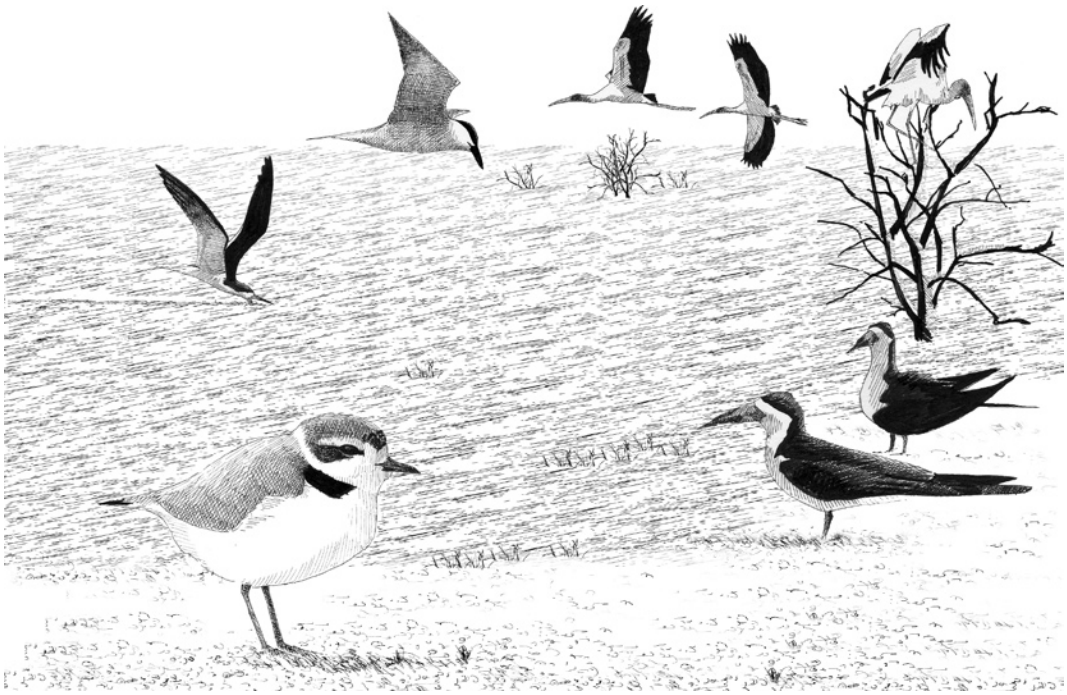
II

Species Accounts



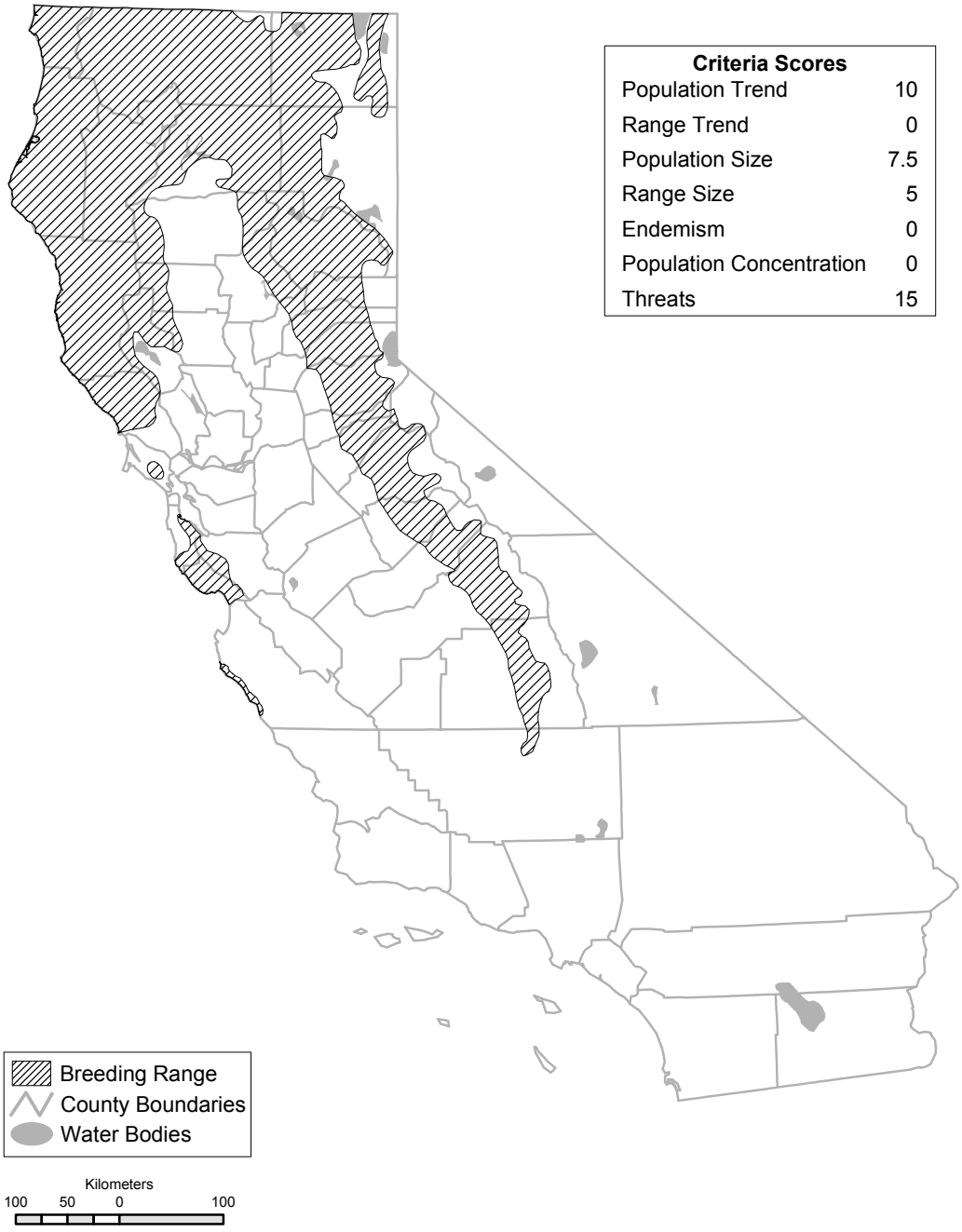
Andy Birch

PDF of Vaux's Swift account from:

Shuford, W. D., and Gardali, T., editors. 2008. California Bird Species of Special Concern: A ranked assessment of species, subspecies, and distinct populations of birds of immediate conservation concern in California. Studies of Western Birds 1. Western Field Ornithologists, Camarillo, California, and California Department of Fish and Game, Sacramento.

VAUX'S SWIFT (*Chaetura vauxi*)

John E. Hunter



Breeding range of the Vaux's Swift in California; the species is far more numerous in the coastal Redwood zone in the northwestern portion of the state than elsewhere. Outline of the overall breeding range is stable, but numbers of breeders have declined at least moderately. Occurs more widely during migration, when birds may congregate at large communal roosts.

Special Concern Priority

Currently considered a Bird Species of Special Concern (breeding), priority 2. Included on the previous special concern list (CDFG 1992).

General Range and Abundance

One of seven subspecies, *C. v. vauxi* is the only one known to occur north of Mexico, where it breeds in western North America from southeastern Alaska, southern British Columbia, northern Idaho, and western Montana south to central California. Migrates in breeding range and to east from Idaho, Nevada, and Utah south through the southwestern United States, Baja California, and western Mexico. Winters from central Mexico south throughout the breeding range of the other subspecies in Middle America and in Venezuela (AOU 1998). There are no reliable quantitative estimates of abundance for the species.

Seasonal Status in California

Occurs primarily as a migrant and summer resident from mid-April to mid-October; breeds from early May (Bent 1940) to mid-August (Hunter et al. 2005). Occurs rarely and irregularly in winter in southern California (Garrett and Dunn 1981).

Historic Range and Abundance in California

Grinnell and Miller (1944) described the Vaux's Swift as "common" in summer and breeding in a narrow coast belt from the Oregon border in Del Norte County south to Santa Cruz, Santa Cruz County. Historic locations of confirmed breeding in the coast belt include sites in Humboldt and Santa Cruz counties (Bendire 1895, Taylor 1905). Observations of birds at other possible breeding locations included locations in Sonoma, Marin, and San Mateo counties (Grinnell and Wythe 1927).

