CHAPTER 3. ENVIRONMENTAL CONSEQUENCES

This chapter discusses the potential effects of the Proposed Action on air quality; biological and cultural resources; recreation; soils, hydrology, and water quality; vegetation, fire and fuels; and visual quality. In addition, the potential changes to those environments that would result from implementation of the alternatives are evaluated.

Air Quality

Description of Existing Conditions

The federal government and the State of California have each established ambient air quality standards for several criteria air pollutants. Ambient air quality data are routinely gathered and reported by the California Air Resources Board. The air quality monitoring stations nearest the Quail project area are Echo Summit, South Lake Tahoe (Sandy Way), and Tahoe City (Lake Forest Road). The project area has good air quality that rarely violates state or federal ambient standards.

Ozone

The Lake Tahoe region of Placer and El Dorado Counties is designated as an unclassified/attainment area for all ozone standards. Since 1995, there have been 2 days that exceeded state ozone standards and 1 day that exceeded the national 8-hour ozone standard at the Sandy Way station. At Echo Summit, there were 2 days that exceeded state ozone standards (California Air Resources Board 2004).

Particulate Matter

The Lake Tahoe region of Placer and El Dorado Counties is designated as an unclassified/attainment area for particulate matter less than 10 microns in diameter (PM10). The only exceedances of the state PM10 standard have occurred at the Sandy Way station, where the standard has been exceeded approximately 37 days since 1995 (California Air Resources Board 2004). No data are currently available for PM2.5 concentrations from monitoring stations in the Lake Tahoe Basin.

Carbon Monoxide

The Lake Tahoe region was a non-attainment area for carbon monoxide (CO) from 1992 until 1997. In 1998 the area was redesignated as an attainment area for CO (California Air Resources Board 2004). As of November 2004, the Environmental Protection Agency has designated the Lake Tahoe Region is designated as an unclassified maintenance area (U.S. Environmental Protection Agency 2004).

Environmental Consequences

No-Action Alternative

The No-Action Alternative would result in no exhaust or smoke emissions being generated during implementation. Smoke production was modeled on the basis of a scenario of a wildfire occurring in 2005 using the Fire and Fuels Extension of the Forest Vegetation Simulator (FFEFVS) (Reinhardt and Crookston 2003) (Table 3-1; see also Table B-4 in Appendix B). On average, wildfires in treatment stands would burn as passive crown fires in 2005 rather than as stand-replacing active crown fires. In 2005, 15 stands would burn as passive crown fires, five would burn as surface fires, and one would burn as a conditional crown fire. However, the probability of a crown fire would increase over time as fuels continue to accumulate. By 2025 the average treatment stand would be expected to experience a conditional crown fire, resulting in greater emissions than current conditions would entail (Table B-4).

Proposed Action

The potential direct, indirect, and cumulative effects on air quality of the Proposed Action are expected to be minor and would be minimized by implementation of county-specific Smoke Management Plans. The Proposed Action would result in a direct effect on air quality in the project vicinity as a result of smoke generated from burning piles and the prescribed burning of slash and other downed woody debris. Exhaust and fugitive dust emissions generated by equipment and power tools used in vegetation treatments could also result in direct effects.

Smoke Effects

Potential smoke-related emissions from wildfires under both the Proposed Action and the No-Action Alternative with wildfire in 2005 are summarized in Table 3-1. Smoke emissions from a passive crown fire (which would remove a greater amount of understory biomass than the Proposed Action) in 2005 would be greater than those predicted as a result of burning thinned materials in 2006. Emissions resulting from prescribed underburning of stands 5 years after thinning operations would be greater in

mechanically thinned stands than in hand-treated stands, because residual chipped material in the mechanically thinned stands would be burned during underburning operations, whereas thinned materials piled during hand treatments would be burned 1 year after thinning operations. Because the probability of crown fire increases over time, and because understory fuels would continue to accrue, the emissions from a wildfire in 2010 if no treatment is undertaken would be expected to exceed the total emissions under the combination of pile burning in 2006 and prescribed underburning in 2010.

The Proposed Action would have minor adverse effects on air quality as a result of prescribed burning; however, the Proposed Action is expected to result in long-term benefits to air quality throughout the Basin because of decreased smoke emissions generated during uncontrolled wildfire events. The expected smoke emissions generated by prescribed burning as described in the Burn Plan are expected to be at least one-third less than those generated by an uncontrolled wildfire event if no fuel reduction actions are taken.

Table 3-1. Predicted Smoke Production from Wildfire and Prescribed Burns following Hand and Mechanical Treatments

Wildfire[1]		Hand Treatment			Mechanical Treatment		
Smoke (Particulate Tons/ac)		Burn Type[2]	Smoke (Particulate Tons/ac)		Burn Type[2]	Smoke (Particulate Tons/ac)	
PM2.5	PM10		PM2.5	PM10		PM2.5	PM10
0.40	0.47	Pile burn[3]	0.26	0.31	Underburn	0.29	0.34
		Underburn	0.20	0.24			

[1] Wildfire in 2005 without treatment (assumes the average stand would experience a passive crown fire)
[2] Burn Type: Pile burning in 2006 and underburning in 2010
[3] Assuming 80% of thinned fuels from 70% of the stand were concentrated into piles covering 10% of the stand area (see Reinhardt and Crookston 2003 for additional details)

Exhaust Emissions

The Proposed Action would affect air quality through the generation of exhaust emissions from equipment and power tools, such as a cut-to-length processor and forwarder, a chipper or masticator mounted on an excavator base, and chainsaws. Estimated exhaust-related emissions are shown in Table 3-2, and are based on the following assumptions.

- In mechanically treated units, one forwarder and two processors would work simultaneously.
- A chipper or masticator would be used over a period of 10 days total.
- In hand treatment units, 10-person crews would use 10 chainsaws concurrently.

- Mechanical and hand treatments would occur concurrently (worst-case scenario).
- Treatments would take place over approximately 60 days each year for 2 years.
- All equipment is assumed to operate for 8 hours/day.

Exhaust emissions from all mechanical equipment and hand tools operating simultaneously are expected to average 42 lbs/day of reactive organic gases (ROG), 31 lbs/day of oxides of nitrogen (NO_x), <2 lbs/day of PM10, and 164 lbs/day of CO. Chainsaws rather than forwarders and processors generate most of the ROG and NO_x emissions due to the engine and fuel types. These levels of daily emissions, and the total exhaust emissions generated over the course of the Proposed Action, are well below the levels of significance established by Placer County APCD. These levels are 80 lbs/day for ROG, NO_x, and PM10 and 550 lbs./day for CO (California Air Resources Board 2001). Air emissions generated during implementation are considered to be individually and cumulatively minor and short term, and would not result in adverse cumulative air quality effects.

Fugitive Dust

Dust on roads and landings would be controlled at all times of the year when dust is present (see measure AIR-8), thereby minimizing effects on air quality. Dust generated by equipment use off roads is not predicted to adversely effect air quality, because the equipment would not be in contact with bare soil and any resulting dust would not remain airborne.

Table 3-2. Estimated Daily and Total Air Exhaust Emissions Generated under the Proposed Action

Pollutant	Significance Threshold (lbs/day)	Proposed Action	
		Daily (lbs)	Total (lbs)
ROG	80	42	5,040
NO_x	80	31	3,720
PM10	80	2	240
CO	550	164	7,374

Biological Resources

Description of Existing Conditions

Habitat in the Project Area

The forest stands in the Quail project area consists entirely of the mixed conifer forest type, although Jeffrey pine (*Pinus jeffreyi*) is a dominant species within this type. Streamside riparian vegetation and the aspen (*Populus tremuloides*)/meadow community type also occur in the project area.

