

Swainson's Hawk
Survey Protocols, Impact Avoidance, and Minimization Measures
for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern
Counties, California

State of California
California Energy Commission and Department of Fish and Game
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Swainson's Hawk Background Information

The Swainson's hawk (*Buteo swainsoni*) is listed as a California state threatened species under the California Endangered Species Act (CESA). The species is not listed as threatened or endangered under the federal Endangered Species Act. To comply with state wildlife protection requirements and receive project approvals, renewable energy project developers proposing projects in the Desert Renewable Energy Conservation Plan (DRECP) area may be required to conduct surveys and avoid or minimize impacts to Swainson's hawks and related nesting and foraging habitat. The survey protocols and mitigation and monitoring plan recommendations provided below suggest approaches and measures for complying with protection requirements.

Antelope Valley Swainson's hawks are known to have historically nested in Joshua tree woodlands and foraged in grasslands and native desert scrub communities. Currently, they nest in Joshua tree woodlands, ornamental roadside trees, and windrow or perimeter trees in active and historical agricultural areas. Foraging habitat includes dry land and irrigated pasture, alfalfa, fallow fields, low-growing row or field crops, new orchards, and cereal grain crops. Swainson's hawks may also forage in grasslands, Joshua tree woodlands, and other desert scrub habitats that support a suitable prey base. Gophers dominate the prey base of agriculturally based pairs while Swainson's hawks nesting in natural desert habitats consume a wider variety of prey species. While California's Central Valley Swainson's hawk population winters in Mexico, Central America South America, and a small percentage in the Central Valley, the migration habits of the Antelope Valley population are unknown. Recent observations suggest that they may arrive in nesting territories generally later than the Central Valley Population (Pete Bloom, raptor biologist, personal communication).

Environmental Review Considerations

The California Environmental Quality Act (CEQA), Warren-Alquist Act and implementing regulations, and CESA require consideration of direct, indirect, temporary, permanent, individual project, and cumulative impacts. CEQA allows approval of projects with significant effects when measures have been included to avoid or mitigate those effects, or specific considerations make such measures infeasible and specific benefits outweigh the significant effects. (CEQA Guidelines §21081). CESA regulates the

taking of state-listed species. "Take" is defined as to "hunt, pursue, catch, capture, or kill, or to attempt to hunt, pursue, catch, capture, or kill." (Fish and Game Code §86). Incidental take authorization requires that all impacts to the species are minimized and fully mitigated and that mitigation is roughly proportional to the extent of the impacts of the taking. (14CCR § 783.4). This "full mitigation" standard is intended to ensure that the status of the species is the same or better after project and mitigation implementation as it was prior to project implementation.

Renewable energy project development could cause direct, indirect, individual, and cumulative adverse impacts to Swainson's hawks when facility construction and operation areas (such as wind turbines, power plants, solar panels and tower sites, access roads, staging areas, and pulling/splicing locations) occur in areas where hawks are present. Potential impacts include loss of foraging habitat and disruption of breeding activities due to increased dust, noise, and human presence. Direct mortality from vehicle strikes and collisions with wind turbines is also known to occur. Construction disturbance during the breeding season and habitat loss could cause incidental loss of fertile eggs or nestlings, or otherwise lead to nest abandonment.

The current land uses in the Antelope Valley area support approximately 10 breeding pairs. This area comprises the southernmost edge of the known breeding range for this species in California. The small number of breeding Swainson's hawks in the Antelope Valley and the potential isolation from other Swainson's hawk populations makes the Antelope Valley population particularly susceptible to extirpation. Swainson's hawks have high nest site fidelity, meaning they return to the same site year after year (Estep 1989, Woodbridge et al. 1995) This may limit exchange of individual birds between distant breeding groups (Hull et al. 2007). Hull et al. (2007) found evidence suggesting that the Central Valley population has had little recent genetic exchange with other populations east of the Sierra Nevada. Due to the geographical isolation of the Antelope Valley Swainson's hawk population from other breeding populations, together with the species' high site fidelity, it is reasonable to infer that rapid re-colonization of the Antelope Valley would be unlikely if nesting pairs were lost. Given these facts, the California Department of Fish and Game (Department) would consider impacts to breeding pairs to be potentially significant because they may cause the population to become less than self-sustaining.

A substantial reduction in numbers or habitat of a rare, threatened, or endangered species would be considered a significant impact under CEQA. Potentially significant impacts may result from activities that cause nest abandonment, loss of nest trees, loss of foraging habitat that would reduce nesting success (loss or reduced health or vigor of eggs or young), or direct mortality. Due to the Swainson's hawk's known preference for areas of low vegetation that support abundant prey, such as grasslands or alfalfa fields (Bechard 1982, Babcock 1995), the Department considers conversion of foraging areas to renewable energy power plant facility sites to be habitat loss. For example, solar panel arrays are expected to eliminate most or all foraging potential. Significant habitat loss may result from individual projects and cumulatively, from multiple projects. Each

project which contributes to a significant cumulative effect must offset its contribution to that effect in order to determine that the cumulative impacts have been avoided.

