Terrestrial Management Indicator Species Analysis
El Dorado Hydroelectric Project Relicensing
July 2003

Eldorado National Forest
& Lake Tahoe Basin Management Unit

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I. INTRODUCTION

Implementing regulations for the National Forest Management Act, establish that National Forests must identify management indicator species for the purpose of 1) establishing objectives for the maintenance and improvement of habitat, 2) evaluating the quantity and quality of habitat and of animal population trends within planning alternatives, and 3) monitoring the trends of MIS species and determining the relationships to habitat changes determined (36 CFR 219.19). Management indicator species (MIS) are used in environmental analysis to represent a larger group of vertebrates that have similar habitat requirements, thereby addressing habitats that are most important to the viability of wildlife populations and diversity. In addition, MIS are used to show environmental conditions and trends for wildlife and fish, especially in regard to the recovery of threatened and endangered species, the maintenance of population viability in vertebrates, and the production of game and special interest species to meet recreational demands. Several Special Interest Species identified by the Tahoe Regional Planning Association (TRPA) are also analyzed since these species are cooperatively monitored by the Forest Service in the Lake Tahoe Basin to evaluate and address project effects.

Table 1 displays the MIS identified in the Eldorado National Forest's (ENF) and Lake Tahoe Basin Management Unit's (LTBMU) Land and Resource Management Plans (LRMPs), and whether or not the species is appropriate to use for analysis of the El Dorado Hydroelectric Project Relicensing, based upon the Forests' LRMPs.

Table 1. MIS species analyzed for the El Dorado Hydroelectric Project Relicensing.

Species	Status	Is the Species Selected for Project Analysis?
Deer	MIS – Eldorado NF MIS – Lake Tahoe Basin Mgt Unit	Yes
Black Bear	MIS – Eldorado NF MIS – Lake Tahoe Basin Mgt Unit	Yes
Mountain Quail	MIS – Eldorado NF	Yes
Blue Grouse	MIS – Lake Tahoe Basin Mgt Unit Special Interest Species – TRPA	Yes
Mallard/Waterfowl	MIS – Lake Tahoe Basin Mgt Unit Special Interest Species – TRPA	Yes
Osprey	Special Interest Species – TRPA	Yes
Golden Eagle	Special Interest Species – TRPA	No. Golden eagle habitat on the LTBMU does not occur within or adjacent to the project.
Cavity nesting birds Pileated woodpecker	MIS – Eldorado National Forest MIS – Lake Tahoe Basin Mgt Unit	Yes
Trout	MIS – Eldorado National Forest	Yes*
Bald eagle (ENF &	MIS – Eldorado National Forest Special Interest Species – TRPA	Yes**

Species	Status	Is the Species Selected for Project Analysis?
Peregrine falcon	MIS – Eldorado National Forest Special Interest Species – TRPA	Yes**
California spotted owl	MIS – Eldorado National Forest	Yes**
Northern goshawk	MIS – Eldorado National Forest Special Interest Species – TRPA	Yes*
Willow flycatcher	MIS – Eldorado National Forest	Yes*

* *Species is addressed in the Aquatic Species Management Indicator Species Analysis*
** *Species is designated as Forest Service "sensitive" and is addressed in a Biological Evaluation which analyzes effects upon sensitive species occurring within the project area.*

II. DESCRIPTION OF THE PROJECT

The Federal Energy Regulatory Committee (FERC), is in the process of deciding if it will issue a new license for the continued operation of the El Dorado Hydroelectric Project, and, if so, what conditions it will impose in any license issued. In connection with this decision, the Forest Service has developed proposed 4(e) conditions based on the Land and Resource Management Plans (as amended) for the Eldorado National Forest and Lake Tahoe Basin Management Unit. The Forest Service's proposed action is to issue the project conditions described in the document entitled *Forest Service Preliminary Terms and Conditions Provided Under 18 CFR § 4.34 (b) b(1) In Connection With the Application for Relicensing of the El Dorado Hydroelectric Project (FERC No. 184)* (May 1, 2003) which shall be included in any new license the FERC may issue for the continued operation of the El Dorado project.

