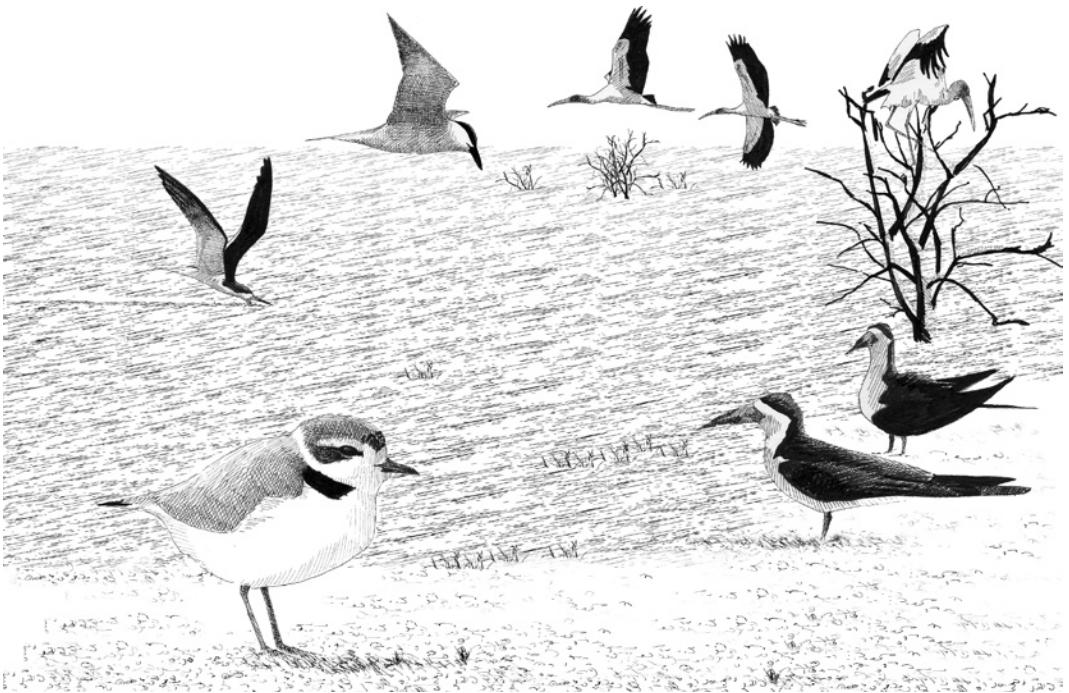


II

SPECIES ACCOUNTS



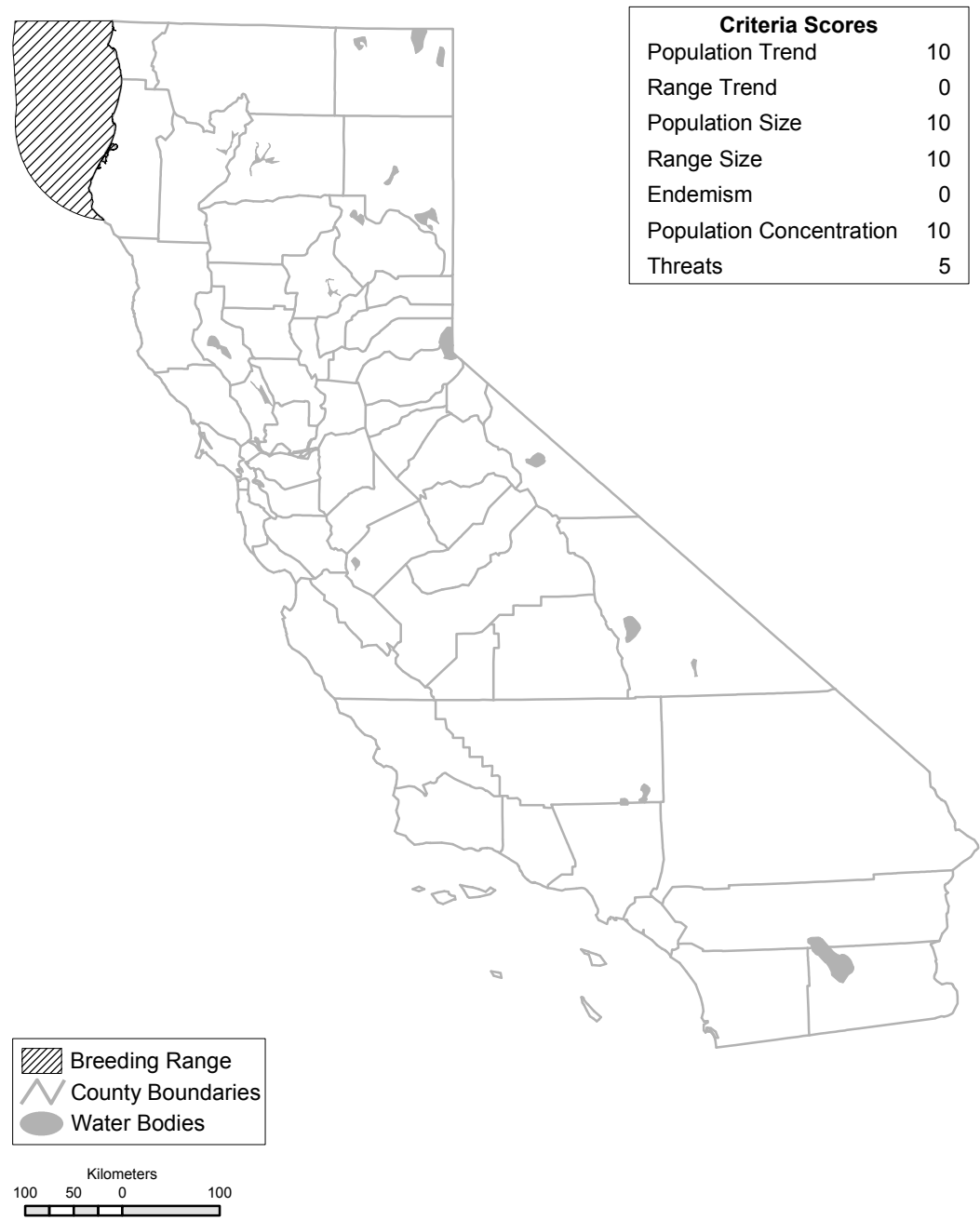
Andy Birch

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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.

FORK-TAILED STORM-PETREL (*Oceanodroma furcata*)

GERARD J. MCCHESENEY AND HARRY R. CARTER



Breeding-season range of the Fork-tailed Storm-Petrel in California; since the 1960s known or suspected to nest on a total of only six islands in Del Norte and (northern) Humboldt counties. Birds forage at sea, mainly over the outer continental shelf and shelf edge within 100 km of colonies. Numbers have declined but range generally unchanged. During nonbreeding season, ranges at sea to central and, occasionally, southern California, mostly in waters of the continental slope and beyond.

SPECIAL CONCERN PRIORITY

Currently considered a Bird Species of Special Concern (breeding), priority 3. Included on both prior special concern lists (Remsen 1978, 2nd priority; CDFG 1992).

BREEDING BIRD SURVEY STATISTICS FOR CALIFORNIA

Data inadequate for trend assessment (Sauer et al. 2005).

GENERAL RANGE AND ABUNDANCE

Two subspecies: the northern *O. f. furcata* and southern *O. f. plumbea*. Breeds along the Pacific coast of North America from the Aleutian Islands, Alaska, south to northern California, and the Pacific coast of Asia from the Commander Islands south to the Kurile Islands (Boersma and Groom 1993, AOU 1998). Core of breeding distribution occurs in Alaska. Southern subspecies breeds from Alexander Archipelago, Alaska, south to California (AOU 1957). At sea during the breeding season, occurs in waters of the outer continental shelf