefore, no cumulative effects would occur to this species.

Western Bumble Bee

There are 94 collection records for the western bumble bee *Bombus occidentalis* on 11 national forests of the PSW Region (Hatfield 2012). There are ten detection records on the Lassen National Forest – two are from recent 2013 surveys on the Eagle Lake Ranger District. Bumble bees are threatened by habitat alterations that 1) may fragment or reduce the availability of flowers that produce the nectar and pollen they require, and 2) decrease the number of abandoned rodent burrows that provide nest and winter hibernation sites for queens.

Alternative 1 – Proposed Action

Direct Effects

During the course of implementing the fuels reduction around the Summit Springs Recreation Residences and the Camp Tehama Organization Camp, flowering plants and shrubs may get crushed. The negative effect of disturbance would be relatively short-term, possibly lasting

through the end of the year. A positive response of flowering plants and shrubs to the decrease in canopy cover due to proposed project activities, will likely result by the following spring, if not earlier. In the long run, the increased abundance of flowering herbaceous plants would provide greater abundance of flowers for the Western bumble bee to utilize for sustenance and reproduction.

There will be a loss of habitat to the proposed new parking area as well as the proposed new bathroom facilities. Removing old, dilapidated bathroom facilities and allowing the meadow area to return to a natural state, would likewise be beneficial to the bumble bee.

Indirect Effects

As indicated above, there will be a loss of habitat to the proposed new parking area as well as the proposed new bathroom facilities. However, design of the newly created parking area will discourage visitors from driving off designated routes, thereby allowing previously-impacted non-system routes to revegetate and heal. Decommissioning of non-system routes would be beneficial for the bumble bee, allowing for a greater area of former road-impacted habitat to return to a more natural state with opportunity for flowering plants to grow and flourish.

Overall, there will be positive, long-term effects from the proposed Brokenshire project that will allow for a greater amount of natural habitat within the proposed project area. The decrease in roaded area will allow for a greater amount of flowering habitat for the Western bumble bee. The increased number of non-roaded acres will also provide a larger area for small burrowing animals that can indirectly provide increased over-wintering burrows for the bumble bee.

Cumulative Effects

The Brokenshire project would not combine with other past, present or future projects to result in any negative cumulative effects to the Western bumble bee or its habitats. Possible negative direct effects expected to western bumble bee are considered minimal and very low risk. Indirect effects to the Western bumble bee are expected to be positive for the species. Therefore, the overall cumulative effects would be positive. Localized disturbance may occur with recreational activities in the area; however this effect is limited to individuals and should not have a measurable adverse cumulative effect on the western bumble bee or their habitats.

Alternative 2 (No Action)

Direct and Indirect Effects

The continued use of unauthorized roads and OHV trails (total of approximately 0.8 miles) around Summit Springs Recreation Residence Tract and within the proposed project area would continue to degrade the existing habitat. Annual flowering plants and small mammal burrow habitat would be inhibited by the continued use of these roads. Continued disturbance from vehicular traffic into wet meadows would continue to negatively affect flowering plant and shrub species needed by the bees.

In the long term, in the absence of 53 acres of proposed fuels treatments, the risk from wildfire would continue to increase. The effects of a resulting wildfire would likely be beneficial to the western bumble bee, as the removal of the conifer overstory would return the forest to early seral habitat consisting initially of increased abundance and diversity of herbaceous flowering species and shrubs that would provide increased forage for the bee.

Without implementation of the proposed project Alternative 2 would allow for the continued degradation of habitat associated with the use of non-system roads and degradation of meadow

habitat from trespass onto wet meadow habitat. The western bumble bee would not be able to utilize restored habitat from the removal of the old bathroom facilities nor would they enjoy the increased abundance of flowering shrubs and forbs that would be realized from the implementation of the proposed fuels reduction activities.

Cumulative effects

Implementation of Alternative 2 would result in the continued direct and indirect negative effects of non-action.

