WESTERN BIRDS

Vol. 24, No. 1, 1993

Volume 24, Number 1, 1993

An Annotated Checklist of the Birds of Isla Socorro, Mexico *Walter Wehtje, Harmut S. Walter, Ricardo Rodriguez Estrella, Jorge Llinas, and Aradit Castellanos Vera* 1

A Reassessment of the Taxonomic Status of the Yellow-billed Cuckoo *Kathleen E. Franzreb and Stephen A. Laymon* 17

Notes on Breeding Coastal Waterbirds in Northwestern Sonora *Eric Mellink and Eduardo Palacios* 29

The Association Between Vaux's Swifts and Old Growth Forests in Northeastern Oregon *Evelyn L. Bull and Janet E. Hohmann* . . . 38

Drought and Predation Cause Avocet and Stilt Breeding Failure in Nevada *Julie A. R. Alberico* 43

NOTES

An Arctic Warbler in Baja California, Mexico *Peter Pyle and Steve N. G. Howell* 53

New and Noteworthy Bird Records from Baja California, Mexico, October 1991 *Steve N. G. Howell and Peter Pyle* 57

President's Message *Robert McKernan* 63

Bulletin Board 64

Cover photo by © Ian C. Tait of Mill Valley, California: nesting Yellow-billed Cuckoo *(Coccyzus americanus)*, Kern River Preserve, California, July 1988.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Philip Unitt, 3411 Felton Street, San Diego, CA 92104. For matter of style consult the Suggestions to *Contributors to Western Birds* (8 pages available at no cost from the editor) and the *Council of Biology Editors Style Manual* (available for $24 from the Council of Biology Editors, Inc., 9650 Rockville Pike, Bethesda, MD 20814).

Reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

Volume 24, Number 1, 1993

AN ANNOTATED CHECKLIST OF THE BIRDS OF ISLA SOCORRO, MEXICO

WALTER WEHTJE and HARTMUT S. WALTER, Department of Geography, University of California, Los Angeles, California 90024-1524 (present address of Wehtje: Western Foundation of Vertebrate Zoology, 439 Calle San Pablo, Camarillo, California 93010)

RICARDO RODRIGUEZ ESTRELLA, JORGE LLINAS and ARADIT CASTELLANOS VERA, Centro de Investigaciones Biológicas de Baja California Sur, Apartado Postal 128, La Paz, Baja California Sur 23000, Mexico

In recent years, ornithologists have devoted increased attention to insular avifaunas and the problems they face (Scott et al. 1986). Many island species are critically endangered and require human intervention in order to survive. Island species also provide the opportunity to test differing ecological and biogeographical theories (MacArthur and Wilson 1967, Jones and Diamond 1976). However, many remote islands are not visited frequently enough or for periods long enough to provide information on population trends and the loss and/or gain of breeding species. Such has been the case for the Islas Revillagigedo of Mexico (Figure 1).

The Islas Revillagigedo are a group of four islands lying off the Pacific coast of Mexico. In ascending order of size they are Roca Partida, Isla San Benedicto, Isla Clarión, and Isla Socorro. The last is located at 18° 47' N, 110° 57' W, about 460 km south of Baja California (Figure 2). In the absence of a good topographic map, we estimate the size of Isla Socorro as 110 km^2. The maximum elevation of the island, Cerro Evermann, is 1040 m. The flora of the island has been described by Levin and Moran (1989) and consists of at least 117 native species of plants, 30 of which are endemic. There are six principal plant associations (León de la Luz pers. comm.): mixed scrub, dominated by *Dodonaea viscosa* and *Pteridium caudatum* (0–700 m), deciduous scrub, dominated by *Croton masonii* (0–250 m), sheep-induced prairie, mainly with *Mitracarpus hirtus, Aristida* spp., and *Boerhavia* spp. (250–400 m), the shore habitats with *Conocarpus erecta,* woodlands dominated by *Bumelia socorrensis, Ficus cotonifolia, Ilex socorrensis, Guettarda insularis,* and *Psidium* sp. (350–850 m), and highland prairie, dominated by *Castilleja socorrensis, Gnaphalium attenuatum, Heterotoma cordifolia,* and *Linaria canadensis* (850–950 m).

The mixed scrub, up to 3 m high, covers much of the island below 700 m elevation. Where it is undamaged, this extremely thick brush effectively restricts access. The vegetation of the southern half of the island, however, has been severely damaged by feral sheep, introduced during the 1860s. We estimate the present sheep population at 2000 individuals. The damage caused by sheep ranges from inhibiting regrowth in forest at mid-elevations to the complete removal of vegetation on some slopes and hilltops. Soil erosion is a major problem in several areas.

In addition to sheep, feral domestic cats and house mice are also present on Isla Socorro. The latter two species are believed to have arrived on the

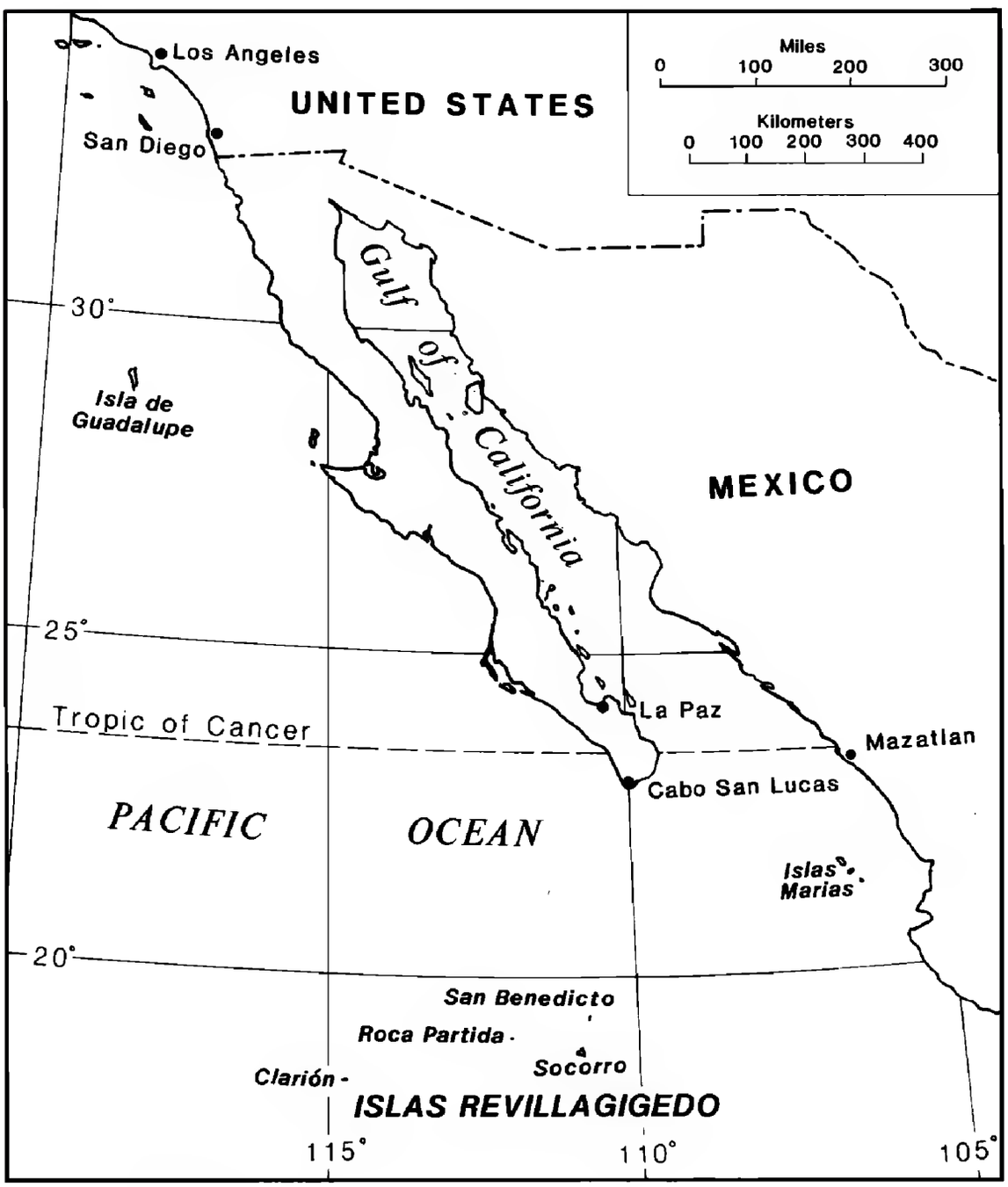


Figure 1. Location of Isla Socorro in the Pacific Ocean to the south of Baja California.

island when the Mexican navy established a base there in 1958 (Jehl and Parkes 1982). Miraculously, rats have not invaded Isla Socorro.

The navy base is located on the southernmost tip of the island and houses close to 200 military personnel and dependents. There is also a landing strip and radar station, constructed on the eastern side of the island in 1978. The only roads on the island are one connecting the airstrip to the navy base and another leading from this main road to the southern plateau region, terminating at approximately 500 m elevation on the southern slope of Cerro Evermann. Previous authors (Jehl and Parkes 1982, Brattstrom and Howell 1956) mentioned a temporary lake called Laguna Escondida on the southern side of the island. It has never been filled during our visits. There are a number of deep potholes in the canyons that contain limited quantities of fresh water after the rainy season (July–November). Apart from the navy base and a spring located in the tidal zone at Caleta Grayson, no known permanent sources of water exist on the island.

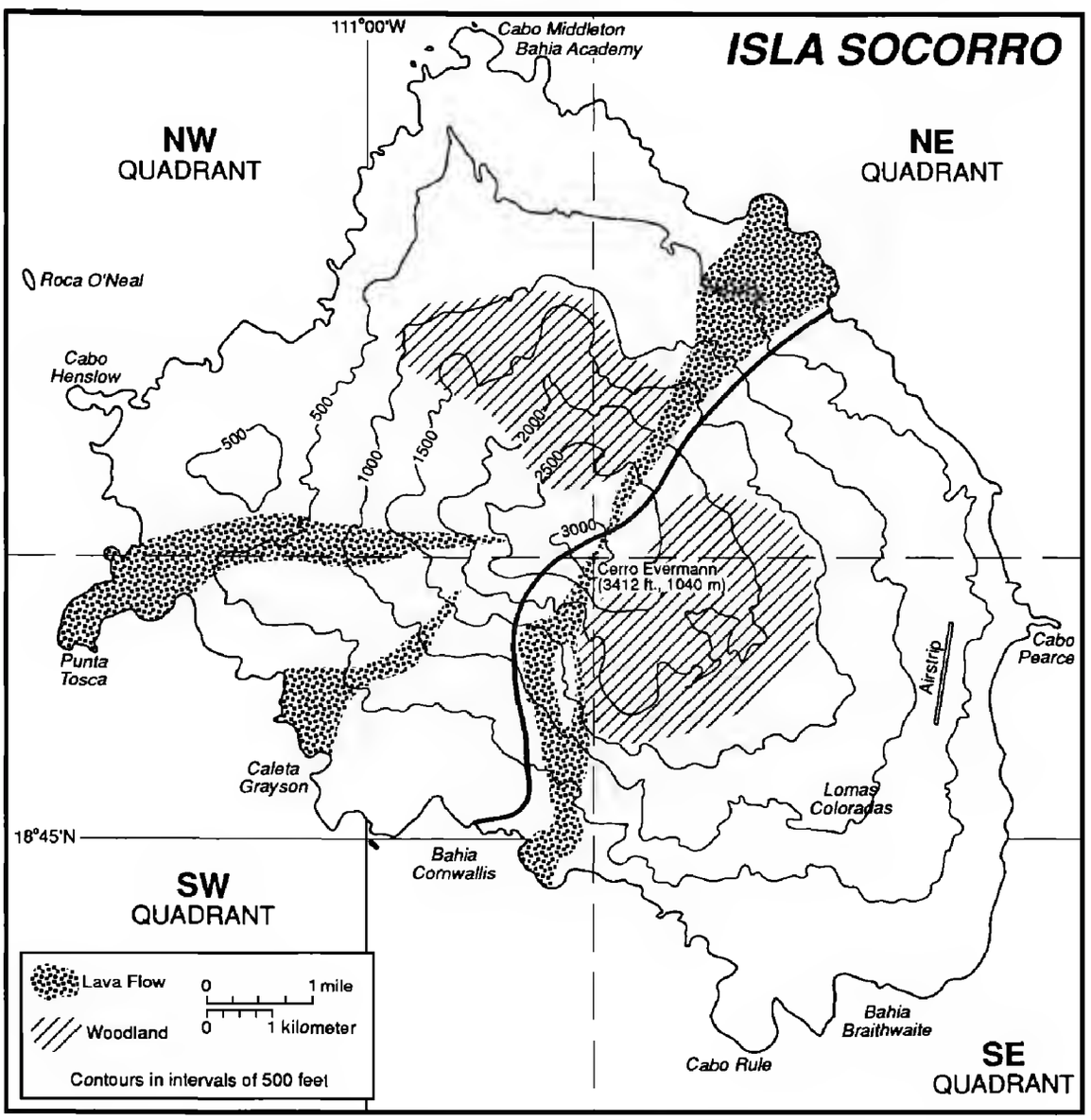


Figure 2. Socorro Island. The northeast–southwest line partitions the island into the sheep-free northern half and the sheep-degraded southern half.

The Revillagigedos belong to the federal government of Mexico and are currently administered by its navy. Access to Isla Socorro is severely restricted because of the lack of facilities for visitors. The absence of roads limits the area that can be easily visited. Two trails lead to the peak of the island from the end of the mountain road. Areas affected by sheep are also fairly easily traversed by humans. The rugged terrain, lava flows, and nearly impenetrable vegetation of the northern side of the island make much of the island difficult to survey. Because of these conditions, most earlier reports were based upon studies in severely altered habitat. Time constraints kept most researchers in the past from spending any length of time in undisturbed areas. We have been able to explore a larger portion of the island for a greater length of time, and over different seasons during the same year.

