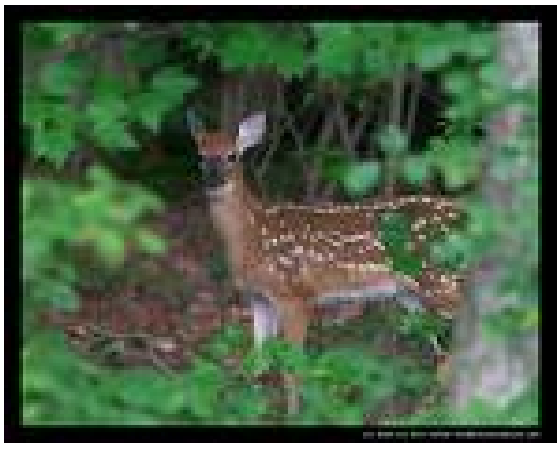
Management Indicator Species Report

for the

SUGARBERRY PROJECT

Feather River Ranger District

Plumas National Forest



Prepared By _____ **Date**_____

Cindy K. Roberts
Wildlife Biologist
Feather River Ranger District

Reviewed By __/_____ **Date**_____

George Garcia
Forest WFRP Program Manager
Plumas National Forest

Table Of Contents

TABLES

APPENDICIES

1. INTRODUCTION

The purpose of this report is to evaluate and disclose the impacts of the Sugarberry Project on the terrestrial and aquatic wildlife Management Indicator Species (MIS) identified in the Plumas National Forest (NF) Land and Resource Management Plan (LRMP) (USDA 1988). This report documents the effects of the proposed action (Alternative B), No Action (Alternative A) and two other action alternatives (Alternatives C and G) on selected MIS. Detailed descriptions of the Sugarberry Project alternatives are found in Chapter 2 of the Sugarberry Project, Draft Environmental Impact Statement (DEIS) (USDA 2007a) and Fish and Wildlife Biological Assessment and Evaluation (BA/BE) (USDA 2007b).

MIS are animal or plant species identified in the Plumas NF LRMP (USDA 1988), Appendix G, Pages (G-1 and G-2), which was developed under the 1982 National Forest System Land and Resource Management Planning Rule (1982 Planning Rule) (36 CFR 219). Guidance regarding MIS set forth in the Plumas NF LRMP directs Forest Service resource managers to (1) at project scale, analyze the effects of proposed projects on the habitats of each MIS affected by such projects, and (2) at the national forest (forest) or bioregional scale, monitor populations and/or habitat trends of forest MIS, as identified by the LRMP.

1.a. Direction Regarding the Analysis of Project-Level Effects on MIS

Project-level effects on MIS are analyzed and disclosed as part of environmental analysis under the National Environmental Policy Act (NEPA). This involves examining the impacts of the proposed project alternatives on MIS habitat by discussing how direct, indirect, and cumulative effects will change the quantity and/or quality of habitat in the analysis area.

These project-level impacts to habitat are then related to broader scale (generally national forest, and, in some cases, bioregional) population and/or habitat trends. The appropriate approach for relating project-level impacts to broader scale trends depends on the terms in the LRMP. Under the 2005 National Forest System Land Management Planning Rule (2005 Planning Rule) (70 Federal Register 1060, January 5, 2005), national forests with LRMPs developed under the 1982 planning rule, including the Plumas NF, "may comply with any obligations relating to MIS by considering data and analysis relating to habitat unless the plan specifically requires population monitoring or population surveys for the species" (36 CFR 219.14(f)).

Hence, where the Plumas NF LRMP requires population monitoring or population surveys for an MIS, the project-level effects analysis for that MIS may be informed by population monitoring data, which are gathered at the forest or bioregional scale. Population monitoring and survey data are not generally gathered for site-specific projects, consistent with the 2005 planning rule, which states, "Site-specific monitoring or surveying of a proposed project or activity area is not required, but may be conducted at the discretion of the Responsible Official" (36 CFR 219.14(f)). For certain MIS, the

Plumas NF LRMP does not require population monitoring or surveys; for these MIS, project-level MIS effects analysis can be informed by forest-scale habitat monitoring and analysis alone. The Plumas NF LRMP requirements for MIS analyzed for the Sugarberry Project are summarized in Section 3 of this report.

Therefore, adequately analyzing project effects to MIS, including Threatened, Endangered, and Sensitive (TES) species that are also MIS, involves the following steps:

- Identifying which MIS have habitat that would be either directly or indirectly affected by the project alternatives; these MIS are potentially affected by the project.
- Identifying the LRMP forest-level or bioregional-level monitoring requirements for this subset of forest MIS.
- Analyzing project-level effects on MIS habitats or habitat components for this subset of forest MIS.
- Discussing forest or bioregional scale habitat and/or population trends for this subset of forest MIS.
- Relating project-level impacts on MIS habitat to habitat and/or population trends for the affected MIS at the forest or bioregional scale.

These steps are described in detail in the Pacific Southwest Region's draft document "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination", May 2006 (USDA 2006a; **Appendix 1**) and the "Plumas National Forest - Management Indicator Species Report" and appendices, November 2006 (USDA 2006b; **Appendix 2**). This Management Indicator Species (MIS) Report documents application of the above steps to select and analyze MIS for the Sugarberry Project.

1.b. Direction Regarding Monitoring of MIS Population and Habitat Trends at the Forest or Bioregional Scale

Forest or bioregional scale monitoring requirements for the Plumas NF's MIS are found in the Monitoring Plan of the LRMP (USDA 1988, Chapter 5, pages 5-1 to 5-21) and in Appendix E of the Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement and Record of Decision (SNFPA FEIS/ROD) (USDA 2001), as adopted by the 2004 Sierra Nevada Forest Plan Amendment Final Environmental Impact Statement and Record of Decision (SNFPA FSEIS/ROD) (USDA 2004) and modified by Chapter 2 of the 2004 SNFPA SEIS.

1.b.1. Habitat Status and Trend

The Plumas NF LRMP (USDA 1988) requires forest-scale monitoring of habitat status and trend for select MIS on the Plumas NF; for MIS with habitat potentially affected by the Sugarberry Project, these habitat monitoring requirements are summarized in **Table 2** of this report. Habitat status is the current amount of habitat on the Plumas NF. Habitat trend is the direction of change in the amount of habitat between the time the LRMP was approved and the present. The methodology for assessing habitat status and trend for the

Plumas MIS is described in detail in the Plumas NF MIS Report (USDA 2006b) and summarized below.

Habitats are the vegetation types (for example, mixed conifer forest) and/or ecosystem components (for example, cliffs or lakes) and any special habitat elements (for example, snags) required by an MIS for breeding, cover, and/or feeding. Required habitat is identified using habitat relationships data, GIS vegetation layers or models. For each terrestrial wildlife MIS on the Plumas NF, the habitat relationship models are from the California Wildlife Habitat Relationship (CWHR) System (CDFG 2005). The CWHR System is considered "a state-of-the-art information system for California's wildlife" and provides the most widely used habitat relationship models for California's terrestrial vertebrate species.

In the case of MIS that are also federally threatened or endangered or Forest Service sensitive species that have been studied in detail, additional habitat relationships information may be used to augment the CWHR system. Habitat relationships for fish are identified individually. Detailed information on the habitat relationships for MIS on the Plumas NF and on the CWHR System can be found in the Plumas NF MIS Report (USDA 2006b).

MIS habitat trend is monitored using ecological and vegetation data for the Plumas NF. These data include spatial ecological and vegetation layers created from remote-sensing imagery obtained at various points in time, which are verified using photo-imagery, on-the-ground measurements, and tracking of vegetation-changing actions or events (for example, wildland fires).

1.b.2. Population Status and Trend

Population monitoring requirements for the MIS of the Plumas NF are identified in either Appendix E of the SNFPA FEIS/ROD (USDA 2001), as adopted by the 2004 SNFPA FSEIS/ROD (USDA 2004), or the Monitoring Plan of the LRMP (USDA 1988, Chapter 5, pages 5-6 to 5-10).

For Plumas NF MIS (USDA 1988, Appendix G) that are listed in Appendix E of the SNFPA FEIS/ROD (USDA 2001), population monitoring requirements are identified in Appendix E. For all other Plumas NF MIS, population monitoring requirements are identified in the LRMP Monitoring Plan (USDA 1988). These documents require monitoring of population status and trend for select MIS on the Plumas NF. There are many types of population data, and these documents also identify the type of population monitoring data required for each MIS. The population monitoring requirements for the MIS with habitat potentially affected by the Sugarberry Project are summarized in Table 2 of this report. All population monitoring data are collected and/or compiled at the forest or bioregional scale, consistent with the LRMP as amended by the 2004 SNFPA FSEIS/ROD and the 2005 Planning Rule that "site specific monitoring or surveying of a proposed project or activity area is not required" (36 CFR 219.14(f)).

Population status is the current condition of the MIS related to the type of population monitoring data (population measure) required in the LRMP for that MIS. Population trend is the direction of change in that population measure over time.

As discussed in Appendix E of the 2001 SNFPA FEIS (USDA 2001), there is a wide range of monitoring data that can be used to describe the status and trend (or change) of populations, ranging from describing changes in distribution based on presence-absence data to describing changes in population structure. A distribution population monitoring approach is identified for most MIS listed in Appendix E (Tables E-9 to E-11). Distribution population monitoring consists of collecting presence data for the MIS across a number of sample locations; over time, changes in the distribution of the MIS can then be identified and tracked. Presence data is collected using a number of direct and indirect methods, such as surveys (population surveys), bird point counts, tracking number of hunter kills, counts of species sign (such as deer pellets), and so forth. Presence population data for MIS are collected and consolidated by the Plumas NF in cooperation with State and Federal agency partners (including the California Department of Fish and Game, USFS PSW Research, Department of Water Resources, and USDI Fish and Wildlife Service) or conservation partners (including Partners in Flight and various avian joint ventures).

The Plumas NF's MIS monitoring program for species typically hunted, fished, or trapped was designed to be implemented in cooperation with California Department of Fish and Game (CDFG), consistent with direction in the 1982 Planning Rule to monitor forest-level MIS population trends in cooperation with state fish and wildlife agencies to the extent practicable (36 CFR 219.19(a)(6)). To be biologically meaningful for wide-ranging MIS, presence data are collected and tracked not only at the forest scale, but also at larger scales, such as range-wide, state, province (Sierra Nevada), or important species management unit (for example, Deer Assessment Unit or waterfowl migratory routes). Population data at various scales are important to both assess and provide meaningful context for population status and trend at the forest scale.

For several MIS, such as California spotted owl and American marten, Appendix E of the 2001 SNFPA FEIS and Chapter 2 of the 2004 SNFPA SEIS identify other population monitoring requirements. For these species, population data are collected and compiled at the bioregional (Sierra Nevada) scale, not the forest scale (SNFPA 2001).

2. SELECTION OF PROJECT LEVEL MIS

Management Indicator Species (MIS) for the Plumas NF are identified in the LRMP (USDA 1988). The MIS analyzed for the Sugarberry Project were selected from this list of MIS identified in the LRMP, as indicated below in **Table 1**. In addition, **Table 1** identifies the status of the MIS (2nd column), the reason each MIS was identified in the LRMP (3rd column) and discloses whether or not the MIS is potentially affected by the Sugarberry Project (4th column).

Table 1. Management Indicator Species, Plumas NF, and Selection of MIS for Project-Level Analysis for the Sugarberry Project.

Management Indicator Species	Species Status	LRMP Habitat Indicator	Category for Project Analysis [1]
Bald Eagle (*Haliaeetus leucocephalus)*	Federally Threatened	Mature forest adjacent to open water bodies	Category 1
Peregrine Falcon (*Falco peregrinus anatum*)	Forest Service Sensitive	cliff nesting habitat	Category 1
California Spotted Owl (*Strix occidentalis occidentalis)*	Forest Service Sensitive	mature, mixed conifer conditions	**Category 3**
Northern goshawk (*Accipiter gentilis*)	Forest Service Sensitive	mature, mixed conifer and red fir conditions	**Category 3**
American marten (*Martes Americana*)	Forest Service Sensitive	mature, red fir conditions	**Category 3**
Mule Deer	Harvest	early seral, shrub	**Category 3**
Canada Goose (Branta canadensis)	Harvest	wetlands	Category 1
Golden Eagle (Aquila chrysaetos)	Special Interest	open forest	Category 2
Prairie Falcon (*Falco mexicanus*)	Special Interest	early seral/cliff	Category 1
Trout Group Rainbow (*Oncorhynchus mykiss*) Brook *(Salvelinus fontinalis)* Brown *(Salmo Trutta)*	Harvest	coldwater aquatic	**Category 3**
Largemouth Bass (Micropterus salmoides)	Harvest	warmwater aquatic	Category 1

[1] **Category 1:** MIS whose habitat is not in or adjacent to the project area and would not be affected by the project.
Category 2: MIS whose habitat is in or adjacent to project area, but would not be either directly or indirectly affected by the project.
Category 3: MIS whose habitat would be either directly or indirectly affected by the project.

2.a. Category 1

The, **Bald Eagle, Peregrine Falcon, Canada Goose, Prairie Falcon** and **Largemouth Bass** identified as Category 1 above, will not be further discussed because the habitat factors for these species are not in or adjacent to the project area; therefore, the project will not directly or indirectly affect the habitat for these species and will, therefore, have no impact on Bald Eagle, Peregrine Falcon, Canada Goose, Prairie Falcon and Largemouth Bass forest-level habitat or population trends.

2.b. Category 2

The **Golden Eagle**, identified as Category 2 above, has habitat in or adjacent to the project area but will not be further discussed because the habitat factors for this species would not be either directly or indirectly affected by the project; therefore, the project will not affect habitat for this species and will, therefore have no impact on Golden Eagle forest-level habitat or population trends.

2.c. Category 3

The MIS whose habitat would be either directly or indirectly affected by the Sugarberry Project, identified as Category 3 in **Table 1**, are carried forward in analysis. This MIS report will evaluate the direct, indirect, and cumulative effects of the proposed action and alternatives on the habitat of the Category 3 non-TES MIS and summarize effects to those TES MIS discussed in the BA/BE. The MIS selected for Project-Level MIS analysis for the Sugarberry Project are: **California Spotted Owl, Northern Goshawk, American Marten, Mule Deer** and **Trout group**.

3. LRMP MONITORING REQUIREMENTS FOR MIS SELECTED FOR PROJECT-LEVEL ANALYSIS

3.a. MIS Monitoring Requirements

The Plumas NF LRMP (USDA 1988, Chapter 5) and Appendix E of the SNFPA FEIS (USDA 2001), as adopted by the 2004 SNFPA FSEIS/ROD (USDA 2004), identify forest and bioregional scale habitat and population monitoring direction for the Plumas NF MIS. As discussed in the introduction to this report, forest-scale habitat monitoring direction is identified in the Monitoring Plan of the Plumas NF LRMP (USDA 1988, Chapter 5). For those Plumas NF MIS (USDA 1988, Appendix G) that are listed in Appendix E of the SNFPA FEIS (USDA 2001), population monitoring direction is described in Appendix E. For all other Plumas NF MIS, population monitoring direction is described in the LRMP Monitoring Plan (USDA 1988, Chapter 5). Habitat and population monitoring results for Plumas NF's MIS are described in the Plumas NF MIS Report (USDA 2006b) and are summarized below in **Table 2** for the MIS being analyzed for the Sugarberry Project.

Table 2. Plumas NF LRMP MIS Requirements for the Selected Project-Level MIS for the Sugarberry Project (USDA 1988, as amended by the SNFPA FSEIS/ROD 2004).

SELECTED PROJECT-LEVEL MIS SPECIES	MIS MONITORING REQUIREMENTS	
	Habitat	**Population**
California Spotted Owl	Habitat trends in network Territories (54 SOHA's) (USDA 1988, Chapter 5) [a]	Distribution and demographic (USDA 2001, Page E-50) [b]
Northern Goshawk	Habitat trends in nest groves (USDA 1988, Chapter 5)[a]	Distribution and demographic (USDA 2001, Page E-51) [b]
American Marten	Changes in habitat capability (USDA 1988, Chapter 5)[a]	Geographic distribution monitoring (USDA 2001, Page E-56) [b]
Mule Deer	None	Distribution population monitoring (USDA 2001, Page E-76) [b]
Trout	Habitat trends in Quantity and Quality (USDA 1988, Chapter	Distribution population monitoring (USDA 2001, Page E-76) [b]

	5) [a]	

[a] Plumas NF LRMP, Monitoring Plan (USDA 1988, Chapter 5).
[b] FEIS, Appendix E (USDA 2001).

3.b. How MIS Monitoring Requirements are Being Met.

California Spotted Owl: The habitat monitoring direction is being met by the Plumas NF through tracking of changes/trends in habitat within the 54 Spotted Owl Habitat Areas designated under the LRMP (i.e. network territories). In an effort to monitor changes in old growth and nesting habitat (CWHR 5M, 5D and 6) at a larger scale, the Plumas NF is using data collected under the Herger-Feinstein Quincy Library Group monitoring program for tracking the 10% threshold set for old growth habitat. For project level analysis of habitat trends, the habitat indicators that are tracked include: changes in acres in the amount of foraging and nesting habitat affected within the respective analysis area for each project.

Forest plan monitoring and survey efforts (USDA 1988) to determine population trends were conducted annually from 1991 to 1995 (USDA 2006b). The distribution and demographic population monitoring direction shown in **Table 2** above comes from SNFPA 2001, Appendix E. This monitoring direction is being met by the Plumas through: 1) implementing project level surveys to detect changes in the forest owl population (i.e. new territorial singles or pairs that would result in the formation of a Protected Activity Center (PAC); 2) Continued implementation of the Plumas-Lassen Administrative Study as part of the bio-regional distribution and demographic monitoring.

Northern Goshawk: This monitoring objective is being met by the Plumas through monitoring of status and trends within designated nest groves. Designated nest groves are defined as suitable habitat within Goshawk PACs. In an effort to monitor changes in old growth and nesting habitat (CWHR 5M, 5D and 6) at a larger scale, the Plumas will be using data collected under the Herger-Feinstein Quincy Library Group monitoring program for tracking the 10% threshold set for old growth habitat. For project level analysis of habitat trends, the habitat indicators that are tracked include: Changes in acres of habitat within established PACs, and acres of foraging and nesting habitat outside of PACs that are affected within the respective analysis area for each project.

Forest plan monitoring and survey efforts (USDA 1988) to determine occupancy on 25 percent of known nest groves was attempted annually from 1988 to 2000. The distribution and demographic population monitoring of Northern goshawk populations in the Sierra Nevada is occurring using the following methods: 1) goshawk occurrence data is tracked through a geodatabase (Fauna, CalGos, etc.), and 2) focused research and monitoring of select established PACs. From 2000 to 2005, PAC monitoring has occurred on approximately 30 percent of all PACs across the northern province of the Sierras (Region 5 statistics). The Redwood Science Lab (RSL), of the Pacific Southwest Research Station, is currently (2004-2006) conducting a Goshawk OHV study on the Plumas National Forest where they are annually evaluating and monitoring the effects of

OHV noise on goshawks. One aspect of this study is providing distribution monitoring by annually monitoring between 20 to 40 goshawk PACs on the Forest for occupancy and nesting success.

In addition and as discussed in the Sugarberry Project BA/BE (USDA 2007b), there has been recent monitoring of nest sites on the Feather River Ranger District plus comprehensive surveys throughout much of the Sugarberry wildlife analysis area from 2003 through 2005. These surveys provide distribution monitoring useful at the both the Forest and Project levels.

American Marten: This monitoring objective is being met by the Plumas through tracking of status and trends in habitat for the Marten. In an effort to monitor changes in habitat (CWHR 5M, 5D and 6), the Plumas will be using data collected under the Herger-Feinstein Quincy Library Group monitoring program for tracking the 10% threshold set for old growth habitat (defined as 5M, 5D and 6). For project level analysis of habitat trends, the habitat indicators that will be tracked include: changes in acres in the amount of 5M, 5D and 6 habitat affected within the respective analysis area for each project. The Plumas NF MIS Report (USDA 2006b) describes the current habitat and population trends for American marten on the Plumas NF.