The El Dorado hydroelectric project and its associated facilities are described in the Draft Environmental Impact Statement , El Dorado Hydroelectric Project (FERC No. 184-065), issued in March of 2003. The project occurs within the South Fork of the American River (SFAR) watershed, on both private land and lands administered by the Eldorado National Forest and Lake Tahoe Basin Management Unit. The project boundary includes 1,334 acres of National Forest land, occurring between about 3,400 and 8,000 feet in elevation. The El Dorado Project consists of four storage reservoirs (Lake Aloha, Echo Lake, Silver Lake, and Caples Lake), seven diversion dams (occurring on seven tributaries of the SFAR) that provide water to the El Dorado canal. The El Dorado Canal occupies National Forest land between the El Dorado Diversion dam (located on the SFAR just below its confluence with the Silver Fork American River), to the western edge of the Forest boundary at Fresh Pond. Project facilities on National Forest lands also include a 110 by 40 foot power house on the SFAR, and portions of a 2.8-mile long combination pipeline and penstock conveyance between the El Dorado forbay and the Akin powerhouse. Streamflow requirements specified in Forest Service 4e conditions are described site specifically in this BE where such conditions directly or indirectly affect one of the terrestrial species analyzed in this BE.

The proposed action identifies the following specific conditions to project sensitive terrestrial wildlife species that may occur in the project area, or may be affected by the project.

Conditions Associated with Operation of the El Dorado Canal:
To protect wildlife from the hazards of open canals and other Project facilities, the licensee for the

term of a new license for the Project shall maintain and operate in working condition all devices and measures for wildlife along the El Dorado Canal that are deemed necessary by the FS *and CDFG.*

Ensure that all canal crossings and canal fencing on National Forest System lands and licensee adjoining property are maintained in functioning condition. The fencing, canal crossings, and approaches shall be inspected at least twice per year, in the spring and fall prior to deer migration. Fencing repairs or replacement necessary to prevent wildlife from entering the canal will be made and maintained in a manner that will continually allow their use by wildlife. The licensee shall report the results of inspections and maintenance at the annual review meeting described in Condition No. 45.

The licensee shall provide the FS *and ERC* by April 1 of each year an annual report describing the date, location, and species information (deer or other wildlife) found in the El Dorado Canal. In consultation with the agencies listed in Condition No. 45, the FS *and ERC* shall review these data and determine the need for additional fencing or other protective measures. The amount, kind, and location of any additional future fencing shall be decided upon at the annual meeting described in Condition No. 45.

Within 6 months of license issuance, the licensee shall reconstruct those portions of the canal fence that do not meet deer fencing specifications provided by CDFG or shall develop a schedule for completing such work that is agreed upon by the FS *and CDFG.*

Conditions Associated with New Construction or Maintenance of Project Facilities or Recreation Developments:
Before commencing any new construction or maintenance (including but not limited to proposed recreation developments) authorized by the license on National Forest System lands that may affect a FS sensitive species or its habitat, the licensee shall ensure that a biological evaluation (including necessary surveys) is completed that evaluates the potential impacts of the action on the species or its habitat and follows the recommendations in the biological evaluation determined necessary by the FS. The operations and maintenance plan referenced in Condition No. 45 will assist the FS in determining whether a biological evaluation is necessary for any annual maintenance. The biological evaluation must be approved by the FS. In consultation with FERC, the FS may require mitigation measures for the protection of sensitive species.

Before commencing any activities to construct (including but not limited to proposed recreation developments), operate, or maintain the Project that may affect a species proposed for listing or listed under the federal Endangered Species Act, or that may affect that species' critical habitat, the licensee shall ensure that a Biological Assessment that evaluates the potential impacts of the action on the species or its critical habitat is prepared and reviewed by the FS prior to the licensee submitting the Biological Assessment to the relevant Service agency (United States Fish and Wildlife Service or National Marine Fisheries Service) for consultation or conference in accordance with the Endangered Species Act.

If occurrences of FS sensitive species are detected prior to or during ongoing construction, operation, or maintenance of the Project or during Project operations, the licensee shall immediately notify the FS. If the FS determines that the Project-related activities are adversely affecting the sensitive species, the licensee shall, in consultation with the FS, develop and implement appropriate protection measures.

Conditions requiring construction or improvement of recreation facilities:

1. Silver Lake East Campground

Within 5 years of license issuance, the licensee shall reconstruct the paved surfaces, toilets, and water system at the 62-unit Silver Lake Campground, including upgrade of this facility to meet the current FS design standards and the USDA Forest Service Region 5 accessibility standards requirements of the Americans with Disabilities Act (ADA).

2. Caples Lake Campground

Within 10 years of license issuance, the licensee shall reconstruct the paved surfaces, toilets, and water system at the 36-unit Caples Lake Campground, including upgrade of this facility to meet the most current FS design standards and the USDA Forest Service Region 5 access standards and the Americans with Disabilities Act.

3. Caples Lake Dam Parking

Within 5 years, the Caples Lake Dam Parking area shall be reconstructed and upgraded to meet the current FS design standards and the USDA Forest Service Region 5 access standards and the Americans with Disabilities Act.

Within 7 years of license issuance, the licensee shall construct a new boat launching ramp, associated parking lot, toilet facilities, access road, and picnic area at Caples Lake on land designated by the FS, located on the northeast end of the lake.

