

United States Department of Agriculture
Forest Service – Pacific Southwest Region

Biological Assessment

Pilgrim Vegetation Management Project

Shasta McCloud Management Unit
Shasta-Trinity National Forest
Siskiyou County, California
June, 2005

Modified for errors and additional clarity in November and December, 2005
All but minor modifications are highlighted in yellow

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Executive Summary

This Biological Assessment is used for consultation under the Endangered Species Act with the Fish and Wildlife Service and to aid in biological analysis for the project Environmental Impact Statement (EIS). This BA determines that the project may effect, but is not likely to adversely affect the northern spotted owl, and will affect designated critical habitat. The Project affects very low capability dispersal habitat for the northern spotted owl and occurs in Critical Habitat Unit CA-2.

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I. INTRODUCTION

This Biological Assessment presents the likely effects of actions to federally listed threatened, endangered or proposed species from the proposed action, the Pilgrim Vegetation Management Project (the Pilgrim Project or the Project). This document is prepared in accordance with current policy and follows standards established in Forest Service Manual direction (FSM 2670.32). Plants are covered in separate biological assessments.

The species considered in this document are:

Endangered:

- winter-run chinook salmon, Sacramento River, (*Oncorhynchus tshawytscha*)

Threatened

- Bald eagle (*Haliaeetus leucocephalus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Delta smelt (*Hypomesus transpacificus*)
- Central Valley steelhead (*Oncorhynchus mykiss*)
- Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*)

Candidate Species

- Central Valley fall/late fall-run chinook salmon (*Oncorhynchus tshawytscha*)
- Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)
- Fisher (*Martes pennant*)

Critical Habitat

- Designated Critical Habitat for the Northern Spotted Owl

Context of the Assessment

This assessment bases discussions at three scales:

- 1) **The Net Project Area** includes only proposed units totaling 3,780 acres.
- 2) **Project area** or “the Project” includes the 1.5-mile buffer on each unit totaling about 7,700 acres.
- 3) **Watershed** includes Ash and Upper McCloud 5th field watersheds.

SPECIES DROPPED FROM FURTHER ANALYSIS

Long-term monitoring efforts indicate no **bald eagle** activity. The Project is over 10 miles from the nearest eagle habitat¹ at McCloud Reservoir². Consequently, this species will not be further discussed except in the determinations section.

¹ Measured from National Forest map. Mangels, et.al.

² Bald Eagle Recovery Plan, p. 13.

There is no year-round aquatic habitat in the area. Ash creek is an intermittent stream that is unlikely to support fish consistently. However, in the Spring of 2005, Curt Babcock of California Fish and Game reported that a brown trout had been sampled from Trout Creek in Section 13, T. 41 N, R 1, just north of the project area. Dennis Caine, who works for Hancock Industries noted that he had seen Trout Creek wet almost every year up to the Coonrod Flat Road (40N12). Curt Babcock recommends that this be considered intermittent Redband Trout refugium habitat from the current designation/ford in section 12 to the Coonrod Flat Road and that they may want to further evaluate the habitat downstream of the Pilgrim Creek Road.

Although the Redband Trout is a species of concern to the U.S. Fish and Wildlife Sacramento office, and a sensitive species for the Shasta-Trinity National Forest, it is not currently a listed nor a candidate species. It will not be further considered in this document, but will be addressed more thoroughly in the Biological Evaluation. There are no other listed or candidate inland fish species in this area. All listed inland fish species are eliminated from further consideration.

Anadromous fish are unable to pass above the Shasta Dam. Therefore, anadromous fish such as the Central Valley steelhead (*Oncorhynchus mykiss*), the Central Valley spring-run chinook salmon (*Oncorhynchus tshawytscha*) or the Central Valley fall/late fall-run chinook salmon (*Oncorhynchus tshawytscha*) will not be found above the dam. Shasta Dam also effectively blocks any possible migration into the project area by the Delta Smelt (*Hypomesus transpacificus*) and blocks any possible downstream effects the project might initiate. The flat, dry terrain of the project area also makes sediment transport to the McCloud River highly unlikely. These species will not be discussed further in this document.

The Western yellow-billed cuckoo is only found in an isolated section of the northern Sacramento Valley. The project is outside of the current known range of this species, and will not be further considered in this document.

II. CONSULTATION TO DATE

Heidi Crowell, biologist, with the U.S. Fish and Wildlife Service (Red Bluff Field Office), visited the Project area in October 2004 and discussed the proposed actions with the team. Danielle Chi (USFWS, Red Bluff Office) was e-mailed a draft of this document on February 17, 2005; subsequent comments were incorporated into this document and are pertinent to species associated with late-successional conifer habitat. Danielle Chi observed and discussed it in the field with the team in October 2004. The Project was adopted by Crowell in 2005.

The biologist downloaded final updated species lists for the three 71/2 minute USGS quads covering the entire Project Area on June 20, 2005 from the Sacramento Fish and Wildlife Office website. Updated species lists may be accessed at http://sacramento.fws.gov/es/spp_list.htm on June 20, 2005. The species lists used in this document were last updated on May 27, 2005 and may be found in hard copy in the

project file and appended to this document as Appendix A. These species lists are recorded as document numbers:

050620102902 Kinyon
050620120953 McCloud
050620121138 Rainbow Mtn.

III. CURRENT MANAGEMENT DIRECTION

The Shasta-Trinity National Forest (STNF) maintains full compliance with the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD). The Regional Forester approved the STNF Land and Resource Management Plan (LRMP) April 28, 1995. The ROD was incorporated into the LRMP.

The LRMP adopts the recovery plan for the bald eagle (USDI 1986) and manages the spotted owl (as well as other species associated with older forest habitat) under the direction provided in the ROD. The STNF expects the network of areas withdrawn from active timber management (e.g., wilderness, LSRs, riparian reserves, and administratively withdrawn areas) and the protection of riparian reserves (including wet meadows) to provide habitat adequate to maintain viable, well-distributed populations (or potential habitat for colonization) of species. The LRMP establishes retention levels for snags, logs and hardwoods to maintain important habitat components across the landscape.

IV. DESCRIPTION OF THE PROPOSED ACTION

PROJECT ASSESSMENT AREA OVERVIEW

The Pilgrim Timber Sale proposes to manage approximately 3,780 acres of timber land and meadow in the McCloud Flats area of the Shasta-McCloud Management Unit of the Shasta Trinity National Forest. Timber harvest will occur on about 3,485 acres, leaving the remaining 295 acres for meadow restoration, and aspen release. As you will see later in the BA, the only anticipated effect will be to NSO dispersal and critical habitat. For your convenience, I have included in the table below the total actual and potential dispersal habitat acreage affected in each treatment category (Table 1 comparisons follow on page 6).

Table 1: Acreage Summary by Harvest Treatment

Vegetation Treatment	Approximate Acres	NSO Actual Dispersal Habitat: Acres Affected	Additional NSO Potential Dispersal Habitat: Acres Affected
Ponderosa Pine Dead Stand Harvest and Replant	375	0	317.87
Knobcone Dead Stand Harvest and Replant	10	0	10.2
Thinning, standard pine prescription to 40% canopy	1200	700.55	136.66
Thinning to 30-40% canopy for disease control	1075	672.50	240.46
Thinning, old tree release to 40% canopy	40	40.56	0.29
Older Plantation Biomass Thinning	785	48.55	481.11
Aspen Release	20	0	0
Dry Meadow Restoration	275	54.03	64.3
Approximate Totals	3,780 Acres Treated	1,516.19 Actual dispersal acres affected	1,250.89 Potential dispersal acres affected

McCloud Flats is known as the generally level area north of McCloud River Canyon, south of Fons/Trout Creek Butte, west of Black Fox Mountain/Kinyon Ridge, and east of Shasta Forest Subdivisions. The Project affects less than 6 square miles in the middle of 70 square miles of the flats.

The Project area has been harvested and grazed for over 100 years. Most trees on the flats are 55 to 110-year-old ponderosa pine, with remnant isolated older trees. Scattered black oaks occupy sloping sites and some rock outcrops. Scattered small stands of aspen are usually decadent due to conifer overgrowth.

All treatments are on level coarse-textured volcanic soil, so erosion hazards are low.

Ash Creek flows perennially in the LSR. The entire flow sinks in the Project and emerges at big springs on the McCloud River.³ Surface runoff to the McCloud River

³ Stream photo report, in Project files.

occurs only during exceptional runoff events, usually at 3 to 6 year intervals.⁴ These peculiar “sandy ditch” streams yield almost no riparian vegetation or habitat.

All of the Project area has been designated as critical habitat for the northern spotted owl and is outside of adjacent Elk Flat LSR and distant from all other LSRs.

PROPOSED ACTION

The Project proposes to harvest green, dead and dying trees, and manage associated forest fuels on approximately 3,780 acres. This alternative is responsive to the proposed purpose and need for the action as documented in the Environmental Impact Statement.

Manage stand densities for forest health, timber growth and timber yield:

Ponderosa Pine Dead Stand Harvest and Replant: Harvest and re-plant approximately 375 acres of 95-110 year old pine stands suffering from root disease and bark beetle mortality. Diseased trees that have chlorotic foliage, ragged and fading crowns, poor needle retention and/or evidence of successful insect attacks will be removed. About 40% of the trees in these stands are already dead and have already lost their foliage. These trees are scattered throughout the stands and in small pockets. If available, retain up to 6-10 trees/acre of healthy and full crowned overstory trees. All species other than pine will be favored as leave trees as their long term viability will be greater. Retention areas should include the largest, oldest (where available) and healthiest live trees, decadent or leaning trees and hard snags occurring in the unit. Leave all healthy white fir, incense-cedar, sugar pine, Douglas-fir and black oak. Tractor pile and burn residual slash. Re-plant with mixed species in shaded areas, ponderosa pine in open areas.

Knobcone Dead Stand Harvest and Replant : Remove dead and dying knobcone pine on approximately 10 acres. Tractor pile and burn residual slash and re-plant with ponderosa pine.

Thinning, Standard Pine Prescription to 40% Canopy: On approximately 1200 acres of 75-95 year old pine stands, remove trees that are dead or dying from insects, root disease and/or drought. In remaining overstocked areas thin to a density of approximately 120-150 square feet of basal area. Regeneration needs due to past and present tree mortality will be evaluated post harvest and if necessary areas larger than 1 acre in size would be planted.

Thinning to 30-40% Canopy for Disease Control: On approximately 1075 acres of 75-110 year old pine stands which are currently experiencing more mortality than the “thinning” stands, remove trees that are dead or dying from insects, root disease and/or drought and then thin any remaining overstocked areas to approximately 100-120 square feet of basal area. Regeneration needs due to past and present tree mortality will be evaluated post harvest and if necessary areas larger than 1 acre in size would be planted.

⁴ Hydrologist’s Report, in Project Files

Thinning, Old Tree Release to 40% Canopy: On approximately 40 acres, thin two-storied mature stands to reduce understory ladder fuels and maintain older trees, especially pines.

Older Plantation Biomass Thinning: On approximately 785 acres of 25-45 year old pine stands, thin from below to a spacing of approximately 20 feet between trees. About 90% of these stands are older plantations. The resulting product will be primarily wood chips.

The thinning prescriptions include the removal of trees in the lower crown classes as well as diseased or dying trees. The objective is to concentrate growth on the residual trees in the stand with the best ability to respond to less competition. These trees have larger crowns and a greater capacity to photosynthesize and increase their crown size as more light reaches the full crown.

Aspen Release: Release aspen from conifer competition on approximately 20 acres by removing conifers within 100-150 feet of aspen.

Dry Meadow Restoration: On approximately 275 acres, adjacent to historic dry meadow areas, remove small diameter (< 14" dbh) conifers and thin remaining overstory trees to 80 sq ft/acre of basal area to restore the openness of these dry meadow areas.