The mixed conifer forest type is characterized by white fir (*Abies concolor*) throughout the overstory. Other overstory components include Jeffrey pine, sugar pine (*Pinus lambertiana*), incense cedar (*Calorcedrus decurrens*), red fir (*Abies magnifica*), lodgepole pine (*Pinus contorta*) and western juniper (*Juniperus occidentalis*). Dominant understory shrubs include tobacco brush (*Ceanothus velutinus*), oak (*Quercus vaccinfolia*), snowberry (*Symphoricarpos* spp.), and squaw carpet (*Ceanothus prostrata*). Herbaceous plants include white-veined wintergreen (*Pyrola picta*), kellogia (*Kelloggia galioides*), white flowered hawkweed (*Hieracium alviflorum*), lousewort (*Pedicularis semibarbata*), Ross' sedge (*Carex rossii*), and fescue (*Festuca* spp.) (Laacke 1990; Fites 1993; Potter 1994).

Streamside riparian vegetation in the Basin is often dominated by lodgepole pine, with black cottonwood (*Populus trichocarpa*), willows (*Salix* spp.), or alder (*Alnus* spp.). White fir and Jeffrey pine also grow in the overstory. A mix of small white fir, shrubs, and herbaceous species typically composes the understory. The aspen/meadow community type includes aspen stands and mountain meadows. Although aspen dominates these stands, willows are common in the understory. Meadows are composed of a mix of various grasses, sedges, forbs, and scattered willows.

The present mixed conifer type developed following Comstock-era logging (1880 to 1920) and in the absence of the most prevalent historic disturbance regime, fire. Prior to the early 1900s, when effective suppression began, fire was essential to keeping stands open and minimizing shrubs and ground fuels. In the absence of fire, shade-tolerant species such as white fir have crowded the understory and become a dominant component of the overstory. Concurrently, overall tree densities have increased, and shrub encroachment has significantly reduced the herbaceous understory. During drought cycles, epidemic bark beetle populations have caused large-scale mortality, primarily in white fir species. The 2004 annual mortality survey indicates that mortality due to bark beetles is increasing.

A portion of the project area was sanitation/salvage logged in the 1960s, with some selection harvest taking place in the Blackwood and McKinney Management Areas. Moderate amounts of mortality occurred during the drought cycle of 1988–1996.

Extensive salvaging was conducted in the floodplain of the Meeks Bay Management Area in the early 1990s.

Existing Forest Structure and California Wildlife Habitat Relationships Types

Stand exam plot data (USDA Forest Service 2002) were collected and summarized for each treatment stand before planning the Proposed Action. Data were collected by LTBMU staff between 1999 and 2003. Based on the stand exam plot data, each treatment stand was typed according to the California Wildlife Habitat Relationships (CWHR) structural stage classification scheme (Mayer and Laudenslayer 1988). For tree-dominated habitats or stands, a CWHR stage is a combination of average tree size (diameter at breast height [dbh]) and canopy closure classes. Table 3.3 shows the CWHR standards for tree size. Table 3-4 shows the standards for canopy closure.

Table 3-3. CWHR Standards for Tree Size

CWHR Size Code	Size Class	DBH (inches)
1	Seedling	<1
2	Sapling	1–6
3	Pole	6–11
4	Small tree	11–24
5	Medium/large tree	>24
6	Multi-layered tree	Size class 5 trees over a distinct layer of size class 4 or 3 trees; total tree canopy closure exceeds 60%

Table 3-4. CWHR Standards for Canopy Closure

CWHR Canopy Closure Code	Closure Class	Canopy Closure (%)
S	Sparse cover	10–24
P	Open cover	25–39
M	Moderate cover	40–59
D	Dense cover	60–100

A CWHR structural stage or type is expressed by combining the CWHR size and canopy codes. For example, the average condition of a forest stand typed as 4M is 11–24 inches dbh and 40–59% canopy closure. Alternatively, a stand with a mean tree diameter of 9 inches and canopy closure of 30 percent would be typed as 3P.

The CWHR system is used to summarize habitat conditions for several species and to quantify effects of the Proposed Action (e.g., habitat modification or change) on those species, because the biological analyses and planning efforts presented in the SNFPA EIS are based primarily on this system. Also, the SNFPA EIS defines habitat suitability for several species, including California spotted owl, northern goshawk, and American marten, in terms of the CWHR system.

Most treatment stands in the project area are two-storied, with shade-tolerant species in the understory and pine and fir in the overstory. Stand ages range from 70 to 100 years. Most of these stands are in the stem-exclusion stage of stand development. In this stage, some trees begin to die while survivors grow larger and express differences in height and diameter; first one species and then another may appear to dominate the stand (Oliver and Larson 2000).

Table 3-5 summarizes the existing (i.e., preproject) average structural conditions of each treatment stand (see Figure 2-1 for the locations of stands); the average condition of all stands combined (i.e., the average condition over the project area); and the CWHR type of each stand.

Special-Status Wildlife, Plant, and Fish Species

Special-status wildlife, plant, and fish species include species listed as endangered or threatened, or proposed for listing, under the federal Endangered Species Act (ESA); designated as sensitive by the Regional Forester; or designated as special-interest species by TRPA. The BE/BA prepared for this project (Jones & Stokes 2004b) analyzed 23 special-status species that could be affected by the Proposed Action. This determination was based primarily on whether a special-status species is known to occur or could occur in the project area. The potential for occurrence of a species was evaluated on the basis of the known regional and local distribution of the species, occurrence records, and the known or potential presence of suitable habitat in the project area.

Sixteen additional species were initially considered for analysis in the BE/BA. However, these species were not evaluated further because no suitable habitat occurs in the project area or the project area is outside the known range of these species. The status of each species and rationale for eliminating it from further evaluation are described in the BE/BA.

The BE/BA describes the habitat associations, occurrence, and regulatory status of each special-status species in the project area. The BE/BA is hereby incorporated by reference and is available for review at the LTBMU Supervisor's Office. The known or potential occurrence in the project area of the 23 species analyzed in the BE/BA is summarized below.

Lahontan Cutthroat Trout

Lahontan cutthroat trout is not known to occur within treatment stands; however, this species has been documented in the project area in the Cascade Creek watershed (see above). Because the Cascade Creek watershed is hydrologically connected to treatment stand 5-5, it is included in the project area.

Several other streams and lakes in the Basin were historically suitable for and/or occupied by this species. However, because exotic fish species currently inhabit most or all of these streams and lakes, and efforts to remove or control exotic fish in most of these areas have not been implemented, most of these habitats are generally considered unsuitable for Lahonton cutthroat trout. Fluvial populations of Lahontan cutthroat trout are considered intolerant of predation and competition by nonnative salmonids, and rarely co-occur with them (DeStaso and Rahel 1994; Schroeter 1998; Dunham et al. 2000). At least nine fish species are known to occur in streams along the west Basin, including several predatory trout such as rainbow trout, brook trout, and brown trout (Lahontan Regional Water Quality Board 2004). It is assumed that these habitat conditions prevail in most of the project area. Because of these assumed habitat conditions, as well as the highly limited distribution of known occurrences, Lahontan cutthroat trout is not expected to occur in the project area beyond the Cascade Creek watershed.

Mountain Yellow-Legged Frog

Despite widespread implementation of amphibian surveys in recent years (e.g., Multispecies Inventory and Monitoring Program), the only known extant population of mountain yellow-legged frog in the Basin occurs at Hell Hole in the south Basin. Historic records of mountain yellow-legged frogs in the Basin include observations at Grouse Lake (1974), Tamarack Lake (1975), Secret Harbor Creek (1994), and 5.5 miles north of Incline Village (1932) (USDA Forest Service 2001c *citing* Schlesinger pers. comm.).

