Swainson's Hawk Use of Utility Poles and Similar Structures as Nest Sites

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Swainson's Hawks (*Buteo swainsoni*) in California occur primarily in the Central Valley, northeastern California, and some Great Basin and Mojave Desert areas. They are migratory and typically begin arriving in the Central Valley from the wintering grounds in Mexico, Central America, and South America in March to breed and nest (Airola et al. 2019). A statewide population reduction detected in the late 1970s attributed mainly to habitat loss—including the conversion of native habitats to agriculture (Bloom 1980) —resulted in the 1983 listing of the species as Threatened under the California Endangered Species Act. Since then, population monitoring has detected a gradually increasing population through the 1980s and 1990s in the Central Valley and a more accelerated increase since the mid-2000s (Battistone et al. 2019, Furnas et al. 2022).

In the Central Valley, the abundance and distribution of the Swainson's Hawk is closely associated with the distribution of compatible agricultural foraging habitats and suitable nesting habitats (Estep 1989, Bechard et al. 2020). Larger and more dense nesting populations occur in the southern Sacramento and northern San Joaquin valleys where suitable foraging and nesting habitats are more abundant than in the central and southern San Joaquin Valley (Battistone et al. 2019). Suitable nesting trees are absent from large areas of the central and southern San Joaquin Valley, limiting the abundance and distribution of the species (Estep and Dinsdale 2012).

In the Central Valley, Swainson's Hawks nest in riparian woodlands, patches of oak woodlands, tree rows along field borders and roadsides, large solitary trees in open fields, trees in farmyards and rural residential settings,

and less frequently in urban areas or within the urban-rural interface (England et al. 1995, Pandolfino et al. 2021). Nests are usually within or adjacent to suitable agricultural or grassland foraging habitat, including hayfields, rotated irrigated cropland, and pasturelands (Bechard et al. 2020).

Central Valley Swainson's Hawks typically build or reuse nests in large trees, such as valley oak (*Quercus lobata*), Fremont's cottonwood (*Populus fremontii*), willow (*Salix* spp.), walnut (*Juglans hindsii* x *regia*), western sycamore (*Platanus racemosa*), Eucalyptus (*Eucalyptus* spp.), and ornamental redwoods (*Sequoia sempervirens*) and pines (*Pinus* spp.; Bechard et al. 2020, Estep 2020, Estep and Dinsdale 2012). Outside of California, they have also occasionally been reported to build their nests on wooden utility poles and similar power distribution structures. For example, Swainson's Hawk nests have been reported on the crossarms of a telephone pole in Wyoming (Dunkle 1977), on a railway signal gantry in Saskatchewan, Canada (James 1992), and on wooden poles in Saskatchewan, Alberta, and Washington state (Fitzner 1978, Munro 1935, Schmutz 1984). In Alberta, Swainson's Hawks have also been reported to use specially designed nesting poles (Schmutz et al. 1984).

In California, Swainson's Hawks have not previously been reported to use artificial structures for nesting. Here we report recent Swainson's Hawk use of wooden power poles and other utility structures as nest supports, including four sites in the San Joaquin Valley and two sites in the Sacramento Valley. All locations were found during systematic localized surveys or monitoring efforts. The four San Joaquin Valley sites were found during surveys conducted for a 112 km-long infrastructure project in Fresno, Kings, and Tulare counties. One Sacramento Valley site was found during driving transect surveys conducted to assess Swainson's Hawk use of a solar facility in Sacramento County, and the other during annual monitoring surveys of the Swainson's Hawk nesting population in Yolo and northern Solano counties.

The first San Joaquin Valley nest site was discovered on 7 June 2018 by T. Dayton. An adult Swainson's Hawk was tending to a nestling on a nest constructed on a lattice electrical transmission tower east of Highway 137 and south of Avenue 176, 1.3 km east of the city of Corcoran, Tulare County (Figure 1). The surrounding landscape consisted primarily of orchard intermixed with hayfields to the east and northeast. This entire area is largely devoid of suitable nest trees. Within 2 km of the nest site, the only potential nest trees include ornamental trees surrounding a rural residence approximately 0.3 km west of the site and several ornamental trees at the Corcoran Cemetery, 1.3 km north of the site. On 19 June 2018, a single nestling, approximately 2–3 weeks old, was observed in the nest. The nestling may have fledged, but the exact status is unknown.



Figure 1. Tower nesting site at the Orange Avenue and California State Highway 137 intersection. Photo by T. Dayton.