Distribution information is provided by the CDFG, project surveys, and incidental sightings of animals and sign occurrence data. Data is tracked in geo-databases and used at the Forest level for distribution and trend monitoring and at the Project level for effects analysis. Geographic distribution monitoring for the marten is occurring at the bio-regional scale under the Sierra Nevada Forest Plan Amendment Province furbearer monitoring project. Information on bioregional monitoring for the American marten is available at: http://www.fs.fed.us/r5/snfpa/am/2005mareport.html and the data summarized in the Plumas NF MIS Report (USDA 2006b).

Mule Deer: Consistent with LRMP direction, mule deer population status and trend are tracked and monitored in cooperation with the California Department of Fish and Game (CDFG), the agency responsible for deer herd management within the State of California. The Plumas NF works closely with CDFG to periodically review deer population status on the forest. Population distribution monitoring for mule deer is conducted at a variety of scales: (1) statewide, hunting zone, and herd population monitoring is managed by CDFG using a variety of methods (CDFG 2002 and 2003) and (2) forest-level presence data are collected through tracking actual sightings of deer and through documenting sign occurrence data, including pellet groups (scat), tracks, antlers, tree rubs, and beds. The Plumas NF MIS Report (USDA 2006b) provides additional information about the methodology for collecting deer data and the results relative to monitoring population distribution trends for mule deer.

Trout Group: The habitat monitoring direction is being met through conducting Stream Condition Inventories as part of the HFQLG monitoring program. Selected streams are being monitored for habitat quality through inventories for reference stream conditions, pre-treatment stream conditions and post treatment stream conditions across the HFQLG

pilot project area, which includes the Plumas NF. Habitat quantity is being monitored and tracked through the miles of perennial and intermittent fish bearing and non-fish bearing streams.

The population direction shown in **Table 2** above comes from the 2001 SNFPA FEIS, Appendix E. This monitoring on the Plumas NF is being met through in stream monitoring at selected sample locations on the Forest. Twenty fish bearing stream reaches are selected to monitor for species occurrence and distribution across the forest. The Plumas MIS Report (USDA 2006b) describes the current habitat and population trends for trout on the Plumas NF. Population information from the Department of Water Resources, California Department of Fish & Game, and other partners may be used to meet this monitoring direction.

4. DESCRIPTION OF THE PROPOSED PROJECT

The Proposed Action and Action Alternatives of the Sugarberry Project implement fuel reduction (DFPZ), group selection (GS), individual tree selection (ITS), habitat enhancement and associated road activities in the project area. A detailed description of each of the alternatives is in Chapter 2 of the Sugarberry Project Draft Environmental Impact Statement (DEIS) (USDA 2007a).

Project Design standards for all action alternatives include standards & guidelines identified in Table 2 of the Supplemental SNFPA (2004) Record of Decision, and the use of limited operating periods identified in Table 2.3, HFQLG FEIS (1999).

The *terrestrial wildlife analysis area for determining cumulative effects on terrestrial wildlife* includes **38,545** acres of National Forest System land and **11,223** acres of private land for a total of **49,768** acres. The *terrestrial wildlife analysis area for determining direct and indirect effects on terrestrial wildlife* includes the **38,545** acres of National Forest System land. Sugarberry Project is surrounded by private land and/or other HFQLG projects. Private land accounts for approximately 22.6 percent of the area which includes a high degree of commercial timber production and harvest.

The *aquatic analysis area for determining direct, indirect, and cumulative effects on fisheries and aquatic habitat-dependent wildlife* includes **43,800** acres of National Forest System lands and **14,290** acres of private land for a total area of **58,088** acres. The aquatic analysis area is comprised of 44 subwatersheds ranging from 510 to 2,350 acres each, and is the same as the Cumulative Watershed Effects analysis area described in the Sugarberry Project, Hydrology Report (USDA 2007d).

All direct, indirect and cumulative effects discussed, occur within these analysis areas. Cumulative effects include those past, present and future actions on state, federal and private lands listed in Chapter 3 (Section 3.3.1) of the Sugarberry Project DEIS (USDA 2007a). The direct and indirect effects of each alternative, together with the additive or cumulative effects of each alternative, have been considered in evaluating impacts to MIS and MIS habitat.

The Sugarberry Project proposes to treat **3,295** acres, which is **8.5**% of the **38,545** acre (FS lands) terrestrial wildlife analysis area (6.6% including private lands), **5.9%** of the 58,088-acre aquatic analysis area (which includes private), and **0.2**% of the **1,528,667** acre Pilot Project area.

Action alternatives, Alternatives B, C and G, treatments would not enter known owl sites (PACS and SOHAs). Alternatives B, C and G have DFPZ, GS and ITS with a 30" dbh maximum cut level. The action alternatives are similar for DPPZ treatments. Of the **2,100** acres of DFPZ treatments, **250** acres are proposed for thinning. Thinning treatments would reduce canopy cover on **170** acres of CWHR 4 stands (trees 11-24 inches dbh) to a minimum of 40%. However, only two units would be taken down to 40% canopy cover and most treatments would retain canopy covers closer to 49%. Thinning treatments would reduce canopy cover on **80** acres of CWHR 5 stands (greater than 24 inches dbh) to a minimum of 50%. The remaining **1,850** acres of DFPZ would have treatments such as mastication or underburning which would effect the understory. Alternative B proposes **1,040** acres of Group Selection. Under Alternative B the canopy cover for the **155** acres of ITS treatments would be retained at 50%, were available. Alternatives C and G address hydrologic "thresholds of concern". The major difference between Alternative B, and Alternatives C and G is that under Alternatives C and G: 1) within DFPZ units, **125** acres of hand-cut and burn treatments would be hand-piled instead of tractor-piled; 2) **20** acres of GS would be dropped; and 3) **5** acres of ITS would be dropped.

Alternatives B, C and G would treat 2,100 acres of DFPZ. Within DFPZs, Alternatives C and G would treat **125** acres of hand cut-hand pile (in portions unit 901A). The transportation improvements would be very similar between Alternatives B, C and G. However, in Alternative G there would be **11.34** miles of decommissioned roads versus 4.7 miles in Alternatives B and C. In addition to retaining black oaks greater than 10" not only in DFPZ units but also in Group Selection units. Implementation of Alternative G does not decrease the reduction of subwatersheds over Threshold of Concern (TOC). Proposed black oak and aspen, release and enhancement treatments, and restoration activities would remain the same. The modifications to treatments between the three alternatives are minimal and difficult to measure habitat qualitatively. For that reason the occurring habitat modifications and disturbances related to the project implementation by all action alternatives will be discussed under Alternative B "Habitat Effects of the Action Alternatives" and "Effects of the Action Alternatives".

Alternative B, Group Selection would be 1,040 acres, while Alternatives C and G, Group Selection treatment would be **1,020** acres and 3.5 acres of those acres of Group Selection would be yarded by helicopter. Individual Tree Selection (ITS) treatments would be **150** acres. Of those approximately 13 acres ITS (which includes some GS) would go from ground-based equipment to a helicopter harvesting system (unit 584). Alternatives C and G would treat **320** acres with Sporax®.

Proposed transportation system would 1) provide needed access for completion of timber harvest and fuel reduction activities, and 2) contribute to watershed restoration, meadow enhancement, fish passage improvement, and streambank stabilization. The following treatments are proposed to allow access to treatment units for completion of DFPZ construction, group selection, and individual tree selection harvest:

- Approximately **0.6** miles of new classified system roads would be constructed.
- Approximately **25.3** miles of existing system roads would be reconstructed prior to project use. Reconstruction would consist of brushing, blading the road surface, improving drainage, and replacing/upgrading culverts where needed.
- Approximately **21.7** miles (21 miles under Alternatives C and G) of temporary spur roads would be constructed. All temporary spurs would be decommissioned after the project is completed; all re-opened spurs would be closed with barriers and allowed to revegetate.
- Approximately **60** existing landings and **190** new landings are in the project area. Harvest landings in group selection units and DFPZs would be constructed or reconstructed as needed. Landings would be subsoiled upon project completion, except where sensitive aquatic or riparian might be negatively affected.
- Approximately **4.7** miles of unauthorized roads would be decommissioned (restored to a natural condition). The roadbed would be stabilized or removed, culverts would be pulled, and stream crossings would be stabilized.

For the Sugarberry Project analysis area the representative CWHR vegetation types are listed in **Appendix 3**. Existing condition CWHR types were derived from VESTRA vegetation mapping (USDA 2002a) and aerial photo interpretation of 2000 photos. Field analysis provided the basis for adjustments to the vegetative landbase. The CWHR habitat types present within the project analysis area are reflective of those found within the westside mixed conifer and consist of Sierra Mixed Conifer (including white fir type), Red fir, Lodgepole Pine, Ponderosa Pine and Montane Riparian/ Meadow. These habitat types are described in *A Guide to Wildlife Habitat of California*, California Department of Forestry and Fire Protection, October 1988 (CDFG 1988).

5. EFFECTS OF PROPOSED PROJECT ON SELECTED MIS

5.a. California Spotted Owl

5.a.1. Habitat/Species Relationship

Detailed information on MIS for the Plumas NF is documented in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference. Habitat relationships for spotted owl are defined by the California Wildlife Habitat Relationships (CWHR) models, which model habitat suitability for California's terrestrial vertebrates (CDFG 2005).

Habitat requirements for the California spotted owl are found in the CASPO Technical Report (Verner et al 1992), SNFPA FEIS/ROD (2001) and 70 Federal Register June 21,

2005. There are presently 296 PACs on the Plumas National Forest. A full discussion on protection measures, species status and associated habitat, project effects on species and determinations for the Sugarberry Project is provided in the Sugarberry Project BA/BE, pages 20-21, 41-54, 67-74, 85-91, 95-96, 98-135, 157-183 and 207-210 (USDA 2007b). A summary of this analysis as it relates to the California spotted owl as an MIS follows.

5.a.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis:

The following factors are used to assess the effects of the proposed action and alternatives on spotted owl habitat: (1) impacts to known 300 acre PACs and 1000 acre HRCAs, and changes to suitable nesting/roosting and foraging habitat in the Analysis Area, (2) group densities and fragmentation, (3) impacts to suitable nesting habitat across the HFQLG Pilot Project Area and (4) level of risk associated with stand replacement fire.

Analysis Area for Project-level Effects Analysis:

The Sugarberry Project wildlife analysis area is approximately **49,768** acres, of which **38,545** acres are National Forest managed by the Plumas National Forest and **11,223** acres of private land within National Forest boundary. For the analysis of effects of the Sugarberry Project documented in this report, the "wildlife analysis area" geographic boundary was delineated based on the potential direct, indirect and cumulative effects on spotted owl Protected Activity Center (PAC) and Home Range Core Area (HRCA) distribution. The geographic scope of the cumulative effects analysis was selected to encompass the directly affected spotted owl PAC/HRCA's and provide some indication of affects to neighboring PACs/HRCAs, allowing an evaluation of the project's cumulative effects upon the nesting, foraging and dispersal capabilities of owls within and adjacent to the project area. The direct and indirect effects of the project would not magnify beyond this boundary and would encompass cumulative effects to owls as a result of project treatments. The analysis area extends to a point at which no direct or indirect effects are discernable and would not act cumulatively with other actions.

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

NOTE: *General effects of the proposed action and the action alternatives (in terms of impacts to various CWHR types as a result of implementing fuel reduction, group selection, individual trees selection and biomass removal) have been described in detail in the* Sugarberry Project BA/BE *(USDA 2007b). This MIS report references that document.*

Habitat conditions in the analysis area for spotted owl are presented in Table 11 and 18 of the Sugarberry Project BA/BE and in **Appendix 3**. Suitable nesting habitat for the spotted owl is considered CWHR 6, 5D, 5M and suitable foraging habitat is considered CHWR 4D and 4M. Suitable nesting and foraging habitat affected are displayed in

Table 3 below. PACs were not directly affected by project activities. Acres of suitable habitat within each of the **21** affected HRCAs are displayed in Table 26 of the Sugarberry Project BA/BE (USDS 2007b).

The direct, indirect and cumulative effects of the action and no action alternatives are displayed and discussed in the Sugarberry Project BA/BE, 85-91, 95-96, 98-135 and 157-183 (USDA 2007b). These impacts are summarized below for each alternative. The spatial scale for the potential effects of the Sugarberry Project on spotted owl habitat is the analysis area as identified in 5.a.2 above. The temporal scale for the analysis is 1970 to 2012 (five years from the present), which is the period of time the direct effects of the project should occur, and for which there is information on reasonably future actions in the analysis area.

Table 3. Change in CWHR Habitat types within Project Analysis Area

CWHR Class	No Action	Alt. B	Alt. C/G	Change	
				Alt. B	Alt. C/G
MHC4D	21	20	20	0	0
MHC4M	35	35	35	0	0
MHC5D	84	84	84	0	0
MHC5M	15	15	15	0	0
MHW4D	1482	1479	1479	-3	-3
MHW4M	384	386	386	2	2
MHW5D	323	323	323	0	0
MHW5M	34	34	34	0	0
MRI4M	22	22	22	0	0
RFR4D	206	206	206	0	0
RFR4M	10	10	10	0	0
SMC4D	3843	3679	3681	-164	-162
SMC4M	2984	3026	3030	42	47
SMC5D	6565	6066	6127	-500	-438
SMC5M	1882	2128	2077	246	195
WFR4D	12318	10847	10965	-1472	-1353
WFR4M	9194	9916	9908	722	714
WFR5D	2916	2735	2745	-181	-171
WFR5M	1134	1451	1416	317	282

*Acres not equal due to rounding and GIS digitizing errors

***Alternative A** (No Action)*

1) No short-term reduction in owl habitat, no treatment within HRCAs, and no change in forest interior habitat.

2) No fuels treatment would leave habitat vulnerable to high intensity wildfire, increasing the risk of large-scale habitat fragmentation, loss of PACs and loss of owl habitat.

3) Implementation of Alternative A involves little to no risk to owl habitat in the short term and thus short term future owl activity would be less uncertain. Not reducing the risk of catastrophic wildfire would pose a threat to long-term availability and recruitment of owl habitat.

Alternatives B, C and G *(Action Alternatives)*

1) The Sugarberry Project wildlife analysis area is approximately **49,768** acres, of which **38,545** acres are National Forest managed by the Plumas National Forest and **11,223** acres of private land within National Forest boundary. The Sugarberry Project area is over **90**% ridge-top, which is utilized for foraging but not preferred for nesting by the owls.

2) Of the **38,545** acre wildlife analysis area there are **33,813** acres that are considered suitable habitat for the California spotted owl. Of the **33,813** acres, there are **6,110** acres of PAC and **2,139** acres of SOHA[1] habitat managed for CSO nesting. PACS and SOHAs will not be entered under the Sugarberry Project area. There are **21** PACs, and associated HRCAs, and **5** SOHAs within the analysis area. There are no treatments proposed within PACs or SOHAs for Alternatives B, C and G.

3) Of the **33,813** acres of suitable habitat there are **25,564** acres, outside of PACs and SOHAs; **10,498** are considered suitable spotted owl nesting habitat (CWHR classes 5M and 5D), and **23,315** acres are considered suitable foraging habitat (CWHR classes 4M and 4D). The California Wildlife Habitat Relationship (CWHR) system describes forest habitats through tree size and canopy closure. Although shrub and herbaceous layers are decidedly important wildlife habitat attributes, they are not used by the CWHR system as a means to describe habitat.

   Two to four years of surveys, to "protocol", have been conducted in the Sugarberry area (Slate Creek watershed). Therefore, any effects to potentially occupied nesting habitat outside of PACs and SOHAs are expected to be minimal. Also, there is a very small percentage of habitat typed as nesting within treatment units.

4) Of the **25,564** acres, **11,799** acres fall within HRCAs. The HRCAs are 700 acres of foraging buffers that surround 300-acre PACs. Some HRCAs maintain less than 700 acres of foraging habitat due to the lack of available suitable habitat and/or due to the amount of surrounding private lands (SNFPA ROD 2004, page

[1] The information about suitable nesting and foraging habitat for California spotted owls that may be affected by this project excludes the protected areas within California spotted owl PACs and SOHAs, but not northern goshawk PACs (i.e. acres in northern goshawk PACs are added in to the total number of acres within the analysis area). Protected habitat within northern goshawk PACs may or may not be suitable for California spotted owls.

39). The decision assumes some short-term risk because it decreases spotted owl habitat suitability, and potentially, owl use of the treated areas. There are **21** HRCAs in the wildlife analysis area. Of these, **18** HRCAs would be affected by DFPZ, GS and ITS treatments.

5) Alternatives B, C and G have similar treatments for DFPZ, GS and ITS with a 30" dbh maximum cut level.

6) Alternative B proposes **2,100** acres of DFPZ, **1,040** acres of GS and **155** acres of ITS. The action alternatives (B and C) propose a treatment down to minimum of 40% canopy cover, which is a minimal requirement for spotted owl foraging habitat. However, only two units will be reduced to 40% canopy cover and the majority of the units would retain closer to 50% canopy cover. The major difference between Alternatives B and C is that Alternatives C and G would have a reduction of **20** acres of GS. Under Alternatives C and G, **5** acres of ITS would be dropped. Under the action alternatives, canopy cover for ITS treatments would be retained at 50%, were available.

7) Under Alternative B, there are **3,295** acres proposed for DFPZ/GS/ITS treatment. Of the 3,295 acres, there are **1,055** acres of the treatments within HRCAs. The 1,055 acres are **8.9%** of the 11,799 acres of HRCA acres available within the analysis area.

- Of the **2,100** acres of DFPZ there are approximately **360** acres (3%)of DFPZs treatments for Alternative B, C and G.
  *Of the **250** acres of DFPZ thinning treatments there are approximately 108 acres in HRCAs, 0.9% of the available HRCA acres. Of the **1,850** acres of non-thinning DFPZ there are approximately 258 acres in HRCAs, 2.2% of the available HRCA acres.
- Of the **1,040** acres of GS, Alternative B would reduce habitat suitability within approximately **565** acres (4.8%). Alternatives C and G would reduce habitat suitability within approximately 553 acres.
- Of the **155** acres of ITS, Alternative B would reduce habitat suitability for approximately **132** acres (1.1%). Alternatives C and G by approximately 127acres.

8) DFPZs: Treatments are proposed on **2,100** acres, which includes **250** acres of thinning with **1,850** acres of underburning, masticatioin, plantation thin, and hand-cut/pile/burn. The DFPZs would be constructed along existing roads, ridge tops, or other suitable terrain (HFQLG FEIS, page 2-20). DFPZs are constructed along ridge tops and would tend not to be nesting or roost habitat preferred by owls. However, disturbance due to construction or maintenance activities could limit use by all old-forest-associated species. There are minimal changes in acreage between Alternatives B, C and G. Effects outside of PACs, SOHAs and in HRCAs are expected to be low. The CWHR size for the total **2,100** acres are as follows: 1,228 acres of 4Ds; 209 acres of 4M; and 94 acres 5D; and 569 acres of

Of the **250** acres, 170 acres are CWHR 4. Thinning treatments would reduce canopy cover a minimum of 40 percent. However, only two units are expected to be reduced to the 40 percent, most units would be reduced to 49 percent. The other 80 acres of Thinning treatments would reduce canopy cover of CWHR 5 stands to a minimum of 50% (**Table 27**). The, 250 acres is approximately 0.016 percent of the Pilot Project area (HFQLG FEIS, page 3-103). In addition, this is expected to be a short-term impact to achieve fuels hazards reductions, improve fire-fighting capabilities, prevent potential stand-replacing fires, and increase stand size classes by reducing tree densities and brush competition.

Of the **1,850** acres 1,075 acres are mastication treatments (750 strictly mastication, 205 of mastication and underburn and 120 acres plantation thin and masictions). Mastication units would not reduce canopy cover below 50 percent. Mastication units remove under story canopy cover not over story canopy. There are 370 acres are of underburning. Underburning is expected to reduce canopy cover by 1 percent of the existing conopy cover. The remaining 405 acres of hand-cut tractor pile and hand-cut pile and burn should not affect canopy cover. There are 120 acres of Plantation treatments proposed. Plantations do not have canopy restrictions, they are considered developing areas that require management prescriptions so that they may continue to grow healthy trees for the future. The difference between Alternative C, G and B in DFPZ units is minimal. The difference being the acres of hand-cut pile tractor verses hand-cut pile burn.