Determination:

The proposed Brokenshire Project would not affect the following federally listed species or their designated critical habitat:

Northern Spotted Owl, Valley Elderberry Longhorn Beetle, or Gray Wolf

The proposed Brokenshire Project would not affect the following FS sensitive species:

Northern Bald Eagle, California Spotted Owl, Great Gray Owl, Greater Sandhill Crane, Willow Flycatcher, Yellow Rail, Sierra Nevada Red Fox, California Wolverine, Pacific Fisher, Pallid Bat, Townsend's Big-eared Bat, Northwestern Pond Turtle or Shasta Hesperian Snail

The Brokenshire Project may affect individuals, but is not likely to cause a trend towards federal listing for the following species:

Northern Goshawk, Fringed Myotis, or Western Bumble Bee

Management Indicator Species

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

The following species habitats are not within the project area and will not be either directly or indirectly affected by the proposed project (identified as Category 1 in Table 1): fox sparrow (*Passerella iliaca*), greater sage-grouse (*Centrocercus urophasianus*), mule deer (*Odocoileus hemionus*), Sooty (blue) grouse (*Dendragapus obscurus*), and black-backed woodpecker (*Picoides arcticus*).

Lacustrine/Riverine Habitat (Aquatic Macroinvertebrates)

Habitat/Species Relationship

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

chemistry, temperature, and physical habitat; aquatic factors of particular importance are: flow, sedimentation, and water surface shade.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat

There would be no direct effects upon suitable macroinvertebrate habitat resulting from project implementation. No project activities are proposed within perennial stream channels. Mechanical equipment would not be permitted to cross stream channels within the project area.

When assessing indirect effects upon macroinvertebrate habitat, three habitat factors are considered: stream flow, sedimentation, and water surface shade. These factors are analyzed and discussed below.

Stream flow: No alterations to stream flow are anticipated as a result of project activities. Proposed activities within the Brokenshire project area include fuels reduction adjacent to stream channels, including an unnamed spring creek and Decom Creek. Removal of conifers up to 10 inches diameter at breast height (DBH) would occur within the Riparian Habitat Conservation Areas (RHCAs) of both of the aforementioned streams. Perennial stream RHCAs extend from the edge of the active channel, to approximately 300 feet outside the channel. No riparian hardwoods or conifers greater than 10 inches DBH would be removed. Since all large, live conifers and riparian vegetation would be retained near the stream channels, transpiration rates near stream channels are unlikely to be significantly changed from pre-project conditions. Changes in soil moisture would be negligible, and would not result in a measurable change in stream flow in the unnamed spring creek or Decom Creek.

Sedimentation: Project activities would have a low risk of sediment production into perennial streams flowing through the project area. No mechanical equipment would be permitted to operate within 50 feet of perennial stream channels (with the exception of Decom Creek, where equipment would be permitted to operate to within 25 feet of the stream), which would aid in groundcover retention and minimize the potential for fine sediment to be transported into stream channels. Best Management Practices (BMPs) would be followed when operating mechanical equipment within RHCAs, and would only permit mechanical operations within RHCAs to occur when soils are dry to a minimum of 12 inches in depth; this restriction would minimize the potential for soil compaction. Mechanical equipment used in perennial stream RHCAs (but greater than 50 feet away from stream channels, with one exception) would be low ground pressure-rated, thus further reducing the potential for soil compaction. An exception to the 50 foot mechanical exclusion zone for streams is Decom Creek (near the southern portion of Summit Springs), where mechanical equipment would be permitted to operate up to 25 feet from the stream due to heavy concentrations of fuels in this area. Only hand treatments would be permitted within 50 feet of the unnamed spring channel near Camp Tehama, and within 25 feet of Decom Creek. This action would minimize the risk of ground disturbance near the unnamed spring channel and Decom Creek. Finally, the area proposed for treatment adjacent to the stream channels is relatively small. Approximately 14 acres of RHCA treatment is proposed around the unnamed spring creek, and 9 acres of RHCA is proposed for treatment around Decom Creek. Using the above information, it is unlikely that a measurable volume of sediment would enter macroinvertebrate habitat.