Although Isla Socorro was first discovered by the Spanish in 1533, the first natural history expeditions to the island were made by Andrew Jackson Grayson in 1865 and 1867. Shipwrecked there for 10 days (19–28 May 1867), he and his son discovered and collected specimens of all the island's endemic birds (Grayson 1872). Ornithological assessments of other early expeditions can be found in Anthony (1898), McLellan (1926), Brattstrom and Howell (1956), and Jehl and Parkes (1982).

Interest in the avifauna of the Islas Revillagigedo has increased during the past decade, and several articles dealing with these islands have recently been published (Jehl and Parkes 1982 and 1983, Jehl 1982, Brattstrom 1990, Howell and Webb 1990, Parkes 1990, Santaella and Sada 1991). The last comprehensive annotated bird list for the archipelago was that of Jehl and Parkes (1982).

Most visits to Isla Socorro have been ship-based, limiting the time observers can spend ashore. As members of a joint conservation project of the University of California, Los Angeles (UCLA), the Centro de Investigaciones Biológicas (CIB) in La Paz, and the World Wildlife Fund, we visited this rugged island repeatedly by airplane in April, July, September, November, and December 1988, February, May, and November 1990, and August 1991, spending a total of 62 days on the island. During these visits we improved our understanding of the population status of the resident species and other visitors, and observed 23 previously unrecorded bird species. Here we provide an updated annotated checklist for the avifauna of Isla Socorro.

An asterisk before a species name specifies a new record.

ANNOTATED SPECIES LIST

Pied-billed Grebe (*Podilymbus podiceps*). Brattstrom found a dead specimen on the beach at Cabo Henslow on 14 November 1971 (Jehl and Parkes 1982).

Laysan Albatross (*Diomedea immutabilis*). Howell and Webb (1990) observed an individual over Cabo Henslow on 16 February 1988. Two birds on 7 May 1990 (Walter) and one on the following day (Wehtje) were seen flying over the navy base. This species is extending its range, with breeding recorded on Isla Clarión and Isla Guadalupe and nesting behavior observed on Isla San Benedicto, 55 km north of Isla Socorro (Howell and Webb 1990).

Wedge-tailed Shearwaters (*Puffinus pacificus*) have been observed near Isla Socorro in moderate numbers (10–130) in March, April, May, and November (Anthony 1898, Brattstrom and Howell 1956, Jehl and Parkes 1982, Santaella and Sada 1991). The lack of sightings in other months is probably due to the absence of observers. This species breeds on Isla San Benedicto (Jehl and Parkes 1982).

Townsend's Shearwater (*Puffinus auricularis*). Jehl (1982) is the best source for information on this species, but here we add a few observations that confirm and elaborate on his findings. Jehl stated that breeding birds arrive in December and leave by June. We spent the night of 20 November 1990 in a forested canyon on the north side of the island at 750 m elevation and found ourselves in the midst of a very noisy shearwater colony. This suggests that the birds arrive at least by mid-November. We captured and photographed one individual at the mouth of a burrow under a large boulder. Other birds were heard inside their burrows during daylight hours. Most of the burrows were located on steep slopes that were difficult to reach. We also heard between one and five shearwaters calling over land on 25 August 1991, indicating that this species may visit its breeding colonies throughout the year. Shearwaters were commonly seen from shore in numbers of up to a dozen in August.

In the evening of 23 February 1990 we found another colony, northeast of Cerro Evermann at 500 m elevation, where we estimated hearing close to 100 birds calling simultaneously. Because of the impenetrability of the vegetation, we were unable to approach it. On 24 February Rodriguez heard a similar number of birds to the northwest of Cerro Evermann, indicating another colony in that area. The breeding colonies were concentrated at higher elevations in undisturbed forest and mixed scrub. We agree with Jehl's (1982) assessment of the current population size (approximately 1000 pairs) but do not believe that the population is in imminent danger from cat predation. We base this assessment on the fact that no obvious cat sign was found near the colonies discovered. Three carcasses located did not have bitten-off feathers consistent with cat predation, nor did we find any cat feces in these areas. The largest number of Townsend's Shearwaters recently observed was several hundred in mid-February 1990, a flock staging just south of the naval base at sunset (F. Gohier pers. comm.).

Audubon's Shearwater (*P. lherminieri*). Santaella and Sada (1991) observed 110 individuals between Isla San Benedicto and Isla Socorro on 30 April 1990.

Leach's Storm-Petrel (*Oceanodroma leucorhoa*). Anthony (1898) reported that in early May 1897 it was "common at sea near the island" and "apparently migrating." L. Baptista and Walter observed one less than 2 km off the west side of the island on 27 July 1988.

Galapagos Storm-Petrel (*O. tethys*). Reported as uncommon but regular in November 1974 in the vicinity of Isla Socorro by Jehl and Parkes (1982).

Red-billed Tropicbird (*Phaethon aethereus*). This species appears to be resident, with records from February, March, May and November (Anthony 1898, McLellan 1926, Brattstrom and Howell 1956, Jehl and Parkes 1982, Howell and Webb 1990, Santaella and Sada 1991). None, however, were seen by Wehtje and Walter along the east side of the island on 23 and 25 August 1991. This species may breed on Isla Socorro, as two to four pairs were courting over Roca O'Neal on 7 April 1981 (Jehl and Parkes 1982), but there is no other evidence.

Masked Boobies (*Sula dactylatra*) have regularly been observed in February, March, April, May, July, and November (Anthony 1898, Brattstrom and Howell 1956, Jehl and Parkes 1982). McLellan (1926) did not observe any in May 1925. We have seen this species on every visit, albeit in low numbers, never more than ten at a time. As with the other boobies at Isla Socorro, there is no evidence that they breed there, although they roost on coastal cliffs.

Brown Booby (*S. leucogaster*). This species has been recorded by all visitors, with Howell and Webb (1982) observing up to 120 birds roosting along the cliffs between Caleta Grayson and Cabo Henslow in February 1988.

Red-footed Booby (*S. sula*). Anthony (1898) noted "quite a colony . . . gathered about the cliffs on the southwest end of the island." He may have been referring to *S. sula, S. leucogaster* and *S. dactylatra* together, or only *S. sula*. One or two were seen daily in 1974, 1978, and 1981 by Jehl and Parkes (1982). Howell and Webb (1990) observed two immatures roosting with the Brown Boobies. Wehtje saw two brown-phase birds off the northeast side of the island on 22 February 1990.

Magnificent Frigatebird (*Fregata magnificens*). Another species observed by all visitors except McLellan (1926). We have observed Magnificent Frigatebirds during each visit, usually with no more than three birds seen at any one time. This species breeds on Isla San Benedicto (Howell and Webb 1990).

Great Frigatebird (*F. minor*). Brattstrom and Howell (1956) reported unidentified frigatebirds at Isla Socorro that may have been this species. Howell and Webb (1990) identified a female at Bahía Academy and recorded breeding on Isla San Benedicto.

Great Blue Heron (*Ardea herodias*). "Not uncommon" according to Anthony (1898). None were seen by McLellan (1926), nor did Jehl and Parkes (1982) report any sightings. One individual was fishing at Playa Blanca on 25 July 1988 (Walter). Two individuals were seen by Santaella and Sada (1991) at Bahía Braithwaite, 2–3 May 1990. A single bird was observed by Walter on 18 November 1990 in the orchard near the naval base. Baptista, Walter, and Wehtje saw one near the harbor on 24 November 1990. Another individual was seen on the north side of the island on 25 August 1991. This species appears to be an occasional nonbreeding visitor.

*Great Egret (*Casmerodius albus*). Walter saw one on 17 December 1988 near the navy base. On 25 November 1990, a single bird was observed at the landing strip by Baptista, Rodriguez, Castellanos, Walter, and Wehtje.

*Snowy Egret (*Egretta thula*). One individual was seen near the navy base by Llinas and Wehtje from 22 to 27 February 1990.

Cattle Egret (*Bubulcus ibis*). First sighted by Jehl and R. L. Pitman, who saw flocks of 11, 19, and 35 arrive at the south end of the island in the early morning between 21 and 24 November 1974 (Jehl and Parkes 1982). They also saw between six and eight at the navy base in 1981. Two were present there on 14 December 1988 (Walter). On 16 February 1990, one was seen near the garrison. On 22 February three were present at the same location. Up to 14 were seen on 25 November 1990 by Walter and Wehtje. None was observed in August 1991.

Yellow-crowned Night-Heron (*Nycticorax violaceus gravirostris*). This resident species is most commonly encountered at night. At the navy base, at least three birds, most often immature, can be counted every night. We have encountered this species throughout the island, up to 500 m elevation, but in low numbers (one to two individuals at a time). It feeds primarily on land crabs (*Cardisoma* sp.) and to a lesser extent on scorpions (Llinas pers. obs.). Because the crabs are so abundant, food cannot be limiting the herons, and predation by Red-tailed Hawks is probably a factor limiting the herons' numbers. On several occasions we encountered remains of herons that appeared to have been killed by hawks.

Osprey (*Pandion haliaetus*). Brattstrom and Howell (1956) reported one on 19 November 1953. Additionally, Brattstrom observed two in 1971. Jehl and Parkes (1982) saw two at Caleta Grayson on 10 April 1978 and one at Cabo Henslow the next day. One was seen hunting on the southwest shore on 7 May 1990 by Walter. Three birds were seen soaring over Cerro Evermann on 20 November 1990 (E.

Martínez, Walter, Wehtje), and two birds were stationed near Bahía Academy during our August 1991 visit (Wehtje, Walter). The species may remain on Isla Socorro year round.

*Northern Harrier (*Circus cyaneus*). Walter saw one immature on 15 November, a female on 14 December, and two individuals on 15 December 1988.

*Sharp-shinned Hawk (*Accipiter striatus*). J. Clements, R. Clements, and Walter observed a female on 15 December 1988. Baptista saw a female on 24 November 1990 on the south side of the island at 500 m elevation.

Cooper's Hawk (*A. cooperii*). One was seen on 15 November 1988 leaving the island, flying south at an altitude of a few hundred meters. Nearest land in that direction is Clipperton Island, over 900 km away. Additionally, one individual was observed in the orange grove southeast of Cerro Evermann on 20 November 1990. Both observations by Walter.

Red-tailed Hawk (*Buteo jamaicensis socorroensis*). This endemic subspecies is the main avian predator on the island. Prey remains found in active nests were of Northern Mockingbirds, Townsend's Shearwaters, lizards, and lambs. We have also observed them feeding on land crabs. We estimate the current population at 15–25 pairs. The hawks are found throughout the island but are most commonly seen in the open areas in the southern part of the island and near the peak. Walter (1990) discussed this species further.

American Kestrel (*Falco sparverius*). First observed on the island by J. Clements and A. Sada in early December 1986 (Clements pers. comm.). On 16 November 1988 Walter observed a single individual. On 14 December of the same year, he found two birds. Wehtje and Rodriguez observed an adult female on 18 February 1990, and a female and male on 21 February 1990. A female was present in late November 1990 at the terminus of the mountain road. All individuals have been seen on the southern side of the island in disturbed habitat. This species has not been recorded during the spring or summer months and cannot be considered a breeding species, as stated by Parkes (1990).

Peregrine Falcon (*F. peregrinus*). Brattstrom and Howell (1956) reported one from Caleta Binner on 18 November 1953. Walter observed one individual on 14 and 16 November 1988. Rodriguez saw another on 22 February 1990 near the navy base.

Black-bellied Plover (*Pluvialis squatarola*). Jehl and Parkes (1982) observed three birds near the airstrip on 13 April 1978. Baptista and Walter recorded one at Bahía Blanca on 27 July 1988.

Semipalmated Plover (*Charadrius semipalmatus*). One was collected by Brattstrom at Bahía Braithwaite on 3 May 1955; a second was collected by Jehl and Parkes (1982) on 11 April 1978.

Killdeer (*C. vociferus*). One was heard by K. C. Parkes near the temporary lake on 6 April 1981 (Jehl and Parkes 1982).

Willet (*Catoptrophorus semipalmatus*). Listed by Brattstrom and Howell (1956) as accidental without any specific reference.

Wandering Tattler (*Heteroscelus incanus*). This winter visitor arrives by August and has been seen as late as the middle of May (Anthony 1898, McLellan 1926, Santaella and Sada 1991). Three were observed near the navy base on 21 February 1990 (Wehtje), with others observed at the lava flow south of Bahía Cornwallis on 22 November 1990 (Baptista, Walter, Wehtje). Additionally, Wehtje observed four individuals at Bahía Academy on 25 August 1991.

Spotted Sandpiper (*Actitis macularia*). Anthony (1898) observed a single bird on the north side of the island on 14 May 1897. Also noted by McLellan (1926) on "the beach." Brattstrom and Howell (1956) reported seeing several at Caleta Binner and at Punta Henslow in March 1953, in addition to collecting a specimen on the north side of the island on 20 November 1953. One was observed at Cabo Henslow on 1 May 1990 (Santaella and Sada 1991).

Whimbrel (*Numenius phaeopus*). This is another species that appears to winter regularly. Most sightings have been between November and May (Brattstrom and Howell 1956, Jehl and Parkes 1982, Santaella and Sada 1991). Baptista, Walter, and Wehtje saw one individual on the lava flow at the south end of Bahía Cornwallis on 22 November 1990.

*Surfbird (*Aphiriza virgata*). Walter saw a single bird on 26 July 1988 at Playa Blanca.

Sanderling (*Calidris alba*). Listed by Brattstrom and Howell (1956) as accidental with no reference for its inclusion.

Western Sandpiper (*C. mauri*). One seen at Laguna Escondida on 6 April 1981 (Jehl and Parkes 1982).

Northern Phalarope (*Phalaropus fulicaria*). Jehl and Parkes (1982) saw a few small flocks between Isla Socorro and Isla San Benedicto in 1981.

Pomarine Jaeger (*Stercorarius pomarinus*). Jehl and Parkes (1982) noted two at Bahía Braithwaite on 18 November 1974.

Laughing Gull (*Larus atricilla*). One immature observed on 21 November 1974 (Jehl and Parkes 1982). A first-year bird was seen at the garrison by Wehtje on 21 February 1990.

Franklin's Gull (*L. pipixcan*). An adult was photographed on 7 June 1977 (Jehl and Parkes 1982).

