

6.1 Bald Eagle and Osprey Study Plan¹

6.1.1 Pertinent Issue Questions

The bald eagle and osprey study addresses Terrestrial Resource Issue Questions:

- 7(b). What are the relevant and known factors (limiting and beneficial) affecting special status bird populations in the Project area and how/where are these factors influenced by Project operation and maintenance?
21. What are the Project impacts on special status birds with particular emphasis on Project facilities, operation, maintenance and Project-influenced recreation?
22. To what extent do Project operations and maintenance activities and Project-induced recreation affect bald eagle populations?

6.1.2 Background

Ospreys and bald eagles have the following special status designations:

- Osprey - California Species of Concern.
- Bald Eagle - Federally-listed threatened (proposed for delisting), California Endangered, California Fully Protected, and USFS Management Indicator Species.

Bald eagles may be affected by: 1) recreation activity in the vicinity of active nests and critical winter roost sites; and 2) direct and indirect disturbance to nesting and wintering birds and their prey due to Project operation (e.g., reservoir fluctuation) and maintenance activities. Biologists speculate that low reservoir levels during the breeding season may be one of the limiting factors that result in decreased bald eagle nesting success. Reservoir levels can: 1) dictate how far eagles have to travel from a nest site to suitable foraging habitat, 2) influence prey species numbers and availability; and 3) affect the amount, type, and timing of recreation disturbance in the vicinity of a nest site.

Extensive research has been conducted on foraging behavior and prey selection of osprey and bald eagles. In general, both species are opportunistic predators that typically take fish from near the surface of water bodies. Inland osprey populations in western North America take suckers, carp, bullhead, and perch when nesting near warm, shallow lakes or reservoirs, but take trout when nesting near deeper, colder waters (Swenson 1978, 1981; VanDaele and VanDaele 1982; Flook and Forbes 1983; Poole 1989). Bald eagle prey selection varies by location, ranging from an exclusive diet of fish in some areas to an exclusive diet of birds, primarily waterfowl, in others (Jenkins 1992).

Project reservoirs have increased the distribution and amount of potential foraging and nesting habitat for osprey throughout the watershed when compared to pre-project conditions. Several osprey have nested in the vicinity of Project reservoirs in recent years and ospreys are observed in the Project area on a regular basis. Furthermore, ospreys are known to have a high tolerance level for human activity in the vicinity of their nests relative to most other raptors, and often select nest sites in close proximity to high levels of human activity. As a result, the Project is not likely to have a substantial impact on osprey populations or their habitat, and no formal study is proposed to address osprey in the context of Terrestrial Resource Issues 7b, 21, and 22. Nonetheless, studies to be performed for bald eagle, as presented below, will provide relevant incidental information that can be used for osprey management in the Project area, as appropriate.

As with osprey, Project reservoirs have increased the distribution and amount of potential foraging and nesting habitat for bald eagles throughout the watershed when compared to pre-project conditions. Bald eagles winter annually in the Project area and one pair has nested at Union Valley Reservoir each year since 1986 (SMUD 2001). The first known nest site at this reservoir was located in the Wench Creek Campground (T. 12N, R. 14E, Section

¹ Note: Because of overlap between Eldorado National Forest responsibilities for eagle management and the responsibilities of the Licensee to address issues raised during the Alternative Licensing Process, the Licensee and ENF will coordinate their 2002 studies. No cost sharing will occur.

14). The Wench Creek nest fledged young successfully in 1986 and 1987; and the nest site was occupied but unsuccessful in 1988, 1990 and 1991. The Wench Creek nest tree was removed for safety concerns in 1995. A second nest site, named the West Point nest, was discovered near Union Valley Dam (T. 12N, R. 14E, Section 29) in 1989. Biologists believe that the eagles began constructing the West Point nest in 1988, and the pair appeared to be feeding young in 1989, but the nest failed that year following a late-spring snowstorm. The Cleveland Fire destroyed the West Point nest in 1992. A third nest was discovered in 1992 on Granlees Point (T. 12N, R. 14E, Section 23), and this site fledged young successfully in 1992, 1993, 1994, 1997 and 2000. The Granlees Point nest was unsuccessful in 1995, 1996, 1998, 1999 and 2001.