Although streams in the project area provide aquatic habitat, it is assumed that most or all of these streams are not considered suitable breeding habitat for this species due to their relatively high gradient and fast flows and/or the occurrence of nonnative predatory fish. At least nine fish species are known to occur in streams along the west Basin, including several predatory trout such as rainbow trout, brook trout, and brown trout (Lahontan Regional Water Quality Board 2004). Mountain yellow-legged frogs are not expected to occur in the project area due to these habitat conditions, combined with the highly limited distribution of known occurrences. However, prior to implementation of the Proposed Action, a more rigorous assessment of suitable habitat within the project area by LTBMU biologists would be a conducted to determine the presence and distribution of suitable habitat and the likelihood of occurrence for this species.

Table 3-5. Existing Average Structural Conditions of Treatment Stands

Stand	Acres	Basal Area (ft^2/ acre)	Trees (per acre)	QMD (inches)	Canopy Closure (%)	CWHR Type
1-1	13.0	302.9	475.5	10.8	70.3	4D
1-3	86.7	302.9	475.5	10.8	70.3	4D
1-2	80.0	159.0	842.5	5.9	60.1	3D
1-4	186.0	224.8	589.1	8.4	55.9	3M
1-5	129.3	135.6	1,397.1	4.2	51.8	2M
5-1	3.0	323.8	1,477.9	6.3	75.4	3D
5-2	3.4	323.8	1,477.9	6.3	75.4	3D
5-5	51.3	323.8	1,477.9	6.3	75.4	3D
5-4	7.8	213.6	669.2	7.7	63.3	3D
5-6	14.6	213.6	669.2	7.7	63.3	3D
5-7	127.0	229.5	652.2	8.0	63.3	3D
5-8	69.6	308.0	963.0	7.7	71.7	3D
5-13	3.0	308.0	963.0	7.7	71.7	3D
5-9	118.3	373.9	547.5	11.2	68.3	4D
5-10	151.1	192.6	558.8	8.0	54.1	3M
5-11	79.8	237.5	930.0	6.8	61.6	3D
5-12	9.5	228.4	925.0	6.7	57.9	3M
13-1	268.6	200.4	928.7	6.3	59.0	3M
13-2	207.2	177.4	575.5	7.5	57.7	3M
13-3	266.3	209.5	1,245.4	5.6	68.9	2D
13-4	113.2	124.4	1,176.0	4.4	58.3	2M
14-12	183.4	202.6	481.8	8.8	59.7	3D
14-15	200.0	144.6	357.1	8.6	45.2	3M
14-16	309.9	162.4	1,088.9	5.2	51.8	2M
14-17	15.8	288.1	394.8	11.6	54.1	4M
14-18	6.3	252.2	538.8	9.3	60.0	3D
Average		237.1	841.5	7.6	62.5	
Total	2,704.1					

Bald Eagle

Winter season surveys for bald eagles are conducted annually and sponsored by LTBMU; breeding season surveys are conducted annually by TRPA. Breeding bald eagles do not occur in the project area. However, treatment stands 5-4 and 5-6 occur approximately 0.75 mile from the bald eagle nest site at Emerald Bay. Treatment stands 5-4, 5-6, 5-2, and 5-5 are adjacent to TRPA-designated wintering habitat at Emerald Bay. TRPA protects all historic and current nest sites within a 0.5-mile radius delineated around each nest (Tahoe Regional Planning Agency 1987); TRPA also applies a *non-degradation* standard to wintering habitat.

American Peregrine Falcon

The project area does not support suitable nesting habitat for peregrine falcons. There are no TRPA-designated peregrine falcon threshold population sites in the project area. The nearest known cliff sites considered suitable for nesting are located at the Blackwood Canyon Cliffs and Eagle Falls above Emerald Bay, outside the project area. These areas were surveyed by TRPA in 2000; no peregrine falcons were detected.

California Spotted Owl

As of 1999, there were nine pairs of spotted owls and five single birds known to occur on USFS and other lands in the Basin (USDA Forest Service 2001c). Most spotted owl occurrences in the Basin are in the northwestern, western, and southern portions of the Basin. California spotted owls occur and nest in the project area.

Protocol-level surveys for spotted owls have been conducted in portions of the project area most years between 1991 and 2004; surveys would continue in 2005. There is one California spotted owl PAC (Lower Blackwood PAC), encompassing 343.3 acres, in the project area.

CWHR stages considered suitable for California spotted owl in Sierran mixed conifer forest are 4M, 4D, 5M, 5D, and 6. Types 5M, 5D, and 6 are considered suitable for nesting; 6 is considered preferred nesting habitat (USDA Forest Service 2004). Based on this system, 233.8 acres of habitat suitable for spotted owl occur in treatment stands; of this, 183.5 acres are located outside spotted owl PACs (Table 3-6).

Table 3-6. Summary of Suitable Spotted Owl Habitat (based on CWHR classification) in Treatment Stands inside and outside PACs

		Acres		
Stand	CWHR Type	Inside PACs	Outside PACs	Total
1-1	4D		13.0	13.0
1-3	4D	50.3	36.4	86.7
5-9	4D		118.3	118.3
14-17	4M		15.8	15.8
	Total	50.3	183.5	233.8

Northern Goshawk

Northern goshawks are year-round residents in the Lake Tahoe region and are distributed throughout the Basin from approximately lake level to treeline (Keane 1999). Nineteen goshawk territories were active in the Basin in 2003 (USDA Forest Service 2003a); based on the distribution of known territories and habitat, an additional five to six territories likely exist (USDA Forest Service 2003a *citing* Keane unpublished data).

Northern goshawks occur and nest in the project area. Protocol-level surveys for northern goshawks have been conducted in portions of the treatment stands most years between 1991 and 2004; surveys would continue in 2005. There are three northern goshawk PACs and several known nest sites in the project area.

CWHR forest stages considered suitable for northern goshawk in the Lake Tahoe area are 4P, 4M, 4D, 5M, 5D, and 6. According to this system, 233.8 acres of suitable habitat for northern goshawk occur in treatment stands; of this, 155.3 acres are located outside goshawk PACs (Table 3-7).

Table 3-7. Summary of Suitable Northern Goshawk Habitat (based on CWHR classification) in Treatment Stands inside and outside PACs

		Acres		
Stand	CWHR Type	Inside PACs	Outside PACs	Total
1-1	4D	4.0	9.0	13.0
1-3	4D	74.5	12.2	86.7
5-9	4D		118.3	118.3
14-17	4M		15.8	15.8
	Total	78.5	155.3	233.8

Willow Flycatcher

Willow flycatchers are not known to occur in the project area; however, they have been detected 0.5 mile downstream of stands 1-2 and 1-4. Suitable nesting habitat for this species is present in the project area in stands 1-1 through 1-4, 13-1 through 13-4, and 14-12 through 14-18. Riparian vegetation occurs along several streams in the project area. The composition of riparian woody vegetation is dominated primarily by alder and also includes some willow and cottonwood. However, most streams in the project area are high-gradient and/or incised with dry banks and adjacent uplands. The riparian vegetation distributed along these streams is typically sparse, narrow, and patchy.

Osprey

LTBMU and TRPA annually monitor breeding ospreys using walk-in and shoreline boat survey methods. More than 15 osprey nest sites (including historical sites) occur in or near the project area along the shorelines of Cascade Lake, Emerald Bay, and Lake Tahoe between Emerald Bay and Sugar Pine Point. There are no nest sites within treatment stands. This conspicuous species (nesting ospreys are highly vocal and detectable when disturbed) has not been detected incidentally during recent surveys for other species in portions of the treatment stands. However, treatment stand 5-7 is approximately 0.25 mile east of nest sites along Lake Tahoe north of Emerald Bay. The present occupancy and reproductive status of these nest sites are not known. This stand will be surveyed for osprey activity prior to treatment; a wildlife biologist will be consulted and the prescription will implement LOPs. Several other nest sites are near (but more than 0.25 mile from) treatment stands. TRPA protects intact nest sites within a 0.25-mile radius delineated around each nest (Tahoe Regional Planning Agency 2002).

