

Nests of Swainson's Hawks in Solano and Yolo Counties

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I began monitoring a small number of nests of Swainson's Hawks (*Buteo swainsoni*) in Yolo County in 1998. I gradually expanded my area of observation over several years while focusing on the counties of Solano and Yolo. In 2004 I attempted to search the flat areas of Yolo County as well as Solano County east of Vacaville. All of these nests have been reported to the California Natural Diversity Database maintained by the Department of Fish and Game. This article reports what I found in 2004 and 2005.

Most of my observations have been made from public roads, but private roads have been used where permission has been granted. Most observation has been from a substantial distance in order to minimize disturbance of the birds and because many nests are inaccessible. For that reason, eggs were not seen, and chicks were not detected while small.

In this report, I considered a nest active if the breeding code as used for the European Bird Census Council's (EBCC) European breeding bird atlas project (Hagemajer and Blair, 1997) was seven or greater. The list of those codes (omitting situations which were inapplicable because of the species or because of the methods of observation) is as follows:

Possible breeding:

- 1 Species observed in breeding season in possible nesting habitat

Probable breeding:

- 3 Pair observed in suitable nesting habitat in breeding season
- 4 Permanent territory presumed through territorial behavior on at least two different days a week or more apart at the same place
- 5 Courtship and display
- 6 Visiting probable nest site
- 7 Agitated behavior or anxiety calls from adults
- 9 Nest building

Confirmed breeding:

- 11 Used nest or eggshells found
- 12 Recently fledged young
- 13 Adults entering or leaving nest site in circumstances indicating occupied nest (including high nests, the contents of which cannot be seen) or adult seen incubating
- 14 Adult carrying food for young
- 16 Nest with young seen

Only the southern part of Yolo County was searched in 2005 so the findings are divided into Solano County, the portion of Yolo County searched only in 2004 and the portion of Yolo County searched in both years. Large areas were not searched in both areas because access was not obtained or by choice.

Substantial areas known or presumed to contain nests of Swainson's Hawks which were not searched include the cities, University of California campus, riparian strips along the principal waterways (Sacramento River, Cache Creek, Putah Creek, most of Willow Slough) and the Yolo Bypass. Some nests which were accidentally found in some of those locations have been included.

RESULTS AND DISCUSSION

The choice of an EBCC code of at least 7 to define active nest sites was arbitrary. It yielded 144 active sites detected in Solano County in 2005 (Table 1). Choosing an EBCC code of at least 10, which is the lower limit for confirmed nesting, reduces the number to 130. Choosing an EBCC code of at least 3, which is the lower limit for probable nesting, raises the number to 166. Using all applicable EBCC codes raises the number to 196. In Solano County, 106 fledglings were detected at 73 nest sites in 2004, and 161 fledglings were detected at 109 nest sites in 2005. In Yolo County, 147 fledglings were detected at 104 nest sites in 2004, and 40 fledglings were detected at 30 nest sites in 2005.

Townships T7N R1E, T7N R2E and T6N R1E are contiguous and lie entirely within Solano County with a combined area of approximately 279.7 square kilometers (108 square miles). Using an EBCC code of at least seven to define active sites, 26, 32 and 33 sites were detected in these townships in 2005 for a density of 3.25nests/10 square kilometers (84.3nests/100 square miles). Using an EBCC code of at least 1, those numbers become 33, 33 and 35 for a density of 3.61nests/10 square kilometers (93.5nests/100 square miles).

No valid inference can be drawn from these data about possible change in population between 2004 and 2005. The amount of time and effort which were available to search and monitor the excessively large area in 2004 were entirely inadequate. Substantially more time and effort were applied to a much smaller area in 2005 but were still inadequate to approach complete detection of either nests or fledglings. Substantially more nests and fledglings must have been missed in 2004.

Bloom (1980) attempted an inventory of Swainson's Hawk nesting sites for the entire state in 1979. He found 110 sites and estimated the total number of pairs in California to be 375. Four of the 110 were reported to be in Solano County, all described as "near Davis" which is in Yolo County on the border with Solano County. Two were in Valley Oaks (*Quercus lobata*) and two in unidentified trees. His definition for a nesting territory was "...the

location where at least one adult Swainson's hawk was observed, even if the nest was not found. Later, during the post-fledgling period, this definition was expanded to include recently fledged nestlings." This definition applied to my 2005 data would yield a number of sites for Solano County even larger than the 196 which resulted from use of all applicable EBCC codes. Yet large parts of Solano County were not searched in 2005.

Table 1. Tree types used by Swainson's Hawks for nests in Solano and Yolo counties in 2004 and 2005 (nests with EBCC code 7 or greater).