Manage Forest Fuels: The thinning treatment stands will be examined post harvest and if necessary treatments will be prescribed to reduce excessive accumulations of down wood and deep needle slash by underburning on approximately 200 acres and/or tractor piling on approximately 700 acres.

Road Management: Following harvest and fuels treatments approximately 9 miles of existing roads will be closed with either guardrail barricades or earth berms. An additional 2.6 miles of existing roads will be decommissioned and removed from the forest road system. In addition, approximately .3 miles of new road construction will be needed to reduce skidding distance in one harvest unit.⁹ (See Appendix _ for a list of specific road management actions).

The timber harvest outputs from the entire Project are anticipated to be approximately 40-50 thousand CCF (25-30 MMBF) of sawlog products, plus approximately 3,000 tons of biomass products.

The proposed action includes borax application on stumps to prevent the spread of *annosus* root disease, but does not include the use of herbicides or other pesticides.

The Project includes some use of existing unclassified roads in order to keep skidding distances under one quarter mile. The Project may include the construction of short lengths of low-standard road and the closure or decommissioning of other roads. A roads analysis will be completed prior to the draft EIS.

MITIGATING MEASURES INCORPORATED INTO THE PROJECT DESIGN

Snags and woody debris: The LMP requires viable populations of cavity-nesting species.⁵ The standard is 1.5 standing dead trees and 6 down logs per acre.

Snags larger than 15 inches DBH which are not hazardous to operations⁶ will be left standing at two per acre average⁷ where possible. Snag marking recommendations from the biologist will be given to crews. Continual disease problems are expected to recruit more snags and deadwood.

Fuel hazard tonnage will not be exceeded, but LMP deadwood requirements will be met or have the prospect of existing snags meeting minimum log levels. Less than six logs per acre, with less than 1.5 standing snags per acre, does not meet standards. Where not met, one 10x10' minimum slash pile or equivalent 5-15 tons maximum large deadwood per acre will be left unburned where tractor piling is prescribed. Cull logs greater than 20 inches large end diameter will not be included as timber. Slash piles within 200' of a system road may be burned to reduce hazards or improve visual quality.

Hardwoods: The LMP directs that hardwoods be managed for sustainability.⁸ Aspen trees and sprouts within the Project area will be favored by removing *all* competing conifers within 100-150'. Aspen groves will be fenced after harvest if cattle grazing limits tree growth. Oaks, which are relatively uncommon in the flat portions of the Project area, will be protected or released using contract provision B6.32. Pole-sized or larger oaks will be released from conifer competition to both crown and root.

Monitoring

Staff and ID team will review the preparation prior to advertisement. The administrator will conduct weekly inspections of harvest operations. The soil scientist, biologist, and/or hydrologist will be consulted if problems occur with management practices. ID team and staff will monitor during and after implementation. The range officer/biologist will monitor aspen/oak/prescribed burns and require fencing if overgrazing occurs.

⁵ LMP p. 4-62.

⁶ Snag Hazard Rating is based on Region 1 ID Team Guidance for Reserve Trees, in Project files. Type 1 and type two trees are generally retained. Since faller/buncher and skidder operators work within an enclosed cab, some type 3 trees may be retained on a case by case basis.

⁷ Draft Snag Guidelines for the Shasta-Trinity National Forest, in Project files.

⁸ LMP, p. 4-67

V. EXISTING ENVIRONMENT

PROJECT AREA, LAND ALLOCATIONS, AND CRITICAL HABITAT:

The Project area lies entirely within Matrix in Management Area 2 and spotted owl Critical Habitat Management Area CA-2. Late-Successional Reserve (LSR) Elk Flat (RC-360) is adjacent⁹ to the northwest edge. The LRMP requires maintaining viable populations of species associated with late successional and old growth (LS/OG) forest ecosystems. The strategy provides for connectivity between large areas set aside for these species while maintaining over 15% of federal forestland in LS/OG conditions. Conditions between LS/OG areas must allow dispersal of associated species that must be able to move through these habitats.

Connectivity or Dispersal Habitat

Connectivity or dispersal habitat for northern spotted owls is usually defined as conifer stands meeting at least "50-11-40" conditions (i.e., an average overstory tree diameter of at least 11 inches DBH and at least 40 percent canopy closure over at least 50% of the landscape) (Thomas et al. 1990). Locally, owl calling crews report that owls seldom cross gaps over 200' wide when approaching a caller¹⁰. This level of connectivity is not available in almost all of the Project area, and likely never existed due to soils and climate causing large natural openings of hundreds of acres such as Coonrod, Pilgrim, and Elk Flat. Overall, the two watersheds do not meet this standard. Although there are stands that have overstories meeting an 11-inch dbh and a 40% canopy closure, they do not cover 50% of the landscape. Appendix D notes the estimated coverage of dispersal habitat based on timber type approximations. Averaged over the two watersheds, stands that could contribute to suitable dispersal habitat covers about 17% of the two watersheds, and could potentially cover only about 26%.

The "50-11-40 rule" (50% coverage, 11" average dbh and 40% canopy coverage) is admittedly artificial. Spotted owls do not cease to disperse if canopy closure drops below 40%, nor do they move freely above 40% canopy.¹¹ The 50-11-40 rule was developed to provide foresters with a standard by which to manage matrix lands to facilitate the dispersal of juvenile owls. Density is a linear relationship; owls appear to progressively avoid more open areas and forage/disperse more readily in progressively more closed canopy (up to a certain point), primarily because they successfully catch prey there¹² or avoid predation. Individual owl behavior varies, but this pattern is distinctly true to the species. Therefore, preservation of an open forest structure to provide minimal connectivity is preferable to the loss of entire stands due to natural mortality from insect

⁹ The Draft Recovery Plan for the Northern Spotted Owl proposed to drop this area from critical habitat, but this was never made final. Maps from Federal Register 1992 are in the GIS system.

¹⁰ Mangels, also reported by S. Thomas and K. Piper, et.al., in over 20 years of local owl calling.

¹¹ Bart 1995 p. 943

¹² Ward 1998 p. 79.

and disease infestations. McCloud Flats presents this choice. Considerable numbers of green trees must be removed if the choice is to preserve minimal connectivity rather than passively allow epidemic levels of insect and pathogen infestation to eliminate forest cover in significant pockets on the flats.

Based upon habitat mapping, aerial photograph interpretation, and field reviews, owl connectivity through the Ash Creek and McCloud Flats 5th Field Watershed appears discontinuous¹³. “McCloud Flats,” as used in this document, is the generally level area between the foot slopes of Mt. Shasta to Black Fox Mountain and north of the McCloud River Canyon. Natural openings, natural open forests, and old harvested areas limit owl dispersal. High-elevation open forests unsuitable for dispersal limit connectivity to or from further north¹⁴. Therefore, any connection with the marginal Klamath owl habitats is extremely unlikely to nonexistent.

Historically, spotted owls were not likely to have used the McCloud Flats for nesting, roosting, foraging or dispersal. Pioneer diaries of 1860-90 describe Ash Creek (McCloud Flats) as a desert six miles wide and/or without trees¹⁵. A 1911 photo from Black Fox shows the flats below as grassland with some brush and small trees¹⁶. The 1944 aerial photographs confirm it as open and unsuitable¹⁷ for nesting, roosting, foraging or dispersal. While journals are anecdotal observations, they provide historical evidence that the flats and the Project area were historically unsuitable habitat for spotted owls. Large natural openings and discontinuities of tree cover persist to the present (see Appendix E for an example).

Blackstain and annosus root disease limits probability of dense, old growth forests occurring on the flats. Through creation of natural openings or salvage harvesting, the disease creates large open areas¹⁸ that would limit owl dispersal westward through the flats¹⁹. **All attempts to maintain dense tree canopy in the flats have failed for fifty years, as diseases and bark beetles thrive under moderate to dense canopy conditions.**²⁰ The condition is well known and unfortunately widespread all over the flats. Therefore, any sustainable connectivity habitat is historically and pathologically very unlikely in the flats unless it is open canopy. Spotted owls disfavor such cover,²¹ but juveniles may use it occasionally.²²

Although Kinyon north to Black Fox and northwest on +20% slopes is likely to be the most viable long-term dispersal route northward around the flats, it is a very poor one. The better route west is undoubtedly through the McCloud River

¹³ Aerial Photo files 1995-2003.

¹⁴ USGS Topographic Quadrangle Maps: Kinyon, Rainbow Mountain, Ash Creek Butte.

¹⁵ McCloud Flats Watershed Analysis page 57.

¹⁶ District Archeology files.

¹⁷ Aerial Photo files 1944. Report on Ecological Succession in McCloud Flats by Mangels on file.

¹⁸ Personal communication from district foresters: Funk, Campbell, Steel, Fleming.

¹⁹ Ibid Watershed analysis: 16, 17.

²⁰ Peter Angwin and Dave Schultz, forest pathologist and entomologist, in years of field trips to flats.

²¹ Ward 1998 p.79.

²² Bart 1995 p. 973

Canyon, four miles south of the Project and highway 89. This route can be followed on any STNF map 1/2" to the mile or larger scale that shows the McCloud River. The most likely route for owl dispersal around McCloud Flats is the direct southern route along the north slopes of McCloud River Canyon and west. The poorer northern route is north on Kinyon Ridge in the LSR, avoiding the Project area with its large plantations and natural openings, then north over Black Fox Mountain. From there, the route becomes progressively poorer west into the Elk Flat LSR and then possibly west over Snowman Summit. CA-4 about ten miles south is the best route of all.

Survey results indicate owls can enter Elk Flat LSR. A pair of owls were found on Black Fox in 2002. In 2003 an owl was located in Elk Flat LSR, and may have come from the west. In 2004 all owls were gone. These events may be explained by poor habitat conditions forcing owls to move on in search of adequate prey and habitat.²³ Elk Flat LSR habitat is low capability. The Project area is naturally considerably worse habitat.

In 1990 a tagged owl dispersed from upper McCloud River Canyon to near Mt. Shasta City, likely over Snowman Summit²⁴. We know dispersal occurs, but not the route or success rate. The southern route (four miles south of the Project area) was most likely.

The Project has very little value for owl dispersal, yet is designated critical habitat. It may retain 30-40% canopy in larger ponderosa pine and fir where the site currently has over 40% canopy. Due to root disease, blackstain fungi, and bark beetle mortality, sustaining denser canopy cover has been impossible in the flats. Type 4N could be temporarily achieved in some small areas with unusual circumstances, but history indicates such canopy density has seldom existed on the flats due to fires, dry soils, insects, and disease. Consequently, the flats are naturally very low-capability dispersal habitat at its best. **Future management will likely be directed to maintaining very open pine forests, because chronic diseases have not allowed sustained development of canopies over 40% density.** This means that spotted owl dispersal can be sustained by management, but only at low levels.

Spotted owls typically forage on flying squirrels and wood rats. The district biologists and foresters have never seen wood rat nests or flying squirrels on the flats in over twenty years and the habitat appears unsuitable for these two primary prey species.²⁵ The CDF mammal narratives indicate the flats are not in the range of dusky-foot wood rats, but Simons²⁶ has found bushy-tailed wood rats in fair habitat outside the flats along Mud Creek. Flying squirrels do not inhabit such open dry park-like pine forests²⁷ and have never been found in the flats, though they occur at higher elevations around it.²⁸ This habitat is thus suspected to have a very poor prey base and thus be unattractive to raptors. Since owls often hunt where preferred prey is abundant,²⁹ it would be very unlikely for

²³ Ward 1998, Forsman 2000, Carey 1992,

²⁴ District biology TES files.

²⁵ Mangels, personal comm.

²⁶ Simons 1997

²⁷ CDF WHR Vol. 3 Mammal narratives.

²⁸ Mangels 2005.

²⁹ Ward 1998, pages 88,89.

owls to forage and hence, disperse in such poor habitat as the Project area in the center of the worst habitat of McCloud Flats.

