

Staff report  
re: Mike Bradbury

### SWAINSON'S HAWK LIFE HISTORY

Swainson's hawks are neotropical migrants that over-winter in South America and return to North America in March to breed. Swainson's hawks nest in tall trees near suitable foraging habitat. Suitable foraging habitat adjacent to nesting sites is an important aspect of prime Swainson's hawk habitat. More than 50% of radio-marked Swainson's hawk foraging activity occurs within one mile of the nest site, although foraging forays out to 18 miles and beyond have been documented.

Having foraging habitat in close proximity to nesting habitat is important because a foraging bird can return to the nest with prey more often with less effort. This provides a positive energetic balance which enhances the probability of nestling hawk survival. Survival of young Swainson's hawks is the chief means of effecting a population increase in California because little immigration from breeding populations from other states occurs.

Swainson's hawks display a high degree of nest site fidelity. Biologists have documented that female Swainson's hawks with individually identifiable, color-coded leg bands use the same nest site for up to 10 successive years. These nest sites are often near where a particular female was fledged. This clustering effect is in response to "nest success" that occurs when habitat factors favor reproductive efforts. Chronic failure at particular nest sites leads to abandonment of nesting areas. These factors, taken together, lead to local populations of Swainson's hawks that have a high degree of genetic relatedness in areas of favorable habitat, and a paucity of nesting Swainson's hawks in other locales. This patchy or spotty distribution is directly related to reproductive success as impacted by habitat quality.

Swainson's hawks nest as close as 0.3 to 0.5 miles apart in riparian woodland habitat in Yolo County and in other areas of Sacramento and San Joaquin counties. High nesting density can be correlated with high quantity and quality of foraging habitat adjacent to the nest sites and the habitat's ability to support high densities of breeding hawks and their young.

The most frequently used nest tree species are Fremont's cottonwood, valley oak, California black walnut, tall willow species, sycamores, and some exotic tree species. These trees may be scattered across agricultural lands or along roadsides, but most are associated with remnants of riparian forests that exist along waterways in central and northern California.

Agriculture has transformed the Central Valley landscape since the gold rush days. Some of the best foraging habitat that exists under the current agricultural conditions in the Central Valley is alfalfa, hay, row crops (eg. tomatoes and sugar beets) and pasture lands.

Suitable agricultural foraging habitat has no physical barriers that inhibit the flight capability of hawks. The hawks must have a fairly unobstructed course of attack to capture prey. Newly mown or harvested crops have minimal physical obstruction while taller crops, orchards and vineyards do not provide access to prey for these birds.

Another key attribute of agricultural foraging habitats is an abundance of prey. Prey abundance is generally highest in fields where cover, food, and burrows are available for long periods of time. Alfalfa fields are one of the best foraging habitats for Swainson's hawks because the crop generally remains in place for three to seven years and consequently provide some long term habitat for gophers, meadow mice, and other rodents. Alfalfa fields also go through a rotation of mowing, hay baling, and flooding that makes rodents susceptible to predation. Swainson's hawks are known to follow harvesters and other farm equipment working the fields.

Seasonal crops make good habitat for prey by providing good food value and cover during the growing season, but these fields are generally kept in a plowed and weed-free condition over winter and do not sustain prey. Nearby strip habitat associated with canals, ditches, fence-lines, railroad tracks, riparian habitat or other ruderal lands provide a refuge for over-wintering prey. These areas are a source for colonization of agricultural fields during the next growing season. This waxing and waning of habitat and prey abundance follows the annual cycle of many agricultural crops and is coincidental with the foraging needs of Swainson's hawks.

Swainson's hawks also consume reptiles and insects. Large insects represent a significant portion of the hawk's diet during parts of the year. Dragonflies, grasshoppers, and cicadas are the insects most likely to be taken. The habitats that produce these prey represent another form of habitat to be considered. Dragonflies usually undergo portions of their life cycle in aquatic habitats, permanent wetlands, fresh water canals and waterways, and rice fields. Grasshoppers and cicadas lay eggs in deep cracks in the soil or between the soil and rocks, tree or shrub roots, and other openings, including the space under the bark of dead trees, logs, or other cracks where moist detritus is present. The eggs remain in the soil until the resultant larvae develop and emerge. These habitats are also associated with the riparian corridor and non-farmed strip habitats discussed above. Large insect production is increased by the creation or enhancement of moist soils habitat.

Swainson's hawk survival and recruitment requires two broad habitat categories - habitats that provide a nesting substrate and those habitats that provide or enhance a forage base. It is important to recall that foraging habitat should be as close as

possible to nesting habitat. Neither habitat alone will sustain the Swainson's hawk in California.

#### CONSERVATION STRATEGY

Based on the biological needs for both habitat types and the discussions regarding mitigation at the lower ratio of 0.5 to 1, appropriate mitigation as part of this settlement offer would include two components. The first component would comprise 50% of the mitigation requirements and would consist of lands managed under existing agricultural practices.

