Appendix B-1

Biological Evaluation- Terrestrial Wildlife Species
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BIOLOGICAL EVALUATION
TERRESTRIAL WILDLIFE SPECIES

Pit 3 and 4 Hydroelectric Project License

Hat Creek Ranger District, Lassen National Forest
Shasta Lake Ranger District, Shasta-Trinity National Forests
May 2003

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I. INTRODUCTION

The purpose of this Biological Evaluation (BE) is to document analysis of the potential effects of the proposed relicensing for the Pit 3 and 4 Hydroelectric Project upon Forest Service designated terrestrial Sensitive Species. This BE is prepared in accordance with direction provided in Forest Service Manual (FSM) 2672.42 and implementing regulations [19 U.S.C. 1536 (c), 50 CFR 402.12 (f) and 402.14 (c)].

The Regional Forester's Sensitive Species list for Region 5 (dated June 8, 1998), identifies the following terrestrial sensitive species which may occur on the Lassen and Shasta-Trintiy National Forests:

American peregrine falcon (*Falco peregrinus anatum)*
Great gray owl (*Strix nebulosa*)
Northern goshawk (*Accipter gentils)*
Sawinson's Hawk *(Buteo swainsoni)*
California spotted owl *(Strix occidentalis occidentalis)*
Greater sandhill crane *(Grus canadensis tabida)*
Willow flycatcher (*Empidonax trailii)* subspecies *brewsteri* on Sierran west slope
California wolverine *(Gulo gulo luteus)*
Pacific fisher (*Martes pennanti)*
American Marten (*Martes americana)*
Sierra Nevada red fox (*Vulpes vulpes necator)*
California wolverine (*Gulo gulo luteus)*
Pallid bat (*Antrozous pallidus)*
Townsend's big-eared bat (*Corynorhinus townsendii)*
Western red bat (*Lasiurus blossevillii)*
Northwestern pond turtle (*Clemmys marmorata marmorata)*
Shasta Salamander (*Hydromantes shastae*)

II. CURRENT MANAGEMENT DIRECTION

Current management direction for Sensitive species can be found in the following documents:

-Forest Service Manual and Handbooks (FSM/H 2670)
-National Forest Management Act (NFMA)
-National Environmental Policy Act (NEPA)
-Lassen National Forest Land and Resource Management Plan (LRMP 1992), as amended in 1994
-Shasta-Trinity Forest Land and Resource Management Plan (LRMP 1995)

General Forest Service direction for Sensitive species is summarized below. Additional management direction relevant to individual species is described in Appendix A.

- As part of the National Environmental Policy Act process, review programs and activities, through a biological evaluation, to determine their potential effect on sensitive species.

- Avoid or minimize impacts to species whose viability has been identified as a concern.

- If impacts cannot be avoided, analyze the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole.

- Establish management objectives in cooperation with the States when a project on National Forest System lands may have a significant effect on sensitive species population numbers or distribution.

Most of the NFSL within the project area are to be managed as Late Seral Reserves, or as riparian reserves. A small portion (around 10%) is under Matrix management. Matrix lands may be managed for multiple uses, but there is an emphasis on maintaining snags and coarse woody debris.

III. DESCRIPTION OF THE PROPOSED PROJECT

Note: A more detailed description of project activities can be found in the Final Environmental Impact Statement for the Pit 3, 4 and 5 Hydroelectric Project and in the document entitled Enclosure 1, Pit 3, 4 and 5 Hydro Relicensing Preliminary 4(e) Terms and Conditions, May 2003. A summary is presented here.

Project Description

The existing Pit River Project consists of three storage reservoirs, three powerhouses, and several diversions and conduits. The Pit 3 reservoir (Britton Lake), the Pit 3 dam and the Pit 3 powerhouse are on or adjacent to lands administered by the Lassen National Forest. The shoreline of Britton Lake, the dam and upper part of the reach are on private lands, while the majority of the lower reach and the powerhouse are located on public lands. The Pit 4 reservoir, dam, reach and powerhouse are on lands managed by the Shasta-Trinity National Forest. Reach 5 and associated facilities are all on private land. The Pit 5 reach and facilities will not be addressed in this evaluation.

Within the analysis area, about 62% of the area is dominated by upland vegetation. The following table (based on information in the DEIS on page 152 and Table 28) shows dominant cover types and percent of the project area.

Table 1. Dominant cover types in the project area (this includes Pit 3, 4 and 5 reaches).

COVER TYPE	PERCENT OF PROJECT AREA
Non-vegetation	37%
Reservoirs	34%
Transmission corridors	2%
Other	1%
Upland vegetation	62%
Douglas-fir or Sierran mixed conifer	34%
Jeffrey pine	8%
Oregon white oak	5%
Ruderal (disturbed, weeds)	4%
Eastside ponderosa pine	3%
Canyon live oak	2%
Jeffrey pine-Oregon white oak	2%
Black oak	1%
Other	3%
Riparian	1%
Torrent sedge or wet herb	<1%
Brickellbrush	<1%
Willow shrub	<1%
White alder	<1%
Black cottonwood	<1%
Oregon ash	<1%
Black oak	<1%

Other minor types (<1%) in the non-vegetation include basalt cliffs, mines and seeps. These three types combined account for about 1% of the project area. Minor upland vegetation cover types include annuals/non-natives, bracken fern, wedgeleaf ceonothus/chapparal, greenleaf manzanita/chaparral, rubber rabbitbrush and ponderosa pine/Sierran mixed conifer dominated by ponderosa pine. These types combined, comprise about 3% of the project area.

Existing Project Operation

The Pit 3 and 4 Projects make use of waters released from storage for power generation. FERC initiated the re-licensing process in October 1998. Since that time, the Forest Service has been involved with Pacific Gas and Electric (PG&E), resource agencies, non-governmental organizations, the Pit River Tribe, and other interested parties in the Pit River Collaborative Team (PRCT). Currently the river is managed with a minimum in-stream flow release of 150 cfs. Spring run-off (March to May) has higher flows of 3,000 to 5,000 cfs and sometimes up to 20,000 cfs. The rest of the year it ranges from 150 to 1,800 cfs. PG&E is currently allowed to draw down a total of 9 feet in Britton Reservoir, but due to a number of reasons, it is operated with a 6-foot draw down.

Proposed Environmental Measures

The Forest Service proposed Preliminary 4(e) Conditions in October 2002. These were updated in May 2003. The first are standard conditions that have no physical impacts on habitats. The Project Specific Conditions include a range of resources, including river

flow conditions, gravel and woody debris augmentation, vegetation and wildlife management, recreation and roads. About half of these are plans or surveys that have no impact on habitats or species. Those conditions that have the potential to impact habitat are summarized below.

- Flow regime conditions address flows, ramping, dry year freshet flows, longer inudation periods and planned spill events. Minimum in-stream flows would be increased to 400 cfs in the Pit 3 reach and 450 cfs in the Pit 4 reach in the interim until shaping is established. Shaping would allow higher flows in spring and would range between 300 and 1000 cfs through the year. Ramping addresses the rate of change of flow releases. In dry years, as measured on March 1, a freshet flow could be released. The Peak Flow Management Plan would reduce the large magnitude flow fluctuations between spring and winter and extend the duration of spring peak flow, resulting in longer inudation periods on the bars in the bottom of the natural channel not inudated by minimum flows.