Grinnell and Miller (1944) also reported this species as "occasional" in summer in the Sierra Nevada but lacked evidence of nesting; observations of birds at possible breeding locations along the Cascade-Sierra axis were from Siskiyou, Tehama, Lassen, Plumas, Sierra, and Fresno counties. Grinnell and Miller (1944) noted migrants occurred practically statewide, with reports of flocks sometimes numbering in the hundreds to tens of thousands (Sheldon 1922, Michener 1933, Watson 1933).

Recent Range and Abundance in California

The breeding range on the northern and central coast appears to have changed little since 1945 (see map); this area still contains most of California's population (Sterling and Paton 1996). It is uncertain whether recent records in northeastern California or coastwise in Santa Clara and Monterey counties (Roberson and Tenney 1993, Sterling and Paton 1996, FN 52:500) represent a range expansion, better observer coverage, or the latter after recolonization by swifts following regrowth of logged forests; if the former, it may reflect displacement of birds by habitat removal in the Redwood (*Sequoia sempervirens*) zone.

The range of the Vaux's Swift in coastal California generally follows the distribution of Redwoods, but probably is patchy because of forest fragmentation. Although lacking prior to 1945, confirmed breeding records now exist for Del Norte, Mendocino, Sonoma, Marin, San Mateo, and Santa Clara counties (Sibley 1952, Sterling and Paton 1996, Hunter and Mazurek 2003, FN 51:1050). Breeding bird atlas projects confirmed breeding by swifts in 18 (4.2%) of 425 and 9 (4.6%) of 195 survey blocks in Humboldt and Sonoma counties, respectively (Burridge 1995, Hunter et al. 2005). Possible or probable breeding was recorded in 12 (5.4%) of 221 and 3 (0.8%) of 385 blocks in Marin and Monterey counties, respectively (Roberson and Tenney 1993, Shuford 1993). Observations of birds along the Big Sur coast and in the Santa Lucia Mountains, Monterey County, may represent the southernmost breeding locations in the Coast Ranges.

Outside the Redwood zone, small numbers of swifts probably breed locally in an arc from Trinity and western Siskiyou counties east to the Warner

Breeding Bird Survey Statistics for California

1968–2004					1968–1979			1980–2004			All data from Sauer et al. (2005)
Trend	*P*	*n*	(95% CI)	R.A.	Trend	*P*	*n*	Trend	*P*	*n*	Credibility
–2.1	0.41	24	–6.8, 2.7	0.24	–2.0	0.68	12	–2.5	0.37	20	Medium

Mountains, Modoc and Lassen counties, and on the west slope of the Sierra Nevada south to Tulare County (Sterling and Paton 1996). The only confirmed breeding locations for these inland areas are in Modoc, Mariposa, and Tulare counties (AB 28:945, AFN 22:573, FN 52:500). Most breeding season records from the Sierra are at 1500–4500 ft (457–1433 m), with the southern limit of confirmed breeding for the region being at Log Meadow, Sequoia National Park, Tulare County (Sterling and Paton 1996, AB 28:945).

During migration, roosting flocks in coastal counties may number in the hundreds to tens of thousands (Huey 1960, Unitt 1984, Burridge 1995, K. Garrett pers. comm., T. Wodetzki pers. comm.). Many of these migrants undoubtedly nest north of California.

Breeding Bird Survey (BBS) trends in California for the periods 1968–2004, 1968–1979, and 1980–2004 are all negative but not statistically significant, and of medium credibility (Sauer et al. 2005). The loss, however, of about 95% of the original old-growth Redwood forests in California (L. Fox pers. comm.) has undoubtedly reduced swift numbers substantially. Longtime observers consider a decline of this species likely reflects logging of old-growth habitats (S. Harris pers. comm.). Other observers have either predicted or observed that the increasing use of chimneys by swifts for nesting or roosting was a result of the loss of suitable nest trees (Finley and Finley 1924, Bent 1940, Stager 1965). The degree, however, to which this possible shift in habitat use has offset population declines from tree removal is unknown.