Golden Eagle

The project area does not support suitable nesting habitat for golden eagles. There are no TRPA-designated golden eagle threshold population sites in the project area. The nearest known cliff sites considered suitable for nesting are located at the Blackwood Canyon Cliffs and Eagle Falls above Emerald Bay, outside the project area. TRPA surveyed these areas in 2000; no golden eagles were detected.

Waterfowl

Waterfowl species occur in aquatic habitats throughout the project area. Foraging and resting habitat occurs in open water habitat, slow-moving streams, and adjacent herbaceous uplands. Suitable nesting habitat is limited in the project area because the Proposed Action would occur on drier conifer-dominated sites. There are no TRPA-designated waterfowl threshold sites and no habitat mapped by LTBMU as suitable for waterfowl in the project area. However, there are TRPA-designated waterfowl sites at Lily Lake, McKinney Lake, and Blackwood Creek.

American Marten

Several forest carnivore surveys have been conducted throughout the Basin since 1991 (Lake Tahoe Basin Management Unit file information). LTBMU has conducted carnivore surveys using track plates and/or camera stations in the south Basin at Heavenly Ski Resort and near Angora Lake, Big Meadow, and Glen Alpine Creek; in the east Basin at South Camp Peak and other east shore locations; and in several west Basin watersheds, including the Ward Creek watershed. LTBMU's Multispecies Inventory and Monitoring Program has recently conducted carnivore surveys in several randomly selected locations throughout the Basin; moreover, USFS's Urban Biodiversity Study has been studying carnivore use of USFS urban lots in the Basin.

American martens have been detected at several locations throughout the Basin over the past decade, including several west Basin watersheds (Lake Tahoe Basin Management Unit file information). Mixed conifer forest and riparian habitat in the project area provide suitable habitat for this species. Surveys for American marten and other carnivores have been conducted in 14 of the project stands (1-3, 1-4, 5-6, 5-7, 5-9, 5-10, 5-11, 13-1 through 13-4, and 14-12 through 14-16). American martens have been detected in eight of the stands (1-3, 5-10, 5-11, 13-2, 13-3, 13-4, 14-12, and 14-16) as well as within 100 meters of two additional stands (14-17 and 14-18).

CWHR stages considered moderately to highly important for American marten are 4M, 4D, 5M, 5D, and 6 (USDA Forest Service 2004). Based on this system, 233.8 acres of suitable habitat for American marten occur in treatment stands (Table 3-8).

Table 3-8. Summary of Suitable American Marten Habitat (based on CWHR classification) in Treatment Stands

Stand	CWHR Type	Acres
1-1	4D	13.0
1-3	4D	86.7
5-9	4D	118.3
14-17	4M	15.8
	Total	233.8

Pacific Fisher

Pacific fishers have never been detected during focused carnivore surveys in the Basin. Although fisher historically occurred here, there are no recent reliable reports of this species in the Basin (USDA Forest Service 2003a).

The presence and distribution of Pacific fishers in or near the project area are not known. However, protocol-level surveys have been conducted in the stands surveyed for

American marten to document the presence or absence of carnivores, including Pacific fishers. Mixed conifer forest and riparian habitat in the project area provide biophysical conditions that appear suitable for fishers; however, the species' potential for occurrence in the Basin and the project area is considered extremely low. There are no recent occurrence records of fishers in or near the Basin, and this species is presently thought to be extirpated in the Sierra Nevada from Yosemite National Park northward (Zielinski et al. 1995). This reported gap in Pacific fishers distribution includes the Lake Tahoe Basin.

CWHR stages considered moderately to highly important for Pacific fisher are 4M, 4D, 5M, 5D, and 6 (USDA Forest Service 2004). Based on this system, 233.8 acres of suitable habitat for Pacific fisher occur in treatment stands (Table 3-9).

Table 3-9. Summary of Suitable Pacific Fisher Habitat (based on CWHR classification) in Treatment Stands

Stand	CWHR Type	Acres
1-1	4D	13.0
1-3	4D	86.7
5-9	4D	118.3
14-17	4M	15.8
	Total	233.8

California Wolverine

Wolverines have never been detected during focused carnivore surveys in the Basin. However, observations of wolverines in and near the Basin have been reported over the last 30 years. Most of these reported observations have not been confirmed. Some of these observations are summarized in the BE/BA.

The presence and distribution of wolverines in the project area are not known. The 1990 observation in Desolation Wilderness occurred approximately 1 mile from treatment stands in the project area. The majority of the survey effort for furbearers within the project area had been conducted using covered trackplates. In addition to the stands described above for American marten, stands 5-7, 5-10, 5-11, and 13-3 have been surveyed using camera stations, which are more suited to detecting California wolverine. No wolverines have been detected at any of these stations. Mixed conifer forest and riparian habitat in the project area provide biophysical conditions that appear suitable for wolverines; however, the species' potential for occurrence in the project area is considered very low. There is only one confirmed occurrence record of a wolverine in the Basin. Also, if wolverines presently occur in the Basin, they probably occur in

relatively remote locations at higher elevations than the project area, away from human development and disturbance.

Mule Deer

Mule deer are likely to use mixed conifer forest and riparian habitat in the project area as summer range and to occur there in low numbers. There is no designated critical summer range or critical fawning habitat for either the Loyalton-Truckee or Carson River herds in the project area. Important habitat requirements for mule deer fawning include undisturbed meadow and riparian areas that provide hiding cover and forage. Mule deer also use shrub habitat for forage and fawning. CWHR modeling conducted by TRPA predicted the occurrence of suitable fawning habitat in several of the riparian/meadow areas within west Basin watersheds (Tahoe Regional Planning Agency 2002). However, it is assumed that much of the riparian habitat along streams in the project area does not provide suitable mule deer fawning habitat. The riparian vegetation distributed along many of these montane streams is sparse, narrow, and patchy.

Subalpine Fireweed

Subalpine fireweed is not known to occur in the Basin. Suitable habitat for this species was found in riparian areas and wet pockets during plant surveys conducted by LTBMU in treatment stands in 2002 (August, September, and October) and 2003 (June and October). However, subalpine fireweed was not observed during these surveys.

Starved Daisy

Starved daisy is not known to occur in the Basin. Some suitable habitat for this species may be present within the action area. However, this species was not observed during plant surveys conducted by LTBMU in treatment stands in 2002 (August, September, and October) and 2003 (June and October).

Upswept Moonwort, Scalloped Moonwort, and Western Goblin

Suitable habitat for upswept moonwort, scalloped moonwort, and western goblin was found in riparian areas and wet pockets during plant surveys conducted by LTBMU in treatment stands in 2002 (August, September, and October) and 2003 (June and October). However, these species were not observed in treatment stands. Western goblin has not been documented in the Basin. One occurrence of scalloped moonwort is known from Ward Canyon and another from Blackwood Canyon. The Blackwood Canyon occurrence is approximately 600–700 feet west of treatment stand 1-4 and was observed during the 2002–2003 surveys.

Veined Water Lichen

Veined water lichen is not known to occur in the Basin. Comprehensive surveys have not detected veined water lichen in the project area. Some suitable habitat for this species may be present within SEZs in the project area.

Bolander's Candle Moss, Three-Ranked Hump-Moss, and Broad-Nerved Hump-Moss

Bolander's candle moss and broad-nerved hump-moss are not known to occur in the Basin. However, three-ranked hump moss has been documented in the Basin. Comprehensive surveys have not detected any of the three mosses in the project area. Some suitable habitat for these species may be present in the project stands in wet areas.