- The Gravel and woody debris program condition identifies a gravel and woody debris supply program;

- The Land and Habitat Management Plan includes development of a vegetation management plan, which could include prescribed burning to rejuvenate brush and reduce fuels; revegetation of spoil piles and management of vegetation under transmission lines; management of noxious weeds; and removal of select riparian overstory removal;

- It also include plans and monitoring for amphibians, threatened, endangered and sensitive species (bald eagles, bank swallow colonies, peregrine falcons etc). There are also a couple of direct actions. One is the construction of a bat accessible gate at the tunnel entrance below Pit 4 Reservoir, and continuation of a motorized boat speed restriction at upper Lake Britton;

- The LHMP also includes development of a Recreation Management Plan that addresses recreational concerns. These conditions include addition of information kiosks at existing sites; reconstruction of developed and undeveloped sites (campgrounds, boat launches, new trails, and new parking areas); pursue changing county ordinances to open Pit 4 Reservoir to non-motorized boats, boats with battery-powered motors, and float tubes; develop an Upper Britton OHV plan, which could include seasonal or yearlong restrictions and road/trail rehabilitation; and development of access points for white-water boaters.;

- The Roads and Facilities Management Plan includes re-paving, expanding the existing paving, replacing three bridges and installing culverts at spring locations;

- Finally, the LHMP includes a spoil disposal plan, which includes direction for management of spoil piles and disposal of project related native materials.

IV. SPECIES ACCOUNTS AND EFFECTS

The following table lists those species introduced in Section I, their preferred habitats, and whether, based on the activities the project proposes, the species has the potential of being impacted by any of the proposed activities on NFS lands. Species that may be impacted by the activities proposed under this project are highlighted.

Table 2. Sensitive species that may be present or affected by activities, and their potential to occur in the Pit 3 and 4 Project area affected by the proposed issuance of the FERC License. *

Species	Elevation Range of Habitat (ft)	Preferred Habitat	Potential for Project to Affect this Species
Shasta Salamander	Sea level to >3200 ft.	Limestone outcrops and adjacent forested habitats	None. Limestone habitat only occurs in Pit 5 Reach, outside of The project area.
American peregrine falcon	From sea level to summit	Vertical cliff habitat with large potholes or ledges	Occupied habitat occurs within the project area.
California spotted owl	Above 2,000	Mature coniferous forest greater than 40 percent canopy cover and multi-storied conditions	None. This subspecies is found to the south of hwy 299, assume all spotted owls in the analysis area are northern spotted owls
Northern goshawk	Above 3,000	Older age coniferous, mixed, and deciduous forest habitats	Occupied habitat occurs within the project area.
Swainson's Hawk	Below 2,500	Oak savannah, juniper/sage flats, grasslands, agricultural fields	None. Suitable habitat does not occur within the project area.
Great gray owl	4,500 to 7,500	Coniferous forest in association with meadows or other openings with herbaceous vegetation.	None. Suitable habitat does not occur within the project area. Lacks open meadow foraging habitat.
Greater sandhill crane		Wet meadows interspersed with emergent vegetation.	None. Suitable habitat does not occur within the project area.
Willow flycatcher	Below 8,000	Meadows with perennial streams or standing water and willow or alders	Occupied habitat occurs within the project area.
Pacific fisher	3,000 to 8,000	Dense (60-100% canopy cover) multi-storied, multi-species, late seral stage coniferous forests	Suitable habitat occurs within the project area, but there have been no confirmed species detections**.**
American marten	Above 4,000	Mature, dense mesic forests of red fir, red fir/white fir mix, lodgepole pine, and Sierran mixed conifer	None. May be too low in elevation, none have been detected in camera/bait station or track-plate surveys.
Sierra Nevada red fox	Above 5,000	Forested areas interspersed with riparian and meadow habitat, and brush fields	None. The analysis area is outside of the range for this species, which is found at higher elevations toward Lassen Volcanic NP.
California Wolverine	Above 4,500	Remote areas in mixed conifer, red fir, lodgepole pine, subalpine conifer, alpine dwarf-shrub, wet meadows, and montane riparian habitats	Suitable habitat occurs within the project area, but there have been no confirmed species detections.
Pallid bat	Primarily below 6,000	Most common in open, dry habitats that contain rocky areas for roosting.	Occupied habitat occurs within the analysis area.
Western red bat	Below 3,000	Riparian and wooded habitats, particularly with willows, cottonwoods, and sycamores	Occupied habitat occurs within the analysis area.
Townsend's big-eared bat	Below 10,800	Edge habitats along streams and areas adjacent to and within a variety of wooded habitats	Occupied habitat occurs within the analysis area.
Northwestern pond turtle			Occupied habitat occurs within the analysis area.

Based on knowledge of distribution and habitats in the project area, there are several species that will not be analyzed further. These are displayed in the above table. Implementation of this project with license conditions will have no impact on Shasta salamander, California spotted owl, Swainson's hawk, great gray owl, greater sandhill crane, American marten, and Sierra Nevada red fox or their habitat.

All of the rest of the species vary in how they might be affected by the conditions attached to the license. Terrestrial species may not be directly affected by changes in stream flows, but could be indirectly affected by changes in riparian vegetation as a result of the changes in stream flows. Others may be affected by recreational uses in the area. The following analysis of effects will focus on those conditions that may directly, indirectly or cumulatively affect each individual species.

The LHMP requires development of a "Protection of TES Species Plan". This says that before the licensee takes any action on NFSL that may affect a listed species, the Licensee shall prepare a biological evaluation and submit it to the Forest Service. The biological evaluation shall 1) develop procedures to minimize adverse effects, 2) ensure the project shall meet restrictions included in site-specific management plans, and 3) develop implementation and effectiveness monitoring of measures taken to reduce effects.

American Peregrine Falcon

Existing Environment.

Species and Habitat Account. Information about this species' life history and habitat preference used for this analysis is provided in Appendix A. Less than one percent of the project area provides cliff habitat. There are three known or suspected nesting areas for peregrine falcons within the analysis area; one in the Pit 3 river reach, and two on the Pit 4 river reach. Monitoring information on the Pit 4 Powerhouse site shows that birds were first observed in the area in 1979, and the site has been occupied since. This pair has been consistently productive over the last two decades. The Pit 3 site (Siren) was first suspected in 2000, when a juvenile peregrine falcon was observed flying in the area. Monitoring since then found birds there in 2002, but no breeding has been confirmed. A new, suspected site was found in April 2003 around Pit 4 Dam. Two adults were observed flying and perched on a ledge. This site will continue to be monitored.

Effects of the Proposed Action.

Direct and Indirect Effects. Nesting habitat would not be directly affected as no project activities would affect cliffs. The primary potential indirect effect to peregrine falcons is from disturbance during the nesting season which may cause loss of reproduction and/or abandonment of the nesting site. In general, potential disturbance effects to peregrine falcon can result from maintenance activities, road and dam maintenance, siren use, and recreational activities within ½ mile of the Pit 3 and Pit 4 nesting territories.

The Pit 4 Powerhouse site is above an existing facility. Ongoing work activities and maintenance will occur. In addition, license conditions include continued use of an existing spoil pile, revegetation in the area, development of a trash collection site and potable water source for recreation users. These actions should not result in a large increase in use of that site and the potential for disturbance should not increase substantially. This site has been very productive over the last decade and this trend is expected to continue.

The Pit 3 site (Siren) is above an existing road, has a parking area adjacent, and has a warning siren nearby. License conditions include improvement of the parking area at the Talus siren and would consider this area as a site for gravel augmentation. To date, no breeding has been documented at this site.

The Pit 4 Dam site is potentially a new nesting site. A pair of peregrines were observed here in April 2003, but continued monitorin will determine if nesting occurs. Proposed activities in the general area include revegetation, installation of a bat accessible gate on a tunnel entrance, a possible gravel augmentation site, improvements at Ruling Creek dispersed camping area, and spoil pile restoration.

All three sites lie above the river and road corridor, where there is frequent human activity. Most of the proposed activities would be done over relatively short-time periods and disturbance would be limited to the area along the road and river corridor, not on slopes adjacent to nesting cliffs. Currently the peregrines appear to tolerate some level of human use, and it is not known if increased use on the river/road corridor would affect suitability of the cliff sites. Monitoring will continue in the future. The LHMP condition for monitoring would help to minimize adverse effects.

Cumulative Effects. Direct effects to peregrine falcon habitat are minimal and will not, therefore, contribute to cumulative losses or degradation of habitat. Indirect impacts to the peregrine falcon cliffs at all sites are minimal. Other identified risk factors (found in Appendix A) are not currently known to be issues in this area.