Eldorado National Forest (ENF) has developed a Bald Eagle Management Plan for nesting eagles at Union Valley Reservoir. This plan establishes seasonal and spatial closure zones around the Granlees Point nest site and staff biologists monitor the nesting eagles annually. The Granlees Point nesting territory closure zone is effective during the critical nesting period from January 1 through August 15, or until the young have fledged or the nest is abandoned. Public entry into this zone is prohibited during this period. Closure notices are posted along the boundary of this zone and information is posted at campgrounds and boat launches around Union Valley Reservoir, as well as at the ENF Information Center and Crystal Basin Information Center. In previous years, the closure area consisted of the shoreline adjacent to the nest area, as well as the nest stand, but did not restrict use of the cove adjacent to the nest stand. This cove receives a great deal of boat traffic, which contributes to people using the restricted shoreline area. According to the Bald Eagle Management Plan, buoys were to be installed near the entrance to this cove in the fall of 1998 to restrict boat access during the closure period, and to establish a 5-mph zone in the cove the remainder of the year.

No other nest sites are known to exist currently within the Project area or anywhere else within the ENF. However, suitable nesting, summer, and winter bald eagle habitats have been mapped at various sites in the Forest, including around the following Project features:

- Loon Lake Reservoir: Summer habitat along southeast shore
- Gerle Creek Reservoir: Summer habitat around entire shoreline
- Ice House Reservoir: Summer/winter habitat along northwest & southeast shores
- SFAR: Winter habitat from about Kyburz to western edge of ENF
- Union Valley Reservoir: Nesting/winter habitat at northeast and southeast shores;
Summer/winter habitat around entire reservoir

The ENF has delineated additional summer habitat at Wright's Lake just east of the UARP. Also, the CNDDDB reports that eagles have wintered at Bass Lake in western El Dorado County (T. 10 N., R. 9 E., S. 31, NE Qtr.; elevation 1,250 ft.) for over 40 years. Bass Lake is about 1.5 miles south of the UARP transmission line. Residential development has been identified as a major concern to wintering eagles at Bass Lake.

6.1.3 Study Objectives

The objectives of the bald eagle study are: 1) determine the relationship of the Union Valley nesting territory, and eagle utilization of this territory, to Project operation and maintenance and Project-induced recreation; 2) determine if Project operation and maintenance and Project-induced recreation have a beneficial or adverse effect on wintering and nesting bald eagle behavior, nesting success, and general health of the population; and 3) determine if reservoir operations affect the type, number, and availability of bald eagle prey (e.g., primarily fish, waterfowl, carrion) during the critical brood-rearing period (April-June) and wintering period (December-February).

6.1.4 Study Area and Sampling Sites

The bald eagle study area will, in most cases, correspond to the territory utilized by the resident pair of bald eagles nesting at Union Valley Reservoir. However, the specific extent of this territory is currently unknown and its determination is a basic objective of this study. At this early stage of the process we speculate that Union Valley Reservoir comprises the bulk of this territory with regular low-level utilization of Ice House Reservoir, Wright's Lake, and to a lesser extent, smaller reservoirs and streams within the Crystal Basin. Defining the nesting territory

as the study area is driven by the need to establish the relative importance of habitats directly affected by the UARP versus other (e.g., non-Project) habitats used by the resident pair at Union Valley. Field studies will be restricted to those lands where the Licensee has legal access (e.g., ownership/easement rights, public lands) and will not occur on private lands without prior permission from the landowner.

6.1.5 Information Needed From Other Studies

A determination of potential Project impacts on nesting and wintering bald eagles will require information from a variety of studies including the Instream Flow Study, Hydrologic Model, Reservoir Habitat Study, Fisheries Study, Recreation Supply Study, Vegetation Mapping Study, Waterfowl Study, and the Land Management Study. Important information will be derived from past and current monitoring efforts conducted by the ENF staff biologists and from a review of the scientific literature.