The second component would comprise the other 50% of the mitigation requirements and would be more actively managed to increase the carrying capacity of the land for Swainson's hawks. Because both foraging and nesting habitats are required, this requirement would be met through three conservation strategies: development of riparian habitat, development of habitat on upland or alluvial soils, and development of enhanced foraging habitat on lands under modified agricultural cultivation. These three components could be provided in roughly equal parts but the offer could include the ability to deviate from this if both parties agreed. The conservation strategy employed should be site specific to assure success.

Each of the habitat components is further described below. This settlement offer would propose that mitigation lands be in the areas designated on the attached maps in 80 acre minimum parcels and managed under one of the following protocols. If a smaller parcel was proposed or if land outside of the areas designated on the maps was proposed, a process could be incorporated into the settlement offer to allow DFG to approve of those acquisitions.

Mitigation lands under each classification may be used for other legal activities consistent with the management of the lands. Legal hunting and fishing during the sport season would be allowable. Creating an off-road vehicle park would not be allowed.

#### CONSERVATION STRATEGY: EXISTING AGRICULTURAL LANDS

Maintenance of existing agricultural practices is the form of Swainson's hawk habitat mitigation that is most compatible with current agricultural practices for those crops that provide foraging habitat for the hawk; alfalfa, other hay, pasture, tomatoes, sugar beets, cereal grains, and other row crops that do not mechanically prevent foraging.

Orchards and vineyards would be excluded under this habitat classification for Swainson's hawks for the reasons described

above. Asparagus is another crop that does not provide good foraging habitat for the Swainson's hawk and would be excluded because it becomes too tall during a good part of the year and is a perennial plant with fields dedicated to its culture year after year.

Corn is another tall crop that prevents foraging during substantial portions of the year. However unlike asparagus, corn is present only one season out of each three or four year period. Corn is not ruled out as a component of agricultural/conservation easements for Swainson's hawks because it is an annual crop in the normal agricultural crop rotation practiced in most areas. As part of this settlement offer, corn could be allowed on the mitigation lands if we would resolved issues related to the existing acreage on site currently planted in corn.

On these lands pesticide or herbicide use would not be restricted except as the use of these substances is controlled by label restrictions and coordinated with the County Agricultural Commissioner's Office. The crops planted or their rotation would not be restricted other than to exclude orchards, vineyards, and crops like asparagus. These lands would preserve normal agriculture that has proven to be compatible with Swainson's hawks.

Annual monitoring on these lands would be limited to ensuring that the lands were still under agricultural cultivation in an appropriate crop.

#### CONSERVATION STRATEGY: ENHANCED SWAINSON'S HAWK HABITAT

The portion of the habitat where the carrying capacity is to be improved would include both foraging and nesting habitats. This section contains three habitat prescriptions for the wet soil riparian species, the upland or alluvial species, and for enhanced foraging habitat on agricultural lands.

Vast California riparian forests have been reduced to less than 10% of historic levels. These habitats were perpetuated in California's flood plains prior to extensive flood control measures undertaken in conjunction with agriculture and urbanization. The necessity of modern day flood control measures, and requisite policies to prevent or reduce the growth of vegetation on levees precludes many options for enhancing riparian forests along most leveed waterways. However, there are many examples of riparian strips, bands, or riparian habitat remnants existing throughout the Sacramento Valley the Sacramento-San Joaquin River Delta and portions of the San Joaquin River. Efforts to preserve and expand or enhance these existing sites should be a primary mitigation goal. Habitat enhancement activities may need to be modified based on site

characteristics such as soil type, water table depth, the amount and proximity of other habitats and other site specific factors.

PRESCRIPTION FOR WET SOIL  
RIPARIAN HABITAT

- \* Plants must have their roots in the water table or they will not survive.
- \* Plantings may require irrigation until their roots reach the water table.
- \* Best sites are along waterways within existing levees, if allowed.
- \* If plants are prohibited within levees, plants may be planted on the land-side of levee toe drains.
- \* Minor canals and drains, not associated with flood control, may provide the necessary soil moisture for plantings to be effective along these waterways if compatible with other land use and agricultural purposes.
- \* Where none of the above wet soil conditions apply, construction of waterways, small canals or a network of ditches, may provide the wet soil required. An existing rice field could be an outstanding site. These more intensive measures take land out of agricultural production and would likely demand ownership in fee.
- \* The most important goal of site selection is to expand on existing belts of riparian habitat. A secondary goal is to restore historical riparian habitat and to provide riparian corridors for connectivity.
- \* Native plant species shall be used and should include:

Thinned to 50 foot centers  
Fremont cottonwood  
western sycamore

Thinned to 30 foot centers  
Gooding's black willow  
red willow  
Oregon ash

Planted on ten foot centers  
sandbar willow  
narrowleaf willow  
alder  
box alder  
buckeye

Scattered seeds and plantings

wildrye  
California buckwheat  
melic  
lotus  
California rose  
canary grass  
fat-hen  
swamp timothy