The Department considers a nest site to be active if it was used at least once during the past 5 years. Impacts to suitable habitat or individual birds within a five-mile radius of an active nest will be considered significant and to have the potential to “take” Swainson’s hawks as that term is defined in §86 of the Fish and Game Code. Please consult with the Department when determining whether “take” authorization is warranted for a specific project.

Special Considerations for Wind Energy Development

Wind turbines present an additional, continuous, long-term risk of Swainson’s hawk take throughout the life of a project. This continuous risk is not always considered in the environmental analyses for other types of projects that may have limited short-term impacts (e.g. construction related impacts). It has been documented elsewhere in California that Swainson’s hawks are killed by wind turbines. Turbine strikes could occur during migration or during the nesting season. Swainson’s hawk surveys for wind energy development should follow the same methods as for solar energy projects, described below, but the impacts analysis and corresponding mitigation should consider the additional continuous long-term risk of turbine-related fatalities. Habitat impact analysis should consider both the ground surface area and the air space that is used by Swainson’s hawks. The mitigation methods described below are specific to ground surface impacts. Wind energy development project proponents should consult with the Department to develop avoidance measures and mitigation specific for the loss of air space and the potential for on-going take of Swainson’s hawk during project operations.” For additional avian considerations that are applicable to Swainson’s hawk, please refer to the “California Guidelines for Reducing Impacts to Birds and Bats from Wind Energy Development” (California Energy Commission and California Department of Fish and Game 2007). The guidelines can be found at <http://www.energy.ca.gov/windguidelines/index.html>.

Survey Protocol

The following survey protocols and monitoring/mitigation recommendations suggest surveys and acquisition of mitigation lands prior to construction of the project if nests are found within five miles of a project site. Before conducting surveys for a particular project, project developers are encouraged to contact the Department and the appropriate lead agencies for up-to-date, site-specific issues and possible refinement of the following survey protocols and monitoring/mitigation recommendations. Survey methods may be flexible depending on surveyor experience and/or already-known nesting status for a given site. Please contact the Department (Region 4 for Kern County and Region 5 for Los Angeles County) to use an alternate survey plan from that suggested within this document.

A qualified raptor biologist with Swainson's hawk survey experience, approved by the Department and the appropriate lead agency, should conduct surveys in a manner that maximizes the potential to observe the adult Swainson's hawks and the nest/chicks via visual and audible cues within a five-mile radius of the project. All potential nest trees within the five-mile radius shall be surveyed for presence of nests. Surveys should be conducted prior to environmental analysis. Surveys should be repeated within the 5-mile radius if a survey season ensues or elapses before the onset of project related activities. If construction begins mid-survey season the year after the initial surveys, then the surveys should continue for that part of the season before construction.

Examples of suitable habitats are Joshua tree woodlands, grasslands, desert scrub communities, and agricultural lands (such as alfalfa, fallow fields, beet, tomato, onions, and other low-growing row or field crops, dry-land and irrigated pasture, cereal grain crops [including corn after harvest], and new orchards). Consult with the Department when determining whether the project site is within five miles of already-known nest sites. If hawks or known nest sites are found within the five-mile radius, consult with the Department and the appropriate lead agency for follow-up to the surveys.

Minimum Equipment

Minimum survey equipment includes a high-quality pair of binoculars and a high quality spotting scope. Surveying even the smallest project area will take hours, and poor optics often result in eye-strain and difficulty distinguishing details in vegetation and subject birds. Other equipment includes good maps, GPS units, flagging, and notebooks.

Walking vs Driving

Driving or "windshield surveys" are usually preferred to walking if an adequate roadway is available through or around the project site. While driving, the observer can typically make a closer approach to a hawk without causing the bird to fly. Although it might appear that a flying bird is more visible, they often fly away from the observer using trees as screens; and it is difficult to determine from where a flying bird originated. Walking surveys are useful in locating a nest after a nest territory is identified, or when driving is not an option.

Angle and Distance to the Tree

Surveying subject trees from multiple angles will greatly increase the observer's chance of detecting a nest or hawk, especially after trees are fully leafed and when surveying multiple trees in close proximity. When surveying from an access road, survey in both directions. Maintaining a distance of 50 meters to 200 meters from subject trees is optimal for observing perched and flying hawks without greatly reducing the chance of detecting a nest/young. Once a nesting territory is identified, a closer inspection may be required to locate the nest.

Speed

Travel at a speed that allows for a thorough inspection of a potential nest site. Survey speeds should not exceed 5 miles per hour to the greatest extent possible. Stop frequently to scan subject trees with binoculars and a spotting scope.