and shelf edge. During the nonbreeding season, ranges widely at sea from the Bering Sea south to central (occasionally southern) California (Briggs et al. 1987, Vermeer et al. 1988, AOU 1998). Boersma and Groom (1993) estimated a world population of 5 to 10 million individuals.

SEASONAL STATUS IN CALIFORNIA

Occurs year round in offshore waters; breeding season extends from mid-March to mid-August (Sowls et al. 1980). South of northern California breeding colonies, most numerous during the nonbreeding season, but may occur at almost any time. Fairly large numbers (tens to hundreds) sometimes occur near shore seasonally (mainly winter and spring) during strong westerly winds (Roberson 2002).

HISTORIC RANGE AND ABUNDANCE IN CALIFORNIA

Grinnell and Miller (1944) described the Fork-tailed Storm-Petrel as "resident in general, but seasonal status irregular locally." Known breeding locations were on the offshore islets of Castle Rock (Castle Island) and Whaler Island near Crescent City, Del Norte County, and Green, Flatiron (Off-Trinidad), and Blank (Sugar Loaf) rocks near Trinidad, Humboldt County (Grinnell and Miller 1944, Osborne 1972, Harris 2005). Also, an egg

collected by R. R. Talmadge on 20 April 1939 documents historic nesting at Prisoner Rock, Humboldt County (WFVZ #12,093). Colonies appeared to be small, as few nests were reported, but Fork-tailed Storm-Petrels often were mixed with large numbers of Leach's Storm-Petrels (*O. leucorhoa*). The only early population estimate was of 100 pairs of Fork-taileds on Whaler Island (Clay 1916). Howell (1920) estimated nearly ten thousand pairs of storm-petrels at Whaler Island in 1919, mostly Leach's.

