United States Department of Agriculture
Forest Service

North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments Grazing Management Project

Final Environmental Assessment

Eagle Lake Ranger District, Lassen National Forest, Lassen County, CA

October 2020

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Cover photo: Pine Creek Valley and Wetland looking toward Antelope Mountain (photo taken by Mo Suarez, June 2018).

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Introduction

The Lassen National Forest (LNF) is proposing to authorize continued livestock grazing with changes to management strategies on the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments (hereafter Pine Creek Allotments Project). These allotments cover 74,569 acres of National Forest System lands administered by the Eagle Lake Ranger District (ELRD), including 4,476 acres of privately-owned lands. The allotments are located approximately 15 miles northwest of Susanville, CA (centered at Logan Mountain).

This environmental assessment (EA) has been prepared to determine whether implementation of the Pine Creek Allotments Project may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement or a finding of no significant impact. By preparing this EA, the Lassen National Forest is fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA) and the terms of Section 504(a) of the 1995 Rescission Act (Public Law 104-19). In addition, the forest service was identified as a collaborating agency to focus management on stream habitat to enhance the natural production of Eagle Lake Rainbow Trout (ELRT) in the "Conservation Agreement for Eagle Lake Rainbow Trout" (CAELRT 2015). This EA addresses objective 2.1 to reduce impacts from grazing and to restore Pine Creek stream habitat and channel.

Differences to the proposed action (scoped in March 2018) were made in response to comments received and identified in the draft EA. See page 30 of the Environmental Consequences section of this EA for a list of specialist's reports incorporated by reference.

Project Location

The Pine Creek Allotments are located approximately 15 miles northwest of Susanville, CA. They include portions of Townships 31, 32, and 33 North; Ranges 8, 9, 10 and 11 East; Mount Diablo Meridian. The allotments encompass areas of wide valleys surrounded by timbered slopes. They include a large part of the Pine Creek Valley, Champs Flat, Antelope Valley, Dow Butte and extend to a small portion of the west shore of Eagle Lake.

Elevations range from 5,800 feet up to 7,136 feet. The mean annual precipitation averages 15 to 28 inches (1981 - 2010) with most precipitation occurring as snowfall. Soils are generally very rocky and moderately productive, meadows have deep alluvial soil. Vegetation consists of mixed conifer, eastside pine, and grass-sage communities. Sagebrush flats are intermingled with forested islands. Areas of noncommercial forest land are sparsely stocked with scattered pine and juniper.

Approximately 26.5 miles of Pine Creek flows through the project area. The stream reaches in the project area are intermittent and typically flow from mid-March to June and are otherwise disconnected from Eagle Lake during most of the grazing season depending on the water year. Within the project area, Pine Creek reaches cross a sequence of four large, broad, nearly level, alluvial valleys separated by short, relatively steep, volcanic bedrock narrows before entering Eagle Lake. Pine Creek Valley is the largest valley in the Upper Pine Creek watershed. The valley includes ten miles of Pine Creek flowing in anastomosing channels. Anastomosing channels are multi-threaded stream channels but are much more stable than braided channels and commonly have thick clay and silt banks, vegetated islands, and occur at lower stream bed gradients.

The vegetative communities in valleys are characterized by grass and grass-like plants in both wet (*Juncus balticus, Carex nebrascensis)* and dry *(Carex filifolia, Deschampsia cespitosa)* habitats, as well as brush (*Artemisia tridentata, A. arbuscula*, *Purshia tridentata*, *Ericameria bloomeri*).

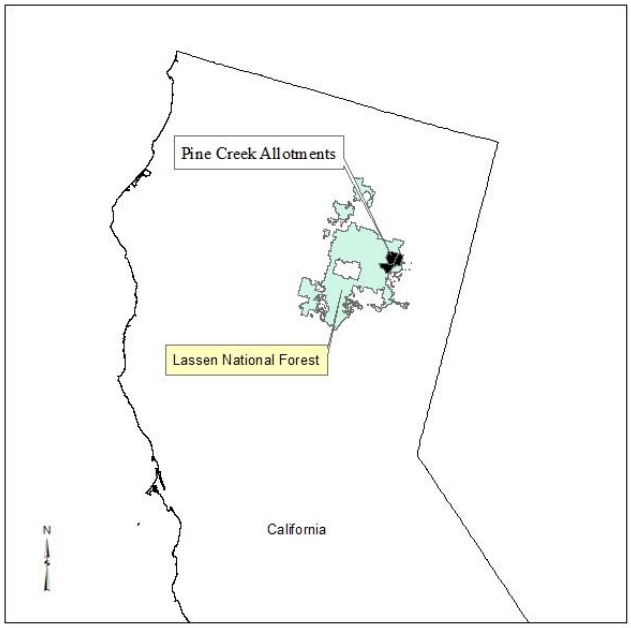


Figure 1. Vicinity of Pine Creek Allotments Project

Background Information

From 2005 through 2007, the US Forest Service was given authority to document environmental analysis of grazing allotments under a temporary Categorical Exclusion (CE) authority. The North Eagle Lake,

Champs Flat and Lower Pine Creek Allotments were analyzed using the CE authority and a Decision Memo signed in 2006. A regional litigation filed in 2008 on the use of the CE authority resulted in an agreement by Region 5 of the US Forest Service to re-analyze these allotments under an Environmental Assessment by the end of 2016. Due to changing Forest priorities and lack of personnel, it has been delayed until now.

It is appropriate to analyze these three allotments together because one livestock herd grazes all three allotments in a deferred rotation system. A second, smaller herd of livestock grazes a smaller, separate unit in the Champs Flat Allotment. The current grazing management systems have included rotating livestock through numerous pastures, resting riparian pastures from grazing during certain years, adjusting livestock numbers, and adjusting timing and length of grazing based on annual forage and water conditions. Grazing management has been adaptive through Annual Operating Instructions (AOI) in an effort to help improve conditions of the Pine Creek drainage, the primary stream that flows through all three allotments and terminates at Eagle Lake.

Pine Creek is important because it is the largest stream draining into Eagle Lake and provides the primary natural spawning habitat for the Eagle Lake rainbow trout (ELRT), historically native only to this system and highly adapted to the alkaline environment.

The portion of Pine Creek that flows through the project area is intermittent, and flows are highly variable, depending on the amount of runoff from snowmelt during the spring. Streamflow typically begins in March and ends by June, depending on water year. Riparian areas and meadows are graminoid-dominant, lacking a riparian woody species component. Pine Creek within Pine Creek Valley is a wide, shallow, multiple channel system with stable and relatively well-vegetated banks. Pine Creek and tributaries are significantly more incised in the large alluvial valleys, including Champs Flat, McCoy Flat, Antelope Valley, and Little Antelope Valley, with less stable, vertical banks and considerable lateral erosion. Incision along Pine Creek and tributaries is due to multiple factors, including historic road and railroad infrastructure for logging, channelization, as well as intensive livestock grazing, and sheep drives that occurred between the late 1800s and early 1900s. Several segments of Pine Creek are relatively steeper and stable where it crosses volcanic bedrock through narrow canyons between the large valleys.

Most watershed degradation can be attributed to legacy effects from human activities and landscape use during the past 120 years (e.g. -extensive logging, heavy grazing, stream channelization, and construction of railroads and roads across meadows and streams).

Within the Pine Creek watershed many restoration actions have occurred primarily through the collaborative efforts of the Pine Creek Coordinated Resource Management and Planning (CRMP) group,

that includes resource managers (Lassen National Forest, California Department of Fish and Wildlife) tribes (Susanville Indian Rancheria), non-profit organizations (Trout Unlimited, CalTrout, and American Rivers), consultants, and local agencies (Honey Lake Resource Conservation District). Since 1987, the CRMP has been successfully advancing projects to improve watershed conditions. The 1995 Pine Creek Riparian and Fish Passage Improvement Project EA included changes in grazing management focused primarily on the mainstem of Pine Creek (see page 5 for more detail). More recent range improvements include building a fence to eliminate a livestock access to a section of Pine Creek in the Harvey Valley Allotment EA (2013). In the Upper Pine Creek Allotment, a drift fence was implemented in 2016 to alleviate an ongoing problem of livestock drift from the adjacent pasture.

A Geomorphic Assessment and Trend Analysis as well as a Meadow Assessment for restoration opportunities in the Pine Creek watershed were completed in 2015 and 2016, respectively. The reports identified areas that could benefit most from restoration efforts, using active and/or passive methods. The Pine Creek Restoration Project (2014) is awaiting implementation and will address some of the areas identified in these assessments. Both the Confluence Meadow Project and McKenzie Meadow Project are currently being analyzed and would also address identified areas for restoration. These projects would use active methods that physically change the stream channel, move soil, and require the use of machinery. Proposed actions identified in this analysis focus more specifically on developing compatible livestock management and related actions to compliment the above activities.

Laws, Regulations, and Other Direction

The Proposed Action is designed to be consistent with the 1992 Lassen National Forest Land and Resource Management Plan (LRMP) and 1993 Record of Decision (ROD) as amended by the Sierra Nevada Forest Plan Amendment (SNFPA) FSEIS and ROD (2004), and other relevant Federal and State laws and regulations.

The Pine Creek Allotments Project will be implemented under the pre-decisional objection process found at 36 CFR 218. Under this collaborative process public concerns can be addressed before a decision is made increasing the likelihood of resolving any concerns and making better, more informed decisions.

Purpose and Need for the Proposal

Purpose

The purpose for the proposed action is to continue to permit livestock grazing on all or portions of the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments. An adaptive livestock management strategy would be developed to reduce the impacts from grazing and move existing riparian vegetation

and stream channel conditions toward desired conditions in a timely manner, consistent with Forest Plan objectives, as amended and objective 2.1 in the CAELRT.

It is timely to re-evaluate the allotment management on these allotments because the Eagle Lake Ranger District has assessed other projects in the Pine Creek watershed that can complement and be compatible with this project in an effort to improve resource conditions throughout the watershed. This project focuses on areas within the allotment boundaries.

Authorization of livestock grazing and management is appropriate in the project area because:

- Where consistent with other multiple use goals and objectives there is Congressional intent to allow grazing on suitable lands. (Multiple Use Sustained Yield Act of 1960, Wilderness Act of 1964, Forest and Rangeland Renewable Resources Planning Act of 1974, Federal Land Policy and Management Act of 1976, National Forest Management Act of 1976).
- These allotments contain lands identified as suitable for domestic cattle grazing that meet the goals, objectives, standards, and guidelines as described in the Lassen National Forest Land and Resource Management Plan (LRMP, 1992), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA, 2004).
- It is Forest Service policy to make forage available to qualified livestock operators from lands suitable for grazing consistent with land management plans (36 CFR 222.2 (c)).
- It is Forest Service policy to continue contributions to the economic and social well-being of people by providing opportunities for economic diversity and by promoting stability for communities that depend on range resources for their livelihood (FSM 2202.1).
- Updated management strategies would outline how livestock would be grazed and at what levels to assure implementation of Forest Plan management direction and meet Section 504 of Public Law 104-19 (Rescission Bill, signed July 27, 1995), which requires revision of existing allotment management plans.

Need

Historically, livestock grazed the entire season with no control of when (timing), where (duration), and how often (frequency) they had access to Pine Creek. Over the last 20-25 years, resource management, including grazing, has focused on improving riparian and stream conditions along the length of Pine Creek. The Fish Passage and Habitat Improvement EA (1995) revised grazing allotments to improve habitat conditions along 30.85 miles of Pine Creek. Approximately 33% of the Pine Creek main stem is currently protected from grazing by exclusionary fencing or by management, including most of the perennial stream reaches managed by the LNF. Of the remaining intermittent stream reaches, several are in confined rocky channel types not susceptible to livestock impacts. In areas where livestock do have access to the stream channel, management strategies range from rotational short duration use to

occasional fall gathering, in order to reduce impacts from prolonged livestock use. None of the grazed stream reaches are scheduled for season-long use.

The existing pastures, both upland and riparian, were designed and constructed to establish a deferred rotational system that manages the amount, timing, and duration of grazing, to improve or maintain healthy riparian conditions. Riparian pastures, riparian exclosures, and more restrictive livestock use standards have helped improve vegetative cover and species composition, and increased bank stability along the creek and in adjacent riparian areas. However, recent analyses and utilization monitoring from 2012 to 2017, have identified segments of Pine Creek where additional changes in livestock management are needed, especially in drought years, in order to continue improving riparian vegetation composition and streambank stability.

Livestock Management

Monitoring over the last few years has indicated there is a need for changes in livestock management to improve riparian vegetation condition and streambank stability along segments of Pine Creek, particularly in the large open valleys of Pine Creek, Champs Flat, and McCoy Flat. Timing of use, repeat grazing, and incomplete removal of livestock from pastures has resulted in overuse of riparian vegetation and/or aspen in some areas. Late season grazing has resulted in excessive bank trampling in some locations such as McCoy Flat. There is a need to refine the grazing strategy to adjust timing, change distribution patterns and duration of cattle use to continue upward trends in riparian conditions.

Fences

Improvements or repairs to existing fences, as well as some new fences, are needed. Pasture fences constructed for riparian and stream improvement were previously placed too close to the stream channel and need to be relocated to allow for natural movement of the channel as it improves. Active headcuts have developed in the Stanford Headquarters area and need to be fenced to allow them to stabilize and recover. Additional boundary fences are needed where livestock drift into adjacent allotments because natural barriers, such as thick timber, that previously acted as fences, have been thinned or removed.

Watershed Improvements

Man-made impoundments used to water livestock and historical grazing patterns have contributed to degradation of streambanks within multiple meadows and valley bottoms within the allotments. On-channel waterholes along Pine Creek continue to act as attractants, particularly in drought years, which encourages livestock to concentrate in adjacent meadow areas. There is a need to restore flow patterns and rehabilitate channels and associated meadow vegetation by replacing on-channel waterholes with alternate water sources, stabilizing headcuts, and changing livestock distribution at times when bank

trampling is most critical. Several locations have been identified for proposed improvement work that would meet this need.

Aspen Enhancement

Aspen are shade intolerant and are often overtopped and shaded by conifers in the absence of disturbance. Conifer encroachment into aspen communities has significant effects on mature aspen tree growth and regeneration success through changes in light conditions. Therefore, removing conifers to increase direct and indirect light is typically recommended to enhance aspen vigor and regeneration success. Aspen regeneration is also a preferred browse resource in late summer for livestock and wildlife because it has higher forage value. Excessive browsing suppresses establishment of new aspen tree cohorts by maintaining suckers in a hedged form or totally eliminating regeneration. Moderate or even incidental browsing occurring along the edges of aspen communities can impede aspen communities from expanding where possible.

Identified aspen stands within the allotments are declining in vigor and regeneration from conifer encroachment and/or browsing of regeneration. Conifer removal followed by some form of protection from browsing is needed in these stands to promote regeneration and increase the health and vigor of the stands.

Public Involvement and Tribal Consultation

The North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project was developed with input from grazing permittees, Pine Creek Coordinated Resource Management Program (CRMP) members, and resource specialists from the Lassen National Forest.
Opportunities for public and tribal involvement prior to scoping for the proposed action included the following meetings:

- Permittees and Non-government Organizations Meeting to discuss projects in the Pine Creek Watershed, including the grazing EA – Feb. 23, 2016 (RCD, CRMP, UC Extension, Todd Sloat)
- Published in Lassen NF SOPA – January 2016
- SIR overview of the project at quarterly tribal meeting – April 12, 2017
- Initial Scoping for comments to the Proposed Action – March 6-21, 2018
- Public Field Meetings – June 25-26, 2019
- Eagle Lake District Public Open House – December 5, 2019
- PIT River Tribal quarterly meeting – March 5, 2020 (progress update)

The Pine Creek Allotments project has been listed in the Lassen National Forest Schedule of Proposed Actions (SOPA) since January 2016. Scoping for the Pine Creek Allotments Project Proposed Action Purpose and Need was initiated on March 6, 2018. The scoping document was mailed or emailed to 25 individuals, groups, and other agencies that responded to the SOPA or otherwise could be potentially affected. The scoping document was also made available on the LNF website. The designated public comment period lasted 15 days and ended March 21, 2018. Five individuals and/or organizations provided comments during the designated comment period. The North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project Review of Comments Received from Public Scoping document, is available in the project record and identifies how initial scoping comments were addressed, either in resource reports and/or the environmental analysis.

Changed *Conditions since Initial Scoping*

Whaleback Fire

From July 27 through August 8, 2018, the Whaleback Fire burned over 18,000 acres, of which, approximately 4,814 acres are within this project area. The LRMP recommends no grazing on perennial grass range after fire (LRMP 4-22(5)). Mostly unsuitable or transitory rangelands were burned, but some secondary rangelands were also affected. Livestock use within and movement between pastures will be modified during fire recovery activities, such as salvage logging and revegetation, to allow desirable plants to establish. Proposed changes to grazing rotations are identified below in Alternative 1: Proposed Action, Livestock Management section, subsections for the Combined Allotments.

Water Quality

Eagle Lake was included on the Clean Water Act (CWA) Section 303(d) list as an impaired waterbody in 2006. Earlier reports (1990) had listed Eagle Lake and Pine Creek as impaired waters under the CWA 303(d) provisions, but Pine Creek was delisted in 2006. Recently, interest about the effects of livestock access to the lakeshore and the potential for nutrient loading has increased and concerns shared with the Lahontan Regional Water Quality Control Board (LRWQCB). In response, there have been numerous communications, several meetings and field trips with Water Board and Forest Service personnel, local residents and ranchers. As a result, changes to the proposed action, as well as better descriptions of how activities address water quality concerns with relation to livestock grazing are included.

Livestock have access to the shoreline of Eagle Lake via the Lakeshore gathering pasture. This is a fenced pasture used as a gathering area for 2 weeks at the end of the grazing season. This use was implemented in response to the listing in 2006, with the objective of removing season-long access by livestock and reducing it to two weeks in the fall. Established BMPs for water quality were applied by limiting livestock contact with the lake water (shorter duration) and reducing the potential for nutrient

transfer to the lake by providing vegetative filters through implementation of utilization, stubble height, and bank trampling standards.

Cattle distribution and patterns changed during recent drought years (2012-2016) due to water and forage availability. Cattle disproportionately used riparian pastures where water and green forage was more prevalent on the landscape. The Eagle Lake shoreline was highly variable, and livestock initially followed the receding shoreline to access water. In successive years, as the access to the water consisted of muddy lake bottom sediment, cattle preferred to drink at alternative upland troughs. The Proposed Action includes a strategy to adjust the grazing period, cattle numbers and the length of the grazing season during drought years (see Table1). Grazing strategies to improve cattle distribution and frequency of use include portable water systems in the uplands and an additional gathering pasture so that the lakeshore pasture would not be grazed during drought years and the season of use can be changed in the rotation of pastures.

Invasive Weeds

After the Whaleback Fire, surveys were conducted in and around the fire area for new occurrences of invasive weeds. As a result, several occurrences were identified along the lakeshore of Eagle Lake, within this project area. NEPA analysis is being initiated and treatments of these weed populations may require adjustments to the grazing schedule to avoid livestock exposure to herbicide treatments and allow for effective elimination of any weed population.

Proposed Action and Alternatives

After review of comments received during the initial scoping period, changes were made to the original Proposed Action in response to some public suggestions.

Alternative 1: Proposed Action

The Forest Service proposes to continue to authorize livestock grazing on the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments under updated Allotment Management Plans (AMPs) that would implement decisions based on this environmental analysis. Changes to livestock management would incorporate specific rest for pasture units, adjustments to cattle numbers, season and length of use based on identified drought conditions and use of portable water facilities and gathering pastures to improve livestock distribution.

Grazing Authorization

Grazing in the project area would be authorized under two Term Grazing Permits for two different permittees (Table 1). One permit would authorize grazing on the Northwest Unit of the Champs Flat Allotment, referred to below as "Champs Flat (NW)". Pasture units included in this Unit are listed in Table 2 and shown on Map 2 (attached). The second permit would authorize grazing on all three allotments, referred to below as "Combined Allotments". This permit would authorize one herd of cattle to rotate through 10-12 pastures/units, identified in Tables 3 and 4 and shown on Map 2, attached. Each permit would have a separate AMP to document management because livestock would not graze in common. The following table displays details of both permits.

Table 1. Authorized Grazing by Term Permit

Allotment	No.	Class	Permitted Dates	Adjusted Dates for Drought Conditions	Days	AM's	AUM's
Champs Flat (NW)	175	Cow/calf	6/1-9/30	5/1-8/31	122	702	927
Combined Allotments							
N. Eagle Lake	200	Cow/calf	6/1-9/30	5/1-8/31	122	802	1059
Champs Flat	300	Cow/calf	6/1-9/30	5/1-8/31	122	1203	1588
L. Pine Creek	492	Cow/calf	6/1-9/9	5/15-8/25	101	1634	2157
	992				112	3639	4804

Terms and Conditions Common to Both Permits

Variable Numbers and Season

Each permit would be under a variable grazing permit where numbers, type of livestock (cow/calf, yearlings, dry cows) dates and times may be adjusted when authorized by a Forest Officer. Variable management operations may occur on a year-by-year basis.

- Seasons of use may vary between May 15th to October 15th during typical or normal years based on precipitation and forage conditions.
- Seasons of use may be adjusted by as much as one month earlier for years where there is moderate or greater severity drought, resulting in reduced forage growth and shortages of water supply. Additionally, numbers of livestock and duration of grazing may be reduced depending on conditions. Because of the great degree of inter-annual variability in regional precipitation, drought severity would be determined using common, nationally recognized drought indices that use multiple key indicators; these include the US Drought Monitor classification scheme and Palmer Hydrologic Drought Index (PHDI). Drought conditions would be triggered when the US

Drought Monitor classification scheme is at D1 or greater severity, and PHDI values are at -2.0 or below.

- On and off dates would be determined annually based on range readiness, allowable use standards, and management objectives.
- Scheduled yearlong rest could be applied in the grazing strategy as resource protection versus personal convenience nonuse.
- Adult cattle include animals weaned or 6 months old or older at the time of entering the allotment, those animals which will become 12 months of age during the grazing season, and animals greater than 600 pounds in body weight.

Grazing Utilization Standards - General

For general areas of rangeland within allotments that have not been assigned site-specific utilization standards, the following standards from the Forest Plan (LRMP, 1992) as amended by the Sierra Nevada Forest Plan Amendment Record of Decision (SNFPA ROD, 2004), would apply.

Upland Rangelands:

- 50 percent utilization of perennial rangeland vegetation that is in at least fair condition with stable trend and not associated with riparian zones.
- On perennial vegetation where rangeland condition is in less than fair condition or has a downward trend, adjust utilization to promote upward trend.
- Utilization is based upon current year's annual growth (actual percent by weight).