PRESCRIPTION FOR UPLAND  
OR ALLUVIAL SOILS WOODLAND HABITAT

- \* May be planted on well-drained soils and soils with deep water tables.
- \* Will require initial irrigation.
- \* Some species also tolerate wet soils and can bridge between wet and dry soils to provide continuous habitat.
- \* May be planted in small clumps or units that provide "islands" in the middle of agricultural fields, especially the valley oak and black walnut trees.
- \* When solitary trees are planted, native grasses, forbs and shrubs should be planted to at least the drip line to avoid root damage and over-watering.
- \* Native plant species shall be used and should include:

Thinned to 100 foot centers

valley oak  
interior live oak

Thinned to 50 foot centers

northern California black walnut

Thinned to 30 foot centers

blue elderberry  
buckeye  
California bay

Scattered grasses and forbs

vetch species  
clovers  
buckwheat  
atriplex  
fescues  
stipas

Scattered grasses and forbs (continued)

oats  
native bromes

**PRESCRIPTION FOR ENHANCED FORAGING HABITAT**

- \* Foraging habitat can be developed using the suggested native grass and forb species listed under the upland habitat prescription.
- \* Existing agricultural lands can be used for this habitat type if normal farming activities are modified to increase the forage base. Examples of acceptable activities include delayed first mowing of alfalfa or other hay types, portions of a crop left standing to provide prey food and cover, or the inclusion of hedge row areas on field borders.

The wet soil and alluvial soil habitats represent the types of enhanced habitat primarily formulated to benefit nesting Swainson's hawks. The enhanced foraging habitat prescription provides enhanced foraging habitat over and above that normally provided by production agriculture. All three of these generic habitats require specific management activities and related costs.

Adequate buffers must be provided to isolate all forms of enhanced habitat prescriptions from existing production agriculture or other incompatible land uses. The prescribed conservation habitats may abut, however there must be a buffer between the enhanced areas and areas where herbicide or pesticide use, inconsistent with the intent of the conservation plan, would occur. The buffer area would likewise protect any structures from falling tree limbs or agricultural crops from weeds and other pests. In many instances the prescription for enhanced foraging habitat could be used as a buffer. Any reduced crop production within the enhanced foraging/buffer area would be addressed and compensated by the easement.

**MONITORING AND MAINTENANCE ON ENHANCED HABITAT**

Habitat improvements would need to be monitored on an annual basis. Minimum standards are to achieve the goal statements as further detailed in individual site specific plans. Criteria would be set annually to meet the goals outlined in the five year prescription.

In addition to the annual monitoring, the following activities would need to be conducted yearly:

- \* Control of noxious weeds per the Agricultural Commission.

- \* Control of invasive weeds that could adversely impact success of mitigation plantings.
- \* Necessary maintenance of irrigation systems if needed.
- \* Control of illegal trespass and dumping employing signs and or fencing, as needed.

#### GUIDELINES FOR INDIVIDUAL PARCEL ACCEPTANCE

1. Submit a conceptual habitat plan and location map to the Department of Fish and Game for each parcel intended for mitigation. The conceptual plan will identify which prescription will be used, how the property will be secured (ie. fee title or easement), and what the current land use is including, crop acreage for the previous 5 years.
2. After the Department of Fish and Game approves the concept plan, a more detailed plan that specifies the types and numbers of plants to be used and the planting locations. The plan should also specify the success criteria for habitat improvements and remedial actions designed to assure success within a five year period to meet the spacing standards for vegetation in the selected prescription.
3. Sufficient financial guarantees that annual operation and maintenance be performed and that an annual monitoring report for each site be provided in perpetuity. This can be in the form of an O&M trust account or through an assessment. These financial assurances must specifically address the costs of water required for the plan.
4. After the specific plan is adopted it can become the basis for the conservation easement developed for that parcel. The conservation easement is the legal document which shall specify deed restrictions, the provisions for adequate water for enhancement, the management of the lands, and detail access for inspection and other purposes to the satisfaction of the lessee and lessor. Lands may also be provided by fee-title acquisition.
5. After the conservation easement is ratified including deed restrictions and establishment of required trust accounts or other fees including the Department of Fish and Games costs for recording the deed, the habitat lands shall be incorporated as mitigation appropriate for this settlement.



## GENERAL EASEMENT TOPICS

- \* All easements are voluntary.
- \* All easements run with the deed and are in effect for perpetuity.
- \* All habitat enhancement is site specific according to soil types, water depth, and local habitat needs. For example, wet-soil riparian will not succeed on sandy soils. A positive example would be planting a solitary oak in agricultural fields to provide nesting opportunity where no local trees exist.
- \* Enhanced Habitat Easements are managed intensively and may reduce or preclude agricultural production. Landowners are paid the full-fee value for enhanced easement lands that totally preclude agricultural production.
- \* Agricultural/conservation easements have no effect on production of specified crops. Landowners are paid 50 percent of fee value for agricultural/conservation easements.
- \* Landowners are paid between 100 and 50 percent of fee value for easement lands managed to produce foraging habitat, depending on the degree of lost agricultural production.
- \* Easement lands may be used for other legal activities consistent with the purpose of the easement. Legal hunting and fishing during the sport season would be allowable. Creating an off-road vehicle park would not be allowed.