6.1.6 Study Methods and Schedule

The Bald Eagle Study contains three interrelated components: 1) determination of the relationship of the Union Valley nesting territory, and eagle utilization of this territory, to potential Project-related disturbance factors; 2) Evaluation of Project-related factors influencing winter habitat availability and utilization by eagles; and 3) Evaluation of Project-related factors influencing eagle prey availability, abundance, and selection.

Pre-Field Investigations

The following data will be gathered in spring/summer 2002 from existing sources of information and/or from other UARP resource studies, as this information becomes available:

- Findings of all available studies on responses of nesting bald eagles to hydro operations and maintenance activities, recreation, and other sources of disturbance of relevance to the UARP [Source: literature review and consultation with experts].
- Location and mapping of all past and current nest sites utilized by the nesting pair at Union Valley Reservoir [Source: ENF records].
- Location, type, intensity, and season/frequency of occurrence of all existing recreation sites within the eagle nesting territory (extent of territory to be determined from field studies but currently assumed to be focused primarily around Union Valley and Ice House reservoirs [Source: ENF/SMUD records and findings of Recreation studies].
- Location, type, intensity, and season/frequency of occurrence of Project operations and maintenance activities within the eagle nesting territory [Source: SMUD records].
- Distribution of moderate- to high-quality nesting habitat within 0.5-mile of Union Valley and Ice House reservoirs [Source: Vegetation Mapping Study, ENF data, and ground-truthing/eagle monitoring as described below].
- Distribution of moderate- to high-quality foraging habitat (large reservoirs and streams with substantial fish populations) within 10 miles of Union Valley Reservoir [Source: existing maps, ENF records, and eagle monitoring as described below].
- Distribution of moderate- to high-quality wintering habitat (i.e., known preferred eagle concentration areas and preferred perch trees) within 0.25-mile of all Project waters [Source: Vegetation Mapping Study, ENF data, and ground-truthing/eagle monitoring as described below].
- Distribution of other potential sources of disturbance (e.g., major roads) within the eagle nesting/wintering territory [Source: existing maps, ENF/SMUD records, and other UARP relicensing studies].

As appropriate, relevant data obtained as described above will be plotted using Geographic Information System maps for subsequent analysis.

Field Investigations

Determination of the relationship between Project-related factors and nesting territory utilization and nesting success will involve the following field studies. Prior to implementation of any studies that require handling of bald eagles, nests, eggs, or young, all necessary state and federal permits and Memoranda of Understanding will be obtained as required by applicable laws and regulations.