Riparian Zones:

- Up to 45 percent use of streamside herbaceous vegetation with no reduction in ground cover for streamside zones in good condition.
- For streamside zones in poor condition, adjust utilization to 1-25 percent until restored to fair condition.
- Retain 4-6 inches stubble height, where feasible, on streamside vegetation at the end of the grazing season.
- Prevent disturbance to streambanks and natural lake and pond shorelines from exceeding 20 percent of stream reach or 20 percent of natural lake and pond shorelines. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots.

Browse Utilization:

- Limit browsing to no more than 20 percent of the annual leader growth of mature riparian shrubs (including willow and aspen) and no more than 20 percent of individual seedlings. Remove livestock from any area of an allotment when browsing indicates a change in livestock preference from grazing herbaceous vegetation to browsing woody vegetation.

Grazing Utilization Standards - Site-specific Areas

Site-specific standards are applied in locations that require more careful management to obtain resource objectives and are typically more restrictive. Key areas were identified throughout the allotments in uplands, meadows, and along Pine Creek in 2006 and site-specific standards were established to promote upward trends in conditions. The site-specific standards identified in 2006 have not changed and are summarized below with the key areas they apply to. When a standard is reached in a pasture, livestock would be removed from that area.

Uplands:

- 45% utilization of perennial grasses - Uplands associated with Gordon Creek, Antelope Valley, McCoy Flat and Pine Creek Reaches 9 and 10.

Riparian:

- 40% utilization of herbaceous vegetation - Meadows associated with Pine Creek Reaches 9, 10, and 20 through 24
- 30% utilization of herbaceous vegetation - Meadows associated with Pine Creek Reaches 16, 17 and 18.
- 0-5% utilization - Pine Creek Reaches 15 and 19 are excluded from grazing (5% in case unplanned grazing occurs).
- 40% utilization of herbaceous vegetation - Dry meadows in the North Champs Field (associated with aspen), Ashurst and Houseman areas.

Streamside Stubble Height: (on key species)

- Pine Creek reaches associated with the meadow areas above (Reach 9, 10, 20-24) would leave a minimum of 4” herbaceous residual stubble height along the streambanks when grazing is finished in that unit.
- A minimum of 4” herbaceous residual stubble height would be left along the streambank of the tributary to Ashurst Lake.

- A minimum of 6" herbaceous residual stubble height would be left around the edge of the Pine Creek Wetland *(Carex nebraskensis)*.

Livestock Management

1. Livestock moves between pastures or general areas would be completed prior to utilization standards being met. This would necessitate beginning the move one or more days prior to reaching the allowable use standard or the scheduled off date. Any livestock use after the scheduled off date would be approved in advance by the Forest Officer and would be based on an estimate of forage remaining until allowable use standards would be reached.
2. Portable watering facilities would be used as a tool for distribution of livestock into upland areas and reduce grazing pressure on meadow/riparian areas, particularly during dry years, or as needed for specific situations. Facilities would include a portable storage tank, trough with float system, or other efficient set-up that would meet the objective.
3. Sites for portable watering facilities would be identified and approved in cooperation with the permittees prior to their use, and would typically be areas of past disturbance, such as old logging landings, road intersections, etc. Locations would be outside of known archaeological sites, known botanical, terrestrial, or aquatic TES populations or sensitive areas, aspen stands, riparian areas, and known invasive weed sites.
4. No salting or livestock supplement stations would be placed within 1/4 mile of water developments, streams, or other riparian areas. This would not apply to portable watering facilities.
5. Salt blocks, livestock supplement stations, and staging or gathering areas would be located outside of known archaeological sites, known botanical, terrestrial, or aquatic TES populations or special habitats, aspen stands, known invasive weed sites and aquatic features, i.e. stream channels, wetlands, springs, lakes or associated RCAs.
6. The permittee would be authorized to use Off Highway Vehicles (OHV) off designated routes, trails, or OHV use areas to conduct permitted activities, including removal of dead livestock and/or construction and maintenance of range improvements. Cross-country travel in the performance of these responsibilities would be reviewed and approved annually in the Annual Operating Instructions. Wet or sensitive areas would be avoided, use would be a route with the least impact, and "Tread Lightly" guidelines would be practiced. The permittee is responsible for abiding by all state OHV safety regulations as they apply to implements of husbandry.
7. All allotment boundary fences would be maintained to standards prior to livestock entering the allotment. Internal pasture fences would be maintained to standards prior to livestock

entering the pasture. Maintenance responsibility and standards are included in Part 3 of the Term Grazing Permit.

Terms and Conditions Specific to the Champs Flat (NW) Allotment (Maps 2, 3A)

- On alternating years, livestock would graze the Northwest Field, beginning in the Ashurst area first, then drifting south toward Champs Flat. On the other years, livestock would graze the Champs Flat area first, then move north toward Ashurst.
- The Pine Creek Reaches (16-18) would be grazed early, one year out of every three years, before entering the Northwest Field, resting at least one reach each year.
- The remaining holding fields would be grazed in rotation, as needed, to change season of use from one year to the next.

Terms and Conditions Specific to the Combined Allotments (Maps 2, 3A, 3B, 3C)

- Full rest of at least one pasture/unit would be incorporated into the rotation schedule annually. Rest would be coordinated with watershed improvement projects, included in this or other project proposals, to allow recovery/re-establishment of soils and vegetation. The rotational grazing system and pasture rests would be identified annually within the Annual Operating Instructions (AOI).
- The Lakeshore Unit would not be grazed annually, but rather in rotation with other gathering pastures. Depending on the rotation schedule, it would be grazed for two weeks, one year out of every three, either during the spring or fall. The Lakeshore pasture would not be used during identified drought years.
- A new gathering pasture would be created near the Spalding Troughs (T33N, R10E, Sec 25). It would be large enough to provide sufficient forage and space for the herd prior to trailing them off the forest. The troughs would be accessible to this pasture so that additional sources would not need to be developed.
- Utilization standards would determine the length of time spent in each unit. If utilization standards are reached in any unit prior to the scheduled rotation date, livestock would be moved to the next unit. The full rotation schedule would remain flexible to provide for meeting standards throughout all units.
- These allotments are permitted for 955 cow/calf pair based on Forest Service lands, and an additional 37 pair under the on/off provision for the private lands within the Lower Pine Creek Allotment. Total numbers permitted on these allotments is 992 cow/calf pair. Authorized animal numbers generally vary from 500 to 992 cow/calves.

- The allotments are authorized up to a total of 4,804 Animal Unit Months. Numbers and season of use may be adjusted from year to year, as long as total AUMs are not exceeded. AUMs available in each allotment would not be exceeded, so days within each allotment would be adjusted based on authorized numbers.
- Areas within the project area affected by the Whaleback Fire were not grazed the first year following the fire. Most of the burned area was not rangeland and does not provide forage vegetation. The one exception would be the Penitentiary Flat pasture. This pasture has potential to provide good forage as vegetation re-establishes after the fire and it has a functioning fence to control livestock access to it. This pasture would be rested from grazing until vegetative monitoring indicates plants have established and are healthy enough to sustain grazing.

Herd Movement (refer to Map 2)

Champs Flat (NW)

The Champs Flat (NW) allotment is divided into 11 units, including two private land inholdings (Table 2). Generally, a small group of cow/calf pairs would be placed in one of the three Pine Creek pastures first, for early season grazing. The remaining pairs would graze two of the smaller holding fields, before the entire herd would be moved into the main pasture, the Northwest Field. Once utilization is reached, livestock would be gathered to the remaining fields on the flat to finish the season. In general, the fields grazed early one year would be grazed late the following year.

Table 2. Champs Flat (NW) Pastures

Pasture/Field		Order of Rotation	Length of Use
East Cabin Field (Private)	Cow/calf pairs	1st or last - alternate w/Gordon & Corral fields	Early or end of season
West Cabin Field (Private)	Cow/calf pairs	1st or last - alternate w/Gordon & Corral fields	Early or end of season
Government Field (FS)	Cow/calf pairs	1st or last - alternate w/Gordon & Corral fields	Early or end of season
Gordon Creek Field (FS)	Cow/calf pairs	1st or last - alternate w/Cabin & Govt. fields	Early or end of season
Corral Field (FS)	Cow/calf pairs	1st or last - alternate w/Cabin & Govt. fields	Early or end of season

Herrick Field (FS & Private)	Cow/calf pairs	before or after NW field	2 weeks mid-season
Northwest Field (FS)	Cow/calf pairs	3rd or 4th	Mid-season
Pine Creek Reach 15		n/a	No grazing
Pine Creek Reach 16	Cow/calf pairs	First	Graze 1 of 3 years
Pine Creek Reach 17	Cow/calf pairs	First	Graze 1 of 3 years
Pine Creek Reach 18	Cow/calf pairs	First	Graze 1 of 3 years

Combined Allotments

There are eleven (11) main pasture units (Table 3), three each in Champs Flat and Lower Pine Creek, and five in North Eagle Lake, which would be grazed in rotation by one herd of cattle. The order of use would vary each year to avoid use of any one area during the same time of year and vegetative development stage in consecutive years. Length of time in each pasture would vary from year to year, depending on the order of rotation and which pastures are being rested. The objective would be to rest at least one pasture unit each year. Some pastures may be rested more often than others depending on resource objectives, such as when additional rest is necessary for recovery of treated aspen stands, or vegetation/soil recovery after watershed projects, etc.

As indicated previously, the Whaleback Fire affected very little rangeland, except the Penitentiary Flat pasture. This pasture would be one of the rested pastures in the grazing rotation until monitoring determines the vegetation has recovered sufficiently to support grazing.

Table 3 shows a rotation strategy during a typical grazing season. The strategy would allow timing to be adjusted annually in order to use pastures during different seasons, change the direction of rotation and reduce frequency of use (single direction versus a loop), and provide flexibility to meet objectives during drought conditions and watershed improvement projects within the allotments.

Table 3. Main Pastures/Units – Combined Allotments

Pasture/Unit	Allotment	Time in Rotation	Days of Use
North Champs	Champs Flat	As fits into other pasture restrictions – both upland pastures	14-30
South Champs	Champs Flat		
Reach 21b Pine Creek	Champs Flat	Mid-season	14
North Pasture	L. Pine Cr	Mid-season	30 combined
South Pasture	L. Pine Cr	Early, Mid-season	
Mountain Pasture	L. Pine Cr	Mid, late season	
Houseman Unit	N. Eagle Lake	1st or 2nd	14
McCoy Flat Unit (No Pine Cr.)	N. Eagle Lake	Before preference to browse aspen occurs	7-10

Penitentiary Flat Pine Cr. Reach 23	N. Eagle Lake	Before preference to browse aspen occurs (rest initially for fire recovery)	7-10
Spalding	N. Eagle Lake	First/Last	7-10
Lakeshore	N. Eagle Lake	First/Last *(1 in 3 yrs)*	14
North Shore Gather Pasture (new)	N. Eagle Lake	First/Last	14+

There are six (6) riparian pastures (Table 4), created in the mid-1990s, along Pine Creek, mostly in the Champs Flat Allotment. These pastures would be used only as short-term, pass-through areas when moving livestock between larger pastures. Individual riparian pastures would be rested when watershed improvement projects within that pasture are implemented.

Table 4. Riparian Pastures/Units – Combined Allotments

Pasture/Unit	Allotment		Days of Use
Champs holding field	Champs	Between pasture moves	Small groups, 2-3 days
Reach 19 Pine Creek	Champs		Exclosure; no grazing
Reach 20 Pine Creek	Champs	Between pasture moves	Small groups, 2-3 days
Reach 21a Pine Creek	Champs	Between pasture moves	Small groups, 2-3 days
Reach 21c Pine Creek	Champs	Early to mid-season	Overnight w/ small groups
Reach 22 Pine Creek	N. Eagle Lake	Early or Late	Overnight w/ small groups

Rangeland Improvements and Developments

All proposed actions involving fences, water developments, and aspen treatments would occur as soon as is feasible after a decision is signed. Where several projects are in the same area and complement each other, activities would be coordinated for efficiency of time and resources. Maps of proposed improvements are by allotment to better display location and identification of individual proposed actions. (Maps 3A, 3B, 3C)

Proposed Fences

The allotments are well fenced, particularly for riparian protection and controlled management within reaches of Pine Creek. Some new fences are needed to control drift from the Champs Flat Allotment into adjacent allotments due to timber activities that have removed natural barriers that previously impeded livestock movement. Some realignment of fences along Pine Creek is needed to allow for natural movement of the stream channel. Fence maintenance responsibilities are included in Part 3 of the Term Grazing Permit which would be modified to include permanent fences that are implemented as part of this project.

1. Boundary fence between Champs Flat (Northwest) and Harvey Valley Allotment – T33N, R9E, Section 8 from Ashurst Mountain, northeast along the ridge to Forest Road 33N05A where it crosses the saddle, then continuing northeast along the ridge to the Forest boundary in T33N, R9E, Section 4. Then continuing east along the Forest boundary to the existing boundary fence in Section 3. (Map 3A)
2. Fence Realignments along Pine Creek – The fences along Pine Creek from Bradford Crossing to McCoy Flat would be realigned to allow for movement of the stream channel and accommodate rest periods when watershed projects are implemented. (Map 3A)
3. Aspen stands (GOPS 04 & 05) along Forest Road 33N94 on the southeast side of McCoy Flat would be fenced to *exclude livestock* and protect sprouts and suckers from livestock browsing. (Map 3B)
4. The fence along 33N94 would be moved from the east side to the west side of the road along McCoy Flat. A cattleguard would be installed west of the junction with Forest Road 32N67Y to Penitentiary Flat. The existing gate at this junction would be moved south, past Prison Spring. These changes would create an enclosure for the aspen stands, while allowing livestock to graze Penitentiary Flat. (Note: These aspen stands were burned by the Whaleback Fire, so these actions would allow natural regeneration of the aspen, and when grazing is allowed in Penitentiary Flat, the aspen would not be susceptible to browsing.) (Map 3B)
5. Stanford Headquarters – the meadow at Stanford Headquarters (T33N, R9E, Section 34) would be fenced to exclude livestock and to protect head-cut treatments and the known archaeological site. (Map 3A)
6. Aspen stand GOST 02 (T33N, R9E, Section 27), northeast of Stanford Headquarters, is bisected by the existing pasture fence between the South Champs pasture and Pine Creek Reach #18. This fence would be re-located to the north of the aspen stand so it would have less incidence of browsing by livestock due to the proximity of a water source within the riparian pasture. (Map 3A)
7. Water Gap – a fence would be constructed to create a water gap at the waterhole adjacent to the three culverts where Pine Creek flows under County Road 105 (T32N, R9E, Section 32). This would allow livestock to access the water from both the north and south pastures and provide an alternative water source to replace those proposed for removal in the next section. (Map 3C)
8. Mapes Cow Camp – a fence would be constructed around the two springs in the meadow below the old cabin site in T32N, R9E, Section 33 to protect the historic features of the site and discourage livestock from concentrating there for water. (Map 3C)

9. An alternative gathering pasture would be developed near the Spalding Troughs north of County Road A-1. This would include fencing an area equivalent to the size of the Lakeshore Pasture to gather and hold cattle for a period before trailing them off the forest. It would abut the fence around the troughs, which would provide the necessary water source. This pasture would be used in place of the Lakeshore pasture and during drought years.

   The Lakeshore pasture would be grazed one year in three, for two weeks, to maintain forage health and vigor by removing dead vegetative material from ungrazed years. Upland water troughs and supplements (i.e. salt or minerals) would be used to encourage livestock from watering at the lake. No portable fence would be installed. (Map 3B)

10. Corral Facility at Spalding Troughs – a second corral would be constructed near the Spalding Troughs to facilitate livestock sorting when the rotation schedule results in mid- to late-season use in the North Eagle Lake Allotment. (Map 3B) (This would be included as part of the gathering pasture described in #9) (Map 3B)

11. Lake Pasture Troughs – the two new troughs on the north side of the Spalding Road would be moved away from a known archaeologic site to protect it from impacts by livestock while watering at the troughs. (Map 3B)

12. Remove the old drift fence south of Antelope Valley (T32N, R10E, Secs 6, 12) that is no longer functional or necessary. (Map 3A)

Watershed Improvement

Stock ponds and historical grazing patterns have contributed to degradation within multiple meadows and valley bottoms within the allotments. These features on the landscape and past management practices have resulted in headcuts, gully formation, alterations in flow patterns, and changes in meadow vegetation. Several locations have been identified for proposed improvement work. Existing water developments would not be decommissioned without a functioning replacement water source being in place prior to the decommissioning. These include the following locations:

1. A headcut located in the small meadow north of FSR 33N07 near the old Stanford Headquarters (T33N, R9E, Secs 34 and 37), would be stabilized to halt continued incision and protect meadow and riparian vegetation communities. It is proposed to rehabilitate the channel grade by recontouring to match the surrounding area to the extent possible, then stabilizing the channel by using straw wattles or riprap and filter cloth. The meadow area would be fenced to eliminate this attractant to livestock and thus to protect the headcut treatment and an adjacent archaeological site. Materials would be staged on the south side of 33N07, on the opposite side of the road from

the meadow. Installation of materials and recontouring of features would be conducted by hand or with the aid of a tracked backhoe or similar machinery. (Map 3A)

2. Decommission waterholes and provide new water sources in upland areas away from Pine Creek, its tributary drainages and riparian areas, and improve reliability of some existing waterholes by increasing depth using mechanical equipment. Waterhole locations proposed for decommission, improvement and/or relocation include those in the Table 5. (listed by priority within each allotment):

Table 5. Watershed Improvement

PROPOSED WATERHOLE TREATMENTS by ALLOTMENT				
Allotment	**Location**	**Waterhole Inventory ID**	**Recommendation**	**Township, Range, Section**
Champs Flat	Shay's Hole	WDCF08	Re-contour and fill existing waterhole and create new one on edge of meadow further south	T33N, R9E, S12 NE 1/4
Champs Flat	Champs Flat	21	Re-contour and fill; need maintenance on WDCF28 to ensure reliability	T33N, R9E, S23
Champs Flat	Gordon Aspen	W6	Fence off existing water hole; pump to trough to reduce livestock use adjacent to aspen	T33N, R10E, S18 NE 1/4
N. Eagle Lake	McCoy Flat (Pine Cr Reach 22)	TBD	Try management changes 1st, (ie. small #s, overnight use), then consider need for off-stream water source in north pasture	T33N, R10E, S32
L. Pine Creek	Martin Springs	WH15 & WH17	Fence springs; pump to trough or use well located in Cowbell	T32N, R9E, S33
L. Pine Creek	Summit Camp and adjacent meadow	WDLP11 & 14	Re-contour and fill 14; need maintenance on WDLP11 to ensure reliability (reconnect well and troughs); improve borrow hole at Antelope LO junction	T32N, R9E, S24 SE ¼
L. Pine Creek	East of Summit Camp	WDLP10 & WDLP05	Re-contour and fill 10; need maintenance on	WDLP10: T32N, R10E, S19 NE 1/4;

			WDLP05 to ensure reliability (deepen)	WDLP05: T32N, R10E, S20 W 1/2
L. Pine Creek	21 Rd near Cowbell	2	Remove & re-contour dugout waterhole	T32N, R9E, S34 N

Aspen Enhancement

Protection of aspen regeneration from browsing is often necessary to sustain the existence of declining aspen communities as well as increase aspen health and vigor. In aspen communities with excessive browsing in large areas, temporary fencing would be used to exclude cattle, using a four-strand barbed wire fence, or to exclude deer using a wildlife exclosure. In stands with moderate browsing, excessive browsing in small patches, or stands with limited access, hinge barriers would be constructed in patches or along edges to protect aspen regeneration. Hinge barriers are created by felling live or dead conifers 3-4 feet above the ground while maintaining stem connection to the stump. Monitoring would also be used in moderately browsed aspen communities to determine if fencing would be needed after initial treatment. In aspen communities near areas of primary and secondary forage, conifers would be hand felled, hand-piled outside the aspen root system and burned or lopped and scattered. Aspen stands proposed for treatment are listed in Table 6 by priority, based on risk, within each allotment.

Table 6. Aspen Enhancement

PROPOSED ASPEN TREATMENTS by ALLOTMENT				
Allotment	**Location**	**Stand Inventory ID**	**Recommendation**	**Township, Range, Section**
Champs Flat	Antelope Valley	GOAV 01, 02	Handthin <10” dbh; hinge	T33N, R9E, Sec 36
	SE of Million $$ Bridge	GOPC 06	Handthin <10” dbh; Hinge	T33N, R10E, Sec 30
	Stanford Hdqts	GOST 01	Handthin < 20” dbh; fence	T33N, R9E, Sec 34
	Pine Cr Reaches	GOST 03	Handthin <10” dbh; Hinge (03)	T33N, R9E, Sec 27
	SE of Shays Hole	GOGW 01	Handthin <10”dbh; expand existing fence	T33N, R10E, Sec 7
	McCoy Flat	GOMF 01	Handthin <10”dbh; monitor for fence	T32N, R10E, Sec 5
	SE of Million $$ Bridge	GOPC 04, 05	Handthin <10” dbh; Hinge	T33N, R10E, Sec 30
	Stanford Hdqts	GOPC 08, 09	Handthin <10” dbh; Hinge (08)	T33N, R9E, Sec 34
	Pine Cr Reaches	GOST 02, 04	Handthin <10” dbh; Fence (02)	T33N, R9E, Sec 27

Champs Flat (NW)	Ashurst Lake	GOAH 01, 02	Handthin <10” dbh; fence	T33N, R9E, Secs 3,4
	Ashurst Lake	GOAH 06	Handthin <10” dbh; hinge	T33N, R9E, Secs 3,4
	SE of Ashurst Lake	GOSC 01	Handthin < 20” dbh; Monitor for fence	T33N, R9E, Sec 10
	SE of Ashurst Lake	GOSC 02, 03, 04	Handthin <10” dbh; Monitor for fence	T33N, R9E, Sec 10
	Ashurst Lake	GOAH 03	Handthin <10” dbh; fence	T33N, R9E, Secs 3,4
	Ashurst Lake	GOAH 04, 05	Handthin <10” dbh; expand existing fence	T33N, R9E, Secs 3,4
	North of Ashurst	GOSH 01	Handthin <10” dbh; Hinge	T33N, R9E, Sec 3
N. Eagle Lake	East end of McCoy Flat	GOPC 10	Handthin <10” dbh; Hinge	T33N, R10E, Sec 33
	McCoy Flat	GOPS 04, 05 (portion on west side of 33N94 road) Burned in Whaleback Fire 2018	Handthin <10” dbh; Realign existing fence, move gate south	T33N, R10E, Sec 33

Integrated Design Features

The following Integrated Design Features (IDFs) are resource protection measures that were developed by specialists and incorporated as part of the Proposed Action for this project. They are in addition to Best Management Practices (BMPs) and Standards and Guidelines from the Lassen LRMP, as amended. These IDFs are also included for implementation parameters that would be incorporated into treatments and contracts and/or used to guide Forest Service personnel in conducting implementation.