Based on our general knowledge of spotted owl habitat preferences and observation of vegetative types, we can reasonably presume that dispersal is regionally important and practically limited on SMMU.

Between Mt. Shasta and Shasta Lake presumably lies the only dispersal route connecting coastal and Sierra spotted owls. To the north and south of SMMU is the unsuitable grassland/shrub habitat of Shasta Valley and Central Valley. Owls dispersing east-west from this Project area must use Snowman Summit at 4500' elevation below Mt. Shasta or stay further south away from the Project, in areas where opportunities are considerably better at lower elevations with less fragmentation. McCloud Flats and its wider connections to larger owl populations are thus marginal compared to southern areas.

While this paragraph exceeds the usual watershed level of analysis, it shows the uniqueness of SMMU for dispersal, and a general irrelevance or low priority of the Project area to population connectivity in northern California.

Late-Successional and Old-Growth Habitat (LS/OG):

DEFINITION

LS/OG habitat is defined as mature stands(having annual growth peaked) and /or old growth, usually 180-220 years old with moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags, heavy accumulations of wood, including large logs on the ground³⁰.

The *McCloud Flats Ecosystem Analysis 5th Field Watershed* presents a limited analysis of current forest conditions related to LS/OG habitat. The Assessment Area does not include quality LS/OG and the Project is consistent with the recommendations for LS/OG retention. The analysis recommends increasing the growth of immature stands by all practical means, preserving forests for dispersal, enhancing diversity, and saving the largest trees available.

Determining Northern Spotted Owl Suitable Habitat

The Modoc Plateau, which includes the McCloud Flats, Goosenest and other areas, is a unique region for the northern spotted owl and presents some issues in developing reasonable appraisals of suitable habitat. Biologists generally predict spotted owl occurrence and define suitable spotted owl habitat in any one or a combination of four approaches:

- 1) documented presence of owls;

³⁰ Thomas et al. 1990

- 2) categorical inclusion of selected vegetation types from vegetation data, e.g. any class five Douglas fir type would be considered suitable nesting and roosting;
- 3) habitat capability models such as those developed as part of the California Wildlife Habitat Relations (WHR) System³¹ that allow for more site specific definitions such as dead and down woody debris, distance to water, etc., and
- 4) application of a validated model that predicts species occurrence based on a tested relationship between habitat variables, e.g. the spotted owl baseline model.

Although owl survey work is the most reliable method of defining suitable habitat or predicting owl occurrence, it may take several years, is costly and is not necessarily infallible. Categorical inclusion, or the determination of suitable habitat based on a simple delineation of vegetation types, is the simplest and frequently the only available approach, particularly in large scale analyses.

Use of habitat capability models is only possible where biologists are able to survey site-specific habitat variables and evaluate their weighted importance. Specific validated models such as the northern spotted owl baseline are generally the most accurate over a large landscape, but are limited to the specific analytical boundaries of the validity testing. The McCloud and Goosenest areas are very different from the rest of the province and their unique nature excluded them from the strong relationship the baseline found between the best model and the probability of owl occurrence.³²

In other words, the Northern Spotted Owl Baseline Analysis was not a good predictor of owl occurrence in much of the McCloud or Goosenest areas. It tends to make errors of occurrence by predicting owls based on structural features (distribution of vegetation types and structures) in areas where surveys had consistently found no owls. In some areas, the baseline model predicts more suitable habitat in the area than owl occurrence would indicate, and in other areas, predicts fewer owls (much of the Goosenest).

Because of the addition of more variables to evaluate and the ability to factor in local experience in owl surveys, owl habitat capability models may be our best means of predicting owl occurrence without additional extensive survey work in the McCloud area.

The best habitat capability models currently available for the northern spotted owl in California are those created by the California Department of Fish and Game. These models were widely adapted for use by the Shasta Trinity National Forest in California in the 1995 Forest Land and Resource Management Plan and provide an objective description of habitat use as identified by a highly experienced group of wildlife biologists (Appendix G in the Shasta-Trinity Land and Resource Management Plan). This model adapts and addresses the special situations of the high elevation dry climate habitats in mixed conifer pine forests.

³¹ Laymon, Stephen A. and Reginald H. Barrett, 1982; California Department of Fish and Game, 2002; California Department of Fish and Game and California Interagency Wildlife Task Group. 2000.

³² Personal communications, Kelly Wolcott, Owl Baseline Team member and Lynn Roberts, Owl Baseline Team Leader, and Jeff Dunk, Principal Researcher on the NSO Baseline Project.

Although these models are old by current standards, and recent work has developed superior modeling in other areas³³, these are the best available for site-specific analysis in SMMU. Recent models deal with much lower elevations and wetter climates predominated by Douglas fir, a tree uncommon in high and dry McCloud habitats.

Habitat capability is defined in Appendix G of the Shasta-Trinity National Forest Land and Resource Management Plan (LRMP) (Appendix B). Twelve habitat factors are divided into high (preferred), moderate (minimum requirements for nesting), and low (marginal for occupancy, used for dispersal/foraging) capability. These factors are:

- vegetation types,
- seral stages,
- nest stand structure,
- nest stand size,
- home range suitable habitat acreage,
- home range total,
- snag density/size,
- distance to water from nest,
- slope %,
- slope aspect,
- dead/down material,
- food requirement, and
- disturbance.

The habitat capability models include these factors and allow the site specifics to determine their individual weight. Accordingly, the habitat capability model in Appendix G indicates that water or slope limitations may indicate an area is low capability or unsuitable for spotted owls.

Almost all factors must be met to some degree under each capability category to qualify, or it drops to a lower rating. Some interpretation is at the discretion of the local biologist, as some factors may be more important than others in some areas. In fact, some factors are limiting, creating unsuitable habitat no matter how 'suitable' forest structure may be.

For example, an area may have high capability in relation to vegetation type (old growth), stand structure, snags, and size, but have low capability or be unsuitable due to a lack of nearby surface water, a prey base, and its location on flat ground. These latter factors are more important in the McCloud area than what is typical in other areas of owl range.³⁴

Although unsuitable habitat is not listed in the model, when conditions for low capability are not fully met, the condition drops to unsuitable.³⁵ To be unsuitable, an area usually

³³ Raphael, et. al. 2002

³⁴ Simons, 1997 p. 1-20

³⁵ STNF-LRMP Appendix G

has canopy under 40%, below minimum snags, inadequate stand size, water (riparian) over a mile away, poor prey base, or excessive disturbance as the biologist interprets.

Distribution of Habitat in the Project area:

The following table compares Vegetation Typing acreages and Habitat Capability Model acreages and helps to explain low capability in the Project area. Using the habitat capability models presented in Appendix G of the LRMP, 1516 acres of timber classified as 3N, 4N or 4G (usually considered nesting, roosting and foraging habitat based on vegetation type) within the Project area are actually unsuitable under the habitat capability model. This is supported by more than 20 years of survey work in this area. Although these stands have been classified as 3N, 3G, 4N and 4G, they are not comparable to similarly classified stands found in moister areas of the forest. In addition, 216.62 acres of dead ponderosa pine stands are still classified as 3N, despite an average of 40% of the trees being already dead and devoid of cover foliage.

Table 2: Vegetation Database labeling Compared to Habitat Capability Modeling

	Nesting and Roosting	Nesting and Roosting	Foraging (sometimes nesting and roosting)	Dispersal (sometimes considered Foraging)	Total <u>Current</u> Dispersal Habitat Acres
Total Acres Treated (According to Vegetation Typing)	14.35 4G acres	0.01 4N Acres	0 3G Acres	1706.86 3N Acres	1721.22
Total Acres Treated (according to Habitat Capability Model)	0	0	0	1516.19 Dispersal <u>only</u>	1516.19

Discrepancy in 3N typing and stand characteristics are common in this area. In units on the flats, the tree distribution is very clumpy and non-uniform, often with under-one-acre patches of dense trees surrounded by non-forest. When these areas were originally typed for the LRMP database, a judgment call was made to average it all together as 3N. This focused foresters on commercial possibilities and stewardship responsibilities of the scattered large trees in the area, without accounting for the large gaps between the clusters. The final figures (1516 acres) also do not include the dead ponderosa pine that currently does not provide cover for dispersal (see Appendices B and C).

Species and Habitat Account:

NORTHERN SPOTTED OWL

Ash Creek and Upper McCloud Watersheds:

The spotted owl is associated with late-successional and old growth conifer forest³⁶. From a forest vegetation type or **structural** standpoint, the two watersheds include approximately 3,208 acres of 4N and 4G timber types, and 10,740 acres of 3G timber types for a total of 13,948 acres of 3G, 4N and 4G timber types. The watersheds also include 29,914 acres of 3N timber types that in other locations would likely be classified as foraging habitat. This acreage is based only on forest structure, and not on any other important requirements for suitable habitat.

As the foregoing paragraph shows, the watershed has very limited 4G and 4N forest types. Ash Creek Watershed has only about 18% of the watershed in suitable dispersal habitat and is only capable of maintaining about 27% of the watershed in capable dispersal habitat. Upper McCloud Watershed has only about 16% suitable dispersal and is only capable of maintaining about 25% in suitable dispersal habitat. Both of these figures are well below the 50% coverage that we have used as a guideline in the past (see Appendix D).

The project affects less than 1% of the available 4N and 4G timber types in the watersheds, 0% of the available 3G and about 5 % of the available 3N stands in the two watersheds. These are very small fractions of the watersheds.

However, as stated and argued above, the actual Project **contains no suitable nesting, roosting or foraging habitat** from a habitat capability perspective. Approximately 1502 acres of low-quality 3N timber type stands would be considered foraging habitat in other areas, and about 14 acres of the 4N and 4G timber types would be considered nesting and roosting, but they are so limited by the conditions of the flats, that we do not consider them as suitable northern spotted owl nesting, roosting or foraging habitat.

While multiple observations or sightings of owl pairs or singles define activity centers in this general area, many similar sites are now or usually vacant. Examples are Sugar Pine (in Elk Flats LSR) #215, Fons Butte #221, Cold Creek #214, Harris Mountain #218, Toad Mountain #223, Buck Mountain #224, and Lookout Point #222. These nearby examples are similarly limited in suitable acreage, are dry or semi-dry, and most are non-nesting activity centers. Only Lookout Point has had a reproductive year in the last five, most likely because it has an intermittent spring and the owls reproduced in a very wet year. All of these sites are outside of the project boundary and located on higher site areas, usually small mountains located in parts of the flats.

Surveys and Activity Centers:

³⁶ Ibid in 32.

Owl surveys over 20 years note similarities among activity centers in this watershed. The habitat is always limited and occupancy is very irregular³⁷. These sites are seldom reproductive, and usually vacant. Recent surveys in 2004, like all other surveys for 20 years, show no spotted owls within 1.3 miles of the Project area. None were ever expected due to the unsuitable and very low capability habitat, nor are owls expected in future surveys.

Black Fox Mountain and Elk Flat centers, and the owls that occasionally reside there are well over 1.3 miles outside the net Project area and will not be affected by the proposed Project. These centers are irregularly and seldom occupied and contain low to moderate capability habitat (the best in the watershed). The probability of owls in the more marginal, unsuitable, and very low-capability habitat (the worst in the watershed) of the Project area is very low.³⁸ This is not expected to change.

A single female appeared in 2003 in the long-vacant Elk Flat LSR activity center. Conditions for viable dispersal may therefore occasionally occur in this area. The female found at Black Fox in 2002 may have moved west into Elk Flat, but all owls disappeared in 2004. Similar records of occasional singles, disappearances, and no reproduction are typical of centers in this watershed. This appears primarily due to naturally poor habitat and extensive timber harvest associated with private industrial forest on checkerboard ownership patterns. Limited habitat tends to cause abnormal behavior patterns like nomadic wandering in spotted owls,³⁹ a classic case of avoidance of poor habitat.