Visual and Audible Cues

Focus surveys on both observations and vocalizations. Observations of nests, perched adults, displaying adults, and chicks during the nesting season are all indicators of nesting Swainson's hawks. In addition, vocalizations are extremely helpful in locating nesting territories. Vocal communication between hawks is frequent (1) during territorial displays, (2) during courtship and mating, (3) through the nesting period as mates notify each other that food is available or that a threat exists, (4) and as older chicks and fledglings beg for food.

Distractions

Minimize distractions while surveying. Although two pairs of eyes may be better than one pair at times, conversation may limit focus. Radios should be off, not only are they distracting, they may cover a hawk's call.

Notes and Species Observed

Take thorough field notes. Detailed notes and maps of the location of observed Swainson's hawk nests are essential for filling gaps in the California Natural Diversity Data Base; please note all observed nest sites, including date and time of observation, location name, UTM coordinates, number of young, and any behavioral observations. Also document the occurrence of nesting great horned owls, red-tailed hawks, red-shouldered hawks and other potentially competitive species. These species will infrequently nest within 100 yards of each other, so the presence of one species will not necessarily exclude another.

Timing

To meet *the minimum level* of protection for the species, surveys should be completed for *at least* the two survey periods immediately prior to a project's initiation. For example, if a project is scheduled to begin on June 1, you should complete three surveys in Period II and three surveys in Period III. However, it is always recommended that surveys be completed in Periods II, III, and IV prior to environmental review.

Survey Period I

Survey dates: January-March 31 (optional but recommended; pre-arrival)

Survey Time: All day

Number of Surveys: 1

Justification and search image: Prior to Swainson's hawks arrival from wintering grounds, it is very helpful to survey the project area to determine potential nest locations. Most nests are easily observed from relatively long distances, giving the surveyor the opportunity to identify potential nest sites, as well as becoming familiar with the project area. It also gives the surveyor the opportunity to locate and map competing species nest sites such as great horned owls from February on, and red-tailed hawks

from March on. After March 1, surveyors may observe Swainson's hawks staging in traditional nest territories.

Survey Period II

Survey dates: April 1 – April 30 (arrival; nest building)

Survey Time: All day

Number of Surveys: 3

Justification and search image: Most Antelope Valley Swainson's hawks return by April 1, and immediately begin occupying their traditional nest territories. For those few that do not return by April 1, there are often hawks ("floaters") that act as place-holders in traditional nest sites; they are birds that do not have mates, but temporarily attach themselves to traditional territories and/or one of the site's "owners." Floaters are usually displaced by the territories' owner(s) if the owner returns. Most trees are leafless and are relatively transparent; it is easy to observe old nests, staging birds, and competing species. The hawks are usually in their territories during the survey hours, but typically soaring and foraging in the mid-day hours. Swainson's hawks may often be observed involved in territorial and courtship displays, and circling the nest territory. Potential nest sites identified by the observation of staging Swainson's hawks will usually be active territories during that season, although the pair may not successfully nest/reproduce that year. Both males and females are actively nest building, visiting their selected site frequently. Later in this survey period, territorial and courtship displays are increased, as is copulation. The birds tend to vocalize often, and nest locations are most easily identified. This period may require a great deal of "sit and watch" surveying.

Survey Period III

Survey dates: May 1 – May 30 (egg laying; incubation)

Survey Time: daylight hours, as needed to monitor known nest sites only

Number of Surveys: 3

Justification and search image: Nests are extremely difficult to locate this time of year, and even the most experienced surveyor may miss them, especially if the previous surveys have not been done. During this phase of nesting, the female Swainson's hawk is in brood position, very low in the nest, laying eggs, incubating, or protecting the newly hatched and vulnerable chicks; her head may or may not be visible. Nests are often well-hidden, built into heavily vegetated sections of trees or in clumps of mistletoe, making them all but invisible. Trees are usually not viewable from all angles, which may make nest observation impossible. Following the male to the nest may be the only method to locate it, and the male will spend hours away from the nest foraging, soaring, and will generally avoid drawing attention to the nest site. Even if the observer is fortunate enough to see a male returning with food for the female, if the female determines it is not safe she will not call the male in, and he will not approach the nest; this may happen if the observer, or others, are too close to the nest or if other threats, such as rival hawks, are apparent to the female or male.

Survey Period IV

Survey dates: June 1 – July 15 (fledging)

Survey Time: Sunrise to 1200, 1600 to sunset

Number of Surveys: 3

Justification and search image: Young are active and visible, and relatively safe without parental protection. Both adults make numerous trips to the nest and are often soaring above, or perched near or on the nest tree. The location and construction of the nest may still limit visibility of the nest, young, and adults.