Threatened, Endangered, or Sensitive (TES) Plant Species

1. Any new occurrences of TES or Special Interest plant species discovered after project implementation would be monitored for effects by livestock. If monitoring indicates effects from livestock activities, then adjustments would be made to alleviate continued effects.
2. *Erythranthe inflatula* occurrences would be avoided by all aspen treatment activities.
3. *Erythranthe inflatula* Occurrence #3, along Pine Creek just west of Spalding and Road 33N89, would not be used by livestock until the soils are dry and the plants have set fruit. In wet years, the site would be grazed only late in the season.
4. Where possible, when filling/recontouring waterholes where *Diplacus pygmaeus* or *Juncus hemiendytus* var. *abjectus* are present, slight depressions would be left in moist places for the plants to recolonize.
5. Piles from aspen treatments would be placed outside of known occurrences of TES or Special Interest species.

Invasive Plant Species

1. All off-road equipment would be weed-free prior to entering the Forest. Staging of equipment would be done in weed-free areas.
2. Known invasive plant infestations would be identified and mapped for this allotment. Identified invasive plant sites within or adjacent to the project area containing isolated patches with small plant numbers would be evaluated and treated according to the species present and project constraints.
3. Monitoring for implementation and effectiveness of invasive plant treatments and control of new infestations would be conducted as soon as possible within the allotment.
4. If project implementation calls for hay or other feed, straw, and/or mulch, it 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.

Cultural Resources

1. All historic properties within areas proposed for ground disturbing activities shall be clearly delineated prior to implementing any associated activities that have the potential to affect historic properties. (Regional Programmatic Agreement (RPA) Appendix E. section 1.3(1)(2))
   a. Historic property boundaries shall be delineated with coded flagging and/or other effective marking.
   b. Historic property location and boundary marking information shall be conveyed to appropriate Forest Service administrators or employees responsible for project implementation so that pertinent information can be incorporated into planning and implementation documents, contracts, and permits (e.g., clauses or stipulations in permits or contracts as needed).
2. Proposed ground disturbing undertakings shall avoid historic properties. Avoidance means that no activities associated with undertakings that may directly affect historic properties, unless specifically identified in this RPA, shall occur within historic property boundaries, including any defined buffer zones. Portions of undertakings may need to be modified, redesigned, or eliminated to properly avoid historic properties. (RPA Appendix E. section 1.1)
3. Felling and removal of hazard, salvage, and other trees within historic properties under the following conditions: RPA Appendix E section 2.2a(1)(2)(4)
   a. Trees may be limbed or topped to prevent soil gouging during felling;
   b. Felled trees may be removed using only the following techniques: hand bucking, including use of chain saws, and hand carrying, rubber-tired loader, crane/self-loader, helicopter, or other non-disturbing, HPM-approved methods;
   c. No skidding nor tracked equipment shall be allowed within historic property boundaries; and
4. If an unanticipated discovery of an at risk historic property is made during project implementation and the site has been impacted by project activities, the Forest shall use the process defined in the Discoveries and Inadvertent Effects stipulation (stipulation 7.10) to notify and consult with Region 5, the SHPO, and the ACHP. RPA Appendix H section 7.3b(1)
5. If an unanticipated discovery of an at risk historic property is made during project implementation and the site has not been impacted by the time of discovery, project activities shall be halted immediately in the vicinity of the site, and the HPM, in consultation with fuels, vegetation management, or fire specialists as necessary, shall design and implement SPMs to eliminate or minimize impacts, prior to authorizing resumption of project activities. RPA Appendix H section 7.3b(2)

6. Standard Protection Measures (SPM) are those actions which prevent ongoing or future damage to "resources of interest" (ROIs), or those heritage resources most subject to adverse effects from rangeland activities. Stipulation III.B.2 identifies the following acceptable SPMs:
    a. fencing or exclosure of livestock from the heritage resource with some specifications;
    b. relocation of livestock management facilities and resources away from the heritage resource;
    c. removal of the area(s) containing heritage resources from the allotment.

    Additional SPMs may be developed by the Forest, contingent upon consultation with and approval by State Historic Preservation Officer. Monitoring for the effectiveness of SPMs may be necessary to ensure long-term resource protection. (Lassen National Forest Grazing-Heritage Management Strategy section 5. Standard Protection Measures)

7. The following conditions may be used to determine a threshold for mandatory evaluation and/or the application of Standard Protection Measures to ROIs, per the discretion of the Heritage Resource Specialist (HRS), in consultation with appropriate staff and other interested parties. Data for these conditions may be derived from observations made during initial site re-visitation and/or monitoring, or from existing field records: (Lassen National Forest Grazing-Heritage Management Strategy section 3. Site Selection/Monitoring for Existing Damage)
    a. Site exhibits erosional features such as cattle wallows churned to a depth greater than one inch and greater than 25 square feet;
    b. Single cattle trails churned to a depth of greater than one inch;
    c. Presence of braided cattle trails (more than two "figure 8s") regardless of depth;
    d. Rangeland facilities (salt licks, fences, corrals, etc.) onsite
    e. Erosion features resulting from onsite or nearby cattle trails, wallows, stream access points (stream bank chiseling) etc.
    f. Physical alteration of rock or historic features
    g. Damage or displacement of surface artifacts;
    h. Loss of visual landscape important to or physical alteration of Traditional Cultural Properties

8. Resources of Interest where impacts from rangeland activities are identified, but the effects to the resource may be ambiguous or unknown, will be monitored to determine if rangeland activities are producing an ongoing effect. Additionally, sites treated by SPMs may be monitored to determine the adequacy of treatment measures over time. All monitoring within LNF allotments will use the following standards: (Lassen National Forest Grazing-Heritage Management Strategy section 5. Monitoring Plan)

- *Regularity and Timing* - Sites will be monitored twice each season for potential impacts from rangeland activities. Monitoring shall occur once before the commencement of activities on the allotment and once at the end of activities defined as follows: no earlier than one week prior to the end of grazing and no later than one week after grazing has ceased;
- *Consistency* - Monitoring consistency will be made through the use of standardized monitoring forms that focus on recording possible damage to the resource from rangeland activities. Monitoring will be conducted through the use of consistent observation points, photographic media, descriptions of possible damage and detailed site mapping;
- *Reporting* - standard monitoring forms will be used for site monitoring, sufficient to easily identify changes in the physical features of the site that may be caused by grazing. The HRS will review monitoring forms to assess the potential for damage and determine if continued monitoring, evaluation, application of SPMs or other management option is necessary;
- *Duration* – monitoring will continue for three years after initial site revisitation and updating.

<u>Wildlife</u>

1. Fences would be designed, built, and maintained to prevent barriers to wildlife movement and possible injury or death from impact or entanglement. Standards include smooth bottom wire and maximum height and spacing requirements.
2. The following actions would be taken to minimize the potential for livestock/wolf conflicts, in cooperation with the permittee and California Department of Fish and Wildlife personnel.
    a. If an active den or rendezvous site is within one mile of the planned turn out area, the turn out location would be changed to be at least one or more miles away.
    b. If an active den or rendezvous site is in or within one mile of the allotment, management activities such as infrastructure installation or maintenance would be suspended as follows and as feasible within the limits of Annual Operating Instructions:
        i. Salt blocks would be promptly relocated to minimize livestock use near the site(s) and the potential for conflicts.
        ii. Allotment management activities would be suspended within one mile of an active den site or rendezvous site from April 1 – August 31.
        iii. The one-mile distance from the den or rendezvous site may be reduced based on site-specific information.
    c. Salt or other livestock attractants would not be placed within one mile of current or *the preceding*-year wolf dens or rendezvous sites in order to minimize livestock use of these areas.

d. Sick or injured livestock within three miles of an active den or rendezvous site would be removed from the allotment as soon as feasible.
e. Livestock carcasses or bone piles within three miles of an active den or rendezvous site would be removed or otherwise disposed of as soon as feasible within the existing regulatory framework.
f. In the event of a suspected livestock depredation (injured or killed animal including guard or herding dogs, or other domestic animals), the permittee would notify Forest Service personnel with the location and other details so that the proper agencies can be notified.

3. If an active den or rendezvous site is located within one mile of proposed activities such as aspen enhancement, fence construction or watershed improvements, implementation of those activities would be suspended from April 1 – August 31.
4. If new locations of Western bumble bee *(Bombus occidentalis)* are documented within the project area, insure salting and portable watering locations are beyond 0.25 miles from the new locations.
5. During construction of the proposed fence line on Ashurst Mountain, no tree over 10 inches diameter at breast height (dbh) would be felled to avoid alterations of current stand structure of the existing California spotted owl Protected Activity Center (PAC) and associated Home Range Core Area (HRCA).

Aquatics

1. Screening devices would be used for water drafting pumps, including those utilized for off-site watering. Pumps with low entry velocity would be used to minimize removal of aquatic species, including amphibian egg masses and tadpoles, from aquatic habitats.

Hydrology and Soils

1. Riparian Conservation Area widths are allocated along all streams, wetlands, wet meadows and other special aquatic features within the allotment boundaries in accordance with the 2004 Sierra Nevada Forest Plan Amendment (SNFPA) Record of Decision (ROD). Features and associated RCA widths are described in the table below.

RCA Category	RCA Width (feet)	Features within Project Area
Special Aquatic Features (wet meadows, springs, waterbodies)	300	Wetlands associated with springs and seasonally-flowing streams, Eagle Lake, Houseman Camp Reservoir, Signal Butte Reservoir, Ashurst Lake, Shays Hole Reservoir, Prison Spring, McCoy Water Pit, Pine Creek Wetland, Martin Springs, other unnamed springs

Perennial streams	300	None in the project area
Seasonally-flowing streams	150	Pine Creek and ephemeral tributaries, Martin Creek

2. Best Management Practices (BMPs) would be implemented to meet water quality standards. The BMPs applicable to range management include:
   - BMP 8.1 (Range Analysis and Planning) /Range-1 (Rangeland Management Planning) (range analysis, management planning and permit administration to safeguard water quality under perpetual production and forage harvest by livestock),
   - BMP 8.2 (Grazing Permit Administration) /Range-2 (Rangeland Permit Administration) (controlled livestock numbers and season of use to safeguard water quality under perpetual production and forage harvest by livestock), and
   - BMP 8.3 (Rangeland Improvements)/Range-3 (Rangeland Improvements).
3. Watershed improvement sites other than Martin Springs and Gordon Aspen, which would have permanent fenced exclosures, would be excluded from grazing, using either temporary fence or rest, to protect and facilitate healing at these sites until channels and banks achieve desired conditions and have been revegetated.
4. Any spring or water development would be designed in such a way that the water source would not be dewatered by the delivery of water to the off-site trough.
5. Soils would be firm before grazing starts and moisture content would be low enough to minimize soil erosion related to trampling and compaction; soils would not be saturated. (Range Readiness Guidelines)
6. Soils must be operable for vehicles to enter Riparian Conservation Areas (RCA). Under moist or wet conditions, vehicles may not create ruts exceeding two inches in depth and 25 feet in length. No ruts exceeding three inches in depth are allowed, and vehicles may not operate when soils are saturated.

Alternative 2: No Grazing

Under Alternative 2, livestock grazing would no longer be authorized on the North Eagle Lake, Champs Flat or Lower Pine Creek Allotments. The Term Grazing Permits would be cancelled. No actions proposed in Alternative 1 would occur for improved watershed function or aspen enhancement under this alternative. Structural rangeland improvements would not be maintained. Allotment boundary fences would be re-assigned to adjacent permittees for maintenance. Current management practices such as road maintenance and fire suppression would continue.

Alternatives Considered but Eliminated from Detailed Study

The analysis for alternatives considered but eliminated from detailed study is contained in the document, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project Public Scoping Issue Analysis & Alternative Development, and is hereby incorporated by reference and is located in the Pine Creek Allotments project record at the Eagle Lake Ranger District office. Alternatives not considered in detail may include, but are not limited to, those that fail to meet the purpose and need, are technologically infeasible or illegal, or would result in unreasonable environmental harm.

No Action - Current Management

Current Management provided the basis for the Proposed Action but did not include as much detail for the management of livestock and the use of the rangeland as needed. It did not define specific timeframes for the rotation schedule, timing of use for the various pastures, or include specific rest within the pasture rotations. It did not include the flexibility to adjust the authorized season of use during drought periods, changes to fences or water sources to improve riparian habitat along Pine Creek, or the use of additional tools for distributing livestock, such as portable water facilities, improving existing water sources, and the decommissioning of less dependable waterholes. The current management met portions of the Purpose and Need for this analysis, but does not meet it fully. Thus, it was used as current condition for describing expected changes associated with the Proposed Action.

Decision to be Made

The decision to be made is: 1) whether to implement the Proposed Action as described above, 2) whether to implement an alternative which better responds to the Purpose and Need, or 3) whether to take no action. A decision on this project is expected by December 2020.

Environmental Impacts of the Proposed Action and Alternatives

This section describes the environmental impacts of the alternatives in relation to whether there may be significant environmental effects as described in 40 CFR 1508.27. The impacts summarized in this Environmental Assessment (EA) are taken from the following documents which are available upon request and are hereby incorporated by reference into this EA. Further analysis and conclusions about the potential impacts of the proposed project are available in these reports and other supporting documentation located in the project record.

- Biological Evaluation and Assessment for R5 Sensitive and Federally Listed Plant Species, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project: Lepley, March 3, 2020 (Botany BE/BA)
- Biological Evaluation for the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project; Rickman, March 2, 2020 (Wildlife BE)
- Biological Assessment for the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project; Rickman, March 10, 2020 (Wildlife BA and USFWS Concurrence)
- Biological Evaluation for the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project; Raitanen, September 29, 2017 (Aquatics BE) (Reviewed July 2020)
- Cultural Resources Report, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project; Martin, July 10, 2020
- North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project, Hydrology Report; Blaschak, May 1, 2018 (reviewed July 2020)
- Management Indicator Species Report, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project, Rickman, March 2, 2020 (MIS Report)

Additional documents used for the Pine Creek Allotments project are also available upon request and are hereby incorporated by reference into this EA, including the following:

- North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project, Invasive Plant Species Risk Assessment; Lepley, March 2, 2020 (Invasive Plant Species Risk Assessment)
- Migratory Bird Treaty Act Report, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project; Rickman, March 2, 2020 (MBTA Report)
- Past, Ongoing, and Reasonably Foreseeable Future Actions Report for the Pine Creek Allotments Grazing Management Project (PORFFA Report), February 2, 2020.

With the exception of the analysis for cumulative watershed effects, the cumulative effects boundary for each resource was the Pine Creek Allotments project area. Explanation and maps of these cumulative effects analysis areas can be found in the PORFFA Report.

The cumulative watershed effects (CWE) analysis for the Pine Creek Allotments Project is based on the 6th field (HUC-12) subwatersheds that intersect the project area. These include Antelope Valley-Pine Creek, Brockman Flat-Frontal Eagle Lake, Bullard Lake, Champs Flat-Pine Creek, Cleghorn Creek-Frontal Eagle Lake, Heath Dam Reservoir, Houseman Camp Reservoir-Frontal Eagle Lake, Martin Creek, Pine Creek Valley-Pine Creek, Russell Dairy Creek, and Squaw Valley-Pine Creek. Long-term effects are evaluated in the Cumulative Watershed Effects analysis for a period of 30 years, after which the land and hydrology is assumed to have recovered to levels similar to if no treatments were implemented.

Botanical Resources

Three Region 5 Forest Service Sensitive plant species are known to occur within the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project: *Astragalus pulsiferae* var. *suksdorfii* (four occurrences), *Erythranthe inflatula* (three occurrences), and *Phacelia inundata* (one occurrence). No other currently listed Region 5 Sensitive plant species or federally listed plant species are known to occur or have potential habitat within the project area. Effects to Sensitive plant species are discussed in detail in the Biological Evaluation and Assessment for R5 Sensitive and Federally Listed Plant Species, North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project.

ALTERNATIVE 1 – PROPOSED ACTION

Direct Effects

Direct effects involve physical damage to plants or their habitat, including the crushing, breaking, or removal of individual plants and the disturbance or compaction of the soil around plants. Such damage can not only kill plants but eliminate their potential to contribute to the resident seed bank. Although trampling or waste burial may occur as cattle, on their way to preferred grazing areas, pass through the rare plant occurrence habitats discussed here, the amount of habitat involved and the effect on the occurrences are likely to be minor or none. Furthermore, the project proposal stipulates that salt blocks, portable watering facilities, and other gathering areas will be situated away from TES occurrences, so the potential for direct effects at the occurrences is reduced.

Implementation of the Pine Creek Allotments may have some effects on *Astragalus pulsiferae* var. *suksdorfii* at its four occurrences around Lower Pine Creek Valley as livestock travel around the allotment. However, the sites all feature more or less sandy, very dry soils supporting sparse ground cover. There is little to attract cattle to these sites, especially compared to the vegetation-rich zones on the valley floor around Pine Creek and Martin Creek, and livestock damage has seldom if at all been noted at the occurrences. The only resource improvement activity that is proposed near an *Astragalus pulsiferae* occurrence under this project is some fencework near Pine Creek just south of Occurrence #19, intended

to provide cattle with access to water, but it would draw cattle away from the occurrence, not toward it. Moreover, *Astragalus pulsiferae* plants have been found directly beside or even in roads, indicating that the species can sustain some level of disturbance. As far as is known, all the occurrences are persistent and stable and are likely to remain so even with implementation of the Proposed Action.

Astragalus pulsiferae var. *suksdorfii* has never been found in the Champs Flat or North Eagle Lake allotments, but additional suitable habitat may exist in Lower Pine Creek Valley. Even if more occurrences of *Astragalus pulsiferae* var. *suksdorfii* are found, the suitable habitat does not attract livestock usage. Therefore, any direct effects on *Astragalus pulsiferae* var. *suksdorfii* with implementation of the Pine Creek Allotments project would be minimal and well within the management guidelines, which permit disturbance to 50 percent of plants in occurrences greater than one acre (USDA FS 2001).

While *Erythranthe inflatula* plants are not directly grazed by livestock, due to their small stature, plants could be damaged by trampling or waste deposition during their early-summer window for flowering and fruiting. There is likely a persistent seed bank, however, and the populations are believed to be stable. All three occurrences are associated with aspen stands, only one of which occurs at a stand proposed for treatment. IDFs would protect the occurrence from both treatment activities as well as livestock. A second occurrence would only be grazed after the habitat was dry and plants set fruit. The third occurrence has never shown signs of livestock impacts due to its location in a rocky, ephemeral creekbed.

Even at the time of discovery in 2005, the *Phacelia inundata* occurrence at Sandy Beach was one plant. Tens of thousands of plants occurred elsewhere on the rockier, flatter shores between Eagle Lake and the Brockman Flat lavas. The Sandy Beach occurrence has apparently succumbed to prolonged drought and therefore would not be affected by any livestock activity in the area. The remaining shoreline within the North Eagle Lake Allotment is of limited extent and is not characteristic of *Phacelia inundata* habitat elsewhere around the lake.

Indirect Effects

Indirect effects primarily relate to changes in a species' habitat, such as changes in the structure or patterns of competition within the associated plant community or an increased risk of noxious weed invasion. Indirect effects can be beneficial, neutral, or harmful.

Given that the Pine Creek Allotments project would not change the permitted ceilings on livestock numbers, grazing is unlikely to have any indirect effects on the habitat for *Astragalus pulsiferae* var. *suksdorfii* in Lower Pine Creek Valley. If anything, the defined pasture rest proposed by the Pine Creek

Allotments project might well decrease potential for a habitat change such as weed invasion, as would the adaptive management flexibility provided by the project design.

With measures taken to keep cattle away from two occurrences of *Erythranthe inflatula* and the absence of livestock use at the third, indirect effects of any kind seem unlikely. Even the removal of conifers from the aspen stand is unlikely to change *Erythranthe* habitat.

As for *Phacelia inundata,* should plants ever again establish themselves at Sandy Beach, the Pine Creek Allotments project would provide adaptive management flexibility to protect them. In any case, that habitat would not change as a result of anything done in the project.

All three of these species occur in more or less open habitats, so any removal of associated competing vegetation by grazing, trampling, or burial might actually have beneficial effects (if competing vegetation was a limiting factor). On the other hand, disturbance of open habitat can invite the establishment of invasive plants with potential to outcompete native plants. Five plant species considered invasive are known to occur in the Pine Creek Allotments project area, none of them near TES plant occurrences or characteristic habitat for them. Nine occurrences of these species are known, at least two of which appear to be extirpated. This is a very low rate of occurrence for such a large area, and the risk of spread of invasive plants due to implementation of the Pine Creek Allotments project is considered low. See the Invasive Plants Species Risk Assessment for the Pine Creek Allotments for discussion of weeds in this project area.

Cumulative Effects

A cumulative effect can result from the incremental impact of the proposed action when added to the effects of past, present, and reasonably foreseeable future actions (40 CFR §1508.7). The project area was chosen as the cumulative effects analysis area for *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* and *Phacelia inundata* because the precise historical range and specific habitat requirements are unknown for these species, and it is assumed that if the Pine Creek Allotments project would not affect the viability of the species within the project area, it would not affect their viability outside of the project area.

Past Actions

Past activities known to have occurred within the project area include timber harvest and other vegetation management actions, Christmas tree permits, road maintenance activities, and various recreation activities, such as hiking and camping, OHV use, and hunting. By examining current inventories of *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula* 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 by the species summaries above.

Ongoing Actions

Ongoing vegetation management projects, road maintenance, and special uses activities can affect TES plant species. Vegetation management projects on the Eagle Lake Ranger District have been surveyed to similar standards as the Pine Creek Allotments project, and known occurrences of Sensitive plant species for which viability was a concern have either been avoided by project activities or protected by Integrated Design Features to minimize impacts. Vegetation management activities can affect herbaceous plants, but *Erythranthe inflatula* and *Phacelia inundata* grow in habitats free of woody growth that would be targeted by such activities, and *Astragalus pulsiferae* var. *suksdorfii* extends only minimally from its open habitat into neighboring lower montane forests.