Water surface shade: Alterations to stream channel shade resulting from project activities would be negligible, and would not affect stream temperatures. As no conifers greater than 10 inches

DBH would be removed, changes in canopy cover adjacent to project-area stream channels would be negligible. Furthermore, no riparian hardwoods would be removed from stream channel banks. All live trees greater than 10 inches DBH within RHCAs would be retained. Given the limited area adjacent to stream channels that is proposed for treatment and the upper diameter limit of 10 inches DBH, there would be no effect to stream temperatures resulting from canopy cover reduction.

Cumulative Effects

As stated under Indirect Effects, the greatest concern resulting from project activities is potential increases in sedimentation within suitable macroinvertebrate habitat. The risk of increased sedimentation resulting from project activities combining with effects of past, present, and reasonably foreseeable actions within the project area is considered low. Land management activities around project-area stream channels (the unnamed spring creek and Decom Creek) have mostly consisted of road decommissioning, an action which reduces chronic sediment sources over the long term. A large landslide occurred within the Decom Creek subwatershed in 1997 as a result of a rain-on-snow event. However, riparian hardwoods such as willow have largely recolonized the landslide area, providing increased stream bank stability and attenuating stream bank erosion.

In summary, the risk of cumulative effects resulting from proposed project activities and past, present, and reasonably foreseeable activities affecting macroinvertebrate habitat within and adjacent to the project area is considered low.

Alternative 2 (No Action)

Direct and Indirect Effects to Habitat

There would be no direct or indirect effects upon aquatic macroinvertebrate habitat under Alternative 2. No project activities would occur under Alternative 2.

Cumulative Effects

There would be no cumulative effects upon aquatic macroinvertebrate habitat under Alternative 2. No project activities would occur under Alternative 2.

When considering that implementation of Alternative 2 would have no cumulative effects upon BMI habitat in the analysis area, there would be no effect on BMI habitat at the bioregional scale.

Late Seral Closed Canopy Coniferous Forest Habitat (California spotted owl, American marten, and northern flying squirrel)

Habitat/Species Relationship

California spotted owl: The California spotted owl was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. The California spotted owl is strongly associated with forests that

have a complex multi-layered structure, large-diameter trees, and high canopy closure (CDFG 2005, USFWS 2006). It uses dense, multi-layered canopy cover for roost seclusion; roost selection appears to be related closely to thermoregulatory needs, and the species appears to be intolerant of high temperatures (CDFG 2005). Mature, multi-layered forest stands are required for breeding (Ibid). The mixed-conifer forest type is the predominant type used by spotted owls in the Sierra Nevada: about 80 percent of known sites are found in mixed-conifer forest, with 10 percent in red fir forest (USDA Forest Service 2001).

American Marten: The American marten was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. Martens prefer coniferous forest habitat with large diameter trees and snags, large down logs, moderate-to-high canopy closure, and an interspersed of riparian areas and meadows. Important habitat attributes are: vegetative diversity, with predominately mature forest; snags; dispersal cover; and large woody debris (Allen 1982). Key components for westside and eastside marten habitat can be found in the Sierra Nevada Forest Plan Amendment FEIS (USDA Forest Service 2001), Volume 3, Chapter 3, part 4.4, pages 20-21.

Northern flying squirrel: The northern flying squirrel was selected as an MIS for late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat in the Sierra Nevada. This habitat is comprised primarily of medium/large trees (equal to or greater than 24 inches dbh) with canopy closures above 40% within ponderosa pine, Sierran mixed conifer, white fir, and red fir coniferous forests, and multi-layered trees within ponderosa pine and Sierran mixed conifer forests. The northern flying squirrel occurs primarily in mature, dense conifer habitats intermixed with various riparian habitats, using cavities in mature trees, snags, or logs for cover (CDFG 2005).

Project-level Effects Analysis – Late Seral Closed Canopy Coniferous Forest Habitat

Habitat Factor(s) for the Analysis: (1) Acres of late seral closed canopy coniferous forest (ponderosa pine, Sierran mixed conifer, white fir, and red fir) habitat [CWHR ponderosa pine (PPN), Sierran mixed conifer (SMC), white fir (WFR), red fir (RFR), tree size 5 (canopy closures M and D), and tree size 6]. (2) Acres with changes in canopy closure (D to M). (3) Acres with changes in large down logs per acre or large snags per acre.

