

11.12 Iowa Hill Northern Goshawk Study Plan

11.12.1 Pertinent Issue Questions

This study addresses the following terrestrial resource questions for the proposed Iowa Hill Pumped Storage Development Project, as identified by the Upper American River Project (UARP) Relicensing Terrestrial Resources Technical Working Group (TWG) and as adapted from previously approved UARP studies:

- Do northern goshawks occur within the proposed Project Area?
- What are the potential impacts of the construction, operation, and maintenance of the proposed Project on northern goshawks and their habitat?

11.12.2 Background

The northern goshawk has the following special status designations: Federal Species of Concern, California Species of Concern, Forest Service Sensitive Species, and Forest Service Management Indicator Species. Nesting northern goshawks may occur within the vicinity of the proposed Iowa Hill project and, if so, are subject to impacts from construction, operation, or maintenance of the development.

The northern goshawk on the west slope of the Sierra Nevada is reported to breed from about 2,500 feet in elevation in the ponderosa pine/mixed-conifer vegetation types up to approximately 10,000 feet in the red fir and lodgepole pine types (USDA 2001). They are generally year-round residents in suitable habitat but some limited seasonal altitudinal movements may occur. Nests are generally constructed in live conifer or hardwood trees, but also occasionally in snags. Nest trees are usually among the largest trees in a stand. Nests are usually established in stands of trees that exhibit greater canopy cover, greater basal area, greater numbers of large diameter trees, lower understory cover, and more moderate slopes relative to non-used stands. Currently, over 500 occupied nest territories are known to occur on national forest lands of the Sierra Nevada (USDA 2001).

The goshawk nesting period extends from mid-February through mid-September, with egg laying occurring between mid-April and mid-May (USDA 2001). The incubation period is approximately 32 to 34 days. The nestling period is approximately 42 to 45 days and, once fledged, juveniles remain in the nest area for a period of four to eight weeks before dispersing. Annual variation in reproduction is affected by weather and prey dynamics, and not all pairs of goshawks reproduce each year.

The goshawk preys mainly on small mammals (e.g., tree and ground squirrels, rabbits) and birds (e.g., Steller's jay, northern flicker, American robin) on or near the ground. Foraging typically occurs in forests with a dense to moderately open overstory, and an open understory interspersed with meadows, brush patches, riparian areas, or other openings (USDA 2001).

The U.S. Department of Agriculture, Forest Service (USFS) has been directed by the Forest Plan Amendment (USDA 2001) to establish 200-acre Protected Activity Centers (PACs) around all known and newly discovered breeding territories detected on national forest lands. PACs are intended to contain the best available nesting habitat in the largest contiguous blocks possible, based on aerial photography. In patchy habitats, PACs are to consist of multiple patches greater than 30 acres within 0.5-mile of the nest site. Best available forest stands for PACs on the westside of the Sierra Nevada have the following characteristics: 1) trees in the dominant and co-dominant crown classes average 24 inches diameter at breast height or greater and 2) stands have at least 70 percent tree canopy cover. Non-forest vegetation types (e.g., brush and meadows) are not counted as part of the 200 acres.

The USFS is directed to maintain PACs regardless of occupancy status, unless the habitat is rendered unsuitable by a catastrophic stand-replacing event (e.g., fire) and surveys confirm non-occupancy (USDA 2001). Fuel treatment and vegetation management activities are limited within PACs. In addition, Limited Operating Periods (LOPs) prohibit activities within approximately 0.25-mile of a nest site during the breeding season (February 15 through September 15) unless surveys confirm that northern goshawks are not nesting. If the location of a nest stand within a PAC is unknown, surveys can be conducted to determine the stand location or the LOP can be applied to a 0.25-

mile area surrounding the PAC. LOPs do not apply to existing road and trail use and maintenance or continuing recreation use, except where analysis of a proposed project or activity indicates that disturbance to a nest is likely to result. The LOP may also be waived for individual projects or activities of limited scope and duration, or when a biological evaluation documents that such projects are unlikely to result in breeding disturbance. Where a biological evaluation determines that a nest site will be shielded from planned activities by topographic features that minimize disturbance, the LOP buffer distance may be reduced. PACs may be removed from consideration if surveys determine they are unoccupied for two years.

No northern goshawk PACs have been delineated within or immediately adjacent to the Project boundary. The nearest PAC (designation G3-23) is located approximately 1.0 mile southeast of the Project (see attached figure).