RECENT RANGE AND ABUNDANCE IN CALIFORNIA

The recent breeding range remains largely unchanged (see map), although it may have expanded south to the South Farallon Islands, San Francisco County. Colony extirpations have occurred, and additional small colonies have been found. The species no longer occurs at Whaler Island, formerly one of the state's largest colonies. A breakwater constructed in the late 1930s connected the island to the mainland. In the early 1950s, the east side of the island was quarried, and the breakwater fortified, destroying habitat and allowing access by mammalian predators such as rats (*Rattus* spp.; Osborne 1972). Nesting habitat at Blank and Flatiron rocks was lost through soil erosion prior to the 1960s (Osborne 1972).

Since the 1960s, nesting by about 200 pairs of Fork-tailed Storm-Petrels has been documented or suspected at six colonies in traditional areas of Del Norte and Humboldt counties (Osborne 1972, Harris 1974, Sowls et al. 1980, Carter et al. 1992). These colonies and the most recent breeding population estimates are Castle Rock (50 pairs), Tolowa Rocks (30 pairs), Green Rock (25 pairs), Prisoner Rock (0), Trinidad Bay Rocks (Tepona Rock; "present" in small numbers), and Little River Rock (100 pairs; summarized in Sowls et al. 1980, Carter et al. 1992). All estimates date from 1970 to 1980 and are rough because of the difficulty of censusing this species. At Prisoner Rock, nesting was suspected on the basis of the remains of six birds found on 10 August 1972 (Osborne 1972), but no Fork-tailed Storm-Petrels were found there during surveys in 1979 (Sowls et al. 1980) or 1989 (Carter et al. 1992). At Southeast Farallon Island, several records since 1990 of Fork-tailed Storm-Petrels mist-netted during the breeding season suggest possible nesting there (G. J. McChesney unpubl. data, PRBO unpubl. data). Southeast Farallon Island lies about 380 km south of the southernmost known colony at Little River

Rock. Small numbers probably breed on other islets along the northern California coast.

Numbers of Fork-tailed Storm-Petrels have declined in California since the 1930s, primarily because of changes to nesting habitat (Osborne 1972, Carter et al. 1992). At Castle and Little River rocks, more recent declines have been suspected and current numbers are probably lower than reported above (Carter et al. 1992; see "Threats" below).

At sea in California during the breeding season, Fork-tailed Storm-Petrels are uncommon and irregular in waters of northern and central California. They are most numerous in waters of the continental slope and shelf break near the breeding colonies, probably within 100–200 km (60–120 mi; Briggs et al. 1987, 1992). In the non-breeding season birds disperse farther offshore, occurring mostly in waters of the continental slope and beyond (Briggs et al. 1992).

ECOLOGICAL REQUIREMENTS

Information on ecological requirements of the Fork-tailed Storm-Petrel in California is restricted mostly to descriptions of nest-site characteristics. These storm-petrels breed on offshore rocks and islands that are largely free of mammalian predators. Birds nest primarily in natural crevices but also in earthen burrows dug by themselves or other species, often in association with Leach's Storm-Petrels (Howell 1920, Osborne 1972, Harris 1974, Boersma et al. 1980, Vermeer et al. 1988). In California, Fork-tailed Storm-Petrels have been found nesting under boulders, in natural rock crevices, in soil burrows, under stolons of Sea-fig (*Carpobrotus chilensis*), and in the burrows of Tufted Puffins (*Fratercula cirrhata*; Osborne 1972). Diet studies are lacking in California. Elsewhere, Fork-tailed Storm-Petrels feed on pelagic amphipods, fish (primarily myctophids), jellyfishes, copepods, isopods, euphausiids, shrimp, squid, and octopus, which they obtain at the ocean surface (Vermeer et al. 1988).

THREATS

The primary threat to Fork-tailed Storm-Petrels in California has been destruction of nesting habitat. Creation of a breakwater and quarrying at Whaler Island in the 1930s to 1950s led to the loss of one of California's largest colonies. Vegetation and soil loss at other colonies also has led to declines. Most of these changes have been associated with breeding Brandt's (*Phalacrocorax penicillatus*) and Double-crested (*P. auritus*) cormorants

and Common Murres (*Uria aalge*), which can destroy burrowing habitat by trampling vegetation and soil. The cormorants also pull up vegetation for use as nesting material (Osborne 1972, SOWLS et al. 1980, Carter et al. 1992). Since the 1940s, such habitat loss has occurred at Castle, Green, Flatiron, and Little River rocks. In recent years, soil erosion at Castle Rock has also been caused by thousands of Aleutian Cackling Geese (*Branta hutchinsii leucopareia*), which roost there during spring migration (Jaques and Strong 2001).