Current Condition of the Habitat Factor(s) in the Project Area:

Within the Brokenshire project area there are 18.7 acres of late seral closed canopy forest. There is an average of 48.42 tons of down woody debris per acre in the project area and an average of 21.39 tons of 9.1”+ dbh per acre, which is considered the large down woody debris. Most down woody debris in the project area will be grapple piled and burned. Within the fuels treatment portion of the project on the west side of Highway 172 there is less than one snag per acre, all of which will be removed to reduce wildfire spread and intensity and to protect life and property. Felled snags will be piled and burned with the downed woody debris to protect Summit Springs and Camp Tehama communities from the risk of potential wildfire.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat

Although 73% of the late seral closed canopy forest in the project area would be treated, this would not result in a change in canopy closure or in tree size. The objective of the fuels reduction part of this project is to reduce fuel accumulations in the wildfire urban interface zone by hand thinning the ladder fuels, and piling and burning down logs and snags. This would directly affect habitat features such as down logs and snags that the California spotted owl, American marten, and northern flying squirrel may utilize, but would indirectly protect the large trees and dense canopy from potential wildfire if one should occur.

Cumulative Effects to Habitat in the Analysis Area

Some past management activities that include patch clearcut, single tree selection cut, sanitation and seed step shelterwood from 1985 have occurred near the Brokenshire project area. Since then forest treatments were for the most part forest health improvement and fuels reduction in the form of thinning from below and light sanitation. All of these forest activities have most likely had a cumulative effect to habitat used by species relying on late successional aging forests or dense forest conditions. However, the proposed treatment would not change late seral conditions and therefore would not have a cumulative negative effect to mixed conifer late seral forests.

The cumulative effects to this habitat would be the removal of down woody debris and snags to reduce the risk of wildfire to nearby communities. Although the treatment may affect those features, the project would not result in a change in late seral closed canopy habitat type.

Although certain habitat characteristics within the project area would be removed, there would not be a change in canopy closure or tree size and would not alter the existing trend in habitat.

Alternative 2 (No Action)

Direct and Indirect Effects

Selection of this alternative would not authorize any federal actions and therefore, no direct or indirect impacts to late seral closed canopy coniferous forest habitat would occur.

Cumulative Effects

There would be no changes to late seral closed habitat with the No Action alternative, therefore this alternative would not alter the existing trend in the habitat.

Snags in Green Forest Ecosystem Component (Hairy woodpecker)

Habitat/Species Relationship

The hairy woodpecker was selected as the MIS for the ecosystem component of snags in green forests. Medium (diameter breast height between 15 to 30 inches) and large (diameter breast height greater than 30 inches) snags are most important. The hairy woodpecker uses stands of large, mature trees and snags of sparse to intermediate density; cover is also provided by tree cavities (CDFG 2005). Mature timber and dead snags or trees of moderate to large size are apparently more important than tree species (Siegel and DeSante 1999).

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

Habitat Factor(s) for the Analysis: (1) Medium (15-30 inches dbh) snags per acre. (2) large (greater than 30 inches dbh) snags per acre.

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

Currently the Brokenshire project contains 1.4 snags per acre of all dbh sizes. Of the medium snags there are 0.75 snags per acre. The large snags inhabit 0.22 snags per acre. All older dead standing snags are white fir and range from 13.4”dbh to 38.5”dbh. The recently dead standing snags are all incense cedar and range from 12”dbh to 12.7”dbh.

Alternative 1 (Proposed Action)

Direct and Indirect Effects to Habitat

The Brokenshire project proposes to hand fall and grapple pile most snags within a 300 foot buffer around the Summit Springs Recreation Residence Tract and Camp Tehama Organizational camp boundaries to decrease the risk of wildfire occurring within the project area with potential impacts to Forest users, property, and riparian vegetation.

The nearby communities experience high visitor use which increases the risk of fire. Management objectives were designed to create defensible space near communities, and provide a safe and effective area for suppressing fire. Therefore, the removal of all ladder fuels must be completed to ensure an effective means of preventing crown fire near the communities.