9) **Group Selection** There are **21** HRCA in the wildlife analysis area. Of the 21 HRCAs, **18** HRCAs would be directly affected . Alternative B would reduce habitat suitability in **1,020** acres. Alternative B would reduce habitat suitability within HRCAs by **565** acres. Alternative C and G would reduce habitat suitability within HRCAs by **553** acres. Based on acres that would be affected in individual HRCAs, it is difficult to predict if there would be a shift in owl use due to habitat alteration.

Of the **1,040** acres of Group Selections, there are **334** acres of CWHR 5 (244 acres of CWHR 5Ds and 90 acres of CWNR 5M) and **686** acres of CWHR 4s (587 acres of CWHR 4Ds and 99 acres of CWHR 4Ms).

- Of those acres, **565** are in HRCAs: 214 acres CWHR 5s (78 acres of CWHR 5M and 136 acres of CWHR 5D), 344 acres in CWHR 4s (19 acres in 4M and 325 acres of CWHR 4D) and 7 acres in CWHR 3D and 3P.

10) **Individual Tree Selection**, also called area thinning, would be conducted on approximately **155** acres under Alternative B and **150** acres in Alternative C and G. Five acres would be dropped due to concerns about

subwatershed over the “thresshold of concern”. All of the 155 acres are in CWHR size class 4D and would be reduced to CWHR 4Ms. These acres would be maintained at a 50% minimum canopy cover which is above minimal foraging levels. The 155 acres would retain more understory components and although being thinned they should provide suitable nesting habitat within 10 years as the overstory matures.

Actual acres in HRCAs include **132** acres in Alternative B and **127** acres in Alternative C and G. The difference between Alternative B and Alternatives C and G is that **5** acres of ITS would be dropped which are inside a HRCA (unit 7).

11) Based on the direct/indirect effects, implementation of this alternative would contribute to cumulative effects on spotted owl and spotted owl habitat. There would be a cumulative reduction in habitat in the fuel treatments and in GS areas. Because of the three items above, implementation of Alternative B involves a level of risk to owl habitat in the short term and uncertainty about future owl activity; this level of risk is slightly greater than Alternative C and G.

12) Implementation of fuels treatments could decrease the likelihood of active crown fires and increase ability of fire management to suppress, control, and contain fires. This could reduce the potential risk of increased large-scale habitat fragmentation, and loss of owl habitat as a result of high intensity wildfire. This alternative would decrease the risk of PAC loss due to wildfire for PACs adjacent to and upslope of fuels treatments.

13) No new road construction will occur in CSO PACs or SOHAs. For any road reconstruction in PACs a LOP would be applied to all CSO activity centers. A LOP will be applied to haul routes within ¼ mile of an active nest. Noise from vehicles and equipment and increased human activity and presence could affect this species. Disturbance would be limited to individual treatment units and last a few days to 2 weeks in any location. Implementation of the LOPs for known nests, as listed in the HFQLGFRA FEIS ROD, would reduce impacts on California spotted owls. Impacts from disturbance would be limited and not substantially affect habitat use or reproductive capacity of this species. No treatment of aspen stands will occur in California spotted owl PACs or SOHAs or within ¼ mile of know active nests.

There will be permanent road construction and reconstruction and temporary construction that would increase human disturbance. However, road closures and decommissioning of some permanent and old temporary roads is also proposed. Approximately 4.7 miles of road decommissioning, 25.3 miles of road reconstruction, 0.6 miles of new classified road construction, and 21.7 miles of new temporary spur construction. Decommissioning of roads would lower the average road density from 4.5 miles per square mile to 4.4 miles per square mile, which is still a high road density for most species. Habitat loss and species

disturbance in the long-term would be only slightly reduced as a result of the proposed road reduction.

5.a.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Plumas NF LRMP (as amended by the SNFPA) requires forest-scale habitat monitoring of Habitat trends in network Territories (54 SOHA's) and status and change monitoring at the Bioregional scale for the California spotted owl (**Table 2** above) (USDA 2001, Page E-50); hence, the spotted owl effects analysis for the Sugarberry Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population status and trend data for the spotted owl. This information is drawn from the detailed information on habitat and population trends in the Plumas National Forest MIS Report (USDA 2006d), which is hereby incorporated by reference.

Habitat Status and Trend:

Current spotted owl habitat status was calculated using the vegetation data developed by VESTRA and satellite imagery and presented in the HFQLG EIS (USDA 1999). Impacts to spotted owl nesting habitat can be related to the amount of CHWR size classes 5M, 5D and 6 that have been tracked across the HFQLG Pilot Project, which includes the Plumas, Lassen and Sierraville District of the Tahoe (HFQLG EIS, pg. 2-8, HFQLG 2005 Monitoring Summary Report (3/3/2006)(USDA 2006c). Reductions are documented and a cumulative total is tracked to make sure that no greater than a 10% reduction occurs over the life of the Pilot Project (1999 to 2009). There are currently 186,394 acres classified as 5M, 5D and 6 in the pilot project area. According to the HFQLG 2005 Monitoring Summary Report (3/3/2006)(USDA 2006c) to date habitat suitability on 3,282 acres has or will have been reduced (includes the projected acres of reduction for the Sugarberry Project, based on projects with a signed decision). These acres total approximately 1.7% of the acres in 5M, 5D and 6 within the Pilot Project. These acres have been reduced to either CWHR 5P in DFPZ's or CWHR 1 and 2 in group selections.

Most of the projects affecting the spotted owl on the Plumas NF have been HFQLG projects, so the amount of 5M, 5D, and 6 affected by HFQLG appears to be a good indicator of habitat trend. The 1.7% of the (existing) 5M, 5D and 6 habitat affected to date is relatively low compared to the overall amount of suitable habitat available across the pilot area. The Plumas share of this total would be less than the 1.7%. Thus across the HFQLG area there has been a slight decrease in nesting/roosting habitat since 2000.

Population Status and Trend:

The PNF MIS Report (USDA 2006b) provides background information on the status, population estimates and trends of spotted owl populations located on the Plumas NF. The Plumas LRMP, Table 4-4, set a minimum management objective of providing suitable habitat for a Forest-wide network of 54 spotted owl habitat areas. The Plumas

LRMP established this minimum objective in order to provide for owl viability on the Forest. In addition, Table 4-2 from the LRMP estimated 69 owl pairs in the 1st decade (1986 – 1995) and maintaining that same number of pairs over the 2nd decade (1996 – 2005). The forest exceeded that projection in 1991 and has maintained those numbers through 2005. The viability threshold defined by the Plumas LRMP of maintaining 54 Spotted Owl Habitat Areas (SOHAs) has been accomplished since 1991. In addition, the 296 California spotted owl PACs currently delineated on the Plumas are widely distributed across the forest where suitable habitat is present and available.

The Forest calculated occupancy rate information from 1991 data on the 54 Spotted Owl Habitat Areas (SOHAs) being monitored under the forest plan at that time. The 1991 occupancy rates showed that owl pairs at the time occupied 74% of habitat areas, singles occupied 22%, and that 4% of the sites had no owls or were unoccupied.

Bio-regional demographic and distribution monitoring under the 2004 SNFPA Appendix E is being conducted as part of the Plumas Lassen Administrative Study (PLAS) spotted owl module. The PLAS has been gathering owl presence/occupancy information within specific survey areas (Treatment Units) on the PNF for the last three years. In 2004, the study located 50 spotted owl sites. Of these 50 spotted owl sites, 43 had pairs and 7 had single owls. Therefore, pairs occupied 86% of the sites located in 2004, while single owls occupied 14%. In 2005, 103 spotted owl sites were located. Of the 103 sites, 76 contained pairs, 17 contained unconfirmed pairs (one member of pair confirmed as territorial single, plus single detection of opposite sex bird), and 10 single owls. Therefore, in 2005, pairs occupied 74% of the sites, 16% were occupied by unconfirmed pairs, and 10% by single owls. This 2005 PLAS occupancy data strongly resembles 1991 occupancy data from the Plumas NF. Over this 14 year period, the occupancy rates for owls on the Plumas NF has remained stable. The PLAS as also established a crude density estimate of 0.075 owls/km² (0.075 owls/247.1 acres) over the study area.

The Spotted Owl population status on the Plumas National Forest consist of 296 PACs. Based on monitoring data collected on the Forest, these PACs contain a range of 135 to 163 owl pairs, and 93 to 142 single owls (USDA 2006d). Occupancy rates of owl sites indicate a stable trend on the forest based on Plumas NF data from 1991 and PLAS data from 2005. The spotted owl population is well above the estimated number of owl pairs projected by the Forest LRMP during the 1st and 2nd decade (Chapter 4, LRMP, page 4-14.

Bio-regional monitoring (including the Plumas Lassen Administrative Study (PLAS) spotted owl module, and the latest U.S. Fish & Wildlife Service listing determination indicates a stable to slightly upward population trend for the California Spotted Owl (Federal Register 50 CFR 17, Volume 71, Number 100, May 24 (USDI 2006). Plumas National Forest data indicates that spotted owls are widely distributed across the forest where suitable habitat is currently present (Pumas NF MIS Report, USDA 2006b).

5.a.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

The Sugarberry Project analysis concludes that there would be a reduction in quality of habitat of approximately **1,055** acres with Alternative B, approximately **1,045** acres with Alternatives C and G (Refer to the Sugarberry Project BA/BE, page 161). Therefore, there would be a cumulative contribution to the loss of suitable habitat for old forest-dependent species within the HFQLG Planning Area as a result of implementing four of the five action alternatives. These figures have already been incorporated into the total acre figure reduced across the pilot project discussed in 5.a.3.

The three action alternatives avoid habitat modification within PACs/SOHAs. No changes in spotted owl PAC/HRCA/SOHA occupancy, distribution or the spotted owl population on the PNF is expected to occur. With implementation of an action alternative, California spotted owl habitat could be better protected from stand replacement fires (from the existing condition) for the next 10-20 years. The project-level habitat impacts will contribute to the current forest-wide trends of short-term reductions for long-term protection of PACs, SOHAs and HRCAs.

5.b. Northern Goshawk

5.b.1. Habitat/Species Relationship

Detailed information on MIS for the Plumas NF is documented in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference. Habitat relationships for northern goshawk are defined by the California Wildlife Habitat Relationships (CWHR) models, which model habitat suitability for California's terrestrial vertebrates (CDFG 2005). Habitat requirements for the species are found in SNFPA FEIS (USDA 2001). There are presently 144 Northern Goshawk PACs on the Plumas National Forest. A full discussion on species status, as well as habitat/species relationships for the Sugarberry Project is provided in the Sugarberry Project Biological Assessment / Evaluation, pages 21-22, 41-54, 74-78, 85-91, 96-97, 98-135, 183-193 and 207-210(USDA 2007b).

5.b.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis:

The following factors are used to assess the effects of the proposed action and alternatives on goshawk habitat: (1) impacts to known goshawk PACs, (2) impacts to suitable habitat within the Analysis Area and (3) level of risk associated with stand replacement fire.

Analysis Area for Project-level Effects Analysis:

The Sugarberry Project analysis area (or wildlife analysis area) is approximately **49,768** acres, of which **38,545** acres are National Forest managed by the Plumas National Forest and **11,223** acres of private land within National Forest boundary. The wildlife analysis

area geographic boundary was delineated based on the potential direct, indirect and cumulative effects on the California spotted owl Protected Activity Center (PAC) and Home Range Core Area (HRCA) distribution. The average home range of the owl is the largest and representative of the maximum home range of other terrestrial species using similar habitats (4M, 4D, 5M, 5D, and 6), and therefore effects to the owl at this spatial scale would be indicative of the effects to other late seral stage species. This analysis considers project level effects to goshawk PACs and goshawk habitat included in the analysis area.

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

NOTE: *General effects of the proposed action and the action alternatives (in terms of impacts to various CWHR types as a result of implementing fuel reduction, group selection, individual trees selection and biomass removal) have been described in detail in the* Sugarberry Project BA/BE *(USDA 2006c). This MIS report references that document.*

Habitat conditions in the Analysis Area for goshawk are displayed in **Table 3** above (from Table 12 and 18 of the Sugarberry Project BA/BE) and **Appendix 3**.

The Direct/Indirect and cumulative effects of the action and no action alternatives are displayed and discussed in the Sugarberry Project BA/BE (pages 85-91, 96-97, 98-135 and 183-193). These impacts are summarized below for each alternative. The spatial scale for the cumulative effects of the Sugarberry project on goshawk habitat is the analysis area identified in 5.b.2 above. The temporal scale for the analysis is 1970 to 2012 (five years from the present), which is the period of time the direct effects of the project should occur, and for which there is information on reasonably future actions in the analysis area. The effect of actions on goshawk habitat range from 10-20 years for fuel treatments and thinning and approximately 50 years before group selection units provide forested habitat.

Alternative A* *(No Action)

1) No short-term reduction in goshawk habitat.

2) No fuels treatment would leave habitat vulnerable to high intensity wildfire, increasing the risk of large scale habitat fragmentation, loss of PACs and loss of suitable goshawk nesting and foraging habitat.

3) Implementation of Alternative A involves little to no risk to goshawk habitat in the short term and thus future goshawk activity would be less uncertain.

Alternatives B, C and G* *(Action Alternatives)

1) The Sugarberry Project wildlife analysis area is approximately **49,768** acres, of which **38,545** acres are National Forest managed by the Plumas National Forest and

11,223 acres of private land within National Forest boundary. The Sugarberry Project area is over **90**% ridge-top, which is utilized for nesting and foraging by goshawks.

2) Currently, there are **20** Northern goshawk PACs in the terrestrial wildlife analysis area. The **3,382** acres within these PACS will be managed for suitable nesting habitat for the Northern goshawk. No goshawk PACs would be entered for DFPZ, GS or ITS treatments. Twelve goshawk PACs overlap with California spotted owl PAC habitat (goshawk nesting habitat requirements are similar to spotted owl nesting requirements [HFQLG, page 3-106]). The establishment of northern goshawk PACs, as well as CSO PACs, will conserve habitat for this species.

3) The effects to potentially suitable nesting habitat outside of established PACs was considered under indirect effects based on the assumption that surveys, following regional protocol, would have detected any activity centers. Any new activity centers would become part of established PACs or new PACs would have been designated. Within the **38,545** acre terrestrial wildlife analysis area, there are **33,813** acres of potentially suitable goshawk nesting habitat (5M, 5D, 4M, 4D) and are **4,732** acres of potentially suitable goshawk foraging habitat (3M, 3D, 4P, 5P and 6). This analysis is based on CWHR forest strata types identified as nesting and foraging habitat in the HFQLG FEIS (p.3-106).

4) There is little difference in the effects to goshawk habitat between Alternatives B and C and G in regards to implementation of actions designed to create DFPZ's. There are slight changes as a result of implementing GS and ITS with biomass. Effects of Action Alternative B would affect goshawk habitat trends forest-wide by decreasing habitat suitability in the short-term from a maximum of 1,208 acres (250 acres of DFPZ, 803 acres of GS and 155 acres of ITS). However, the 250 acres of DFPZ thin and 155 acres of ITS will retain at least minimum foraging levels. The GS treatments were averaged over the stands. Habitat suitability on the 1,850 acres of DFPZ underburn/mastication/hand-cutting treatments should improve habitat suitability. Alternatives C and G would treat 20 acres less of GS and 5 acres less of ITS.

5) **DFPZs**: Approximately **2,100** acres of DFPZ are proposed for treatment, which is approximately **5.4**% of the available suitable Northern goshawk habitat. Of the **2,100** acres of DFPZ treatments, **250** acres are proposed for thinning. Thinning treatments would reduce canopy cover on **170** acres of CWHR 4 stands (trees 11-24 inches dbh) to a minimum of 40%. However, only two units would be taken down to 40% canopy cover and most treatments would retain canopy covers closer to 49%. Thinning treatments would reduce canopy cover on **80** acres of CWHR 5 stands (greater than 24 inches dbh) to a minimum of 50%. An overall 49% canopy cover retention provides suitable foraging habitat in the short-term. Also, Northern goshawks prefer open understories for foraging so thinning and other treatments within the DFPZ units would benefit foraging habitat in the long-term. The action alternatives are similar for DPPZ treatments.

6) **Group Selections**: Approximately **1,040** acres of Group Selection (GS) are proposed for treatment, which is approximately **2.7**% of the available suitable Northern goshawk habitat (**33,812** nesting and **4,732** foraging acres) within the **38,545** acre terrestrial wildlife analysis area. Alternatives C and G propose to drop 20 acres of the 1,040 acres identified under Alternative B due to watershed "Thresholds of Concern".

Alternative B would reduce suitability of approximately **803** acres (2.4**%)** of potentially suitable nesting habitat and less than 1% of potentially suitable foraging habitat within the analysis area. It is important to note that, numerous GS unit acres overlap within the one-mile buffer. For example, **Table 32** of the Sugarberry BA/BE shows that within the one mile of PAC's T61 and T63 there are 66 acres of GS. Alternative C and G would reduce suitability of approximately **790** acres (2%) of potentially suitable nesting habitat and less than 1 percent of potentially suitable foraging habitat.

7) **Individual Tree Selection**: Units designated for Individual Tree Selection (ITS) would be treated by cutting diseased or otherwise unhealthy trees (sanitation cut) combined with a thinning from below. Approximately **155** acres of ITS are proposed for treatment, approximately **0.4**% of the available suitable Northern goshawk habitat (33,812 nesting and 4,732 foraging acres) within the 38,545 acre terrestrial wildlife analysis area. All of the 155 acres fall within suitable goshawk habitat. All of the 155 acres are in CWHR size class 4D and would be reduced to CWHR 4Ms. Under both action alternatives, canopy cover for ITS treatments would be retained at 50%, were available. A 50% canopy cover retention provides suitable foraging habitat in the short-term. Also, Northern goshawks prefer open understories for foraging so thinning within the ITS units would benefit foraging habitat in the long-term. Under Alternative C **5** acres of ITS would be dropped.

8) Action Alternatives B, C and G have DFPZ, GS and ITS with a 30" dbh maximum cut level. However, it is important to note that an estimated of **1,385** trees > 30 inches could be removed for operational purposes, such as roads and landings through out the project.

9) Based on the direct/indirect effects, implementation of these action alternatives would contribute to cumulative effects on goshawk habitat at the Forest level. There would be a cumulative reduction in habitat in the fuel treatments and within group selection areas. Implementation of the action alternatives involves a level of risk to goshawk habitat in the short term and some uncertainty about future goshawk activity. However, overall proposed treatments are expected to improve Northern goshawk habitat in the long-term.

10) Implementation of fuels treatments could decrease the likelihood of active crown fires and increase ability of fire management to suppress, control, and contain fires. This could reduce the potential risk of increased large-scale habitat fragmentation, and loss of goshawk habitat as a result of high intensity wildfire. These alternatives

would decrease the risk of PAC loss due to wildfire for a minimum of five PACs immediately adjacent to, and upslope, of fuels treatments.

11) Northern goshawks prefer mature forests with large trees and open understories. Therefore in the short-term goshawks may be impacted, however, treatments proposed under the action alternatives should improve foraging, as well as nesting, habitat in the long-term. The action alternatives would provide more effective fuel reductions treatments, would reduce fuel-loading, provide for safe/effective zones to fight fires, and reduce the potential of stand replacing fires in the long-term and the potential loss of suitable habitat, nesting as well as foraging. None of action alternatives are considered detrimental to the Northern goshawk. Indirect effects are expected to be low for each action alternative. The project may add to cumulative effects in a way that would affect individual northern goshawks and change the distribution of habitat because it is a part of the larger Pilot Project for the HFQLGFRA. Since direct effects are not expected and indirect effects would be low, it is expected that cumulative effects would be low. Cumulative effects will be similar for Alternatives B and C and G.