Predation is a moderate to serious threat at some colonies. High levels of predation, especially on adults, can cause decline or extirpation of some colonies. The most significant predators on Fork-tailed Storm-Petrels in California are River Otters (*Lutra canadensis*), Western Gulls (*Larus occidentalis*), and Barn Owls (*Tyto alba*; Howell 1920, Osborne 1972, SOWLS et al. 1980, Carter et al. 1992). River Otters, in particular, can take large numbers of storm-petrels at accessible colonies (Boersma et al. 1980, Quinlan 1983, Vermeer et al. 1988). At Prisoner Rock between 1969 and 1972, Osborne (1972) found 104 Leach's and 6 Fork-tailed storm-petrels that probably were killed by River Otters (although Osborne believed the culprit was a mink, *Mustela vison*). Researchers found the remains of 45 and 12 depredated Leach's Storm-Petrels on Prisoner Rock in 1980 and 1989, respectively (SOWLS et al. 1980, Carter et al. 1992). Introduced rats contributed to the extirpation of the Whaler Island colony after they were allowed access across a breakwater (Osborne 1972). Introductions of rats at other colonies could have similar results.

Marine pollutants are a moderate threat to storm-petrels at present, but impacts are not well known. Although the species typically is not heavily affected by oil spills, thousands of Fork-tailed Storm-Petrels were killed in the massive *Exxon Valdez* spill in Alaska in 1989 (Ford et al. 1996, J. F. Piatt pers. comm.). The small California population of Fork-tailed Storm-Petrels would be at risk if a large oil spill occurred during the breeding season off the Del Norte or Humboldt county coasts. Storm-petrels also ingest petroleum products while feeding, which can have toxic effects (Boersma and Groom 1993). Organochlorine contaminants (e.g., DDE and PCBs), which cause eggshell thinning, are generally high in storm-petrels for reasons that are unclear, but these levels might be associated with storm-petrel feeding at oceanic fronts that concentrate floating materials (Boersma and Groom 1993). At the Queen Charlotte Islands, British Columbia, Fork-tailed

Storm-Petrel eggs had the highest levels of DDE among five species of seabirds sampled (Elliot et al. 1997). Moderate to high levels of organochlorines and eggshell thinning were found in the eggs of Ashy Storm-Petrels (*O. homochroa*) in central and southern California in 1992–1997 (Fry 1994, Kiff 1994, D. Welsh and H. R. Carter unpubl. data). Storm-petrels also frequently ingest plastics while feeding, but no adverse effects have been shown (Boersma and Groom 1993).

Fork-tailed Storm-Petrels are sensitive to human disturbance and will readily abandon nests if disturbed. Humans occasionally access storm-petrel nesting rocks near Trinidad, such as Prisoner, Little River, and Button rocks (the latter within Trinidad Bay Rocks), either from the beach at low tides or from boats (G. McChesney and H. Carter pers. obs.). Such disturbance could cause nest failures, especially if birds on nests are handled in any way.

MANAGEMENT AND RESEARCH RECOMMENDATIONS

- Protect offshore nesting islets from human disturbance and introductions of mammalian predators, especially rocks near Trinidad that are easily accessible.
- Conduct detailed breeding population surveys of offshore islets from the Oregon border to the Farallon Islands to reassess the state population. Surveys should include mist-netting at sample locations, to determine presence or absence and relative numbers, and nest searches of accessible islets where these activities would not disturb sensitive surface-nesting birds (such as cormorants, murres) or marine mammals. Surveys should include assessments of habitat availability and use.
- Investigate impacts of habitat changes, such as soil erosion caused by cormorants, murres, and geese at Castle and Little River rocks, and restore nesting habitats where feasible.
- Conduct research on nesting and foraging ecology in California, including breeding phenology, breeding success, and diet. This may be difficult, since so few Fork-tailed Storm-Petrels nest in easily accessible locations.

MONITORING NEEDS

The state's breeding population should be monitored periodically (e.g., about every 10–15 years).

Fork-tailed Storm-Petrels should be surveyed during the main part of the breeding season (Apr to Jul), preferably during the peak of the incubation period (Apr and May). Populations of surface-nesting cormorants and murres also should be monitored at important storm-petrel colonies, such as Castle and Little River rocks, including assessments of soil erosion caused by these species and its effects on storm-petrel nesting habitat.

ACKNOWLEDGMENTS

We thank W. R. McIver and W. D. Shuford for reviews on an earlier draft of this account.

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