The proposed action would directly affect snags within the project area, but the area is too small to accurately portray snag characteristics within the CWHR stands. At the stand level, the risk to snags is low in the SMC6 and SMC4D stands, but remains high in the SMC4M stand. Approximately 17% of the SMC6 stand, 6% of the SMC4D stand, and 62% of the SMC4M stand would be treated for fuels reduction. Snag data was only collected in the project area, therefore landscape scale analysis of snags is difficult to quantify. Indirect effects may include a loss of future habitat characteristics such as downed woody debris and snags comprising high levels of decay.

In summary, the proposed action would remove most snags around the communities to reduce the risk of wildfire, consequently the risk to snags within the project area is considered high.

Cumulative Effects to Habitat in the Analysis Area

Some of the past activities include sanitation and salvage logging which most likely had an adverse impact on snag densities. General forest thinning may have also reduced snag numbers to some extent, however snag retention guidelines have been in place for many years and the impact from logging activities may be small in comparison to the targeted removal of snags through sanitation and salvage logging. Because most snags would be removed within the project area, the proposed action would contribute to a cumulative decline in the number of snags in the project area.

Snag densities, distribution, size, and condition vary across the landscape spatially and temporally. Therefore, snags are difficult to quantify without yearly data collection. The risk to snags at the project level is high, but the project area is too small to accurately portray snag characteristics at the stand or landscape level. Although snags within the project area would be

removed, it is unlikely that the Brokenshire project would contribute to a decline in snag levels across the landscape.

Alternative 2 (No Action)

Direct and Indirect Effects

There would be no change to this type of habitat, thus it will not result in a change in the amount of snags present within the project area.

Cumulative Effects

No direct or indirect effects would occur; therefore no cumulative effects would occur. No changes to snags in green forest would occur as a result of the No Action alternative; therefore this alternative would not alter the existing trend in the habitat.

Aquatic Species

Species of Concern

This analysis addresses Federally-listed (TES) aquatic species (Date accessed: July 9, 2013¹), and Forest Sensitive Species (FSS) as designated by the Region 5 Regional Forester that occur within or adjacent to the Lassen National Forest, and rationale for their consideration under the proposed Brokenshire Project.

Amphibians

The Cascades frog (*Rana cascadae*) is a mountain frog most common in small pools adjacent to streams flowing through subalpine meadows. They also inhabit fens, seasonally-flooded, forested swamps, small lakes, ponds, and marshy areas adjacent to streams. Cascades frogs are unlikely to survive in ephemeral situations where at least some of the substrate does not remain saturated. Historic records indicate Cascades frogs once inhabited perennial streams within the project area. The species is not known to currently occupy potential habitat within the project area. However, potentially suitable habitat still exists within the project area. Within the Brokenshire project area, three perennial streams totaling approximately 3.2 miles in length and approximately 93 acres of freshwater emergent wetland provide potentially suitable habitat for the Cascades frog.

Alternative 1 (Proposed Action)

Direct Effects

There would be a low risk of direct effects upon Cascades frogs, or their habitat, resulting from activities proposed under Alternative 1. There are three potential scenarios in which Cascades frogs could be adversely affected by project implementation. These scenarios include 1) frogs coming into direct contact with mechanical equipment, 2) tree falling upon individual frogs, and 3) frogs coming into contact with burn piles. However, these scenarios are unlikely to occur under Alternative 1.

Mechanical equipment would not be permitted to cross perennial stream channels off existing roads (Watershed and Soils IDF #9), and mechanical equipment operations would not proceed

¹ The list is available on-line at http://www.fws.gov/sacramento/es_species/Lists/es_species_lists_NF-action-page.cfm

until soils are dry to 12 inches in depth (Soils IDF #4). When soil conditions become dry, individual frog movement is typically restricted to stream courses and/or wetlands. Therefore, the risk of frogs coming into contact with mechanical equipment is considered very low.

If hand felling of trees were to occur during wet soil conditions, there may be a negligible risk of felled trees coming into contact with Cascades frogs traveling overland during the spring months.