4. Information Kiosk on Highway 88

Within 5 years of license issuance, the licensee shall construct an information kiosk to FS specifications, at a location agreed to by the FS.

5. Martin Meadow Overflow Camping Area

Within 5 years of license issuance, the licensee shall make the following improvement at the Martin Meadows Overflow Camping Area to address recreation impacts: Install barrier rocks to restrict uncontrolled vehicle travel. The FS will make available the barrier rocks from a site identified by the FS.

6. Echo Lakes Upper Parking Facility

Within 10 years of licensee issuance, the licensee shall prepare existing parking facility for resurfacing by patching, scarifying, or other methods, as determined by the FS. Place asphalt overlay on parking area.

7. Pacific Crest National Scenic Trail Crossing

Within 5 years, the licensee shall construct a crossing for the Pacific Crest National Scenic Trail across the Echo Conduit, to meet current FS design standards, at a location agreed to by the FS.

IV. EFFECTS TO SPECIES AND HABITAT

Deer

Current Management Direction

Mule deer is a MIS for the ENF and the LTBMU representing habitat requirements found in an interspersion of habitat types and seral stages including riparian vegetation, meadows, hardwood, and early to mid-successional stages of most vegetation types. Habitat is managed based upon standards and guidelines in the LRMPs of the Eldorado National Forest and the Lake Tahoe Basin

Management Unit (USDA Forest Service 1989, USDA Forest Service 1988) and the deer herd plans developed by California Department of Fish & Game. The LRMP for the ENF identifies an objective of increasing deer habitat capability (and associated populations) by 20 to 25 percent by 2030 (USDA Forest Service 1989). The LRMPs include specific management strategies to maintain healthy deer populations, including the identification of winter and summer ranges, fawning areas, and migration corridors, emphasis upon suitable forage and cover components within these ranges, maintenance of hardwoods, and limiting the density and location of forest roads.

Population Status and Trend based upon Forest Plan Monitoring

The California Department of Fish and Game analyzes the status and trend of deer populations within California. This information is used by the National Forests to evaluate deer population trends, and to determine the relationship of population trends to habitat changes on the Forest. The California Department of Fish and Game reports that deer populations in the Sierra Nevada peaked in the 1960s with numbers above the carrying capacity of the available habitat. Since then, numbers have declined to be more in line with habitat conditions (CDFG, 1998a). Deer herds on the Eldorado National Forest are included within CDFG Deer Assessment Unit (DAU) 5, which encompasses the western slope of the central Sierra Nevada, and deer herds on the LTBMU are generally included within DAU 6, with sharing of summer ranges probably occurring near the Sierra crest. The California Department of Fish and Game estimates that deer populations in DAU 5 declined from about 120,000 to between 50,000 and 90,000, and populations in DAU 6 declined from about 26,000 to between 10,000 to 13,000 between 1990 and 1996 (CDFG, 1998a). Although the report does not provide data for individual deer herds, population trends for the herds utilizing the Eldorado National Forest and LTBMU are not expected to differ from the trends described for the larger Central Sierra Nevada and Eastern Sierra Nevada areas. Nonetheless, deer remain well-distributed across the forests with no indication that populations are approaching critical lower thresholds that might result in viability concerns.

Habitat status and trend

Mule deer are browsers and the availability of brush species including *ceanothus spp. manzanita spp.* mountain mahogany, chokecherry, and acorns, provide important food items on winter and intermediate ranges. Tree thickets, brushy areas, and tall shrub understories are used for escape cover. Early successional vegetation stages with brush that can be used for forage and cover provide important summer range habitat; undisturbed meadow and dense riparian areas that provide hiding cover and succulent forage (forbs, grasses, willow) are important fawning habitats.

Seven deer herds have a portion of their range on the Eldorado National Forest or Lake Tahoe Basin Management Unit. The LTBMU primarily provides summer range and fawning habitat for the Carson River and Truckee-Loyalton herds, and the ENF contributes to winter range, intermediate range, summer range and fawning habitats used by five deer herds.

The latest assessment of mule and black-tailed deer habitats and populations in California (CDFG 1998a), describes the following common factors that are negatively affecting deer habitat on public lands: 1) Forests moving away from early successional habitats through the lack of fire and through fire suppression; 2) Forests moving away from early successional habitats through timber management practices and reforestation efforts that include forest thinning, biomass treatments and herbicide treatments; and 3) livestock grazing impacts on important habitats such as mountain meadow-riparian, aspen, and lower Westside oak habitats.

On the LTBMU, high recreational use in critical fawning areas may impact deer populations.