Recommendations.

1. Continue to monitor peregrine falcon nest territories annually, or until such time that it's determined that the study can cease. The draft Monitoring Plan being prepared by the FWS currently proposes surveys every three years for a total of five surveys. FERC recommends following the FWS Monitoring Plan. The LHMP condition will provide more information on site occupancy and nest success.

Determination. Implementation of the license conditions may impact individual peregrine falcons or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

Willow Flycatcher

Existing Environment.
Species and Habitat Account. Information about this species life history and habitat preference used for this analysis is provided in Appendix A. Surveys for willow flycatchers were conducted in a total of 43 riparian shrub habitat patches ranging in size from 0.06 acres to 12.4 acres. Most areas on the river reaches included stands of willow, often adjacent to alder and Oregon ash trees, and bordering open floodplain habitats of sedge, forbs, rocks and standing water. One willow flycatcher breeding area was located during the surveys. A male responded to calls with territorial songs on August 1, 2000 in a 1.5-acre patch of willow/blackberry/skunk bush complex on upper Lake Britton. The area was adjacent to a wet meadow and extensive dry meadow/grassland along the Pit River confluence with Lake Britton. Since no female or breeding behavoir was observed, the site can be classified only as potential breeding habitat for willow flycatcher (PG&E draft report, April 2001).

General point count surveys for breeding birds documented three willow flycatchers on one plot in 2000. This plot was on Reach 5, outside of the project area. They were found in early June but were not documented in the area in early July. One brown-headed cowbird was detected at this same point.

Almost 90% of the riparian habitat in the project area was mapped as alder and willow cover types.

Effects of the Proposed Action.
Direct and Indirect Effects. Minimum in-stream flows would be increased to 400 cfs in the Pit 3 reach and 450 cfs in the Pit 4 reach. This increase in minimum flows would remove small amounts of alder and willow over the short-term, but both willow and alder would be likely to re-establish along the new ordinary high water mark in a relatively short amount of time (5-10 years). As a result, there could be a short-term decrease in the amount of habitat, but over the long-term habitat would be expected to increase back to current levels. Based on Table 32 in the DEIS, there could be about a 10% decrease in willow and immature alder in the Pit 3 and 4 reaches over the short-term if minimum flows were increased to 600 cfs. This is higher than the flows proposed in the license conditions, and the short-term decrease in habitat would be expected to be less.

Other conditions include some recreational use management in the Lake Britton dispersed use area. This is the area potentially used as breeding habitat in 2000. These include a boat launch area (already disturbed), closure of a parking area and development of an interpretive drive loop road (using existing road). Loss of habitat is not an issue with these proposals.

There may be some select riparian overstory removal for foothill yellow-legged frog. This would only be done in select areas around known egg-laying sites.

One of the risk factors that has been identified for this species is vulnerability to loss of nest due to recreational use. The degree to which this could be an issue is not known. But,

looking at recreational use information for the Upper Lake Britton area, about 23% of the observed recreational use was by fishermen or hikers (Confluence Resources and Consulting, April 2001).

Cumulative Effects. Another threat to this species that could be contributing cumulative effects includes brown-headed cowbird nest parasitism. Breeding bird surveys in early June found 1 brown-headed cowbird on one point count station during surveys in 2000 (PG&E draft report April 2001).This is the same point where three willow flycatchers were observed. It is unknown what effects cowbird parasitism might have on breeding success.

Recommendations.

1. The LHMP includes development of implementation and effectiveness monitoring of measures taken or employed to reduce effects to listed species. This would include monitoring of changes in riparian vegetation as a result of changes in minimum flows. FERC recommends that PG&E conduct point count surveys as a means of monitoring implementation of the new flow regime, and then at 5-year intervals to monitor changes over time.

Determination. Implementation of the license conditions for this project may impact individual willow flycatchers or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

Northern Goshawk

Existing Environment.
Species and Habitat Account. Information about this species life history and habitat preferences is provided in Appendix A. Comprehensive past goshawk surveys have not occurred throughout the vicinity of the project, however suitable habitat does exist in the project area. Project-related surveys did not find any northern goshawk breeding areas, but goshawks were periodically observed in the Pit River drainage during other field work (PG&E draft report April 2001). There is one known nest site adjacent to the analysis area on the south side of the Pit River Canyon south of the Pit 4 Dam (Chalk Mtn CLSRA, 1996).

Effects of the Proposed Action.
Direct and Indirect Effects. As stated above, the only known goshawk nest area is outside of the project area, across the river on the less developed side of the river. The likelihood of any project-related activities disturbing goshawks in this areas is low.

About 45% of the project is dominated by conifer cover types. Habitat alteration in these cover types on national forest land can involve removal of various trees as hazard trees in proximity to the transmission lines, project buildings, roads, and other project facilities. This usually occurs as part of routine maintenance and site-specific locations and information on these activities is not included in the project description. As stated in the

Forest Service 4 (e) conditions, the Forest Service must be consulted before these activities occur, during which time the Forest Service may impose conditions and initiate NEPA to display the effects of such actions. Other habitat alteration activities proposed in the project involve upgrading and expansion of recreation facilities, campgrounds, trails and associated access roads and parking areas. These activities are expected to have minimal effects on habitat for the goshawk. This is due to the fact that these activities are proposed within the boundaries of or immediately adjacent to established recreation facilities and adjacent to existing roads. The likelihood of the habitat in these areas being of high quality is low due to disturbance from recreation use.

Although project activities will not impact any known goshawk nest sites, if new or previously undetected nesting occurs in the area, disturbance could occur. Disturbance during nesting has the potential to cause nest abandonment, loss of eggs or young due to overheating, cooling or trampling due to activities of the adult, and pre-mature fledging of young (Joslin and Youmans, 1999).

Cumulative Effects. Direct and indirect effects to goshawk habitat are minimal and will not, therefore, contribute to cumulative losses or degradation of goshawk habitat. Risks identified by CDFG were logging and falconry. Neither of these factors are expected to contribute cumulative effects to goshawks in the project area.

Recommendation.

1. The LHMP includes development of a "Protection of TES Species Plan". This says that before the licensee takes any action on NFSL that may affect a listed species, the Licensee shall prepare a biological evaluation and submit it to the Forest Service. The biological evaluation shall 1) develop procedures to minimize adverse effects, 2) ensure the project shall meet restrictions included in site-specific management plans, and 3) develop implementation and effectiveness monitoring of measures taken to reduce effects.
2. FERC recommends that the Licensee should conduct goshawk surveys if it is determined that project-related construction or vegetation management could affect potential nesting habitat.
3. The Forest Plans/Monitoring Reports include direction or recommendations to limit operating periods adjacent to active goshawk nesting sites (200 acres) until the young have fledged.

Determination. Implementation of the license conditions for this project may impact individual northern goshawks or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

Literature Cited.

Joslin, G. and H. Youmans, eds. 1999. Effects of recreation on Rocky Mountain wildlife: A review for Montana. Committee on Effects of Recreation on Wildlife, Montana Chapter of the Wildlife Society. Pg 3.14.

Pacific Fisher and California Wolverine

Existing Environment.
Species and Habitat Account. Information about these species life histories and habitat preferences is provided in Appendix A. There have been no comprehensive surveys for these species in the project area. Short-term track plate surveys have been conducted for these species but there have been no confirmed sightings of fisher or wolverine in the project area. Habitat for both of these species occurs within the project area. As described in Appendix A, the LNF and S-T NF have identified areas on the Forests that currently provide the highest capability habitat for fisher (Chalk Mountain Late Seral Reserve).