Heermann's Gull (*L. heermanni*). Jehl and Parkes (1982) found a partial skeleton at Playa Blanca on 11 April 1978. Wehtje observed a first-year bird at the navy base on 16 February 1990.

*Ring-billed Gull (*L. delawarensis*). The most common gull at the garrison on 16 February 1990, with approximately 175 individuals present, 30% of them adults. By 27 February the same number of birds remained, but only 10% of them were adults (Wehtje). Identification was assisted by comparison with California Gulls.

California Gull (*L. californicus*). A first-winter bird was collected in November 1974 (Jehl and Parkes 1982). One adult and fewer than five immatures were observed at the garrison by Wehtje on 16 February 1990. By 27 February several adults and up to 20 immatures were present.

*Herring Gull (*L. argentatus*). Several were at the garrison on 22 February 1990 (Wehtje).

Western Gull (*L. occidentalis*). Anthony (1898) found on the southwest side of the island the remains of an immature gull that he tentatively identified as being of this species.

Glaucous-winged Gull (*L. glaucescens*). A first-year bird was collected at Bahía Braithwaite on 21 November 1974 (Jehl and Parkes 1982). A first year bird was seen by Wehtje at the navy base on 16 February 1990.

Sooty Tern (*Sterna fuscata*). Anthony (1898) reported a large colony nesting on a rock 1 mile southwest of Isla Socorro. Such a rock does not now exist. He may have

been referring to Roca O'Neal, which lies about 2 km to the northwest of Isla Socorro. McLellan (1926) observed some near Roca O'Neal in early May 1925. Howell and Webb (1990) saw up to 14 associated with Townsend's Shearwaters off Isla Socorro but none at Roca O'Neal. Over 100, many of them nesting, were observed there on 30 April 1990 by Santaella and Sada (1991).

Brown Noddy (*Anous stolidus*). This species was found by Anthony (1898) to be nesting with the Sooty Terns in equally large numbers. A few individuals were noted near Isla Socorro in early May 1925 (McLellan 1926). Twenty were seen along the east coast on 7 April 1981 (Jehl and Parkes 1982). Howell and Webb (1990) saw none in February 1988 but Baptista and Walter saw two birds on 27 July 1988 along the west coast. Over 100 were observed around and nesting on Roca O'Neal on 30 April 1990 by Santaella and Sada (1991). Single birds were seen feeding in Bahía Braithwaite by Walter and Wehtje in August 1991.

White Tern (*Gygis alba*). Gifford (1913) reported a single bird collected on Roca O'Neal in 1905 by R. H. Beck.

Rock Dove (*Columba livia*). Only a few domesticated pigeons were seen in 1982 (Jehl and Parkes 1982). Fourteen were counted by Clements and Walter in December 1988. The population had dramatically increased to slightly less than 100 in February 1990, and 80 were counted in November 1990 (Wehtje). So far, the birds are found only within the navy base where they feed, roost, and breed only in buildings. We have urged the navy commander on the island to eliminate this species, as it may carry diseases for which island birds may be highly susceptible.

Mourning Dove (*Zenaida macroura*). First observed by Jehl and Parkes (1982) in April 1978, with over 100 seen on or near the airstrip and many others seen on the southeast side of the island. In 1981, they were found to be abundant on the southeast part of of the island (Jehl and Parkes 1982). Hundreds of breeding birds were observed on the southern side of the island in 1988 (Walter). Two were seen near Playa Blanca on 26 July 1988 (Baptista, Castellanos, Walter). Flocks of up to 60 individuals were seen in February 1990 (Wehtje). Well over 100 individuals were seen near rainwater puddles in an otherwise dry riverbed on the southwest side of the island in November 1990. At least one pair was seen at Bahía Academy in August 1991 (Walter, Wehtje). This species appears to be well established on Isla Socorro.

Socorro Dove (*Z. graysoni*). Still extinct in the wild, but more than 100 pairs of this Isla Socorro endemic survive in captivity in California and Germany (Baptista pers. comm.). The Socorro Island Restoration Project intends to repatriate this population in the near future. This goal is supported by a unanimously approved resolution of the Commission of the Californias (Newport Beach, March 1988).

Common Ground Dove (*Columbina passerina socorrensis*). This endemic subspecies is found in small numbers at lower elevations throughout the island. It is most numerous between the airstrip and the garrison, particularly in the *Croton* matorral at the southern end of the island, where it is not uncommon to see a total of 20 birds along the length of the road.

Green Parakeet (*Aratinga holochlora brevipes*). Although the island population of this species (Figure 3) probably exceeds several hundreds, it can be missed during short visits. During much of the year it frequents the upper elevations. Here, troops of 10–30 parakeets fly noisily over the forest. Seasonally available food in coastal groves brings them to these habitats as well. On the morning of 26 August 1991, more than 100 parakeets flew over our camp near the end of the mountain road in less than 15 minutes. Flocks of up to 60 individuals were observed later that day feeding in the *Ficus* groves.

*Groove-billed Ani (*Crotophaga sulcirostris*). A single individual was found in the orchard near the garrison in February 1990 (Rodriguez). What appeared to be the same individual was relocated there on 7 May 1990 by Walter; no trace of it was found in November of the same year.

Barn Owl (*Tyto alba*). In November 1990, naval personnel reported that this species might be present at Punta Tosca. Llinas and Rodriguez observed one near the garrison in February 1990 and collected a pellet, which contained crab remains. Villa (1960) also reported signs at Bahía Braithwaite. This owl may breed on Isla Socorro.

Elf Owl (*Micrathene whitneyi graysoni*). The last record for this species was in 1931, when a specimen was collected (Jehl and Parkes 1982). We have visited most of the likely coastal habitat of this species without any luck. As it has not been recorded for 60 years and little unexplored habitat remains, we fear that the subspecies may be extinct.

Belted Kingfisher (*Ceryle alcyon*). Brattstrom and Howell (1956) reported seeing one flying near Cabo Henslow on 18 March 1953. Brattstrom saw three in 1971, while Jehl and Parked (1982) observed several in 1978.

*Red-naped Sapsucker (*Sphyrapicus nuchalis*). Walter observed a single individual feeding in *Bumelia* trees on 26 November 1990, 300 m beyond the end of the mountain road.

Northern Rough-winged Swallow (*Stelgidopteryx serripennis*). Jehl and Parkes (1982) saw two at Bahía Academy on 14 April 1978. A flock of more than ten birds, probably of this species, was seen near the garrison on 25 November 1990 (Wehtje).

*Barn Swallow (*Hirundo rustica*). A few individuals were seen at scattered locations on the south side of the island between 19 and 24 November 1990 by Baptista, Walter, and Wehtje.

Figure 3. The Green Parakeet (*Aratinga holochlora brevipes*).

Socorro Wren (*Thryomanes sissonii*). This habitat generalist is the second most abundant bird of the island. It is found everywhere, from coastal cliffs to dense matorral and open canyon forest (Figure 4).

*Swainson's Thrush (*Catharus ustulatus*). Rodriguez saw a single bird in a fig grove at approximately 500 m elevation on the south side of the island on 18 February 1990.

Northern Mockingbird (*Mimus polyglottos*). This species was first reported by Jehl and Parkes (1982). It appears to have invaded the island after 1971, and is now a common breeder in disturbed habitat on the southern side of the island. It is rare in undisturbed scrub, the preferred habitat of the endemic Socorro Mockingbird. However, two Northern Mockingbirds were observed near a pair of Socorro Mockingbirds in undisturbed vegetation on the northeastern part of the island in February 1990 (Wehtje, Castellanos). In November 1990, no Northern Mockingbirds were observed north of the peak, where more than 30 Socorro Mockingbirds were found.

Socorro Mockingbird (*Mimodes graysoni*). Though considered the island's most common bird in the 1950s and earlier, the Socorro Mockingbird (Figure 5) has since decreased dramatically. Isla Socorro's best differentiated endemic is now rare but fortunately not yet extinct, and there may be enough time and habitat left to prevent further decline. The birds are often inconspicuous and silent but respond well to playbacks of their song. We were not able to confirm the presence of the species in any coastal or lowland habitat. The woodland and matorral ecotones around Cerro Evermann contain the largest numbers of the remaining population, consisting of more than 30 confirmed territory holders and an estimated total of 80–200 pairs. The decline in numbers of this species coincided with the establishment of the navy base, leading us to believe that the feral cats are responsible for their present rarity.

Water Pipit (*Anthus spinoletta*). Listed by Brattstrom and Howell (1956) as accidental without any specific reference.

Figure 4. The Socorro Wren (*Thryomanes sissonii*).

*Cedar Waxwing (*Bombycilla cedrorum*). Rodriguez saw 30–35 north of Cerro Evermann on 25 February 1990. Two days later, Wehtje saw a flock of 50–60 at the end of the mountain road.

Tennessee Warbler (*Vermivora peregrina*). One was observed at Bahía Braithwaite on 12 April 1978 (Jehl and Parkes 1982). On 18 February 1990, Llinas observed one in the *Ficus* groves on the southern flank of Cerro Evermann.

Tropical Parula (*Parula pitiayumi graysoni*). This is the most abundant bird on Isla Socorro. We found this very active and unafraid bird in most habitats from the shore to the peak of the island (Figure 6).

Yellow Warbler (*Dendroica petechia*). Jehl and Parkes (1982) observed an immature male Mangrove Warbler (subspecies *castaneiceps* or *rhizophorae*) at Bahía Braithwaite on 10 April 1978. They saw another individual in the same area two days later. On 26 February 1990, Rodriguez saw one near the garrison.

Yellow-rumped Warbler (*D. coronata*). "Many" were observed by Villa (1960) in 1958. One seen at end of mountain road on 18 February 1990 (Wehtje). Two were seen in the orchard on 28 February 1990. On 18 November 1990, Walter saw six individuals in the orchard.

Townsend's Warbler (*D. townsendi*). A male was collected on Cerro Evermann on 13 April 1978 (Jehl and Parkes 1982). Walter observed one male in dense forest on the southern flank of Cerro Evermann on 9 May 1990.

Black-throated Green Warbler (*D. virens*). Two females were collected along with the Townsend's Warbler on 13 April 1978 (Jehl and Parkes 1982).

Figure 5. An adult Socorro Mockingbird (*Mimodes graysoni*).

*Blackpoll Warbler (*D. striata*). Walter observed one in the orchard with a group of Yellow-rumped Warblers on 18 November 1990.

*American Redstart (*Setophaga ruticilla*). A female was observed by Walter in April 1988 in the forest near the planted orange grove.

*Wilson's Warbler (*Wilsonia pusilla*). A female was observed in the orchard on 17 November 1990 by Baptista, Wehtje, and Walter.

*Summer Tanager (*Piranga rubra*). Rodriguez banded a female near the end of the mountain road on 22 November 1990.

*Rose-breasted Grosbeak (*Pheucticus ludovicianus*). A first-spring male was seen in the orange grove by S. Bailey and K. S. Anderson on 18 March 1988.

*Indigo Bunting (*Passerina cyanea*). An adult male was observed by Baptista and H. Horblit near the garrison on 29 July 1988.

Rufous-sided Towhee (*Pipilo erythrophthalmus socorroensis*). A resident endemic that is quite numerous in its shrub and woodland habitats from the coast to the upper limits of shrubby vegetation. This species is easily overlooked when inactive, as it remains hidden in thick brush. In contrast to Parkes (1990), we have found this species to be inquisitive and tame.

*Lark Sparrow (*Chondestes grammacus*). Walter observed one bird near the garrison on 7 May 1990.

*Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*). Recorded in the deciduous scrub near the airstrip by Llinas on 24 February 1990.

Figure 6. A Tropical Parula (*Parula pitiayumi graysoni*), Isla Socorro's most abundant bird species.

*Brown-headed Cowbird (*Molothrus ater*). First observed in the garrison area in April 1988 (Walter and Castellanos). One individual was seen there by Baptista on 29 July 1988. Nine, three of them adult males, were seen at the garrison on 17 December 1988. In February 1990 two males and a female were present at the garrison. One bird was seen on 7 May 1990. In November 1990, five birds were present. None were found on the island in August 1991. The species appears to be a regular visitor.

*House Sparrow (*Passer domesticus*). An adult male and female were seen by Walter on 7 May 1990 at the garrison.

DISCUSSION

In terms of abundance, nonresident species make up a small portion of Isla Socorro's avifauna. The pelagic species are few in number, and most likely visitors from Isla San Benedicto. Of the eight species of gulls recorded, only the Ring-billed and the California Gulls have been seen in any great numbers. Shorebirds, with the exception of the Wandering Tattler and Whimbrel, appear to be accidentals. Isla Socorro possesses few sandy and muddy beaches that would attract them.

Perhaps the most interesting of our observations are of the raptors. The simultaneous presence of the American Kestrel, Northern Harrier, Cooper's Hawk, Sharp-shinned Hawk, Peregrine Falcon, and Barn Owl suggests increased bird predation on this remote island, where Red-tailed Hawks are the only resident birds of prey (Walter 1990). This may complicate the planned reintroduction of the Socorro Dove.

Except for the Yellow-rumped Warbler, the passerines usually occur as single individuals. Migrants frequently concentrate in the planted mango, lemon, and palm orchard near the navy base. Additional migrants are likely to be recorded.

Of considerable concern are the frequent sightings of the Brown-headed Cowbird. So far, we have not detected any attempted breeding of this brood parasite. The observation of the Groove-billed Ani is not a surprise because the species' population in Mexico is increasing. Cattle Egrets and House Sparrows have been confined to the immediate vicinity of the navy base.

The navy base has had a substantial impact upon the avifauna of Isla Socorro. The introduction of domestic cats was almost certainly the major factor in the extirpation of the Socorro Dove and drastic reduction in numbers of the Socorro Mockingbird (Jehl and Parkes 1982, 1983). On the other hand, some of the native bird species appear to have adjusted well to the permanent human presence on Isla Socorro. The Yellow-crowned Night-Heron is most commonly seen in the garrison area at night, while the Common Ground-Dove is attracted by the constant availability of fresh water. Indirectly, the introduction of the house mouse may have provided the Barn Owl with a prey source, enabling it to colonize the island.