However, livestock grazing has declined on both Forests over the past decade, probably resulting in an improvement in deer summer and fawning habitats on both forests. On both the ENF and LTBMU, a century of fire exclusion has allowed dense forest canopies to shade out forage and browse species favored by deer (TRPA 2001, CDFG 1998a). As fuels treatments increase on the ENF, some activities such as prescribed burning and thinning projects designed to leave a mosaic of understory conditions, are likely to enhance deer habitats; other fuels projects that might occur, such as herbicide treatments and more thorough removal of understory vegetation, are likely to reduce the quality of deer habitats.

The habitat capability model used for analyzing deer habitat on the ENF (Borrego and Fullman 1993), includes four variables: vegetation type, escape cover patch size, cover:forage ratio, and road densitities. Summer range habitat also includes a "distance to water" variable.

Deer Habitat within the Project Area

The project area includes deer habitat surrounding the four project reservoirs and alongside the El Dorado Canal. The project area provides summer range and critical fawning habitat for the Grizzly Flat deer herd around Silver and Caples Lakes, and intermediate and winter range habitat for the Grizzly Flat herd along the El Dorado Canal down to the Forest boundary near Fresh Pond. The project area also includes summer range habitat for the Pacific deer herd around Lake Aloha, and summer range habitat for the Carson River deer herd east of Echo Lakes and east of Caples Lake.

Direct and Indirect Effects of the Project

The project area overlaps habitat mapped for three deer herds, as described above, but primarily occurs within habitat for the Grizzly Flat herd. The El Dorado canal occurs within intermediate range for the Grizzly Flat herd. Fencing along the canal and crossing structures are intended to reduce deer mortality in the canal. EID was requested to provide a review of deer mortality records kept by the previous project licensee (PG&E). A review of these records indicates that a total of 101 dead deer were recorded from Camp 1 (Siphon at Alder Creek) and Camp 2 (Plum Creek), over a 10 year period from 1983 to 1992 (records kept from 1993 to 1998 are not being analyzed since the canal was not fully operational during much of this time period due to the 1992 Cleveland Wildfire and the 1997 flood damage). Approximately six miles of canal occur on National Forest lands below ditch camp 2 and remain unfenced; records of deer losses within this portion of the canal were not provided. Bases on the available information, annual losses in the canal above Ditch Camp 2 have averaged 10 deer per year, but were as high as 21 deer in 1985 (EIP Associates Technical Memorandum No. 4). The extent of any additional losses in the six miles of canal downstream from Camp 2, is unknown.

The California Department of Fish and Game (CDFG) has provided height and construction specification for deer fencing along the canal (figure 1). Based upon a survey of deer fencing, bridges, and other canal features (EIP Associates Technical Memorandum No. 7, 2002), a substantial portion of the canal fencing is below the height recommended by the CDFG to exclude deer (8-10 feet on the uphill side and 6-8 feet on the downhill side).

Under the Proposed Action, Forest Service proposed 4(e) condition number 43 requires that 1) inspections occur twice annually to ensure that all canal crossings and canal fencing on National Forest System lands and licensee adjoining property are maintained in functioning condition, 2) the Forest Service, CDFG, and licensee annually review deer mortality records to evaluate the need for additional deer fencing or other protective measures, and 3) portions of the canal fence that do not currently meet deer fencing specifications provided by CDFG are reconstructed to meet

such specifications. These actions are expected to reduce deer mortality within the canal by ensuring that fencing is operational and at adequate heights to prevent deer access, and that additional improvements are made, as needed, to reduce deer mortality in the future. It will be important that monitoring and reporting of deer mortality take place for the portions or the canal that are downstream of Camp 2, since the level of historic deer mortality along this unfenced portion of the canal remains unknown. Depending upon the results of future monitoring, it may be necessary to install fencing along portions of the currently unfenced canal in order reduce impacts to deer from the project.

The adequacy of wildlife crossing structures was evaluated by using trailmaster cameras installed to record movement across the crossings during the deer migration periods in the fall of 2001 and spring of 2002. Mule deer, as well as other wildlife, were recorded crossing at all four bridge locations monitored. All of the wildlife crossing structures monitored were utilized by a variety of terrestrial wildlife species, thought at substantially different rates. There is currently no information indicating a need for changes in the design or location of wildlife crossing structures, provided the structures remain well-maintained (EIP Associates Technical Memorandum No. 9, 2002).

Recreational facilities that are associated with project reservoirs, campgrounds, recreational residences, and day use areas, occur within summer range for the Grizzly Flat deer herd (Silver Lake and Caples Lake) and the Carson River deer herd (Echo Lakes). Habitat immediately adjacent to these project reservoirs is heavily influenced by human disturbance, and the high levels of recreation use probably reduces use of this habitat by deer for fawning or foraging. The construction of a new boat launching ramp, associated parking lot, toilet facilities, access road, and picnic area on the northeast end of Caples Lake, will affect less than 10 acres of summer range habitat within the Carson River deer herd boundary. These actions and other elements of the Proposed Action do not result in direct or indirect effects that will alter any of the variables assessed in the deer habitat capability models, and are unlikely to reduce overall habitat capability for deer within the project area. The project will not reduce moderate or high capability habitat for deer.