Management Indicator Species

Wildlife management indicator species (MIS) identified in the LTBMU LRMP are bald eagle, American peregrine falcon, northern goshawk, California spotted owl, willow flycatcher, blue grouse, mallard, pileated woodpecker, mule deer, and black bear. Fish MIS are Lahontan cutthroat trout, rainbow trout, and brook trout. These species are known to occur or potentially occur in the project area. MIS are addressed in Appendix A of the BE/BA.

Environmental Consequences

No Action

No adverse direct effects are expected to result from implementing the No-Action Alternative. Indirect effects include the increased probability of stand-replacing catastrophic wildfire, which could substantially reduce forest wildlife habitat and result in detrimental effects on watershed and water quality. The likelihood of such an event is higher than under the Proposed Action and would continue to increase over time.

Proposed Action

Direct and Indirect Effects

This section describes the potential direct and indirect effects of the Proposed Action on forest, aquatic, and riparian habitats in general, and on each special-status species addressed in this EA. Direct effects are defined as those that are caused by the Proposed Action and would occur at the time of the action; indirect effects are those that are caused by the Proposed Action and are later in time, but still reasonably certain to occur. In this analysis, direct effects are those that would occur while the Proposed Action is being implemented (e.g., disturbances during construction). Indirect effects are those that

would occur as a result of the Proposed Action, such as alterations of forest succession processes and changes in water quality. To minimize redundancy and unnecessary parallel analyses, the analysis of species-level effects would tier from the more general analysis of habitat effects, as well as analyses and results presented in the SNFPA EIS (USDA Forest Service 2001a), SEIS (USDA Forest Service 2004), and BE (USDA Forest Service 2003b).

The Proposed Action was designed specifically to meet the objectives of and comply with the SNFPA ROD (USDA Forest Service 2004), which amended portions of the LTBMU Land and Resource Management Plan (LRMP). It also directly incorporates the ROD's standards and guidelines. A programmatic-level BE was prepared to analyze regional implementation of the SNFPA on 193 sensitive species (USDA Forest Service 2003b). The BE concluded that the Proposed Action may affect individuals or habitat of some sensitive species, but would not likely contribute to a trend toward federal listing or cause a loss of viability of any sensitive species. This section presents a project-level analysis intended to tier from analyses and conclusions presented in the SNFPA SEIS and BE. This analysis assumes that all applicable standards and guidelines specified in the ROD are directly incorporated in and met by the Proposed Action. Please see the ROD for a description of these standards and guidelines.

Forest Structure and CWHR Types

Simulations of various treatment and non-treatment scenarios were conducted by LTBMU staff with the stand exam data using the Forest Vegetation Simulator (Dixon 2002). Four scenarios were simulated over a 25-year period: 1) no treatment; 2) no treatment with a wildfire in 2005; 3) hand treatment; and 4) mechanical treatment. The simulated prescription for hand treatment generally consisted of thinning trees up to 14 inches in diameter in 2005, piling thinned material and selected ground fuels in 2005, burning the piles in 2006, and underburning in 2010. The simulated prescription for mechanical treatment generally consisted of thinning trees up to 30 inches in diameter in 2005, chipping treated materials and ground fuels in 2005, and underburning in 2010. Table 3-10 presents predicted CWHR types for each stand in the year 2025 under both the No-Action and Proposed Action scenarios. The Proposed Action scenario combines both manual and mechanical treatments. Figures 2-1 and 2-2a–c depict specific locations within stands where mechanical and manual treatments would be implemented. Table 3-11 presents a summary of the total amount and net change of each CWHR type in all treatment stands combined under both the No-Action Alternative and Proposed Action. A full set of modeling results, including values for numerous variables (e.g., stand structure, fuel loads, smoke conditions), is included in Appendix B.

Terrestrial Vegetation and Wildlife

Completion of the Proposed Action, including thinning, biomass removal, pile burning, and prescribed burning, would lead to a reduction in surface fuel loading and fuel ladder conditions in the urban defense and threat zones. This reduction would change the overall structure of wildlife habitat in the project area. Through the removal of

Table 3-10. Predicted CWHR Types for Each Stand Immediately after Treatment and in Year 2025 under the No-Action and Proposed Action Scenarios

Stand	Existing Condition		No Action: Predicted Conditions in Year 2025		Proposed Action: Predicted Conditions Immediately After Treatment, Year 2005				Proposed Action: Predicted Conditions in Year 2025			
	CWHR Type	Acres	CWHR Type	Acres	CWHR Type in Manually Treated Portion of Stand	Acres	CWHR Type in Mechanically Treated Portion of Stand	Acres	CWHR Type in Manually Treated Portion of Stand	Acres	CWHR Type in Mechanically Treated Portion of Stand	Acres
1-1	4D	13.0	4D	13.0	4M	0.1	4M	12.9	4M	0.1	4M	12.9
1-3	4D	86.7	4D	86.7	4M	31.9	4M	54.8	4M	31.9	4M	54.8
1-2	3D	80.0	3D	80.0	3S	26.4	3P	53.6	3P	26.4	3M	53.6
1-4	3M	186.0	3D	186.0	3M	55.3	3M	130.7	3M	55.3	3M	130.7
1-5	2M	129.3	2D	129.3	2P	129.3		0	2M	129.3		0
5-1	3D	39.3	3D	57.7	3M	13.1	3M	44.6	3M	8.9	3M	30.4
5-2	*Data for stand 5-1 represent 5-1, 5-2, and 5-5 combined*											
5-5	*Data for stand 5-1 represent 5-1, 5-2, and 5-5 combined*											
5-4	3D	22.4	3D	22.4	3P	14.8	3P	7.6	3M	14.8	3M	7.6
5-6	*Data for stand 5-4 represent 5-4 and 5-6 combined*											
5-7	3D	127.0	3D	127.0	3P	54.4	3M	72.6	3M	54.4	3M	72.6
5-8	3D	69.6	3D	69.6	4M	69.6		0	4M	69.6		0
5-13	3D	3.0	3D	3.0	4M	3.0		0	4M	3.0		0
5-9	4D	118.3	4D	118.3	4M	118.3		0	4M	118.3		0
5-10	3M	151.1	3D	151.1	3P	151.1		0	3P	151.1		0
5-11	3D	79.8	3D	79.8	3P	79.8		0	3M	79.8		0
5-12	3M	9.5	3D	9.5	3M	9.5		0	3M	9.5		0

Table 3-10. Continued

Stand	Existing Condition		No Action: Predicted Conditions in Year 2025		Proposed Action: Predicted Conditions Immediately After Treatment, Year 2005				Proposed Action: Predicted Conditions in Year 2025			
	CWHR Type	Acres	CWHR Type	Acres	CWHR Type in Manually Treated Portion of Stand	Acres	CWHR Type in Mechanically Treated Portion of Stand	Acres	CWHR Type in Manually Treated Portion of Stand	Acres	CWHR Type in Mechanically Treated Portion of Stand	Acres
13-1	3M	268.6	3D	268.6	3P	186.9	3P	81.7	3M	186.9	3M	81.7
13-2	3M	207.2	3D	207.2	3P	149.0	3P	58.2	3M	149.0	3M	58.2
13-3	2D	266.3	3D	266.3	3P	207.5	3M	58.8	3M	207.5	3M	58.8
13-4	2M	113.2	3D	113.2	2P	113.2		0	3M	113.2		0
14-12	3D	183.4	3D	183.4	4P	150.5	3P	32.9	3M	150.5	3M	32.9
14-15	3M	200.0	3M	200.0	3P	200.0		0	3P	200.0		0
14-16	2M	309.9	3D	309.9	2P	309.9		0	3M	309.9		0
14-17	4M	15.8	4D	15.8	4M	0.2	4P	15.6	4M	0.2	4M	15.6
14-18	3D	6.3	3D	6.3	4M	0	4M	6.3	4M	0	4M	6.3