The navy base also acts as a magnet for visiting birds. One reason that there have been so many new records of species on Isla Socorro may be that the area around the navy base is more attractive to vagrants than the rest of the island and they are more likely to be seen there. The orchard has

several fruit trees that attract insects, while the garbage produced by the navy personnel provides an ample food supply for visiting gulls. When observed, Brown-headed Cowbirds have been in the company of the few horses and cattle present. Both the Snowy Egret and the Cattle Egrets were seen in the vicinity of the navy base.

At present, the known avifauna on Isla Socorro consists of eleven endemic species and subspecies, of which one, possibly two, are extinct in the wild (Socorro Dove and Elf Owl), two or three newly established species (Mourning Dove, Northern Mockingbird, and possibly Barn Owl), two species of seabirds that nest on nearby islets (Sooty Tern and Brown Noddy), and 68 seasonal visitors and accidental species. The increase recorded in the past few years in the number of nonresident species is probably a result of more frequent visits to the island.

As noted, Isla Socorro's avifauna has undergone substantial changes within the past two decades (Jehl and Parkes 1982, 1983). We believe that Isla Socorro provides an excellent opportunity to document ongoing changes in species composition and relative abundance over time. In addition, if the feral sheep and cats can be successfully removed from the island, there is the prospect of observing how the recently established bird species adapt to a less disturbed habitat. We hope to be able to report on these changes in the future.

ACKNOWLEDGMENTS

We thank all participants of the recent Isla Socorro expeditions for their excellent stamina and enthusiasm: Luis F. Baptista, Stephen F. Bailey, Jim and Robert Clements, Helen Horblit, Enrique Martínez Ojeda, Filemon Manzano Hernández, and Andres Sada, who all contributed their unpublished data for this paper. We thank the Mexican armed forces for their invaluable assistance with transportation and logistics, the Secretaría de Desarrollo Urbano y Ecología for sponsoring our conservation efforts, Admiral Gordillo Rodriguez for his unfailing support and deep curiosity about anything on Isla Socorro, Manuel Marin for valuable comments on several drafts, UCLA and CIB for the establishment of a binational conservation project, and the Commission of the Californias for initiating the official quest for the return of the Socorro Dove.

LITERATURE CITED

Anthony, A. W. 1898. Avifauna of the Revillagigedo Islands. Auk 15:311–318.

Brattstrom, B. H. 1990. Biogeography of the Islas Revillagigedo, Mexico. J. Biogeogr. 17:177–183.

Brattstrom, B. H., and Howell, T. R. 1956. The Birds of the Revilla Gigedo Islands, Mexico. Condor 58:107–120.

Gifford, E. W. 1913. The birds of the Galapagos Islands, with observations on the birds of Cocos and Clipperton islands (Columbiformes to Pelecaniformes). Proc. Calif. Acad. Sci., Ser. 4, 2:1–132.

Grayson, A. J. 1872. On the physical geography and natural history of the islands of the Tres Marias and of Socorro, off the western coast of Mexico. Proc. Boston Nat. Hist. Soc. 14:261–302.

Howell, S. N. G., and Webb, S. 1990. The seabirds of las Islas Revillagidedo, Mexico. Wilson Bull. 102:140–146.

Jehl, J. R. Jr. 1982. The biology and taxonomy of Townsend's Shearwater. Gerfaut 72:121–135.

Jehl, J. R. Jr., and Parkes, K. C. 1982. The status of the avifauna of the Revillagigedo Islands, Mexico. Wilson Bull. 94:1–19.

Jehl, J. R. Jr., and Parkes, K. C. 1983. "Replacements" of landbird species on Isla Socorro, Mexico. Auk 100:551–559.

Jones, H. L., and Diamond, J. M. 1976. Short-time-base studies of turnover in breeding birds of the California Channel Islands. Condor 76:526–549.

Levin, G. A., and Moran. R. 1989. The vascular flora of Isla Socorro, Mexico. San Diego Soc. Nat. Hist. Memoir 16.

MacArthur, R. H., and Wilson, E. O. 1967. The Theory of Island Biogeography. Princeton Univ. Press, Princeton, N.J.

McLellan, M. E. 1926. Expedition to the Revillagigedo Islands, in 1925. VI. The birds and mammals. Proc. Calif. Acad. Sci., Ser. 4, 15:279–322.

Parkes, K. C. 1990. Was the Socorro Mockingbird (*Mimodes graysoni*) a predator on small birds? Wilson Bull. 102:317–320.

Santaella, L., and Sada, A. M. 1991. The avifauna of the Revillagigedo Islands, Mexico: Additional data and observations. Wilson Bull. 103: 668–675.

Scott, J. M., Mountainspring, S., Ramsey, F. L., and Kepler, C. B. 1986. Forest bird communities of the Hawaiian Islands: Their dynamics, ecology, and conservation. Studies Avian Biol. 9.

Villa, R. B. 1960. Vertebrados terrestres, in La Isla Socorro. Monogr. Inst. Geofis., Univ. Nacl. Autónoma Méx. 2: 203–216.

Walter, H. S. 1990. Small viable population: The Red-tailed Hawk of Socorro Island. Conserv. Biol. 4:441–443.

Accepted 28 March 1992

A REASSESSMENT OF THE TAXONOMIC STATUS OF THE YELLOW-BILLED CUCKOO

KATHLEEN E. FRANZREB, Endangered Species Office, U.S. Fish and Wildlife Service, 2800 Cottage Way, Room E-1823, Sacramento, California 95825 (present address: U.S. Forest Service, Southeastern Forest Experiment Station, Department of Forest Resources, Clemson University, Clemson, South Carolina 29634-1003)

STEPHEN A. LAYMON, Kern River Research Center, P. O. Box 990, Weldon, California 93283

Two North American subspecies of the Yellow-billed Cuckoo (*Coccyzus americanus*) have been defined by a difference in size: a smaller eastern (*C. a. americanus*) and a larger western (*C. a. occidentalis*). This taxonomic treatment was proposed originally by Ridgway (1887) and later followed by other workers (Peters 1940, A.O.U. 1957, Oberholser 1974), though various authors have questioned the validity of this separation (Todd and Carriker 1922, Van Tyne and Sutton 1937, Mees 1970, Banks 1988).

The purpose of our investigation was to reexamine the taxonomic status of the Yellow-billed Cuckoo. We assessed behavioral and ecological differences between the two populations to determine whether they were correlated with morphological differences. Additionally, we wanted to determine the taxonomic identity of birds from New Mexico, western Texas, and adjacent Mexico.

MATERIALS AND METHODS

Richard C. Banks kindly provided all the raw measurements that he had taken for his analysis (Banks 1988). We measured 41 additional specimens by Banks' techniques. We divided the specimens into four geographic samples (west, east, Caribbean, and Texas and vicinity) and analyzed the sexes separately. We analyzed birds collected in western Texas, New Mexico, and adjacent Mexico separately because of the likelihood that they are intermediate between the eastern and western subspecies. We included tail length as one of the variables, measuring it on the 41 additional specimens and and using it where available in Banks' data set.

We attempted to restrict our evaluation to breeding birds only. On the basis of the nesting chronology in Bent (1940), we used eastern specimens collected from 1 June through 15 August and western specimens collected from 1 June through 31 August only in our sample. Vagrant Yellow-billed Cuckoos are not uncommon, especially during spring and the early part of the breeding season (Gaines and Laymon 1984), so individuals collected away from breeding areas were excluded from the analysis. One bird was excluded because it had an abnormally small bill.

Specimens from eastern Texas east were combined into the eastern sample, while those from western New Mexico west were combined into the western sample. Specimens from eastern New Mexico, western Texas, and adjacent Mexico constituted a third group. In addition, our preliminary review of the data indicated there was the possibility that the Caribbean

birds were different enough from the eastern population to warrant being segregated from them, so we defined them as a fourth group.

We used Students' *t* test to compare means of measurements from adult eastern birds and western birds, each sex handled separately. We defined the difference between the means of two populations as being significant if the *t* test specified that the probability of their being the same was less than 0.05. Separate *t* tests for each sex compared eastern and western birds for differences in maxilla depth, bill length, wing length, and tail length.

All statistical analyses were done on an IBM PC XT computer by means of the Number Cruncher Statistical Package (Hintze 1987). Univariate statistics were computed by means of the descriptive statistics program and the unpaired *t* test program.

We performed a discriminant analysis on the data by using the discriminant analysis program. Discriminant function analysis distinguishes between two populations on the basis of several variables considered simultaneously. Using measurements obtained from members of two known populations, this program devises an equation, the discriminant function. For example, the discriminant function equation for eastern males was calculated from the data from all male specimens collected in the east. Applying the rule to measurements of an individual specimen yields a score that assigns the individual to one of the two populations. We used measurement of 256 western and 393 eastern Yellow-billed Cuckoos to derive a discriminant function for each sex and population that produced maximal separation between these samples on the basis of four variables (bill length, maxilla depth, tail length, and wing length). When not all measurements could be taken on a specimen, the program disregards all data from that specimen. Because of wear, tail measurements were often unreliable. Therefore, we ran the discriminant analysis first using all four variables, then using only three variables, bill length, maxilla depth, and wing length, to maximize sample size. The resulting functions were evaluated to yield discriminant scores for each individual in the two presumed populations. The discriminant function was tested for statistical significance with the Wilk's lambda test (Marascuilo and Levin 1983).

The discriminant functions for separating male eastern and western Yellow-billed Cuckoos are presented in Equation 1. Results for females are shown in Equation 2. When values (in millimeters) from an individual specimen are inserted into the eastern equation, a score greater than 0.5 suggests that the individual is from the eastern population, while a score less than 0.5 suggests that the bird originated from the western population. Similarly, when the western equation is used, if the score is more than 0.5, the individual would be classified as a western bird. We analyzed only the equations for eastern birds because the equations for western birds are a mirror image and thus provide no additional information. Finally, we figured the classification score: the percentage of Yellow-billed Cuckoos in each sample categorized as expected on the basis of range.

Equation 1. Regression Equation for Discriminant Analysis of Male Yellow-billed Cuckoos

East: If 8.8315 + [wing length (–0.0184) + tail length (–0.006) + bill length (–0.1606) + maxilla depth (–0.2399)] > 0.5, bird is likely of eastern origin; if < 0.5, bird is likely of western origin

West: If –7.8315 + [wing length (0.0184) + tail length (0.006) + bill length (0.1606) + maxilla depth (0.2399)] > 0.5, bird is likely of western origin; if < 0.5, bird is likely of eastern origin

Equation 2. Regression Equation for Discriminant Analysis of Female Yellow-billed Cuckoos

East: If 10.5013 + [wing length (–0.0195) + tail length (–0.0268) + bill length (–0.1279) + maxilla depth (–0.0836)] > 0.5, bird is likely of eastern origin; if < 0.5, bird is likely of western origin

West: If –9.5013 + [wing length (0.0195) + tail length (0.0268) + bill length (0.1279) + maxilla depth (0.0836)] > 0.5, bird is likely of western origin; if < 0.5, bird is likely of eastern origin

RESULTS

Student's *t* Test

Western cuckoos of both sexes were significantly longer winged (males 4.45 mm, $t = -9.28$, $P < 0.00001$; females 5.71 mm, $t = -11.69$, $P < 0.00001$) than their eastern counterparts (Tables 1–3). Although some tail feathers were a little frayed, western males averaged 5.06 mm longer-tailed than eastern males ($t = -6.60$, $P < 0.00001$) (Tables 1 and 3). Mean tail lengths of females were 6.95 mm greater in western than in eastern specimens ($t = -8.33$, $P < 0.00001$) (Tables 2 and 3). Our *t* test results showed that bill length and maxilla depth were significantly greater in western than in eastern cuckoos among both males and females (Tables 1–3).

A comparison of cuckoos from the Caribbean and eastern North America indicated that males are similar in tail length, bill length, and maxilla depth but that Caribbean birds have significantly shorter wings ($t = 2.39$, $P < 0.02$) (Table 3). Female Caribbean birds had both wings ($t = 2.76$, $P < 0.05$) and tails ($t = 2.52$, $P < 0.05$) significantly shorter than did eastern birds (Table 3). Western Yellow-billed Cuckoo males were significantly larger than the Caribbean males in all four variables (Table 3). Female western specimens were larger in terms of wing length, tail length, and bill length but were not significantly different in maxilla depth (Table 3).

Males from eastern New Mexico, western Texas, and adjacent Mexico, were similar to eastern birds in wing length, tail length, and maxilla depth (Table 3). However, their bills were longer than those of eastern birds by a mean difference of 0.74 mm (Table 3). Similarly, females from this area had bills (by 0.53 mm) and wings (by 5.21 mm) significantly longer than those of eastern females (Table 3).

Western males were significantly larger in wing length, tail length, and maxilla depth than males from western Texas, eastern New Mexico, and adjacent Mexico, but were similar in bill length (Tables 1 and 3). Females from the western populations had longer wings, tails, and bills than those

Table 1 Sample Sizes, Means, and Standard Deviations of Measurements (mm) of Male Yellow-billed Cuckoos from the East, West, Texas and Vicinity, and the Caribbean; Discriminant Function Scores for Males in the East and West

	n	*X*	S.D.[a]	Range
Wing length				
East	186	140.63	4.09	128.7–155.6
West	141	145.08	4.55	131.0–155.5
W. Texas & vicinity	18	140.89	3.84	132.3–147.8
Caribbean	20	138.32	4.37	130.0–151.0
Tail length				
East	152	138.43	4.93	125.4–152.0
West	87	143.49	6.85	124.6–166.6
W. Texas & vicinity	11	138.37	4.46	129.1–144.2
Caribbean	15	136.32	3.79	130.0–147.2
Bill length				
East	174	19.03	0.86	16.6–21.2
West	135	20.13	1.02	17.2–22.9
W. Texas & vicinity	16	19.84	0.81	18.2–21.1
Caribbean	20	19.05	0.75	17.7–20.8
Maxilla depth				
East	181	6.48	0.36	5.4– 7.5
West	141	6.66	0.44	5.6– 7.7
W. Texas & vicinity	17	6.42	0.43	5.8– 7.4
Caribbean	20	6.38	0.25	6.0– 6.9
Discriminant function score				
East	136	0.748	0.234[b]	0.09–1.00
West	59	0.292	0.282[c]	0.00–0.95

[a]S.D., standard deviation
[b]Standard error, 0.40
[c]Standard error, 0.073

from Texas, New Mexico, and Mexico; however, maxilla depth was similar (Tables 2 and 3).