- Determination of species composition and relative abundance of prey (presumably dominated by fish, waterfowl and carrion) actually taken by eagles nesting at Union Valley Reservoir [Method: inspection of prey remains at nest sites and/or direct observation of prey selection by eagles during the nesting season].
- Qualitative assessment of prey (fish, waterfowl, carrion, etc.) distribution, abundance, and availability at Project reservoirs during brood-rearing (maximum prey requirements) and winter (December-January) months. [Method/Source: review of CDFG records, Aquatic Resource and Waterfowl studies, other available data].
- Ground-truthing of moderate- to high-quality nesting and wintering habitat within 0.25-mile of all Project waters as delineated initially from the Vegetation Mapping study [characteristics representing moderate- to high-quality habitats to be determined from existing literature].
- Temporal and spatial assessment of nesting, foraging, and winter habitat utilization patterns (i.e., territory time/activity budget) of the Union Valley Reservoir resident pair over a 1-year period. Data to be derived from Global Positioning System (GPS)-based satellite telemetry, standard field telemetry, direct observation or a combination of these techniques to be determined. Habitat utilization by eagles other than the resident pair will be recorded as incidental observations. [Note: GPS-based satellite telemetry is being tentatively considered as a cost-effective option that reportedly reduces the amount of labor needed to collect the desired information. This emerging technology entails: 1) initial capture of eagles; 2) outfitting eagles with transmitters; 3) pre-determined periodic transmission of location data to a satellite; 4) data relay to an earth-based station (e.g., operated by NASA); and 5) acquisition of data as needed via the internet on a subscription fee basis. However, additional information still needs to be acquired to determine the efficacy of using this technology for this study.] This task would begin February 2002 or as soon as feasible.
- Substantial information exists on the response (e.g., flushing response) of bald eagles to the various types of disturbances that may be present in the eagle nest territory (e.g., Altman 1974, Boyle and Samson 1985, Buehler et al. 1991, Craig et al. 1988, Grubb and King 1991, Knight and Knight 1984, McGarigal et al. 1991, Pomerantz et al. 1988, Schuek and Marzluff 1995, Shapiro et al. 1982, Stalmaster and Kaiser 1998). This information will be supplemented by incidental observations of eagle behavior collected by ENF staff and the Licensee during the course of other field investigations.
- The ENF monitors eagle nesting success/failure as part of their normal management responsibilities. This study assumes that ENF will continue this effort and provide the results to the Licensee for analysis and reporting in the overall context of this study. Monitoring of nest success/failure is expected to follow the California Department of Fish and Game (CDFG) protocols for bald eagle breeding surveys, including completion of the associated field data forms and submittal of these forms to CDFG as required (CDFG 1999). These protocols emphasize the need for surveys at least three times during the nesting season, especially during the incubation (March to early April) and early nestling periods (late April to early May). The purpose of the first survey is to determine whether the territory is occupied and includes recording of adult presence, courtship behavior, evidence of nest repair or construction, and incubation. Surveys during the early nestling period confirm territory occupancy, or if confirmed during first survey, to determine if the adults are still tending the nest. A check during the late nestling period (mid-June) is intended to determine how many nestlings are approaching fledgling age. However, the protocols allow deviation from these survey dates if the territories can be checked more frequently or if particular pairs are known to begin nesting earlier or later in the season. Observers are to report the stage of nestling development as defined by Carpenter (1990). Completed forms are to be submitted to Mr. Ron Jurek at CDFG by September 1st of each year of monitoring. Mr. Mike Mainz at CDFG will also be kept apprised of study progress and/or any problems encountered during the study period.

6.1.7 Analysis

The variety of data retrieved during the implementation of the Methods will be analyzed as follows:

- Correlate past nest site selection, nest abandonment, nesting productivity, and winter habitat utilization with information collected during implementation of Methods. This includes: 1) breeding, wintering, and foraging habitat distribution and quality; 2) location, timing, duration, and intensity of all potential sources of disturbance related to project operation and maintenance activities, recreation, use of project roads, unusual weather patterns, etc.; and 3) abundance, distribution, and availability of prey.
- Review literature and contact experts regarding the findings of similar evaluations for other hydroelectric projects. Compare UARP reservoir operations to similar projects that support nesting bald eagles.

6.1.8 Study Output

Preliminary study results will be presented to the Terrestrial Resources Technical Working Group (TWG) and Plenary Group in November-December 2002. However, the ultimate study output will be a written report that includes the issues addressed, objectives, study area, methods, analysis, results, discussion, and conclusions. The reports will be prepared in a format that allows the information to be inserted directly into the Licensee-prepared Draft Environmental Assessment that will be submitted to FERC with the Licensee's application for a new license.

6.1.9 Preliminary Estimated Study Cost

SMUD's consultant estimates that this study will cost \$141,000 ± 20 percent.

6.1.10 TWG and Plenary Group Endorsement

Terrestrial TWG representatives from the following agencies/organizations approved this study plan on December 21, 2001: California Department of Fish and Game, Eldorado National Forest, California Sport Fishing Alliance, and SMUD. The Plenary Group approved this study plan on February 6, 2002. The participants at the meeting who said they could "live with" the study plan were California Department of Fish and Game, California Native Plant Society, California Outdoors, California Sportsfishing Protection Alliance, El Dorado County, El Dorado County Citizens for Water, Friends of El Dorado County, National Parks Service, Placer County Water Agency, Sacramento Municipal Utility District, State Water Resources Control Board, Taxpayers of El Dorado County, U.S. Bureau of Land Management and Eldorado National Forest. None of the participants at the meeting said they could not "live with" the study plan though PG&E abstained since this study plan does not apply to the Chili Bar Project.

6.1.11 Literature Cited

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