12) Effects common to all action alternatives follow: management requirements include the retention of large trees (30 inches dbh and larger) and snags (4 per acre of 15 inches dbh and larger). Down woody material (10–15 tons per acre of the largest diameter) will be retained. However, due to operability and safety concerns, the snag retention goal may not be achieved. In addition, approximately **1,385** trees, 30 inches dbh and larger, would be removed for each action alternative as a result of: permanent and temporary roads construction, reconstruction of temporary roads, and new and reconstruction of landings due to "operability" (Sugarberry Project - Silviculture Report, 2007. The percent of trees 30 inches dbh and larger that may be removed from the project area is estimated at **0.3%.** The HFQLG FEIS, and SNFPA FEIS and FSEIS each discuss the importance of large tree retention for old forest associated species. Large trees are an important habitat component. In addition, the loss of this large tree component affects numbers of large trees for future snag recruitment. The loss of the approximate **1,385** trees is within habitat typed as suitable, although not determined as occupied, for the Northern goshawk.

13) No new road construction will occur in goshawk PACs. For any road reconstruction in PACs a LOP would be applied to all goshawk activity centers. A LOP will be applied to haul routes within ¼ mile of an active nest. Noise from vehicles and equipment and increased human activity and presence could affect this species. Disturbance would be limited to individual treatment units and last a few days to 2 weeks in any location. Implementation of the LOPs for known nests, as listed in the HFQLGFRA FEIS ROD, would reduce impacts on Northern goshawks. Impacts from disturbance would be limited and not substantially affect habitat use or reproductive capacity of this species. No enhancement/restoration treatments will occur in PACs or within ¼ mile of know active nests.

There will be permanent road construction and reconstruction and temporary construction that would increase human disturbance. However, road closures and decommissioning of

some permanent and old temporary roads is also proposed. Approximately 4.7 miles of road decommissioning, 25.3 miles of road reconstruction, 0.6 miles of new classified road construction, and 21.7 miles of new temporary spur construction. Decommissioning of roads would lower the average road density from 4.5 miles per square mile to 4.4 miles per square mile, which is still a high road density for most species. Habitat loss and species disturbance in the long-term would be only slightly reduced as a result of the proposed road reduction.

5.b.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Plumas NF LRMP (as amended by the SNFPA) requires forest-scale habitat monitoring of habitat trends in network Territories (PACs) and status and change monitoring (Table 2); hence, the goshawk effects analysis for the Sugarberry Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population status and trend data for the goshawk. This information is drawn from the detailed information on habitat and population trends in the Plumas NF MIS Report (USDA 2006b) and the Sugarberry Project BA/BE (USDA 2007b) which are hereby incorporated by reference.

Habitat Status and Trend:

Current goshawk habitat status was calculated using the vegetation data developed by VESTRA and satellite imagery and presented in the HFQLG EIS (USDA 1999). Effects to some goshawk nesting habitat can been related to the amount of CHWR size classes 5M, 5D and 6 that have been tracked across the HFQLG Pilot Project, which includes the Plumas, Lassen and Sierraville District of the Tahoe. Reductions are documented and a cumulative total is tracked to make sure that no greater than a 10% reduction occurs over the life of the Pilot Project (1999 to 2009). There are currently 186,394 acres classified as 5M, 5D and 6 in the pilot project area. To date habitat suitability on 3,282 acres has or will have been reduced (includes the projected acres of reduction for the Sugarberry Project, based on projects with a signed decision). These acres total approximately 1.7% of the acres in 5M, 5D and 6 within the Pilot Project.

Most of the projects affecting the goshawk on the Plumas have been HFQLG projects, so the amount of 5M, 5D, and 6 affected by HFQLG appears to be a good indicator of habitat trend. The 1.7% of 5M, 5D and 6 habitat affected to date is relatively low compared to the overall amount of suitable habitat available across the pilot area. The Plumas share of this total would be less than the 1.7%. Thus across the HFQLG area there has been a slight decrease in habitat since 2000. Additional goshawk nesting habitat (4M, 4D) has been tracked at the project level and at the RD level. This tracking of nesting habitat is displayed in the Sugarberry BA/BE.

Population Status and Trend:

Currently, the Plumas has 144 Goshawk PACS. The Plumas met its minimum LRMP objective (i.e. threshold) of 60 Goshawk PACs in 1996. The current 2005 numbers exceeds the minimum LRMP objectives by more than double, and the predicted capacity of 100 PACs by 44 PACs. Goshawk PACs on the Plumas have increased since development of the Forest Plan. From 1988 to 2005, the number of PACs has increased by an average of 7 PACs per year over this 17-year period.

Although the Goshawk OHV study has only been going on a few years, the RSL is showing a reproductive success rate of 63%, 57% and 52% for the number of active nest monitored in 2004, 2005 and 2006.

From 2000 to 2005, PAC monitoring has occurred on approximately 30 percent of all PACs across the northern province of the Sierras (Region 5 statistics). The combination of historic information and more recent inventory and monitoring data, indicate that the northern goshawk populations in the Sierra Nevada including the Plumas NF are relatively secure with the increase in occupancy of previously unoccupied sites indicating potentially increasing populations at the forest scale.

5.b.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

There is little difference in the effects to goshawk habitat between Alternatives B and C and G in regards to implementation of actions designed to create DFPZ's. There are slight changes as a result of implementing GS and ITS with biomass. Effects of Action Alternatives B would affect goshawk habitat trends forest-wide by decreasing habitat suitability in the short-term from a maximum of 1,208 acres (250 acres of DFPZ, 803 acres of GS and 155 acres of ITS). However, the 250 acres of DFPZ thin and 155 acres of ITS will retain at least minimum foraging levels. The GS treatments were averaged over the stands. Habitat suitability on the 1,850 acres of DFPZ underburn/mastication/hand-cutting treatments should improve habitat suitability. Alternatives C and G would treat 20 acres less of GS and 5 acres less of ITS.

The action alternatives avoid habitat modification within goshawk PACs. It is not anticipated that the expected habitat reduction would result in loss of occupancy, productivity or distribution of known goshawk PACs, and therefore no changes to the goshawk population on the PNF and within the Sierra Nevada is expected to occur.

5.c. American Marten

5.c.1. Habitat/Species Relationship

Detailed information on MIS for the Plumas NF is documented in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference. Habitat relationships for American Marten are defined by the California Wildlife Habitat Relationships (CWHR) models, which model habitat suitability for California's terrestrial vertebrates (CWHR 2005). Habitat requirements for the species are found in SNFPA FEIS (2001). A

full discussion on species status, as well as habitat/species relationships for the Sugarberry Project are discussed in the Sugarberry Project Biological Assessment and Biological Evaluation, pages 22, 41-54, 78-81, 85-91, 97, 98-135, 193-200 and 207-210.

5.c.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis:

The following factors are used to assess the effects of the proposed action and alternatives on marten habitat: (1) impacts to suitable habitat within the Analysis Area, and (2) connectivity of habitat across the analysis area.

Analysis Area for Project-level Effects Analysis:

The Sugarberry Project analysis area (or wildlife analysis area) is approximately **49,768** acres, of which **38,545** are National Forest managed by the Plumas National Forest and **11,223** acres of private land within National Forest boundary. The "wildlife analysis area" geographic boundary was delineated based on the potential direct, indirect and cumulative effects on spotted owl Protected Activity Center (PAC) and Home Range Core Area (HRCA) distribution. The average home range of the owl is representative of the home range of other terrestrial species using similar habitats (4M, 4D, 5M, 5D, and 6), and therefore effects to the owl at this spatial scale would be indicative of the effects to other late seral stage species. The owl is used as a surrogate for marten due to known owl locations on the landscape, and the fact that similar habitats are used by these species. No known locations of marten exist in the analysis area. Effects (direct, indirect, cumulative) to owl habitat will be reflective of effects (direct, indirect, cumulative) to marten habitat within this same analysis area. Because marten and spotted owls share similar habitat requirements, such as those for dense, old forests with large trees and high representation of snags and logs, utilizing an analysis area based on spotted owl habitat requirements was deemed an appropriate scale for marten as well. Marten denning, resting and foraging habitat, including high elevation red fir, is distributed across the analysis area, predominately above 5,000 foot elevation.

The Plumas Forest has mapped a draft forest carnivore network across the Forest that consists of scattered historic marten sightings, large habitat management areas, and wide dispersal or connecting corridors. The management intent of this draft network is to provide a continuously connected system of habitats focused on the needs of the Marten. This corridor is designed to provide a habitat connectivity corridor linking the Tahoe NF with the Lassen NF. The draft Plumas network is comprised of four components: 1) the riparian zone; 2) old-forest habitat, including mature red fir, spotted owl PACs, SOHAs, and Goshawk territories (another old forest dependant species), 3) connectors, such as Special Interest Areas, Bucks Lake Wilderness, Wild & Scenic River corridors and 4) known and historic marten sightings. Much of the forest carnivore network is in areas reserved from harvest for other reasons (e.g., Wilderness). This network is considered draft since it is not incorporated into the Plumas LRMP as a land allocation with standards & guidelines and is subject to revision based on developing scientific theory. It

is a plan to project analysis tool designed to maintain future options. The network is used as a tool to evaluate impacts of specific projects on habitat connectivity for the Marten. This network encompasses 274,408 acres on the Plumas NF. Approximately **0.05%** (**133 acres**) of the 274,408 acres would be affected by implementation of the Sugarberry Project. Surveys have not detected marten in the analysis area.

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

NOTE: *General effects of the proposed action and the action alternatives (in terms of impacts to various CWHR types as a result of implementing fuel reduction, group selection, individual trees selection and biomass removal) have been described in detail in the* Sugarberry Project BA/BE *(USDA 2006c). This MIS report references that document.*

Habitat conditions in the Analysis Area for marten are displayed in **Table 3** above (from Table 11 and 12 of the Sugarberry Project BA/BE and **Appendix 3**). The 2001 SNFPA EIS identifies CWHR types 4D, 4M, 5D, 5M and 6 as moderately to highly important to the marten. Preferred forest types in the Sierra are red fir, lodgepole pine, subalpine conifer, mixed conifer-fir, Jeffrey pine, and eastside pine. The CWHR type found in the project area is Sierra Mixed Conifer (SMC). Within the 22,659 acre analysis area, over half of the acres may be considered suitable habitat (based on the Vestra mapping). No marten denning sites have been discovered on the Plumas NF. Protection of CSO and NOGO PACs, and establishment of the draft forest carnivore corridor and RHCA's will provide connectivity between large blocks of suitable habitat.

The Direct, Indirect and Cumulative effects of the action and no action alternatives are displayed and discussed in the Sugarberry Project BA/BE (pages 85-91, 97, 98-135 and 193-200, USDA 2007b). These impacts are summarized below. The spatial scale for the cumulative effects of the Sugarberry project on marten habitat is the analysis area identified in 5.f.2 above. The temporal scale for the analysis is 1970 to 2012 (five years from the present), which is the period of time the direct effects of the project should occur, and for which there is information on reasonably foreseeable future actions in the analysis area.

Alternative A* *(No Action Alternative)

1) No short-term reduction in goshawk habitat.

2) No fuels treatment would leave habitat vulnerable to high intensity wildfire, increasing the risk of large scale habitat fragmentation and potential loss of suitable denning/resting and foraging/travel habitat.

3) Implementation of Alternative A involves little to no risk to American marten habitat in the short term and thus future goshawk activity would be less uncertain.

Alternatives B and C and G* *(Action Alternatives)

1) Within the Sugarberry Project the draft network includes a riparian or movement corridor along Slate Creek, a tributary to the North Fork Yuba River, which runs down the center of the project area; and Canyon Creek which makes up the eastern boundary of the project area. Another key component of the network is mature forest blocks which is made up of established CSO and NOGO PACs, and Special Interest Areas within the project area.

2) All action alternatives would reduce existing canopy covers. Retaining CWHR 5s and 4s at the maximum percent canopy cover would have less impact on habitat suitability within the short-term. However greater thinning of the canopy within CWHR 4s and 5s will create CWHR 5s and 6s at a faster rate, creating more suitable and higher quality habitat in the long-term. Changes in canopy cover can alter temperature in foraging areas. However, due to the overall percentage (**6.6**%) of ground treated by DFPZ, GS and ITS units (**3,295** acres), within the overall analysis area, the overall effects should be low. In addition, small openings as a result of GS may create foraging habitat as a result of increasing habitat for prey species such as small rodents. Implementation of the action alternatives should have little effect on the approximate 758,431 acres of suitable denning and foraging habitat identified in the HFQLG FEIS (p3-110).

3) Although the existing suitability of habitat would be reduced, habitat would not be totally removed. Habitat suitability will be retained at minimum foraging levels or higher. This analysis is based on HFQLGFRA FEIS p. 3-110.

Alternatives B and C and G have DFPZ, GS and ITS with a 30" dbh maximum cut level. The major difference between Alternative B and Alternatives C and G is that Alternatives C and G would have a reduction of 20 acres of Group Selection. Under both action alternatives, canopy cover for ITS treatments would be retained at 50%, were available. Under Alternative C and G, five acres of ITS would be dropped.

The action alternatives are similar for DPPZ treatments. Of the 2,100 acres of DFPZ treatments, 250 acres are proposed for thinning. Thinning treatments would reduce canopy cover on 170 acres of CWHR 4 stands (trees 11-24 inches dbh) to a minimum of 40%. However, only two units would be taken down to 40% canopy cover and most treatments would retain canopy covers closer to 49%. Thinning treatments would reduce canopy cover on 80 acres of CWHR 5 stands (greater than 24 inches dbh) to a minimum of 50%.

Retaining CWHR 5s and 4s at the maximum percent canopy cover would have less impact on habitat suitability within the short-term. However, greater thinning of the canopy within CWHR 4s and 5s will create CWHR 5s and 6s at a faster rate, creating higher suitable habitat in the long-term. Changes in canopy cover can alter temperature in foraging areas. The overall percentage of GS is 10 percent and the overall effects should be low. In addition, small openings may create foraging habitat as a result of increasing habitat for prey species such as small rodents (Rotta 1999). Implementation of

the action alternatives should have little effect on the approximate 758,431 acres of suitable denning and foraging habitat identified in the HFQLG FEIS (p3-110).

4) There will be permanent road construction and reconstruction and temporary construction that would increase human disturbance. However, road closures and decommissioning of some permanent and old temporary roads is also proposed. Approximately 4.7 miles of road decommissioning, 25.3 miles of road reconstruction, 0.6 miles of new classified road construction, and 21.7 miles of new temporary spur construction.

There will be some permanent road construction, reconstruction, and temporary construction, which would increase human disturbance. However, road closures and decommissioning of some permanent and old temporary roads is also proposed. These activities could result in some site-specific short-term disturbance but could also create additional denning and foraging habitat and a decrease habitat fragmentation in the long-term. All of the system roads within the Sugarberry Project area (Slate Creek watershed) are classified as open. Decommissioning of roads would lower the average road density from 4.5 miles per square mile to 4.4 miles per square mile, which is still much higher than the road density for the species of less than 2 miles per square mile for moderate impacts. Disturbance in the long-term would be only slightly reduced as a result of the proposed road reduction.

5) Prescribed burning is proposed for Alternatives B and C and G on approximately 370 acres. Analysis indicates that prescribed burning would result in 60 to 80 percent mortality in residual conifers, hardwoods (8 inches or less), and most shrubs. Burns will be conducted to retain snags and large DWM. Prescribed burns leave a mosaic of burned and unburned areas, so some shrubs will remain to provide cover for carnivores and prey species using these areas. Habitat modification by these treatments would not affect the over story of mature forest stands in RHCA, used by carnivores as travel corridors.

However, these are short-term effects. The risk for potential stand-replacing fires are higher for the no action alternative which could mean a loss of many more acres of potentially suitable nesting, foraging, roosting and travel habitat in the long-term. Also, even though habitat outside of the forest carnivore network boundaries is potentially suitable. However, this habitat has a lower potential for selection for habitat utilized by forest carnivores.

5.c.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Plumas NF LRMP (as amended by the SNFPA) requires forest-scale changes in habitat capability monitoring and status and change of geographic distribution monitoring at the Sierra Nevada scale for marten (Table 2), (USDA 2001, Page E-56)); hence, the marten effects analysis for the Sugarberry Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population

status and trend data for the marten. This information is drawn from the detailed information on habitat and population trends in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference.

Habitat Status and Trend:

Effects to old forest habitat considered marten denning and resting habitat (CHWR Classes 5M, 5D and 6) have been tracked across the HFQLG Pilot Project, which includes the Plumas. Reductions are documented and a cumulative total is tracked to make sure no greater than a 10% reduction occurs over the life of the Pilot Project. There are currently 186,394 acres of 5M, 5D and 6 in the Pilot project area. To date habitat suitability on 3,282 acres has or will have been reduced (does not include the projected acres of reduction for the Sugarberry Project, based on projects with a signed decision). These acres total approximately 1.7% of the acres in 5M, 5D and 6 within the Pilot Project. These effects to old forest habitat (i.e. 1.7%) include mature red fir habitat that is preferred by the Marten in CWHR Classes 5M, 5D and 6.

Cumulative impacts to the forest carnivore network, in terms of acres treated by various silvicultural prescriptions have been tracked at the RD level. These acres amount to <1% of the total forest carnivore network. These actions have not created any large scale, high contrast fragmentation within the network, allowing for continued connectivity across the network in denser forested stands (M & D).

Based on the small acre percentage of Marten habitat affected by projects across the HFQLG Pilot Project, including within the draft Forest carnivore network, and that the percentage on the Plumas of affected denning and resting habitat is less than the 1.7% currently documented, habitat trends for the Marten are considered stable on the Plumas National Forest.

Population Status and Trend:

The Global conservation status of marten is "G5-Secure" ("demonstrably widespread, abundant, and secure") and the United States National conservation status is "N5" ("secure – common, widespread, and abundant in the nation) (Nature Serve 2005). The Global Short-Term Trend is Stable (unchanged or within plus or minus 10% fluctuation in population, range, area occupied, and/or number or condition of occurrences) (Ibid).

Current population status and trend – California and Sierra Nevada
California Population Status and Trend. The California Natural Diversity Database (CNDDB) rank is "G5S3S4": Global 5 indicates marten is globally "demonstrably secure; commonly found throughout its historic range"; State 3 / State 4 indicates that, in California, marten is between being 'apparently secure'(G4) and 'restricted range/rare'(G3); G4 indicates that there are some factors to cause some concern, such as narrow habitat or continuing threats; G3 indicates the species has about 21-80 viable occurrences or 1,000-3,000 individuals or 10,000 to 50,000 acres of occupied habitat within the State) (CDFG 2006).

Sierra Nevada Population Status and Trend. Recent studies and sightings indicate that martens are relatively well distributed in a pattern similar to their historical distribution in the Sierra Nevada (Zielinski & Kucera 1995). American marten populations have been tracked and monitored using a variety of methods. Status and trend monitoring for fisher and American marten was initiated in 2002; the objectives of the monitoring are to be able to detect a 20% decline in population abundance and habitat (USDA 2005, 2006).

Based on Zielinski (2005), trends in marten detections in Plumas County, and by inference Plumas National Forest, from the early 1900's to the late 1900's are downward, primarily due to relatively small amounts of late seral/old-growth forest attributes. Concern about the status of marten also is a result of the possible deleterious effects of trapping (Zielinski & Kucera 1995). Trapping may have adversely affected marten populations and may have contributed to or hastened local extinctions (Ruggiero et al 1994). There has been no open trapping season for marten in California since 1954 (SNFPA 2001). Carnivore surveys have been conducted on the Plumas NF. Approximately 50% of the Plumas National Forest has been systematically surveyed to protocol using track plates and camera stations (Plumas GIS database, PNF MIS Report).

Geographic distribution monitoring for the marten is also occurring at the bio-regional scale consistent with direction from the Sierra Nevada Forest Plan Amendment (SNFPA 2001). This monitoring for the marten began in 2002. Bio-regional monitoring for the Marten occurs on all Forests throughout the Sierra Nevada (Ibid). Population monitoring involves conducting presence/absence surveys throughout the region to estimate the proportion of sites (primary sample units) annually occupied by marten, and detect declines over the proposed ten-year monitoring period. During the past four field seasons, 708 primary sample units have been completed (with more than 4,500 individual survey stations and over 45,000 survey nights). During this time, marten were detected at 84 sites throughout the region, 28 of which occurred in wilderness areas. This bio-regional monitoring under the Sierra Nevada Forest Plan Amendment has not resulted in any new detections on the Plumas NF.