Road maintenance activities could have some effects on *Astragalus pulsiferae* occurrences that approach roadways. Those occurrences appear to be stable, however, and the fact that *Astragalus pulsiferae* can be found in old landings, skid trails, and system roads speaks to its preference for low-competition, open habitats and its capability to withstand a moderate amount of disturbance.

Recreational activities, including hunting, could affect *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* or *Phacelia inundata*, most likely by trampling, but these activities are widely dispersed on the landscape, and any effects would be, at most, very limited and incidental. Effects on *Erythranthe inflatula* and *Phacelia inundata* are especially unlikely, since the plants are annual and ephemeral. Similarly, woodcutting, firewood gathering, and Christmas tree removal are highly dispersed and could entail trampling of plants on the ground, but they would not likely be occurring in the open habitats preferred by *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* and *Phacelia inundata.* Road and recreational traffic have potential to facilitate the introduction and/or spread of invasive plants on the Forest and therefore to contribute cumulatively to effects on TES plant habitat. Weeds can compete with TES plants and can cause permanent habitat degradation for TES and other desirable species. Nonetheless, with the implementation of IDFs for the Pine Creek Allotments project, weed issues are unlikely to intensify from their presently low level.

Foreseeable Future Actions

Future foreseeable actions would include vegetation management treatments within or neighboring the project area. Such actions would be adequately surveyed for Sensitive plant species, and any species for which viability was a concern would either be avoided by project activities or protected by Integrated Design Features. At present, no future actions are known that would involve any of the known TES plant sites associated with the Pine Creek Allotments project. More broadly, the introduction or spread of

invasive plants related to other projects would be a possible cumulative effect; however, given the low incidence of weeds across the Pine Creek Allotments area and with the implementation of IDFs, weed issues in the project area are unlikely to intensify.

In summary, there are few impacts from ongoing or future activities that would add cumulatively to those impacts from the proposed action. With the exception of *Phacelia inundata*, which appears to have been eliminated by sustained drought and fall of the water level of Eagle Lake, TES occurrences in the project area appear stable and persistent. Overall, any effects from the implementation of the proposed action, including cumulative effects, would be well within the current management guidelines for TES species in the Pine Creek Allotments project area.

ALTERNATIVE 2 – NO GRAZING

Direct and Indirect Effects

There would be no direct effects on *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* or *Phacelia inundata* from the No Grazing alternative other than those associated with current ongoing actions. Removing the possibility of trampling, grazing, and burial by livestock could be a positive effect, especially at *Erythranthe inflatula* occurrence #3, where livestock impacts have been noted in the past. If, however, vegetative succession in the absence of grazing resulted in adverse competition in TES plant habitats, the effects could be negative. Such effects are very unlikely, since habitats for *Astragalus pulsiferae* var. *suksdorfii* are naturally sparsely vegetated and unlikely to change much, and habitats for *Erythranthe inflatula* and *Phacelia inundata***,** with thin soils and annual saturation in spring, appear to be inhospitable to most plants. In sum, the No Grazing Alternative would likely have only beneficial effects, if any at all, for TES plant species and their habitats in the Pine Creek Allotments project area.

Cumulative Effects

Cumulative effects from past, ongoing, and foreseeable future actions would be the same as those discussed under Alternative 1.

Determination

Implementation of the Proposed Action may have some effects on occurrences of *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* and *Phacelia inundata* in the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments Grazing Management Project. Grazing, trampling, or burial under animal waste would be the most likely effects, but plant habitats in question are either very little used by cattle or are protected by Integrated Design Features for the project. Therefore, it is my determination that the implementation of the Proposed Action though it may affect some individuals or habitat of *Astragalus pulsiferae* var. *suksdorfii, Erythranthe inflatula,* and *Phacelia inundata,* it would not likely result in a trend toward federal listing of these species as Threatened or Endangered or in a loss of their viability as species.

Cultural Resources

A cultural resource analysis was conducted for the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments Grazing Management Project to determine if cultural resources were present in the Area of Potential Effects (APE), and if historic properties would be affected by project actions. The APE for the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments Grazing Management Project are the primary and secondary grazing areas, since these areas have the highest probability of impacts from grazing.

Archaeological work specific to the North Eagle Lake, Champs Flat, and Lower Pine Creek Allotments Grazing Management Project area consists of 74 unpublished surveys related to project activities. To date, all of the primary and secondary grazing areas that have been field verified that are suitable for grazing have been surveyed intensively. This consists of new and recent adequate surveys within the 10,900 acres of primary rangeland acres and 19,872 acres of secondary rangeland acres. A total of 273 cultural resources have been recorded within the project area including both prehistoric and historic activities.

The primary goal of the Lassen National Forest Grazing-Heritage Management Strategy (2008) is to manage livestock so as to provide for historic range activities within each allotment while protecting and preserving historic properties. Desired Conditions for cultural resources within the boundaries of LNF Grazing Allotments are as follows:

1. All historic properties within the allotment susceptible to grazing impacts are identified through appropriate inventory and/or relocated and monitored;
2. The located historic properties within the allotment are recorded to current standards and data are shared with regulatory agencies, affected Federally recognized Indian Tribes, research institutions, and the public according to applicable regulations and standards, pursuant to the National Historic Preservation Act, the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act and related legislation;
3. All historic properties within the allotment are monitored on a regular timetable in order to assess the overall effectiveness of program implementation in consultation with the State Historic Preservation Officer, the Advisory Council on Historic Preservation, Federally recognized Indian Tribes and other interested organizations;
4. Historic properties meeting the threshold for adverse effects identified during inventory and monitoring are treated according to stipulations outlined in this management plan. This includes evaluation and data recovery as determined necessary by the Heritage Resource Specialist.
5. The potential for damage to the sites may be determined based on the presence or absence of the following documented conditions out of the LNF Grazing Strategy:

a. Site exhibits erosional features such as cattle wallows churned to a depth greater than one inch and greater than 25 square feet;

b. Single cattle trails churned to a depth of greater than one inch;

c. Presence of braided cattle trails (more than two "figure 8s") regardless of depth;

d. Rangeland facilities (salt licks, fences, corrals, etc.) onsite

e. Erosion features resulting from onsite or nearby cattle trails, wallows, stream access points (stream bank chiseling) etc.

f. Physical alteration of rock or historic features

g. Damage or displacement of surface artifacts;

h. Loss of visual landscape important to or physical alteration of Traditional Cultural Properties

Alternative 1

Grazing Authorization

Direct and Indirect Effects

The proposed grazing authorization described in the proposed action has the potential to adversely impact cultural resources. Ground disturbing activities resulting from cattle grazing can lead to major impacts to artifacts and features, which can result in a loss of the context and integrity of a cultural resource. The loss of the context and integrity of a cultural resource is irreversible and considered an adverse impact because it could lead to the change in the determination of eligibility to the historic properties.

The presence and/or evidence of cattle grazing on historic properties does not itself equate to grazing damage. Cultural resources are considered impacted only when physically altered by activities that can reasonably be attributed to cattle grazing, movement, concentrations or other activities. Possible impacts may be caused by trampling, trailing, concentrating livestock such as when gathering, salting or watering in or near cultural resource sites. The proposed action includes Standard Protection Measures (SPMs) as identified in both the National Range Programmatic Agreement (1995) and the Lassen National Forest Grazing-Heritage Management Strategy (2008) that provide direction for limiting impacts to cultural resources by livestock grazing activities. SPMs include fencing to exclude livestock, relocation of livestock facilities away from cultural resources, or removing a cultural area from the grazing area. Implementation of SPMs, as well as monitoring in situations where impacts are not clearly understood, would address any possible direct or indirect effects from continued grazing in the project area.

Indirect effects from project related activities are more difficult to mitigate than direct effects. Site monitoring would be conducted to determine if any indirect effects from grazing are occurring. If indirect effects are found to be occurring, appropriate SPMs would be used to ensure the long-term protection of the resource.

Proposed Fences

Direct Effects

Seven sites are located in areas where construction of fences for grazing management are proposed. The construction of fences is a ground disturbing activity that could adversely impact a site. As such, fence construction would avoid historic properties and the sites would be protected from potential adverse impacts via the SPMs identified in the Range Programmatic Agreement, Appendix E. Sites would be clearly delineated so activities would avoid the sites, including any required buffer zones. If necessary, portions of proposed activities may be modified, redesigned, or eliminated to properly avoid historic properties. With implementation of appropriate SPMs, there would be no direct effects to historical sites by proposed fence construction under Alternative 1.

Indirect Effects

Any fence constructed directly bordering a site could result in trailing within the site boundary. Single cattle trails churned to a depth of greater than one inch are considered a grazing impact to cultural resources. A buffer would be placed on the site to avoid constructing a fence directly adjacent to it and to prevent deep cattle trails along fence lines adjacent to site boundaries. Buffer zones would be determined case-by-case, based on the site, activities proposed, equipment needed for the proposed activity. With implementation of appropriate SPMs, there would be no indirect effects to historical sites by proposed fence construction under Alternative 1.

Watershed Improvement

No historic properties are located in or near areas where watershed improvements will take place. Unless an unanticipated discovery is made, no direct or indirect effects will occur.

Aspen Enhancement

Historic era arborglyph carvings have been recorded within locations identified as in need of aspen enhancement. These carvings are unevaluated but will be treated as potential historic properties. There is no intention of felling aspen trees where these resources are located. However, the felling of conifers within aspen groves may result in damage to glyphs if they are felled against arborglyph trees. Burning conifer debris outside of the aspen stand will not put arborglyphs at risk. In the event an unanticipated discovery is made, the mitigation measures for unanticipated discoveries will be implemented.

All Treatments: Unanticipated Discovery

There is always the possibility that surface and sub-surface cultural resources will be located during project operations. Should any additional project cultural resources be located, the find must be protected from operations and reported immediately to the Heritage Resource Staff. All operations in the vicinity of the find will be suspended until the sites are visited and appropriate recordation and evaluation is made by the Zone or Forest Archaeologist.

Cumulative Effects

The cumulative effects analysis for cultural resources considers impacts of the alternatives when combined with the past, present, and foreseeable future actions. Events prior to the 1974 Forest and Rangeland Renewable Resources Planning Act and the archaeological protection laws of the mid 1960s, effects to cultural resources were not considered during project planning or implementation.

Consequently, cumulative impacts of varying degrees occurred within the project area from various land management activities including primarily logging, road construction, and grazing. Natural environmental processes and unrestricted land uses have also contributed to effects to cultural resources within the Pine Creek Allotments project area. These include dispersed recreation, OHV uses, user created roads and trails, wildfires, erosion, and exposure to the elements.

The cumulative effects analysis boundary for cultural resources is the Area of Potential Effects. The geographic scope of this boundary was selected because impacts to cultural resources accumulate at the specific location of cultural resources, irrespective of actions in surrounding areas. Archaeological sites are stationary resources, which are protected from all project (current or future) related activities that would adversely impact them until eligibility to the National Register of Historic Places has been determined. Generally, historic properties are not influenced by actions taken outside their boundary since this is addressed and mitigated during project planning and integrated design features. A temporal scope was also selected in determining cumulative effects, because impacts to cultural resources at a given location can accumulate over time from different activities or events.

Activities associated with the proposed action would comply with the National Historic Preservation Act of 1966, as amended and implementing regulations 36 CFR 800. Tribal communities would continue to be consulted for any concerns regarding this project. Monitoring and the application of approved SPMs as stipulated in the National Range PA and RPA would be utilized to meet the desired condition for cultural resources as outlined in the Lassen National Forest Grazing-Heritage Management Strategy. Implementation of SPMs would avoid all project impacts to historic properties. Following such protective measures, no adverse effects to the known sites are anticipated.

Alternative 2

Under this Alternative no new permits would be issued, and grazing would be stopped in the project area. Cultural resources in the project area would not be exposed to impacts from cattle or grazing improvements. Grazing and its impacts would be eliminated under this alternative. No effects to any cultural resources would result from implementing this alternative. Cultural Resources would not be impacted by exclusion of grazing in the allotments.

Hydrology

Streams are complex and dynamic systems that reflect the balance between stream flow, sediment input and substrate/bank composition. The balance between these variables is a result of all the natural and anthropogenic characteristics within a watershed. Changes in any of these variables can cause system-wide changes. Effects of the proposed actions on stream conditions are discussed in terms of stream flow, water quality and channel morphology. Effects to riparian areas, wetlands and water bodies are also discussed.

Stream Flow

There are approximately 368 miles of ephemeral and intermittent streams and 10 miles of perennial streams in the 6th field subwatersheds that encompass the Pine Creek Allotments project area. Approximately 140 miles of intermittent and ephemeral streams are located within the allotment boundaries. The porous nature of the soils and fractured volcanic bedrock contribute to the general lack of perennial flows. The channels within the three grazing allotments flow primarily as a result of spring snowmelt and are generally dry by July, depending on water year. Tributaries rarely provide surface flow to the main Pine Creek channel.

Approximately 20 miles of the intermittent section of Pine Creek flows through the allotments in the Pine Creek Valley-Pine Creek, Squaw Valley-Pine Creek, Champs Flat-Pine Creek, and Antelope Valley-Pine Creek subwatersheds. Historically, stream flow has been altered by roads, railroad grades, impoundments and channelization throughout the analysis area for all allotments. Waterholes concentrate hydrologic flow locally in some areas.

Water Quality

The primary water quality concerns associated with livestock grazing impacts on California rangelands are nutrients, sediments, pathogens, and increased stream temperatures (Tate et al., 1999). Nitrogen and phosphorous are generally the nutrients of concern. These nutrients can accumulate where livestock congregate and have the potential to enter surface and groundwater when livestock congregate near water bodies, particularly during rain or runoff events.

Stream temperatures can be increased when streamside vegetation is removed or when excess sedimentation causes aggradation of fine sediments. Soil erosion and sedimentation may contribute to impaired water quality when a high percentage of vegetative cover is removed exposing bare soils to erosion and subsequent transport into water bodies. Livestock can accelerate these processes when overgrazing and trampling occurs near water bodies.

Surface and groundwater can become contaminated by pathogens associated with livestock. Fecal coliform is often used as an indicator that pathogens could exist. Levels of pathogens tend to increase with the intensity of livestock use (UC COOP, 1996). Currently, Eagle Lake is the one 303(d) listed water body just east of the project area. It is listed for the nutrients nitrogen and phosphorous, but the 303(d) list for the State of California states the pollutant source as unknown.

Stream Morphology

Streams in the analysis area are seasonal and somewhat discontinuous in nature. Well-defined channels are interrupted by meadows and flat open areas that typically have poorly defined channels, except along reaches that are incised.

Pine Creek within Pine Creek Valley is a wide, shallow, multiple channel system with stable and relatively well-vegetated banks. Pine Creek and tributaries have become incised in the large alluvial valleys, including Champs Flat, McCoy Flat, Antelope Valley, and Little Antelope Valley, with unstable, vertical banks and considerable lateral erosion. Incision along Pine Creek and tributaries is due to multiple factors, including historic road and railroad infrastructure for logging, channelization, as well as intensive livestock grazing, and sheep drives that occurred between the late 1800s and early 1900s. Several segments of Pine Creek are relatively steeper and stable where it crosses volcanic bedrock through narrow canyons between the large valleys (River Run Consulting and Todd Sloat Biological Consulting, Inc., 2015).

Channel morphologies of some streams have been altered by impoundments for livestock watering, borrow ditches adjacent to roads and abandoned railroad grades. These features affect the flow regime of the streams and hence, their channel morphology. These can serve to divert and concentrate water, lower shallow water tables and reroute seasonal streams from natural flow paths.

Riparian and Wetland Areas

There are approximately 2,235 acres of wetlands, including wet meadows, lacustrine, and riverine, in the Pine Creek Allotments. Most of the natural wetlands are seasonal and hold surface water during spring and early summer. Riparian areas along intermittent streams are dominated by grasses, lacking a

significant woody species component, except for several limited aspen stands along volcanic bedrock reaches and alluvial fans.

Historic grazing practices in the late 1800s and early 1900s (Kling 1909 and 1910) led to some areas of compacted and exposed bare soils, soil pedestals and trailing. Most areas are slowly trending toward recovery under current management practices.

Alternative 1

Direct and Indirect Effects

Stream Flow

The activities proposed under Alternative 1 that have the potential to affect stream flow include grazing/livestock management and the watershed improvement projects. The proposed aspen enhancement activities through hand thinning are not expected to have an effect on stream flow, as the vegetation manipulation would be limited to localized areas. Fencing activities associated with rangeland structural improvements are not expected to have any direct effects to stream flows. Indirect effects may include contributing towards decreased local peak flows, but this would be negligible.

Grazing/Livestock Management

A potential indirect effect of grazing on stream flow may result from a change in plant cover. Plant cover serves to provide bank stability, slow flood flows, enhance infiltration and entrap sediments. The rest periods under a pasture rotation system proposed under this alternative would allow previously grazed areas to recover some degree of these functions. A beneficial indirect effect would be to contribute towards slightly reduced local peak flows and longer duration base flows. Maintaining end-of-season stubble heights along streambanks and 80 percent of natural streambank stability along streams would meet the standards and guidelines for Riparian Conservation Areas and should not place undue stress on the stream environment. The proposed action would modify these standards as needed depending on the stream condition and grazing system. This would include but not be limited to extending the period of non-use from grazing in site-specific areas.

Intense livestock use can compact soils and thus have the indirect effect of potentially reducing infiltration, increasing runoff and peak flows, and shortening the duration of base flows. The proposed action would address these potential impacts through implementing grazing utilization standards, livestock management and herd movement. This would allow vegetation to facilitate soil infiltration and prevent increasing runoff. Additionally, rotation strategies would be utilized to prevent heavy grazing, which would assist in the recovery of infiltration rates. By implementing the grazing utilization standards and livestock management strategies proposed, it is expected that the proposed livestock grazing would have little or no effect on stream flow.

Watershed and Improvement Activities

Watershed improvement activities proposed under Alternative 1 that have the potential to affect stream flow include recontouring headcuts in the Stanford Headquarters area, decommissioning, maintaining, or fencing/pumping waterholes, and developing new water sources. Recontouring and stabilizing headcuts at Stanford Headquarters would have the localized effect of slowing areas of concentrated flow and reducing hydrologic connectivity associated with headcuts. Decommissioning and recontouring waterholes would have the effect of improving local surface flows in and to meadow areas. Localized lowering of base levels from some of the dugout waterholes to be recontoured may currently be contributing to erosive flows and channel incision. Filling and recontouring them would have the effect of dispersing flow onto the meadow and reducing some of the concentrated flow. The proposed water source developments utilizing pumps would have little to no direct effect on stream flows. A beneficial indirect effect of the other watershed improvements would be to contribute towards decreased local peak flows and longer duration base flows.

Water Quality

Activities with potential to affect water quality are grazing/livestock management, watershed improvements, and rangeland structural improvements. The proposed aspen enhancement activities through hand thinning are not expected to have an effect on water quality, as the vegetation manipulation would be limited to localized areas and would not utilize mechanical equipment.

Grazing/Livestock Management

Livestock grazing can lower water quality by introducing excess sediment, nutrients and pathogens. Over-grazing by livestock has the potential to reduce vegetative/ground cover and expose bare soils, making them more susceptible to erosion and possible transport to surface waters. Streambank trampling may also increase sediments entering stream channels. Excess sediments in stream channels can potentially increase width/depth ratios, which could result in increased stream temperatures and lower dissolved oxygen levels. This could have the indirect effect of lowering water quality for aquatic organisms.

Studies in areas with Mediterranean climates show that the distance fecal coliform travels from where it is deposited is low (Buckhouse and Gifford, 1976 and Tate et al., 2003), thus it is in areas immediately adjacent to the stream that are of greatest concern in terms of introducing pathogens into the stream. A water quality study conducted across five National Forests in northern California (Roche et al., 2013) found that nutrient concentrations observed across these extensively grazed landscapes were at least one order of magnitude below levels of ecological concern and were similar to USEPA estimates for background conditions in the region. The study also found greater fecal indicator bacteria concentrations when cattle were present, but did not find overall significant differences in concentrations between key grazing areas and non-concentrated use areas, and most regional water quality benchmarks in terms of coliform bacteria were met across the study region.

Management strategies that disperse livestock, such as placement of salt blocks and mineral supplements ¼ mile from streams, springs and water developments and outside of all Riparian Conservation Areas (RCA); fences; moving cattle prior to utilization standards being met; decommissioning and modifying waterholes; and herd rotation are all proposed under this alternative and would help minimize concerns with respect to water quality, including pathogens, sedimentation, and water temperature.

Alternative 1 is not expected to impair water quality except where livestock have direct access to surface waters. However, impairment would be minimized with the implementation of proposed grazing strategies and livestock management as well as utilization of BMPs and proposed IDFs. It would be expected that the Beneficial Uses for the subwatersheds in the Pine Creek Allotments would be maintained and likely improved at some specific sites as a result of the proposed fencing and water developments.

Watershed Improvements

Proposed watershed improvements involving ground-disturbing activities in RCAs include decommissioning waterholes, developing off-site water sources, and stabilizing headcuts at Stanford Headquarters. Mechanized equipment in RCAs have the potential to displace soil, create ruts and remove ground cover, which can lead to excessive erosion and deposition of sediment into stream systems. Implementation of BMPs and IDFs would address these possible effects and be effective in reducing sedimentation. Disturbance associated with these activities would be expected to result in a short-term increase in sedimentation at a localized scale. Although there may be short-term increases in sediment, no long-term adverse effects to water quality are expected as a result of implementing BMPs and IDFs. BMPs are designed to maintain water quality and protect beneficial uses.

The proposed off-site water sources would help disperse livestock away from riparian areas and stream channels. This would have the effect of maintaining or improving water quality at these sites. There would likely be long-term beneficial effects to water quality associated with the proposed actions to decommission and recontour waterholes and stabilize headcuts, as riparian vegetation cover and functions would be improved at these locations, and hence be better able to filter nutrients and contaminants.

Rangeland Structural Improvements

Relocating fencing away from Pine Creek in the Champs Flat pastures would have the effect of dispersing cattle away from sensitive cut bank along the stream channel. This would have the indirect effect of reducing the risk of potential bank collapse and stream channel sedimentation associated with trampling. This would have an indirect effect of reducing the potential for water quality impairment associated with streamside grazing such as sedimentation, increased water temperature, and pathogens.

Channel Morphology

Activities from Alternative 1 with potential to affect channel morphology are grazing/livestock management, aspen enhancement, and watershed and rangeland structural improvements. No direct or indirect effects would result from aspen enhancement activities.