11.12.3 Study Objectives

The objectives of the northern goshawk study are: 1) to determine the location, extent, and distribution of nesting goshawks in relation to potential sources of Project-related disturbance (e.g., operation, maintenance, and recreation activities), 2) assess potential effects on goshawk habitat, including foraging and nesting requirements, due to habitat alteration actions resulting from the Project, including clearing of the appurtenant transmission line corridor, and 3) note incidental observations of other raptor species that include observations of nesting, foraging, or roosting areas. This information will be evaluated to determine if Project activities could be modified to reduce adverse impacts to the species and to support ENF management objectives for northern goshawk.

11.12.4 Study Area and Sampling Sites

The analysis area for determining effects on northern goshawks will be all suitable forested habitat within 0.5-mile of proposed Project facilities. Specific survey areas, transects, and call points will be determined in consultation with ENF and CDFG biologists and will be based on standardized USFS protocols for conducting northern goshawk surveys (USDA 2000).

11.12.5 Information Needed From Other Studies

A determination of potential Project impacts on nesting goshawks will be supported by information from the Vegetation Mapping Study and Wildlife Habitat Characterization Study. Important information will be also be derived from past and current monitoring efforts conducted by staff biologists of ENF and Sierra Pacific Industries.

11.12.6 Study Methods and Schedule

The northern goshawk study methods follow the standardized protocols in *Survey Methodology for Northern Goshawks in the Pacific Southwest Region, U.S. Forest Service* (USDA 2000). This methodology will focus on determining the presence of active nests within 0.5-mile of potential Project-related sources of disturbance. The methodology identifies three techniques that can be used to locate goshawks and their nest sites depending on objectives and conditions of a given survey effort. In most situations, a combination of these techniques is most effective, depending on timing, amount and distribution of suitable habitat, and available resources. The three techniques or methods are: 1) Dawn Acoustical Survey; 2) Stand Searches; and 3) Broadcast Acoustical Survey. The Broadcast Acoustical Survey will be used to survey the analysis area. It is a 2-year protocol based on broadcast of taped calls along transects to elicit defensive behavior from territorial adults. This is the most commonly used method for detecting goshawks and is applicable to large areas of land such as the proposed project area. Follow-up surveys using other methods may be necessary to augment the results of the Broadcast Acoustical Survey.

The standardized protocols recommend a step-down approach to 1) reduce the area requiring physical surveys, and 2) maximize efficiency in surveying specific habitats. To create a goshawk survey plan, begin by using habitat data from known goshawk territories in your area (same bioregion, forest type) to create a model of suitable (likely to be occupied) habitat versus low-quality habitat. Model parameters should include forest structure (species composition, size class, density) as well as patch size, topographic features (slope, aspect), and hydrologic features (meadows, riparian habitats). Overlay map of proposed project area with map of (modeled) suitable habitat, and delineate habitat patches and buffers likely to be affected by project. Overlay map of proposed project area with map of

previously known goshawk territories; delete a 1-mile radius surrounding each territory center from survey. Based on these protocols, the ENF has prepared a map of the overall analysis area. Biologists affiliated with the ENF, CDFG, and the Licensee will collaborate on final selection of survey transects and call points prior to initiating surveys.

Number of Surveys: This is a 2-year protocol. Surveys should be conducted at least twice during a given year, and repeated twice in the following year.

Timing of Surveys: Timing of surveys will be performed consistent with the Broadcast Acoustical Survey method. Surveys should be conducted during the nestling and fledgling periods, including early post-fledgling dependency, between June 1 and August 15. Surveys may begin ½ hour before sunrise and should cease ½ hour before sunset.

Establishment of Survey Stations: Survey stations will be established consistent with the Broadcast Acoustical Survey method. Prior to initiating surveys, use aerial photographs and topographic maps to determine optimal placement of survey transects. Draw detailed maps of survey routes and station location and provide them to field crews conducting surveys. When possible, establish start and end points of transects along existing roads, trails, streams or other landforms. The maximum distance between parallel transects should be 250 meters. Minimize number of stations located on roads, unless roads are entirely within habitat of interest. Call stations should be located 200 meters apart along each transect. To increase coverage, offset station locations on adjacent transects by 100 meters.

The most important factor in transect and station placement is completeness of coverage; to achieve acceptable confidence in survey results, all suitable habitat should be within 150 meters of a calling station..