Table 3-11. Total Amount and Net Change of Each CWHR Type in all Treatment Stands Combined under the No-Action and Proposed Action Scenarios

CWHR Type	Existing Condition (acres)	No Action: Predicted Acres in Year 2025	Proposed Action: Predicted Acres Immediately after Treatment (2005)	Proposed Action: Predicted Acres in Year 2025	Net Change between Existing Condition and Proposed Action Immediately after Treatment (acres)	Net Change between Existing Condition and Proposed Action in Year 2025 (acres)
2P	0	0	552.4	0	+552.4	0
2M	552.4	0	0	129.3	-552.4	-423.1
2D	266.3	129.3	0	0	-266.3	-266.3
3S	0	0	26.4	0	+26.4	0
3P	0	0	1,277.5	377.5	+1,277.5	+377.5
3M	1,022.4	200	366.2	1,866.2	-656.2	+843.8
3D	610.8	2,122.6	0	0	-610.8	-610.8
4P	0	0	166.1	0	+166.1	0
4M	15.8	0	297.1	312.7	+281.3	+296.9
4D	218	233.8	0	0	-218	-218

competing intermediate and suppressed small-diameter trees, the potential for residual trees to develop late successional/old-growth characteristics and fire resiliency would be enhanced.

The direct effects of thinning under the Proposed Action would be improvement of residual tree survival of high-intensity wildfire, reduction of potential for crown fire occurrence, and increased growth rates of residual trees. The treatments are expected to create forest conditions that would support prescribed burning as a forest health and fuel management tool for managing wildlife habitat in the future.

Stand diversity would be maintained by thinning based on canopy position (i.e., intermediate and suppressed trees would be selectively thinned), which would result in uneven spacing of residual trees. To maintain a mosaic of forest conditions within treated stands, SEZs, wildlife clumps, and untreated pockets with limited or no treatment would be retained in most stands except within developed sites or very small stands. Weed and shrub invasion would be minimized by limiting canopy reductions to no more than 30% of existing conditions; retaining some chips and existing mulch as soil cover following treatments; and by planting, if necessary, seedling conifers.

Project activities such as thinning and prescribed burning could disturb the reproductive and foraging activities of wildlife species. Implementing LOPs would reduce the potential adverse short-term effects on some species. LOPs would be in effect where species activity centers are known and mapped. Consequently, short-term disturbance of these species would be minimized by implementing project activities outside LOPs.

Other potential effects of the Proposed Action are habitat removal and modification. Project activities include removal of live trees and snags, downed trees, and understory and midstory structure. Such activities could result in short-term habitat loss or habitat modification for individuals dependent on these habitat elements. However, in compliance with LRMP direction, trees more than 30 inches in diameter would not be thinned, and stand projection modeling of the total canopy cover indicates that cover would not be reduced by more than 30%. Overall, the Proposed Action is predicted to result in a net increase in CWHR structure classes considered suitable for some species associated with mature forests (e.g., California spotted owl, northern goshawk, American marten) (Tables 3-10, 3-11, 3-12, 3-13, and 3-14).

Disturbances to wildlife species could occur in the form of noise disturbance and smoke from prescribed fires. These disturbances would be temporary and not likely to result in a substantial change in behavior or habitat use. A temporary reduction in common prey species (e.g., passerine birds and rodents) could influence foraging activities of some predator species (e.g., California spotted owl, northern goshawk, American marten). However, local and temporary disruptions of prey populations are not expected to affect predators because the impacts would not occur over a significant portion of any individual’s foraging range.

Nest or den locations of sensitive wildlife would be protected. Additional measures to protect biological resources are described in *Measures Incorporated into the Proposed Action to Avoid or Minimize Adverse Effects* in Chapter 2.

Creating and burning debris piles could affect wildlife species that would temporarily use them. Burn piles would remain on the forest floor for at least 1 year before being burned. Rodents could use these piles for resting, temporary escape cover, or food caching. The presence of piles and increased availability of escape cover and caching sites could temporarily reduce predation rates on rodents and enhance their populations locally. Rodents that would use these piles for escape cover or food caching, such as deer mouse, Douglas squirrel, and golden-mantled ground squirrel, are not expected to use these piles as breeding or nesting sites. These species nest either underground (e.g., deer mouse, ground squirrel) or in trees (Douglas squirrel) rather than in aboveground piles, and probably would not be sensitive to pile burning during sensitive reproductive periods. Individuals using burn piles as temporary cover could vacate them before or during burning; however, pile burning could eliminate important food stores for individuals using burn piles as cache sites. Ground-nesting birds such as blue grouse could use debris piles as nest sites. However, pile burning is expected to occur in early spring (only in locations outside sensitive wildlife areas) or fall (outside the sensitive nesting period of most ground-nesting birds in the Basin).

The Proposed Action would have a beneficial indirect effect of reduced potential for catastrophic wildfire, which is considered to be one of the primary threats to habitat for forest species. Other anticipated benefits to wildlife include an increase in overall forest health. In addition, thinning from below and removal of suppressed trees could reduce competition in the residual stands and increase the rate of recruitment of large-diameter trees. In the long term, such recruitment could benefit species associated with late successional/old growth forests, such as northern goshawk, California spotted owl, and American marten.

Aquatic and Riparian Habitats

Potential effects of the Proposed Action on soils, water quality, and RCAs are analyzed in the Soils and Hydrology Report (Jones & Stokes 2004a) prepared for this project, which is hereby incorporated by reference.

The Proposed Action would involve the use of low-impact hand and mechanical thinning treatments, slash piling and chipping treatments, and prescribed fire treatments to modify dense vegetation conditions and reduce fuel loads in RCAs. However, limited or no treatment would occur in SEZs. Mechanized thinning treatments, pile burning, and prescribed fire treatments would be excluded from SEZs, but hand removal of standing dead trees and trees actively infested with pests or pathogens would be allowed in SEZs where the removal of such trees has been identified as a need and when it can been accomplished in accordance with TRPA and RWQCB regulations. In general, all vegetation and fuel treatments conducted in RCAs would focus on improving forest

Table 3-12. Total Amount and Net Change of Each CWHR Type Considered Suitable for California Spotted Owl under the No-Action and Proposed Action Scenarios

CWHR Type Considered Suitable	Existing Condition (acres)	No Action: Predicted Acres in Year 2025	Proposed Action: Predicted acres Immediately after Treatment (2005)	Proposed Action: Predicted Acres in Year 2025	Net Change between Existing Condition and Proposed Action Immediately after Treatment (acres)	Net Change between Existing Condition and Proposed Action in Year 2025 (acres)
4M	15.8	0	297.1	312.7	+281.3	+296.9
4D	218	233.8	0	0	-218	-218
5M	0	0	0	0	0	0
5D	0	0	0	0	0	0
6	0	0	0	0	0	0
Total Suitable Habitat	233.8	233.8	297.1	312.7	+63.3	+78.9

Table 3-13. Total Amount and Net Change of Each CWHR Type Considered Suitable for Northern Goshawk under the No-Action and Proposed Action Scenarios

CWHR Type Considered Suitable	Existing Condition (acres)	No Action: Predicted Acres in Year 2025	Proposed Action: Predicted acres Immediately after Treatment (2005)	Proposed Action: Predicted Acres in Year 2025	Net Change between Existing Condition and Proposed Action Immediately after Treatment (acres)	Net Change between Existing Condition and Proposed Action in Year 2025 (acres)
4P	0	0	166.1	0	+166.1	0
4M	15.8	0	297.1	312.7	+281.3	+296.9
4D	218	233.8	0	0	-218	-218
5M	0	0	0	0	0	0
5D	0	0	0	0	0	0
6	0	0	0	0	0	0
Total Suitable Habitat	233.8	233.8	463.1	312.7	+229.4	+78.9