Effects of the Proposed Action.
Direct and Indirect Effects. Habitat alteration on national forest land can involve removal of various trees as hazard trees in proximity to the transmission lines and the flume/conduit, project buildings, and other project facilities. This usually occurs as part of routine maintenance and site-specific locations and information on these activities is not included in the project description. As stated in the Forest Service 4 (e) conditions, the Forest Service must be consulted before these activities occur, during which time the Forest Service may impose conditions and initiate NEPA to display the effects of such actions. Other habitat alteration activities proposed in the project involve upgrading and expansion of recreation facilities, campgrounds, and associated access roads and parking areas. These activities are expected to have minimal effects on habitat for the fisher or wolverine. This is due to the fact that these activities are proposed within the boundaries of or immediately adjacent to established recreation facilities. The likelihood of the habitat in these areas being of high quality is very low due to disturbance from recreation use. Most of the adjacent upland areas are in Late Seral Reserve management and this favors habitat for these species. Lands managed as Matrix still have an emphasis on retention of snags and coarse woody debris, which are important component for these species.

Due to the fact that these species are sensitive to disturbance, the likelihood of denning sites occuring in the vicinity of established recreation areas or routinely maintained project facilities is also low. Therefore disturbance of denning animals or loss of reproduction is likely a minimal risk from the project activities.

Cumulative Effects. The project will not contribute to adverse cumulative effects upon fisher or wolverine since direct and indirect impacts of the project are minimal.

Determination. Implementation of the license conditions for this project may impact individual fishers or wolverines or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

Pallid Bat, Townsend's Big-eared Bat, and Western Red Bat

Existing Environment.

Species and Habitat Account. Life history and habitat information for these species is provided in Appendix A. Extensive bat surveys have been conducted in the project area. These surveys looked at powerhouses, dams and associated structures, as well as over open, relatively still water, river margins and riparian forest sites.

Pallid bats appear to be rare in the surveyed section of the Pit River. Acoustic surveys did record this species in mixed oak conifer and at the base of cliffs. Surveys in the analysis area (Pierson et al, 2001) found guano attributed to the Townsend's Big-eared bat in a cave-like space under the conduit on the north side of Rock Creek. They attributed this to use for roosting by one male. Surveys in the analysis area obtained many acoustic records for the red bat. Three were obtained in July, while 21 were September records. They state that the increase in number of detections in September suggests that this species may be migrating down the Pit River to wintering sites along the coast or in southern California.

Effects of the Proposed Action.
Direct and Indirect Effects. Removal of habitat structures, such as powerhouses, portions of the flume, campground buildings, rock or cement crevices in the dams, and tunnels, is not proposed in the project. Habitat alteration is the removal of various trees as hazard trees in proximity to the transmission lines and the flume/conduit, project buildings, and other project facilities can occur as part of routine maintenance. Site-specific locations and information on these activities is not included in the project description. As stated in the Forest Service 4 (e) conditions, the Forest Service must be consulted before these activities occur, during which time the Forest Service may impose conditions and initiate NEPA to display the effects of such actions. The extent to which these bats may use trees that would be felled as hazard trees is unknown . The species most dependent upon trees and vegetation, the western red bat, primarily roosts individually. Hazard tree removal would likely not have a substantial effect on habitat for the western red bat. Pallid bats also use trees as roost sites, but not to the extent that red bats do.

One of the license conditions requires the construction and installation of a bat"friendly" gate on the tunnel entrance below Pit 4 Reservoir. This will restrict access to the public, but will still allow access as needed for PG&E personnel and reduce disturbance to any roosting bats. This "cave-like" structure may be used by Townsends big-eared bat or other speices.

The project is not likely to result in roost, hibernation, or maternity colony site disturbance and/or abandonment and loss of reproductive success. Townsend's big-eared bats are highly susceptible to disturbance at maternal roosts. However, only one male was detected in project bat surveys. Pallid bats were determined to be rare in the area and were located in mixed conifer forest and at the base of cliffs. These habitats have little to no disturbance associated with the license conditions. Western red bats appear to use the area mostly during fall migration, are mostly solitary and most roosting occur in riparian trees or shrubs.

Cumulative Effects. Direct and Indirect effects to bat habitat are minimal and will not, therefore, contribute to substantial cumulative losses or degradation of bat habitat. Although project activities will not impact any known Townsend's Big-eared bat, pallid bat, or western red bat roosting, hibernation, or maternity colony sites, if new or previously undetected use occurs in the area, disturbance could occur. The major risk factors identified for these species include disturbance (already addressed) and pesticides. No pesticides are used on NFSL in the project area. However, they may be used on adjacent private lands. The type, amount, and effects on prey species (moths etc) is unknown.

Recommendation:

1. The LHMP includes development of a "Protection of TES Species Plan". This says that before the licensee takes any action on NFSL that may affect a listed species, the Licensee shall prepare a biological evaluation and submit it to the Forest Service. The biological evaluation shall 1) develop procedures to minimize adverse effects, 2) ensure the project shall meet restrictions included in site-specific management plans, and 3) develop implementation and effectiveness monitoring of measures taken to reduce effects.
2. This includes construction and installation of a "bat friendly" gate on the tunnel entrance below Pit 4 reservoir.
3. FERC recommends additional measures that were identified during bat surveys. These focus on other bat species, but include enclosure of a stairway chamber to exclude bats and modification of a wooden cabinet to exclude bats.

Determination. Implementation of the license conditions for this project may impact individual pallid, Townsends or western red bats or their habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

Northwestern Pond Turtle

Existing Environment.
Species and Habitat Account. Life history and habitat information for these species is provided in Appendix A. There were previous records of this species around Burney Creek in 1996. More recent surveys found that they were common in the reservoirs but generally uncommon in the river reaches of the project (Spring Rivers, 2001). In the reservoirs, turtles were primarily observed on partially submerged fallen trees lodged on banks. These surveys found one turtle in the Pit 3 reach, 8 in the Pit 4 reach and that they were very common in Lake Britton.

Effects of the Proposed Action.
Direct and Indirect Effects. This species nests on upland sites, usually on sandy banks or in fields or sunny spots. The hatchlings probably overwinter at these sites and move down to water the next spring. During this first year, the eggs or hatchlings could be

vulnerable to trampling due to project-related activities. This could be from hiking traffic, hazard tree removal, campground or recreation facility work etc.

The next spring, the hatchlings and young juveniles will spend much of their time feeding in shallow water that typically has dense vegetation. Both bass and bullfrogs are potentially predators on young turtles (Jennings and Hayes, 1994). Changes in minimum flows may affect turtles and their predators. Reservoir habitats are not expected to change because of flows. These areas would remain suitable for all three species. Increasing the minimum flows in the river would maintain the same amount of pool habitat (they would be a little deeper at higher flows). Although pond turtles are weak swimmers, the proposed increase in flow should not affect suitability of pool habitats. Higher flows could also create new habitat in shallows, backwaters and around undercut banks.

Water temperatures are predicted to increase in the Pit 3 reach and decrease in the Pit 4 reach, at higher flows. Warmer temperatures may more favorable for the young turtles, as their growth rate is affected by temperature. However, bullfrogs are adapted to warmer waters, and this could favor them as well.

Cumulative Effects. An additonal risk factor that may be present in the project area is the potential to be caught by fishermen using baited hooks. Jenning and Hayes (1994) found that surveys in Oregon found that nortwestern pond turtles are frequently caught on baited hooks and are subsequently released carrying a hook that can impair or entirely prevent normal feeding behavoir. Based on weigh loss observations in such turtles, a high likelihood exists that most of the individuals caught in this manner ultimately perish without removal of the hook.

Fishing is a popular recreational activity. For example, recreational activities observed in the Pit 3 reach found that 30% of the recreationists were fishing. Some proportion of those fish with bait, and have the potential to catch turtles. In the Britton Lake area, fishing is mostly bait or lure fishing; this is the same area where these turtles were noted as being very common.

Recommendation:

1. The Amphibian and Reptile Monitoring Plan requires a monitoring plan for the pond turtle. It includes determination of population trends based on developing a size class distribution of the extant population.
2. The potential for loss of turtles due to being released without removal of the hook could be addressed through some kind of public education targeting fishermen.