Grazing/Livestock Management

Livestock trampling of streambanks can have a direct effect on channel morphology by increasing stream channel width/depth ratio (channel widening), resulting in a change in stream type. General management strategies proposed under this alternative for riparian areas in non-key areas include specified use standards for streamside herbaceous vegetation and riparian shrubs, residual stubble height at the end of the grazing season, and bank disturbance. These standards meet the standards and guidelines for RCAs (SNFPA ROD, 2004) and have been shown to be sufficient to protect streambanks (Clary and Webster, 1989). Implementation of these standards would allow for more vigorous plant cover and roots to establish along streambanks, having the effect of increasing streambank stability.

Watershed Improvements and Rangeland Structural Improvements

Stabilizing the headcut area in the pasture near Stanford Headquarters would have the effect of dispersing flow and preventing channelized areas from continuing to incise. Fencing the pasture and excluding it from grazing would further facilitate recovery.

The fence realignment in Champs Flat would be relocated away from the incised channel of Pine Creek. This would have the beneficial effect of reducing streambank disturbance, reducing chiseling and trailing, and locally improve lateral channel stability.

Riparian Areas, Wetlands, and Water Bodies

Riparian areas and wetlands are particularly susceptible to impacts from grazing, since they typically have higher soil moisture for longer timeframes than surrounding upland areas. Ground disturbing activities in and around riparian areas and wetlands can result in rutting, trampling, trailing, ponding, and stripping of vegetation especially in areas of repeat traffic. Activities with potential to affect riparian areas, wetlands and water bodies are grazing/livestock management, aspen enhancement, watershed improvements, and rangeland structural improvements.

Grazing/Livestock Management

Proposed management strategies under Alternative 1 include utilizing variable numbers and seasons, herd movement and grazing utilization standards.

A potential effect of grazing in riparian areas may be reduced infiltration rates resulting from a change in plant cover and soil compaction. The proposed utilization standards would meet the standards and

guidelines for RCAs (SNFPA ROD, 2004) which were established to preserve, restore or enhance special aquatic features such as meadows and wetlands.

Herd movement in a pasture rotation would be utilized, which would assist in maintaining infiltration rates recovered during periods of non-use. Livestock numbers may vary as long as use does not exceed grazing utilization standards or the authorized totals.

As a result of implementing the grazing utilization standards, herd movement and appropriate BMPs, the livestock grazing proposed under Alternative 1 would at a minimum maintain resource objectives for riparian areas, wetlands and water bodies described in the Lassen National Forest LRMP (1992), as amended by the SNFPA (2004).

Recent studies have shown that grazing using proper management strategies does not detrimentally affect meadow plant communities. Freitas et al. (2014) found that long-term trends in meadow plant community responses were not different between study sites excluded from grazing and grazed sites that utilized riparian standards. A recent range BMP evaluation of a site at McCoy Flat on the North Eagle Lake Allotment in 2016 described that the majority of long-term indicators currently show the pasture is no longer declining and has remained unchanged, and that there has been some improvement in long-term trend as a result of fencing and tighter control of livestock rotation and utilization monitoring. This alterative would limit the time of use in this riparian pasture, and would also likely result in improving long-term trends.

Aspen Enhancement

Alternative 1 proposes to hand-thin conifers in multiple aspen stands within the allotments and subsequently either fence or hinge trees to exclude cattle. BMPs and IDFs would be implemented to protect all RCAs. Consequently, no adverse effects to riparian areas, wetlands and water bodies are expected to result from the proposed hand-thinning of conifers along meadow edges. Beneficial effects of these treatments would include increased extent of riparian hardwoods where they occur naturally and increased quantity and duration of soil water availability.

Watershed and Rangeland Structural Improvements

The watershed improvements proposed under this alternative are in or near meadows, wet meadows or springs and would require ground disturbing activities. The proposed action includes decommissioning multiple waterholes throughout all three allotments and headcut rehabilitation in the Stanford Headquarters area.

Decommissioning waterholes would have the beneficial effects of allowing flows to better disperse over meadow areas, increasing water storage in the meadow and enhancing riparian vegetation. This may have the effect of locally improving wetland conditions. Decommissioning waterholes through fencing and

development of off-site water troughs would help reduce livestock concentration within riparian areas and subsequent use.

Relocating the pasture fence in Champs Flat would have the effect of directing cattle away from a currently unstable bank along Pine Creek. This would have the indirect effect of reducing the risk of potential bank collapse and allow time for the bank to stabilize and prevent further loss of immediate streamside riparian area within the incised channel width. The placement of recontouring and stabilizing headcuts in the Stanford Pasture area would have the beneficial effect of slowing areas of concentrated flow and reducing the associated erosion. An additional exclosure fence in the Stanford Headquarters area would allow an area that is currently vertically unstable to recover after headcut treatments and improve riparian vegetation cover, protecting from erosion and potential longer-term loss of a meadow.

A direct effect of these proposed activities would be a short-term increase in sedimentation in localized proposed treatment areas. This would be minimized by implementing BMPs and IDFs to protect RCAs. Consequently, no long-term adverse effects are expected. Long-term beneficial effects would include improved natural hydrologic flow paths, improved soil moisture and water storage capacity in meadows and enhanced riparian vegetation in localized areas.

Cumulative Effects

Some of the activities proposed under the action alternative involve ground disturbing activities or may have the potential to affect subwatershed conditions in the Pine Creek Allotments analysis area. Cumulative effects are the direct and indirect effects that result from the proposed action or alternatives when added to other past, ongoing, and reasonable foreseeable future actions in the project subwatersheds. Other previous activities include grazing, road construction (including railroads), timber harvesting, fire and fuels maintenance and wildfires. Cumulative watershed effects (CWE) are discussed in terms of the Equivalent Roaded Acre (ERA) method. This method is a tool for assessing Cumulative Watershed Effects (CWE) developed for National Forests in Region 5 (Appendix B and USDA FS, 1988). The ERA model assigns a risk using cumulative effects from activities that may occur. A low risk of cumulative watershed effects is defined as an ERA of less than 50% of the threshold of concern (TOC).

Project level 6th or 7th field subwatersheds are typically used in CWE analysis because they are at a scale sufficient to produce measurable effects that may be masked by other effects when larger watersheds are analyzed. The TOC for all subwatersheds in the analysis area is 15% ERA (USDA FS LRMP, 1992). Given the scale of the analysis area, which encompasses three allotments, it was determined that the 6th level subwatersheds would be the most appropriate scale for CWE analysis. The ERAs for existing conditions in the subwatersheds are shown below.

Threshold of Concern and current ERAs prior to all alternatives.

6th Field Subwatershed	ERA	Existing Condition %ERA	% TOC
Antelope Valley-Pine Creek	1,181	5	30
Brockman Flat-Frontal Eagle Lake	463	2	9
Bullard Lake	595	5	25
Champs Flat-Pine Creek	879	7	40
Cleghorn Creek-Frontal Eagle Lake	346	1	8
Heath Dam Reservoir	669	4	20
Houseman Camp Reservoir-Frontal Eagle Lake	885	8	45
Martin Creek	1,072	9	47
Pine Creek Valley-Pine Creek	1,549	6	32
Russell Dairy Creek	503	3	14
Squaw Valley-Pine Creek	704	5	27

Source: CWE analysis for Pine Creek Allotments

The proposed action includes grazing and hand-thinning conifers within aspen stands. ERAs for the proposed activities under Alterative 1 and other past, ongoing, and reasonably foreseeable future actions are less than 10% for each 6th field subwatershed. Thus, the subwatersheds in the Pine Creek Allotments are at low risk for cumulative watershed effects one year post proposed action. The proposed watershed improvements have not been quantified in the ERA method. However, the footprint of proposed watershed improvement activities that would be ground disturbing is small, site specific, and would serve to benefit the subwatersheds in the long term (see Hydro Report).

The CWE results include all past, ongoing, proposed, and reasonably foreseeable future activities. Considering that no subwatershed would exceed the 15% TOC, and that BMPs and IDFs would be implemented to protect channel morphology from adverse changes, cumulative channel morphology impacts are not expected. The proposed actions under this alternative would maintain or improve bank stability through livestock grazing strategies that disperse livestock away from channels and watershed improvements that would reduce areas of concentrated flows. These actions would have the cumulative beneficial effect of trending the subwatersheds toward obtaining more stable and natural channel morphologies.

Since none of the ERA percentage values exceed the TOC, detrimental cumulative watershed effects are not anticipated by the proposed livestock grazing under this alternative. The other ground-disturbing treatments besides livestock grazing under Alternative 1 are small relative to the scale of the subwatersheds. Thus, there would be negligible cumulative watershed effects resulting from those activities. Additionally, the watershed improvements would trend watershed conditions toward improved hydrologic flow paths and riparian functions.

Alternative 2

Direct and Indirect Effects

There are no direct effects of choosing the no grazing alternative. Under this alternative ground cover would increase and there would be no ongoing soil compaction associated with livestock grazing. This would have the beneficial effect of increasing infiltration and reducing runoff at a faster rate than under Alternative 1. Thus, decreased peak flows and longer duration base flows would be expected as watershed conditions recover over the long-term. Streambank stability would be expected to increase, and channels may trend towards narrower and deeper.

An indirect effect of Alternative 2 is an accelerated trend toward decreased peak flows and longer duration base flows as ground cover and infiltration rates recover. There would be no thinning of encroaching conifers in aspen stands. There would be no effects to stream flow associated with not implementing these treatments under this alternative. No watershed or rangeland improvements would be implemented under this alternative, and thus there would be no localized beneficial effects with respect to stream flows, channel morphology, or riparian vegetation under this alternative.

Cumulative Effects

The discussion for cumulative watershed effects to Alternative 1 applies to this alternative with the exception that there would be no grazing and no watershed or rangeland structural improvements implemented under this alternative. The cumulative effects of no grazing would potentially reduce some water quality concerns associated with livestock grazing. This would trend subwatersheds towards improved water quality. As a consequence of no watershed improvements under this alternative, there would also be no improved riparian functions in these areas to enhance the trend of the subwatersheds towards improved water quality. Thus, the trend toward improved water quality may proceed slower.

There would be no livestock grazing under this alternative. Therefore, there would be no ongoing soil compaction or bank trampling associated with livestock grazing. Vigorous plant cover and roots would be able to establish along streambanks. Cumulatively, this would have the effect of increasing streambank stability and with time channels may naturally trend towards narrower and deeper.

There would be no watershed or rangeland structural improvements under this alternative. So, although cumulatively streambank stability and channel morphology would be improving under no pressure from grazing, continued degradation at locations identified for watershed improvement needs could somewhat slow this recovery.

Cumulatively, riparian conditions in primary grazing areas would recover at a more rapid rate without the usage associated with livestock grazing. However, at the site-specific areas identified as needing watershed improvement, recovery would likely be slower as a consequence of not implementing these actions.

There would be no facilitated trends toward improving hydrologic flow paths, or extra measures taken for water quality protection. There would be beneficial indirect cumulative effects towards enhancing riparian habitat, flood water retention, and improved water quality though they may be achieved more slowly.

Range Resource/Livestock Management

The rangeland resource and livestock management are inter-related when managed on public lands identified as suitable for grazing. Rangelands include wet and dry meadows, riparian areas, uplands dominated by herbaceous vegetation (sometimes with a woody shrub component), open-canopy timber areas, as well as timbered areas that have been thinned and provide a temporary herbaceous understory. Rangelands provide forage and water for livestock that in turn can be managed to maintain healthy, vigorous and productive rangelands. Livestock numbers, season of use, length of time, distribution, and the allowable amount of forage for grazing, must be considered when managing livestock grazing. Water sources are also critical for livestock. Management actions affect both in various ways. Resource actions that affect rangeland resources, may affect livestock management, and vice-versa.

A third component affected by resource management actions is the rancher who manages the livestock to maintain the rangeland in a sustainable manner. Actions that affect the viability of a ranch operation, may have farther reaching effects to local economies.

Alternative 1

Grazing Authorization

Direct Effects

The proposed action does not change permitted numbers or amount of time authorized under the Term Grazing Permits. It does provide for the adjustment of actual dates when livestock may graze during periods of drought conditions. An adjustment to actual calendar dates would have minor effect on how each ranch operation is able to move livestock between private and public land ranges and would require coordination between all entities. However, it would be a short-term and intermittent effect.

Proposed utilization standards are those identified in the LRMP as amended by the SNFPA. Site specific standards would be applied where other resource concerns or needs were identified, such as waterfowl or bank stability. The standards would not change from previous management. Better control of the livestock to meet the standard would be the primary difference from previous management.

Direct effects of the proposed action are changes to the grazing rotation schedule, incorporating rest periods into the pasture rotation, and identifying specific amounts of time spent in each, primarily for the

Combined Allotments. No changes are proposed to the rotations in the Champs NW pastures. Management of the livestock by moving cattle more often and not allowing them to return to previously grazed pastures would have the most effect to the permittees' time spent on the allotments. More frequent moves would require planned days for gathering and moving livestock, as well as additional days to find stragglers and making sure all livestock are removed from a grazed pasture and gates are closed to prevent any from returning. More days spent regularly moving livestock would provide better knowledge of use patterns and when standards are being approached. Defined timeframes for each pasture would help ensure grazing utilization standards are met annually, as well as help show where adjustments need to be made to the amount of time spent in each pasture. Adaptive management would allow adjustments to time spent in each pasture, when pastures need to be rested, and how time correlates to meeting utilization standards. Over time, these adjustments should have a positive effect on both management of the resource and the livestock. The rangeland resource would be more vigorous and meeting standards would provide healthy, palatable forage for livestock.

The use of portable watering facilities would help distribute livestock away from other sensitive areas and provide water for livestock, particularly in drought years, when uplands may provide useable forage but not the necessary water. During the recent drought, portable watering facilities were beneficial in distributing livestock into upland areas and discouraging concentrations of livestock in meadows and riparian areas. It allowed for continued grazing, in areas that typically were under-utilized. Even during typical years, portable watering facilities could help distribute livestock into under-utilized areas away from other sensitive locations. During typical years when water and forage is plentiful, limited use of portable facilities to distribute livestock into uplands, would be beneficial by minimizing concentrations within riparian areas close to water and would distribute use across the pasture, decreasing utilization overall.

The negative effect of these facilities would be the expense, primarily the hauling of water to keep the tanks full. There is no water source within an economical distance of the allotments to fill water trucks and transport water to the portable facilities, several times a week. Hauling water requires heavy-duty trucks with tanks that can carry sufficient water for numerous facilities. The operation would require a driver who knows the roads, how to maneuver rough and rocky dirt roads with a heavy load, and who understands how water changes the maneuverability of a large vehicle. Hauling water would be more beneficial in drought years when providing water for a portion of the season would allow for limited grazing versus total non-use.

Indirect Effects

The indirect effects of the proposed changes to the grazing and rotation schedule would be the additional expense related to more travel to and from the allotments including fuel, vehicle use, and personnel time.

Additionally, there would be a learning curve for the cowboys who would be learning the rotation schedule, the expectations for pasture moves, as well as understanding what the utilization standards are for each pasture. Personnel turn-over would require constant re-training and oversight by the permittee to make sure management is meeting requirements. It would take additional time and personnel initially to gather cows when they are not used to being gathered as often as may be required for the proposed rotations and there would be greater incidence of stragglers, requiring re-riding pastures to assure all are moved to the new pasture.

It also takes time to "train" livestock to a new routine, so more gathers and trailing would initially cause more stress to livestock that can result in weight loss or could result in cows and calves becoming separated temporarily. However, once the cows become accustomed to more regular gathering, they would be less disturbed by the activity and younger animals would learn the routine.

Rangeland Improvements and Developments

Direct and Indirect Effects

Proposed Fences

The majority of the proposed fences would have minimal direct effects to livestock management or the range resource. The proposed fences would be beneficial by protecting archaeological sites, aspen, and stream channels from livestock impacts. The areas are small compared to the overall size of the allotments and fencing livestock out of these areas would allow continued use of the surrounding pastures and remove small areas that have been difficult to manage to standards.

Re-alignment of the Pine Creek fence and one aspen fence would be adjustments due to changed natural conditions since they were constructed and would continue to protect the resource they were originally intended to benefit.

The water gap fence would help to distribute livestock away from the stream channel downstream by providing a dependable water source that would serve two adjacent pastures. It currently is only accessible from one pasture. It would also serve as an alternate water source to replace those being proposed for removal downstream.

The alternative gathering pasture (North Shore Gather Pasture) at the Spalding Troughs would incorporate the original proposed corral facility. Both facilities would have direct benefits to livestock management and the range resource of the project area. The gather pasture would provide an upland area for end-of-season gathering when the lakeshore pasture is scheduled for rest. The corral would facilitate loading small groups of cattle into trailers when needed. The pasture would also be useful for use in the

spring of those years when the rotation starts in that area. However, just as the other pastures in the proposed rotation, this pasture should be rested periodically to allow vegetation to complete a full growth cycle, including seed-set, without grazing. The inclusion of this improvement would be beneficial for both livestock management and the rangeland resource.

The addition of the alternative gathering pasture (North Shore Gather Pasture) would alleviate the need for the portable, temporary fence in the lakeshore pasture. Having an alternative pasture available for gathering livestock to in the fall, would add flexibility and variation to the overall rotation strategy and would meet objectives for grazing areas during different times from year to year, and improve rangeland vegetation health.

Construction of the North Shore Gather Pasture would eliminate the need for the portable fence in the Lakeshore pasture proposed in the original Proposed Action. Due to the seasonal and annual fluctuation of lake levels, no defined location would be best for installing a fence, thus making a permanent fence an unviable alternative as well. The proposed temporary fence would require complete installation of temporary posts and wire, then removal every year, and would be labor intensive, for a purpose that has not been proven necessary. It would have a negative effect to management. The two upland water sources, the Lake Pasture troughs and the Spalding troughs, provide fresh, clean water for livestock when in the Lakeshore pasture, which they prefer over walking through silty, lake bottom to reach open water. When the rotation schedule includes the lakeshore pasture, salt and mineral supplements would be used to attract livestock away from the shoreline into the upland areas of the pasture to minimize livestock contact with lake waters.

The proposed extention to the boundary fence between Champs NW and the Harvey Valley Allotment would have a beneficial effect by providing better control of cattle from both allotments and eliminate drift onto adjacent areas. It would also allow for alternating the season of use in the Champs Northwest Field from early to late, so vegetation has a deferred rest every other year.

Watershed Improvements

The proposal at Stanford Headquarters to treat the existing headcut and fence the meadow would have beneficial effects overall. It would prevent further advancement of the headcut, stabilize the stream channel, and protect the known archaeological site that is nearby. Fencing this small meadow would eliminate the attractant where livestock have concentrated and often over- utilized the meadow vegetation. Because of its small size, removing grazing from this meadow would not negatively affect the management of livestock or the range.

There are eight proposed changes to existing waterholes across the three allotments. Waterholes were developed to aid in distribution of livestock, and with other tools, such as salt, livestock can be encouraged to disperse and not concentrate in sensitive areas. Some waterholes are less dependable for providing good sources of water, while others provide water in nearly all conditions. It is important to identify and develop dependable, alternative water sources prior to removal of existing ones.

The proposal to re-contour and fill four waterholes would remove the less reliable of two water sources at each location. The remaining water source would receive maintenance to ensure its reliability prior to removing the less reliable one. Removal of non-reliable water sources would have no negative effect to livestock management or the range, provided the remaining water source is made dependable first.
For the Shay's Hole water source, the new waterhole would need to be constructed and have time to prove its reliability before the old one is filled. This area is more upland, so has fewer water sources available. Elimination of one without a good replacement would result in livestock returning to sensitive riparian areas for water, negatively affect distribution and possibly the ability to meet standards in those areas.

The proposal for the Pine Creek reach in McCoy Flat would provide for changes in management before attempting to locate an off-channel water source in this pasture. This reach of Pine Creek often held late season water which acted as an attractant to livestock as they were being moved back toward Eagle Lake. Often livestock would concentrate in small groups in late season, trampling the streambank. The proposed management would require this pasture be used only as an over-night pasture for small groups of livestock. Spring use would not concentrate livestock in small areas along the stream because more of the reach would have water, and the short duration with small numbers in the fall would be expected to limit the amount of trampling to being within standards. This adjustment to management would not have negative effects to livestock management, would improve the meadow and stream conditions, and could eliminate the need to develop any additional water sources.

Aspen Enhancement

The proposed treatments for aspen stands in the allotments would have no direct effects to livestock management or the range resource. The effects would be indirect. The proposed treatments would open the stands from conifer encroachment, but instead of fencing, almost half of them would use natural barriers to keep livestock from browsing young sprouts and saplings. This would be a less costly and management intensive method to promote new aspen growth. Several are associated with other aspen stands that have already been treated and propose extending the existing fence. Similar to some of the other proposed fences, these would be small areas that would have no negative effect to the management of the allotments. Those that indicate monitoring to determine future need for fencing, would also minimally affect livestock management.

Terrestrial and Aquatic Wildlife Resources

Management Indicator Species

Management Indicator Species (MIS) for the Lassen NF are identified in the 2007 Sierra Nevada Forests Management Indicator Species (SNF MIS) Amendment (USDA Forest Service 2007a). The list identifies the habitat or ecosystem component, Indicator species, whether habitat is in or adjacent to the project area and if habitat would be directly or indirectly affected by the proposed action (see MIS Report). Habitats are the vegetation types (for example, early seral coniferous forest) or ecosystem components (for example, snags in green forest) required by an MIS for breeding, cover, and/or feeding. MIS for the Sierra Nevada National Forests represent 10 major habitats and 2 ecosystem components. These habitats are defined using the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005) which provides the most widely used habitat relationship models for California's terrestrial vertebrate species.

The MIS selected for project-level MIS analysis for the Pine Creek Allotments Project were: Riverine/Lacustrine (aquatic macroinvertebrates), Riparian (yellow warbler) and Wet Meadow (Pacific tree frog). The four green forest conifer types as well as snags in green forest habitat all exist within the project boundaries. However, because this is a livestock grazing project there would be no effect to these types. Hand thinning of conifers proposed in aspen stands within the project area would be discussed under the Riparian habitat type.

The cumulative effects analysis area was retained at the project boundaries, inclusive of private lands, and not expanded further due to lack of influence of any past, ongoing or reasonably foreseeable future projects in adjacent areas to which this project could potentially act as a cumulative effect to the MIS habitats analyzed for this project.

Riverine/Lacustrine (aquatic macroinvertebrates)

Aquatic or Benthic Macroinvertebrates (BMI) 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

Direct and Indirect Effects to Habitat

- Flow: The actions included in Alternative 1 would have no substantive effect to flow. The only riverine habitat is at the mouth of Pine Creek. None of the proposed actions would result in a measurable change in flow in this section of Pine Creek. In addition, there would be no substantive changes to flow or inputs into the lacustrine habitats.