Based on the monitoring data collected on the Plumas, as required by Appendix E and the Plumas LRMP, it appears Marten are locally distributed in and around the Lakes Basin area of the forest. This distribution of Martens has remained stable since development of the LRMP in 1988.

5.c.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

Habitat reduction as a result of implementing alternatives mirrors that described for spotted owls and goshawks. Effects to the habitat trend on the draft Forest Carnivore network from the Sugarberry project are expected to be minimal (<1%). Marten habitat could be better protected from stand replacement fires (from the existing condition) for the next 10-20 years with implementation of the proposed action. The project-level habitat impacts will contribute to the current forest-wide trends of short-term habitat

reductions for longer term protection of old forest habitat. Based on known detections of marten on the PNF, no changes in marten occupancy or distribution on the PNF would occur.

5.d. MULE DEER

5.d.1. Habitat/Species Relationship

The Plumas National Forest Land & Resource Management Plan (LRMP 1988) requires that the Forest monitor deer population trends in relation to management activities and ensure project compliance with recommended mitigation measures. This is to be accomplished every five years to get 5-year trend analysis (Chapter 5, page 5-10) to determine if population goals in deer herd plans and predicted deer populations identified in the LRMP are being achieved.

The California Fish & Game, Deer Management Program is composed of branch and field biologists who work together coordinating programs throughout the state. The Deer Management Program, its activities, and staff are largely supported by hunters through the purchase of hunting licenses and deer tags. Biologists develop hunting regulations, provide expertise on habitat and population assessments, compile harvest information, conduct and direct research needs, monitor and estimate populations and respond to various public inquiries related to deer in California. Biologists also work to coordinate joint projects with outside agencies, universities and private entities. Reference: www.dfg.ca.gov.

In 1976 *a "Strategic Plan for California Deer"* was developed to respond to the decline in deer numbers resulting from the loss and degradation of quality deer habitat. With the growing human population in California and continuing loss of quality deer habitats, biologists have realized the goal to restore deer herd numbers to those in the1960s is unlikely and unrealistic. Biologists are currently developing a more realistic approach through a "*Strategic Plan for California Deer"* in order to more effectively manage deer herds given the existing and anticipated changes to California's environment. Reference: www.dfg.ca.gov.

Detailed information on life history, habitat use, and population trends for MIS on the Plumas NF is documented in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference. Habitat relationships for mule deer are defined by the California Wildlife Habitat Relationships (CWHR) models, which model habitat suitability for California's terrestrial vertebrates (CDFG (CWHR) 2005).

Mule Deer seasonal ranges, as identified in individual deer herd plans, have been mapped across the Plumas and are displayed in Figure 6 of the PNF MIS Report (USDA 2006b). Forest-wide, summer range habitat amounts to 1,454,381 acres, fawning areas make up 26,498 acres, winter range makes up 211,169 acres, critical winter range habitat is made of 21,435 acres, a known holding area makes up 3,704 acres and critical summer range is 7,095 acres.

CWHR suitability ratings for deer reflective of selected Sierra Mixed Conifer (SMC) types that would increase and or decrease with the action alternatives are displayed in **Table 4**. The SMC type is the most abundant and representative CWHR type within the analysis area (**Appendix 3**). Based on field analysis, the majority of the lower elevation white fir (WFR) component is more reflective of the SMC type. Thus SMC is used as the representative type to reflect changes in habitat suitability across the analysis area for MIS analyzed in depth in this report.

Table 4. CWHR Suitability for Deer in Selected Sierra Mixed Conifer types.

SPECIES	KEY HABITAT FEATURES	CWHR Suitability Rating**
Mule Deer (includes blacktail)	Mosaic of early to intermediate seral stages of most forest, woodland and brush vegetation providing an interspersion of herbaceous openings, dense brush or tree thickets (critical for summer and winter thermal regulation), riparian areas and abundant edge. Moderate to dense shrublands near water needed for fawning.	MH = 1.00 SMC1 = 0.44 SMC2 = 0.89 SMC3P = 0.89 SMC4P = 0.66 SMC4M =0.77 SMC4D = 0.55 SMC5P = 0.66 SMC5M = 0.55 SMC5D = 0.44

**CWHR Suitability rating: 1.0 = high suitability, optimal for species occurrence, 0.66 = moderate suitability, suitable for species occurrence, can support moderate population densities; 0.33 = low suitability, marginal for species occurrence, can support low population densities; 0.00 = unsuitable for species occurrence. SMC=Sierra Mixed Conifer. MH=Montane Hardwood.

Disturbances within Sierran Mixed conifer usually results in a diverse, fire adapted shrub component consisting of species preferred as browse. Within the project area, preferred browse includes snowbrush ceanothus (*Ceanothus velutinous*), whitethorn ceanothus (*C. cordulatus*), deerbrush (*C. integerrimus*), bittercherry (*Prunus emarginata*), greenleaf manzanita (*Arctostaphylos patula*), and black oak (*Quercus kelloggii*), including mast, while winter forage is provided by wedgeleaf ceanothus (*C. cuneatus*) and silktassel (*Garrya fremontii*). Brushfields that develop on summer range after perturbations such as wildfire, logging, and broadcast burning have been found to provide highly nutritious forage, and often be very important fawning areas, especially up to the first 10-12 years following the disturbance (CDFG 2003a).

Within Plumas and Butte Counties, deer respond in a predictable manner to manipulated habitats that set back the successional pattern of vegetation. The first 10 years there are local increases in deer use and numbers within the disturbed area, whether it is created by logging or fire. As habitat matures, about 15-25 years brush gets high and thick, and fawning use starts to decline. Deer use continues, but typically at lesser numbers than what was realized in the first 10 years, especially if natural openings and forested stands allow for movement. Planting the shrub areas with conifers accelerates the decline in deer use; thinning and release of conifers can result in a flush of new vegetative growth for deer browse up to the time that the conifers start shading out this growth. Somewhere between 25-50 years, the conifers within plantations or cutover areas dominate the site and browse is less available, but hiding and thermal cover is provided. Post harvest fuels

treatments may prolong representation early successional brush and shrub habitats in treated stands.

5.d.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis:

Key factors used to assess the effects of the proposed action and alternatives on deer habitat are: (1) overall acres of suitable foraging and cover habitat, (2) forage to cover ratio, (3) road density and (4) disturbance.

Analysis Area for Project-level Effects Analysis:

For the analysis of effects of the Sugarberry Project documented in this report, the "wildlife analysis area" geographic boundary was delineated based on the potential direct, indirect and cumulative effects on spotted owl Protected Activity Center (PAC) and Home Range Core Area (HRCA) distribution. The Sugarberry Project analysis area (or wildlife analysis area) is approximately **49,768** acres, of which **38,545** acres are National Forest managed by the Plumas National Forest and **11,223** acres of private land within National Forest boundary. Review of the Plumas NF database, wildlife sighting spot maps, deer herd plans, district files and vegetation mapping reveals that mule deer and habitat are distributed across the entire analysis area. Effects (direct, indirect and cumulative) to deer as a result of project treatments will be contained within this analysis area. Any effects beyond this analysis area boundary will be considered insignificant and discountable to deer (i.e. deer habitat or individuals will not be impacted).

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

Habitat acre changes as a result of actions are summarized in **Appendix 3**.

Blacktail (mule deer) *(Odocoileus hemionus)* is the most numerous big game species on the PNF. Much summer range, but little winter range, lies within the Forest. Mule deer occupy, to some extent, almost all types of habitat within their range but, in general, they seem to prefer the more arid, open situations. The food of the mule deer is quite varied but usually feed upon green leaves, green herbs, weeds, and grasses. Reference: www.npwrc.usgs.gov/resource/2001.

Within Plumas County, deer respond to manipulated habitats that set back the successional pattern of vegetation in a predictable manner. The first 10 years there are local increases in deer use and numbers within the disturbed area, whether it is created by logging or fire. Deer respond to the vegetative response of the disturbance, manifested by an increase in succulent shrub and forb growth. As habitat matures, and brush gets high and thick, fawning use starts to decline after about 15-25 years. Deer use can continue at lesser numbers than what was realized in the first 10 years, especially if natural openings and forested stands allow for movement. Planting the shrub areas with conifers accelerates the decline in deer use; thinning and release of conifers can result in a flush of new vegetative growth for deer browse up to the time that the conifers start shading out

this growth. Somewhere between 25-50 years, the conifers within plantations or cutover areas dominate the site and browse is less available, but hiding and thermal cover are provided.

Shrub species may dominate and persist for up to 50 years or longer before conifer growth significantly reduce shrub growth through shading. This shrub stage has two characteristic successional sequences: 1) On poor, typically shallow soils, often overlaying bedrock, the shrubs tend to predominate to form a climax community and 2) On deeper forest soils, this shrub community represents secondary succession following disturbance. The shrub species may exclude conifers for many years. However, these same species may facilitate the germination of shade tolerant conifer species by providing a protective cover, moderating microclimate, and improving soil conditions. If no conifer seed source exists, such as within the interior of a stand replacing fire, the shrub community can occupy the site for several decades beyond normal successional timeframes. In mature timber stands, shrub species mature and die due to insufficient light and are only present as a sparse understory. The shrub component provides important habitat, including winter range, for deer, as well as early seral habitat for shrub nesting species, such as green-tailed towhees, fox sparrows and mountain quail.

Forage for deer is defined as all CWHR (**Table 4**) vegetation types identified as grass/forb, shrub, and early successional habitat, montane hardwood, as well as all CWHR vegetation types with <40% canopy cover (S and P). These more open stands support some element of understory vegetation in varying degrees of species composition and availability that probably are used by deer for forage more so than for cover. Preferred forage is browse consisting of silktassel, wedgeleaf ceanothus, deer brush, mountain whitethorn; staple browse species consist of greenleaf manzanita, bittercherry, and black oak (*Quercus kelloggii*), including mast. Cover is supplied by CWHR types with canopy cover >40% (M and D). Desired forage:cover ratio within the summer range it is 50:50, whereas, the desired forage:cover ratio within winter range is 60:40.

Based on CWHR, the Sugarberry project analysis area supports a mix of forage such as grass/forb, shrub, and early successional habitat (CWHR 1, 2, NR, NB, PGS, GP, GM, CX, MCP) (**Appendix 3**). The majority of this habitat was created as a result of even-aged timber harvest and wildfire. This habitat is important to a number of wildlife associates, including ground nesting birds, small mammals, several species of reptiles, and bats. Forage habitat will increase at varing levels within the DFPZ treatments. The Sugarberry Project also provides a mix of cover habitat. The majority of treatments propose to thin the understory in CWHR 4/5D and 4/5M stands; opening up the stands yet providing some short-term understory cover.

Local DFG biologists have identified lack of suitable forage as a limiting for Plumas deer herds, (CDFG Lidburg, Unit Biologist, 2006c pers. comm.). Opportunities to improve foraging habitat within summer range as identified in the statewide Deer Assessment Unit (DAU) assessment plan include thinning and burning, reducing livestock use in aspen and riparian areas, and encouraging aspen regeneration.

Open road density per square mile is an index used to predict at what level upland habitat would be effective in providing potential ungulate use of that habitat, referred to as a habitat effectiveness index. Higher road densities infer increased use by human users, which can result in changes in behavior and habitat use patterns by ungulate species (Lyon, 1979, USDA (Thomas) 1979, Wisdom 1996). The higher the open road density per square mile, potentially the less the surrounding habitat will be fully used (Lyon, 1983). The Western Association of Fish & Wildlife Agencies Mule Deer Working Group identified removing the negative effects of roads by reseeding and limiting access as a means of improving habitat for mule deer in forests (WAFWA, 2002). The Deer Herd Management Plans call for reducing road access to increase the values of habitats to deer by reducing disturbance and also reduce illegal kill (CDFG 1984).

Alternative A (No Action)

DIRECT and INDIRECT EFFECTS: Selection of this alternative would not authorize any federal actions and therefore no direct or indirect effects would result. Therefore, there would be no direct or indirect impacts to Sierran Mixed Conifer or Black Oak habitat. As a result, existing forest conditions and deer habitat conditions would be maintained. There would be no change in the forage:cover ratio, and the existing forage conditions would continue to mature, decline in quantity and decrease in quality without any disturbance event. The potential release of black oak would not be achieved and this habitat component would continue to suffer from competion within conifer stands, ultimately losing their representation within these stands.

Not treating existing fuels through thinning, fuels treatment and DFPZ implementation would make potential wildfires in the area difficult to suppress and create a more intense burn, which could lead to increased rates of spread resulting in additional acres burnt. Given historical fire return interval for this area of 11-15 years, it is likely that National Forest system lands would burn. The existing fuel loads within the area could produce a very hot fire, which could kill re-sprouting species of shrubs, potentially create monocultures, provide a medium for noxious, invasive weeds, and burn minerals from the soil, leading to soil erosion and lower productivity. Based on the past fire patterns on this predominately south to southwest aspect of the project area, wildfires in this area would burn intensively, creating larger, monotypic foraging areas with little mosaic forested cover within this foraging habitat.

There would be no reduction in the open road density within the analysis area, maintaining current levels of fragmentation, and reduced habitat capability in those areas.

CUMULATIVE EFFECTS**:** The No Action alternative would do nothing to reduce the identified possible limiting habitat factors for California deer herds (loss of brush fields, lack of prescribed fire, overstocked conifer stands, increased road densities). The cumulative effects of no action could fall in line with the analysis conducted for the SNFPA (described above) and contribute to the decline of mule deer within the project area, the Plumas NF, and the Sierra Nevada range. In the short term, forested stands would not be opened-up through thinning and underburning, thus very little regeneration

of foraging habitat would occur. On the other hand, no action could result in potential larger and more intense wildfires, which, depending on weather conditions and fuel loadings, could either, increase or decrease the productivity of foraging habitat.

Based on the direct, indirect and cumulative effects of the no action alternative, it is suspected that deer numbers would respond slightly and positively to the habitat changes created on private land. The carrying capacity on National Forest land would not be improved, thus there would be a stable to downward trend in deer numbers on National Forest, thus not contributing to the LRMP Forest goal of 24,000 deer on Plumas National Forest land. With the increased potential for a stand destroying wildfire, 1) a high intensity wildfire could reduce productivity of deer range for a long period of time, resulting in a long term reduction in carrying capacity, or 2) depending on fire intensity, decadent brush and closed forest could be converted to potentially improved deer habitat and carrying capacity could be improved above current levels.

Cumulative Effects Conclusion: Although selection of the no action alternative would contribute to undesirable future habitat conditions, these would occur as a result of not taking action. Because selection of the no action alternative would contribute to no direct or indirect effects, there would also be no cumulative effects as a result of selecting this alternative.

Alternatives B and C and G (Action Alternatives)

General effects of the proposed action and the action alternatives (in terms of impacts to various CWHR types as a result of implementing DFPZs, GS, and ITS) has been described in detail in the Sugarberry Project BA/BE (USDA, 2007b). This MIS report tiers to that document.

DIRECT and INDIRECT EFFECTS**:** There may be short-term direct and indirect effects to deer with the action alternatives. However, the long-term effects are expected to be positive for the Mooretown Deer Herd.

Forage:Cover ratio: The Sierra Mixed Conifer (SMC) in all seral stages (SMC1-SMC6) provides for breeding, cover, and feeding habitat suitability, with the highest habitat suitability for all life requisites achieved in the SMC2S, 2P and 3P (young tree, <40% canopy cover). The proposed action alternatives create more open forested habitat with creation of DFPZ; group selection harvest units increase the amount of early seral openings (SMC1 and SMC2) and increase within stand edge.

Within the Sugarberry Project analysis area (Slate Creek watershed) identified **25**% of the landscape to be available for forage and **75**% available as cover (this includes private lands). The desired forage:cover ratio, as identified within the Bucks Mountain/ Mooretown Deer Herd Management Plan, within winter range is 60:40, whereas on summer range it is 50:50. The Sugarberry Project is completely within summer range for deer and does not meet the desired forage:cover ratio.

Within the summer range, as many as **1,040** acres of group openings (1-2 acres) would be created. The Slate Creek Landscape Analysis stated that historically "Overall, there would have been many small openings, 0.05 to 0.6 acres, but relatively few large openings (up to 16 acres in size). These openings could have supported shrubfields long term or as precursors to timbered stands" and that "historical levels of seral stage one for foraging at 19% of the landscape". The proposed treatments would be expected to increase forage habitat.

Of the **2,100** acres of DFPZ treatments; **250** acres of open forested stands will be created (mechanical and hand thin). In addition, a portion of the **1,800** acres of DFPZ non-thinning treatments using prescribed fire and other treatments are proposed in old, decadent brushfields, located within summer range, which would result in new, palatable, nutritious and highly palatable forage for deer. The Slate Creek Landscape Analysis (SCLA) (USDA 1999b) stated " There is deer habitat throughout the Slate Creek landscape, however, good quality habitat is patchy, especially shrub forage, with most of the landscape in a forested condition. Historically, there were probably the same assemblages of shrub species throughout the landscape that exist today. However, as historic fire regimes have been altered due to fire suppression, the abundance of deer has likely decreased as the quality of the forage has decreased".

Changes to the CWHR in the mixed conifer as a result of the action alternatives would result in slight increases in habitat suitability when opening up denser stands (M & D), although there is a slight decline in suitability by reducing 4M to 4P (cover reduction). The largest increase in improving forage suitability comes from creating open, younger age stands (1, 2, 4P), as both forage and brush cover is provided at higher levels than older and denser conifer stands. Alternative B improves foraging habitat suitability across the analysis area for deer above than the no action alternative but only slightly better than the action Alternatives C and G.

The post project forage:cover ratio would persist for several years, and slowly change as brush quality for forage declines due to increased shade from developing conifers in DFPZ and increased conifer growth within group selection units. In 12-20 years it is predicted that the amount of forage would again decline. With reforestation, conifers would dominate the brush within group openings anywhere from 15-50 years, depending on site and aspect.

Oak Habitat: Black oak is a major component within the analysis area. Thinning prescriptions implemented in DFPZ's and Individual Tree Selection (ITS), with oak retention, would enhance oak health and improve acorn productivity. The largest oaks (12" and greater) are to be retained up to 25-35 square feet basal area/acre. Black oaks 30 inch and greater will be retained in GS and ITS units. Removal of small diameter trees (oak or conifer) will allow remaining hardwoods to grow more rapidly. This would improve mast production while still providing for forest cover. GS units were placed to avoid stands with a high percentage of black oak component. The proposed GS treatments adjacent to black oak stands would increase health and size of surrounding black oaks.

Road Density: There will be permanent road construction and reconstruction and temporary construction that would increase human disturbance. However, road closures and decommissioning of some permanent and old temporary roads is also proposed. Approximately 4.7 miles of road decommissioning, 25.3 miles of road reconstruction, 0.6 miles of new classified road construction, and 21.7 miles of new temporary spur construction.

The average road density within the project area is **4.5** miles per square mile. Many species are sensitive to the noise and human activity associated with roads. For example, the Mooretown Deer Herd Management Plan by California Fish and Game recommended a maximum road density of 2 miles per square mile in order to minimize disturbance to forest carnivores and mule deer, respectively. Decommissioning roads would lower the average road density to **4.4** miles per square mile. Closing **4.7** miles of road would reduce potential roadkill, as well as reduce human accessibility into suitable habitat and making mule deer less susceptible to both illegal kill and hunter mortality, and provide for a slight increase in habitat effectiveness above pre-treatment levels. These decommissioned and closed roads would begin to recover habitat features, such as forbs, grass and browse, in 2-15 years. These activities could result in some site-specific short-term disturbance but could also create additional foraging and cover habitat in the long-term. However, disturbance in the long-term would be only slightly reduced as a result of the proposed road reduction. In addition, potential affects to habitat components and habitat loss to wildfire, as discussed, could also be affected in the long-term as a result of the no action alternative.