The second San Joaquin Valley nesting site was discovered on 10 May 2020 by T. Dayton. The Swainson's Hawk was observed in an incubation position in a nest on a utility pole east of Highway 43 and on the north side of Avenue 84, 6.6 km northeast of the city of Alpaugh, Tulare County (Figure 2a). The surrounding landscape consisted primarily of havfields and grazing lands and was mostly devoid of suitable nest trees. The only potential nest tree within 2 km of the nest site was along a canal 1.3 km southwest of the site. On 13 July, the nest had fallen out of the utility pole and the two prematurely fledged nestlings that were incapable of flight were hiding in vegetation beneath the pole (Figure 2b). Both adults fed the nestlings on the ground. On 17 July, the young were still on the ground, apparently in good health, being tended to by the adults. On 3 August, one juvenile was perched on a utility pole near the nest with an adult perched nearby, presumably tending to it. It is unclear if the second juvenile had successfully fledged, though Dayton observed no signs of predation. Since 2020, T. Dayton has not observed the Swainson's Hawks re-nesting at this site.



Figure 2a. Pole nesting site east of Highway 43 and on the north side of Avenue 84, 6.6 km northeast of city of Alpaugh, Tulare County.



Figure 2b. Fledgling Swainson's Hawks on the ground near the base of the nest site after the nest fell from the pole. *Photos by T. Dayton.*

The third San Joaquin Valley nesting site was discovered 7 April 2022 by T. Dayton. A Swainson's Hawk was nest-building on a utility pole adjacent to Avenue 56, 3.5 km east of Alpaugh (Figure 3a). A previous nest 0.4 km north of the Avenue 56 site was in a cottonwood tree on private property in 2020 and 2021. The tree began to die in 2021 and was cut down later that year. The removal of the cottonwood tree appears likely to have caused the Swainson's Hawk pair to move to the utility pole. The surrounding landscape consisted primarily of row crop and hayfield agriculture and solar facilities. The area was largely devoid of suitable nest trees, with no potential nest trees within 2.0 km of the nest site. By 28 April, the nest was fully constructed on the crossarms of the pole. On 2 May, a Swainson's Hawk was in an incubating position and by mid-June a single chick, approximately two weeks old, was observed in the nest (Figure 3b).



Figure 3a. Pole nest site adjacent to Avenue 56, 3.5 km east of the town of Alpaugh, Tulare County.

Figure 3b. Chick in nest.

Photos by G. Biddy and T. Dayton.



The fourth San Joaquin Valley nest site was discovered 3 May 2022 by T. Dayton. A Swainson's Hawk was in an incubation position in a nest on a utility pole south of Jersey Avenue and on the west side of 7th Avenue, 6 km southeast of city of Hanford, Kings County (Figure 4). A single chick, approximately two weeks old, was in the nest in early June 2022. The surrounding landscape consisted of dairy farms and hayfields intermixed with orchards and row crops. Suitable nest trees were somewhat more abundant in this area, but largely limited to ornamental trees around rural farmsteads and scattered trees along irrigation ditches and channelized streams, such as the East Branch Lakeside Ditch, 1.6 mi east of the nest site.



Figure 4. Pole nest site south of Jersey Avenue, on the west side of 7th Avenue, 5.9 km southeast of city of Hanford, Kings County. *Photo by T. Dayton.*

The first Sacramento Valley nest site was discovered on 16 June 2018 by J. Estep. The nest was in a wooden utility pole crossarm with two downy young (Figure 5) on the south side of Becker Road, 1 km east of Old Davis Road in Solano County, 3 km south of the city of Davis. The surrounding landscape consisted of row crops and hayfields with scattered rural homes. Although nesting habitat was limited in the immediately vicinity of the nest, it was relatively abundant in the surrounding area. The South Fork of Putah Creek, which supports abundant nesting habitat, is 1.6 km north of the site. This area supported a large, dense Swainson's Hawk nesting population, particularly to the north of the site (Estep 2020). Apart from rural residential trees approximately 0.4 km east of the site, the nearest suitable nesting habitat was 1 km away, where many suitable trees grew along roadsides and field borders. Most of these areas were occupied by other nesting Swainson's

Hawks or Red-tailed Hawks (*Buteo jamaicensis*; Estep 2020). On 10 July 2018, J. Estep observed both nearly fledged young perched on the wooden crossarm (Figure 6). After fledging, this nest rapidly deteriorated, and the site was not used in subsequent years.



Figure 5. Swainson's Hawk nest on wooden utility pole, Becker Road, south of Davis, Solano County.

Photo by J. Estep.



Figure 6. Becker Road nest site with two nearly fledged young.

Photo by J. Estep.