Cumulative Effects

For this analysis, the individual deer herd boundaries provide the analysis scale within which cumulative effects are evaluated. Project facilities on National Forest lands (project reservoirs, canals, powerhouses, and penstocks) affect a small proportion of the habitat in any of the three affected deer herds. As described above, the California Department of Fish and Game has analyzed and compiled deer population data and described the results for various "Deer Assessment Units" (CDFG 1998a). Deer populations within the central Sierra Nevada have declined dramatically over the past six years and numerous factors have been identified as potentially having significant impacts on deer within California (CDFG 1998). Those most applicable to the Grizzly Flat, Pacific, and Carson River deer herds include habitat loss and conversion, reduced quality of forage and cover, timber harvest, livestock grazing, wildfire and fire suppression, and residential development within winter ranges, as described above under the heading, *deer habitat status and trend.* The Proposed Action does not involve any of these activities that have been identified as the major source of cumulative effects upon Sierra Nevada deer herds over the past several years.

Deer mortality in the El Dorado canal does, however, contribute to cumulative effects upon the Grizzly Flat deer herd population. The contribution is probably small in relation to the habitat factors described above. Since the proposed action is expected to reduce deer mortality in the El

Dorado Canal, it will reduce the project's contribution to cumulative impacts upon the Grizzly Flat deer herd.

Analysis of historic vegetation that likely occurred in the areas inundated by project reservoirs indicates that about 182 acres of meadow vegetation was inundated by Silver Lake and Caples Lake Reservoirs for the El Dorado hydroelectric project (EIP Associates Technical Memorandum No. 5, 2002). Historically this meadow acreage likely provided deer fawning habitat. Inundation of riparian habitat by the El Dorado hydroelectric project has contributed to cumulative losses of meadow habitat within the Sierra Nevada, and specifically to reductions in fawning habitat available to the Grizzly Flat deer herd. The proposed action, however, does not result in further reductions in the amount or quality of habitat for deer and may improve the condition of meadow habitat below Caples Lake spillway.

Black Bear

Current Management Direction
The LRMP's for the Eldorado National Forest and the Lake Tahoe Basin Management Unit identify black bear as a Management Indicator Species associated with downed logs, riparian, meadows, montane shrubs, hardwoods, ponderosa pine, red fir, lodgepole pine, habitats. Habitat is managed based upon standards and guidelines in the Eldorado National Forest Land and Lake Tahoe Basin Management Unit Resource Management Plans (USDA Forest Service 1989, as amended 2001, and USDA Forest Service 1988, as amended in 2001). Standards and guidelines provide direction for maintaining riparian and meadow habitats and maintaining hardwoods.

Population Status and Trend based upon Forest Plan Monitoring
The California Department of Fish and Game analyzes the status and trend of bear populations within California. As described by the State, it is difficult to detect trends in black bear populations since bears are relatively secret and solitary. All of the methods used to derive population estimates and trends have inherent bias, therefore the Department uses several population monitoring techniques to evaluate population trends. A determination of female reproductive histories, hunter surveys, and harvest data are all used to estimate population trends (CDFG 1998b).

In 1998 the CDFG prepared a habitat management plan for black bear (CDFG 1998b). In this plan the statewide bear population is conservatively estimated to be between 17,000 and 23,000 and is thought to have increased from 1983 to 1998. Forty percent of the statewide black bear population occupies the Sierra Nevada and over two-thirds of the habitat for black bear in this region is on federal lands (CDFG 1998b).

Habitat status and trend
Black bears occupy a variety of habitats; however, bear populations are densest in forested areas with a wide variety of seral stages. Vegetation and structure diversity provide for greatest food availability which has been strongly correlated to black bear survival and reproductive success. In particular, montane hardwood, montane chaparral, and mixed conifer forests sustain high bear populations because they supply sufficient food, cover, and water (CDFG 1998b).