- Sedimentation: Overall, the proposed action alternative is not expected to impair water quality except where livestock have direct access to surface waters (hydrology report, project record). However, impairment would be minimized with the implementation of proposed grazing strategies and livestock management as well as utilization of BMPs and proposed IDFs (hydrology report, project record). There would likely be little change in sedimentation under Alternative 1 relative to the existing condition under which these allotments have been grazed in past years.
- Water surface shade: As above, there would likely be little change in water surface shade under Alternative 1 relative to the existing condition under which these allotments have been grazed in past years. The riverine section at the mouth of Pine Creek may be grazed when the lakeside pasture is used, and thus there would be some reduction in streamside shade as herbaceous plants are cropped along the stream edge. There would also be some expected reduction of water surface shade along the margins of the lacustrine habitat, including at Ashurst Lake, due to livestock grazing along the margins of these areas. Thus, there would be some expected reductions in water surface shade along the margins of each of the features that contribute to these habitat types.

Conclusion: Due to the livestock grazing as proposed in this alternative, which will largely be managed as it has in the past where these habitats are concerned, there would be some expected loss of water surface shade along the margins of these areas, and some potential for sedimentation due to livestock presence where they have direct access to waterbodies. Thus, all included habitat acres could be slightly affected in relation to water surface shade and sedimentation when grazing is directly occurring in the areas of habitat. However, as summarized in the hydrology report (project record), "Cumulatively, the proposed watershed improvements would have a beneficial effect of trending the subwatersheds towards improved water quality. Riparian functions in these areas, such as filtering nutrients and contaminants, would be enhanced".

Alternative 2

Direct, Indirect and Cumulative Effects to Habitat.

Under this alternative there would be no direct changes to the habitat factors for aquatic macroinvertebrates. Flow and water surface shade would be primarily dependent on annual precipitation and other natural influences. As summarized in the hydrology report (project record), "Ground cover would increase and there would be no ongoing soil compaction associated with livestock grazing. Thus, infiltration rates and meadow functions, such as filtering nutrients and contaminants, would improve more quickly. This would have the effect of reducing livestock associated degradations to water quality. There would also be no watershed improvements in terms of headcut stabilization or waterhole

decommissioning, which could potentially have adverse effects to water quality long-term at the local scale".

Riparian Habitat (Yellow warbler)

Within the project area riparian habitat is represented by 71 stands of aspen, totaling 336 acres. The largest of these aspen communities is about 67 acres, the smallest is 0.02 acres, averaging about 4.7 acres. Most of these stands have experienced long-term declines in health and ecological function due to increasing conifer encroachment as a result of fire suppression, and excessive herbivory by native ungulates (deer and elk) and livestock. Some of the stands, including the largest stand within the project area, have received past restoration treatments as part of an on-going aspen restoration program on the Eagle Lake RD. As part of the proposed action, approximately 30 aspen stands totaling 37 acres would receive some treatment, including hand thinning of conifers and fencing, as needed.

Alternative 1

Direct and Indirect Effects to Habitat

- Acres of riparian habitat: None of the actions proposed under Alternative 1 would cause an immediate increase or decrease in the acres of this habitat type. In time, hand thinning of encroaching conifers and preventing overbrowsing of aspen sprouts by fencing or other means may expand the existing extent of some of the aspen patches by promoting successful regeneration of the enhanced aspen stands.
- Acres with changes in deciduous canopy cover: None of the actions proposed under Alternative 1 would cause an immediate, substantive increase or decrease in the existing amount of deciduous canopy cover. In time, hand thinning of encroaching conifers and preventing overbrowsing of aspen sprouts by fencing or other means may expand the existing extent of some of the aspen patches by promoting successful regeneration of the enhanced aspen stands, resulting in an increase in overall deciduous canopy cover. In addition, removal of competing conifers would also allow aspen to achieve a larger, fuller crown in areas where growth has been restricted by dense encroachment of conifers. This also would, in time, lead to a slight increase in deciduous canopy closure within the 37 acres of aspen stands proposed for treatment.
- Acres with changes in total canopy cover: Proposed hand thinning of conifers within 30 stands, totaling 37 acres, would reduce overall canopy cover in the affected areas by reducing the density of conifers. Due to the constraint of hand thinning only, larger diameter conifers would remain. Therefore, the net reduction of total canopy cover would be less than if mechanical removal of conifers was to be implemented. However, some canopy cover reductions are expected and desired within these aspen patches proposed for treatment.

Cumulative Effects to Habitat in the Analysis Area.
As previously stated, approximately 71 aspen stands totaling 336 acres exist within the project area. All these stands have to varying degrees been affected by fire suppression (and subsequent encroachment by conifers) and many by excessive herbivory (by both native ungulates and livestock). As part of an on-going aspen restoration program on the Eagle Lake Ranger District, past aspen restoration treatments within the project area have enhanced approximately 20 of these stands, totaling approximately 149 acres. These restoration treatments have included conifer removal, both mechanically and by hand thinning, and fencing to control excessive browsing. Implementation of the proposed treatments would enhance aspen in the project area to 70% of existing aspen and 55% of existing acres. As a result, the health and ecological functioning of this habitat type would be further improved. As stands respond to treatment, there may be some marginal increases in this habitat type as aspen expand their footprint, as well as increases in deciduous canopy closure. As a result of the past and proposed treatments, there would also be a reduction in total canopy cover due to the reduction in the conifer component.

Conclusion: Aspen treatments as proposed would have an immediate effect in total canopy cover in 37 acres of this habitat type. There may be some long-term increases in deciduous canopy cover and the overall footprint of aspen as the enhanced stands respond to treatment. Cumulatively, treatment of these stands would result in 70% of aspen stands within the project area, and about 55% of aspen acres, having received some enhancement treatments.

Alternative 2

Direct, Indirect and Cumulative Effects to Habitat.
Under this alternative, there would be no direct change in habitat conditions within this habitat type. As a result of fire suppression, aspen stands that have not previously had conifers removed would continue to be encroached by conifers to varying degrees. Also, as a result of excessive herbivory by wildlife, some stands would not be able to successfully regenerate. Thus, these long term trends of conifer encroachment and excessive herbivory would continue in approximately three-quarters of the stands and approximately one quarter of the acres of this habitat type that exists within the project area.

Wet Meadow Habitat (Pacific tree (chorus) frog)
The Pacific tree frog (now known as the Pacific chorus frog) is a broadly distributed species that requires standing water for breeding. Tadpoles require standing water for periods long enough to complete aquatic development, which can be as long as 3 or more months at high elevations in the Sierra Nevada (CDFG 2005). During the breeding season, adults take cover under clumps of vegetation and surface objects near water during the day. During the remainder of the year, they leave their breeding sites and seek cover in moist niches in buildings, wells, rotting logs or burrows (ibid).

As indicated by the US Fish and Wildlife Service's National Wetland Inventory GIS layer, there are approximately 2,108 acres of wet meadow habitat on USFS administered lands within the project area. The majority of these areas are within primary rangeland, with most of the habitat in large, non-forested valleys including Pine Creek Valley, Champs Flat, Gordon Valley and McCoy Flat.

Alternative 1

Direct and Indirect Effects to Habitat

- Acres of wet meadow habitat: The proposed action would not create nor destroy wet meadow habitat, thus there would be no change to the amount of this habitat within the project area as a result of Alternative 1.
- Acres with changes in CWHR herbaceous height classes: Essentially all the acres of this habitat would be grazed by livestock under this alternative. The proposed fence at Stanford Headquarters would remove grazing on about 9 acres of this habitat type. As an expected result of livestock grazing, there would be an annual reduction in herbaceous height in all grazed acres of this habitat type.
- Acres with changes in CWHR herbaceous ground cover classes: Essentially all the acres of this habitat would be available for grazing by livestock under this alternative. Annual grazing on these acres, and reduction in herbaceous cover as a result of grazing, would result in a reduction in herbaceous ground cover be removing taller blades and culms of grass that would have provided cover if left ungrazed. This is an expected result of grazing. The proposed fence at Stanford Headquarters would remove grazing on about 9 acres of this habitat type, and thus in this 9-acre area there would be no annual reduction in ground cover.

Cumulative Effects to Habitat in the Analysis Area.

No on-going or foreseeably future project would be expected to change the acres of this habitat type. No other on-going or reasonably foreseeable future project was identified that would affect this habitat other than livestock grazing.

Conclusion: The primary management action that has affected this habitat has been on-going livestock grazing within the allotments in the project area. As an expected result of proposed livestock grazing, there would be annual changes in herbaceous height and herbaceous ground cover on the acres of this habitat type that is grazed in any given year.

Alternative 2

Direct, Indirect and Cumulative Effects to Habitat.

Under this alternative, there would be no direct change in habitat conditions within this habitat type. Annual herbaceous height and herbaceous cover would primarily be influenced by annual precipitation levels and other natural influences.

Threatened, Endangered, and Sensitive (TES) Wildlife Species

Species to be considered for this analysis were determined based on review of the U.S. Fish and Wildlife Service website where official species lists were obtained on April 17, 2018, and on review of the USDA Forest Service Sensitive species list for Region 5. The official species lists did not include gray wolf (*Canis lupus*). However, due to the known presence of this species on the ELRD and within the project area, the potential effects to gray wolf were analyzed.

As there is no suitable, potential or critical habitat within the project area, and the species has never been reported within the project area or on the Eagle Lake Ranger District (ELRD), it is determined the project would have no effect on the proposed threatened:

- North American wolverine

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, it is determined the action alternatives would have no effect on the following Federally Listed threatened or endangered species or their critical habitat:

- northern spotted owl, valley elderberry longhorn beetle

Due to the project area being outside the range of the species, or the lack of suitable habitat or habitat components in the project area, or due to the lack of effects to suitable habitat, it is determined the action alternatives would have no effect on the following Forest Service Sensitive species:

- California wolverine, American marten, Pacific fisher, Sierra Nevada red fox, California spotted owl, great gray owl, yellow rail, willow flycatcher, Shasta Hesperian snail

Sensitive species analyzed in detail for the Pine Creek Allotments project were northern bald eagle *(Haliaeetus leucocephalus)*, northern goshawk *(Accipiter gentilis)*, greater sandhill crane *(Grus canadensis tabida)*, pallid bat *(Antrozous pallidus)*, fringed myotis *(Myotis thysanodes*), Townsend's big-eared bat *(Corynorhinus townsendii)* and western bumble bee (*Bombus occidentalis*). Effects to these Sensitive wildlife species are summarized below and are discussed in detail in the Biological Evaluation

for the North Eagle Lake, Champs Flat and Lower Pine Creek Allotments Grazing Management Project (project record).

Northern bald eagle

Bald eagle nest territories are typically associated with lakes, reservoirs and rivers, and are usually located within 2 miles of a water source that supports an adequate food supply. Nests are usually located in uneven-aged stands with large, old trees. Bald eagle roost trees typically are the oldest trees within a stand.

The most common prey items for bald eagles are fish, waterfowl and carrion. At Eagle Lake, tui chubs are the primary prey species; other prey includes the Tahoe sucker and grebes (Jackman et al 1999). Within the project area, the primary prey species are waterfowl.

There are two known bald eagle nest sites, the Ice Cave and Fish Trap territories, both of which occur within the North Eagle Lake Allotment along the western shore of Eagle Lake. The proposed project would have little to no effect on foraging habitat for either of these two nest locations.

A third nest location, at Little Harvey Valley, is located within 2 miles of the Champs Flat Allotment boundaries. Adult eagles from the Little Harvey Valley territory are commonly observed foraging at the Pine Creek Valley wetland. The primary prey source for the Little Harvey Valley pair of bald eagles is likely waterfowl, encountered in small fishless lakes and impoundments in the area, such as at the Pine Creek wetland areas, Harvey and Little Harvey valleys, and Ashurst Lake. Of the three bald eagle nests, the proposed project would thus have the greatest potential to affect prey populations of the Little Harvey Valley bald eagles due to the marginal nature of the area for bald eagles.

Alternative 1

Direct and Indirect Effects

No effects to the structure of forested nesting habitat for bald eagles would occur as a result of this project. The potential effect of livestock grazing to bald eagle habitat is primarily grazing-induced changes to prey habitat, which within the project area is primarily waterfowl habitat. Grazing can affect nesting habitat for early nesting species such as mallard by reducing the amount of residual vegetation under which nesting ducks can find cover for nesting. Livestock may also trample waterfowl nests and their eggs.

Within the project area, nesting habitat is limited due to the small amount of open water. Available water is generally in the form of stockponds and reservoirs like the Pine Creek Valley wetland and Camp 10 wetland areas, both of which contain constructed waterfowl nesting islands. The shallow, marshy Ashurst

Lake represents the only named lake contained within the allotment boundaries. Waterfowl also make extensive use of the Pine Creek corridor in spring and early summer while water is available, and in small numbers throughout the summer where residual pools exist.

The primary foraging habitat for bald eagles that represent the Ice Cave and Fish Trap territories would be Eagle Lake. Due to the size of this lake and the fish species that the lake provides as prey, the proposed project would have little to no effect on foraging habitat at Eagle Lake. In addition, grazing use along the shoreline of Eagle Lake has been occurring prior to and during the time these nest sites have been known, indicating that successful bald eagle nesting at these sites will continue to occur given the anticipated livestock use as a result of this proposal.

The Little Harvey Valley bald eagle nest was discovered in 2001, and thus this pair of eagles established the territory despite livestock grazing that has been ongoing within the project area, and in the adjacent Harvey Valley Allotment. While on-going grazing likely affects waterfowl habitat to some degree due to reducing residual vegetation that some waterfowl species use for nest placement, sufficient prey was available in the area to allow this pair of eagles to establish a territory. Relative to the existing condition, the proposed action contains elements that would serve to reduce livestock use in important waterfowl areas. For instance, the proposed action would require a 6-inch stubble height of key forage species along the shoreline of the Pine Creek Valley wetland area. This would serve to reduce the time livestock are in this wetland area and would insure an increase in residual vegetation for waterfowl nesting habitat.

Cumulative Effects

The cumulative effects analysis area was retained primarily at the project area boundaries and not extended further due to the project not bisecting areas of waterfowl habitat, and negligible effects to foraging habitat at Eagle Lake that do not necessitate an analysis of a larger portion of Eagle Lake itself. No other ongoing projects affect the wetland areas contained within the project area except grazing. The numbers of bald eagles that nest on FS lands has increased on the Eagle Lake RD since the 1970s, during which time these allotments have been actively grazed. Given the increase in eagles during this same period and given the design features of this proposed action would reduce or continue grazing similar to current levels, there would be no substantive cumulative effects to bald eagles or their habitat as a result of this proposed action.

Determination

The effects of the proposed actions would have some effects to the habitat of bald eagle prey, primarily waterfowl, in the project area. Project design features would serve to improve prey habitat relative to the current situation. Therefore, it is determined that the proposed activities in Alternative 1 may affect individuals of northern bald eagles, but are not likely to result in a trend towards federal listing or loss of species viability.

Alternative 2

Direct, Indirect and Cumulative Effects

No grazing or any of the other actions proposed in Alternative 1 would take place under this alternative. Meadow and valley vegetation would not be subject to annual decreases in height and/or abundance as a result of annual grazing. As such, no annual decrease in residual vegetation would occur, and there would be no potential for trampling of waterfowl nests. This would result in enhanced waterfowl habitat which may increase waterfowl populations within the project area.

Northern Goshawk

The project area contains all or parts of 10 goshawk protected activity centers (PACs). The nest locations of 8 of these sites are within the allotment boundaries.

Goshawks nest in stands with greater canopy cover, greater basal area, and greater numbers of large diameter trees, less shrub/sapling/understory cover and fewer numbers of small diameter trees. Nest sites are generally on gentle to moderate slopes and high canopy cover was considered the most consistent structural feature across studies of goshawk nesting habitat (USDA 2001). Studies also indicate that goshawks prefer to forage in mature forests with canopy closures of 40% or greater and select for forests with a high density of large trees, high canopy closure, high basal areas and open understories (Squires and Kennedy 2006).

Alternative 1

Direct and Indirect Effects

There would be no effects to the structure of forested nesting habitat as a result of this alternative. Effects of livestock grazing would be in relation to habitat of goshawk prey, such as golden-mantled ground squirrels, Douglas' squirrels, chipmunks, American robins, Steller's jays, northern flickers and other woodpeckers. These prey species tend to prefer open-canopied stands (10-39% canopy cover) with large trees that provide a productive understory of grasses and shrubs, which could be utilized as forage by livestock. However, goshawks tend to select denser canopied stands with high densities of large trees for foraging. Understory forage in this habitat is sparse, so livestock are not attracted to these denser stands. Goshawks cover large areas when foraging, including dense forested stands and upland areas distant from primary range where livestock would graze. Therefore, for most goshawk foraging habitat, livestock grazing within this allotment would not present a negative effect.

The decommissioning of waterholes, stabilization of a headcut and range fencing, as included within the proposed action would likely have little effect on goshawk prey habitat, being located within or on the margins of large, non-forested valleys and not impacting forested habitat. One range fence, proposed on Ashurst Mountain, travels through forested areas but due to an Integrated Design Feature that limits tree felling to trees less than 10 inches dbh, this proposed fence line would not impact goshawk habitat.

Proposed aspen enhancement projects would directly benefit goshawk prey habitat. The proposed activities would result in healthier aspen communities, and in time, a greater density of aspen trees as new suckers become mature stems. Enhancement of aspen communities within goshawk foraging areas are important for woodpeckers and other goshawk prey. Woodpeckers have been found to be far more abundant in aspen habitat than non-aspen forest. Therefore, aspen treatments such as those proposed within the project area should, in time, enhance goshawk prey abundance.

Cumulative Effects

The goshawk cumulative effects analysis area was retained at the project boundary. The cumulative effects analysis area was not extended beyond the allotment boundaries due to lack of effects to the structure of forested goshawk habitat, and because the areas of primary range (where most of the proposed actions would occur) are primarily the interior of large non-forested valleys that have little direct value as goshawk habitat.

The aspen enhancement projects would serve to ameliorate cumulative, long-term negative impacts to aspen communities as a result of a long history of fire exclusion and livestock grazing. As discussed above, these restorative actions would improve goshawk prey habitat.

Within the allotment area, silvicultural and fuels-reduction treatments including the construction of Defensible Fuels Profile Zones have served to open forested canopies that had become closed due to long-term vegetative trends resulting from a long history of livestock grazing and fire suppression. Often an increase in grasses and other understory vegetation occurs in these thinned areas, especially after prescribed fire. Golden-mantled ground squirrels, a primary prey species of goshawks, generally are most abundant in open, pure stands of ponderosa and other pines, which provide a microhabitat element for golden-mantled ground squirrels. These past projects may have increased potential prey populations that are associated with open-canopied forests.

Snag felling as a result of on-going personal-use woodcutting would result in an on-going reduction in snags within the project area. Since the Pine Creek Allotments Project does not directly involve felling of snags, this project would not represent a cumulative effect in regard to snag availability.
The aspen enhancement projects and project design features would serve to address long-term vegetative trends and improve prey habitat relative to the current situation. Thus, this project would not represent a substantive cumulative effect to goshawks or their habitats within the cumulative effects analysis area.

Determination

The actions proposed under Alternative 1 would not have substantive direct, indirect or cumulative effects to goshawks or their habitat. The primary action relative to goshawk habitat is to re-authorize and continue grazing within this allotment, a practice that has been on-going in the area for over 100 years. There is no evidence that this century's old land use has been contributing to a trend towards listing or a

loss of viability of this species on the Forest, and if project actions and design features are implemented, prey habitat within the project area would improve relative to the existing condition. Therefore, it is determined that the proposed activities in Alternative 1 may affect individuals of northern goshawks, but are not likely to result in a trend towards federal listing or loss of species viability.

Alternative 2

Direct and Indirect Effects

There would be no direct effects to current habitat conditions as a result of this alternative. Due to lack of annual grazing, no annual reductions in vegetative height or density would result. This would confer a benefit to goshawk foraging habitat within the allotment area and provide additional herbaceous cover and food for small mammals like golden-mantled ground squirrels, Belding ground squirrels and chipmunks, and birds. However, because goshawks are considered to select mature forests with higher canopy closures as foraging habitat, this may not result in a substantive increase in prey for foraging goshawks.

Under this alternative, aspen sprouts would not be subject to livestock browsing, thus aspen regeneration in some stands would be more successful in maturing to larger size classes. Understory forbs and grasses would not be affected by annual grazing. Overall ecological functioning of aspen communities would improve and would benefit goshawks by providing high valued habitat for woodpeckers and other avian prey species. However, ongoing conifer encroachment would continue to be a risk factor for aspen stands.

Greater Sandhill Crane

Alternative 1

Direct and Indirect Effects

The ability of cranes to nest at any of the nesting sites within the project boundaries is often dependent on annual precipitation and water levels within reservoirs, shallow lakes or wet meadow areas. The Pine Creek Valley wetland and Ashurst Lake, being the sites with the most dependable aquatic habitat from year to year, tend to be the most reliable locations for crane nesting.

Potential effects of cattle grazing to greater sandhill cranes include possible reductions in small mammal prey abundance, loss of residual vegetation important for hiding cover of young cranes, and potential nest abandonment and trampling of young.

Potential for nest abandonment is highest early in the nesting season during incubation, especially at high stocking rates. Sandhill crane eggs on the Eagle Lake RD generally hatch by early June. While livestock may enter the allotments as early as May 15 (drought years), in normal precipitation years the potential for nest abandonment is low due to crane nests generally being built in several inches of water and away from actual shorelines. Thus, livestock early in the season would not be expected to wade out and directly disturb or trample active nests.

Potential trampling of young is highest when young are less than 5-6 weeks of age and is also highest for cattle herds containing yearlings versus cow/calf pairs. Because the allotments would generally be grazed by cow/calf pairs, the potential for trampling is less, but some potential for trampling by livestock would conceivably exist.

Residual vegetation for hiding cover is important for young cranes until they are approximately 10-12" tall, and the denser, more matted the vegetation the better for concealment. About 10" stubble height was thought to be sufficient to provide cover (Carrol Littlefield, personal communication). Within the proposed action the allowable use in the Pine Creek Valley wetland area would be to maintain a 6-inch stubble height. If this standard is monitored, and livestock are moved when it is met, then a greater amount of residual vegetation would result in this area compared to the existing condition and provide better hiding cover.

The numbers of cranes on the ELRD have increased since surveys in 1930 and may have increased since the 1980s. During these time periods, active livestock grazing was taking place on these allotments. Therefore, while grazing may reduce concealment cover, current ongoing grazing has not been sufficient to prevent the increase in population from occurring.