Net Project Area:

The Project is on the central flats in historically unsuitable or marginal dispersal habitat. The tree distribution is clumpy and non-uniform, often with one-acre patches of dense trees surrounded by non-forest. Clumpy areas were averaged and mapped to 3N or 3P to consider the scattered large trees, but fragmentation is actually more severe than the database indicates. Limited riparian vegetation, flat ground, dry open meadows, and excessive fragmentation from logging and disease also contribute to unsuitability.

We may assume that owls occasionally disperse through the north area (including private land), but are unlikely to stay, even for a short time. The route further north through private land with more slope and at least limited water is more probable, but also low capability and heavily logged. This large expanse of low-capability habitat may explain total owl disappearances in 2004. Severe tree mortality in 2003-2004 contributed to it.

In summary, the best available habitat within and around the Project area has severe limitations that make this area unsuitable for nesting, roosting, and foraging. The conditions would also appear to make it poor dispersal habitat. The nearest activity centers are too far away, over highly fragmented and very low-capability habitat, and therefore the Project is unsuitable for foraging from usually unoccupied low-capability activity centers.

³⁷ District Biologist observations for 20 years of watching these sites.

³⁸ STNF-LRMP Appendix G, p. G-12 table, USGS Maps, Air Photos 1995.

³⁹ Carey, p. 240, 243

Goshawk predators occasionally nest in the LSR and on Black Fox Mountain. Since beetles destroyed the nesting trees of one marginal territory in the flats, neither remaining territory is near enough to affect any owl use in the Project. They may have some very slight effect on juvenile owls that would rarely risk dispersing through the Project.

VI. EFFECTS OF THE PROPOSED ACTION

DIRECT EFFECTS:

These are effects on owls that occur at implementation of the project. Surveys indicate owls once in Black Fox Mountain and Elk Flat LSR were non-breeding or single individuals. The Project area habitat is marginal, low capability and/or unsuitable for nesting and roosting based on Habitat Capability Models and field surveys for 20 years. Mobile, non-breeding owls are likely to avoid harvest operations in poor habitat and thereby not significantly modify their essential foraging, thermal regulation and other typical behaviors. Spotted owls are rarely present on Black Fox Mountain or Elk Flat. These centers are well over 1.3 miles away and will not be affected by the Project. Unoccupied moderate to low capability activity centers are very unlikely to generate owl activity in even lower capability or unsuitable habitat in a Project area outside a normal foraging radius from a center.

The Project area lies in unsuitable nesting, roosting and foraging habitat and very low capability dispersal habitat. This area is very highly fragmented, flat, appears to have no reasonable prey base, is heavily roaded with 4 miles per section, has limited or no water, and has no riparian vegetation. According to Habitat Capability Models, this area is unsuitable or very marginal low capability. Owls are therefore highly unlikely to occur.

Based on the above, it is highly unlikely that the habitat is currently occupied by nesting or roosting owls, and is unlikely to harbor foraging owls. The operation will not have any direct effects on individual northern spotted owls.

There are no interdependent or interrelated actions which would potentially affect a northern spotted owl.

INDIRECT EFFECTS :

Indirect effects are those effects that are caused by or will result from the proposed action and are later in time, but are still reasonably certain to occur. This can include effects on habitat that may affect owls at a latter time. Unlike the evaluation of effects on

designated critical habitat, however, indirect effects document those effects that occur to individual owls likely to use the area at some point later in time. For this portion of the analysis, the absolute effect on habitat has no relevance outside of the potential effect it may have on individual owls.

Because the area is unsuitable for nesting, roosting and foraging for northern spotted owls, owls are not likely to occupy the area for nesting, roosting or foraging at the time of the operation. Because the operation will not modify the limiting factors making the area unsuitable (availability of open water, slope, etc.), it is still highly unlikely that owls would occupy the area post-project. Although the operation modifies forest structure in the thinning and sanitation operations, slope, water and soil limitations maintain unsuitable nesting, roosting and foraging habitat conditions throughout the Project Area.

Although forest conditions will be significantly affected by the project, the lack of actual northern spotted owl use will prevent any indirect effects on the owl from occurring.

Effects to Forest Conditions:

Forest pathogenic conditions are currently severe. Because the limiting factors for this area (dryness, almost no riparian habitat, limited prey base, and no slope) are not affected by this Project, the habitat will remain unsuitable for nesting, roosting, and foraging. The canopy cover is already so low and fragmented from natural causes, pathogens, salvage logging, and existing grasslands that only juvenile dispersing owls are likely to use it now or in the next few decades.⁴⁰ Even this use may meet with poor success. The existing fragmentation and limited prey base will not be significantly changed in the area and thus should not reasonably affect dispersing owls. The pathogenic activity itself has created unsuitable or very low-quality habitat and harvesting will not change the capability. By not changing the general condition and low capability of the habitat, no barriers to dispersal will be created in areas where natural vegetation would otherwise be adequate. No change in essential behaviors of individual owls is likely.

The proposed **ponderosa pine and knobcone pine harvest and replant prescriptions** have almost no effect on owl habitat. Disease and insects have killed about 90% of the trees in these areas with about 40% already 'red dead', meaning that they have already lost their foliage. The resulting stands are now unsuitable for NSO nesting, roosting and foraging habitat and soon will be unsuitable for dispersal habitat, and in fact present significant fire hazards. In most of these units, the 15% retention within a sale boundary will not be met because so few live older ponderosa pine remain.

The proposed **thinning prescriptions** are designed to maintain some degree of poor dispersal habitat where it currently exists. The 3N has intermixed clumps of up to five acres of 3G that will be thinned from below to 3N leaving 30-40% canopy. These isolated clumps provide poor cover for spotted owls and are not likely to harbor them. The prescriptions are designed to sustain a forest canopy, but leave the stands open enough so they may survive the endemic pathogens of the flats. Survival for pathogen

⁴⁰ Bart 1995, p. 943.

tolerance may be less than 40% canopy and mortality after thinning may occur. Forgoing stand density management creates very high risk to habitat in pure pine stands. Treatment in these stands is likely to reduce the risk of total stand loss, thereby helping to maintain some low capability dispersal habitat for the northern spotted owl.

After thinning, the average tree diameter will be larger due to the removal of smaller, suppressed trees. Although this would appear on paper as better habitat structure for owls, poor water and/or canopy cover remain limiting. Canopy closure will eventually recover. Treated stands would be more resistant to stand replacing crown fires or pathogens and would include more large-diameter conifers with fuller crowns and larger lateral branches than untreated stands. However, pathogens would likely prevail as the canopy closed.

In the short-term, vertical structure would be somewhat simplified by removal of smaller diameter commercial conifers along with other understory vegetation. Fire would thin out most of the trees and brush that will be removed and also simplify structure.

Since 1975, smaller conifers have grown into size class 3 (i.e., greater than 13 foot crown diameter). These stands remain classified as unsuitable habitat, and this classification will not change after thinning.

Scattered **hardwoods** greater than 8 inches diameter and new reproduction will increase vertical structural complexity. It will provide diverse cover and prey habitat diversity for an improved food supply. Habitat is limited by external factors in this area, but an improved diverse food supply may provide some slight future benefit to dispersing owls.

Aspen will have all conifer competition removed to improve aspen growth and survival and provide for greater habitat diversity. Oaks and aspen are not harvested, which improves raptor habitat by improving prey diversity (different vegetation provides a niche for different animals). Larger conifers will be removed on 20 acres of aspen, but these trees are not old growth. Removal of larger conifers is regarded as a beneficial trade-off compared to the value of saving the few remaining aspen. Deciduous tree contributions to forest diversity and a diverse prey base would therefore benefit raptors using the area, but on very limited acreage.

Large **snags and logs** would remain at two per acre average where available except for instances where large snags must be felled for safety and left on site as large logs. General district policy is to leave over three snags per acre, but in the flats continued pathogen mortality creates excess snags and logs. Hence, if salvage removes more than the local minimum snags, but leaves more than the forest minimum of 1.5 per acre, then we may expect persistent pathogens to overproduce snags (which become logs). Markers are instructed to preserve snap-top, deformed, or non-leaning snags that are more likely to stand for extended periods. This enables salvage of new snags, and promotes likely formation of uncommon “soft” snags needed by some species, promoting snag diversity.

Preserving **snag habitat** provides cover for prey and may promote greater species diversity within the limitations of the site. General growth would enable the possibility of larger and more useable snags necessary to sustain dispersal habitat and provide for general diversity in the flats. Increasing vegetative or cover diversity increases the prey base and thus helps raptors. This effect remains limited by poor habitat.

Dead and down material is set by LMP at 6 logs per acre, or about 5 tons in matrix lands. Due to extensive mortality in the flats, this is accomplished by maintaining snags. Snags fall in random years, and *maintaining proper snag density generally creates excessive deadwood beyond the prescribed minimum*. Thus, deadwood is not limited.

Prescribed burning would help protect nearby owl habitat from catastrophic fire losses and stimulate prey diversity on the forest floor, providing a more reliable food supply. It would affect about 200 acres of 3N habitat by somewhat simplifying vertical structure through the removal of small diameter (<8" dbh) suppressed understory trees and shrubs. Overall canopy closure may have a slight decrease followed by an increase due to ash fertilization increasing canopy growth. Increasing vegetative diversity increases the prey base and thus helps raptors, but the effect is slight in the Project.

Prescribed burning areas are very open because of mortality from insects and disease. Prescribed burning would have little effect on larger snags and logs because most will occur after burning. In all prescribed burns a small risk occurs that fire could have a larger or smaller impact than proposed. Effects are speculative and can't be analyzed.

Tractor piling would have similar effects to prescribed burning, but would churn up the soils surface and disrupt the fungi and mushroom habitat for several years. This is mitigated by using a tractor brush rake, and done only where fuels are excessive and to prepare sites for planting. This "raking" effect is less natural than burning, but has been done before with satisfactory recovery in less than five years. For practical purposes, it is less desirable than fire, takes more time to recover, and the piles leave a heavier scorched soil area. Effects are speculative and can't be analyzed, but have the corresponding favorable effect of reducing fuel hazards.

Effects to Nesting or Roosting Habitat:

There is no suitable nesting or roosting habitat in the Project area.

Effects to Foraging Habitat:

According to the Habitat Capability Model (appendix G, LRMP), there is no suitable foraging habitat and the Project is unlikely to affect foraging owls.

Effects to Existing Dispersal Habitat:

According to vegetation typing, the proposed actions would affect about 1516 acres of low capability dispersal habitat (3N, 4N and 4G) as determined solely by forest structure and database labeling. As stated previously, on a landscape scale, this area does not meet

minimum dispersal habitat standards (“50-11-40”). However, we also know that owls will sporadically colonize upland areas in the Flats and that dispersal may happen to some minimal degree in this area. We will analyze loss of dispersal habitat under the assumption that some low level of dispersal may happen sporadically through this area, although preferred routes around the Flats probably exist.

While some short-term degradation occurs, the immediate and long-term improvements mitigate the effects to some degree. By maintaining canopy cover 30-40% where possible (less in severe salvage areas), the result is likely to produce no immediate measurable effect on northern spotted owls or their habitat in low-capability areas.⁴¹

If owls used these areas, the above discussed changes in already naturally marginal highly fragmented habitat are not likely to affect the essential behaviors of owls that might enter the area. Limiting factors such as water, poor prey base, and level ground remain after the operation and are likely to limit owl use of the area. Habitat that is historically unsuitable or marginally suitable in the flats will remain unsuitable or marginally suitable.

Effects to Capable (Potential) Habitat:

Plantation thinning would initially decrease canopy cover and thereby reduce the quality of dispersal habitat. However, thinning would also accelerate the development of better dispersal habitat conditions and increase the probability of retaining stands at 40% canopy cover in approximately 25 years. The proposed actions would affect approximately 1,251 acres of potential habitat and improve growth toward higher quality dispersal habitat.

Effects to Connectivity or Dispersal Habitat:

The proposed thinning and low intensity prescribed burning may eventually help create better connectivity habitat. McCloud River Canyon is unaffected and is more viable as a likely dispersal route.