Determination. Implementation of the license conditions for this project may impact individual northwestern pond turtles or habitat but will not likely contribute to a trend toward Federal listing or cause a loss of viability to the population or species (MIIH).

APPENDIX A
Species Accounts

American Peregrine Falcon

Management Status and Direction

The American peregrine falcon was listed as a federally endangered species from 1970 through 1999. This was due to use of organochloride compounds such as DDT, which caused egg-shell thinning. The final rule to de-list the Peregrine falcon was published in the Federal Register on August 25, 1999. Following de-listing the species was placed on the Region 5 Forester's Sensitive Species List (USDA Forest Service 1999). The species' status as "Sensitive" in Region 5 will be re-evaluated at the end of the five-year monitoring period that is identified in the U.S. Fish and Wildlife Service's Final Rule for de-listing the species, as published in the Federal Register; or if there is a change in the species' status under the ESA during this period (for example, if the FWS initiated re-listing due to information gathered from monitoring).

Peregrine falcons will contine to be protected under the Migratory Bird Treaty Act of 1918. Measures currently being taken to minimize disturbance at nesting sites should be maintained in future management for this species. The FWS is currently preparing a de-listing monitoring plan. The proposal at this time is that surveys will be conducted every three years for a total of 5 surveys. Monitoring will include the collection of information on population trends and nesting success. At the end of each three-year period, they will review all available information to determine the status of the species (USDI Fish and Wildlife Service 2001).

Population Status

The number of peregine falcons in California increased from an estimated low of five to ten breeding pairs in the early 1970's, to a minimum of 167 occupied sites in 1998 (USDI FWS, 1999). At the time of the Lassen LRMP (1992), there was only one known occupied territory on the Forest, although there were other areas judged to be suitable. They identified a goal of two additional breeding pairs. The Shasta-Trinity (1995) identified current management plans for about 6 pairs of peregrine falcons on the Forests, with a goal of 3 additional pairs by the end of the decade (pg 4-10).

There are three known or suspected nesting areas for peregrine falcons within the analysis area; one in the Pit 3 river reach, and two on the Pit 4 river reach. Monitoring information on the Pit 4 Powerhouse site shows that birds were first observed in the area in 1979, and it has been occupied since. This pair has been consistently productive over

the last two decades. The Pit 3 (Siren) site was first suspected in 2000, when a juvenile peregrine falcon was observed flying in the area. Birds were again observed in the area in 2002, but no nesting has been documented at this site. The Pit 4 Dam site is potentially a new site. A pair of peregrines were observed here in April 2003, but continued monitoring will determine if nesting occurs.

Life History and Habitat Information

Peregrines have relatively strict nesting requirements: Vertical cliff habitat with large potholes or ledges that are inaccessible to land predators and are preferentially located near habitat that has a high avian prey population.

Peregrines are known to forage near and occasionally within forested habitat types. However, it is not considered an essential habitat type for any stage of their life history. Breeding activity begins as early as February with pair bonding and territory reestablishment. Young fledge in June and July but remain in the territory until late August.

Current Management and Threats to Species Persistence

The peregrine falcon was de-listed in 1999. This was due to increasing populations and the reduction of threats to the species. Localized threats across their range include loss of wetland habitat of primary prey, poachers robbing nests, shooting by hunters, food chain contamination from use of persistent pesticides and human disturbance around nesting habitat (www.natureserve.org). However, upon de-listing, the FWS determined that none of these factors are currently affecting the species such that they are in danger of being re-listed (USDI Fish and Wildlife Service, 1999).

Literature Cited

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Willow Flycatcher

Management Status and Direction

The willow flycatcher is a sensitive species for both the Lassen and Shasta-Trinity National Forests. There are 5 subspecies currently recognized, three of which occur in California. The project area lies between the ranges for *E.t. brewsteri* and *E.t. adastus*; *E.t. brewsteri* is generally recognized as being west of the Sierras. The project area lies along the boundary between these two supspecies.

The southwestern willow flycatcher *(E.t. extimus)* was listed as an endangered species in 1995. As a result,a conservation assessment for the southwestern willow flycatcher was published in 2000. This document, while addressing a different subspecies that is found well to the south and east of the area, does address habitat use, population trends and threats that are relevant here.

The Lassen Plan (as revised in 1994) includes an objective to maintain currently suitable willow flycatcher habitat by preventing degradation of willow/riparian communities. Manage riparian areas to enhance willow production and survival to create additional habitat suitable for nesting (Plan Revision, pg 4-13).

The Shasta-Trinity Plan states that current management direction for willow flycatcher is to provide for population viability through the protection of habitat in the form of riparian management reserves and wet meadows (Plan pg 3-27).

Population Status

The current breeding distribution in California, is as a rare to locally common summer resident in wet meadows and montane riparian habitat from 2,000 to 8,000 feet elevation, throughout the state exclusive of the north coast. Most of the remaining breeding populations occur in isolated mountain meadows of the Sierra Nevada and Cascades. Populations have been found in Sierra, Alpine, Siskiyou and and Plumas counties (CaPIF 1998). Two newly discovered populations documented in the Cascades during the last two years almost double the known population of this subspecies in California.

There are insufficient data to determine trends in California of any subspecies of willow flycatchers or the species as a whole using the Breeding Bird Survey data. Data from the all of North America, Oregon and Washington all show population declines. In California, willow flycatchers appear to have shown both historic and recent population declines (CaPIF 1998).

Within the project area, surveys for willow flycatchers were conducted in a total of 43 riparian shrub habitat patches ranging in size from 0.06 acres to 12.4 acres. Most areas on the river reaches included stands of willow, often adjacent to alder and Oregon ash trees, and bordering open floodplain habitats of sedge, forbs, rocks and standing water. One willow flycatcher breeding area was located during the surveys. A male responded to calls with territorial songs on August 1, 2000 in a 1.5-acre patch of willow/blackberry/skunk bush complex on upper Lake Britton. The area was adjacent to a wet meadow and extensive dry meadow/grassland along the Pit River confluence with

Lake Britton. Since no female or breeding behavoir was observed, the site can be classified only as potential breeding habitat for willow flycatcher (PG&E draft report, April 2001).

General point count surveys for breeding birds were also conducted. Three willow flycatchers were detected on one point on the Pit 5 reach (outside of the project area). These birds were detected in early June but were not found again in early July surveys.

Life History and Habitat Requirements

In California, breeding habitat is typically moist meadows with perennial streams; lowland riparian woodlands dominated by willows, primarily in the tree form, and cottonwoods; or smaller spring-fed or boggy areas with willows or alders. Riparian deciduous shrubs or trees are essential elements on willow flycatcher territories. In lowland riverine habitats, contiguous willow thickets are used, possibly because the linear nature of these areas provide sufficient edge and/or the tree-like willow typically found in these areas provide sufficient openings within the willow canopy (CaPIF, 1998).

Nests are placed in willows, alder or cottonwood or other riparian deciduous vegetation. They are usually located in a vertical crotch or a horizontal limb or slanting fork with small brances that can be woven into the nest are required. Nest height varies considerably, but most range between 2 to 10 feet off the ground.

Current Management and Threats to Species Persistence

The primary cause of population declines is probably the loss and degradation of riparian habitats. Other factors include brown-headed cowbird nest parasitism, grazing disturbance, loss of meadow habitat due to reservoir and hydroelectric developments, lodgepole pine establishment of meadows and habitat loss on wintering grounds (CaPIF 1998 and Finch and Stoleson, 2000). Because nests are placed near the edges of shrub patches, by trails, and over streams, they may be susceptible to being knocked over be recreationists (anglers, swimmers and hikers).

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Northern Goshawk

Management Status and Direction

The USDI Fish and Wildlife Service was petitioned to list the northern goshawk under the Endangered Species Act but determined there was insufficient information to warrant listing (1998). They are listed as sensitive species for both Forests.