Tree type	Solano County		Yolo County			
			part searched only in 2004	part searched in both years		2005
	2004	2005		2004	2005	
n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	
Eucalyptus ¹	34 (33)	52 (36)	9 (8)	11 (24)	11 (22)	
Walnut	34 (33)	46 (32)	33 (31)	11 (24)	12 (24)	
(<i>Juglans</i> spp.)						
Oak	1	2	33 (31)	5 (11)	5 (10)	
(<i>Quercus</i> spp.)						
Cottonwood	6 (6)	5 (3)	11 (10)	5 (11)	4 (8)	
(<i>Populus</i> spp.)						
Willow	6 (6)	6 (4)	5 (5)	3 (7)	4 (8)	
(<i>Salix</i> spp.)						
Black locust	7 (7)	9 (6)	5 (5)	2 (4)	0	
(<i>Robinia pseudoacacia</i>)						
Sycamore	0	2	1	2	1	
(<i>Platanus</i> spp.)						
Other exotic ²	16 (15)	18 (13)	8 (8)	5 (11)	5 (10)	
Unknown	0	4	1	1	8	
Total	104	144	106	45	50	

1 = Most of the eucalyptus were Blue Gum (*Eucalyptus globulus*), but a few were Red Gum (*E. camaldulensis*).

2 = Other exotic includes Almond (*Prunus dulcis*), Arizona Ash (*Fraxinus velutina*), Deodar Cedar (*Cedrus deodara*), elm (*Ulmus* spp.), hackberry (*Celtis* spp.), Osage Orange (*Maclura pomifera*), pine (*Pinus* spp.), palm. Some of the willows and one of the walnuts were also exotics.

Bloom (1980) reported the identified tree types used for nesting in the Central Valley in 1979 to be cottonwood (6), oak (13), willow (1), and eucalyptus (1). One third of the nests found in Solano County in 2004 and 2005 were in eucalyptus, and another third in walnuts in Solano County as well as

Table 2. Swainson's Hawk nest sites environments observed in Solano and Yolo counties in 2004 and 2005 (nests with EBCC code 7 or greater). Occupied farmstead includes rural residences with structure similar to a farmstead regardless of the occupations of the residents. Vacant farmsteads may or may not still have buildings. A nest in a roadside tree in a farmstead is classed as farmstead. Most of the roadside nest sites were on public roads, but some were on private roads. Grove is a small area with the structure of a forest, with continuous canopy; the trees are occasionally native but usually eucalyptus.

Nest site environment	Solano County		part searched only in 2004 n (%)	Yolo County part searched both years	
	2004 n (%)	2005 n (%)		2004 n (%)	2005 n (%)
Occupied Farmstead	29 (28)	43 (41)	19 (18)	8 (18)	9 (18)
Vacant					
Farmstead	12 (12)	14 (10)	6 (6)	6 (13)	3 (6)
Roadside	32 (31)	46 (44)	46 (43)	13 (29)	18 (36)
Pasture or					
Cropland	19 (18)	23 (16)	28 (26)	6 (13)	7 (14)
Urban	2	4	3	5	5
Grove	2	4	0	3	1
Native					
Woodland	2	2	2	0	0
Orchard	1	1	0	0	0
Riparian	3	6	2	4	7
Cemetery	2	1	0	0	0
Total	104	144	106	45	50

the larger part of Yolo County which was searched only in 2004 (Table 1). Eucalyptus were less frequent in Yolo County, but in the southern part accounted for more than a fifth of the sites. Two nests in Solano County in 2004 were in palms. Each fledged one. One of these sites was in a Black Walnut (*Juglans californica*) in 2005. The other repeated nesting in the palm in 2005 and fledged two. The latter had nested in a small pine adjacent to the palm in 2001 fledging one and in 2002 fledging three.

It is clear from Tables 1 and 2 that the distribution of tree types in which Swainson's hawk nests are found depends on the area searched. If I had searched by boat instead of automobile, I would have encountered a different distribution of tree types and site types. Many areas in Solano County have only eucalyptus. Half the nests in the part of Solano County which was searched were in exotic trees. The only native tree available in numbers in that part of the county is Black Walnut, and it is absent from many areas in the county. These distributions cannot be generalized to the Central Valley as a whole. As the type of tree used for nesting is greatly influenced by the types of trees available, no inference can be drawn about preferences of Swainson's Hawks for tree types or site types from surveys of this sort.

The nests found in orchard trees in 2004 and 2005 were in the same orchard and in trees very close together. No chicks were detected in either. Perhaps this was coincidental, but perhaps orchard spraying practices cause such locations to be population sinks.

LITERATURE CITED

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