The second Sacramento Valley nest site was discovered on 18 April 2021 by J. Dinsdale. A Swainson's Hawk nest was on a crossarm tower within an electrical substation that serviced an adjacent solar power facility (Figure 7) 3 km east of Bruceville Road and 0.8 km south of Kammerer Road and the city of Elk Grove, Sacramento County. Other than the solar array, surrounding land use was agricultural, consisting of row and hay crops, orchards, vineyards, and grazed pasturelands, with urbanization encroaching on the north from Elk Grove. Nesting habitat was limited in the immediate vicinity of the nest. Within 2 km of the nest, suitable nest trees were associated mainly with rural homesteads and several isolated single trees. However, nesting habitat in the larger, surrounding area was relatively abundant, including numerous trees along the Cosumnes River, 3.3 km southeast of the site, and this area supported a large, relatively dense Swainson's Hawk nesting population (Estep 2007). Dinsdale regularly monitored the site through fledging of the single chick (Figure 8). Use of this site in 2022 is undetermined.



Swainson's Hawk nest on tower at Kammerer Solar facility substation, south of Elk Grove. Sacramento County.

Photo by J. Dinsdale.

Figure 8. Swainson's Hawk adult feeding nestling at nest on tower crossarm at Kammerer substation.

Photo by J. Dinsdale.



Central Valley Birds, Summer 2022

Several regional surveys conducted in the Central Valley that identified over 1,600 Swainson's Hawk nest sites since 1987 from all regions of the Central Valley (Estep 1989, 2007, 2017, 2020; Jones & Stokes Associates 1990; Estep and Dinsdale 2012; Gifford et al. 2012; ICF 2020) reported no use of utility or other artificial structures. Lack of pole or tower use reported in these studies suggests that use of human structures is a recent phenomenon in California that may be driven in part by the increasing Swainson's Hawk nesting population (Battistone et al. 2019, Furnas et al. 2022).

Swainson's Hawk use of utility structures as nesting sites also may result from a lack of suitable nest trees within an otherwise suitable area. The San Joaquin Valley supports many areas with substantial amounts of crops used by foraging Swainson's Hawks that lack trees suitable for nesting (Estep and Dinsdale 2012). Nest tree availability is substantially greater in the Sacramento Valley but was lacking in the immediate area of the two Sacramento Valley structure sites. The nesting population in the Sacramento Valley is also larger and the breeding density much greater than in the San Joaquin Valley (Furnas et al. 2022), potentially relegating some nesting pairs to less-than-optimal sites.

Utility poles and other structures, especially if outfitted with nesting platforms to avoid potential electrocution hazards, may benefit Swainson's Hawks by allowing them to expand into areas—mainly in central and southern San Joaquin Valley—where foraging habitat is suitable, but nest sites are limited or lacking. Similarly, Osprey (Pandion haliaetus) use of utility poles and installation of nesting platforms on poles to protect them, likely contributed (along with other factors) to the species' population recent increase and range expansion in the Central Valley (Airola and Estep 2022, Airola and Pandolfino 2022). Swainson's Hawk use of utility poles similarly poses risks of electrocution and power outages but may have potential to support a population increase where nesting habitat is limited or lacking. Where nesting habitat is more abundant and supports relatively dense and expanding breeding populations, such as the Sacramento Valley, artificial structures may increase breeding density by creating new nesting opportunities (Schmutz et al. 1984). Currently, however, the few reported examples of structure use in the Sacramento Valley suggest incidental use and an uncertain future benefit.

Swainson's Hawks in the Central Valley have adapted substantially to human landscapes, relying primarily on cultivated agricultural lands for foraging in breeding, migration, and wintering areas (Estep 1989, Airola et al. 2019, Nur et al. 2019). Nesting platforms may be useful in expanding the range of the species by establishing nesting territories in unoccupied areas of the San Joaquin Valley. However, reestablishing sustainable nesting populations should be done in concert with a long-term strategy of restoring native habitats and planting native trees within foraging and breeding areas where suitable nest trees are currently lacking. Unlike artificial nesting platforms, restoring and expanding riparian habitat along streams, creating small woodlots, and planting trees along roadsides and field borders, increases nesting and roosting habitat, provides vegetative cover and protection from predators, and expands habitat and refugia for prey species. More research is needed to determine if Swainson's Hawks will readily adapt to nesting platforms attached to utility poles and other similar structures or to strategically placing poles with nesting platforms in suitable foraging areas within the Central Valley. If so, this adaption could lead to population increase and improve conservation prospects for the species. We recommend that electrical utility companies deploy nesting platforms on utility poles where nests occur and monitor nesting success.

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Volume 25 Number 3

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