Other associated projects like the aspen treatments, headcut restoration and waterhole projects would likely have little effect on sandhill cranes or their habitat.

Cumulative Effects

The cumulative effects analysis area was expanded from the project area to include the entirety of the sandhill crane nesting area at Squaw Valley. The analysis area was not expanded beyond this due to the lack of overlap of the project boundaries with any other known nesting area or other area of unique importance for this species. Livestock grazing is the primary management activity affecting sandhill crane nesting habitat.

Several proposed treatments (aspen treatments, waterhole decommissioning) address long-term effects arising from historical management actions. In addition, within the allotment area, silvicultural and fuels-reduction treatments have and will continue to occur as projects authorized under other NEPA documents. These thinning treatments, followed by prescribed fire, serve to open forested canopies that have closed due to long-term vegetative trends. As a result of these actions, there should be an increase in grasses and other understory vegetation in these thinned areas. An increase in this herbaceous vegetation, especially when adjacent to primary range, may draw livestock into the uplands and away from riparian areas, thus reducing the degree of grazing within riparian sandhill crane habitat.

Livestock grazing is the primary management action that is occurring within sandhill crane nesting habitat in the cumulative effects analysis area. The proposed action recommends actions that would reduce grazing in some areas so the proposed project would not represent a negative cumulative effect to sandhill cranes or their habitat.

Determination

Given the above analyses, the proposed livestock grazing would provide slightly more concealing cover for sandhill crane young than currently. Other actions would confer some benefit to primary crane nesting habitat, primarily in the area of the Pine Creek Valley wetland. Therefore, it is determined that the proposed activities in Alternative 1 may affect individuals of sandhill cranes, but are not likely to result in a trend towards federal listing or loss of species viability.

Alternative 2

Direct and Indirect Effects

Annual livestock grazing is the primary management action occurring within sandhill crane nesting habitat within the project area. Under the No Action alternative, no livestock grazing and none of the associated activities as described under Alternative 1 would take place within the project area. As a result, annual vegetative growth would not be grazed, there would be no annual decreases in concealment cover for sandhill crane young, and no potential for the trampling of young by livestock.

Pallid Bat, Fringed Motis, Townsend's Big-Eared Bat

Alternative 1

Direct and Indirect Effects

There would be no effect of the proposed action to roost habitat for these three species which includes trees with cavities, caves or cave analogs, and talus habitats. The primary source of effects would be the indirect effect of livestock grazing on insect prey abundance as a result of grazing. The diet of all three bat species are arachnids and insects. Pallid bats feed mostly by gleaning large terrestrial arthropods (e.g. scorpions, crickets, grasshoppers and beetles) from the ground. Moths and beetles are primary prey items of fringed myotis and Townsend's big-eared bats that glean prey from vegetation and hawk insects in the air.

Livestock grazing could affect bats if grazing resulted in altered plant species composition and abundance, degradation of riparian habitats, or changes in abundance of prey items. Actions that provide a greater diversity and abundance of grasses, forbs and shrubs will likely enhance bat prey populations. Large moths and butterflies depend on non-coniferous and flowering plants as their host plants. Because these moths and butterflies, as well as other insects, provide critical linkages in terrestrial food webs, the abundance and diversity of these plant types, and thus the abundance and diversity of the insects they support, is important for insectivorous bat species.

Short-term, light to moderate livestock grazing, particularly during late summer, fall, or winter, typically does not negatively impact grass/shrub communities. However, heavy or long-term grazing conducted throughout the spring and early summer tends to result in a negative impact. Native herbs, grasses, and the butterflies and moths that depend on these plants, may be greatly reduced or in some cases eliminated

by such grazing. Livestock grazing in excess of the standards and guidelines that establish allowable use may cause at least localized reductions in larval food plants and thus reductions in moth and other insects relative to what would exist in a non-grazed condition. The number of available flowers can also be reduced due to being trampled in areas of concentrated use, such as around stockponds located within meadows.

A number of design features contained within the proposed action such as retention of 6 inches of stubble height along the edge of the Pine Creek Valley wetland, fence projects and aspen treatments would reduce grazing intensity in localized areas. While some reductions in flowering plants is unavoidable, such as near watering locations, the proposed action would likely result in some increase in moths and other insects that would be available as bat prey.

Associated proposed actions like aspen treatments should also benefit this group of species. Fencing and removing conifers from aspen stands, and managing grazing to meet utilization standards would allow them to successfully regenerate. In time, an increase in successful regeneration would result in a greater number of mature aspen stems, which would provide an increase in potential maternity roost trees for pallid bats. Meeting standards and guides or otherwise preventing over-browsing within these communities would also serve to reduce grazing on grasses and forbs within these aspen communities, providing for a greater abundance of understory plants and associated insect populations, including moths.

Cumulative Effects

The Pine Creek Allotments Project area boundary was considered sufficient as a cumulative effects analysis area for these three bat species because, 1) no spatially-oriented standards and guidelines or limited operating periods are associated with this species, 2) all three species form maternity colonies and thus individuals do not have defined spatial territories that can be mapped or assessed, and, 3) there are no known areas within or adjacent to the analysis area that represent unique habitat opportunities for these species that would warrant expanding the project area.

The proposed associated treatments would help address long-term vegetative trends in the aspen enhancement areas, such as increasing conifer densities as a result of fire suppression. Excessive shading by conifers and excessive utilization by livestock has through time reduced the number of large stems in the aspen stands by preventing aspen regeneration from successfully replacing mature stems as they die. The proposed treatments as well as the allowable use utilization standard would allow the aspen regeneration to successfully replace larger aspen trees as they die, and would ensure perpetuation of aspen in this area. The proposed aspen treatments should improve pallid bat habitat in the long-term by increasing the number of aspen stems large enough in diameter to serve as potential roost trees.

As described by Miller and Hammond (2007) fire exclusion and resulting densification within historically open ponderosa pine forests has caused a decreased diversity and abundance in understory vegetation such as shrubs, grasses and herbs. As the authors discuss, thinning dense forests can help restore the understory vegetation community and enhance moth and butterfly populations. Within the cumulative effects analysis area, silvicultural and fuels-reduction treatments including the construction of Defensible Fuels Profile Zones have and will continue to occur as projects authorized under other NEPA documents are implemented. These treatments serve to open forested canopies that have closed due to long-term vegetative trends. As a result of these actions there should be an increase in grasses and other understory vegetation in these thinned areas, and an increase in moth and butterfly species.

The proposed action proposes elements that would reduce grazing intensity relative to the existing condition and other treatments, such as silvicultural treatments are also occurring within the analysis area that would increase understory vegetation, this project would not represent a substantive cumulative effect to these three bat species or their habitat.

Determination

While the proposed grazing may cause a reduction in herbaceous vegetation that in localized areas may be sufficient to reduce moth and other insect populations, the project would confer some benefit to the prey habitat for these species relative to the existing condition, and the aspen enhancement treatments in time would increase large aspen stems and potential pallid bat roost trees. Therefore, it is determined the proposed activities in Alternative 1 may affect individuals of pallid bats, fringed myotis and Townsend's big-eared bats but are not likely to result in a trend towards federal listing or loss of species viability.

Alternative 2

Direct and Indirect Effects

Little immediate change would likely occur in the existing habitat values for these species. Over time, the lack of annual grazing especially in riparian areas would allow herbaceous plants to grow to the extent that annual growing conditions allow. With no livestock-induced reductions in flowering plants, moth and butterfly species and other insects would likely increase, thus providing greater numbers of insect prey to these three bat species. In addition, aspen stands within the project area would benefit by a cessation of livestock grazing and would be able to regenerate more successfully. An increase in successful regeneration would in time increase the number of aspen stems large enough to provide pallid bat roosts, however these stands would remain at risk due to conifer encroachment.

Western Bumble Bee

Alternative 1

Direct and Indirect Effects

Studies show that livestock grazing can alter the structure, diversity, and growth habits of the vegetation community, which in turn can affect the associated insect community. Grazing can harm pollinator habitat through destruction of potential nest sites or existing nests and contents, direct trampling of adult bees, and removal of food resources. Intensity of livestock grazing can negatively affect bee species richness. Livestock grazing during periods when floral resources are scarce (such as mid- to late-summer) may result in insufficient forage being available to bumble bees that may forage into late September in some areas (Hatfield et al 2012). Grazing is usually beneficial at low to moderate levels and when the site is grazed for a short period followed by ample recovery time. Grazing can be used to maintain open, forb-dominated plant communities that support a diversity of pollinator insects with the correct combination of timing and stocking intensity.

Thus, adhering to utilization standards and guidelines and promptly moving livestock when utilization standards are met, as opposed to allowing livestock to graze longer into the season on a given pasture, would be an important component in managing for this bumble bee species. Meeting standards and guides related to utilization levels within this alternative may help reduce impacts to mid- and late-summer floral resources. The number of available flowers can also be reduced due to trampling in areas of concentrated use, such as around stockponds located in meadows.

Studies of bee communities in aspen stands found that bumblebees dominated aspen stands more strongly than in the surrounding prairie habitat. Not only was the relative abundance of bumble bees greater in aspen, but the species composition of the bumble bee community differed from grasslands, with four species being significantly associated with aspen. Floral resources were considered a potential driver of observed differences between habitats. In late summer, aspen stands had higher blooming plant richness than the surrounding habitat, as well as a distinctive floral community. Preservation of remnant aspen stands is important because it appears to sustain a diverse and abundant bee fauna by providing important habitat and floral resources for certain species of bumble bees that are not available in other nearby habitats, at least in late summer. The proposed removal of conifers from aspen stands, controlling browsing, and adhering to grazing utilization standards and movement of livestock would enhance the ecological functioning of these communities. There would be less grazing within the aspen communities within the project area, providing for a greater abundance of understory plants and floral resources available to bumble bees in late summer when floral resources in aspen stands may be more important to bees. Thus, the proposed aspen treatments should benefit this species.

Cumulative Effects

The cumulative effects analysis area was retained at the project level for this species because 1) no spatially-oriented standards and guidelines or limited operating periods are associated with this species, 2)

there are no defined spatial territories that can be mapped or assessed, and, 3) there are no known areas within or adjacent to the analysis area that represent unique habitat opportunities for these species that would warrant expanding the project area.

Within the analysis area, livestock grazing is the only ongoing management action that affects the meadows and valleys where this species has been detected, or which represent potential suitable habitat.

As discussed within the bat species account, Miller and Hammond (2007) stated that fire exclusion and resulting densification within historically open ponderosa pine forests has caused a decreased diversity and abundance in understory vegetation such as shrubs, grasses and herbs. As the authors discussed, thinning dense forests can help restore the understory vegetation community and enhance moth and butterfly populations. Within the cumulative effects analysis area, silvicultural and fuels-reduction treatments including the construction of Defensible Fuels Profile Zones have and will continue to occur as projects authorized under other NEPA documents are implemented. These treatments serve to open forested canopies that have closed due to long-term vegetative trends resulting from a long history of livestock grazing and fire suppression. As a result of these actions, there should be an increase in grasses and other understory vegetation in these thinned areas, and thus a potential increase in floral resources for this species.

Livestock grazing represents the primary management activity affecting the habitat for this species. The proposed actions would reduce grazing intensity relative to the existing condition. Other treatments, such as silvicultural treatments have occurred within the analysis area that would increase understory vegetation and potentially floral resources, thus this project would not represent a substantive cumulative effect to this species or its habitat.

Determination

While the proposed grazing may cause a reduction in herbaceous vegetation that could reduce floral resources, the project would confer some benefit to habitat for this species and the aspen enhancement treatments would have the potential to improve floral resources. Therefore, if the proposed projects and other design features are implemented, it is determined the proposed activities within Alternative 1 may affect individuals of western bumble bees but are not likely to result in a trend towards federal listing or loss of species viability.

Alternative 2

Direct and Indirect Effects

Little immediate change would likely occur in the existing habitat values for these species. Over time, the lack of annual grazing especially in riparian areas and wet meadows would allow herbaceous plants to grow to the extent that annual growing conditions allow. Western bumble bee habitat would benefit without livestock-induced reductions in flowering plants. In addition, the ecological functioning of aspen

communities within the project area would be improved by the cessation of annual livestock grazing, and these aspen communities would likely provide greater habitat value for this species. However, these aspen stands would remain subject to ongoing conifer encroachment.

DETERMINATION

As discussed above, Alternative 1 would impact habitat values to some extent of each of the species listed below, but it also proposes design elements that would improve habitat conditions relative to the existing condition. Therefore, it is determined that Alternative 1 may affect individuals of the following FS Sensitive species, but is not likely to result in a trend towards federal listing or loss of species viability:

- Northern bald eagle, northern goshawk, greater sandhill crane, pallid bat, fringed myotis, Townsend's big-eared bats, western bumble bee

Gray Wolf

Alternative 1

Direct and Indirect Effects

The potential direct and indirect effects of livestock grazing to wolves and their habitat primarily revolve around potential depredation of livestock by wolves and subsequent control measures (whether lethal or non-lethal) and the effects to prey habitat and availability.

The potential for depredation and subsequent control actions exists. One of the impacts of livestock grazing to wolves is when lethal control is authorized following depredation of livestock. No lethal control in California, where wolves remain federally listed as endangered, would be expected to be authorized at this time. Therefore, authorized lethal control would not be a cause of mortality on the Forest at this time. As discussed by the CDFW (Kovacks et al 2016b, p. 115) non-lethal techniques for livestock protection include fladry (the hanging of numerous flags along ropes a short distance above the ground, often along fence lines), radio-activated guard boxes, livestock guard dogs, range riders, notification of livestock producers when radio-collared wolves are near their property and livestock, and hazing (such as the use of air horns, spotlights, or cracker shells). Some of these techniques (e.g., fencing) are used to defend specific places, while others (e.g., range riders) are generally used to protect free-ranging animals roaming over large areas.

Several integrated design features (IDFs) were incorporated into the proposed action that were designed to help reduce potential conflicts between livestock management and wolves in the event an active den or rendezvous site is located in or within one mile of an allotment. These included the relocation of salt blocks, suspension of allotment management activities within one mile of the den or rendezvous site from April 1 through August 31, and the removal of sick or injured livestock as soon as feasible when within three miles of a den or rendezvous site. In case of suspected livestock depredation, the permittee would

notify Forest Service personnel with the location and other details so that the proper agencies could be notified. While the above IDFs were designed to reduce the potential for conflict, some non-lethal control actions may eventually be implemented within the project area. Such non-lethal actions would temporarily disturb and displace wolves which is the objective of such measures. By potentially reducing disturbance to and depredation of livestock, such measures would ease management issues related to wolf presence on actively grazed rangelands and may reduce the potential of future proposals for lethal control measures.

An indirect effect of livestock grazing is the effect grazing may have on native ungulates, how they select foraging areas when cattle are present or absent, and how that affects the availability of large prey species for the wolf. Cattle and elk diets overlap the most in summer with the primary overlap being for graminoid plants, while mule deer consume more forbs and shrubs than either elk or cattle. Elk and mule deer select higher elevations and steeper slopes than cattle, especially during spring and summer. Cattle differ from native herbivores by avoiding steeper slopes and high elevations, particularly during spring and summer. Indicating that elk and mule deer may be displaced from certain areas based on physical characteristics of the landscape when cattle are present.

District observations of elk numbers and range, State population estimates of deer, and pronghorn population monitoring, all indicate increased populations of these native ungulates during ongoing livestock grazing within the project area and during the time the Lassen Pack members have been known to be on the Eagle Lake District. Whether deer, elk and pronghorn populations would be greater today without livestock grazing is not known, but it is apparent that all three species have increased in number in recent years while livestock grazing has been on-going within the project area.

Moderate livestock grazing may be beneficial to wild ungulates when elk or mule deer preferentially select feeding sites where previous cattle grazing has improved forage palatability. Cattle can have a positive effect on pronghorn in areas dominated by grasses by removing the grasses and increasing the availability of forbs and shrubs preferred by pronghorn. Adhering to the allowable utilization levels as proposed, and timely removal of cattle from pastures when allowable use standards are approached, would help prevent substantive effects of livestock grazing, not only by allowing more forage for elk and deer but also by reducing the duration of any competitive displacement.

Other associated actions proposed in this alternative (aspen enhancement, fence building, water hole management, etc.) would likely not result in substantive effects to the gray wolf. Implementation of these actions would conform to the same limited operating period when within a mile of a den or rendezvous site, and thus disturbance would not be a substantive impact. Aspen enhancement would in time improve forage conditions for elk and deer by providing enhanced foraging opportunities. However, the aspen

stands are small. The small acreage, scattered over a large landscape, would not be expected to be sufficient to result in any measurable increases in elk or deer populations within the project area.

No new roads would be created by this project, and no roads would be decommissioned. As a result, existing road densities would be unaffected by this project. Given this, as well as the IDFs included within this alternative that restrict activities within one mile of a den or rendezvous site, this project should have no substantive change or effect to existing security habitat for gray wolves.

Cumulative Effects

The cumulative effects analysis area for this project was retained at the project area boundaries for the same reasons the action area boundaries were also retained at the project area. Areas adjacent to the project area boundary were evaluated for expanding the analysis, but were retained at the project area boundaries due to:

- the project area is at the northern fringe of the Lassen Pack's territory (as indicated by radio-collar locations of the Lassen Pack female wolf, Pete Figura, pers. comm, 2018).
- the project area is more than 10 miles distant from the 2017 den location.
- no rendezvous sites were located within one mile of the project area boundaries.
- the three well-used rendezvous sites of the Lassen Pack in 2017 were located south of Highway 44 and more than 5 miles distant from the project area boundaries.

Private lands within the cumulative effects analysis area are limited to two parcels within Champs Flat that are privately owned range land, and eight parcels of private timberland. The two parcels of rangeland total approximately 560 acres and are annually grazed by cattle. These two parcels within Champs Flat are surrounded by primary rangeland on USFS administered lands within Champs Flat. The livestock grazing on the private parcels has been a historical, on-going use on these lands, as has the livestock grazing on the surrounding USFS lands. Potential effects of this livestock grazing on the two private land parcels would be similar as analyzed for the proposed livestock grazing on USFS administered lands under Alternative 1.

The eight parcels of private timberland total approximately 2,860 acres. No planned timber sales within these private timber lands have been identified. Private timber lands tend to be less densely forested than the surrounding USFS administered lands due to different management philosophy. As such, these upland parcels may provide more upland forage for deer and elk, on average, than would the surrounding USFS timberlands. If the presence of livestock did displace deer or elk, such areas would provide upland forage opportunities for elk and deer during the time they were displaced.

On USFS administered lands within the cumulative effects analysis area, most past projects have been timber sale-related activity. These past timber sale areas often have thinned forests sufficiently to have resulted in an increase in the diversity and abundance of understory vegetation. As with foraging opportunities represented by private timberlands, these previously harvested areas provide upland foraging areas for deer and elk, and provide areas for the two species to forage if they are displaced by livestock within the analysis area. As more forest-thinning or forest-restoration projects are identified within the analysis area, more upland forage should become available for native ungulates.

Use by people within the analysis area is generally restricted to personal-use woodcutting, hunting and recreational travel by motorists driving USFS Road 21 from Highway 44 to Eagle Lake. Very little camping or outdoor recreation outside of hunting occurs in this area; it is not widely visited. Management of livestock by permittees and their employees has been on-going for many years in this area, and nothing proposed in Alternative 1 would cause a substantive increase in such activity over what has occurred in the past. Implementation of other projects as proposed (aspen enhancement, waterholes, fencing) would cause pulses of increased activity and noise during the implementation of these projects, but all are small in scale and thus disturbance would be localized. In addition, all these activities would adhere to limited operating periods if within a mile of a den or rendezvous site. Thus, this project would not represent a substantive cumulative effect in regard to noise and disturbance to gray wolves within the analysis area.

The aspen enhancement projects and project design features would serve to address long-term vegetative trends and would improve prey habitat relative to the current situation. Thus, this project would not represent a substantive cumulative effect to the gray wolf.

No other specific on-going or reasonably foreseeable future project or projects have been identified such that this project and its potential effects would incrementally represent a substantive cumulative effect on either gray wolves or their habitat within the analysis area.

Alternative 2

Direct, Indirect and Cumulative Effects

The removal of grazing and associated activities, including lack of the other actions proposed in Alternative 1 would serve to reduce the potential for human-caused disturbance in the project area, as well as reduce the potential for wolf-livestock conflict.

Livestock grazing would still occur on the two private parcels of located within Champs Flat. So while there would remain some potential for livestock-wolf conflict within the cumulative effects analysis area, without the grazing on surrounding USFS administered lands this potential would be much less under this alternative.

Aspen communities within the analysis area would remain vulnerable to conifer encroachment as a result of fire suppression and browsing by elk and deer. Removal of livestock grazing may allow some stands to regenerate more successfully, providing better forage for native ungulates. However, due to the small overall acreage involved, this would not be expected to result in measurable increases in deer or elk populations.

Determination

As discussed above, Alternative 1 would affect habitat values of prey species and may result in disturbance to individuals. Alternative 1 proposes design elements that would improve habitat conditions relative to the existing condition and contains provisions to avoid disturbance to den and rendezvous sites. Therefore, it is determined that Alternative 1 may affect but is not likely to adversely affect the gray wolf and would have no effect on designated critical habitat for the gray wolf.

Threatened, Endangered, and Sensitive (TES) Aquatic Species

There are no aquatic federally listed species under the Endangered Species Act (ESA) with ranges within or downstream of the project area, so no aquatic Federally listed species would be affected from the proposed Pine Creek Allotments Project. Thus, no consultation was necessary.

Due to the project area being outside the range of the species, or due to the lack of suitable habitat or habitat components in the project area, it is determined that the action alternatives would have no effect on the following Federally Listed threatened or endangered aquatic species or their critical habitat:

- Central Valley steelhead DPS (*Oncorhynchus mykiss*), Central Valley chinook salmon ESU (*Oncorhynchus tshawytscha*), Delta smelt (*Hypomesus transpacificus*), Winter-run chinook salmon ESU (*Oncorhynchus tshawytscha*), Sierra Nevada yellow-legged frog (*Rana sierrae*), California red-legged frog (*Rana aurora draytonii*), Shasta crayfish (*Pacifastacus fortis*), conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*)

Due to the project area being outside the range of the species, or the lack of suitable habitat or habitat components in the project area, or due to the lack of effects to suitable habitat, it is determined that the action alternatives would have no effect on the following Forest Service Sensitive aquatic species:

- Pacific lamprey (*Entosphenus tridentatus*), Foothill yellow-legged frog (*Rana boylii*), Hardhead *(Mylopharodon conocephalus*), Cascades frog (*Rana cascadae*), Black juga *(Juga nigrina*), Kneecap lanx, *(Lanx patelloides),* Great Basin Rams-horn *(Helisoma newberryi newberryi),* Scalloped Juga *(Juga occata),* Topaz Juga *(Juga acutifilosa),* Montane Peaclam *(Pisidium ultramontanum),* Nugget pebblesnail *(Fluminicola seminalis),* Goose Lake Redband Trout *(Oncorhynchus mykiss).*

One Region 5 Forest Service Sensitive Aquatic Species, the Eagle Lake rainbow trout (Oncorhynchus mykiss aquilarum) has a portion of its migration corridor for spawning located within the project area. Effects to the Eagle Lake rainbow trout are discussed below.