Harvesting disease centers will not reduce connectivity habitat, and may preserve dispersal in the long term by reducing total fragmentation from mortality. Disease and associated beetle mortality will continue to cause severe fragmentation in the flats.

All units are marginal, if not unsuitable, habitat. While a spotted owl could enter some dry, sparsely forested units, it would find a poor prey base and poor foraging opportunities. Effective dispersal is limited because open-canopy units are in more highly fragmented areas with larger natural openings. Owls avoid these areas and thus dispersal is relatively unaffected. Benefits may occur because owls would likely seek better corridors near the McCloud River Canyon.

⁴¹ Solis, 1990

CUMULATIVE EFFECTS

Cumulative effects include those effects of future State or private activities, not involving Federal activities, which are reasonably certain to occur within the action area. Past effects are assumed to be within the baseline of the analysis and future Federal activities will be consulted upon separately. Relative to the northern spotted owl, the action area includes any area within 1.3 miles (the radius of a typical NSO home range) of a harvest or restoration unit. Cumulative affects are derived from those actions which might simultaneously or within a reasonable length of time, affect the same owls that have been affected by this project. Because this project will not significantly affect any owls, there will be no cumulative effects for analysis under the ESA. .

State Actions:

There are no State actions currently planned for the Project area.

Private Actions:

Early-mature conifers dominate federal forest , and a variety of early seral stages occupy private forest. The *McCloud Flats Ecosystem Analysis 1995* presents an analysis of forest conditions and incorporates past actions and events that led to those conditions. This document is incorporated by reference and is available at the McCloud District office of the Shasta-Trinity National Forest.

Private conifer stands within the watershed are intensely managed for timber, and larger trees are continuously removed. No immediate private logging has been proposed within 1.3 miles of the assessment area, as almost all private forestland has been recently cut. These open, intensely managed lands are unsuitable for nesting, roosting or foraging, but some of it remains low-capability dispersal habitat. Hardwood, shrub, or grass habitats would likely have limited management or become plantations⁴². Before 1989, non-forested areas were generally converted into pine plantations.

Proposed actions would reduce ladder fuels and thus potential for stand replacing crown fires. Severe fires could remove owl habitat within and adjacent to the Project area.

Range grazing seldom exceeds proper use in the Project. If ground-level vegetative components are not excessively removed, habitat for a prey base likely continues⁴³ at its usual very low levels. Historical grazing was severe, and many dry meadow areas are apparently still recovering. With it, prey populations will very slowly recover.

Fire prevention has caused unnatural fuel buildups in some areas. This policy increases the probability that catastrophic fire may immediately remove large areas of owl habitat. Contrastingly, roads provide a network of fuel breaks. Fire prevention has caused other

⁴² District biologist field observations, policy of John Hancock Inc. Lands, et.al..

⁴³ McCloud Flats Watershed Analysis, p. 61-65

ecological effects inadequately understood. Coupled with grazing, it likely may explain why trees have invaded the flats⁴⁴.

CRITICAL HABITAT:

Critical habitat, as defined by section 3 of the Endangered Species Act, is “(1) the specific areas within the geographic area occupied by the species...on which are found those physical and biological features (i) essential to the conservation of the species, and (ii) that may require special management considerations or protection; and (iii) specific areas outside the geographical area occupied by a species at the time it is listed...” Critical habitat is formally designated by the FWS through publication in the Federal Register. According to the critical habitat rule, “Specific management recommendations for critical habitat are more appropriately addressed in recovery plans, management plans, and through section 7 consultation.”⁴⁵

The Biological Opinion (BO) for the Northwest Forest Plan acknowledged that LSR networks enlarged on Critical Habitat areas by about 8.6% (7.5 million acres in the LSR network, but only 6.9 million acres in the Critical Habitat Unit Network). This greater commitment to a conservation network for the owl reduced the risk that management for wood products in the matrix critical habitat would jeopardize the species.

Under the Northwest Forest Plan, the designation of critical habitat does not proscribe specific management actions. The Record of Decision (ROD) for the Northwest Forest Plan stated that “any site specific considerations of critical habitat in the matrix are considered minimal and will be evaluated through watershed analysis and addressed in area-specific plans, as appropriate.”⁴⁶ It also states that the “...30% of CHU acreage in the matrix and in AMA’s which may be important for dispersal...will be addressed in watershed analysis and subsequent planning efforts.”⁴⁷

The Pilgrim Project takes place entirely within CA-2. The Project takes place in portions of the critical habitat unit outside of the Elk Flat LSR. The McCloud Flats Watershed Assessment states, “critical habitat was established to provide dispersal habitat. With the ROD allocation network, this area is no longer required for late successional species viability.” The Northwest Forest Plan made apparent its intention that, for the most part, the LSR network was intended to provide for the purposes of critical habitat and substantially delegated critical habitat concerns to larger level analyses such as Watershed Analysis.

Nevertheless, designated critical habitat is a legal entity under the Endangered Species Act apart from the Forest Plan. Critical habitat must be analyzed thoroughly relative to

⁴⁴ McCloud Flats Watershed Analysis, p. 61-65

⁴⁵ US Dept. of the Interior, USFWS, Critical Habitat for the Northern Spotted Owl, Mulder, Barry S, Et. Al., p. 27.

⁴⁶ Final Supplemental EIS for Management of Habitat for Late-successional and Old Growth Dependent Species Within the Range of the Northern Spotted Owl, Vol. 2, Appendix G, p. 22

⁴⁷ Ibid, p. 41

any specific action and independent from any conservation value provided by the overlapping LSRs or other conservation commitments of the Northwest Forest Plan. The following analyzes effects to NSO critical habitat independent of the LSR network.

Primary Constituent Elements:

The Fish and Wildlife Service (FWS) is required to designate primary physical and biological constituent elements that are essential to the conservation of the species. Primary constituent elements may include, but are not limited to: roost sites, nesting areas, feeding areas, and vegetation types.

In the January 15, 1992 final critical habitat rule for the northern spotted owl, the FWS designated “forested lands that are used or potentially used by the northern spotted owl for nesting, roosting, foraging, or dispersing” as the primary constituent elements for the owl⁴⁸. This broad definition relies on a presumption that primary constituent elements may be defined by the owl’s use of an area or its potential use.

If it is used or potentially used, the forest may be considered the ‘primary constituent element.’ One beneficial effect of this utilitarian definition is that it allows for development and refinement in our understanding of the complexities of owl habitat use.

Also, it is apparent that the primary constituent elements are an integration of individual habitat components such as tree and stand structure, prey base, nesting structures, cover, slope, aspect, water availability, etc. These elements holistically comprise the primary constituent elements of northern spotted owl critical habitat.

Franklin⁴⁹ documented a range of reproductive strategies. He found owls that selected more classical old growth habitat with more continuous cover appeared to dine more extensively on flying squirrels and had a lower fecundity and lower mortality. However, owls that lived in more fragmented, mixed habitat, appeared to forage more frequently on wood rats and had higher fecundity and higher mortality. In other words, owl habitat selection varied with reproductive variables and prey (as well as other variables).

This indicates that stand structural characteristics alone are likely to be faulty indicators of the more complex variables that affect the owl’s responses. These complex, interactive variables such as prey density, understory cover, availability of water, predator density, and so on, may be difficult for us to evaluate, but we must acknowledge the role they may play in bounding what is suitable for an owl and what is not. Due to the impossibility of monitoring closely these complex, interacting variables, stand structural characteristics will usually be our best indicators of potential owl habitat and potential owl use of an area. However, due to the unusual nature of the McCloud Flats relative to well-researched owl habitat, structural features alone are likely to be a misleading indicator of actual or potential owl use of an area.

⁴⁸ USDI FWS, 1992

⁴⁹ Franklin, 1997; Alan Franklin, personal communications

Based on this argument, and the argument laid out in the **Determining Northern Spotted Owl Suitable Habitat** section above, it is evident that the forest on McCloud Flats cannot be considered suitable nesting, roosting or foraging habitat for the northern spotted owl. We have seen that water, slope, and aspect appear to severely limit prey populations, which in turn appear to limit owl populations. Given the Federal Register's definition of Primary Constituent Elements, the non-existent or very limited use or potential use of these forest lands by owls forces us to conclude that relative to nesting, roosting and foraging habitat, there are no primary constituent elements in the project area to affect. However, the area may be used as dispersal habitat and therefore contains primary constituent elements relative to the area's use as dispersal habitat.

Treatment Specific Analysis

Commercial harvest units in the Pilgrim Project include plantation treatments in unsuitable (young) habitat, sanitation cuts in unsuitable habitat, regeneration cuts in disease infested stands, and thinnings in variable stands.

Ponderosa Pine Dead Stand Harvest and Replant: About 375 acres are covered in heavy tree mortality due to disease and insects. All healthy trees will remain, but planting may be necessary where mortality has been most severe. Density dependent mortality in these stands has already eliminated all possible current nesting, roosting or foraging opportunities. The area has limited dispersal potential due to endemic pathogens and limiting conditions. The proposed harvest could potentially benefit owl dispersal by promoting the development of more sustainable stands in the long term. This in itself, however, may be self-limiting. Sustainable stands in this area may not resemble the denser, moister Douglas fir stands so commonly associated with northern spotted owls. Drier conditions may promote both forest pathogens and frequent fires, limiting the potential to sustain stands with a minimum of 40% crown cover. Fire suppression and active forest management in this area may have artificially promoted denser stands in this area suitable for limited spotted owl use, but only sustainable through a continuous investment of management dollars and efforts. Depending on future management policies, regrowth in this area may more closely resemble typical, widely spaced, east-side "yellow-pine forests" rather than the current dense growth that allows some limited owl use but is so susceptible to catastrophic loss from both fire and pathogens.

About 40% of the existing trees in these ponderosa pine stands are currently dead and provide virtually no cover for dispersing spotted owls. Although Their harvest and replant will, however, increase the probability of maintaining and decrease the growing time of about 318 acres of potential dispersal habitat.

Knobcone Dead Stand Harvest and Replant: About 10 acres are in knob cone unit 407. This area is typically clumpy with occasional ponderosa pine dominating the dense clumps of pine. Knobcone pine typically forms 'dog-hair thickets' in this area that are highly susceptible to fire⁵⁰. These thick stands will frequently carry the fire into the crowns of the larger ponderosa pine. The knob cone pine is too dense to permit foraging

⁵⁰ Burns, 1990

in the understory and the ponderosa pine is too widely spaced (well below a 40% cover alone) to provide foraging. If treated similarly to the plantation thinnings above, the potential to provide habitat remains limited by water and slope. Implementation may provide some marginal benefits to dispersing owls:

- Removal of knobcone pine promotes faster development of large-conifer cover.
- Greater fire resistance may help to protect known owl activity centers located on nearby mountain.
- Greater pest and disease resistance promotes mature timber with better cover.

The knobcone pine currently provides no cover for dispersing spotted owls. Harvest and replanting may help provide about 10 acres of potential spotted owl dispersal habitat in the future.

Thinning Prescriptions and Dry Meadow Restoration: The three thinning units and the dry meadow restoration project are all characterized by small aggregations of trees surrounded by frequent, very open grassy areas with small, widely spaced individual trees. These operations will affect about 795 acres of spotted owl dispersal habitat. The small aggregations of trees provide small, island ‘refugia’ in a sea of open forestland that may provide some measure of protection for any owls dispersing through the area. Although thinning will open up each of these aggregations, the overall pattern of their occurrence on the flats will remain the same after implementation. Each of these islands will still act as island refugia, but the more open canopy and structure may reduce the protection they may offer dispersing owls. Although this area does not have the kind of continuous coverage thought to be most beneficial to dispersing owls, the overall pattern of refugia will continue to offer some benefits. The removal of competitive trees in each of these aggregations will reduce to some extent the cover they provide. The more vulnerable and limiting open areas between these clusters will remain the same. The operation will not, however, affect the primary limiting factors:

- Lack of open water and deep porous soils that prevent even temporary pooling of water severely limit development of a useable prey base.
- Lack of slope limits the “north slope protection effect” seen in this area that helps maintain moister, more suitable habitat.