Burn piles would be placed at least 25 feet away from perennial streams or wet meadows/freshwater emergent wetlands (Watershed and Soils IDF #7). Since piles would not be placed within potentially suitable habitat for Cascades frogs, the risk of Cascades frogs coming into contact with these piles when they are burning is considered negligible.

Indirect Effects

The two risks associated with project activities that may indirectly affect Cascades frogs or their potentially suitable habitat include 1) increased sedimentation of potentially suitable habitat as a result of ground disturbance, and 2) reductions in canopy cover within potentially suitable habitat as a result of tree felling within RHCAs that could lead to increased water temperatures. It has been determined that activities proposed under Alternative 1 would have a negligible to low risk of sedimentation of stream channel and off-channel habitat, and a negligible risk to changes in canopy cover.

Integrated Design Features would restrict mechanical equipment from operating within 25 feet of Decom Creek (located in the southern portion of the project area), and 50 feet from all other perennial streams within the project area (Watershed and Soils IDF #6). Mechanical equipment would not be permitted to operate until dry soil conditions are met (Soils IDF #4), thus minimizing the risk for soil compaction. Hand treatments adjacent to perennial streams would retain trees greater than 8 inches DBH that are contributing to stream bank stability (Watershed and Soils IDF #4). Given the minimal ground disturbance that would occur within the RHCAs of perennial streams and the relatively small area of perennial stream RHCA proposed for fuels treatment (approximately 25 acres), the risk of sedimentation of perennial streams resulting from implementation of Alternative 1 is considered low.

Given the relatively small areas proposed for fuels treatment that are within 100 feet of perennial stream channels (approximately 9 acres total), the retention of live conifers greater than 10 inches DBH, and the retention of bank-stability trees greater than 8 inches DBH, alterations to stream channel shade resulting from project activities would be negligible and would not affect stream temperatures. Live trees larger than 10 inches DBH would not be felled under fuels reduction activities, and these trees would remain on the landscape to provide stream channel canopy cover.

Cumulative Effects

On a worldwide basis, acid precipitation, ultraviolet radiation, and global climate change have all been suggested as causes to the decline of amphibians. Within the Lassen region, more acute causes of decline for amphibians include the introduction of non-native predatory fishes into Cascades frog habitats, chytridiomycosis (an infectious disease among amphibians), extended drought conditions resulting in reduced habitat quality, and loss of potential breeding habitat through conifer encroachment upon wet meadows.

Currently, there is one Forest Service project planned adjacent to the Brokenshire project area: the Morgan Danger Tree Project. Approximately 106 acres of this project would fall within the

western portion of the Mill Creek Tract Subbasin subwatershed. The Morgan Danger Tree Project would entail the felling of trees considered hazardous to roadways, and some of these roadways cross seasonal stream channels that are tributary to Decom Creek. Sedimentation of these stream channels resulting from danger tree removal is a concern with the Morgan Danger Tree Project. As a result, IDFs for the Morgan Danger Tree Project were designed to minimize the potential for sediment transport to adjacent stream channels. On a cumulative effects scale, the effects of the Morgan Danger Tree Project, when combined with effects of the Brokenshire Project, would have a negligible to low risk upon sediment transport and deposition within the perennial portion of Decom Creek where potentially suitable habitat for Cascades frogs is located. As previously stated, the stream channels that are tributary to Decom Creek that fall within the Morgan Danger Tree Project area are seasonal in nature; as such, no effects to water temperatures are expected.

Alternative 2 (No Action)

Direct Effects

There would be no direct effects upon Cascades frogs with implementation of Alternative 2, as no project activities would occur. Mechanical equipment would not come into contact with Cascades frog individuals or their habitat. Since no trees or snags would be felled under Alternative 2, there would be no risk of trees or snags falling onto Cascades frogs as a result of implementation of Alternative 2. Vehicle access to wet meadows within the project area would remain open; as a result, the risk for recreational vehicles coming into contact with Cascades frogs would remain at existing rates. Since no project activities would occur under Alternative 2, there would be no direct effects towards Cascades frogs.

Indirect Effects

No indirect effects upon Cascades frogs would occur under implementation of Alternative 2. There are no project activities proposed under Alternative 2. Sediment production from NFS and unauthorized routes would continue at existing rates. Stream channel shade and water temperatures would not be affected since vegetation management activities would not occur.