Eagle Lake rainbow trout

Alternative 1

Direct and Indirect Effects

Direct effects to Eagle Lake rainbow trout from implementation of this alternative are unlikely due to timing of streamflow and cattle use in the allotments. The portion of Pine Creek that flows through the project area is intermittent and does not support perennial flow. The six riparian pastures are well fenced and either excluded, rested, or used as short-term pass-through areas. Alternative water sources in the Lake Unit provide clean fresh water with good access for cattle and are preferred by livestock over the lake shore due to the muddy, sediment conditions where the water had receded. The proposal to realign a fence in Champs Flat to allow for stream meander and bank stabilization, as well as to prevent cattle from accessing that area along Pine Creek would reduce potential effects from livestock trampling.
Potential indirect effects to Eagle Lake rainbow trout habitat that could occur from the proposed action are changes in the following measurement indicators (habitat elements): flow duration and intensity, water quality, habitat connectivity (i.e. barriers) and resting habitat for migrating fish (i.e. pools).

Streamflow (duration and intensity)
Implementation of the proposed action is not anticipated to result in measurable changes to streamflow in Pine Creek. Watershed improvement projects include stabilizing small headcuts near Stanford Headquarters, filling and recontouring five waterholes on tributaries to Pine Creek, and fencing two waterholes to pump water to troughs. The proposed improvements are site-specific, but would be expected to improve connectivity to natural floodplains, disperse flows onto adjacent meadows and reduce concentrated flows, and extend the period of stream flow, in localized areas. It is possible that flow effects could extend downstream to Pine Creek. However, given the small nature of the changes relative to the flow of Pine Creek such changes are highly unlikely to be measurable.

Water Quality

Changes in water quality can occur from chemical contamination, physical degradation and activities affecting water temperature. No chemical contamination or activities affecting water temperature are expected from the proposed action.

The watershed improvement projects (both the repair of the headcut and the water hole improvements) would reduce streambed erosion and increase the density of bank and streambed vegetation. The waterhole improvements are designed in part to restrict or discourage cattle from concentrating use in sensitive riparian areas. Reduced erosion and cattle activity near Pine Creek would directly reduce turbidity and suspended material that could include animal waste or phosphorus, however water quality improvements would likely be unmeasurable.

Habitat connectivity

The project does not propose any new crossings on Pine Creek, therefore connectivity for Eagle Lake rainbow trout would not be affected.

Resting habitat for migrating fish (i.e. pools)

Watering holes within the channel of Pine Creek represent the largest threat to resting habitat being impacted by sedimentation because they can encourage concentrated use of nearby vegetation, prevent vegetative cover establishment, and cause direct erosion of streambanks. The project proposes to alter channel morphology directly by filling and re-contouring the one waterhole in Champs Flat on Pine Creek. While this waterhole may provide a resting pool, restoring it will provide benefits that will increase the quality and stability of remaining resting pools and natural resting areas. The remaining waterhole improvements would not directly affect resting habitat in Pine Creek.

Proposed grazing activities would have only a minor effect on resting habitat because of the existing and proposed fencing along Pine Creek, the short term pass through use of riparian pastures, riparian pasture rest schedules, design features that encourage utilization away from Pine Creek, and the utilization standards within the riparian pastures. Grazing in the non-riparian pastures would not be expected to contribute any sedimentation that degrades resting habitat because of the porous flood plain soils that impede suspended sediment from reaching Pine Creek.

Cumulative Effects

The cumulative effects analysis area for the Eagle Lake rainbow trout is the five sixth-level subwatersheds in the Pine Creek allotment project that contain the migration corridor for Eagle Lake rainbow trout. Activities within a subwatershed have the potential to impact the Eagle Lake rainbow

trout habitat within the project area, while activities outside the subwatersheds are unlikely to have an effect.

Since there are no direct or indirect effects to streamflow, water quality, or habitat connectivity from Alternative 1 there would be no cumulative effects by this alternative for these habitat elements.

For resting habitat, no current projects are expected to increase sedimentation that may impact resting habitat, however past grazing is considered to have caused streambank erosion and channel widening (Pustejovski, 2007), that reduce the depth and suitability of resting pools. The Pine Creek Restoration Project (2014) is awaiting permitting from the necessary regulatory agencies and will implement activities including filling and recontouring four dugout in-channel waterholes on Pine Creek. The Confluence Meadow Restoration Project (in process) would also implement watershed improvements with the purpose to improve meadow function and increase duration of flows by reconnecting the creek with its historic floodplain. Both projects would contribute to improvements of fish habitat and complement the proposed actions in this project. Alternative 1 proposes restoration and utilization strategies that will gradually reduce the cumulative effects to resting habitat.

Determination

For the Eagle Lake rainbow trout in Pine Creek, it is determined that Alternative 1 may affect individuals, but is not likely to cause a trend toward federal listing or a loss of species viability because Pine Creek is intermittent throughout the project area and livestock grazing typically occurs after seasonal peak flows have ceased. Direct effects to Eagle Lake rainbow trout from implementation of this alternative are unlikely due to cattle utilization regimes or exclusion prescribed for the riparian pastures of the allotments. The watershed improvement projects are meant to restore more natural hydrological conditions, improve riparian conditions, and reduce or in some cases, eliminate erosion directly related to cattle grazing activities. Eagle Lake rainbow trout population viability is supported through artificial means and cannot rely on natural reproduction in the foreseeable future due to reasons beyond the scope of this project.

Alternative 2

Direct and Indirect Effects

As with Alternative 1, this alternative would likely not result in direct effects to the Eagle Lake rainbow trout. Under this alternative there would be no effects to streamflow, water quality, or habitat connectivity since there would be no projects implemented that affect these elements. For the resting habitat element, the no grazing alternative does not propose to alter Pine Creek channel morphology directly so no direct changes to resting habitat would occur. This alternative would result in a moderate

localized reduction the risk of sedimentation to Pine creek due the removal of cattle and potential cattle crossings and watering in the project area.

Cumulative Effects

Since there are no direct or indirect effects to streamflow, water quality, or habitat connectivity from Alternative 2 there would be no cumulative effects to these habitat elements. Existing habitat degradation may be reduced or slowly reversed due to vegetative regrowth and bank stabilization. Existing infrastructure in the stream and flood plain would continue to impede all habitat elements from returning to a natural state due to their effect on flood plain connectivity and erosion.

Determination

For the Eagle Lake rainbow trout in Pine Creek, it is determined that Alternative 2 would have no effect on Eagle Lake rainbow trout because it authorizes no activities and has no direct, indirect, or cumulative effects.

Maps

1 – Pine Creek Allotments

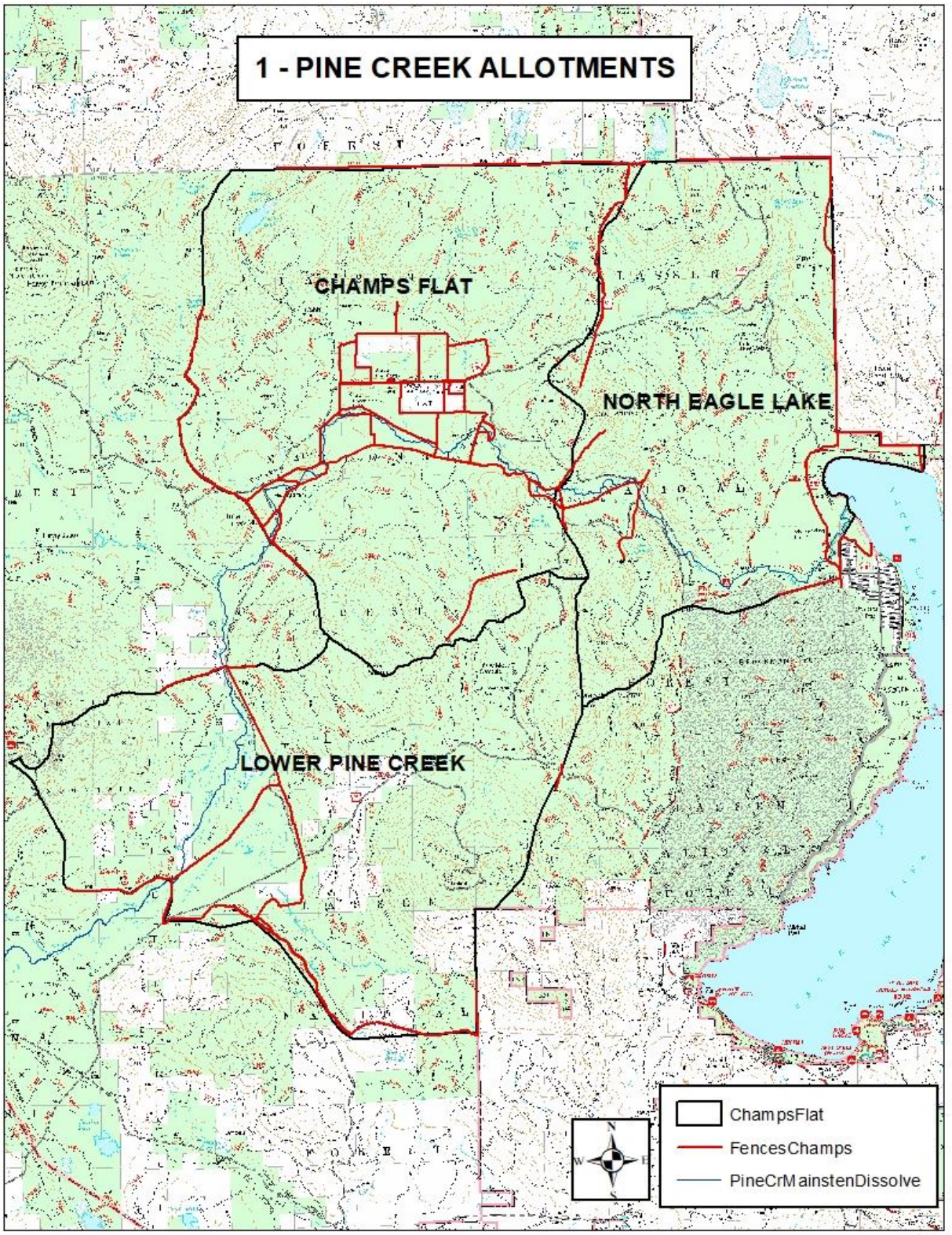
2 – Pine Creek Allotments and Pastures

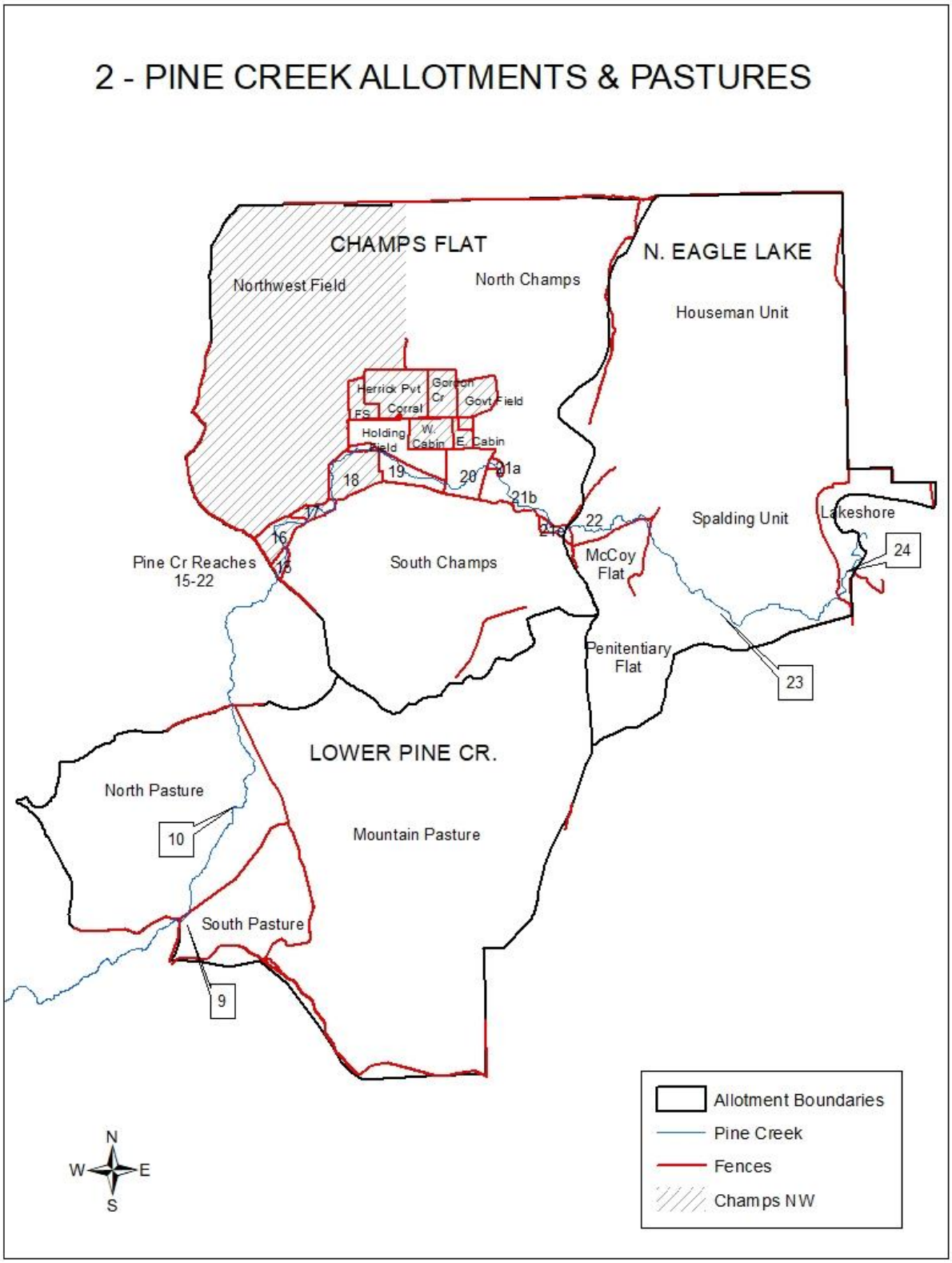
Separate Attachments:

3A – Champs Flat Proposed Actions

3B – North Eagle Lake Proposed Actions

3C – Lower Pine Creek Proposed Actions


1 - PINE CREEK ALLOTMENTS
CHAMPS FLAT
NORTH EAGLE LAKE
LOWER PINE CREEK
ChampsFlat
FencesChamps
PineCrMainstenDissolve
07142020


2 - PINE CREEK ALLOTMENTS & PASTURES
CHAMPS FLAT
Northwest Field
North Champs
N. EAGLE LAKE
Houseman Unit
Herrick Pvt
Corral
Gorrich Cr
Govt Field
FS
Holding Field
W. Cabin
E. Cabin
18
19
20
21a
21b
17
16
15
22
21c
Spalding Unit
Lakeshore
24
Pine Cr Reaches 15-22
South Champs
McCoy Flat
Penitentiary Flat
23
LOWER PINE CR.
North Pasture
10
Mountain Pasture
South Pasture
9
N
W
E
S
Allotment Boundaries
Pine Creek
Fences
Champs NW

APPENDIX A - Improvement list and tentative implementation schedule

Estimated implementation is dependent on available resources, including personnel, funds, and in the case of waterhole treatments, timelines for necessary permits.

FENCE IMPROVEMENTS by ALLOTMENT				
Allotment/Map	**Location**	**Township, Range, Section**	**Planned Actions**	**Estimated Implementation**
Champs Flat/3A	#1 Champs Flat /Harvey Boundary	T33N, R9E, Sec. 8, north to T33N, R9E, Sec. 4	Build boundary fence using 4-strand barbed wire	2022 (2)
	#2 Pine Creek Bradford Crossing to McCoy Flat	T33N, R9E, Sec. 26	Re-locate existing fence further away from stream channel	Fit in with larger projects as able
	#5 Stanford Headquarters	T33N, R9E, Sec. 34	Fence the meadow around the old barn, headcuts, and arch sites	2022 (2)
	#6 Aspen stand protection	T33N, R9E, Section 27	Re-locate existing fence around adjacent aspen stand.	Coordinate with aspen treatments along Pine Cr.
	#12 Removal of old drift fence	T32N, R10E, Secs 6, 12	Remove and dispose of old posts and wire	2023
N. Eagle Lake/3B	#3 & #4 McCoy Flat aspen (33N94)	T33N, R10E, Sec. 33, T32N, R10E, Sec. 4	Move existing fence and gate, install cattleguard to create one aspen exclosure instead of several small exclosures.	2023
	#9 Spalding Gathering Pasture	T33N, R10E, Secs. 24 & 25	Alternate use with Lakeshore Pasture (2 of 3 years)	2021(1)
	#10 Spalding Corral	T33N, R10E, Sec 25	Construct corral facility for gathering/loading small groups of livestock	2021(1)
	#11 Lake Pasture Troughs Fence re-alignment	T33N, R10E, Sec 36	Re-locate existing troughs out of arch site and re-align fence	2023
L. Pine Creek/3C	#7 Water Gap at 105 Road culverts	T32N, R9E, Section 32	Construct wire fence around existing waterhole to provide access from both pastures to provide alternative water in lieu of springs at Mapes Cow Camp.	2024
	#8 Mapes Cow Camp	T32N, R9E, Section 33	Fence the springs and pipe water to troughs or develop alternative water.	2024

WATERHOLE TREATMENTS by ALLOTMENT				
Allotment/Map	**Location**	**Township, Range, Section**	**Planned Actions**	**Estimated Implementation**
Champs Flat/3A	Stanford Headquarters	T33N, R9E, Sec. 34	Re-contour channel grade; stabilize channel with straw wattles or rip-rap; fence (#5)	2022
	Shay's Hole	T33N, R9E, Sec. 12 NE 1/4	Re-contour and fill existing waterhole and create new one on edge of meadow further south	As permits are acquired
	Champs Flat	T33N, R9E, Sec. 23	Re-contour and fill; need maintenance on WDCF28 to ensure reliability	As permits are acquired
	Gordon Aspen	T33N, R10E, Sec. 18 NE 1/4	Fence off existing water hole; pump to trough to reduce livestock use adjacent to aspen	As permits are acquired
N. Eagle Lake/3B	McCoy Flat (Pine Cr Reach 22)	T33N, R10E, Sec. 32	Adjust management 1st, (ie. small #s, overnight use), then consider need for off-stream water source in north pasture	2021
L. Pine Creek/3C	Martin Springs	T32N, R9E, Sec. 33	Fence springs; pump to trough or use well located in Cowbell	2024 w/ Mapes Cow camp fence
	Summit Camp and adjacent meadow	T32N, R9E, Sec. 24 SE ¼	Re-contour and fill 14; need maintenance on WDLP11 to ensure reliability (reconnect well and troughs); *improve borrow hole at Antelope LO junction*	As permits are acquired
	East of Summit Camp	WDLP10: T32N, R10E, Sec. 19 NE 1/4; WDLP05: T32N, R10E, Sec. 20 W 1/2	Re-contour and fill 10; need maintenance on WDLP05 to ensure reliability *(deepen)*	As permits are acquired
	21 Rd near Cowbell	T32N, R9E, Sec. 34	Remove & re-contour dugout waterhole	As permits are acquired
ASPEN TREATMENTS by ALLOTMENT				
Allotment/Map	**Location**	**Township, Range, Section**	**Treatments**	**Estimated Implementation**
Champs Flat/3A	Antelope Valley	T33N, R9E, Sec 36	Handthin[i] <10" dbh; hinge[ii]	2022
	SE of Million $$ Bridge	T33N, R10E, Sec 30	Handthin <10" dbh; Hinge	2025

	Stanford Hdqts	T33N, R9E, Sec 34	Handthin < 20” dbh; fence[iii]	2022
	Pine Cr Reaches	T33N, R9E, Sec 27	Handthin <10” dbh; Hinge (03)	2024
	SE of Shays Hole	T33N, R10E, Sec 7	Handthin <10”dbh; expand existing fence	2024
	McCoy Flat	T32N, R10E, Sec 5	Handthin <10”dbh; monitor for fence	2025
	SE of Million $$ Bridge	T33N, R10E, Sec 30	Handthin <10” dbh; Hinge	2025
	Stanford Hdqts	T33N, R9E, Sec 34	Handthin <10” dbh; Hinge (08)	2022
	Pine Cr Reaches	T33N, R9E, Sec 27	Handthin <10” dbh; Fence (02)	2024
Champs Flat/3A (NW)	Ashurst Lake	T33N, R9E, Secs 3, 4	Handthin <10” dbh; fence	2023
	Ashurst Lake	T33N, R9E, Secs 3, 4	Handthin <10” dbh; hinge	2023
	SE of Ashurst Lake	T33N, R9E, Sec 10	Handthin < 20” dbh; Monitor for fence	2023
	SE of Ashurst Lake	T33N, R9E, Sec 10	Handthin <10” dbh; Monitor for fence	2023
	Ashurst Lake	T33N, R9E, Secs 3, 4	Handthin <10” dbh; fence	2023
	Ashurst Lake	T33N, R9E, Secs 3, 4	Handthin <10” dbh; expand existing fence	2023
	North of Ashurst	T33N, R9E, Sec 3	Handthin <10” dbh; Hinge	2023
N. Eagle Lake/3B	East end of McCoy Flat	T33N, R10E, Sec 33	Handthin <10” dbh; Hinge	2025
	McCoy Flat *(portion on west side of 33N94 road) Burned in Whaleback Fire 2018*	T33N, R10E, Sec 33	Handthin <10” dbh; *Realign existing fence, move gate south*	Coordinate with fence re-alignment 2022 or 2023

[i] Hand thinning - conifers would be hand felled, hand-piled outside the aspen root system and burned or lopped and scattered.

[ii] Hinge barriers are created by felling live or dead conifers 3-4 feet above the ground while maintaining stem connection to the stump.

[iii] Temporary fencing would be four-strand barbed wire to exclude cattle, or wildlife exclosure to exclude deer.