These operations may be able to increase the probability of developing about 201 acres of potentially suitable spotted owl dispersal habitat in the future.

Thinning will reduce the crown canopy in small aggregations to less than 40% on as much as 1075 acres in order to reduce the hazard of pathogens. This operation will affect approximately 673 acres of suitable spotted owl dispersal habitat. The reduction in crown cover may impact the current or potential use of the area by dispersing owls by:

- Forcing dispersing owls to avoid the area;
- Increasing potential mortality from predators in the area;

This area may be able to increase the probability of developing about 240 acres of potentially suitable spotted owl habitat in the future.

Older Plantation Biomass Thinning: About 785 acres of older plantations are still too young and small to be considered suitable habitat. These stands currently contain about 49 acres of marginally suitable spotted owl dispersal habitat. However, these stands are unlikely to ever produce suitable nesting, roosting or foraging habitat. They are severely limited in water and on flat slopes. Similar to the logic provided in the Determining Suitable Spotted Owl Habitat section previously, these units may some day produce large trees with reasonable cover, but are unlikely to support a prey base sufficient for any but transitory owls. Thinning has marginal beneficial effects in the flats:

- Faster development of larger tree canopy cover may benefit dispersing owls.
- Greater fire resistance may help to protect an activity center in Elk Flat LSR.
- Greater pest and disease resistance assures that some dispersal habitat will exist.

This area may be able to produce as much as 481 acres of potentially suitable spotted owl dispersal habitat.

Aspen Restoration: About 20 acres (Unit 902 and some small aggregations) are aspen restoration units. These units have variable pine cover and generally resemble nearby units except for an understory of aspen. Aspen counts as canopy cover and if given a chance, growth can be very rapid. Aspen is not considered significant dispersal habitat for these reasons:

- Fragmented habitat limits access to foraging areas in aspen
- Lack of water limits the prey base.
- Lack of slope limits the “north slope protection effect” seen in this area that helps maintain moister, more suitable habitat.
- Aspen is a small tree, and the few mature trees are decadent and dying.
- Stands often occupy less than one acre (one is 11 acres), too small to be useful.

In summary, the critical habitat area affected by the Pilgrim Project is entirely unsuitable nesting, roosting or foraging habitat and has no current or potential use by owls for nesting, roosting and foraging for the following reasons:

1. About 20 years of owl surveys by the District biologists and wildlife crew have consistently failed to find owls on the McCloud Flats. Although individual, non-breeding and apparently transitory owls have been found on the periphery, and owls may disperse over portions of the flats, it becomes widely discountable that owls may be found nesting, roosting or foraging on the flats.
2. Owls, like many other species, are consistently drawn to areas with a healthy prey base⁵¹. How much this factor weighs against other more discernable variables such as stand structure, we cannot say, but it factors strongly in habitat selection. Limited water in the McCloud Flats area severely limits the prey base⁵² and results in an area that may appear structurally marginally suitable, but lacks necessary elements to maintain an owl population. These same “dryness” factors likely place SMMU on the eastern edge of spotted owl range.

⁵¹ Franklin, 1997; Ward, 1998; Carey, 1992

⁵² CA Wildlife Habitat Relations Database, 2000; Simons, L. personal communications, Thesis, U.C Davis, 1997 also on file at the College of the Siskiyous;

3. Lack of slope creates even more harsh conditions. Without gradient, the Flats cannot benefit from the ‘northern exposure protection factor.’ Again, these harsh conditions, coupled with porous volcanic soils that poorly retain water have created an area with low mammalian prey density.
4. California State habitat capability models used to supplement habitat type definitions of suitable owl habitat include availability of water, slope, aspect and dead and down as important factors to use in evaluating habitat. These factors appear to be limiting in the Flats and reduce the suitability and the potential suitability of the site.

Primary constituent elements were defined for the northern spotted owl critical habitat as “forested lands that are used or potentially used by the northern spotted owl for nesting, roosting, foraging, or dispersing.” The operational areas are unlikely to be used for nesting, roosting or foraging *but may be used for dispersal, as may almost all portions of the landscape*. Dispersal by young owls appears to be somewhat random and is characterized by a willingness to disperse over unsuitable habitat that is uncharacteristic of older owls.

Although no immediate evidence is found for northern spotted owls, owls like other avian dispersers may make a series of ‘micro’ decisions whose cumulative result appears random⁵³. The operational measures in this Project affect a heavily fragmented and little-used marginal habitat area and are unlikely to affect mortality or survivorship in a very few wandering individual juveniles. Adults would normally avoid the flats.

The operation may have some immediate and eventual **beneficial effects to critical habitat**. The Project is likely to reduce the probability of total loss of dispersal habitat through catastrophic fires or insect and disease damage. Again, these effects are extremely minimal over the dispersal landscape, but may have some cumulative benefits over years of treatments.

The Project area has marginal, low-quality and low-capability dispersal habitat at best. The area remains highly fragmented by plantations and natural openings, and naturally limited riparian habitat. Although the Project is not likely to be used by adult owls, juveniles may test this area with poor chances of successful dispersion. The removal of green tree elements will occur in this Project, with none of it in habitat most owls would normally approach except for random dispersal of juvenile owls. The removal of a considerable number of green trees will degrade the current low-capability dispersal habitat in the project area, but will not completely remove it in most of the project. The 375 acres of Ponderosa Pine removal will affect only stands that are currently dead and dying from pathogens and would, in any case, not be available for dispersal cover. Therefore, the proposed actions are unlikely to downgrade marginally suitable dispersal habitat to unsuitable, but will degrade that same habitat

⁵³ Brooker, et. Al. 1999.; Sutherland, et.al.. 2000; Forsman, Eric D. and others, draft paper "Natal and Post-Natal Dispersal of Northern Spotted Owls." (2000):2000; Johnson, et. al. 1990"

VII. DETERMINATIONS

➤ NORTHERN SPOTTED OWL

It is my determination that the proposed action and all alternatives **may affect but would not likely adversely affect** the northern spotted owl based upon the following rationale:

1. The owls in the watershed are non-breeding pairs or single owls and are well over 1.3 miles outside the disturbance and direct effect range of this Project. These centers are usually unoccupied. Direct effects on individual owls are thus insignificant or nonexistent.
2. It is discountable or highly unlikely that owls would forage extensively here.
 - a. The flats are highly fragmented, providing frequent gaps well above the 200-foot barrier commonly experienced. Natural openings include hundreds of acres of natural dry open grassland. Plantations are numerous and extensive, most of them younger age classes.
 - b. The flats have dry porous soils. Lack of water makes poor forage that in turn limits prey populations. Prey density appears to be a major site selection factor for owls and the flats are unlikely to offer it⁵⁴.
3. Northern spotted owl concerns are addressed in the design criteria in the EIS and incorporated into the basic Project design. All LSR lands are excluded, and oak/aspen diversity will be enhanced to increase the prey base. This will be slight because of few oak/aspen acres and naturally poor site quality. Thinning enhances growth and size of conifers, and discounts losses.
4. Dispersing owls are unlikely to be affected by the operations. Dispersing owls are highly mobile, highly selective to better habitat, and thus likely to avoid such poor habitat areas as the Project. They are far more likely to choose much better alternatives far south of the Project.
5. In summary, the Project is unlikely to cause any measurable or observable change in essential northern spotted owl behavior in this area.

➤ NORTHERN SPOTTED OWL CRITICAL HABITAT

It is my determination that proposed actions will **affect** northern spotted owl dispersal habitat in CA-2 for the following reasons:

Using forest vegetation typing, green tree thinning will **degrade** about **741 acres** of very low-capability, relatively open, dispersal habitat (3n acreages in the “thinning, old tree release to 40% canopy” and the “Thinning, standard pine prescription to 40% canopy”), will **degrade** about **49 acres** of 3n, 4g and 4n dispersal habitat in the biomass thinnings, and will **degrade** about **54 acres** of scattered 3n and 4g dispersal habitat in the dry meadow restoration. About **217 acres** of formerly classified 3n dead and dying ponderosa pine will be removed, but the existing 90% mortality in this stand indicates that the removal **should not affect dispersal capability**. About **673 acres** of 3n and 4g habitat in the Thinning to 30-40% for disease control areas **will be either degraded (no 40%**

⁵⁴ Carey, et.al. 1992

threshold for dispersal quality) or downgraded (40% threshold for dispersal) depending on the FWS interpretation (see table following on page 32).

Table 3: Acreage Summary of Critical Habitat effects by Harvest Treatment

Vegetation Treatment	Approximate Acres	Acres of current dispersal habitat affected	How affected
Ponderosa Pine Dead Stand Harvest and Replant	375	0	No effect
Knobcone Dead Stand Harvest and Replant	10	0	No effect
Thinning, standard pine prescription to 40% canopy	1200	701	degraded
Thinning to 30-40% canopy for disease control	1075	673	Degraded or downgraded
Thinning, old tree release to 40% canopy	40	41	degraded
Older Plantation Biomass Thinning	785	49	degraded
Aspen Release	20	0	No effect
Dry Meadow Restoration	275	54	degraded
Approx. Total degraded	3780	1518	Degraded (673 acres possibly downgraded)

1. Although these operations are within habitat unlikely to be used for dispersal, and unsuitable for nesting, roosting and foraging, the removal of an important habitat component, green trees, on over 1500 acres may be significant. Without additional information on threshold effects for dispersal for northern spotted owls in the dry, eastside habitats, it behooves us to select the more conservative choice and consider the operation to likely affect dispersing owls within this critical habitat unit.
2. Dispersal conditions in the rest of the project would remain poor or unsuitable, maintaining unsuitable and low-quality dispersal habitat on the flats. Marginal improvement of dispersal conditions is likely to occur in about 25 years as thinned sites mature and treatments reduce heavy fragmentation from insects and disease. Given the high degree of natural fragmentation and naturally limiting site factors already found on the flats, low quality dispersal habitat will remain low-quality dispersal habitat. However, due to inescapable natural pathogenic conditions in this area, this temporary degradation may persist. Restoration of natural fire regimes on the flat would precipitate a reversion to original, historically open pine grasslands over much of the area. Although limiting for the owl, a restoration of more open, large tree, natural stand conditions in this area may be preferable for ecological reasons beyond the scope of this document.

3. In some of the aspen stands, some larger healthy conifers potentially useful to owls will definitely be removed. These aspen stands will provide some small portion (<1%) of unique forage diversity in a huge area of low-capability dispersal habitat. Since only 20 acres in small isolated patches are involved, the actual beneficial effect in poor dispersal habitat is so slight as to be unobservable for owls.
- **BALD EAGLE**
It is my determination that the proposed actions would have **no effect** on the bald eagle because the habitat is unsuitable in and near the watershed.

VIII. MANAGEMENT RECOMMENDATIONS

Management recommendations were incorporated into the EIS.

IX. CONTRIBUTORS

- Debbie Fleming, Silviculturist, SMMU, Shasta-Trinity National Forest.
- Steve Funk, LRMP Planner, SMMU, STNF (retired).
- Danielle Chi, Wildlife Biologist, U.S. Fish and Wildlife Service, Red Bluff Office.
- Heidi Crowell, Wildlife Biologist, U.S. Fish and Wildlife Service, Red Bluff Office.
- Kelly Wolcott, TES Species Coordinator, Shasta-Trinity National Forest.
- Steve Bachmann, Hydrologist, SMMU, Shasta-Trinity National Forest.
- Mike Rothenberger, Fuels Specialist, SMMU, Shasta-Trinity National Forest.
- Donna Sager, Fuels Specialist, SMMU, Shasta-Trinity National Forest.