Cumulative Effects

No project activities would occur under Alternative 2. There would be no direct or indirect effects from project implementation on Cascades frogs or their potentially suitable habitat. Therefore, Alternative 2 would impose no cumulative effects upon Cascades frogs or their potentially suitable habitat.

Fishes

Central Valley spring-run Chinook salmon (*Oncorhynchus tshawytscha*) and Central Valley steelhead trout (*Oncorhynchus mykiss*) are confirmed within the project area, in the main stem of Mill Creek. Pacific lamprey (*Entosphenus tridentatus*) has not been confirmed within the project area; however, suitable habitat for this species exists within the main stem of Mill Creek.

Alternative 1 (Proposed Action)

Direct Effects

There would be no direct effects upon CV spring-run Chinook salmon, CV steelhead trout, or Pacific lamprey under implementation of Alternative 1, as no project activities would occur within occupied habitat for these species. There would be no direct effects upon Designated Critical Habitat for CV spring-run Chinook salmon or CV steelhead trout.

Indirect Effects

Implementation of the Brokenshire Project may result in negligible risk to CV spring-run Chinook salmon and CV steelhead as a result of potential increased sediment production to anadromous fish habitat located in Mill Creek due to actions associated with fuel reduction and transportation activities, specifically decommissioning, stormproofing, and seasonal stream crossing improvements. The amount of sediment that may be produced through implementation of fuels reduction and road decommissioning activities will be minimized by project design standards, resulting in an insignificant (undetectable) amount of sediment input to seasonal and/or perennial stream channels in the short-term. The insignificant amount of project related sediment that may be generated is not expected to be measurable in Mill Creek with the naturally high background levels of sediment. In the long-term, sediment production from the existing transportation network is expected to decrease as a result of improved drainage features, seasonal stream crossings, and road conditions. Again, these improvements are not anticipated to be measurable within Mill Creek. Additionally, blocking vehicle access from the Mill Creek Dispersed Camp area will result in a beneficial indirect effect by effectively preventing the potential for disturbance to designated critical habitat from any unauthorized motorized use.

Implementation of the Brokenshire Project will not affect existing water temperature or large woody debris recruitment potential within project area stream channels, including anadromous habitat located within Mill Creek, as a result of BMPs and integrated design features built into the planning of the project. Implementation of Alternative 1 will result in a negligible risk of indirect effects to potentially suitable habitat for Pacific lamprey within or downstream of the project area, as sediment has not been shown to negatively affect the species.

Cumulative Effects

Implementation of the Brokenshire Project poses a negligible risk of increases in sediment to stream channels in the project area, and when added to past, ongoing and reasonable future actions on non-federal lands, the project poses a low risk of incremental cumulative increases in sediment within the project area and downstream within occupied anadromous habitat in Mill Creek.

Alternative 2 (No Action)

Direct Effects

There would be no direct effects upon CV spring-run Chinook salmon, CV steelhead trout, or Pacific lamprey under implementation of Alternative 2, as no project activities would occur within occupied and/or Designated Critical Habitat (DCH) for these species.

Indirect Effects

No indirect effects upon CV spring-run Chinook salmon, CV steelhead trout, or Pacific lamprey would occur under Alternative 2. No project activities would occur under Alternative 2. Sediment production from NFS and unauthorized routes would continue at existing rates. Stream channel shade and water temperatures would not be affected since vegetation management activities would not occur.

Cumulative Effects

No project activities would occur under Alternative 2. There would be no direct or indirect effects from project implementation on CV spring-run Chinook salmon, CV steelhead trout, or Pacific lamprey, or their occupied habitat. No effects would occur upon DCH for CV spring-run Chinook salmon or CV steelhead trout. Therefore, Alternative 2 would impose no cumulative effects upon the aforementioned fish species or their respective habitats.

Invertebrates

Potentially suitable habitat for the black juga (*Juga nigrina*) exists within the project area. Black juga are not restricted to a particular area on the LNF, and are found in several streams sharing habitat characteristics similar to those found in perennial streams within the Brokenshire project area. This analysis assumes that black juga are present within the project area.