Habitat for black bears varies with the different seasons. The habitat capability model used for black bear includes four habitat variables: vegetation types, road density, average distance to water, and the relative abundance of large diameter logs. Vegetation types change with each season. In the winter, bears tend to use areas classified as conifer habitat. In the spring, they favor

meadows and riparian areas that are adjacent to conifers. In the fall, they prefer mixed conifer habitat with manzanita, and oaks present. These preferences change with seasonal conditions. Road densities adversely affect bears because of the openings they create in cover areas and the exposure it provides to hunters and poachers. Ideally road densities should remain at 0.5 mile per square mile. Distance to water is optimally less than ¼ mile while downed log densities are preferred to be 15-30 logs per acre and greater than 20 inches dbh (diameter breast height). Based on these requirements, most of the Eldorado National Forest provides habitat for black bear, though quality varies depending upon the size and distribution of various habitat types over the landscape. Most of the Forest exceeds the desired road densities.

Habitat within the project area

The project area provides suitable black bear habitat although human presence and road densities within and surrounding most of the project reservoirs results in lack of optimal habitat conditions. Bear are seen regularly around Silver, Caples, and Echo Lakes, and are sometimes drawn to these sites by food and garbage associated with campground and recreation residence use.

Direct and Indirect Effects

The El Dorado Hydroelectric project will not directly affect black bears or black bear habitat. The construction and upgrades to recreation facilities at Caples, Silver, and Echo Lakes will not have any measurable effect upon the quantity or quality of habitat for black bear given the proximity to existing areas of high human disturbance.

Indirect effects of project-induced recreation at the reservoirs impacts black bear primarily through "attraction." The presence of food and garbage, and its accessibility to bear, have resulted in "positive rewards" and learned behaviors, where a bear learns to frequent certain garbage sites where food is accessible, and, in some cases to damage facilities to get to food (Weist, pers com). The types of activities most responsible for bear nuisance problems are 1) garbage being left in dumpsters or cans that are not "bear proof", 2) barbecues remaining outside and uncleaned after use or cooking grease being disposed of outside, and 3) food remaining outside of recreation residences. These situations have, at times, attracted bear and resulted in the need for the California Department of Fish and Game to issue permits for the removal of problem bears. Proposed 4(e) condition number 50, requires the licensee to replace the garbage container at Caples Lake Dam parking area with a bear-proof garbage container, thus helping to address problems associated with bear attraction. Bear-proof garbage containers currently exist at other project-associated recreation sites.

Cumulative Effects

The proposed action is unlikely to contribute to cumulative effects upon black bear. The amount of black bear habitat affected by project facilities is a very small portion of the habitat available on the Eldorado National Forest. Given an increasing trend for bear populations in the State, and given the new requirements included in the proposed action, the Proposed Action is not expected to contribute to any adverse cumulative effects upon black bears. The need for issuing depradation permits to remove problem bears at resorts, campgrounds, or recreation residences surrounding project reservoirs, should be reduced as bear-proof garbage containers are intstalled at all locations.

Mountain Quail

Current Management Direction
The Eldorado National Forest LRMP identifies mountain quail as a Management Indicator Species associated with edge, brush, early/mid successional habitats. Habitat is managed based upon standards and guidelines in the Eldorado National Forest Land and Resource Management Plan (USFS, 1989, as amended 2001) but standards and guidelines specific to management of mountain quail habitat are not provided in the Plan.

Population Status and Trend based upon Forest Plan Monitoring
The California Department of Fish and Game analyzes the status and trend of quail populations within California. As described in the Eldorado National Forest LRMP, this information is used to evaluate mountain quail population trends, and to determine the relationship of population trends to habitat changes on the Forest. The State has not recently provided an assessment of mountain quail populations, but the Draft Avian Conservation Plan for the Sierra Nevada Bioregion (Seigel and DeSante1999), has calculated Sierra-wide breeding bird survey trends from 1960 to 1996, for 77 bird species with adequate survey data. The mountain quail was found to exhibit a stable trend based upon statistically significant results from BBS survey data (Seigel and DeSante 1999).

Habitat Status and Trend
Mountain quail occur across the elevation range of the Eldorado National Forest. Habitat for mountain quail includes early- to mid- seral stages within preferred vegetation types that have an average distance of less than 0.25 mile to water. Brush fields in a mosaic pattern are important since they provide nesting and foraging habitat for quail. Quail also use oak mast for forage especially in the winter and fall. Mountain quail do best in areas with a good, even distribution of brush. These habitats currently appear to be well-distributed within the Eldorado National Forest, with about 300,000 acres mapped as habitat. Effects of fire exclusion, forests moving away from creation of early successional habitats though timber harvest, and the effects of fuels treatments on shrub habitats, may reduce current amounts and distributions of quail habitat, however.

Habitat within the project area.
The project area provides moderate to high capability quail habitat in high elevation shrub fields that occur adjacent to project reservoirs and within the Cleveland Fire area along the El Dorado Canal.

Direct and Indirect Effects

The construction of a new boat launching ramp, associated parking lot, toilet facilities, access road, and picnic area on the northeast end of Caples Lake, may remove mountain quail habitat. The exact location of these facilities is not yet determined, but it is assumed that construction will affect less than 10 acres.