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**APPENDIX A: FEDERAL T & E SPECIES LISTS FOR KINYON,
MCCLOUD AND RAINBOW MTN QUADS**

***FEDERAL ENDANGERED AND THREATENED SPECIES
THAT OCCUR IN OR MAY BE AFFECTED BY PROJECTS IN THE
KINYON (697C)***

U.S.G.S. 7 1/2 MINUTE QUAD

Database Last Updated: May 27, 2005

Document Number: 050620102902

Listed Species

Fish

Hypomesus transpacificus - delta smelt (T)

Oncorhynchus mykiss - Central Valley steelhead (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Strix occidentalis caurina - Critical habitat, northern spotted owl (X)

Strix occidentalis caurina - northern spotted owl (T)

Species of Concern

Invertebrates

Nebria gebleri siskiyouensis - Siskiyou ground beetle (SC)

Nebria sahlbergii triad - Trinity Alps ground beetle (SC)

Fish

Oncorhynchus (=Salmo) mykiss ssp. - McCloud River redband trout (SC)

Pogonichthys macrolepidotus - Sacramento splittail (SC)

Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Ascaphus truei - tailed frog (SC)

Rana cascadae - Cascades frog (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)

Birds

Accipiter gentilis - northern goshawk (SC)

Agelaius tricolor - tricolored blackbird (SC)

Baeolophus inornatus - oak titmouse (SLC)

Buteo regalis - ferruginous hawk (SC)

Chaetura vauxi - Vaux's swift (SC)

Cinclus mexicanus - American dipper (SLC)

Cypseloides niger - black swift (SC)

Empidonax traillii brewsteri - little willow flycatcher (CA)

Falco peregrinus anatum - American peregrine falcon (D)

Melanerpes lewis - Lewis' woodpecker (SC)

Numenius americanus - long-billed curlew (SC)

Otus flammeolus - flammulated owl (SC)

Selasphorus rufus - rufous hummingbird (SC)

Mammals

Corynorhinus (=Plecotus) townsendii pallescens - pale Townsend's big-eared bat (SC)

Euderma maculatum - spotted bat (SC)

Gulo gulo luteus - California wolverine (CA)

Myotis ciliolabrum - small-footed myotis bat (SC)

Myotis evotis - long-eared myotis bat (SC)

Myotis thysanodes - fringed myotis bat (SC)

Myotis volans - long-legged myotis bat (SC)

Myotis yumanensis - Yuma myotis bat (SC)

Vulpes vulpes necator - Sierra Nevada red fox (CA)

Key:

- (E) *Endangered* - Listed (in the Federal Register) as being in danger of extinction.
- (T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
- (P) *Proposed* - Officially proposed (in the Federal Register) for listing as endangered or threatened.
- (NMFS) Species under the Jurisdiction of the [National Marine Fisheries Service](#). Consult with them directly about these species.
- *Critical Habitat* - Area essential to the conservation of a species.
- (PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
- (C) *Candidate* - Candidate to become a proposed species.
- (CA) Listed by the State of California but not by the Fish & Wildlife Service.
- (D) *Delisted* - Species will be monitored for 5 years.
- (SC) *Species of Concern*/(SLC) Species of Local Concern - Other species of concern to the Sacramento Fish & Wildlife Office.
- (X) *Critical Habitat* designated for this species

**FEDERAL ENDANGERED AND THREATENED SPECIES
THAT OCCUR IN OR MAY BE AFFECTED BY PROJECTS IN THE
MCLOUD (698C)**

**U.S.G.S. 7 1/2 MINUTE QUAD
Database Last Updated: May 27, 2005
Document Number: 050620120953**

Listed Species
Fish

Hypomesus transpacificus - delta smelt (T)

Oncorhynchus mykiss - Central Valley steelhead (T)

Oncorhynchus tshawytscha - Central Valley spring-run chinook salmon (T)

Oncorhynchus tshawytscha - winter-run chinook salmon, Sacramento River (E)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Strix occidentalis caurina - Critical habitat, northern spotted owl (X)

Strix occidentalis caurina - northern spotted owl (T)

Candidate Species
Fish

Oncorhynchus tshawytscha - Central Valley fall/late fall-run chinook salmon (C)

Birds

Coccyzus americanus occidentalis - Western yellow-billed cuckoo (C)

Mammals

Martes pennanti - fisher (C)

Species of Concern

Invertebrates

Nebria gebleri siskiyouensis - Siskiyou ground beetle (SC)

Nebria sahlbergii triad - Trinity Alps ground beetle (SC)

Fish

Lampetra ayresi - river lamprey (SC)

Oncorhynchus (=Salmo) *mykiss* ssp. - McCloud River redband trout (SC)

Pogonichthys macrolepidotus - Sacramento splittail (SC)

Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Ascaphus truei - tailed frog (SC)

Rana boylei - foothill yellow-legged frog (SC)

Rana cascadae - Cascades frog (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)

Birds

Accipiter gentilis - northern goshawk (SC)

Baeolophus inornatus - oak titmouse (SLC)

Chaetura vauxi - Vaux's swift (SC)

Cinclus mexicanus - American dipper (SLC)

Cypseloides niger - black swift (SC)

Empidonax traillii brewsteri - little willow flycatcher (CA)

Falco peregrinus anatum - American peregrine falcon (D)

Melanerpes lewis - Lewis' woodpecker (SC)

Numenius americanus - long-billed curlew (SC)

Otus flammeolus - flammulated owl (SC)

Selasphorus rufus - rufous hummingbird (SC)

Mammals

Corynorhinus (=Plecotus) townsendii pallescens - pale Townsend's big-eared bat (SC)

Euderma maculatum - spotted bat (SC)

Gulo gulo luteus - California wolverine (CA)

Myotis ciliolabrum - small-footed myotis bat (SC)

Myotis evotis - long-eared myotis bat (SC)

Myotis thysanodes - fringed myotis bat (SC)

Myotis volans - long-legged myotis bat (SC)

Myotis yumanensis - Yuma myotis bat (SC)

Vulpes vulpes necator - Sierra Nevada red fox (CA)

Plants

Campanula wilkinsiana - Wilkin's harebell (SC)

Key:

- (E) *Endangered* - Listed (in the Federal Register) as being in danger of extinction.
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- (C) *Candidate* - Candidate to become a proposed species.
- (CA) Listed by the State of California but not by the Fish & Wildlife Service.
- (D) *Delisted* - Species will be monitored for 5 years.
- (SC) *Species of Concern/(SLC) Species of Local Concern* - Other species of concern to the Sacramento Fish & Wildlife Office.
- (X) *Critical Habitat* designated for this species

***FEDERAL ENDANGERED AND THREATENED SPECIES
THAT OCCUR IN OR MAY BE AFFECTED BY PROJECTS IN THE
RAINBOW MTN. (697B)***

***U.S.G.S. 7 1/2 MINUTE QUAD
Database Last Updated: May 27, 2005
Document Number: 050620121138***

Listed Species

Fish

Hypomesus transpacificus - delta smelt (T)

Oncorhynchus mykiss - Central Valley steelhead (T)

Birds

Haliaeetus leucocephalus - bald eagle (T)

Strix occidentalis caurina - Critical habitat, northern spotted owl (X)

Strix occidentalis caurina - northern spotted owl (T)

Species of Concern

Invertebrates

Nebria gebleri siskiyouensis - Siskiyou ground beetle (SC)

Nebria sahlbergii triad - Trinity Alps ground beetle (SC)

Fish

Oncorhynchus (=Salmo) *mykiss* ssp. - McCloud River redband trout (SC)

Oncorhynchus mykiss - Klamath Mts. Province steelhead (SC)

Pogonichthys macrolepidotus - Sacramento splittail (SC)

Spirinchus thaleichthys - longfin smelt (SC)

Amphibians

Rana cascadae - Cascades frog (SC)

Reptiles

Clemmys marmorata marmorata - northwestern pond turtle (SC)

Birds

- Accipiter gentilis* - northern goshawk (SC)
- Agelaius tricolor* - tricolored blackbird (SC)
- Baeolophus inornatus* - oak titmouse (SLC)
- Buteo regalis* - ferruginous hawk (SC)
- Chaetura vauxi* - Vaux's swift (SC)
- Cinclus mexicanus* - American dipper (SLC)
- Cypseloides niger* - black swift (SC)
- Empidonax traillii brewsteri* - little willow flycatcher (CA)
- Falco peregrinus anatum* - American peregrine falcon (D)
- Melanerpes lewis* - Lewis' woodpecker (SC)
- Numenius americanus* - long-billed curlew (SC)
- Otus flammeolus* - flammulated owl (SC)
- Selasphorus rufus* - rufous hummingbird (SC)

Mammals

- Corynorhinus (=Plecotus) townsendii pallescens* - pale Townsend's big-eared bat (SC)
- Euderma maculatum* - spotted bat (SC)
- Gulo gulo luteus* - California wolverine (CA)
- Myotis ciliolabrum* - small-footed myotis bat (SC)
- Myotis evotis* - long-eared myotis bat (SC)
- Myotis thysanodes* - fringed myotis bat (SC)
- Myotis volans* - long-legged myotis bat (SC)
- Myotis yumanensis* - Yuma myotis bat (SC)
- Vulpes vulpes necator* - Sierra Nevada red fox (CA)

Key:

- (E) *Endangered* - Listed (in the Federal Register) as being in danger of extinction.
- (T) *Threatened* - Listed as likely to become endangered within the foreseeable future.
- (P) *Proposed* - Officially proposed (in the Federal Register) for listing as endangered or threatened.
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- (PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.
- (C) *Candidate* - Candidate to become a proposed species.
- (CA) Listed by the State of California but not by the Fish & Wildlife Service.
- (D) *Delisted* - Species will be monitored for 5 years.
- (SC) *Species of Concern/(SLC) Species of Local Concern* - Other species of concern to the Sacramento Fish & Wildlife Office.
- (X) *Critical Habitat* designated for this species

IMPORTANT INFORMATION ABOUT YOUR SPECIES LIST

HOW WE MAKE SPECIES LISTS

We store information about endangered and threatened species lists by U.S. Geological Survey [7½ minute quads](#). The United States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, or may be affected by Projects within, the quads covered by the list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in your quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat by air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regard-less of whether they appear on a quad list.

PLANTS

Any plants on your list are ones that have actually been observed in the quad or quads covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the nine surrounding quads through the California Native Plant Society's online [Inventory of Rare and Endangered Plants](#).

SURVEYING

Some of the species on your list may not be affected by your Project. A trained biologist or botanist, familiar with the habitat requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by your Project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the [Guidelines for Conducting and Reporting Botanical Inventories](#). The results of your surveys should be published in any environmental documents prepared for your Project.

STATE-LISTED SPECIES

If a species has been listed as threatened or endangered by the State of California, but not by us nor by the National Marine Fisheries Service, it will appear on your list as a Species of Concern. However you should contact the California Department of Fish and Game [Wildlife and Habitat Data Analysis Branch](#) for official information about these species.

YOUR RESPONSIBILITIES UNDER THE ENDANGERED SPECIES ACT

All plants and animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 of the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

TAKE INCIDENTAL TO AN OTHERWISE LAWFUL ACTIVITY MAY BE AUTHORIZED BY ONE OF TWO PROCEDURES:

- If a Federal agency is involved with the permitting, funding, or carrying out of a Project that may result in take, then that agency must engage in a formal [consultation](#) with the Service.

During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize the impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the Project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the Project, and federally listed species may be taken as part of the Project, then you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your Project.

Should your survey determine that federally listed or proposed species occur in the area and are likely to be affected by the Project, we recommend that you work with this office and the California Department of Fish and Game to develop a plan that minimizes the Project's direct and indirect impacts to listed species and compen-sates for Project-related loss of habitat. You should include the plan in any environmental documents you file.