Disturbance: The potential exists for increased mortality as a result of increased traffic along all roads during project implementation. Treatment activities could disrupt fawning activity that would be occurring between June and August. This disruption could include direct mortality to hiding fawns, as well as displacement of fawns and does which could increase fawn mortality through predation. There may be disturbances to individuals that may be foraging in habitat within or adjacent to units proposed for treatment, that results in animals moving out of the area while activity is going on.

There may be direct effects to deer with the action alternatives. The potential exists for increased mortality as a result of increased traffic along all roads during project implementation. Treatment activities could disrupt fawning activity that would be occurring between June and August. This disruption could include direct mortality to hiding fawns, as well as displacement of fawns and does which could increase fawn mortality through predation. There may be disturbances to individuals that may be foraging in habitat within or adjacent to units proposed for treatment, that results in animals moving out of the area while activity is going on.

Fire: The action alternatives are designed to reduce the risk of future stand replacement fires and promote the reestablishment and development of a mature closed canopy mixed conifer forest. The long term direct and indirect effects of this action would fall in line

with the analysis conducted for the SNFPA (described above) and contribute to the decline of mule deer within the project area, the Plumas NF, and the Sierra Nevada range. In addition, fuels treatment using prescribed fire are proposed in old, decadent brushfields which would result in new, nutritious and highly palatable forage for deer.

CUMULATIVE EFFECTS: The spatial scale for the cumulative effects of the Sugarberry Project on mule deer habitat is the analysis area identified in 5.a.2 above. The temporal scale for the analysis is 1970 to 2012 (five years from the present), which is the period of time that reflects 1) impacts of past actions identified in Chapter 3 of the Sugarberry Project FSEIS that are still influencing deer habitat suitability, 2) other ongoing activities (not including the Proposed Action) and 3) reasonably foreseeable future actions in the analysis area.

Refer to cumulative discussion under the Sugarberry Project BA/BE. The Slate Creek Landscape Assessment, September 1999, identified the opportunity to improve deer range through broadcast burning, underburning, black oak enhancement projects and close and decommission roads to reduce open road density and road density in general. Landscape "needed actions" are: 1) Within winter deer range, identify thermal cover patches within or outside of DFPZs to be retained during DFPZ construction. Expand DFPZs to include brushfields, and 2) Adjust group selections across the landscape in a manner that maximizes deer forage benefits on winter range, and 3) Thin individual trees and place group selections to release hardwoods, to increase deer forage.

In the Sugarberry Project area, foraging habitat for mule deer could be improved as a result of implementing all action alternatives and could provide higher quality habitat (from existing conditions) until brush is shaded out or becomes decadent in 12-50 years. With reforestation, brush would be set back through release and plantation thin treatments, allowed to recover and provide a small amount of new browse, and eventually are shaded out by the growing conifers at about 50-60 years.

The action alternatives are designed to reduce the risk of future stand replacement fires and promote the reestablishment and development of a mature closed canopy mixed conifer forest. The long term cumulative effects of this action would fall in line with the analysis conducted for the SNFPA (described above) and contribute to the decline of mule deer within the project area, the Plumas NF, and the Sierra Nevada range.

The action alternatives implement positive habitat manipulations that tend to reduce possible identified limiting habitat factors for California deer herds (create opening for grass/forbes, creation of brushfields, using prescribed fire, opening up overstocked conifer stands, reducing road densities). Within these treated areas there could be a short-term increase in deer utilizing the brush/forb regeneration that would flourish with group openings and any treated area that would be underburned, prescribed burned, or masticated. This increase in deer use may be more reflective of changes in use patterns by deer than any major increase in animals. On the other hand, other identified limiting factors (predation) could also be increased by the action alternatives. Urban sprawl would

not be affected by the proposed action, although human access into deer habitat would be reduced.

Future foreseeable actions include DFPZ maintenance (underburning, hand thinning). These actions would benefit deer for a time by regenerating sprouting brush until the forest canopy closes in and shades out brush. These actions would reinvigorate deer forage each time post treatment until canopy cover exceeds 60% and precludes grass and forb production at the ground level.

Deer habitat utility scores were calculated based upon CWHR models (Appendix B, SNFPA 2001) for the 2.3 million acres of mule deer habitat on National Forest in the Sierra Nevada. These scores predict the changes in relative utility of habitats for deer fawning, foraging, cover, and winter range under implementation of management actions. This model is limited in that a number of structural and landscape features important to deer are not well evaluated. These features include the number and species of shrubs, shrub foliage volume, and forest openings. The model is also not able to evaluate spatial distribution of habitat elements, such as level of continuity and presence and design of migration corridors. The SNFPA EIS displayed that mule deer habitat utility declines under all alternatives, including implementation of the Standards and Guidelines outlined in the ROD (FEIS volume 3, part 4.2 page 26). This decline was based on the assumption that practices that open up canopies through mechanical treatments, like thinning, biomass, and salvage logging within green stands, do not generate dense understories of shrubs, forbs and grasses that provide deer foraging habitat. Current direction under the SNFPA emphasizes mechanical treatments in order to insure minimizing potential changes to canopy cover.

With the analysis of S2 in the SNFPA FSEIS in 2004, there was no projected difference in deer habitat from what the 2001 SNFPA analysis disclosed. Overall, deer habitat utility would be expected to decline under the Sierra Nevada Forest Plan Amendment by –6.6% over a five-decade period (SNFPA 2001). Since mule deer are a common species still occupying their historic range in the Sierra Nevada, it does not seem likely that the small decline in habitat utility values under the plan amendment would outweigh either natural environmental variations or risk factors beyond the control of the Forest Service to result in the loss of viable, well-distributed populations (SNFPA 2001).

Private land logging has included many acres of clearcut activity. These clearcuts will remain as early seral (grass/forb/brush/seedling-sapling) for at least the next 10-20 years. After year 25, conifers may start to dominate the vegetative cover, and by year 50 should be classified as size class 3 trees (6-11" dbh). With brush control and release activities, trees could attain this size class earlier than 50 years. Refer to Chapter 3 of the Sugarberry Project FSEIS.

Various silvicultural prescriptions were employed including regeneration (clear cutting), group selection, overstory removal, shelterwood removal, sanitation removal, salvage, and individual tree selection. In addition, pre-commercial thinning occurred and the majority prepped and planted to conifers. Attachment 1 displays the existing vegetative

condition for the analysis area, expressed in CWHR types (Vestra 2002a), which reflects past occurrences and management activities that have resulted in vegetative change.

Based on the direct, indirect and cumulative effects of the action alternatives, it is suspected that the carrying capacity in the analysis area would be improved and deer numbers would respond to the habitat changes such that there could be some upward trend in the Mooretown Deer Herd population for the next 10-20 years. Summer range would be improved by opening up stands through thinning, prescribed burning and or mastication, all actions providing additional high quality forage. Forage will increase as a result of opening created by GS treatments. Improving carrying capacity on National Forest land would contribute to moving the population toward its herd population goal, as well as contributing to the LRMP Forest goal of 24,000 deer on Plumas National Forest land.

With all action alternatives, Sporax (Borax) would be applied to all cut stumps >8" dbh within the DFPZ to minimize the susceptibility to Annosus root rot. Utilization of this antifungal will not affect habitat suitability for deer.

In the Sugarberry Project area, foraging habitat for mule deer could be improved as a result of implementing all action alternatives and could provide higher quality habitat (from existing conditions).

Cumulative Effects Conclusion: It is anticipated that implementation of the action alternatives, in combination with past, present and reasonably foreseeable future actions would improve carrying capacity in the analysis area and deer numbers would respond to the habitat changes such that there could be some upward trend in the Mooretown Deer Herd population for the next 10-20 years. Habitat would be improved by opening up stands through thinning, prescribed burning in thinned stands, as well as prescribed burning old brushfields, all three actions providing additional high quality forage and improving trend in habitat suitability. Improving habitat carrying capacity on Plumas National Forest land would contribute to moving the population toward its herd population goal, as well as contributing to the LRMP Forest goal of 24,000 deer on Plumas National Forest land.

5.d.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Plumas NF LRMP (as amended by the SNFPA) requires distribution population monitoring for the mule deer (**Table 2**); hence, the mule deer effects analysis for the Sugarberry Project may be informed by population monitoring data. The sections below summarize the habitat and population status and trend data for the mule deer. This information is drawn from the detailed information on habitat and population trends in the Plumas NF MIS Report (USDA 2006b), which is incorporated by reference.

Habitat Status and Trend:

Deer habitat utility scores were calculated based upon CWHR models (Appendix B, SNFPA 2001) for the 2.3 million acres of mule deer habitat on the Plumas National Forest in the Sierra Nevada. These scores predict the changes in relative utility of habitats for deer fawning, foraging, cover, and winter range under implementation of management actions. This model is limited in that a number of structural and landscape features important to deer are not well evaluated. These features include the number and species of shrubs, shrub foliage volume, and forest openings. The model is also not able to evaluate spatial distribution of habitat elements, such as level of continuity and presence and design of migration corridors. The SNFPA EIS displayed that mule deer habitat utility declines under all alternatives, including implementation of the Standards and Guidelines outlined in the ROD (FEIS volume 3, part 4.2 page 26). This decline was based on the assumption that practices that open up canopies through mechanical treatments, like thinning, biomass, and salvage logging within green stands, do not generate dense understories of shrubs, forbs and grasses that provide deer foraging habitat. Current direction under the SNFPA emphasizes mechanical treatments in order to insure minimizing potential changes to canopy cover.

With the analysis of S2 in the SNFPA FSEIS in 2004, there was no projected difference in deer habitat from what the 2001 SNFPA analysis disclosed. Overall, deer habitat utility would be expected to decline under the Sierra Nevada Forest Plan Amendment by –6.6% over a five-decade period (SNFPA 2001). Mule deer are a common species which still occupy their historic range in the Sierra Nevada, it is unlikely that the small decline in habitat utility values estimated within the plan amendment would be measurable or discernable in mule deer population trends on the Plumas National Forest. It is also highly unlikely that this projected decline in habitat utility would be sufficient to result in the loss of viable, well-distributed populations (SNFPA 2001).

Habitat capability for mule deer was evaluated at the forest scale for the Plumas NF using the CWHR model as outlined in Appendix A of the Plumas NF MIS Report. Based on CWHR data, the Plumas NF currently supports 211,415 acres of high and moderate capability foraging habitat.

Based on the availability and abundance of habitat for Mule Deer across the Plumas, the trend for available Mule Deer habitat is considered stable.

Population Status and Trend:

The Plumas NF MIS Report (USDA 2006b) provides background information on the status, population estimates and trends of deer populations within the State as well as within the individual deer Assessment units (DAUs) and deer herds located on the Plumas NF. The Sierra All Species Inventory (Appendix R, SNFPA 2001) assigns mule deer a moderate vulnerability rating for the Sierra Nevada. This rating is based upon three factors: (1) the species is ranked as “common,” with a population that exceeds 10,000 individuals, (refer to population estimates below); 2) the population trend is unknown but suspected to be decreasing; and 3) the range of mule deer in the Sierra Nevada is stable or increasing.

Statewide, it is thought that declines in deer populations are due to low fawn survival (CDFG 1998), but causal relationships have not been determined. Conversions of brushfields to conifer plantations, lack of prescribed fire, overstocked conifer stands, increased road densities, competition and displacement by livestock, predation, urban sprawl, and loss of productive riparian systems probably have all contributed to herd declines (Ibid).

During the period around 1850-1920, California wildlands were subject to high disturbance from logging, mining, fire, and grazing. These disturbances led to increased acreages of early successional vegetation (new, young plants) that deer thrive on. Deer populations increased to where overuse of range by deer became evident starting in the early 1930s. Since that time, with increased fire suppression and declining disturbance from mining, etc., the vegetation has matured and is not capable of supporting the previous high numbers of deer. Reference: www.dfg.ca.gov.

These changes began to show in the 1930s, with deer populations not reaching their peak until the 1960s. Dr. Tracy Storer, a noted ecologist from the University of California, had predicted such a change in a 1932 paper published in *Ecology.* The changes have not been instantaneous, rather, have taken several decades to become evident. This adds to the difficulty in making short-term predictions about wildlife populations. Reference: www.dfg.ca.gov.

Department biologists believe that long-term declines in habitat condition, starting in the 1930s and continuing today, are most responsible for the decline. Lack of habitat disturbance, especially from fire, has decreased habitat value for deer and other wildlife in much of the state's forested areas. Deer and numerous other wildlife thrive on early successional (seral) vegetation that grows back in the first few years after fire. Without periodic fire, the habitat becomes old, or "decadent," and is unable to support wildlife populations of the past. Indirect consequences, such as increasing competition with livestock and overuse of ranges by deer themselves, are typical. Deer hunters can also attest that fewer deer in the woods is also result. Reference: www.dfg.ca.gov.

Deer populations have decreased from record highs of the 1950s and 1960s in several areas of the eastern half of the state, with the greatest declines evident in northeastern California and the north and central Sierra Nevada (CDFG 1998). California is divided into 11 Deer Assessment Units (DAUs). The intent is to base analysis and deer harvest recommendations on environmental and ecological factors. The main factors affecting deer herds are fire suppression, timber management practices, and livestock grazing—although long term weather patterns, such as drought, may also play a role. The success of the 2004 (and 2005) deer season was largely the result of favorable weather patterns making deer more accessible to hunters rather than from any real increase in deer population sizes. DFG's long-term survey information indicates that over much of the state deer populations are stable to slightly declining. The estimated deer population in California in 2002 was 554,000, with an average buck to doe ratio of 27 bucks per 100

does. The estimated kill through hunter harvest was 32,430 (CDFG 2003b). The estimated deer kill in 2005 was 29,566 (DFG, 2005 California Deer Kill Report).

The Sugarberry Project is within what is identified as the Central Sierra Region, which is designated DAU 5. DAU 5 encompasses Zones D3 through D7. As of 2004, the population trend is slightly increasing and the 2005 estimate is 106,800. Although these zones experienced an increase in harvest for the 2004/2005 seasons, habitat conditions in the DAU have not improved in any significant way. Survey data indicates the "increasing" population trend may be more a reflection of the increased harvest due to favorable weather conditions in 2004/2005 rather than because of any real increase in population size (DFG 2005). The Sugarberry Project is within Zone D3. For 2005, 612 deer were harvested within Zone D3. Sugarberry Project area includes three counties: Plumas, Yuba and Sierra. Plumas and Yuba counties were identified as "some of the most productive hunting areas" although the comments were neutral or not very positive. In Plumas County - LaPorte area. Hunting has been poor for several years. In Yuba County - North of Bullards Bar Reservoir (Slate Creek). Deer are generally present in mid-October.

The Sierra All Species Inventory (Appendix R, SNFPA 2001) assigns mule deer a moderate vulnerability rating for the Sierra Nevada. This rating is based upon three factors: (1) the species is ranked as "common," with a population that exceeds 10,000 individuals, (refer to population estimates below); 2) the population trend is unknown but suspected to be decreasing; and 3) the range of mule deer in the Sierra Nevada is stable or increasing.

Table 4.2.2.1a. in the SNFPA 2001 FEIS shows estimated deer populations for the six DAUs in the Sierra Nevada Forest Plan Amendment Project Area (CDFG 1998). For DAU 5, the 1952 population high was 65,000 and the 1992 average was 11,500 (current trends and population numbers are taken from the Environmental Document for Deer Hunting, produced by the California Department of Fish & Game, April 2003). Overall, deer habitat utility would be expected to decline. Since mule deer are a common species still occupying their historic range in the Sierra Nevada, it does not seem likely that the small decline in habitat utility values would outweigh either natural environmental variations or risk factors beyond the control of the FS to result in the loss of viable, well-distributed populations (Section 4.2.2.1 in the SNFPA FEIS 2001). Current population trends for mule deer is considered "variable" (Section 3.2.3, Table 3.2.3b in the SNFPA SFEIS 2004).

The Plumas LRMP (USDA Forest Service, 1988), as amended, provides as an objective a deer population goal of approximately 24,000 deer across the Forest. Mule Deer seasonal ranges, as identified in individual deer herd plans, have been mapped across the Plumas (USDA 2006b). Forest-wide, summer range habitat amounts to 1,454,381 acres, fawning areas make up 26,498 acres, winter range makes up 211,169 acres, critical winter range habitat is made of 21,435 acres, a known holding area makes up 3,704 acres and critical summer range is 7,095 acres. Deer numbers are down in all Sierra Deer Herds (CDFG, 1998).

The Sugarberry project falls entirely within the summer range for the Mooretown Deer Herd. Mast from oaks is an important fall food source for deer. There is deer habitat scattered through the landscape. The Mooretown Deer Herd is managed under the guidance of deer herd management plans developed cooperatively between the California Department of Fish & Game and major land management agencies, including the Forest Service. The Mooretown herd is managed under the Bucks Mountain/Mooretown Deer Herd Management Plan (CDFG 1984). This management plan provides deer population goals and habitat goals as well as identifies possible limiting factors to population growth. The management plan contains an action plan for all cooperating agencies to follow to achieve management goals. The Mooretown Deer Herd is composed primarily of Columbian black-tailed deer (*Odocoileus hemionus columbianus*).

Open road density per square mile is an index used to predict at what level upland habitat would be effective in providing potential ungulate use of that habitat, referred to as a habitat effectiveness index. Higher road densities infer increased use by human users, which can result in changes in behavior and habitat use patterns by ungulate species (Lyon, 1979, USDA (Thomas) 1979, Wisdom 1996). The higher the open road density per square mile, potentially the less the surrounding habitat will be fully used (Lyon, 1983). The Western Association of Fish & Wildlife Agencies Mule Deer Working Group identified removing the negative effects of roads by reseeding and limiting access as a means of improving habitat for mule deer in forests (WAFWA, 2002). The Mooretown Deer Herd Management Plan calls for reducing road access to increase the values of habitats to deer by reducing disturbance and also reduce illegal kill. An identified goal was no more than 2 miles per square mile of open road density. The proposed Sugarberry Project reduces the density from 4.5 to 4.4 miles per square mile.

5.d.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

Forest-wide deer population distribution is stable. Selection of an Action Alternative (Alternatives B and C and G) of the Sugarberry Project would result in a slight increase in forest-wide foraging habitat for deer. Based on the direct, indirect and cumulative effects of the action alternatives, the carrying capacity on the Forest would be minimally improved and deer numbers would respond to the habitat changes such that there would be a localized upward trend in the deer population for the next 10-20 years. Improving carrying capacity on National Forest land would contribute to moving the population toward its herd population goal, as well as contributing to the LRMP Forest goal of 24,000 deer on Plumas National Forest land. Based on this small scale increase, the project-level habitat impacts will contribute to existing stable forest-wide population distribution trend.

5.d. TROUT GROUP

5.d.1. Habitat/Species Relationship

Detailed information on MIS for the Plumas NF is documented in the Plumas National Forest MIS Report (USDA 2006b), which is hereby incorporated by reference.

The trout MIS group consists of Rainbow, Brown and Brook Trout. As MIS, trout represent the habitat requirements of coldwater fish species. Only rainbow trout are present in the Sugarberry Project aquatic analysis area.

All three species of trout are considered game species by the California Department of Fish & Game and are allowed to be taken by the public under the California Sport Fishing Regulations (CDFG 2006b). CDFG still maintains a system of "put-and-take" where catchable sized rainbow trout are stocked in state waters. Within the Sugarberry analysis area, trout within the creeks are recruited with natural reproduction, as stocking by the State is no longer conducted in these waters.

Rainbow Trout (*Oncorhynchus mykiss).* The rainbow trout is a native Californian game species. Suitable habitat for the rainbow trout includes perennial lakes, ponds, and streams with cool water temperatures (<22°C maximum) high oxygen concentrations, and clean, well oxygenated gravel substrate for breeding (Behnke 1992, Moyle 2002). Rainbow trout deposit eggs in gravel nests (redds) in the late winter to early summer (February through June). Most eggs hatch within 80 days after fertilization, with hatch date dependent on water temperature. The newly hatched alevins remain within the interstices of the redd and depend on yolk for food. Most of the yolk is depleted within 7-15 days, and the young trout (fry) emerge from the gravel and begin exogenous feeding. Rainbow trout mortality rates are often high during the fry life stage. Therefore, fry survival is considered critical to maintaining sustainable population densities. Optimal fry habitat includes cool, clear, fast-flowing permanent streams and rivers where riffles predominate over pools, where there is ample cover from riparian vegetation or undercut banks, and where invertebrate life is diverse and abundant (Moyle 2002). Headwaters are extremely important to the overall stream condition and structure, particularly with respect to sediment loading and stream temperature.