Cumulative Effects

Habitat for mountain quail is currently well-distributed within and surrounding the project area, with about 300,000 acres of habitat estimated to occur on the ENF. Given the estimated stable population trend for mountain quail in the Sierra Nevada ((Seigel and DeSante1999), removal of less than 10 acres of habitat associated with the project will not result in substantial cumulative effects to mountain quail.

Blue Grouse

Current Management Direction
The Lake Tahoe Basin LRMP identifies blue grouse as a Management Indicator Species representing habitat requirements found in medium to large conifers with less than 40% canopy closure, and interspersed with brush patches and wet meadows. Habitat is managed based upon standards and guidelines in the LTBMU Land and Resource Management Plan (USFS, 1988, as amended 2001).

Population Status and Trend based upon Forest Plan Monitoring
Monitoring data is not available.

Habitat Status and Trend
Blue grouse occur in open, medium to large-tree conifer stands interspersed with medium to large openings. Little information is available on habitat status; Forest Service vegetation management actions, focusing on understory fuels treatments, are a relatively low risk to blue grouse habitat.

Habitat and Occurrence within the Project Area
On the Lake Tahoe Basin, suitable blue grouse habitat occurs in patches surrounding Echo Lakes, particularly on the northeast side of the Lakes.

Direct, Indirect and Cumulative Effects

The proposed action will result in little alteration of blue grouse habitat within the Lake Tahoe Basin Management Unit. The Pacific Crest National Scenic Trail crossing that will be constructed across the Echo Conduit could affect a small amount of habitat but effects would be quite localized and would not be expected to contribute to cumulative effects upon the species.

Cavity Nesting Birds and Pileated Woodpecker

Current Management Direction
The Eldorado National Forest LRMP identifies all cavity nesting birds as a Management Indicator Species group associated with old growth, snags, hardwoods, ponderosa pine, mixed conifer, red fir, lodgepole pine, and late-successional habitats. The LRMP for the LTBMU identifies the pileated woodpecker as a species representing habitat requirements found in large mature conifers and snags. Habitat is managed based upon standards and guidelines in the Eldorado National Forest and Lake Tahoe Basin Management Unit LRMPs (USDA Forest Service, 1989, as amended 2001, USDA Forest Service, 1988, as amended 2001). Standards and guidelines require retention of between 2 and 6 of the largest snags per acre depending upon land allocation and vegetation type.

Population Status and Trend based upon Forest Plan Monitoring
The Draft Avian Conservation Plan for the Sierra Nevada Bioregion (Seigel and DeSante 1999), a project of California Partners in Flight, has evaluated population trend data for 77 bird species with adequate data for calculating Sierra- wide breeding bird survey trends. The following results are described for cavity- nesting bird species that had sufficient data to calculate trends:

Species with Negative trends
Mountain chickadee
Acorn woodpecker
Red-breasted sapsucker

Brown creeper

Red-breasted nuthatch

Species with positive trends
White headed woodpecker

Species with stable trends
Red-shafted flicker

Habitat Status and Trend

Nesting habitat for most cavity nesting birds is associated with snags that are at least 12 inches in dbh. Moderate and high capability habitat is generally limited to mature and older forest stands, that provide large snags and where density-dependent tree mortality results in the creation of greater numbers of snags. There is estimated to be 603,232 acres within the Eldorado National Forest that is capable of providing habitat for cavity nesting birds.

Pileated woodpeckers utilize dense, older forests with canopy closure generally exceeding 40 percent (Zeiner et al. 1990). Snag retention and recruitment are crucial aspects of maintaining habitat and insects, disease, and fire are generally beneficial for woodpeckers by promoting decay and snag creation. Activities that result in removal of large snags, such as salvage timber sales, or which reduce snag recruitment, such as sanitation harvest, forest thinning, or clearcutting, may decrease the occurrence of cavity nesting bird species, including the pileated woodpecker.

Habitat and Occurrence within the Project Area.
The majority of the project area provides habitat for cavity nesting birds. Older, dense stands providing suitable habitat for pileated woodpeckers on the LTBMU, occur along the south and west margin of Echo Lakes.

Direct and Indirect Effects

Removal of snags that are thought to pose safety hazards or hazards to facilities, will continue to occur in proximity to project facilities, including along the El Dorado Canal, and in proximity to project-associated campgrounds and recreation sites. Hazard tree removal may impact cavity nesting birds in these localized areas. The direct and indirect effects would be limited, given the localized nature of these impacts, and th likelihood that snags would remain available outside the areas affected by hazard tree removal.