CRITICAL HABITAT

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide needed space for growth and normal behavior; food, water, air,

light, other nutritional or physiological requirements; cover or shelter; and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless there is Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species list. Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our [critical habitat page](#) for maps.

CANDIDATE SPECIES

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we have enough scientific information to eventually propose them for listing as threatened or endangered. By considering these species early in your planning process you may be able to avoid the problems that could develop if one of these candidates was listed before the end of your Project.

SPECIES OF CONCERN

Your list may contain a section called Species of Concern. This is an informal term that refers to those species that the Sacramento Fish and Wildlife Office believes might be in need of concentrated conservation actions. Such conservation actions vary depending on the health of the populations and degree and types of threats. At one extreme, there may only need to be periodic monitoring of populations and threats to the species and its habitat. At the other extreme, a species may need to be listed as a Federal threatened or endangered species. Species of concern receive no legal protection and the use of the term does not necessarily mean that the species will eventually be proposed for listing as a threatened or endangered species.

WETLANDS

If your Project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

UPDATES

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed, candidate and special concern species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be September 18, 2005.

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**Appendix B: Timber Type Distribution Equated to Actual (Current) Owl
 Dispersal Habitat: Pilgrim Timber Project**

Treatment	Veg Size	Veg Type	Acres	NSO Dispersal Habitat	Totals NSO Dispersal Habitat	
AR	2	n	1.98		Aspen Regeneration (not considered suitable)	
AR	3	n	8.79			
Totals						0
BIO	0		6.12		Biomass	
BIO	1		343.98			
BIO	1	n	130.8			
BIO	2	g	0.21			
BIO	3	n	48.41	48.41		
BIO	3	p	18.58			
BIO	3	s	205.5			
BIO	4	g	0.13	0.13		
BIO	4	n	0.01	0.01		
BIO	4	p	0.76			
BIO	4	s	27.2			
Totals						48.55
DUR	0		59.82			Dry Meadow Restoration
DUR	1		4.48			
DUR	3	n	44.56	44.56		
DUR	3	p	29.75			
DUR	3	s	53.96			
DUR	4	g	9.47	9.47		
DUR	4	p	23.49			
DUR	4	s	49.76			
Totals					54.03	
HR	0		1.84		Ponderosa Pine Dead Stand Removal (note: the ponderosa pine stands are known to be about 40% 'red' dead. The already dead trees have lost their foliage and are currently not providing cover. This drops the cover below 40% and reduces the potential for providing dispersal cover.	
HR	1		1.06			
HR	2	n	91.55			
HR	3	n	125.29			
HR	3	p	17.38			
HR	3	s	3.17			
HR	4	p	12.91			
HR15	0		4.01			
HR15	1		2.79			
HR15	3	n	91.33			
HR15	3	p	8.43			
HR15	4	p	0.49			
HR15	4	s	11.59			
Totals						0
KPG	1		0.09			Knobcone Pine
KPG	3		10.11			
Totals					0	

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 Appendix H: Biological Assessment – June 2007

Treatment	Veg Size	Veg Type	Acres	NSO Dispersal Habitat	Totals NSO Dispersal Habitat
MUT	1		0.26		Thinning old tree release to 40% canopy cover
MUT	3	n	28.97	28.97	
Totals					28.97
OGT	0		0.001		Thinning old tree release to 40% canopy cover
OGT	1		0.03		
OGT	3	n	11.59	11.59	
Totals					11.59
THN	0		25.77		Thinning, Standard Pine Prescription to 40% canopy
THN	1		72.08		
THN	1	n	3.01		
THN	2		6.73		
THN	2	g	12.45		
THN	2	n	16.62		
THN	2	s	1.98		
THN	3	n	700.55	700.55	
THN	3	p	111.05		
THN	3	s	243.67		
THN	4	p	4.6		
THN	4	s	2.82		
Totals					
THS	0		24.64		Thinning to 30-40% Canopy for Disease Control
THS	1		11.6		
THS	1	n	10.14		
THS	2	g	35.47		
THS	2	n	158.61		
THS	3	n	667.75	667.75	
THS	3	p	125		
THS	3	s	19.54		
THS	4	g	4.75	4.75	
THS	4	p	17.81		
THS	4	s	0.04		
Totals					672.5

Highlighted rows usually considered NSO nesting & roosting or foraging habitat

Total NSO Dispersal (Usually nesting, roosting, foraging and dispersal habitat if not for limiting factors of water, slope, aspect)

1516.19

3N foraging type habitat

1501.83

4N type Nesting, Roosting & Foraging

0.01

4G Type Nesting, Roosting & Foraging

14.35

Key to Codes in Table

BIO = Biomass Thinning

AR = Aspen Release

DUR = Dry meadow restoration

HR and HR15 = Ponderosa pine dead stand removal, harvest and replant

KPG = Knobcone Pine dead stand harvest and replant

Treatment Veg Size Veg Type Acres NSO Dispersal Habitat Totals NSO Dispersal Habitat

MUT & OGT = Thinning old tree release to 50%
 THN = Thinning, Standard Pine Prescription to 40% canopy
 THS = Thinning to 30-40% Canopy

**Appendix C: Timber Type Distribution Equated to Potential Owl Dispersal
 Habitat: Pilgrim Timber Project**

Treatment	Veg Size	Veg Type	Acres	NSO Potential Dispersal Habitat	Totals NSO Potential Dispersal Habitat		
AR	2	n	1.98	1.98		Aspen Regeneration (not considered suitable)	
AR	3	n	8.79	8.79			
Totals					0		
BIO	0		6.12	6.12		Biomass	
BIO	1		343.98	343.98			
BIO	1	n	130.8	130.8			
BIO	2	g	0.21	0.21			
BIO	3	n	48.41	48.41			
BIO	3	p	18.58				
BIO	3	s	205.5				
BIO	4	g	0.13	0.13			
BIO	4	n	0.01	0.01			
BIO	4	p	0.76				
BIO	4	s	27.2				
Totals					481.11		
DUR	0		59.82	59.82			Dry Meadow Restoration
DUR	1		4.48	4.48			
DUR	3	n	44.56	44.56			
DUR	3	p	29.75				
DUR	3	s	53.96				
DUR	4	g	9.47	9.47			
DUR	4	p	23.49				
DUR	4	s	49.76				
Totals					64.3		
HR	0		1.84	1.84		Ponderosa Pine Dead Stand Removal 3N stands are included in this calculation because of the high mortality (90%) in these stands. They are not currently supporting live timber and so may be considered potential habitat.	
HR	1		1.06	1.06			
HR	2	n	91.55	91.55			
HR	3	n	125.29	125.29			
HR	3	p	17.38				
HR	3	s	3.17				
HR	4	p	12.91				
HR15	0		4.01	4.01			
HR15	1		2.79	2.79			
HR15	3	n	91.33	91.33			
HR15	3	p	8.43				
HR15	4	p	0.49				
HR15	4	s	11.59				
Totals					317.87		
KPG	1		0.09	0.09		Knobcone Pine	

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Appendix H: Biological Assessment – June 2007

Treatment	Veg Size	Veg Type	Acres	NSO Potential Dispersal Habitat	Totals NSO Potential Dispersal Habitat
KPG	3		10.11	10.11	10.20
MUT	1		0.26	0.26	Thinning old tree release to 40% canopy
MUT	3	n	28.97	28.97	
Totals					0.26
OGT	0		0.001	0.001	Thinning old tree release to 40% canopy
OGT	1		0.03	0.03	
OGT	3	n	11.59	11.59	
Totals					0.03
THN	0		25.77	25.77	Thinning, Standard Pine Prescription to 40% canopy
THN	1		72.08	72.08	
THN	1	n	3.01	3.01	
THN	2		6.73	6.73	
THN	2	g	12.45	12.45	
THN	2	n	16.62	16.62	
THN	2	s	1.98		
THN	3	n	700.55	700.55	
THN	3	p	111.05		
THN	3	s	243.67		
THN	4	p	4.6		
THN	4	s	2.82		
Totals					
THS	0		24.64	24.64	Thinning to 30-40% Canopy for Disease Control
THS	1		11.6	11.6	
THS	1	n	10.14	10.14	
THS	2	g	35.47	35.47	
THS	2	n	158.61	158.61	
THS	3	n	667.75	667.75	
THS	3	p	125		
THS	3	s	19.54		
THS	4	g	4.75	4.75	
THS	4	p	17.81		
THS	4	s	0.04		
Totals					240.46

Total NSO Potential Dispersal Habitat: Timber Types 1n, 1g, 2n, and 2g.

Types 0 and 1 may or may not be capable of growing dispersal habitat, but are included to conservatively allow for an overestimate rather than underestimate of potential dispersal habitat. Density or Cover types P and S are not included. These densities usually indicate a limiting factor in the area and are unlikely to ever be able grow denser habitat.

1250.89

Total NSO Actual Dispersal Habitat from Appendix B:

3N foraging type habitat

1501.83

4N type Nesting, Roosting & Foraging

0.01

4G Type Nesting, Roosting & Foraging

14.35

Treatment	Veg Size	Veg Type	Acres	NSO Potential Dispersal Habitat	Totals NSO Potential Dispersal Habitat
Total Actual (Current) NSO Dispersal Habitat					1516.19
Key to Codes in Table					

BIO = Biomass Thinning
 AR = Aspen Release
 DUR = Dry meadow restoration
 HR and HR15 = Ponderosa pine dead stand removal, harvest and replant
 KPG = Knobcone Pine dead stand harvest and replant
 MUT & OGT = Thinning old tree release to 50%
 THN = Thinning, Standard Pine Prescription to 40% canopy
 THS = Thinning to 30-40% Canopy

Appendix D: Late Successional Data for the Ash Creek and Upper McCloud Watersheds

Actual and Capable Acres	Ash Creek	Upper McCloud	Totals for both watersheds
3N	11,712	15,192	26,904
3G	3,009	6,723	9,732
4N/4G	1,898	786	2,684
Totals	16,619	22,701	39,320
Actual but Incapable Acres			
3N	2,617	393	3,010
3G	776	232	1,008
4N/4G	372	152	524
Totals	3,765	777	4,542
Total in Watersheds Acres			
3N	14,329	15,585	29,914
3G	3,785	6,955	10,740
4N/4G	2,270	938	3,208
Totals	20,384	23,478	43,862
Potential Acres			
Capable	10,680	13,708	24,388
Total Acreage in Watersheds	113,866	146,263	260,129
Total Capable Acres	31,064	37,186	68,250
Percentage of Watershed in stands suitable for Dispersal Habitat	18%	16%	17%
Percentage of Watershed capable of producing stands contributing to dispersal	27%	25%	26%

Capable = Capable of producing and maintaining late successional forest under typical harvest and/or disturbance regimes.

Appendix E: Forest Development in fire-excluded Ponderosa Pine stands in the Bitterroot National Forest.

The following three photos show typical ponderosa pine development under fire exclusion. Although these photos come from the Bitterroot National Forest (Graham, 2004) they are strikingly similar to the conditions we find on the McCloud Flats. Fire exclusion has allowed denser stands to develop, and on the Flats, experience and District records indicate that density-dependent insect and disease problems episodically thin out or eliminate these denser stands (Speight, 1989). The denser stands have allowed better dispersal by owls to moister and richer upland habitat dotted throughout the Flats, but is ecologically unsustainable due to fire, insect and disease limitations. Management may be able to reduce the large fluctuations of conditions by maintaining more open stands, thinning out disease and insect mortality and reintroducing fire. Reintroducing fire gradually by first reducing fuels through thinning and mechanical treatments will help avoid catastrophic fires or epidemic-level disease or insect infestations that may eliminate the stands entirely. More frequent ground fires can then help maintain a healthier stand with a greater degree of ecological integrity (Pimentel, et.al. 2000). Although our ability to maintain these stands at the higher densities more optimal for owl dispersal is doubtful, management is able to reduce the loss to maintain minimal cover.



Figure 1: 1909



Figure 2: 1948



Figure 3: 1989