Ecological Requirements

The ecology of this species is poorly known in California, but Bull and Collins (1993) summarized studies from elsewhere, mostly northeastern Oregon. These swifts nest in cavities in a variety of trees and less frequently in artificial structures, particularly chimneys. Nests are an open half circle made of small twigs or conifer needles fastened together and to the cavity wall by sticky saliva. Birds may locate nests above or below the opening to the cavity, which they enter via a side hole or an open top. Cavities apparently need to be large enough to allow the birds to fly while within the cavity and place the nest at a distance from the opening that provides a dark, sheltered environment.

Of 33 live or dead Grand Firs (*Abies grandis*) used as nest trees in northeastern Oregon, 20 averaged 25.4 m tall and 67.5 cm dbh (diameter at breast height) and had hollow chambers averaging 28.4 cm in diameter and 5.7 m in length (Bull and Cooper 1991); 13 others averaged 83 cm dbh (Bull and Hohmann 1993). Many tree species are acceptable for nest sites as long as they grow large enough, persist long enough, and have decay, fire, or primary excavators such as Pileated Woodpeckers (*Drycopus pileatus*), or otherwise develop large and accessible cavities. Other nests outside California have been in large broken-top Western Hemlock (*Tsuga heterophylla*) and hollow Big-leaf Maple (*Acer macrophyllum*). Tree species used for nesting in California include Western Sycamore (*Platanus racemosa*.; Bendire 1895), California Red Fir (*Abies magnifica*; AFN 22:573), pine (*Pinus* sp.; B. Williams pers. comm., FN 52:500), and Redwood. While published details are limited, most California nests have been in burned-out and hollow Redwood snags or stumps. One was situated about 0.6 m above the ground in a hollow "stub" that was not over 9 m tall (Taylor 1905). Dawson (1923) also mentioned nesting in hollow Redwood stumps and snags in areas logged and burned over. Bent (1940) mentioned four nests from Eureka, all in hollow Redwood stubs ranging from 5.5 to 18.3 m tall, some of which were burned out and one of which was 3 m in diameter at its base. Nests in California are also located in basal hollows of large-diameter living Redwood trees (Hunter and Mazurek 2003), formed when repeated fires incrementally enlarge the cavity by burning out rotten wood (Fritz 1931). Some such nest trees are in campgrounds, clear-cuts, or other open areas; average canopy closure at nests in northeastern Oregon was 70.8% (Bull and Cooper 1991).

Numerous studies have shown a strong positive association between the presence of Vaux's Swifts and old-growth forests (Bull and Collins 1993), presumably reflecting the swifts' requirement of large cavities for nesting. In California, the highest densities of swifts are found in the Redwood zone, the lowest in the Douglas-fir (*Pseudotsuga menziesii*) and other forest types found further inland (Sterling and Paton 1996). The relationship between swifts and Redwood forests may be explained by characteristics of these trees that favor the formation of large and long-lasting cavities. Redwoods can live over 2000 years and reach >7 m dbh (Sawyer et al. 2000). They are also resistant to fire and decay and will remain standing for very long periods while declining or completely dead. The presence of swifts in second-growth Redwood forests may be explained by the presence of remnant or residual

old-growth trees (Sterling and Paton 1996). These scattered residual trees—formerly left during initial harvest(s) due to the presence of "cull" wood, deformity, or other defect—are often excellent potential nest and roost sites. The unique characteristics of nest trees and, hence, their limited numbers may explain the high degree of traditional nest-site use and individual nest-site fidelity exhibited by this species (Bull and Collins 1996, Hunter and Mazurek 2003).

Vaux's Swifts currently appear to nest in chimneys and other man-made structures more than in the past. Nine of the 12 nests reported in Humboldt County from 1995 to 1999 were in chimneys or other man-made structures (Hunter et al. 2005). These breeding bird atlas data, however, were undoubtedly biased toward the more easily observed chimney nest sites. This bias has also led to many published accounts of chimney and smokestack nesting (e.g., Finley and Finley 1924, Bent 1940, Baldwin and Zaczkowski 1963, Thompson 1977). Vaux's Swifts also occasionally nest in other man-made structures, such as in expansion cracks in a highway bridge in Mendocino County (G. Hazard and J. Hunter pers. obs.), an underground water transfer structure in Humboldt County (Hunter et al. 2005), and under the roof of a water tank in British Columbia (Bent 1940).