Table 3-14. Total Amount and Net Change of Each CWHR Type Considered Suitable for American Marten and Pacific Fisher under the No-Action and Proposed Action Scenarios

CWHR Type Considered Suitable	Existing Condition (acres)	No Action: Predicted Acres in Year 2025	Proposed Action: Predicted acres Immediately after Treatment (2005)	Proposed Action: Predicted Acres in Year 2025	Net Change between Existing Condition and Proposed Action Immediately after Treatment (acres)	Net Change between Existing Condition and Proposed Action in Year 2025 (acres)
4M	15.8	0	297.1	312.7	+281.3	+296.9
4D	218	233.8	0	0	-218	-218
5M	0	0	0	0	0	0
5D	0	0	0	0	0	0
6	0	0	0	0	0	0
Total Suitable Habitat	233.8	233.8	297.1	312.7	+63.3	+78.9

health, enhancing or maintaining hydrologic and biologic integrity, and maintaining or enhancing the key attributes of riparian habitats. These attributes comprise cool, moist soil conditions; high water quality; retention of large snags and down logs in sufficient quantities to provide habitat and woody debris recruitment in stream channels; and retention of woody material to provide stability to riparian and aquatic habitats, as well as foraging, hiding, and thermal cover for wildlife species. LTBMU watershed specialists would implement a wide range of activity-specific BMPs (Appendix A) designed to minimize detrimental soil disturbance; protect water quality; and maintain the biological integrity, physical stability, and hydrologic connectivity of riparian and aquatic habitats. The Proposed Action is designed to meet the RCOs established in the ROD.

There is little potential for the Proposed Action to adversely affect the geomorphic, hydrologic, or biological characteristics of riparian and aquatic habitats in the subject watersheds because of the low-impact characteristics of the proposed stand treatments, the limitations that would be imposed on operations within RCAs and SEZs, and the use of activity-specific BMPs.

The greatest potential for Proposed Action to affect the hydrologic connectivity of streams and aquatic habitat exists at SEZ crossings. To minimize the potential for project-related effects on hydrologic connectivity in SEZs, existing SEZ crossings would be used whenever possible. In the event that it is necessary to construct a temporary SEZ crossing, the methods used for construction would be selected to avoid or minimize detrimental soil and vegetation disturbance and to maintain hydrologic connectivity between upstream and downstream features. All temporary crossings would be removed following the completion of project-related activities and would be treated as necessary to restore preproject conditions. Implementation of the activity-specific BMPs would further ensure that hydrologic connectivity in streams and special aquatic features is not adversely affected by the Proposed Action.

In many of the proposed treatment stand RCAs, the age class, structural diversity, composition, and cover of riparian vegetation is currently outside the range of natural variability due to the effects of past logging activities and wildfire suppression. In particular, many of the proposed treatment stand RCAs contain an overabundance of white fir, which has suppressed the growth of more desirable conifers and riparian plant species such as aspen. The mechanical and manual thinning treatments that would be applied to RCAs under the Proposed Action would substantially improve this condition. Management actions undertaken specifically to restore aspen stands or other riparian plant communities would be reviewed by a silviculturalist and watershed specialist from LTBMU on a stand-by-stand basis prior to implementation.

The Proposed Action could directly affect fisheries and amphibian resources, primarily as a result of vegetation removal, slash piling, and prescribed fire immediately following treatment; such activities could lead to soil disturbance and its associated effects on aquatic habitats (e.g., accelerated erosion and sedimentation). Any soil displacement,

compaction, or change in ground cover would cause a direct effect on watershed condition and fish habitat. Conservation measures incorporated into the project would be implemented during the maintenance phase to control erosion and sedimentation. The incorporation of BMPs would avoid or minimize potential increases in sediment loads to streams during project implementation such that prescribed fires are not expected to affect aquatic habitats. Over the longer term, potential adverse effects on water and soils from implementing the Proposed Action are expected to be minor, and substantially less than if an uncontrolled wildfire were to occur.

Special-Status Species

Lahontan Cutthroat Trout and Mountain Yellow-Legged Frog

Lahontan cutthroat trout and mountain yellow-legged frog are not expected to occur near treatment stands. If these species occurred there, the Proposed Action could directly affect them, primarily as a result of soil disturbance and its associated effects on aquatic habitats (e.g., accelerated erosion and sedimentation) caused by thinning activities, site preparation, and prescribed fire immediately following treatment. Any soil displacement, compaction, or change in ground cover would cause a direct effect on watershed condition and aquatic habitat. Conservation measures incorporated into the Proposed Action would be implemented during the maintenance phase to control erosion and sedimentation. Permanent BMPs would stabilize poorly aggregated soils at the crossings and direct runoff to infiltration areas outside SEZs, thus reducing effects to a minor level. Also, limited or no project activities would occur within SEZs. Potential adverse short-term effects are expected to be minor or avoided with the conservation measures incorporated into the project design; any such effects would be offset by long-term improvements to fish and amphibian habitat by reducing the risk of catastrophic wildfire occurrence.

The Proposed Action could cause adverse indirect effects. The Proposed Action would involve the use of low-impact hand and mechanical thinning treatments, slash piling and chipping treatments, and prescribed fire treatments to modify dense vegetation conditions and reduce fuel loads in RCAs. However, limited or no treatment would occur in SEZs. Mechanical treatments could cause soil disturbance that may lead to accelerated erosion and sedimentation, possibly degrading aquatic habitat. Hand treatments would not substantially increase erosion and sedimentation beyond existing levels. Implementing the BMPs in all units would minimize or avoid adverse indirect effects on aquatic habitat. In general, all vegetation and fuel treatments conducted in RCAs would focus on improving forest health, enhancing or maintaining hydrologic and biologic integrity, and maintaining or enhancing the key attributes of riparian and aquatic habitats. Over the long term, potential adverse effects on aquatic habitat resulting from implementation of the Proposed Action are expected to be minor, and substantially less than if an uncontrolled wildfire were to occur.

Some beneficial indirect effects of implementing the Proposed Action are likely to occur. Removing excessive small wood and other fuels would reduce the possibility that

wildfires would consume the entire understory and stands of trees protecting streams and meadows. Chipping some material and leaving it on site would help prevent erosion, rearrange the fuels into a less volatile configuration on the forest floor, and provide a source of organic materials for nutrient cycling. Prescribed fire would reduce available fuels, provide heat stratification for fire-dependent seeds, and contribute to nutrient cycling. All these activities serve to restore important ecosystem processes that could ultimately benefit water and soil resources, as well as habitat for sensitive fish and amphibians.

Bald Eagle

Breeding bald eagles do not occur in the project area. However, treatment stands 5-4 and 5-6 occur approximately 0.75 mile from the bald eagle nest site at Emerald Bay. Treatment stands 5-4, 5-6, 5-2, and 5-5 are adjacent to TRPA-designated wintering habitat at Emerald Bay. Because TRPA protects all historic and current nest sites within a 0.5-mile radius delineated around each nest (Tahoe Regional Planning Agency 1987) and applies a *non-degradation* standard to wintering habitat, project activities would occur outside the no-disturbance buffer around the Emerald Bay nest site and outside designated wintering habitat. Accordingly, the Proposed Action is not expected to affect bald eagles.