Rainbow trout are highly aggressive in establishing and defending feeding territories. They are sit-and-wait predators that feed mostly on drifting aquatic organisms and terrestrial insects, but they will also take active benthic invertebrates (Moyle 2002).

5.d.2. Project-level Effects Analysis based on Habitat

Key Habitat Factor(s) for the Analysis:

The following factors are used to assess the effects of the proposed action and alternatives on trout habitat: (1) Acres of Riparian Habitat Conservation Areas (RHCA's) treated adjacent to known fisheries; and (2) Based on the Cumulative Watershed Effects analysis (CWE), the projected change in the total Equivalent Roaded Acres (ERA) following the proposed treatments and its relationship to Thresholds of Concern (TOC).

Analysis Area for Project-level Effects Analysis:

The Sugarbery Project aquatic analysis area is approximately 58,088 acres, of which approximately 43,650 acres are National Forest managed by the Plumas National Forest and approximately 14,430 acres are private land within National Forest boundary. For the CWE analysis, the Sugarberry Project aquatic analysis area was divided into 44 subwatersheds ranging from 510 to 2,350 acres. A watershed is a naturally-occuring and easily distinguishable division of landscapes. It is particularly well-suited as a spatial analysis unit when considering direct, indirect, and cumulative effects on aquatic species because these effects generally will not extend beyond the physical boundary of the watershed. The aquatic analysis area includes all subwatersheds within which Sugarberry Project activities are proposed. Because upstream activities can have substantial effects in a given location due to the linkage and movement of water and materials from headwaters to downstream areas, the aquatic analysis area also includes all upstream subwatersheds which are directly connected to subwatersheds containing treatment activities, including three subwatersheds within which there are no proposed treatments.

All streams identified in **Table 5** occur within the aquatic analysis area and have treatment units identified for the action alternatives within their respective subwatersheds. Table x lists the fish-bearing streams, approximate miles of occupancy, the type of fishery, and the Sugarberry Project planning units which are in or adjacent to RHCAs of fish-bearing reaches.

Table 5: Perennial Fish Bearing Streams in the Sugarberry Project aquatic analysis area.

Stream	**Miles of Fishery within Analysis Area**	**Type of Fishery**	**Fish Occupied Stream within Planning Area or DFPZ**
Slate Creek	27.1 miles	Resident rainbow trout	None. Adjacent* to 27, 29, 53, 55, 57, 58, 59, 61, 62, 65, 68, 70, 140, 141, 506, 507, 508, 510, 543, 552, 590, 608, 615, 647.
Canyon Creek	19.3 miles	Resident rainbow trout	None. Adjacent to 626.
Rock Creek	5.6 miles	Resident rainbow trout	None. Adjacent to 113, 117, 119, 120, 127, 130, 154.
East Branch of Slate Creek	4.7 miles	Resident rainbow trout	None. Adjacent to 526, 530.
Gold Run Creek	3.5 miles	Resident rainbow trout	915. Adjacent to 79i, 79ii.
Deadwood Creek	3.1 miles	Resident rainbow trout	None.
Potosi Creek	2.7 miles	Resident rainbow trout	SBA1. Adjacent to 526, 533.

Rabbit Creek	2.6 miles	Resident rainbow trout	LP1, LP2, 14B.
Valley Creek	2.6 miles	Resident rainbow trout	None. Adjacent to 18, 35.
Brushy Creek	2.5 miles	Resident rainbow trout	None. Adjacent to 134, 147, 150a, 150b.
Fish Meadow	2.4 miles	Resident rainbow trout	11G. Adjacent to 11P, 128.
Pearson Ravine Creek	2.0 miles	Resident rainbow trout	None. Adjacent to 526.
Onion Creek	1.9 miles	Resident rainbow trout	None. Adjacent to 46.
Whiskey Creek	1.7 miles	Resident rainbow trout	None.
Wisconsin Ravine Creek	1.7 miles	Resident rainbow trout	None.
Wallace Creek	1.4 miles	Resident rainbow trout	None. Adjacent to 542.
East Branch of Rabbit Creek	1.3 miles	Resident rainbow trout	None. Adjacent to 3, 7.
Clark's Ravine Creek	1.0 miles	Resident rainbow trout	None. Adjacent to 29.
Cedar Grove Ravine Creek	0.9 miles	Resident rainbow trout	None. Adjacent to 552.
Gibson Creek	0.8 miles	Resident rainbow trout	None. Adjacent to 500.
Spanish Ravine Creek	0.8 miles	Resident rainbow trout	None.
Lost Creek	0.6 miles	Resident rainbow trout	None.
Unnamed tributary to Slate Creek	0.5 miles	Resident rainbow trout	None. Adjacent to 506.

*Adjacent refers to a section of fish occupied stream not within a treatment area but within the RHCA width distance from treatment unit boundary.

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

Within the analysis area, stream condition inventories were conducted between 1995 and 2001 on the following stream reaches: Onion Creek, Rabbit Creek, Lower Slate Creek near Wambo Bar, unnamed tributary to Rock Creek, Upper Slate Creek, and Wallace Creek. Onion Creek, Wallace Creek, and the Rock Creek tributary are classified as a transport reaches, which means they have higher gradient (>3 percent slope) conditions. The morphology of transport channels is generally resistant to change, and the overall condition rating for these reaches is considered fair to good. Data suggest moderately elevated sediment levels on Onion Creek and the Rock Creek tributary, and a high proportion of unstable or vulnerable stream bank on Wallace Creek. Rabbit Creek and the two Slate Creek reaches are classified as response reaches, with gradients less than three percent. The overall condition rating for these reaches is fair, with elevated sediment

levels reported for all three reaches, but especially in Rabbit Creek and the Lower Slate Creek. In addition, Rabbit Creek had a high proportion of unstable and vulnerable stream bank.

Surveys compiled for the Slate Creek Landscape Analysis (USDA 1999b) corroborate that most streams within the Sugarberry Project aquatic analysis area were in fair condition. Sediment levels and bank stability were described as falling short of desired conditions in the majority of surveyed streams. However, despite the noted lack of riparian cover in a number of channels, water temperatures were within the range of desired conditions in nearly all surveyed streams. Temperatures in excess of this range were recorded in lower Slate Creek and Cedar Grove Ravine.

Surveys also indicate that lack of large woody debris (LWD) in stream channels is a widespread aquatic habitat problem in the Sugarberry Project aquatic analysis area. South Feather Water and Power Agency has intensively analyzed LWD abundance and distribution Slate Creek in association with monitoring and operating the Slate Creek Diversion Dam. They found relatively low quantities of LWD throughout the reach downstream and upstream of the Diversion Dam, suggesting that past land-use practices are limiting the recruitment of this vital habitat component (South Feather Water and Power Agency 2006).

Of the 44 subwatersheds in the Sugarberry Project aquatic analysis area, CWE analysis indicates that three subwatersheds exhibit ERA's which are currently over the TOC (>100% of TOC), whereas ERA's in another four are approaching the TOC (80-99% of TOC). Of the former, Buckeye Creek (subwatershed # 35, 114% of TOC) and Deacon Long Ravine (subwatershed # 19, 165% of TOC) contain no fishbearing waters, whereas East Branch of Rabbit Creek (subwatershed # 11, 111% of TOC) contains 1.3 miles of fishbearing water. Of the latter subwatersheds, an unnamed tributary south of Little Grass Valley (subwatershed 13, 98% of TOC) contain no fishbearing waters, whereas the following subwatersheds contain at least some fish-bearing water: Rabbit Creek (subwatershed # 15, 92% of TOC), Gold Run Creek (subwatershed # 30, 80% of TOC), and an unnamed tributary of Rock Creek (subwatershed # 38, 88% of TOC). All other subwatersheds have ERA's ranging between 8% and 76% of TOC.

Alternative A (No-action Alternative)

DIRECT EFFECTS: There would be no direct effects on trout or trout habitat, as no activities would occur that would cause disturbance to individual fish, nor any impacts to the existing habitat conditions. All trees providing cover to aquatic and riparian habitats would be retained. Accumulations of downed and standing wood in RHCAs, in combination with new vegetation and similar upslope conditions would result in an increasing wildfire risk. Dead wood of all sizes in combination with new vegetation would add to fuel loading including fuel ladders. Conditions would be suitable for unrestricted wildfire spread and crowning and torching of dead and live vegetation in the RHCAs.

Ground cover provided by tree limbs and boles, cones, and new vegetation will help reduce soil erosion and sediment delivery to stream channels. Alternative A would retain potential materials for ground cover in RHCAs. There will be no opportunity to improve fish passage or streambank stability, or to reduce road density within the analysis area, therefore these elements will continue to contribute sediment into the aquatic system and adversely affect riparian and aquatic habitat quality.

INDIRECT EFFECTS: The indirect effects of the No-action Alternative include the potential for future wildfire and its impact on habitat development and recovery. The currently existing fuel loads that would be left untreated by this alternative would make potential wildfires more difficult to suppress and create a larger and more intense burn than would potentially occur following the fuels treatments of the Action Alternatives. While large and intense fires have been relatively uncommon on the western slope of Plumas National Forest, three historic large (>100 acres) and intense fires have occurred within the aquatic analysis area since 1920 (Sugarberry Project Forest Vegetation/Fuels Report, 2007c).

Channel degradation, erosion and sedimentation would likely increase following a large and intense fire (Neary et al 2005). ERA values following a stand-replacing fire in any subwatershed would greatly exceed the Threshold of Concern (TOC) and greatly exceed increases in ERA values associated with implementation of proposed treatment activities under the action alternatives (Sugarberry Project Hydrology Report 2007d). With the potential for large and intense fire and subsequent loss of upland and riparian vegetation, hill slope runoff would increase sedimentation and decreased water quality, adversely affecting downstream MIS trout species habitat. Severe levels of sedimentation could reduce the depth of large pools favored by these trout (Moyle 2002), possibly rendering affected subwatersheds less productive. Also, acute exposure to sediment has been implicated in mass fish mortality events (Bozek and Young 1994). Alterations to the macroinvertebrate fauna could also reduce productivity near and downstream of severely burned areas.

Another short-term indirect effect is the well-established toxicity of fire-retardant and fire-suppressant chemical formulations that would likely be used in the control of a large and intense wildfire (Gaikowski et al. 1996a, Gaikowski et al. 1996b, McDonald et al. 1997, Buhl and Hamilton 2000). Although efforts are made to avoid dropping fire-retardants and fire-suppressants in aquatic habitats, incident circumstances often prevent complete avoidance of this particularly sensitive habitat.

CUMULATIVE EFFECTS: Subwatershed ERAs would remain constant with implementation of the No-action Alternative. Sedimentation and degradation and destruction of riparian habitat caused by the legacy of mining, logging, and road building has no doubt had detrimental effects on the physical habitat structure of potentially suitable habitat for trout in the aquatic analysis area. However, since temperature is not currently a limiting factor here for trout throughout most of the aquatic analysis area, the only negative effect would result from the cumulative effects of past, present, and future

activities in combination with an intense wildfire over a large portion of the watershed. Trout habitat is currently fair to good throughout most of the project area, but could be rendered less suitable or even unsuitable at subwatershed scales in the event of a large and intense wildfire, the risk of which is not reduced by the no-action alternative.

***Alternative B** (Action Alternative)*

DIRECT EFFECTS: In general, there would be no direct effects on MIS trout species with implementation of Alternative B because most proposed activities would occur outside of RHCAs and SMZs. All RHCAs would be protected from harvest activities. Approximately 52 acres of RHCAs on fish bearing reaches would be treated with fuels reduction activities or aspen enhancement projects. Also, watershed enhancement projects including stream crossing improvements and streambank stabilization projects have the potential to directly affect trout because work will occur within the stream channel. However, direct impacts will likely be limited to temporary displacement from the local project sites as trout swim upstream or downstream to avoid project-related disturbance. Because of this, it is unlikely that any trout would be injured or killed by in- or near-channel projects.

INDIRECT EFFECTS: Implementation of Alternative B may result in small, localized short-term (implementation period plus 2-3 years) increases in fine sediment delivery to aquatic habitats, but fine sediment delivery should exhibit a net decrease over the long-term. Through the design of the action alternatives, and by implementation of Standard Management Requirements (SMRs) for soils and streamside management, ground disturbance activities would be minimized. In very few areas, fuels reduction treatments in RHCAs could decrease wood available for ground cover and sediment traps in those RHCAs. The only mechanical DFPZ treatment near stream channels are two mastication units among ephemeral headwater channels on Lexington Hill. One hand cut and pile burn unit would occur adjacent to about 300 linear feet on both banks of the fishbearing Rabbit Creek. Implementation of Best Management Practices designed to minimize upslope erosion should minimize fine sediment delivery to streams and subsequent degradation of aquatic habitats.

Fuels reduction harvesting in RHCAs and on upland slopes would lower the risk of future wildfire and reduce the probability that retained snags, woody debris, and live vegetation in the RHCAs would be consumed by future fire. Fuels reduction harvesting of some trees in the RHCAs would reduce fuel loading and the potential for a large and intense fire. The application of Sporax® (Borax) would be applied to all cut stumps >8" dbh within the five unites (total = 325 acres) to minimize the susceptibility to *Annosus* root rot. Use rates would be one pound to 50 square feet of stump surface. Based on the Pesticide Fact Sheet prepared by Information Ventures, Inc. (1995), this rate is considered non-toxic to vertebrate species, including fish. Borax does not build up (bioaccumulate) in fish. Thus Sporax® applied to stumps should not affect fish, or any species that feeds on fish.

Trout distribution in Potosi, Pearson Ravine, Gold Run, Whiskey, and Fish Meadow creeks would increase by 4.8 miles with the improvement of five stream crossings to allow for upstream fish passage. However, in the case of the Pearson Ravine crossing options, if the low-water crossing option is selected, then this crossing will likely remain at best a seasonal barrier for aquatic organisms, blocking access to 1.0 mile of very high quality trout habitat. Furthermore, if timber hauling traffic is routed over this crossing, fine sediment delivery to this high-quality trout stream will increase proportionally with road use. In addition to increasing accessible spawning, rearing, and foraging habitat for individual fish, removal of barriers will also decrease fragmentation among populations, resulting in increased productivity and increasing the likelihood of long-term persistence in a particular stream.

CUMULATIVE EFFECTS: The spatial scale for the cumulative effects of the Sugarberry Project on trout habitat is the aquatic analysis area identified in 5.d.2 above. The temporal scale for the analysis is 1984 to 2008 (two years from the present), which is the period of time that reflects 1) impacts of past actions identified in Appendix F in Sugarberry Project EIS, 2) the direct effects of the project, and 3) information on reasonably future actions in the analysis area.

Fuel loads would be reduced by Alternative B, reducing the potential for high severity wildfires. Given the history of fire suppression and fuel accumulation in this area, it is likely that National Forest lands in the project area would burn again, threatening upland and aquatic habitats. Any additional acres burned at high intensity could contribute to increased sedimentation, adversely affecting aquatic and riparian habitats.

Past projects (Lower and Upper Slate) treated parts of the aquatic analysis area with some fuel reduction activities. The reduced fuels within the project areas have contributed indirectly, providing better protection from stand replacing fires by reducing fire ladders and surface fuels in the adjacent upland.

Many of the creeks within the area are subjected to recreational mining activities. There are 30 known active placer mining operations along the creeks. The time frame for dredging season is from the third week of May thru October 15 each year. This activity would potentially increase short-term levels of sedimentation and decreased water quality into fishery creeks during the actual dredging activity. Dredging must be in compliance with State regulations under a permit issued by the California Department of Fish & Game.

Under Alternative B, most analysis subwatersheds are predicted have a slight to moderate increase in ERAs (Sugarberry Project Hydrology Report, USDA 2007d). None will decrease. Of concern are three of four subwatersheds that are currently approaching the TOC and would equal or exceed the TOC if Alternative B is implemented. Also, the Clarks Ravine subwatershed, which is currently not approaching the TOC, would exceed the TOC. Including the three subwatersheds that are above TOC in the current condition, a total of seven subwatersheds would exceed the TOC if Alternative B is implemented.

If CWEs were to occur, their most likely expression would be increased channel erosion and chronic sedimentation related to increases in runoff and peak flow during high-intensity rain events (Sugarberry Project Hydrology Report, USDA 2007d). If a CWE were to occur from the Sugarberry Project, it would most likely occur within low-gradient, third-order or greater reaches of the channel network and/or at major confluences (Ibid.). Stream reaches with these characteristics are likely to support trout in all phases of their life cycle, and thus will be likely to adversely affect trout populations and productivity on local or subwatershed scales.

Cumulative Effects Conclusion: It is anticipated that implementation of Alternative B, in combination with past, present and reasonably foreseeable future actions, may result in a short term, localized increases in peak flows and sedimentation associated with proposed project activities. However, over the longer-term (>3 years following project completion), peak flows and sedimentation are expected to return to and possibly drop below background levels as local project-related disturbances recover and effects of watershed enhancement projects and road maintenance activities become apparent.

Alternatives C and G (Action Alternatives)

DIRECT, INDIRECT and CUMULATIVE EFFECTS: Direct, indirect and cumulative effects of Alternative C and G are expected to be similar in nature as those for Alternative B, except that the magnitude of the effects would be slightly less due to reductions or modifications of proposed ground-based activities that would occur in certain subwatersheds that would be put over TOC by Alternative B. There is no difference between the Action Alternatives in unit acreages or prescriptions within RHCAs. Refer to **Table 6** below. For all four subwatersheds, private land timber harvest is the chief source of landscape disturbance.

Table 6. Number, name, and percentages of threshold of concern of Sugarberry Project subwatersheds that exceed or approach the threshold of concern.

Subwatershed number and name	% of TOC
19 - Deacon Long Ravine	165
35 - Buckeye Creek	87
11 - East Branch Rabbit Creek	94
13 - Unnamed tributary south of Little Grass Valley Reservoir	83

The scope of the aquatic analysis area includes 44 subwatersheds ranging from 510 acres to 2,350 acres, with a total analysis area of 58,088 acres. When an Equivalent Roaded Area (ERA) for a watershed is less than or equal to 100%, it is "under" the TOC. When a ERA for a watershed is over 100%, it "exceeds" TOCs. When a watersheds ERA is between 80-99%, it is "approaching" the TOC. Under existing conditions, there are **three** subwatersheds that are approaching the TOC and **one** subwatershed where the ERA exceeds the TOC. If Alternative B is implemented: one subwatershed (#19) that presently exceeds will exceed TOC even further; one of the watersheds (#11) that approaches will result in exceeding TOCs; two watersheds (#13 and #35) that approach

the TOC will remain at approach; and two watersheds (#15 and #21) that do not approach the TOC under existing conditions will approach TOCs.

Alternative C and G would modify the Sugarberry, Proposed Action to reduce disturbance in watersheds over TOC. Alternative C and G address the issue that implementing ground disturbing activities within watersheds that are approaching or over the TOC increases the risk of adverse effects and Cumulative Watershed Effects (CWEs). Alternatives C and G would reduces ERA values in one subwatershed (#11) that would exceed TOC with the proposed acrtion and one subwatersheds (#19) that would reduce ERA values where the existing condition already exceeds TOC. The reduced scope would reduce the risk of inducing cumulative watershed effects in these watersheds, and would help protect on-site and downstream aquatic and riparian beneficial uses and values. Reducing activities in the subwatersheds at risk for CWEs, reducing group selection and area thinning timber harvest may also benefit wildlife habitat by reducing disturbance and maintaining canopy cover.

5.d.3. Summary of Habitat and Population Status and Trend at the Forest/Bioregional Scale

The Plumas NF LRMP (as amended by the SNFPA) requires forest-scale habitat monitoring of quantity and quality of habitat and distribution population monitoring for the trout group (Table 2); hence, the trout effects analysis for the Sugarberry Project must be informed by both habitat and population monitoring data. The sections below summarize the habitat and population status and trend data for the trout group. This information is drawn from the detailed information on habitat and population trends in the Plumas NF MIS Report (USDA 2006b), which is hereby incorporated by reference.