Analysis for the Shasta-Trinity LRMP (1995) determined that the Forest had sufficient habitat to support about 200+ nesting pairs (pg 3-27). The Plan includes forest-wide direction to require a limited operating periods adjacent to active goshawk nesting sites until the young have fledged (pg 4-30). Most of the Shasta-Trinity land within the project area lies within the Chalk Mountain Late Seral Reserve. The LSR's are to be managed to protect and enhance conditions of late-successional and old growth forest ecosystems (pg 4-37).

In 1992, when the Lassen LRMP was completed, there were ten known active goshawk nesting territories on the Lassen Forest. However, frequent sightings of adult birds suggested that there were many additional breeding pairs (Plan EIS, pg 3-98). At the time of the Plan, a habitat network was set up that would allow for at least one territory per 18 sq miles, and 50 acres of mature habitat per pair. This criteria resulted in a habitat network for 112 pairs of goshawks across the Forest. The Plan was amended in 1994; at that time there were 20 known nesting pairs on the Forest (AMS pg 3-42). The Lassen Monitoring and Evaluation Report (2000) recommends maintaining 200 acres of high quality habitat around active nests.

Population Status

The goshawk in as uncommon permanent resident in the mountains of California in the Sierras south to Tulare County and in the Coast Range south to Mendicino County. A review of population trends for northern goshawks using breeding bird surveys data for California suggests population declines from the 1966-2000 period, as well as the 1980-2000 period. However, this trend data is deficient because of very low abundance, very small sample size and the results are very imprecise.

It is likely that additional nest sites and territorial goshawk pairs occur on the Forests in habitat that has not been surveyed and even in areas that have been surveyed with negative results. The lack of fidelity to a single nest site makes it difficult to rely upon past surveys for an accurate estimate of current habitat occupancy.

Project surveys did not find any northern goshawk breeding areas, but goshawks were periodically observed in the Pit River drainage during previous field work (PG&E draft report April 2001). There is one known nest site adjacent to the analysis area on the south side of the Pit River Canyon south of the Pit 4 Dam (Chalk Mtn CLSRA, 1996).

Life History and Habitat Information

The nesting home range of goshawks contains three components: the nest area, the post-fledging family area, and the foraging area (USFS 1991). Goshawks utilize large trees for

nesting, with nests typically built on large, lower-canopy limbs. Nest territories typically contain more than one nest, and usually 3-9. Nest territories in the southern Cascades of northern California apear to be between 50 and 300 acres in size. Post-fleding areas (PFA's) appear to be about 400 acres. PFA's are mosaics of large trees, large snags, mid-aged forests, and openings. These areas generally have relatively good foraging opportunities. Foraging areas are roughly 5500 acres in size and provide the food base during the breeding base (USFS 1998).

The northern goshawk breeding cycle extends from mid-February through mid-Septemer. The precise timing of breeding varies over a three to four week period between years, with egg laying occurring between mid-April and mid-May. Young birds hatch and begin fledging in late June and early July, and are independent by mid-September. Forest Service recommendations for reducing direct effects to breeding goshawks have generally included minimizing disturbances within 0.25 miles of known nests during the breeding season. Not all pairs of northern goshawks reproduce each year.

Current Management and Threats to Species Persistence

The northern goshawk was petitioned for listing; this petition contended that the primary threats to the goshawk were loss or degradation of mature forests used for nesting and foraging; and habitat quality and quantity decreases due to fire suppression. In 1998, the US Fish and Wildlife Service determined that listing was not warranted at that time. They found that 1) the species nests in mature stands of many forest types, many of which are small; 2) forest management practices on federal lands in the western US have moved away from clearcutting and more intensive practices; 3) development of plans to address the issue of wildfire and fuels management; 4) the goshawks current distribution is similar to its historic distribution; and 5) there are no known significant areas of extirpation or clear indications of a declining population (USFWS 1998). The California Department of Fish and Game still list falconry and logging as potential threats to the northern goshawk (www.dfg.ca.gov).

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USDA Forest Service. 1998. Leap Habitat Enhacement Project Biological Evaluation. USDA Forest Service, Lassen National Forest, Hat Creek Ranger District. Fall River Mills, CA.

Pacific Fisher

Management Status and Direction

The Pacific fisher is a Forest Service regionally designated sensitive species, and is listed as sensitive for both Forests. The USDI Fish and Wildlife Service was petitioned to list the Pacific fisher under the Endangered Species Act in 1990 and 1994. In both cases the FWS determined there was insufficient information to make a determination.

The Lassen Plan (as revised in 1994) includes a management objective to manage a system of of five fisher habitat areas, each with about 9,800 acres of suitable habitat and connected by corridors 600 feet wide to provide for the Lassen's contribution to viable populations (Plan Revision pg 4-13).

The Shasta-Trinity Plan (as revised in 1994) states that the current management direction for fishers is to provide a network of suitable habitat to include linkage in the form of dispersal habitat. This is being done through implementation of Late Seral Reserves and riparian reserve systems, in addition to wilderness, roadless and wild and scenic rivers (Plan pg 3-27).

Population Status

This species historically ranged from about 60 degrees north latitude on the western side of the continent, south into central California, Idaho, Wyoming and Montana. In the central part of the continent they range south in southern Illinois and in the east they ranged south into the Appalachian Mountains. Populations were reduced across much of their range due to heavy trapping and early logging. Reintroductions or population augmentations have re-established them across much of their historic range. Pacific fisher populations are presently at low numbers or absent throughout most of their historic range in Montana, Idaho, Washington, Oregon, and California (Ruggiero et al. 1994). The Sierra Nevada and northwestern California populations may be the only naturally-occurring, known breeding populations of fishers in the Pacific region from southern British Columbia to California (Ruggiero et al. 1994, Zielinski et al. 1995).

Life History and Habitat Requirements

Suitable forest structure is characterized by a diversity of tree sizes and shapes; light gaps and associated understory vegetation; snags; fallen limbs; and limbs close to the ground. Late-successional coniferous or mixed forests provide the most suitable fisher habitat because they provide abundant potential den sites and preferred prey species. Abundant snags and downed logs appear important for their prey species (Rugierro et al. 1994).

Riparian corridors and forested saddles between major drainages may provide important dispersal habitat or landscape linkages for the species. Abundant evidence exists for selective movement patterns along drainages (Rugierro et al. 1994). Fisher apparently

use greater percentages of middle to early seral stage habitats for foraging in summer months, although they still appear to need and utilize adjacent mature, old forest stands for denning, especially in areas with high snowfall.

They are generalized predators, feeding on mammals, birds and carrion; including snowshoe hares, squirrels, mice and shrews (Ruggerio et al, 1994).

Current Management and Threats to Species Persistence

Lamberson et al. (2000) describe a number factors that currently put the Sierra Nevada fisher population at risk of extinction:

1) Population size. Although no population size estimates have been published, the population is likely to be no less than 100 and probably no more than 500 individuals.
2) Population isolation. Fishers in the southern Sierra Nevada appear to be isolated from those in northern California by >350 linear km. This distance exceeds the maximum observed dispersal distance for fishers, ~100 km.
3) Habitat / landscape specificity. The combination of timber harvest and fire suppression during the 20th century has resulted in a greater prevalence of small diameter trees. Although higher elevation habitats may provide ample structures for denning and resting, deep snow during the winter months likely impedes fisher mobility; as a result, these forests are of less value to fisher than mid-elevation habitats where snow cover is sporadic and rarely deep for extended periods. Lower elevation habitats (chaparral and woodlands) may lack resting and denning structures, and may not provide thermal regulation during hot summer months.
4) Physiological limitations. The fisher has a relatively low annual reproductive capacity. Fishers are capable of reproducing annually beginning at 2 years old, producing 1-4 young per year.
5) Risk of habitat loss / alteration due to fire and land management. Habitat loss due to catastrophic fire is of concern. Fire suppression policies have apparently altered the disturbance regime from one of frequent, low intensity fires of small areal extent to rare, high intensity fires of potentially large extent. While the former played a crucial role in maintaining a landscape where forests with large trees and heterogeneous canopies were more common, the latter can result in large-scale crown fires that result in habitat of little or no value to fishers.
6) Stochastic phenomena. As with any small, isolated population, risks of extinction are enhanced by stochastic factors. Demographic stochasticity, the chance events associated with annual survival and reproduction, and environmental stochasticity, temporal fluctuations in environmental conditions, tend to reduce population persistence.
7) The interaction of these factors. The interaction of these factors may move the population from a relatively stable, though numerically small condition, into an irreversible extinction vortex. For example, if demographic stochasticity results in lower than average recruitment of female kits into the population in 3 consecutive years, and this is followed by 2 heavy-snow winters and one large

fire, the population may quickly become in jeopardy of local extinction.