American Peregrine Falcon

The project area does not support suitable nesting habitat for peregrine falcons. There are no TRPA-designated peregrine falcon threshold population sites in the project area. The nearest known cliff sites considered suitable for nesting are located at the Blackwood Canyon Cliffs and Eagle Falls above Emerald Bay, outside the project area. These areas were surveyed by TRPA in 2000; no peregrine falcons were detected. In addition, suitable foraging areas for peregrine falcons (e.g., meadows, wetlands, and other open habitats) would not be treated. Therefore, the Proposed Action is not expected to affect peregrine falcons.

California Spotted Owl

There is one California spotted owl PAC (Lower Blackwood PAC) in the project area; fuel and vegetation treatments would occur within a portion of this PAC. The extent and type of proposed treatments within this PAC are summarized below. This PAC overlaps with the East Blackwood northern goshawk PAC.

The Lower Blackwood Spotted Owl PAC is 343.3 acres in size and includes portions of treatment stands 1-2, 1-3, and 1-4. The PAC was surveyed in 1991, 1993–94, and 1996–2004; spotted owls were detected in 1993, 1997, 1999, 2001, 2002, and 2004. Male and female spotted owls were detected once each in 2004. Their current status according to USFS Region 5 protocol was recorded as “status unknown—single owl.” A total of 220.1 acres (64%) of the PAC would be treated under the Proposed Action. Of these 220.1 acres, 165.2 acres (48% of the PAC) would be mechanically treated in stands 1-4, 1-3, and 1-2; 54.9 acres 16% of the PAC would be manually treated in stands 1-4 and 1-3.

Table 3-15 summarizes the predicted changes in CWHR types for treatment stands inside California spotted owl PACs under both the No-Action and Proposed Action scenarios.

Measures incorporated into the Proposed Action are designed to avoid or minimize potential adverse effects on California spotted owls. In compliance with the ROD standards and guidelines, mechanical treatments would not occur within a 500-foot buffer around a spotted owl activity center within a PAC (measure BIO-6); also, a wildlife biologist would oversee treatment preparations in PACs (BIO-8). Treatments within PACs would be prepared to enhance habitat conditions and maintain multiple story canopy structure throughout the unit, while meeting the purpose and need of the Proposed Action. Furthermore, an LOP from March 1 to August 31 would be in effect within 0.25 mile of any known or suspected nest stands. LOPs would reduce the potential for disturbance to nesting pairs. However, California spotted owls have home ranges that exceed the size of PACs; consequently, the potential remains for temporary disturbance during and after vegetation treatments in foraging areas.

On the basis of simulation results, the Proposed Action is predicted to result in a net increase in CWHR structure classes considered suitable for California spotted owl (Table 3-12) over the long term. The Proposed Action would also move treated stands toward achieving desired conditions for California spotted owl home range core areas (HRCAs) as outlined in the SNFPA (USDA Forest Service 2004) and is expected to reduce the risk of catastrophic wildfire and improve forest health.

Northern Goshawk

There are three northern goshawk PACs and several known nest sites in the project area; fuel and vegetation treatments would occur within portions of these PACs. The extent and type of proposed treatments within these PACs are summarized below.

- The East Blackwood Goshawk PAC overlaps with the Lower Blackwood spotted owl PAC. This PAC is 244.2 acres in size and includes portions of treatment stands 1-4, 1-3, 1-1, and 13-1; 224.6 acres (92%) of the PAC would be treated under the Proposed Action. Of these 224.6 acres, 167.8 acres (69% of the PAC) would be mechanically treated in stands 1-4, 1-3, and 1-1; 56.8 acres (23% of the PAC) would be manually treated in stands 1-4, 1-3, and 1-1. Surveys were conducted in this PAC in 1981, 1988–1995, 1997–99, and 2001–04; northern goshawks were detected in the PAC in 1988–89, 1991–93, and 2002.
- The Upper General Creek Goshawk PAC is 239.6 acres in size and includes portions of treatment stand 13-1; 32.8 acres (14%) of the PAC would be treated under the Proposed Action. Of these 32.8 acres, 18.6 acres (8% of the PAC) would be mechanically treated in stand 13-1; 14.2 acres (6% of the PAC) would be manually treated in stand 13-1. This PAC was surveyed 1998–2004. Northern goshawks were detected in 1998–2002.

Table 3-15. Predicted CWHR Types for Treatment Stands inside California Spotted Owl PACs under the No-Action and Proposed Action Scenarios

		Existing Condition		No Action: Predicted Conditions in Year 2025		Proposed Action: Predicted Conditions Immediately after Treatment, Year 2005				Proposed Action: Predicted Conditions in Year 2025			
California Spotted Owl PAC	Treatment Stand	CWHR Type	Acres in PAC	CWHR type	Acres in PAC	CWHR Type in Manually Treated Portion of Stand	Acres in PAC	CWHR type in Mechanically Treated Portion of Stand	Acres in PAC	CWHR Type in Manually Treated Portion of stand	Acres in PAC	CWHR type in Mechanically Treated Portion of Stand	Acres in PAC
Lower Blackwood	1-4	3M	167.4	3D	167.4	3M	39.4	3M	128.0	3M	39.4	3M	128.0
	1-3	4D	50.3	4D	50.3	4M	15.5	4M	34.8	4M	15.5	4M	34.8
	1-2	3D	2.4	3D	2.44	3S	0	3P	2.4	3P	0	3M	2.4

- The Lower General Creek Goshawk PAC is 203.6 acres in size and includes portions of treatment stand 13-1; 2.5 acres (1%) of the PAC would be manually treated in stand 13-1. This PAC was surveyed 1998–2001, and 2004. Northern goshawks were last detected in the PAC in 1999 or earlier.

Table 3-16 summarizes the predicted changes in CWHR types for treatment stands inside northern goshawk PACs under both the No-Action and Proposed Action scenarios

Measures incorporated into the Proposed Action are designed to avoid or minimize potential adverse effects on northern goshawks. In compliance with the ROD standards and guidelines, mechanical treatments would not occur within a 500-foot buffer around a northern goshawk *activity center* within a PAC (measure BIO-6); also, a wildlife biologist would oversee treatment preparations in PACs (BIO-8). Treatments in PACs would be prepared to enhance habitat conditions and maintain multiple-story canopy structure throughout the unit, while meeting the purpose and need of the Proposed Action. Also, an LOP from February 15 to September 15 would be in effect within 0.5 mile of any known or suspected nest stand (BIO-7). LOPs would reduce the potential for disturbance to nesting pairs. However, northern goshawks have home ranges that exceed the size of PACs; consequently, the potential remains for temporary disturbance during and after vegetation treatments in foraging areas.

On the basis of simulation results, the Proposed Action is predicted to result in a net increase in CWHR structure classes considered suitable for northern goshawks (Table 3-13) in the long term provided that snags and down woody material are available at sufficient levels to provide habitat for prey species. It is also expected to reduce the risk of catastrophic wildfire and improve forest health. Moreover, because the forest understory would be thinned without a substantial reduction in canopy cover, northern goshawk foraging habitat could be improved as a result of the Proposed Action.

Willow Flycatcher

Protocol-level surveys for willow flycatchers may be conducted in suitable riparian/meadow habitat if it occurs within 300 feet of a treatment stand (see measures BIO-3 and BIO-7). If willow flycatchers are detected, an LOP between June 1 and August 31 would be imposed. The location of the LOP would be determined by the USFS wildlife biologist on the basis of site conditions and type of project activity. Therefore, the project would not disrupt breeding activities of willow flycatchers.

Because limited or no project activities would occur within SEZs, and because the BMPs and conservation measures would be implemented, the Proposed Action would not be expected to affect the structure, composition, or hydrologic characteristics of suitable habitat for willow flycatchers.

Osprey

Treatment activities in stand 5-7 could affect osprey breeding attempts if nearby sites are occupied. However, LTBMU biologists would survey these sites for presence/absence