Habitat Status and Trend. Trout habitat on the Plumas National Forest (PNF) consists of approximately 1,000 miles of streams, including 658 miles of perennial streams and 341 miles of intermittent streams. Trout also utilize 64 lakes, reservoirs and ponds within and bordering the PNF, with an aggregate surface area of about 14,200 acres. Trout habitat on the Plumas is considered abundant and well distributed across the Forest, and has remained constant since development of the Forest Plan. Habitat trends for trout on the PNF are stable at this time. The Sugarberry Project aquatic analysis area supports about 75 miles of trout habitat (7.5 percent forest total) and no lakes.

Population Status and Trend. Trout population distribution data were taken from seven streams on the Plumas National Forest from standing stock surveys conducted by the Department of Water Resources from 1988 to 2004. This timeframe runs from adoption of the Forest Plan, 1988, and serves to indicate a trend in trout distribution over this 16-year period. Population estimates (number of trout per station) for all seven streams averaged by year indicates an increasing population trend for the trout group on the Plumas NF (Plumas NF MIS Report, USDA 2006b).

5.d.4. Relationship of Project-Level Impacts to Forest-Scale Habitat and Population Trends for the species

Forest-wide trout distribution is stable to increasing. The action alternatives (Alternatives B and C and G) of the Sugarberry Project would result in an improvement to the MIS trout. Stream crossing improvement and culvert replacement will also increase habitat use and trout distribution in Potosi, Pearson Ravine, Fish Meadow, Rock, and Gold Run Creeks, contributing to increased available habitat. Therefore project level habitat impacts could contribute to maintaining existing forest-wide population trends.

REFERENCES

Beck, Randy. 2004. Fire and Fuels Specialist, Mt. Hough RD, Plumas NF.

Behnke, R. J. 1992. Native trout of western North America. American Fisheries Society Mono. 6. 275 pp.

Bozek, M.A., and M.K. Young. 1994. Fish Mortality Resulting From Delayed-Effects Of Greater Yellowstone Ecosystem. Great Basin Naturalist 54:91-95.

Buhl, K. J., and S. J. Hamilton. 2000. Acute toxicity of fire-control chemicals, nitrogenous chemicals, and surfactants to rainbow trout. Transactions of the American Fisheries Society 192-202.

Bull, Evelyn L.; Parks, Catherine G.; Torgersen, Torolf R. 1997. Trees and logs important to wildlife in the interior Columbia River Basin. Gen. Tech. Report PNW-GTR-391. Portland, OR: US DA, Forest Service, Pacific Northwest Research Station. 55p.

CDFG (California Department of Fish & Game). 1984. Bucks Mountain/Mooretown Deer Herd management plan, California Department of Fish & Game/US Forest Service, December 1984.

CDFG (California Department of Fish & Game). 1988. *A Guide to Wildlife Habitat of California*, California Department of Forestry and Fire Protection, October 1988.

CDFG (California Department of Fish and Game). 1998. An Assessment of Mule and Black-tailed Deer Habitats and Populations in California. Report to the Fish and Game Commission. February 1998. 57pp.

CDFG (California Department of Fish & Game). 2002. Final Environmental Document, Resident Small Game Mammal Hunting, State Of California.

CDFG (California Department of Fish and Game). 2003a. Deer Hunting Draft Enviornmental Document, February 3, 2003. State of California, The Resources Agency, Department of Fish and Game. 269pp + appendices.

CDFG (California Department of Fish & Game). 2003b. California Department of Fish 7 Game, Final Environmental Document, Deer Hunting, April 2003.

CDFG (California Department of Fish and Game). 2005 California Interagency Wildlife Task Group. 2005. California Wildlife Habitat Relationships (CWHR) version 8.1 personal computer program. Sacramento, California.

References cited in CWHR 2005:

Clark, T. W., E. Anderson, C. Douglas, and M. Strickland. 1987. Martes americana. Mammal. Species No. 289. 8pp.
deVos, A. 1952. The ecology and management of fisher and marten in Ontario. Ont. Dep.Lands and Forests. Tech. Bull., Wildl. Ser. 1. 90pp.
Grinnell, J., J. S. Dixon, and J. M. Linsdale. 1937. Fur-bearing mammals of California. 2 Vols. Univ. California Press, Berkeley. 777pp.
Haley, D. 1975. Sleek and savage: North America's weasel family. Pacific Search Books, Seattle, WA. 128pp.
Hawley, V. D., and F. E. Newby. 1957. Marten home ranges and population fluctuations. J.Mammal. 38:174-184.
Maser, C., B. R. Mate, J. F. Franklin, and C. T. Dyrness. 1981. Natural history of Oregon coast mammals. Pac. Northwest For. And Range Exp. Sta., USDA, For. Serv., Gen. Tech. Rep., PNW-133. 496pp.
Newberry, D. W. 1973a. A contribution towards a bibliography of California furbearers. Calif. Dept. Fish and Game, Spec. Wildl. Invest., Sacramento. 148pp.
Newberry, D. W. 1973b. Marten field transect study, Tahoe Basin, California. Calif. Dep.Fish and Game. Spec. Wildl. Invest., Sacramento. 9pp.
Schempf, P. F., and M. White. 1974. A survey of the status of seven species of carnivores on National Park Service lands in California. Dep. For. And Conserv., Univ. Calif., Berkeley. 129pp.
Schempf, P. F., and M. White. 1977. Status of six furbearer populations in the mountains of northern California. U.S. Dep. Agric., For. Serv., San Francisco, Calif. 51pp.
Simon, T. L. 1980. An ecological study of the marten in the Tahoe National Forest,California. M.S. Thesis, Sacramento State Univ. 187pp.
Soutiere, E. C. 1979. Effects of timber harvesting on marten in Maine. J. Wildl. Manage.43:850-860.
Weckwerth, R. P., and V. D. Hawley. 1962. Marten food habits and population fluctuations in Montana. J. Wildl. Manage. 26:55-74.

CDFG 2006. Special Animals.

CDFG (California Department of Fish & Game). 2006a. 2005 California Deer Kill Report, www.dfg.ca.gov/ hunting/deer/2005harvest/2005kill.htm.

CDFG (California Department of Fish & Game). 2006b. Freshwater Sport Fishing Regulations, Effective March 1, 2006 to February 28, 2007.

CDFG (California Department of Fish & Game). 2006c. Jim Lidburg, Plumas County Unit Biologist. Personnel communication.

Elliott, G. B., and T. M. Jenkins. 1972. Winter food of trout in three high elevation Sierra Nevada lakes. California Fish and Game. 589:231-237.

Gaikowski, M. P., S. J. Hamilton, K. J. Buhl, S. F. McDonald, and C. H. Summers. 1996a. Acute toxicity of firefighting chemical formulations to four life stages of fathead minnow. Ecotoxicology and Environmental Safety 34:252-263.

Gaikowski, M. P., S. J. Hamilton, and K. J. Buhl. 1996b. Acute toxicity of three fire-retardant and two fire-suppressant foam formulations to the early life stages of rainbow trout (*Oncorhynchus mykiss*). Environmental Toxicology and Chemistry 15: 1365-1374.

Graber, D. 1996. Status of terrestrial vertebrates. Pages 709-734 IN: Sierra Nevada ecosystem project: Final report to Congress. Volume II: Assessments and scientific basis for management options. Wildland Resource Center Report No. 37. 1,528 p.

Information Ventures. 1995. Borax Pesticide Fact Sheet, http//infoventures.com/e-hlth/pesticide/borax.html.

Kalish, T. K. 2001. Brown trout fry from stocked and naturalized populations: relationship between emergence time and food availability. University of Wisconsin-La Crosse thesis. La Crosse, WI.

Kliejunas, John. 1991. An Evaluation of the Verdi Sale, Sierraville Ranger District, Tahoe National Forest, For Potential Impact of Annosus Root Disease, Report Number R91-05, USDA Forest Service, Pacific Southwest Region.

Lidberg, Jim: DFG Unit Biologist, personal communication, 2003.

Lotan & Brown. 1985.

Lyon, L.J. 1979. Habitat Effectiveness for Elk as Influenced By Roads and Cover. Journal of Forestry. 77:No 10, October 1979; 658-660.

Lyon, L.J. 1983. Road Density models describing habitat effectiveness for elk. Journal of Forestry. 81:592-595.

McDonald, S. F., S. J. Hamilton, K. J. Buhl, and J. F. Heisinger. 1997. Acute toxicity of fire-retardant and foam-suppressant chemicals to *Hyalella azteca* (Saussure). Environmental Toxicity and Chemistry 16:1370-1376.

Moyle, P.B. 2002. Inland Fishes of California, Revised and Expanded. University of California Press.

Nature Serve. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. Version 4.7. NatureServe, Arlington, Virginia. Available http://www.natureserve.org/explorer.

Neary et. al. 2005. Factors Affecting Assessment Of Average Watershed Slope." Journal Of Hydrologic Engineering. 10(2), 133-140.

Ruggiero, L. F., K.B. Aubry, S.W. Buskirk, L.J. Lyon, and W.J. Zielinski. 1994. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine. General Technical Report GTR RM-254. Fort Collins, Colorado: USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. 184pp.

SNEP. 1996. Sierra Nevada Ecosystem Project, Final Report to Congress. 3 vols. Centers for Water and Wildland Resources Report No. 37, University California, Davis.

South Feather Water and Power Agency. 2006. South Feather Power Plant FERC (Federal Energy Regulatory Commission) Project NO. 2088.

USDA Forest Service. 1973. The Hospitable Oak, Coordination Guidelines for Wildlife Habitats Number Three, USDA Forest Service, California Region.

USDA Forest Service. 1979. Thomas, J.W. 1979. Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington, USDA, USFS, Agriculture Handbook No. 553.

USDA Forest Service. 1988. Plumas National Forest. Land and Resource Management Plan.

USDA Forest Service. 1999. Lassen, Plumas, Tahoe National Forests. Herger-Feinstein Quincy Library Group Forest Recovery Act Final Environmental Impact Statement (HFQLG EIS), August 1999.

USDA Forest Service. 1999b. Slate Creek Landscape Analysis. September 1999.

USDA Forest Service. 2001. Sierra Nevada Forest Plan Amendment (SNFPA) Final Environmental Impact Statement (FEIS) and Record of Decision (ROD). January 2001.

References cited in SNFPA 2001:

Bull, Evelyn L.; Heater, Thad W. In press. Habitat use of the American marten in northeastern Oregon. *Publisher unknown.*

Bull E.L. and A.K. Blumton. 1999., Effect of Fuels Reduction on American Martens and Their Prey*, PNW-RN-539, March 1999*

Freel, M. 1991. A literature review for management of the marten and fisher on National Forests in California *: USDA Forest Service Pacific Southwest Region.*

Koehler, G.M., W.R. Moore, and R.A. Taylor. 1975. Preserving the pine marten: management guidelines for western forests. Western Wildlife. 2*:31-36.*

*Kucera, T.E., W.L. Zielinski, and R.H. Barrett. 1995. The current distribution of American martens (*Martes Americana*) in California.* California Fish and Game 81*:96-103.*

Soutiere, E. C. 1979. Effects of timber harvesting on marten in Maine. J. Wildl. Manage. 43*:850-860.*

Spencer, W.D. 1981. Pine marten habitat preferences at Sagehen Creek, California*. Unpublished thesis. Univ. of California, Berkeley. 120 pp.*

Steventon, J. 1982. Marten use of habitat in a commercially clear-cut forest. J Wildl Manage. 46*(1):175-82.*
Steventon, J.D. and J.T. Major. 1982. Marten use of habitat in commercially clear-cut forest. Journal of Wildlife Management 46*(1): 175-182.*
Zielinski W.J., Kucera, T.E. (Eds). 1995. American Marten, Fisher, Lynx, and Wolverine: Survey Methods for their Detection*. USDA Forest Service, Pacific Southwest Research Station, General Technology Report PSW-GTR-157.*

USDA Forest Service. 2002a. Vestra. Plumas-Lassen Administrative Study Vegetation Map, Data derived from vegetation mapping contracted to VESTRA Resources, Redding, CA.

USDA Forest Service. 2002b. Plumas National Forest. 2002 Wildlife species database.

USDA Forest Service. 2004. Sierra Nevada Forest Plan Amendment (SNFPA) Final Supplemental Environmental Impact Statement (FEIS) and Record of Decision (ROD). January 2004.

USDA Forest Service. 2006a. "MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination". May 2006.

USDA Forest Service. 2006b. Plumas National Forest. Management Indicator Species Report, November 2006.

USDA Forest Service. 2006c. Pacific Southwest Research Station (PSW). Plumas Lassen Study 2005 Annual Report, March 3, 2006.

USDA Forest Service. 2007a. Draft Environmental Impact Statement Sugarberry Project, Feather River Ranger District, Plumas National Forest Plumas County, California, May 2007.

USDA Forest Service. 2007b. Sugarberry Project, Biological Assessment/Biological Evaluation for Fish and Wildlife, Plumas National Forest, Feather River Ranger District,May 2007.

USDA Forest Service. 2007c. Sugarberry Project, Vegetation/Fuels Report. Plumas National Forest, Feather River Ranger District. May 2007.

USDA Forest Service. 2007d. Sugarberry Project, Hydrology Report. Plumas National Forest, Feather River Ranger District. May 2007.

USDI Environmental Protection Agency. 1995. Reregistration Eligibility Decision (RED) Picloram. US EPA. Office of Prevention, Pesticides and Toxic Substances. EPA 738-R95-019. Aug. 1995. Washington, DC. Available at http://www.epa.gov/REDs/0096.pdf Accessed on-line Aug. 29, 2002.

USDI Fish and Wildlife Service. 2006. Notice of 12-month petition finding for the Californai spotted owl. Federal Register 50 Volume 71, Number 100, May 24, 2006.

Verner, J., K.S. McKelvey, B.R. Noon, R.J. Gutierrez, G.I. Gould, and T.W. Beck, 1992, technical coordinators. The California Spotted Owl: A Techniocal Assessment of its Current Status. GTR PSW-133. Albany, CA: PSW Research Station, USFS, USDA; 285p.

Western Association of Fish & Wildlife Agencies (WAFWA), 2002: Mule Deer, Changing Landscapes, Changing Perspectives. Creative Resource Strategies, Oregon.

Wisdom, Mike. 1996. Roads, Access, and Wildlife. In Natural Resources News – Winter 1996, Blue Mountains Natural Resources Institute.

Whitsett, K. 2006. Sugarberry Project Cumulative Watershed Effects Report, 2006

Zielinski, W. J., T. E. Kucera. August 1995. American Marten, Fisher, Lynx, and Wolverine: Survey Methods for Their Detection. USDA Forest Service, PSW-GTR-157.

Zielinski, W. J., R.L. Truex, F.V. Schlexer, L.A. Campbell and C.Caroll 2005. Historical and contemporary distributions of carnivores in forests of the Sierra Nevada, California, USA, Journal of Biogeography (2005) 32, 1385-1407.

(Zeiner et al.1990b). A study in northwestern California showed that woodrat density was low until previously cut stands reached the sapling/brushy poletimber stage (15 to 40 years after timber harvest) (Sakai and Noon 1993). Flying squirrels would likely be absent within the group selection openings (Waters and Zabel 1995).

(Zeiner et al.1990b). A study in northwestern California showed that woodrat density was low until previously cut stands reached the sapling/brushy poletimber stage (15 to 40 years after timber harvest) (Sakai and Noon 1993). Flying squirrels would likely be absent within the group selection openings (Waters and Zabel 1995). These small openings within the forest may be marginal for foraging spotted owls due to the isolation from the forest interior (Glenn et al. 2004).

Appendix 1

"MIS Analysis and Documentation in Project-Level NEPA, R5 Environmental Coordination"

May 2006

Appendix 2

“Plumas National Forest - Management Indicator Species Report”

November 2006

Appendix 3

"Approximate Change in CWHR Habitat types within Project Analysis Area"

Approximate Change in CWHR Habitat types within Project Analysis Area

CWHR Class	No Action	Alt. B	Alt. C	Change	
				Alt. B	Alt. C
LPN3D	11	11	11	0	0
LPN3M	3	3	3	0	0
MCP	2672	2670	2670	-3	-3
MHC3P	2	2	2	0	0
MHC4D	21	20	20	0	0
MHC4M	35	35	35	0	0
MHC4P	37	37	37	0	0
MHC4S	28	27	27	-1	-1
MHC5D	84	84	84	0	0
MHC5M	15	15	15	0	0
MHW3D	149	129	129	-20	-20
MHW3M	220	239	239	19	19
MHW3P	93	93	93	0	0
MHW4D	1482	1479	1479	-3	-3
MHW4M	384	386	386	2	2
MHW4P	85	85	85	0	0
MHW4S	4	4	4	0	0
MHW5D	323	323	323	0	0
MHW5M	34	34	34	0	0
MHW5P	7	7	7	0	0
MRI	161	161	161	0	0
MRI3P	27	27	27	0	0
MRI3S	34	52	52	18	18
MRI4M	22	22	22	0	0
MRI4P	16	16	16	0	0
MRI4S	55	55	55	0	0
PPN2S	5	5	5	0	0
PPN3D	15	5	5	-11	-11
PPN3M	50	60	60	10	10
PPN3P	150	150	150	0	0
PPN3S	80	80	80	0	0
PPN4S	75	75	75	0	0
PPN5P	9	9	9	0	0
PPN5S	14	14	14	0	0
RFR3M	13	13	13	0	0
RFR4D	206	206	206	0	0
RFR4M	10	10	10	0	0
ROCK	792	791	791	0	0
SMC1S	0	**421**	**370**	**421**	**370**

SMC2D	668	**647**	**648**	**-21**	**-20**
SMC2M	6	20	20	14	14
SMC2P	76	76	76	0	0
SMC2s	1084	1082	1082	-2	-1
SMC3D	207	167	167	-40	-40
SMC3M	564	**602**	**604**	**38**	**40**
SMC3P	802	801	801	-2	-2
SMC3S	957	956	956	-1	-1
SMC4D	3843	**3679**	**3681**	**-164**	**-162**
SMC4M	2984	**3026**	**3030**	**42**	**47**
SMC4P	1127	1117	1117	-10	-10
SMC4S	485	485	485	-1	-1
SMC5D	6565	**6066**	**6127**	**-500**	**-438**
SMC5M	1882	**2128**	**2077**	**246**	**195**
SMC5P	65	65	65	0	0
SMC5S	47	**662**	**601**	**615**	**554**
Water	142	142	142	0	0
WFR2S	18	18	18	0	0
WFR3D	1389	**1288**	**1291**	**-101**	**-98**
WFR3M	1176	**1262**	**1260**	**86**	**84**
WFR3P	1238	**1232**	**1233**	**-6**	**-5**
WFR3S	1118	**1116**	**1117**	**-2**	**-2**
WFR4D	12318	**10847**	**10965**	**-1472**	**-1353**
WFR4M	9194	**9916**	**9908**	**722**	**714**
WFR4P	2416	2406	2406	-10	-10
WFR4S	124	124	124	-1	-1
WFR5D	2916	**2735**	**2745**	**-181**	**-171**
WFR5M	1134	**1451**	**1416**	**317**	**282**
WFR5P	93	93	93	-1	-1
WFR5S	17	17	17	0	0
WTM	77	77	77	0	0
Total*	**62,158**	**62,157**	**62,154**		

*Acres not equal due to rounding and GIS digitizing errors

4=small 11-24″ dbh, 5=medium/large>24″dbh, 6=multistory. D=Dense Canopy Cover> 60%,
M=Moderate Canopy 40-59%,
MRI = MONTANE RIPARIAN
MCP= MIXED CONIFER/PINE
PPN = PONDEROSA PINE
SMC = SIERRA MIXED CONIFER
MHC = M0NTANE HARWOOD/CONIFER
WFR = WHITE FIR
MHW = MONTANE HARDWOOD
WTM = WET MEADOW