Reporting

Provide the Department and the appropriate lead agency with pre-construction survey results in a written report, within 30 days prior to commencement of construction activities. Report should include date of the report, authors and affiliations, contact information, introduction, methods, study location (include map), results, discussion, and literature cited. For surveys intended to support environmental impact analyses prior to project approval, provide the Department and the lead agency with written survey reports within 30 days of survey completion. Submit California Natural Diversity Database (CNDDDB) forms for any listed, fully protected, or species of special concern/countered and positively identified. CNDDDB forms may be found at the following link: http://www.dfg.ca.gov/biogeodata/cnddb/pdfs/CNDDDB_FieldSurveyForm.pdf.

Monitoring and Mitigation Plan Recommendations

1. If surveys locate a nest site, prepare a Swainson's hawk Monitoring and Mitigation Plan in consultation with the Department and the appropriate lead agency. Plans should be prepared by a qualified biologist approved by the Department and the appropriate lead agency. Include in the plans detailed measures to avoid and minimize impacts to Swainson's hawks in and near the construction areas. For example:
 - a. If a nest site is found, design the project to allow sufficient foraging and fledging area to maintain the nest site.
 - b. During the nesting season, ensure no new disturbances, habitat conversions, or other project-related activities that may cause nest abandonment or forced fledging occur within 1/2 mile of an active nest between March 1 and September 15. Buffer zones may be adjusted in consultation with the Department and the lead agency.
 - c. Do not remove Swainson's hawk nest trees unless avoidance measures are determined to be infeasible. Removal of such trees should occur only during the timeframe of October 1 and the last day in February.

2. Monitoring plans should include measures for injured Swainson's hawks:
 - a. For hawks found injured during project-related activities on the project site, plans should call for immediate relocation to a raptor recovery center approved by a Department regional representative.
 - b. A system should be set-up so that costs associated with the care or treatment of such injured Swainson's hawks will be borne by the project developer.
 - c. Include appropriate contact information for immediate notification of the Department and the appropriate lead agency of a hawk injury incident. Have approved procedures in place to notify the Department and the lead agency outside normal business hours. Notify the appropriate personnel via telephone or email, followed by a written incident report. Include the date, time, location, and circumstances of the incident in the reports.
3. Mitigation plans should focus on providing habitat management (HM) lands. Lands which are currently in urban use or lands that have no existing or potential value for foraging Swainson's hawks will not require mitigation nor would they be suitable for mitigation. The plans should call for mitigating loss of Swainson's hawk foraging habitat by providing HM lands within the Antelope Valley Swainson's hawk breeding range at a minimum 2:1 ratio for such habitat impacted within a five-mile radius of active Swainson's hawk nest(s). The Department considers a nest active if it was used one or more times within the last 5 years.

Project developers may consider delegating responsibilities for acquisition and management of the HM lands to the Department or a third party, such as a non-governmental organization dedicated to Mojave Desert habitat conservation. Seek approval of such delegations from the Department and the appropriate lead agency.

Approaches for acquisition and management of HM lands:

- a. HM Land Selection Criteria. Identify the region within which lands would be acquired, and the type/quality of habitat to be acquired. Foraging habitat should be moderate to good with a capacity to improve in quality and value to Swainson's hawks, and must be within the Antelope Valley Swainson's hawk breeding range. Foraging habitat with suitable nest trees is preferred.
- b. Review and Approval of HM Lands Prior to Acquisition. Provide an acquisition proposal to the Department and the appropriate lead agency for their approval at least 3 months before acquiring the property. The proposal should discuss the suitability of the property by comparing it to the selection criteria.
- c. Land Acquisition Schedule and Financial Assurances. Complete acquisition of proposed HM lands before initiating ground-disturbing project activities. If an irrevocable letter of credit or other form of security is provided, complete land acquisition within 12 months prior to beginning ground-disturbing project

activities. Provide financial assurances for dedicating adequate funding for impact avoidance, minimization and compensation measures required for project approval (see 3. d. below).

- d. HM Lands Acquisition. Be prepared to provide a preliminary title report, initial hazardous materials survey report, biological analysis, at a minimum to the Department and the appropriate lead agency. The information will likely also be reviewed by the California Department of General Services, Fish and Game Commission and/or Wildlife Conservation Board.

Fee title or conservation easement will likely be transferred to a Department of Fish and Game-approved non-profit third party and the Department, or solely to the Department. Be prepared to support enhancement and endowment funds for protection and enhancement of acquired lands. The Department will approve establishment and management of the funds, ensuring that qualified non-profit organizations or the Department will manage the funds in an appropriate manner. Contributed funds and any related interest generated from the initial capital endowment would support long-term operation, management, and protection of the approved HM lands, including reasonable administrative overhead, biological monitoring, improvements to carrying capacity, law enforcement measures, and any other action designed to protect or improve the habitat values of the HM lands. Be prepared to reimburse the Department or other entities for all land acquisition costs.

References

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