Discriminant Analysis

The discriminant function scores, means, standard deviations, and ranges for eastern and western males and females are shown in Tables 1 and 2, respectively. Results are plotted in a histogram (Figure 1) that shows the separation of the two groups based on the discriminant function analysis. The results indicate that most birds (more than 70% for all populations) strongly exhibit the characteristics of their respective populations.

Because the figure is based on the equation derived for eastern birds (see Equations 1 and 2), a discriminant function score greater than 0.5 suggests that the bird is of eastern origin, whereas a score less than 0.5 suggests that the bird is from the western population. The discriminant function analysis yielded classification scores of 83.8% and 74.6% for eastern and western

Table 2 Sample Sizes, Means, and Standard Deviations of Measurements (mm) of Female Yellow-billed Cuckoos from the East, West, Texas and Vicinity, and the Caribbean; Discriminant Function Scores for Females in the East and West

	n	*X*	S.D.[a]	Range
Wing length				
East	188	144.63	3.73	134.5–155.0
West	105	150.34	4.49	138.2–163.5
W. Texas & vicinity	16	147.17	5.00	133.7–157.6
Caribbean	16	141.96	3.34	134.8–146.8
Tail length				
East	132	141.84	4.92	130.1–155.2
West	53	148.79	5.65	133.2–161.6
W. Texas & vicinity	8	143.64	4.74	137.1–151.2
Caribbean	10	137.81	4.32	130.9–145.0
Bill length				
East	179	19.31	0.87	16.4–21.4
West	100	20.53	0.99	18.0–23.0
W. Texas & vicinity	16	19.84	0.91	17.9–22.3
Caribbean	14	19.34	0.71	18.4–20.6
Maxilla depth				
East	186	6.45	0.37	5.1–7.4
West	103	6.73	0.49	5.1–7.8
W. Texas & vicinity	16	6.53	0.32	5.6–6.9
Caribbean	15	6.57	0.33	6.1–7.2
Discriminant function scores				
East	120	0.786	0.261	0.02–1.00
West	48	0.184	0.212	0.00–0.95

[a]S.D., standard deviation
[b]Standard error, 0.048
[c]Standard error, 0.061

Table 3 Student's *t* Test Values Comparing Measurements (mm) of Breeding Yellow-billed Cuckoos in Eastern and Western North America, West Texas and Vicinity, and the Caribbean

Comparison	Sex	Wing length	Tail length	Bill length	Bill depth
East vs West	M	−9.28[a]	−6.60[a]	−10.29[a]	−4.19[a]
	F	−11.69[a]	−8.33[a]	−10.74[a]	−5.35[a]
East vs Caribbean	M	2.39[a]	1.61	0.08	1.21
	F	2.76[a]	2.52[a]	−0.15	−1.17
West vs Caribbean	M	−6.25[a]	−3.94[a]	−4.56[a]	−2.83[a]
	F	−7.17[a]	−5.82[a]	−4.34[a]	−1.21
East vs w. Texas	M	−0.26	0.04	−3.63[a]	0.56
& vicinity	F	−2.54[a]	−1.01	−2.36[a]	−0.77
West vs w. Texas	M	−3.74[a]	−2.41[a]	−1.10	−2.11[a]
& vicinity	F	−2.60[a]	−2.45[a]	−2.61[a]	−1.58

[a]$P < 0.05$

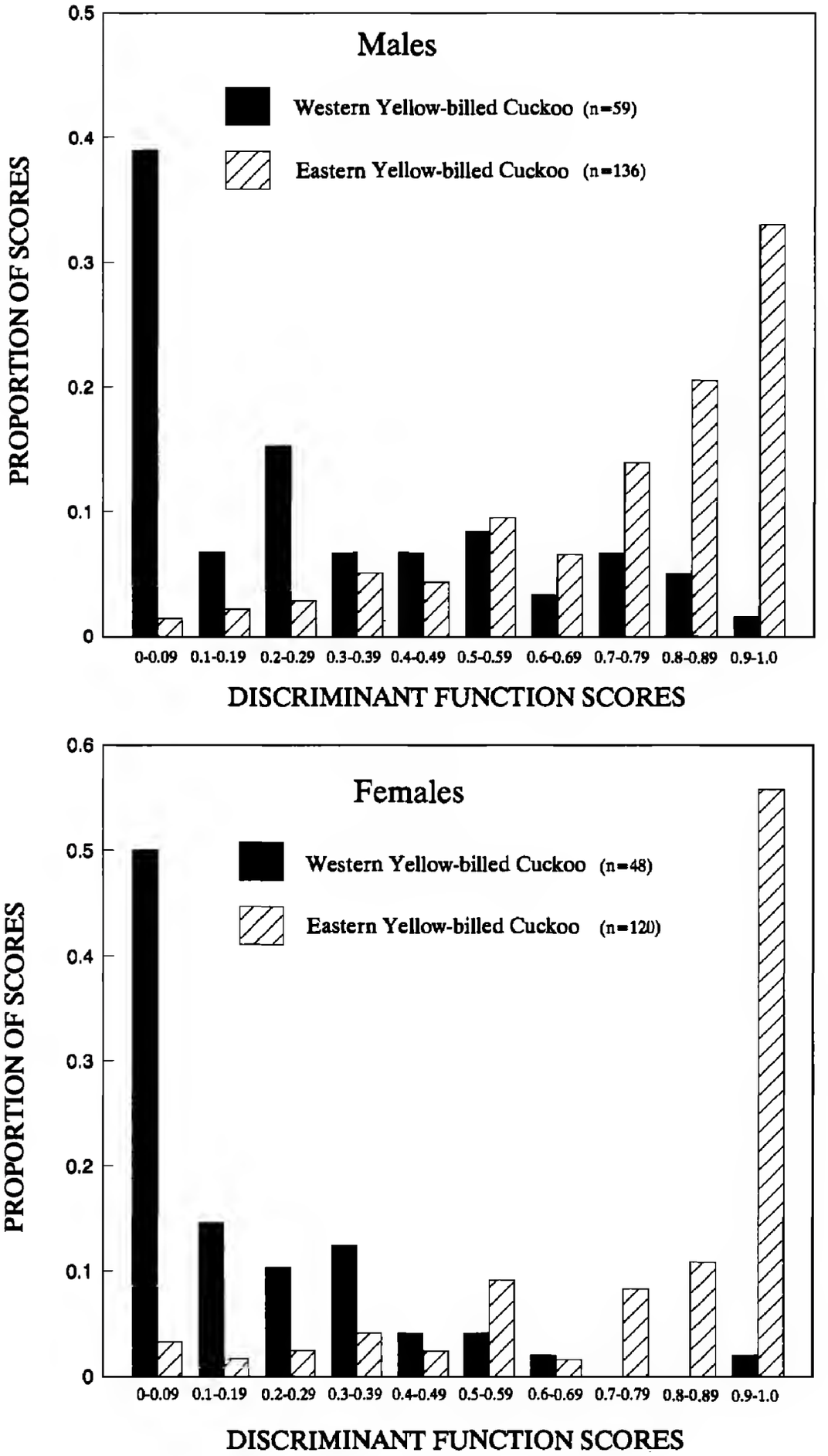


Figure 1. Discriminant function scores for male and female western and eastern Yellow-billed Cuckoos.

Table 4 Percentage of Correctly Categorized Individuals Based on Discriminant Function Analysis of Measurements[a] of Yellow-billed Cuckoos from Eastern and Western North America[b]

	Males	Females
n	195	168
East	83.8%	89.6%
West	74.6%	85.8%
Wilk's lambda	0.643	0.641
F[c]	53.58[a]	47.61[a]

[a]All four variables (wing length, tail length, bill length, and maxilla depth)
[b]Excluding the Caribbean and west Texas and vicinity
[c]$P < 0.001$ for *F* statistic

males, respectively, when all four variables were used (Table 4). Females had a higher probability of being correctly categorized than did males (Table 4): 89.6% of eastern and 85.8% of western females were correctly categorized. The Wilk's lambda test showed that the discriminant function score was significant ($P < 0.001$) (Table 4).

DISCUSSION

Taxonomy

Ridgway (1887) segregated Yellow-billed Cuckoos into two subspecies on the basis of the western birds' being "larger, with proportionately larger and stouter bills" as evidenced by differences in mean measurements of 1.5 mm in culmen length, 1.5 mm in bill depth, 6 mm in wing length, and 13 mm in tail length. Banks (1988) detected no consistent variation in color of the plumage. Moreover, he found that measurements of the maxilla depth, the length of the culmen, and the length of the wing of western and eastern birds were not significantly different. From this analysis he concluded that geographic variation in Yellow-billed Cuckoos is insufficient to warrant a division into two subspecies.

Contra Banks (1988), we found statistically significant differences between eastern and western birds in all variables examined (wing length, tail length, bill length, and maxilla depth). Banks (1990) recently reviewed his data and found that his original statistical analyses were incorrectly done and that there were statistically significant differences in these variables; however, the correction did not alter his view that the populations are not different enough to warrant recognition as subspecies (Banks 1990). Banks examined only one variable at a time and concluded that no single variable could separate eastern and western birds to subspecies.

Discriminant function analysis has been used previously to help define subspecies. Storer (1989) reported that the tremblers (*Cinclocerthia*) on

Dominica and St. Vincent islands warranted subspecific recognition based on his discriminant function analysis and differences in plumage color. Males on Dominica were correctly categorized 87.7% of the time and those on St. Vincent 95.0% of the time. Females from Dominica and St. Vincent were properly categorized 80.0% and 64.7% of the time, respectively (Storer 1989). The level of correct categorization of eastern and western cuckoos is similar to that of the Guadeloupe/Dominica populations recognized by Storer (1989) as subspecies. Although the level of differentiation in cuckoo populations is not as strong as that for tremblers, in our view the differences are substantial enough to support subspecific recognition.

Behavior and Ecology

In birds, subspecies are defined by differences in the color and pattern of the plumage and/or differences in the size and proportion of various body parts, when these differences are believed to be genetically based. Intraspecific differences in other aspects of a species' biology, such as vocalizations, breeding and molt chronology, and migratory behavior, may coincide with these physical differences, implying substantial genetic divergence (Johnson 1980, Lanyon 1982, Robbins et al. 1986, Unitt 1987).

From egg date records (Bent 1940), it is clear that eastern Yellow- billed Cuckoos begin breeding considerably earlier than their western counterparts. For example, in eastern Texas eggs have been noted as early as 24 March and as late as 30 June (n = 34), with the majority (n = 26) between 6 May to 6 June. In Illinois, eggs were noted from 20 May to 19 July (n = 39), with about 50% from 4 to 26 June. Egg dates for New York range from 24 May to 19 August (n = 23), with about 50% concentrated from 4 to 11 June. In contrast, in California, eggs have been observed from 15 May until 20 August (n = 55), with 51% from 17 June to 10 July. In Arizona, egg dates range from 28 June to 24 August (n = 13). Brandt (1951) observed that the height of the nesting season for cuckoos along the San Pedro River, Arizona, was 10–15 July and observed the earliest fresh eggs on 24 June. Incubation in three nests in Arizona commenced on 29 and 30 July and 6 August (Hamilton and Hamilton 1965). Clearly, breeding of the eastern Yellow-billed Cuckoo begins earlier with most clutches laid 2 weeks to 3 months before those of the western birds, depending on the area. For the eastern cuckoo, nesting begins later in more northern than in more southern locations, as is expected in a migratory species. Such a difference is not evident in the western Yellow-billed Cuckoo.

Dates of migration of eastern and western cuckoos also differ. Oberholser (1974) noted that in eastern Texas birds arrived from April to late May, but in the Trans-Pecos (west Texas) area, cuckoos were first observed from May to mid-June. This distinction corresponds with Oberholser's belief that Yellow-billed Cuckoos in west Texas were the western subspecies and those throughout the remainder of the state were the eastern subspecies.

In Florida, Yellow-billed Cuckoos usually are first seen in late March or early April and depart in autumn from late October to mid-November (Sprunt 1954). Transient and summer residents have been noted in Oklahoma from 17 April to 13 October (Sutton 1967). Farther north, cuckoos

seldom arrive in Pennsylvania before the second week in May (average date 12 May) and usually remain until late September (Todd 1940). In contrast, Yellow-billed Cuckoos in California arrive on the breeding grounds occasionally as early as late May, but most frequently in June or early July (Laymon and Halterman 1987a,b). In Arizona, the Yellow-billed Cuckoo is found from the first week in June through September (Phillips et al. 1964).

In California and Arizona, breeding habitats of Yellow-billed Cuckoos include wooded rivers and creeks in the Lower and Upper Sonoran and Transition zones. The riparian forests selected by cuckoos tend to have tall, mature stands of cottonwood (*Populus* spp.) and willows (*Salix* spp.). Dense stands of mesquite (*Prosopis* spp.) and tamarisk (*Tamarix* spp.) are seldom used (Groschupf 1987, Gaines and Laymon 1984).

In the Pecos Valley, New Mexico, Yellow-billed Cuckoos are said to be unusual because they nest not only in cottonwoods and willows but also regularly in dense tamarisks (Howe 1986). In contrast, cuckoos avoid tamarisk in other locations such as Arizona (Ohmart and Anderson 1982), the middle Rio Grande Valley in New Mexico (Hink and Ohmart 1984, Howe 1986), and California (Gaines and Laymon 1984).

Prior to the late 1920s cuckoos bred in towns along the Pecos River such as Roswell, Artesia, and Carlsbad (Bailey 1928). In these situations, the cuckoos probably selected elms (*Ulmus* spp.) and other exotic tree species for nesting (Howe 1986). By the 1920s tamarisk was well established and cuckoos began nesting in it (Hildebrandt and Ohmart 1982, Howe 1986). Currently cuckoos also use planted cottonwoods in this area for nesting. Bent (1940) noted that the eastern Yellow-billed Cuckoo originally may have been a woodland bird but has learned to use urban environments, where it finds an abundant food supply in shade trees, orchards, and gardens; it is seldom seen in dense woods.