Ruggiero et al. (1994) cite even-aged timber management practices as one of the likely reasons that fisher populations have not recovered in the Pacific Northwest. The assessment found insufficient information to determine the impact of uneven-aged timber management practices upon Pacific fisher. In a May 1, 1998 memo, the Regional Forester directed that Forests should maintain habitat options for marten and fisher by: 1) identifying a habitat network, and 2) deferring management activities that signficantly decrease large diameter live trees (including hardwoods), snags and down logs in forest carnivore habitat network areas. On the Lassen and Shasta-Trinity National Forests these conditions are being met through the late seral reserve system.

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California Wolverine

Management Status and Direction

The California wolverine is a Forest Service regionally designated sensitive species and is considered sensitive on both Forests. The LRMP's do not provide specific guidelines for the management of this species. General guidelines are to maintain or increase viable populations of sensitive species (S-T Plan, pg 3-28). In letter issued by the Regional Forester on May 1, 1998 (USDA Forest Service 1998a), national forests were directed to maintain conservation options for forest carnivores. Actions identified include: Avoid proposing timber sales within late seral/old forest polygons ranked 4 or 5 by the Sierra Nevada Ecosystem Project; Defer management activities that significantly decrease the legacy structural elements of large diameter live trees, snags, and down logs in fisher/marten networks not covered by CASPO standards; and Retain standing large diameter ($\geq$ 15 inches dbh) hardwoods in the form of black oak and California live oak within the fisher and marten networks. These measures would also protect California wolverine habitats.

Population Status

Considered a scarce resident in California, the known habitat distribution occurs from Del Norte and Trinity counties east through Siskiyou and Shasta Counties, and south through the Sierra Nevada to Tulare County (Ruggerio et al, 1994). Most sightings in the North Coast mountains fall within the 1600 to 4800 ft. elevational range. In the northern Sierra Nevada, most sightings fall between 4300 to 7300 ft., and in the southern Sierra Nevada, between 6400 to 10,800 ft. (Zeiner et al. 1990). The Hat Creek Ranger District on the Lassen National Forest does not have any observations recorded in their Wildlife Observation Database.

Life History and Habitat Requirements

Wolverines are generally considered a solitary species, with adults apparently associating only during the breeding season. Partial overlap of home ranges of some wolverines of the same sex is common (Ruggiero et al. 1994). Studies indicate that home ranges in North America may vary from less than 38.6 square miles to over 347.5 square miles. Males have larger territories than females. Individuals may move great distances on a daily basis; 15 to 30 miles a day is common for males, and some individuals have moved 60 to 70 miles in a single day. Except for females providing for offspring, or males seeking mates, movement is generally motivated by food (Ruggiero et al. 1994). Although wolverine are primarily nocturnal, diurnal movement is often recorded. During summer, long distance movements appear to be restricted to night when temperatures are cooler (Hornocker and Hash 1976).

Wolverines are generally described as opportunistic omnivores in summer and primarily scavengers in winter (Ruggiero et al. 1994). In winter, most large prey is carrion, but large snowbound prey such as deer, elk, and moose, may also be killed. Wolverines cache food, and may be able to locate and retrieve prey under deep snow. During the summer, marmots, ground squirrels, gophers, mice, berries, insects, and even porcupines may be taken while foraging in open to sparse tree habitats on the ground, in trees, burrows, among rocks, and sometimes in shallow water (Zeiner et al. 1990, Ruggiero et al. 1994).

Little is known regarding wolverine use in forested habitats. Wolverines have a close association with large ungulate mammals, such as deer. However, habitats managed for deer may not necessarily provide for the wolverine's other life needs. The low availability of natal dens may limit reproduction in some areas, and physical structure such as coarse woody debris may be important. Management prescriptions that successfully provide for the life needs of species such as the American marten, fisher, lynx and their prey may also provide for the needs of wolverine at the stand level. It is not known whether this will provide for wolverine habitat needs at the landscape or larger scales.

Current Management and Threats to Species Persistence

California Department of Fish and Game say that specific threats to wolverine are unknown (www.dfg.ca.gov). Witmer et al (1998) lists three major issues for wolverines in the Interior Columbia Basin. One is maintenance of large, remote areas. If populations become too fragmented, low reproductive potential could lead to local extinctions. Coarse woody debris and rocky habitats are important fine-scale components for denning. Other less important issues are prey populations (big game) and incidental trapping.

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Pallid Bat

Management Status and Direction

The pallid bat is a Forest Service regionally designated sensitive species and is listed as sensitive on both Forests. Neither Forest Plan has specific direction for this or other bat species.

This species was also identified as a Protection Buffer species in the Northwest Forest Plan. This Plan identified a standard and guideline that says ”provide additional protection for caves, mines and abandoned wooden bridges and buildings that are used as roost sites for bats”.

Population Status

This species is listed as being a common species throughout most of its range (Harvey et al, 1999). Populations have declined in California within desert areas, in areas of urban expansion, and where oak woodlands have been lost (Brown 1996).

Surveys were done in the analysis area (Pierson et al, 2001). Pallid bats appear to be rare in the surveyed section of the Pit River. This species is relatively vulnerable to capture in mist nets, but none were captured. They will also use man-made structures for night roosts. Surveys of structures (open bays at Pit 5 dam and two bridges) did not find any evidence of this species. Acoustic surveys did record this species in mixed oak conifer and at the base of cliffs.

Life History and Habitat Requirements

This bat is locally common at low elevations in California. It forages on a wide variety of insects and spiders usually within eight feet of the ground. This species is most common in dry, open habitats with rocky areas for roosting. Occassionally this species will roost in hollow trees. The California Wildlife Habitat Relationship program rates the Sierran mixed conifer habitat types as low suitability. They are a yearlong resident in most of their range and hibernate in winter near their summer roost (Zeiner et al.1990).

Day roosts may vary but are commonly found in rock crevices, tree hollows, mines, caves and a variety of human-made structures. Tree roosting has been documented in large conifer snags, and cavities in broken branches of black oak are very important. Roosting sites are usually selected near the entrance to the roost in twilight rather than total darkness. The site must protect bats from high temperatures, as this species is intolerant of roosts in excess of 104 degrees Fahrenheit. Pallid bats are also very sensitive to roost site disturbance (Zeiner et al. 1990). Night roosts are usually more open sites and may include open buildings, porches, mines, caves, and under bridges.

Pallid bats are a gregarious species, often roosting in colonies of 20 to several hundered individuals. Pregnant females gather in summer maternity colonies of up to several hundred females, but generally fewer than 100 (Harvey et al, 1999). Parturition occurs between May and June. Young are weaned in mid to late August with maternity bands disbanding between August and October.

The pallid bat is very maneuverable on the ground and commonly feeds on large ground-dwelling arthropods. Common prey are Jerusalem crickets, longhorn beetles, and scorpions, but they will also forage at low heights of 0.5 to 2.5 meters above the ground on large moths and grasshoppers (Zeiner et al. 1990).

Current Management and Threats to Species Persistence

Threats to this species are not known at this time. However, Wisdom et al (2000) identified several issues for this species in the Interior Columbia River Basin. These include 1) loss of native shrub vegetation; 2) disturbance at nursery and day roosts; 3) impacts of pesticides on bats and their prey; and 4) lack of information in habitat use and population trends.