During the breeding season, Vaux's Swifts forage in a variety of habitats (especially over water) and at various heights, with small flying arthropods the primary prey; radio-tagged birds have been recorded foraging up to 5.4 km from nests (Bull and Collins 1993).

Vaux's Swifts require trees, snags, chimneys, or smokestacks with large hollows or cavities for nighttime roosting. Large numbers of swifts will roost together, especially during overcast or inclement weather during migration. Birds roost close together, presumably to conserve body heat. Roost sites are found in a variety of forested and urban environments. In northeastern Oregon, three roost sites were in broken-top Grand Fir trees averaging 19 m tall and 115 cm dbh. Eighteen other roost trees in northeastern Oregon were in either Grand Fir or Pacific Ponderosa Pine (*Pinus ponderosa*) and averaged 26 m tall and 77 cm dbh (Bull and Blumton 1997). Other tree species used for roosting include cottonwood (*Populus* sp.; Bendire 1895) and Redwood (Hunter and Mazurek 2003). Although roosting in the open is quite rare, Stager (1965) photographed numerous swifts roosting on the external trunk of a tree near Davis Dam, Arizona.

Threats

Loss of potential nest and roost sites are probably the primary threats to the Vaux's Swift. Although most of the remaining old-growth Redwoods are in protected areas, hazard tree removal and fire-control programs destroy potential nest and roost trees and preclude their development. Within intensively managed second-growth forests, the current high value of old-growth Redwood lumber encourages harvest of residual old-growth trees, though only a small proportion may actually be merchantable (Hunter and Bond 2001). California Forest Practice Rules afford no protection for these trees and allow cutting of snags for a variety of reasons, including safety, fire prevention, and the presence of merchantable wood. In addition, the recruitment of new large trees generally does not occur in lands managed for Redwood lumber, and the burned out stumps and snags that remain after the initial harvest of old-growth Redwood stands are becoming increasingly rare with time. The Northwest Forest Plan does provide some protection for late seral habitats on Forest Service and Bureau of Land Management lands, but the bulk of the state's swift population occurs to the west, in the largely private Redwood zone.

Modernization and fire safety improvements to chimneys and smokestacks (e.g., installation of insulated pipe and spark arresters) make their continued availability to swifts questionable (Bull and Collins 1993). Following the 1992 earthquake in Scotia, California, several old brick chimneys apparently used for nesting were damaged or destroyed. During repairs, they were replaced with modern stovepipes, and swifts are no longer seen in these areas (S. Chinnici pers. comm.). This suggests that single stochastic events can lead to potentially significant loss of nesting and roosting structures.

Another threat to the Vaux's Swift is direct mortality at man-made roost sites. There are numerous anecdotal accounts in California of mass mortality events in which hundreds to perhaps low thousands of swifts roosting in chimneys or smokestacks were killed when furnaces or stoves were fired up or when the birds somehow became trapped inside a home or other structure (AB 31:1044, K. Garrett and P. Unitt pers. comm.). These incursions are sometimes misinterpreted as attacks by swallows or bats, with detrimental results for the hapless swifts. The majority of these events undoubtedly go unreported, but see Michener (1933) and Huey (1960) for additional

accounts. A mortality event at a roost containing many thousands of birds could be disastrous for swift populations.

Threats to *C. v. vauxi* in winter south of the U.S. border are unknown. Impacts from pesticides, roost-site destruction, and mortality at roost sites are possible.

Management and Research Recommendations

- Locate and protect traditional nest and roost sites.
- Require the retention of residual old-growth trees and snags in managed forests.
- Provide for the recruitment of new nest and roost structures in managed and old-growth forests.
- Install devices such as grills on hazardous smokestacks and other facilities (Candor 1995).
- Educate the public about chimney nesting, migratory roosts, and mortality events (see Kellogg 2000).
- Conduct basic research on habitat use and breeding biology of the Vaux's Swift in California.
- Evaluate habitat-use patterns and threats on the winter range.

Monitoring Needs

Although Vaux's Swifts are not well sampled by its methods, the BBS provides the only monitoring data available for this species. Hence, there is a need to develop standardized surveys to monitor the state population annually and to devise protocols to survey for nests and roosts at sites proposed for habitat alteration.

Acknowledgments

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