Of the 30 specimens we examined from the Pecos River and Rio Grande, 12 of the 19 from the Rio Grande upstream of Big Bend were scored as western by the discriminant function, whereas 9 of 11 from the Pecos and Rio Grande rivers downstream of Big Bend were scored as eastern by the discriminant function. The discriminant analysis predictions agreed on 70% of the 30 cuckoos, showing a high degree of predictability within the zone of overlap. Of the 9 cuckoos for which the geographic and discriminant analysis predictors did not agree, 7 were "eastern" birds found in the west and only 2 were "western" birds found in the east. Eastern birds may be moving west from the Pecos River Valley at a rate greater than that at which western birds are moving east. The data suggest that this area is a zone of contact between eastern and western Yellow-billed Cuckoos and that continuing urban development, expansion of tamarisk, and seemingly more general breeding habitat requirements may be facilitating the gradual movement of eastern birds west.

The proclivity of western Yellow-billed Cuckoos to arrive on the breeding grounds at any time from the last week in May to the first week in July complicates the matter of judging what is truly a breeding individual. Vagrancy is also a difficult problem to address. Information from other species suggests that it is very likely that many, if not most, cuckoos found on the coast and at desert oases in California from mid-May to late June

and from September to November are of eastern origin. But no specimens of these are available with which this hypothesis could be tested.

Our field work suggests a difference in bill color between live eastern and western cuckoos, eastern birds having yellow bills and western birds having orange bills. These differences are not detectable in older museum specimens, in which the color of the bill fades. Existing tape recordings suggest a possible difference in call and song. Descriptions in the literature and our field work indicate a difference in juvenal plumage: young cuckoos in California have all-black bills for at least three weeks after leaving the nest, whereas juveniles in the east are said to have yellow bills (Oberholser 1974).

CONCLUSIONS

We believe that further study of geographical variation in call, bill color, and genetics of the Yellow-billed Cuckoo is warranted. Because the western Yellow-billed Cuckoo is endangered in most of its range, such a study will have to be restricted to live birds. Because the recognition of the subspecies on the basis of measurements of existing specimens is equivocal and because the apparent differences in calls and bill color need further study, we recommend that the two subspecies of Yellow-billed Cuckoos be retained until such a study is completed. The western Yellow-billed Cuckoo was denied protection under the Endangered Species Act as a result of the taxonomic recommendation by Banks (1988). But because the western cuckoo is so critically endangered (Gaines and Laymon 1984, Laymon and Halterman 1987c), we believe that changes in its classification should be made only after the best possible study.

SUMMARY

We analyzed measurements of 750 museum specimens of eastern (*Coccyzus americanus americanus*) and western (*C. a. occidentalis*) Yellow-billed Cuckoos to determine if recognition of the two subspecies should be maintained. Student's *t* tests of differences in wing length, tail length, bill length, and maxilla depth revealed statistically significant differences between the smaller eastern and larger western birds. A discriminant function analysis correctly categorized 83.8% of males in the east and 74.6% of those in the west, 89.6% of females in the east and 85.8% of those in the west, and we believe that this level of differentiation is sufficient to warrant retention of the two subspecies. These physical differences coincide with earlier migration and breeding and more generalized selection of breeding habitat (including urban development) by the eastern population. Western Texas, eastern New Mexico, and adjacent Mexico is a zone of overlap or intergradation between the eastern and western subspecies, and the eastern Yellow-billed Cuckoo is apparently expanding its range west from the Pecos River valley into the Rio Grande valley, New Mexico. Apparent differences between the eastern and western subspecies in calls and color of the bill of both adults and juveniles warrant further study.

ACKNOWLEDGMENTS

We especially thank R. C. Banks for kindly providing us with the raw data he amassed during his 1988 investigation and for his comments and advice regarding this study. We are grateful to J. Northern, Bird and Mammal Collection, University of California, Los Angeles, for providing the additional specimens we measured to augment the data provided by Banks. We greatly appreciate the valuable comments provided on earlier drafts of this manuscript by Philip Unitt, Stephen F. Bailey, Kenneth C. Parkes, Thomas B. Smith, Robert Storer, and Sanford Wilbur.

LITERATURE CITED

American Ornithologists' Union. 1957. Check-list of North American Birds. 5th ed. Am. Ornithol. Union, Baltimore.

Bailey, F. M. 1928. Birds of New Mexico. N. M. Dept. Game and Fish, Santa Fe.

Banks, R. C. 1988. Geographic variation in the Yellow-billed Cuckoo. Condor 90:473–477.

Banks, R. C. 1990. Geographic variation in the Yellow-billed Cuckoo: Correction and comments. Condor 92:538.

Bent, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies. U.S. Natl. Mus. Bull. 176.

Brandt, H. 1951. Arizona and Its Bird Life. The Bird Research Foundation, Cleveland.

Gaines, D., and Laymon, S. A. 1984. Decline, status, and preservation of the Yellow-billed Cuckoo in California. W. Birds 15:49–80.

Groschupf, K. 1987. Status of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) in Arizona and west Texas. Unpubl. report under contract 20181-86-00731 to U.S. Fish and Wildlife Service, 3616 W. Thomas Rd., Suite 6, Phoenix, AZ 85019.

Hamilton, W. J., III, and Hamilton, M. E. 1965. Breeding characteristics of Yellow-billed Cuckoos in Arizona. Proc. Calif. Acad. Sci. 32:405–432.

Hildebrandt, T. D., and Ohmart, R. D. 1982. Biological resource inventory (vegetation and wildlife), Pecos River basin, New Mexico and Texas. Unpubl. report under contract 9-07-57-VO567 to U.S. Bureau of Reclamation, 23636 N. Seventh St., Phoeniz, AZ 85024.

Hink, V. C., and Ohmart, R. D. 1984. Middle Rio Grande biological survey. Unpubl. report under contract DACW47-81-C-0015 to Army Corps of Engineers, P. O. Box 1580, Albuquerque, NM 87103.

Hintze, J. L. 1987. Number cruncher statistical system version 5.1—graphics. 865 East 400 North, Kaysville, UT 84037.

Howe, W. H. 1986. Status of the Yellow-billed Cuckoo (*Coccyzus americanus*) in New Mexico. Unpubl. report under contract 516.6-75-09 to N. M. Dept. Game and Fish, Villagra Building, Santa Fe, NM 87503.

Johnson, N. K. 1980. Character variation and evolution of sibling species in the *Empidonax difficilis–flavescens* complex (Aves: Tyrannidae). Univ. Calif. Publ. Zool. 112.

Laymon, S. A., and Halterman, M. D. 1987a. Part I. 1986 survey of Yellow- billed Cuckoos in southern California. Unpubl. report to Calif. Dept. Fish and Game, 1416 Ninth St., Sacramento, CA 95814.

Laymon, S. A., and Halterman, M. D. 1987b. Part II. Nesting ecology of the Yellow-billed Cuckoo on the Kern River: 1986. Unpubl. report to Calif. Dept. Fish and Game, 1416 Ninth St., Sacramento, CA 95814.

Laymon, S. A., and Halterman, M. D. 1987c. Can the western subspecies of the Yellow-billed Cuckoo be saved from extinction? W. Birds 18:19–25.

Lanyon, W. E. 1982. The subspecies concept: Then, now, and always. Auk 99:603–604.

Marascuilo, L. A., and Levin, J. R. 1983. Multivariate Statistics in the Social Sciences: A Researcher's Guide. Brooks/Cole, Monterey.

Mees, G. F. 1970. On some birds from southern Mexico. Zool. Mededelingen 44:237–245.

Oberholser, H. C. 1974. The Bird Life of Texas. Univ. of Tex. Press, Austin.

Ohmart, R. D., and Anderson, B. W. 1982. North American desert riparian ecosystems, in Reference Handbook of the Deserts of North America (G. L. Bender, ed.), pp. 433–479. Greenwood Press, Westport, CT.

Peters, J. L. 1940. Check-list of Birds of the World. Vol. 4. Harvard Univ. Press, Cambridge, MA.

Phillips, A., Marshall, J., and Monson, G. 1964. The Birds of Arizona. Univ. of Ariz. Press, Tucson.

Ridgway, R. 1887. A Manual of North American Birds. Lippincott, Philadelphia.

Robbins, M. B., Braun, M. J., and Tobey, E. A. 1986. Morphological and vocal variation across a contact zone between the chickadees *Parus atricapillus* and *P. carolinensis*. Auk 103:655–666.

Sprunt, A., Jr. 1954. Florida Bird Life. Coward-McCann, New York.

Storer, R. W. 1989. Geographic variation and sexual dimorphism in the tremblers (*Cinclocerthia*) and White-breasted Thrasher (*Ramphocinclus*). Auk 106:249–257.

Sutton, G. M. 1967. Oklahoma Birds. Univ. of Okla. Press, Norman.

Todd, W. E. C. 1940. Birds of Western Pennsylvania. Univ. of Pittsburgh Press, Pittsburgh.

Todd, W. E. C., and Carriker, M. A., Jr. 1922. The birds of the Santa Marta region of Colombia: A study in altitudinal distribution. Ann. Carnegie Mus. 14:1–611.

Unitt, P. 1987. *Empidonax traillii extimus*: An endangered subspecies. W. Birds 18:137–162.

Van Tyne, J., and Sutton, G. M. 1937. The birds of Brewster County, Texas. Misc. Publ. Mus. Zool. Univ. Mich. 37:1–115.

Accepted 6 June 1992

NOTES ON BREEDING COASTAL WATERBIRDS IN NORTHWESTERN SONORA

ERIC MELLINK and EDUARDO PALACIOS, Centro de Investigación Científica y Educación Superior de Ensenada, B. C., Apartado Postal 2732, Ensenada, Baja California, Mexico (international mailing address: CICESE, P. O. Box 434844, San Diego, California 92143)

Although several researchers have studied birds in the state of Sonora, Mexico, few published reports exist. Van Rossem (1945) published the only comprehensive summary, now outdated. Recently, Everett and Anderson (1991) addressed the status of the breeding seabirds of the Gulf of California.

The northernmost of Sonora's large lagoons is Bahía San Jorge, with its associated Estero San Francisquito and islands (Figure 1). Bahía San Jorge is a large bay separated from the open gulf by a long (10 km) sand bar on its southern side. Estero San Francisquito, a long, narrow tidal estuary, lies immediately to the south. Except for marshes inside the southern part of the bay, dunes are the principal terrestrial habitats around Bahía San Jorge. Certain areas are open flats with shell debris. Bahía San Jorge and Estero San Francisquito have not been investigated ornithologically in any detail, like the rest of the northern Sonora coast, with the exception of Puerto Peñasco, a popular destination for North American birdwatchers, reported on by Huey (1935) and Janes and Janes (1987).

The Islas San Jorge are several small rocky islands located just outside the bay. They lack vegetation (Felger and Lowe 1976) but are important for the nesting of several birds, including Red-billed Tropicbirds (*Phaethon aethereus*), Elegant Terns (*Sterna elegans*; Mailliard 1923), Royal Terns (*S. maxima*), Yellow-footed Gulls (*Larus livens*), Heermann's Gulls (*L. heermanni*; Bancroft 1927), Craveri's Murrelets (*Synthliboramphus craveri*; van Rossem 1926, Bancroft 1927), and Brown Boobies (*Sula leucogaster*; Everett and Anderson 1991). Felger and Lowe (1976) reported that guano was extracted from the Islas San Jorge, and Mailliard (1923) indicated that egging was carried out by local people. Formerly, there was a fish-meal factory at the tip of the sand bar of Bahía de San Jorge, and the place is now called La Purinera. The bay and estero are used mainly for oyster farming, especially at La Purinera, and low-intensity recreation. However, there is interest in increasing tourist use of the area, and recently palapas (shades) were set in to make the place more attractive to visitors.

Two other small coastal lagoons in this region are Los Tanques and Estero Morúa. Los Tanques lies about 18 km south of El Desemboque and is separated from the sea, on its southern side, by a sand bar and dunes. Estero Morúa, 10 km east of Puerto Peñasco, is limited, on its western side, by a high flattened sand bar, with steep slopes, that ends in a low flat tip.

The Gran Desierto of northwestern Sonora, although containing some small oases, has been overlooked by biologists. So far, there exists only a vegetation survey by Ezcurra et al. (1988). Van Rossem's (1945) work does not include any localities in this area. It is unclear from May's (1976) paper

whether he surveyed most oases in the Gran Desierto, but he seems not to have visited the largest oasis, La Salina.