Calling Procedure: Calling methods will be established consistent with the Broadcast Acoustical Survey method. At each calling station, broadcast at 60 degrees from the transect line for 10 seconds, then listen and watch for 30 seconds. Repeat this sequence 2 more times, rotating 120 degrees from the last broadcast. Repeat 3-call sequence again. After the last sequence, move to the next station. Move (**walk!**) between stations at an easy pace, listening and watching carefully for goshawk calls and sign. The majority of time will be spent walking between stations, so it is important to be alert for goshawks approaching, often silently, to investigate the surveyor. Do not survey from vehicles, or use vehicles to move between stations. Use of two observers probably enhances the probability of visual detections of goshawks, however experienced surveyors may conduct surveys singly. To avoid misidentifying broadcasts of co-workers, simultaneous surveys should be conducted no closer than two transect widths apart.

Interpretation of Goshawk Responses: Surveyors should be aware of different types of responses likely to be encountered during surveys. Joy et al. (1994) classified responses into 3 categories, vocal non-approach, silent approach, and vocal approach. The frequency of each response type varied between sexes, ages, nesting stage, and vocalization broadcasted.

- 1) *Vocal non-approach* – goshawks may respond by perching away from the surveyor, often at the nest, and vocalizing. This response is commonly elicited as begging calls from older nestlings and juveniles, in response to broadcast of either alarm or food-begging calls.
- 2) *Silent approach* – goshawks, particularly adult males, will frequently fly silently in the direction of the surveyor to investigate, and may be visible only briefly. Silent approach by female goshawks during the nestling and early fledgling periods typically indicates an active nest within 200 meters, but male responses may be long distances from the nest. *Failure to detect this common response is a likely cause of poor survey results.*
- 3) *Vocal approach* – commonly in response to broadcast of alarm calls, adult female goshawks (and, less often, males) frequently fly towards the surveyor while vocalizing alarm calls. This response typically indicates the active nest is within 200 meters, particularly if the adult goshawk remains in the vicinity of the surveyor.

Location of Nest Sites: Searches for active nests may be conducted immediately following goshawk detections (particularly vocal approaches or attacks), however it is often necessary to review the results from multiple surveys and stations from a larger area to approximate the likely areas to search. Response type, distance and direction from

transect, and distribution of habitat should be plotted on aerial photographs, and the Stand Search Method should be employed (see protocol)..

11.12.7 Analysis

The location of any northern goshawk detections including nest and roost locations will be evaluated with respect to the proximity of potential Project-related disturbances and habitat alteration. The evaluation will consider such factors as: 1) loss or alteration of habitat utilized by goshawks; 2) loss or alteration of habitat in PACs; 3) clear or obstructed line of sight between nest/PAC and source of disturbance; 2) distance of nest from potential disturbance; 4) timing, intensity, and duration of disturbance relative to nesting stage; 5) need to implement LOPs for source of disturbance. The evaluation will include a review of the literature and consultation with experts to determine findings of related studies on the response of goshawks to the types of disturbances in question.

11.12.8 Study Output

Complete study results will be provided to the Terrestrial Resources Technical Working Group (TWG) during late spring/early summer 2004 in a written and electronic report format. The study report needs to include a data file that delineates broadcast stations, survey results that include date of each detection, and determined status. A map depicting these features needs to have a linked data file with UTM coordinates. Ultimately, the results of the study will be incorporated into Exhibit E of the Licensee's application to FERC for a new license for the UARP. The output will address the pertinent issues, objectives, study area, methods, analysis, results, discussion, and conclusions.

11.12.9 Technical Working Group Endorsement

This study plan was approved by USFS, USFWS, CDFG and SMUD via TWG discussions, a field visit to the Iowa Hill project area, emails and faxes. With incorporation of comments from CDFG and USFS, this study plan was approved via email on March 19, 2004

The study plan was approved by the Plenary Group on April 7, 2004 without modification. There was no one present at the meeting who objected to the study plan going forward for implementation.

11.12.10 Literature Cited

SMUD (Sacramento Municipal Utility District). 2003. Iowa Hill Pumped Storage Development Project Initial Information Package, revision 1. Sacramento, CA.

USDA (United States Department of Agriculture, Forest Service). 2000. Survey methodology for northern goshawks in the Pacific Southwest Region. August 9, 2000.

USDA. 2001. Sierra Nevada Forest Plan Amendment: Final Environmental Impact Statement, Volumes 1-6 and Record of Decision. Pacific Southwest Region, San Francisco, CA. January 2001.