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Townsend's Big-eared Bat

Management Status and Direction

The Townsend's big-eared bat is a Forest Service regionally designated sensitive species and is listed as sensitive on both Forests. Neither Forest Plan has specific direction for this or other bat species.

This species was identified as a Survey and Manage species in the Northwest Forest Plan. This Plan identified a standard and guideline that says "provide additional protection for caves, mines and abandoned wooden bridges and buildings that are used as roost sites for bats".

Population Status

The Townsend's big-eared bat occurs throughout the west and is distributed from the southern portion of British Columbia south along the Pacific Coast to central Mexico and east into the Great Plains, with isolated populations occurring in the south and southeastern United States (Harvey et al, 1999). Populations have incurred serious declines over the past 40 years in parts of California (Brown 1996).

In 2000, there were 92 known maternity colonies in the state, most of which are in caves or mines. There are a number of hibernacula used by a few animals, and four larger ones. These are in both mines and caves. Threats to both the maternity colonies and hibernacula are listed as recreational disturbance (Pierson, Brown and Bolster 2000).

Surveys in the analysis area (Pierson et al, 2001) found guano attributed to this species in a cave-like space under the conduit on the north side of Rock Creek. They attributed this to use for roosting by one male. The only other record for this species was an acoustic detection in the riparian area of Kosk Creek (Pit 5 reach and outside of the analysis area).

Life History and Habitat Requirements

Habitat associations include desert, native prairies, coniferous forests, mid-elevation mixed conifer, mixed hardwood-conifer forests, riparian communities, active agricultural areas and coastal habitat types (Kunz and Martin 1982). Distribution of this species is strongly correlated with the availability of caves and cave-like roosting habitat (Harvey et al, 1999).

Townsend's are a year-round California resident. Individuals are very loyal to their natal sites and usually do not move more than 10 kilometers from a roost site (Pierson et al. 1991). They roost within caves, abandoned mines, and buildings. Buildings must offer cave-like spaces in order to be suitable. This species is highly sensitive to roost disturbance (Brown 1996). Night roosts may occur in more open settings, including under bridges.

Historically, maternal colonies may have contained several hundred individuals. However, maternal colonies at the present usually contain from 35 to 150 individuals (Brown 1996). Maternal colonies select warm parts of the structure, and usually roost in the that zone (Kunz and Martin 1982). These colonies form between March and June (may vary by local climate conditions), with a single pup born between May and July. Pups are fully weaned by six weeks (Kunz and Martin 1982). Females usually remain alert and active in maternity roosts. Clusters of females hang on open surfaces, making them readily detectable.

Males remain solitary during the summer. Winter hibernating colonies are composed of mixed-sexed groups and may range from a single individual to several hundred animals. This bat hibernates throughout its range in caves and mines where temperatures are 55 degees Fahrenheit or less, but generally above freezing. Roost sites are usually in the cooler air near the cave or mine entrance (Kunz and Marten 1982). Individuals may move during winter in response to temperature change (Harvey et al, 1999).

Foraging usually begins well after dark (Kunz and Marten 1982). Foraging associations include edge habitats along streams and areas adjacent to and within a variety of wooded habitats. Flight is slow and maneuverable, with the species capable of hovering (Zeiner

et al. 1990) and gleaning insects off foliage. The Townsend's bat is a moth specialist, with over 90% of its diet composed of lepidopterans (Harvey et al, 1999).

Current Management and Threats to Species Persistence

Threats include loss of habitat (reclamation of abandoned mines), vandalism, and disturbance of maternity roosts and winter hibernacula. Disturbance of such sites is likely to cause the bats to abandon the site and move to an alternative roost (www.natureserve.org). Wisdom et al (2000) list one additional issue for this species; reduction on bat prey base (moths) through excessive use of pesticides.

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Western Red Bat

Management Status and Direction

The Western red bat is a Forest Service regionally designated sensitive and is listed as sensitive for both Forests. Neither Forest Plan has specific direction for this or other bat species.

Population Status

This species is noted as being common throughout its range (Harvey et al, 1999). Surveys in the analysis area obtained many acoustic records for this species. Three were obtained in July, while 21 were September records. They state that the increase in number of detections in September suggests that this species may be migrating down the Pit River to wintering sites along the coast or in southern California.

Life History and Habitat Requirements

This migratory bat forages in forests and woodlands. Roosts are primarily trees and occassionally shrubs, often in edge habitats. This species feeds on a variety of insects at heights from ground level to high above the upper canopy. Although snags are preferred for reproduction and cover, trees with cavities or loose bark are also used. This bat utilizes roosts up through the mixed conifer zone.

Red bats are highly migratorial between their summer and winter range, although migratory patterns are not well documented, and winter behavior is poorly understood. However, it is known to winter in the San Francisco area and to the south, and has been observed hibernating in leaf litter (Brown 1996). The timing of migration for males and females seems to differ, although groups tend to migrate together.

Western red bats are typically solitary. Roosting has been observed in caves, but generally these bats roost singly within tree foliage or shrubs, and often along edge habitat adjacent to streams or open fields. Colonies are not formed.

Foraging is generally at high altitudes over the tree canopy and begins one to two hours after sunset. Although solitary roosters, red bats forage in close association with one another in summer. Food items consist of a wide variety of moths and other insects (Harvey et al, 1999).

Current Management and Threats to Species Persistence

No known risks at this time.

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Northwestern pond turtle

Management Status and Direction

The northwestern pond turtle is a Forest Service regionally designated sensitive and is listed as sensitive on both Forests. This species has no federal listing status, but is listed as threatened in northern California, by the State of California.

Population Status

Historically, the western pond turtle had a relatively continuous distribution in most Pacific slope drainages from Washington to Baja. The known elevational range extends from near sea level to 1430 meters (Jennings and Hayes, 1994). Their distribution and abundance have declined from historical conditions.

Habitat for the northwestern pond turtle is in relatively good condition and abundance in the Intermountain area: the turtles are plentiful in the Fall River and Hat Creek drainages and are common in the midreaches of the Pit River (Spring Rivers, 2001).

There were previous records of this species around Burney Creek in 1996. More recent surveys found that they were common in the reservoirs but generally uncommon in the river reaches of the project (Spring Rivers, 2001). In the reservoirs, turtles were primarily observed on partially submerged fallen trees lodged on banks. These surveys found one turtle in the Pit 3 reach, 8 in the Pit 4 reach and that they were very common in Lake Britton (Snake River Ecological Sciences, April 2001).

Life History and Habitat Requirements

Pond turtles use permanent and intermittent waters of rivers, creeks, small lakes and ponds, marshes, irrigaiton ditches, and reservoirs. They require some slack or slow-water aquatic habitat at these sites. They often use basking sites, which include logs, vegetation mats and rocks. When disturbed, baskers seek cover under water. Radio-tracked turtles in southern California spent 34-191 days in terrestrial refuges, generally under litter from October to February. However, some did not leave aquatic habitat, so they do exhibit flexibility in overwintering sites. They are active from April to October in northern California (Jennings and Hayes, 1994).

This species breeds in April-May and lays eggs. They may migrate up to a kilometer or more between their usual home range and nesting sites. Nests are placed on sandy banks near water or in fields or sunny spots up to a few hundred meters from water. Eggs generally hatch in about 10-12 weeks. The young probably overwinter in nests and emerge in March-April of the next year. These hatchlings spend much of their time feeding in shallow water that typically has a dense vegetation of submergents or short emergents. Zooplankton fauns that can occur at high densities in standing water are an important food of hatchlings and young juveniles (Jennings and Hayes, 1994).

They are scavengers and opportunistic predators. Adults are partially herbivorous, but food items are mostly aquatic (adult and larval insects, worms, crustanceans, carrion and algae).

Current Management and Threats to Species Persistence

Risks or threats to this species inlcude alternation or disturbance of nesting habitat; exotic aquatic predators or competitors; disease; and frequent capture on baited hooks (Jennings and Hayes, 1994).

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