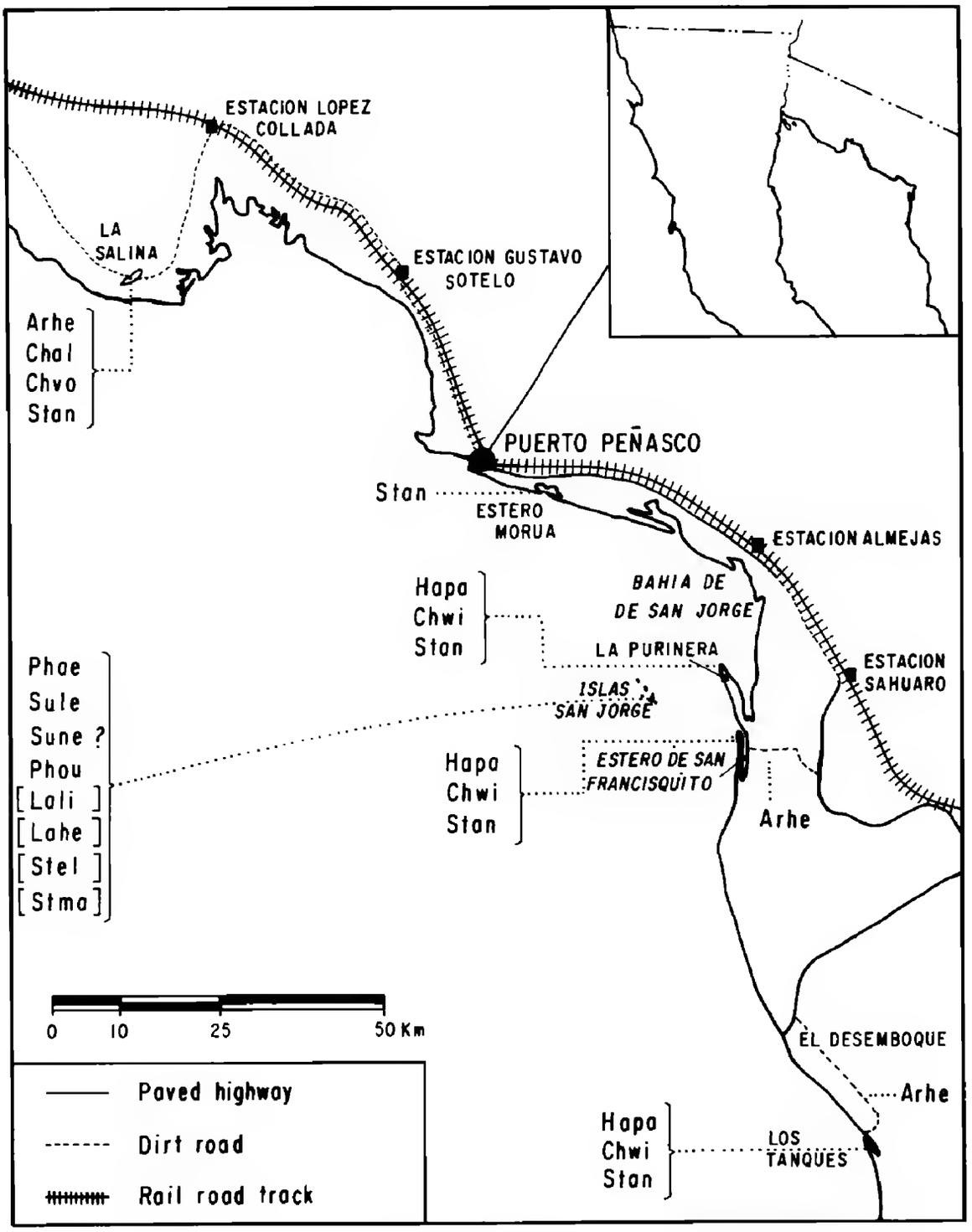


Figure 1. Coastal northern Sonora, showing localities visited and the distribution of the breeding birds recorded. Brackets indicate past but not current breeding. Arhe, *Ardea herodias*; Chal, *Charadrius alexandrinus*; Chvo, *Charadrius vociferus*; Chwi, *Charadrius wilsonia*; Hapa, *Haematopus palliatus*; Lahe, *Larus heermanni*; Lali, *Larus livens*; Phae, *Phaethon aethereus*; Phau, *Phalacrocorax auritus*; Stan, *Sterna antillarum*; Stel, *Sterna elegans*; Stma, *Sterna maxima*; Sule, *Sula leucogaster*; Sune, *Sula nebouxii*.

La Salina oasis (Figure 1) consists of a large salt flat stretching northeast to southwest for about 5 km. Its southwestern tip is separated from the sea by sand dunes. Near the northern end of the salt flat several artesian wells of fresh water feed patches of luxuriant vegetation, including the exotic salt cedar (*Tamarix chinensis*) and stands of screwbean or tornillo (*Prosopis pubescens*), tule (*Scirpus americanus*), saltgrass (*Distichlis spicata*), and ditchgrass (*Ruppia maritima*). At the eastern side there is a well and vegetation consisting mainly of tornillo, saltgrass, and spiny rush (*Juncus acutus*), with stands of arrowweed or cachanilla (*Pluchea sericea*). The hydrology and plant ecology of this and other oases of the Gran Desierto are described by Ezcurra et al. (1988). The salt flats are currently used for intensive salt production.

To study the birds of these areas, we visited the Islas San Jorge on 27 April 1991 and 25 April 1992, Bahía San Jorge on 3 December 1990, 26–27 April 1991, 20 and 22 July 1991, 24–29 April 1992, and 3–4 June 1992, and La Salina on 23–24 April 1991, 4–5 June 1991, 18–21 October 1991, and 1–2 May 1992. We visited Los Tanques on 17 July 1991 and 29 April 1992, and surveyed the sand bar of Estero Morúa on 4 June 1992. We visited the small oxidation basin next to the Centro de Estudios Tecnológicos del Mar (CETMAR), Las Conchas, Puerto Peñasco, on 30 April 1992. At Bahía San Jorge we surveyed the tip of the sand bar (La Purinera and vicinity) in December 1990, April 1991, July 1991, April 1992, and June 1992, and Estero San Francisquito in April 1991, July 1991, April 1992, and June 1992. We visited the marsh at the south end of Bahía San Jorge briefly in July 1991. At La Salina we surveyed the salt flats, some wells, especially the largest, and the tornillo grove at the eastern end of the salt flat. We checked the sandy beach at La Salina during the June 1991 visit.

SPECIES ACCOUNTS

Red-billed Tropicbird. In April 1991 we saw 12 flying over, and one incubating in a small cave about 4 m above sea level (Figure 2), at the Islas San Jorge. In April 1992 we saw only 5 flying over the islands and none nesting; the last year's nest was unoccupied.

Brown Booby. In April 1991 we estimated about 1000 nesting pairs on the Islas San Jorge. Approximately 10% had eggs and 90% had chicks three-quarters grown. On 25 April 1992 we counted, from a boat, 5800 boobies on the islands. We observed only two nests with one egg each, 60 chicks, and several juveniles, but Rubén Astorga informed us that on 28 March 1992 there were many eggs and chicks on the island. This species seems to have fluctuated greatly over time. Whereas Mailliard (1923) reported only a few and Bancroft (1927) none, D. Anderson (pers. comm.) thinks there were more than 1000 during the 1970s, and Mellink saw many in June 1982. Everett and Anderson (1991) reported that up to 5000 pairs breed there in some years. The irregularity of the Brown Booby's nesting was reported by Bancroft (1927), who found on Isla San Luis no Brown Boobies in 1925 yet a large breeding colony in 1926.

Blue-footed Booby (*Sula nebouxii*). We observed this species on all visits to the Islas San Jorge. Although we suspect that it nests there, we saw no definite evidence of this.

Double-crested Cormorant (*Phalacrocorax auritus*). In April 1991 we counted about 100 pairs with small and half-grown chicks (Figure 3) on the Islas San Jorge and a few hundred individuals, including many immatures, at La Purinera and in Estero San Francisquito. These numbers are much higher than those found by Mailliard (1923). The only cormorants that Bancroft (1927) saw in the Gulf of California were on Isla San Luis. In July 1991 there were a few hundred in two groups along Bahía San Jorge, 60 at La Purinera, and about 200 on the oyster boxes.

Osprey (*Pandion haliaetus*). We saw one at La Purinera in December 1990, four along Bahía San Jorge and one at La Purinera in July 1991, and three in June 1992. One was roosting on the La Salina radio antenna in October 1991. Henny and Anderson (1979) reported Ospreys breeding in coastal Sonora, although they didn't record any in the northernmost area, lacking cardón cacti (*Pachycereus pringlei*), in which the birds nest. Neither did Bancroft (1927) report the species in the area. In 1982 Mellink saw one nest, and in 1991 and 1992 we saw several nests along the railroad between estaciones López Collada and Sahuaro. All the Osprey nests we have seen in the area have been on powerline towers and railroad telephone poles, suggesting that these man-made structures have promoted the Osprey's colonizing the region. The railroad telephone system has existed for many decades, but the construction of the powerline towers started in early 1978, ended in mid 1979. Although the maintenance of the power system requires removal of nests, those of Ospreys are spared (J. Virgen pers. comm.).

Great Blue Heron (*Ardea herodias*). In April 1991 we saw at least 32 active nests at three wells at La Salina. In May 1992 we counted 45 active nests at the same wells. Nesting substrate was always tornillo. In June 1991 we saw many adults and juveniles. Brood size was two or three fledglings per nest. In June we saw also one adult at the fishing camp. When the young leave the nests, the birds apparently

Figure 2. Red-billed Tropicbird in nest, Islas San Jorge, 27 April 1991.

Photo by Eric Mellink and Eduardo Palacios

disperse along the coastline, as we saw no Great Blue Herons at La Salina in October 1991. We recorded them also at La Purinera in December 1990, three in Estero San Francisquito in April 1991, and one in the marsh of Bahía San Jorge, three along the shoreline of the bay, and three at La Purinera (one on the oyster boxes) in July 1991. There was one occupied nest in a saguaro (*Carnegiea gigantea*) next to the road leading to Estero San Francisquito, 1 km east of the beach, in April 1991. In June 1992, a nest in the same area had two chicks. In April 1992 we counted seven nests in cardones 6 km northeast of Los Tanques.

Cattle Egret (*Ardea ibis*). In May 1992 Cattle Egrets were nesting at the largest well of La Salina, among the Great Blue Herons. Twelve individuals flew from the site, where we saw at least three nests and found some broken eggs on the ground underneath.

Snowy Plover (*Charadrius alexandrinus*). We observed one male on the salt flats of La Salina in April 1991. In June 1991 there was one juvenile feeding on the salt flat, next to a well. Although May (1976) reported the Snowy Plover as only a migrant in the region, the presence of adults during the breeding season in suitable nesting habitat suggests that the species may breed on the site. The Snowy Plover has not yet been found nesting in Sonora. The species' breeding chronology in Baja California coincides with these observations (Palacios pers. obs.).

Wilson's Plover (*Charadrius wilsonia*). In July 1991 we counted 16 pairs at La Purinera and in Estero San Francisquito. One pair was nesting in the Least Tern (*Sterna antillarum*) nesting colony at La Purinera. When we located this nest, the male was incubating; later, the female took over. At this time we saw two females, one male, and two unsexed individuals at La Purinera and four pairs at Los Tanques.

Figure 3. Double-crested Cormorant family, Islas San Jorge, 27 April 1991. Note Brown Boobies at left behind rock and in flight.

Photo by Eric Mellink and Eduardo Palacios

Of the latter, one pair engaged in a distraction display and another bird sat down on an empty nest. In April 1992 we found several nests with eggs at Estero San Francisquito and La Purinera and five nests with no eggs at Los Tanques. These had probably been preyed upon by the dogs from the oyster farm, whose tracks were all over the area. In June 1992 we found eight nests with eggs at La Purinera.

Killdeer (*Charadrius vociferus*). This species was observed on all visits to the salt flats of La Salina: two individuals in April 1991, four in June 1991, and one (plus several heard) in October 1991 and May 1992. In June 1991 we noted a pair, one of which was performing the broken-wing distraction display and feigning incubation.

American Oystercatcher (*Haematopus palliatus*). In April 1991 we saw two pairs in Estero San Francisquito and two more pairs along the sand bar at La Purinera. One pair in Estero San Francisquito was incubating. In July 1991 we saw two individuals along Bahía San Jorge and one pair plus another individual at La Purinera. In April 1992 we saw two pairs nesting at Estero San Francisquito. At this time we did not record any at La Purinera, but in June we saw a pair with a full-grown chick. At Los Tanques, three pairs had nests in April 1992, on a sand bar separated by tidal channels at its ends. The nests had three, two, and zero eggs.

American Avocet (*Recurvirostra americana*). On 30 April 1992 we saw five individuals in breeding plumage at the oxidation basin near Puerto Peñasco. They attacked us and performed broken-wing distraction displays. We could not find any eggs but suspect that they might have been chicks hidden in nearby bushes.

Heermann's Gulls were seen on all visits. In April 1991, they were in Estero San Francisquito (4 adults, 8 immatures) and on the Islas San Jorge. On the latter, we saw about 20, stealing fish from nests of Double-crested Cormorants. In July 1991 about 150, mainly adults, were standing on the oyster boxes; there were about 120 elsewhere. Although this species has bred on the Islas San Jorge (Mailliard 1923), we found no evidence of its nesting there.

Royal Tern. We saw four individuals in Estero San Francisquito in April 1991 but no sign of them on the Islas San Jorge, where they were reported by Mailliard and Bancroft (1927).

Elegant Tern. We found only one in Estero San Francisquito in April 1991. This species was reported to breed by the thousands on the Islas San Jorge by Mailliard (1923), yet we saw none. Schaffner (1986) found that, in southern California, the populations of this species paralleled changes in the populations of the Northern Anchovy (*Engraulis mordax*). In the northern Gulf of California, the anchovy has appeared commonly in recent years, and Monterey Sardines have decreased (Hamman and Cisneros-Mata 1989, G. Hamman pers. comm.), yet Elegant Terns have evidently disappeared as breeding birds from the islands.

Least Tern. We found 16 pairs nesting and one in ground courtship at La Purinera in April 1991. Of these, one pair had its nest in the sand dunes, and the other 15 had theirs on a flat with shell debris. We marked three nests. One had one egg and two had two. The pair with one egg copulated while we were watching the colony. Another pair moved its eggs next to our marker, which we had placed about 50 cm away. In Estero San Francisquito we counted 38 individuals, forming at least 16 pairs. We observed two pairs in ground courtship, two copulations, and one pair building a nest. In July, we saw several dozen individuals in Estero San Francisquito and along Bahía San Jorge, and counted 58 at La Purinera. Some individuals were seen carrying fish, presumably to feed young.

In 1992 we found important colonies in this area. In April there were five pairs courting and one incubating at Estero San Francisquito and 60 nests with eggs at La Purinera (we marked 45). The members of the oyster-farming cooperative informed

us that nesting had started about 10 April. In early June we counted 120 juveniles and 5 adults in an evening concentration on the beach. We marked an additional 35 nests and estimated 40–50 nests total. We saw also birds courting on the ground and three small chicks. From the success of the birds nesting in April we suspect that this second wave was composed of adults arriving later, possibly including birds that were unsuccessful breeding at nearby sites.

In July 1991 we saw two adults and one juvenile at Los Tanques. One adult was feeding the juvenile. In April 1992, eight individuals were feeding along the beach and in the estero. There were no nests, but 80% of the area had vehicle tracks, allegedly of tourists, and there were dogs in the area. Thus the terns may have attempted to nest unsuccessfully at Los Tanques in 1992.