Alternative 1 (Proposed Action)

Direct Effects

There would be no direct effects upon black juga resulting from implementation of Alternative 1, as no project activities are proposed within their potentially suitable habitat (perennial streams). No mechanical equipment would be permitted to cross perennial stream channels, thus eliminating the risk of black juga being crushed by mechanical equipment.

Indirect Effects

The risks associated with project activities which may indirectly affect the black juga or their potentially suitable habitat are the same risks which may affect the Cascades frog. These risks include 1) increased sedimentation of potentially suitable habitat as a result of ground disturbance, and 2) reductions in canopy cover within potentially suitable habitat as a result of tree felling within RHCAs, which could lead to increased water temperatures.

For the reasons previously described for Cascades frogs, it has been determined that activities proposed under Alternative 1 would have a negligible to low risk upon sedimentation within perennial streams, and a negligible risk of changes in canopy cover over perennial streams within or adjacent to the project area.

Cumulative Effects

Threats to spring and stream habitats occupied by black juga include excessive sedimentation from a variety of ground-disturbing activities, which may smother substrates and stress or kill individuals; livestock trampling and grazing of small streams and spring channels, resulting in reduced dissolved oxygen levels; and water diversions resulting in reduced spring or stream flow.

Since perennial streams within the project area are considered potentially suitable habitat for the black juga, analysis of cumulative effects upon these waterways is essentially the same as described for Cascades frogs because these habitats are also potentially suitable for black juga. When combined with past, present, and reasonably foreseeable actions within the project area, there would be a negligible to low risk of project activities increasing sedimentation of perennial stream channels above current conditions, and a negligible risk of project activities contributing to declines in perennial stream channel shading.

Alternative 2 (No Action)

Direct Effects

There would be no direct effects upon black juga with implementation of Alternative 2, as no project activities would occur. Mechanical equipment would not come into contact with black juga or their potentially suitable habitat. Since no project activities would occur under Alternative 2, there would be no direct effects towards black juga individuals or their habitat.

Indirect Effects

No indirect effects upon black juga or their potentially suitable habitat would occur under implementation of Alternative 2. There are no project activities proposed under Alternative 2. Sediment production from NFS and unauthorized routes would continue at existing rates. Stream channel shade and water temperatures would not be affected since vegetation management activities would not occur.

Cumulative Effects

No project activities would occur under Alternative 2. There would be no direct or indirect effects from project implementation on black juga, or their potentially suitable habitats. Therefore, Alternative 2 would impose no cumulative effects upon black juga or their potentially suitable habitat.

Determinations

After considering known life history requirements, current conditions, historical and current survey information, and Integrated Design Features, the implementation of the Brokenshire Project may affect individuals but is not likely to result in a trend toward Federal listing or loss of viability of the Cascades frog, Pacific lamprey, or black juga. Additionally, the implementation of the Brokenshire Project may affect but is not likely to adversely affect Central Valley spring-run Chinook salmon, Central Valley steelhead trout, and/or their designated critical habitat.

Chinook Salmon Essential Fish Habitat (EFH):

EFH for Chinook salmon includes areas previously designated as critical habitat for the listed CV spring-run Chinook salmon. For reasons described above, there will be “no adverse effect” on EFH.

Consultation and Coordination

The Forest Service consulted the following individuals, Federal, State, tribes, and local agencies during the development of this environmental assessment:

Federal, State, and Local Agencies:

Tehama Glenn Fire Safe Council
Dennis Garton, Tehama County Board of Supervisors
Tehama County Environmental Health
Mill Creek & Mineral Volunteer Fire Departments

Tribes:

Susanville Indian Rancheria
Pit River Tribe
Greenville Rancheria
Mechoopda Indian Tribe of Chico Rancheria
Redding Rancheria

Others:

Sylvia Milligan
Collins Almanor Forest
Frank Stewart, County QLG Forester
Summit Springs Homeowners Association
Christine and Richard O'Sullivan
Sierra Pacific Industries
Patricia Puterbaugh, Lassen Forest Preservation Group