Cumulative Effects

Based on data from Sierra-wide BBS routes, four cavity nesting bird species are showing decreasing trends, two are exhibiting stable trends, and one is showing a positive trend. These monitoring results indicate the need to carefully evaluate cumulative effects upon habitat for cavity nesting birds. Historic selective logging practices and more recent even-aged timber harvest, has reduced the density of large snags within most portions of the Sierra Nevada (Verner et al. 1992). In addition, extensive salvage timber harvest occurred during the episode of drought- related mortality on the Eldorado National Forest between 1990 and 1993. Since that time, removal of dead trees has been limited to post-wildfire salvage logging and removal of hazard trees alongside roadways and within recreation and administrative sites. Current Forest Plan direction continues this limitation on impacts to snags (USDA Forest Service 2001).

In addition, LRMP standards and guidelines require that the four largest snags per acre be maintained in mixed conifer habitat, and the six largest snags per acre maintained in the red fir vegetation type except within a quarter mile of communities (USDA Forest Service 2001). These snag densities are considered to be within the natural range of variability for mature mixed conifer and red fir forests, and published data suggests are likely to maintain viable populations of cavity nesters (Bull et al. 1997, Raphael and White

1984). Although past management actions have probably reduced the size and availability of snags on the LTBMU and the Eldorado National Forest, current management should result in a trend toward increasing size and density of snags on the vast majority of National Forest lands. The amount of area affected by future hazard tree removal projects associated with the proposed action, (e.g. roadsides, campgrounds, and administrative sites) constitutes a small proportion of the habitat available for cavity nesting birds on the Eldorado National Forest or to pileated woodpeckers on the LTBMU. Although snags may be reduced in localized areas, the small amount of habitat affected by the proposed action will not contribute to substantial cumulative effects upon cavity nesting birds on the ENF or upon the pileated woodpecker on the TNF.

Waterfowl Species and Mallard

Current Management Direction

The Lake Tahoe Basin LRMP identifies waterfowl species as ducks, geese, and coots. These are game species although non-consumptive uses, such as viewing, of waterfowl are also an important part of the management objectives for these species. The LRMP presents habitat management guidelines for only one waterfowl species: mallards. Mallard habitat capability is to be improved mainly through direct habitat improvements such as nesting islands and maintaining or increasing water levels in existing or potential wetlands. Waterfowl also serve as a "threshold species" group for the TRPA in the Lake Tahoe Basin. Forest Service management direction for MIS and TRPA guidelines are applicable only to the portion of the project at Echo Lakes. Echo Lakes is designated by the TRPA as a waterfowl habitat site and the TRPA has mapped known nesting sites at the Echo Lakes.

Habitat and Occurrence within the Project Area

On the Lake Tahoe Basin, waterfowl habitat (including mallard habitat) exists at Echo Lakes. The additional three project reservoirs also provide habitat for waterfowl species, with the greatest amount of habitat probably occurring at Silver Lake. Waterfowl nesting habitat was mapped at Silver Lake and surveys were conducted in May and July of 2002 (EIP Associates Technical Memorandum No. 11, 2002). Small pockets of nesting habitat were found to be scattered around the lakeshore. Partially submerged willow thickets along the shore provide small areas of potential nesting habitat but the largest area of potential nesting habitat was located near the southern end of the lake at Plasse's Meadow. Large flocks of Canada geese and young were observed in this portion of Silver Lake; common mergansers and mallards were also observed at Silver Lake in lesser numbers.

Direct, Indirect, and Cumulative Effects

The Proposed Action will not result in changes to the amount or quality of waterfowl nesting habitat at Echo Lakes, Silver Lake, and Caples Lake. Spring and early summer lake levels at Echo, Silver, and Caples Lakes will remain similar to current conditions, with lake levels remaining high prior to Labor Day. Waterfowl nesting habitat will therefore remain similar to past conditions at these lakes. No direct, indirect or cumulative effects to waterfowl habitat, or specifically to mallard habitat, are anticipated.

Osprey

Current Management Direction

The osprey is a Special Interest Species for the TRPA. The Eldorado National Forest and the LTBMU do not provide management direction for osprey.

Habitat and Occurrence within the Project Area

On the Lake Tahoe Basin, suitable nesting habitat for osprey exists at Echo Lakes. Project surveys detected osprey at Echo Lakes in 2000 and recorded an active osprey nest in 2001. Osprey were also

observed at Caples Lake and Silver Lake during bald eagle surveys (EIP Associates Technical Memorandum No. 1, 2002).

Direct, Indirect, and Cumulative Effects

The Proposed Action will not result in changes to the amount or quality of osprey habitat at Echo Lakes. It is unknown whether construction of the new boat launch, picnic area, and parking at Caples Lake might affect osprey habitat; additional site-specific analysis will occur prior to construction.

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