In June 1992 we found seven nests about 30 individual terns at Estero Morúa. Five nests on the south slope of the high sand bar had two eggs each. On the flat area at the tip, one nest had one newly hatched chick and one egg, and the other had one newly hatched chick and two eggs. The area was severely disturbed by off-road vehicles on the weekend that included Memorial Day (a U.S. holiday). The nests observed were probably second attempts.

Although the site is about 3 km from the sea, we saw two pairs on the salt flats of La Salina during the April and June 1991 visits. In April, one pair was building a nest, and in June, one pair had a nest with two eggs. The eggs were partially covered with salt crystals, but the chicks were pipping and picking the shell. One adult was seen fishing by the fishermen's camp. In May 1992 there was one pair with a nest and two eggs on the southernmost salt flat. These eggs had little salt on them.

Interestingly, egg-laying by Least Terns started approximately one month earlier in the upper Gulf of California than on the Pacific coast of Baja California.

DISCUSSION

The San Jorge areas seem to be of great biological importance; in addition to being a breeding site for several species of water birds, the Islas San Jorge are the northernmost locality for the rare Fishing Bat (*Myotis vivesi*; Hall 1981).

It is difficult to assess the conservation threats to the biota of the area. The egging reported by Mailliard (1923) does not seem to be practiced today. The intensification of tourism may present the most serious threat, if it includes driving of off-road vehicles and other destructive activities. We observed one off-road vehicle in the Least Tern colony of Estero San Francisquito and several on the dune at the base of the sand bar of Bahía San Jorge. Their impact on the nesting colonies of Least Terns and Wilson's Plovers at Los Tanques and Estero Morúa seems to have been strong.

La Salina may be an important stop for migratory shorebirds. In April 1991 we saw a flock of 425 Western Sandpipers (*Calidris mauri*) in breeding plumage and 80 Least Sandpipers (*Calidris minutilla*).

At La Salina the only modification of the vegetation has been the cutting of tornillos for fuel by fishermen. This has not been very intense, but already there are areas with dead stumps. An increase of fishermen, which are present only seasonally, might accelerate destruction of the habitat. This wood cutting has not extended to the wells used for nesting by Great Blue Herons. In addition, operation of the salt works results in vehicles being driven among the tornillos, another possible source of degradation.

The salt operation is based on inundating the flats with water locally pumped, letting the water evaporate, and scraping the area with bulldozers. These activities have not destroyed any vegetation, since they are carried out only on the salt flats, but they may affect the nesting habitat of Least Terns and Snowy Plovers and the habitats used by migrating shorebirds. If the pumping modifies the balance and presence of fresh water in the wells of the oasis, severe habitat changes could result.

Some people travel on off-road vehicles along the dirt road. As the beach is a preferred location, they do not camp in the tornillos. If an off-road race were held, the tornillos would be an attractive place for camps and fires. Only a few such events would be sufficient to affect the habitat severely. Owing to the solitude of the area, some drug smuggling apparently takes place. At least the army and narcotics agents patrol the area. The tornillos could be an attractive camping and roadblock point, also affecting the habitat.

Finally, on the Islas San Jorge, instead of a community of dippers (*sensu* Ashmole 1971, mainly Elegant Terns), recorded by Mailliard (1923) in 1921, we found a community of surface plungers and pursuit divers (Brown Boobies and Double-crested Cormorants) in 1991. This change might be in response to environmental changes, as surface water has warmed over the past 100 years (V. Ferreira pers. comm.)

ACKNOWLEDGMENTS

We acknowledge the kind support of the Sociedad Cooperativa Ejidal Bahía de San Jorge, which transported us to La Purinera and to the islands. Rubén Astorga has constantly assisted us, and Antonio López took us to the islands. Mr. Cárdenas kindly allowed us to work at La Salina and discussed the birds and use of that area with us. V. M. Arriaga, H. de la Cueva, J. G. Díaz, C. Paniagua, C. Rodriguez, and M. Roman assisted us during the October 1991 field work at La Salina. S. González helped us during the June 1992 visit. S. Lanham kindly supported us with an aerial reconnaissance of the upper Gulf. P. Unitt greatly assisted us with typescript preparation. D. Anderson, G. Monson, and G. Rosenberg reviewed early drafts of the manuscript.

LITERATURE CITED

Ashmole, N. P. 1971. Sea bird ecology and the marine environment, in Avian Biology (D. S. Farner and J. R. King, eds.), vol. 1, pp. 223–285. Academic Press, New York.

Bancroft, G. 1927. Notes on the breeding coastal and insular birds of central Lower California. Condor 29:188–195.

Everett, W. T., and Anderson, D. W. 1991. Status and conservation of the breeding seabirds on offshore Pacific islands of Baja California and the Gulf of California. Int. Council Bird Preserv. Tech. Publ. 11:115–138.

Ezcurra, E., Felger, R. S., Russell, A. D., and Equihua, M. 1988. Freshwater islands in a desert sand sea: The hydrology, flora, and phytogeography of the Gran Desierto oases of northwestern Mexico. Desert Plants 9:35–44.

Felger, R. S., and Lowe, C. H. 1976. The island and coast vegetation and flora of the northern part of the Gulf of California. Los Angeles Co. Mus. Nat. Hist. Contr. Sci. 285.

Hall, R. E. 1981. The Mammals of North America. Wiley, New York.

Hamman, G., and Cisneros-Mata, M. A. 1989. Range extension ond commercial capture of the Northern Anchovy, *Engraulis mordax* Girard, in the Gulf of California, Mexico. Calif. Fish and Game 75:49–53.

Henny, C. J., and Anderson, D. W. 1979. Osprey distribution, abundance, and status in western North America: III. The Baja California and Gulf of California population. Bull S. Calif. Acad. Sci. 78:89–106.

Huey, L. M. 1935. February bird life of Punta Peñascosa, Sonora, Mexico. Auk 52:249–256.

Janes, D. W., and Janes, J. Z. P. 1978. A checklist of the birds of the Puerto Peñasco region. Dept. Life Sci., Univ. of S. Colo., Pueblo, CO [distributed by photocopies].

Mailliard, J. 1923. Expedition of the California Academy of Sciences to the Gulf of California in 1921: The birds. Proc. Calif. Acad. Sci. 12:443–456.

May, L. A. 1976. Fauna de vertebrados de la region del Gran Desierto, Sonora, Mexico. An. Inst. Biol. Univ. Nacl. Autónoma Méx. Ser. Zool. 47(2):143–182.

Schaffner, F. C. 1986. Trends in Elegant Tern and Northern Anchovy populations in California. Condor 88:347–354.

Van Rossem, A. J. 1945. A distributional survey of the birds of Sonora, Mexico. Occ. Pap. Mus. Zool. La. State Univ. 21.

Accepted 9 July 1992

THE ASSOCIATION BETWEEN VAUX'S SWIFTS AND OLD GROWTH FORESTS IN NORTHEASTERN OREGON

EVELYN L. BULL and JANET E. HOHMANN, USDA Forest Service, Pacific Northwest Research Station, 1401 Gekeler Lane, La Grande, Oregon 97850

The Vaux's Swift (*Chaetura vauxi*) is a neotropical migrant that visits the Pacific Northwest long enough to nest and then returns to warmer climates for the winter. The interest in this species is two-fold. First, in the eastern United States neotropical migrants have undergone a general population decline that may be related to deforestation, habitat degradation, and forest fragmentation. Because the Vaux's Swift nests primarily in large hollow trees (Taylor 1905, Baldwin and Zaczkowski 1963, Bull and Cooper 1991), it could be affected by these factors. Second, in the Washington Cascade Range this species seems to be associated with old growth in Douglas-fir (*Pseudotsuga menziesii*) forests (Manuwal and Huff 1987), which is rapidly being logged. Our objective in this study was to determine if Vaux's Swifts are positively associated with old-growth forests in northeastern Oregon.

STUDY AREA AND METHODS

In 1991, we surveyed 160 stands for Vaux's Swifts on the Umatilla and Wallowa–Whitman national forests in Baker, Umatilla, Union, and Wallowa counties in northeastern Oregon. Half the stands selected were old growth and half had been logged in some way. We selected old-growth stands from maps provided by the Forest Service that delineated the location of these stands. We only used stands that were within 150 km of Wallowa or La Grande, within 1 km of a road, and > 5 ha in size. In addition, the stand had to meet the following conditions: >12 trees/ha ≥51 cm diameter at breast height (dbh), ≥2 canopy layers, ≥60% canopy closure, and little or no logging. In this study we did not use any old-growth stands where we had found swift nests previously (Bull and Cooper 1991).

Once an old-growth stand was located, we selected a logged stand at a random direction and at a random distance between 1 and 3 km away. If the randomly selected point fell in an old-growth stand, we repeated the process until the point fell in a logged stand. Logged stands were classified as partial overstory removals or harvest regeneration cuts. The partial overstory removals were stands where the large overstory trees had been cut; most of the trees that remained were <51 cm dbh. The regeneration cuts included clearcuts, seed tree cuts, and shelterwood cuts where all the old trees were removed eventually after young trees became established. These stands were usually dominated by young trees <6 m tall.

We recorded habitat characteristics in each stand in a transect 83.5 m long and 30 m wide and surveyed for swifts along the same transect. The transect was placed in the middle of the stand, and swifts were not counted if they were seen over a different stand. The habitat characteristics recorded were canopy closure, slope aspect and gradient, proximity to water (mea-

sured in the field or from aerial photographs), canopy height, number of canopy layers, stand size, landform (ridge, slope, draw), type of logging (none, partial overstory removal, or regeneration harvest), and forest type [ponderosa pine (*Pinus ponderosa*) series, Douglas-fir series, or grand fir (*Abies grandis*) series; Johnson and Hall 1990).

Within the transect area of 0.25 hectare we also recorded the number of hollow trees with broken tops, number of trees with conks of Indian paint fungus (*Echinodontium tinctorium*), number of live and dead trees ≥51 cm dbh, and number of potential nest trees for swifts. Potential nest trees were trees that appeared to be hollow with either a broken top or a hole in the side of the tree that swifts could enter. We recorded the density of these trees because swifts typically nest in large decayed trees (Bull and Cooper 1991).

From 1 to 30 June 1991, we surveyed each of the 160 stands once for swifts by walking slowly along the transect for a total of 20 minutes. We recorded the maximum number of swifts seen at any one time. We surveyed between 0900 and 1900 hours when the temperature was >55° F and when there was no precipitation. We surveyed in June because the birds were obvious as they performed extensive courtship flights prior to nesting.

In July and August we returned to the stands where we had observed swifts in June to search for nests. We searched each stand within 200 m of the transect by looking for trees with broken-off tops or with cavities and then watching them for 10 minutes to see if swifts entered. Each stand was searched for at least 1 hour and up to 4 hours if numerous potential nest trees were located. If we saw swifts enter or leave a tree at least three times during the day, we classified it as a nest. We climbed 19 such prospective nest trees in 1990 to verify that there was a nest in each tree (Bull and Cooper 1991).

We compared swift abundance with stand characteristics using multiple linear regression and Spearman's correlation analysis. Significance was defined as $P < 0.05$.

RESULTS AND DISCUSSION

Swifts were seen in 39 of the 160 stands. Forty-one percent of the old growth stands had swifts, while only 8% of the logged stands had swifts (Table 1). The greatest number of swifts seen in any stand was five.

The multiple linear regression showed that the number of swifts was significantly different in old growth and logged stands ($F = 23.14$; 1, 79 df; $P < 0.01$). We attempted to devise a mathematical model that could predict the number of swifts from the habitat characteristics. The best two-variable model for predicting the occurrence of swifts contained the number of dead trees ≥51 cm dbh (x_1) and number of trees with conks of Indian paint fungus (x_2) ($R^2 = 0.27$, $P < 0.01$). The R^2 value indicates the proportion of variability in abundance of swifts (27%) that can be explained by the number of large, dead trees and the number of trees with conks. The equation using these variables to predict number of swifts (y) was

$$y = 0.26 + 0.01x_1 + 0.09x_2$$

Table 1 Numbers of Vaux's Swifts Encountered in Stands of Old Growth, Partial Overstory Removals, and Regeneration Harvests in Northeastern Oregon, 1991

		Logged stands	
	Old growth	Partial	Regeneration
No. stands surveyed	80	42	38
No. stands with swifts	33	2	4
No. swifts/stand	1.0	0.1	0.3
Standard deviation	1.34	0.34	0.87
Range	0–5	0–2	0–3

The prediction equation containing only two variables predicted y almost as well as an equation using 12 variables ($R^2 = 0.36$). The Spearman's correlations showed that the number of swifts was correlated with many habitat variables but because these variables were also correlated with each other, only a few of these variables were needed to predict the number of swifts.

We searched the 39 stands where swifts were observed during surveys and found 13 nests in 9 stands. Eleven of the nests were in old-growth stands; two nests were in a regeneration harvest where >20 large-diameter dead trees had been left adjacent to an old-growth stand. An additional 11 nests were found in old-growth stands not surveyed for swifts but where we found swift nests in 1990.

The occurrence of two nests in regeneration harvests suggests that swifts nest in logged areas if hollow trees are left. In addition, one nest tree found in 1990 (Bull and Cooper 1991) was in a regeneration harvest. Dawson (1923) reported a nest tree in a burn in California. These nests provide some justification for retaining live and dead hollow trees in logged stands for swift nesting habitat. However, when these trees fall, it will take 100–200 years in northeastern Oregon for trees large enough and with the appropriate amount of decay to replace them. Over the long-term, suitable nest trees are most logically provided in old-growth stands.

All the nests were in large, hollow grand firs; tree dbh averaged 83 cm (standard deviation 26.61). Fifteen of the nests were in live trees, and nine were in dead trees. At nine nests, swifts entered the trees through the opening where the top had broken off. At the remaining nests, swifts entered the trees through holes along the trunk that had been excavated by Pileated Woodpeckers (*Dryocopus pileatus*), as described by Bull and Cooper (1991).

We think the association observed between swifts and old growth was due partly to the availability of suitable nest trees. The density of live and dead trees ≥51 cm dbh, of hollow trees, and of decayed trees was higher in old-growth stands than in logged stands, which typically lacked such potential nest trees (Figure 1). The density of these trees was higher in stands with swifts than in stands without swifts (Figure 2). Stands with swifts typically

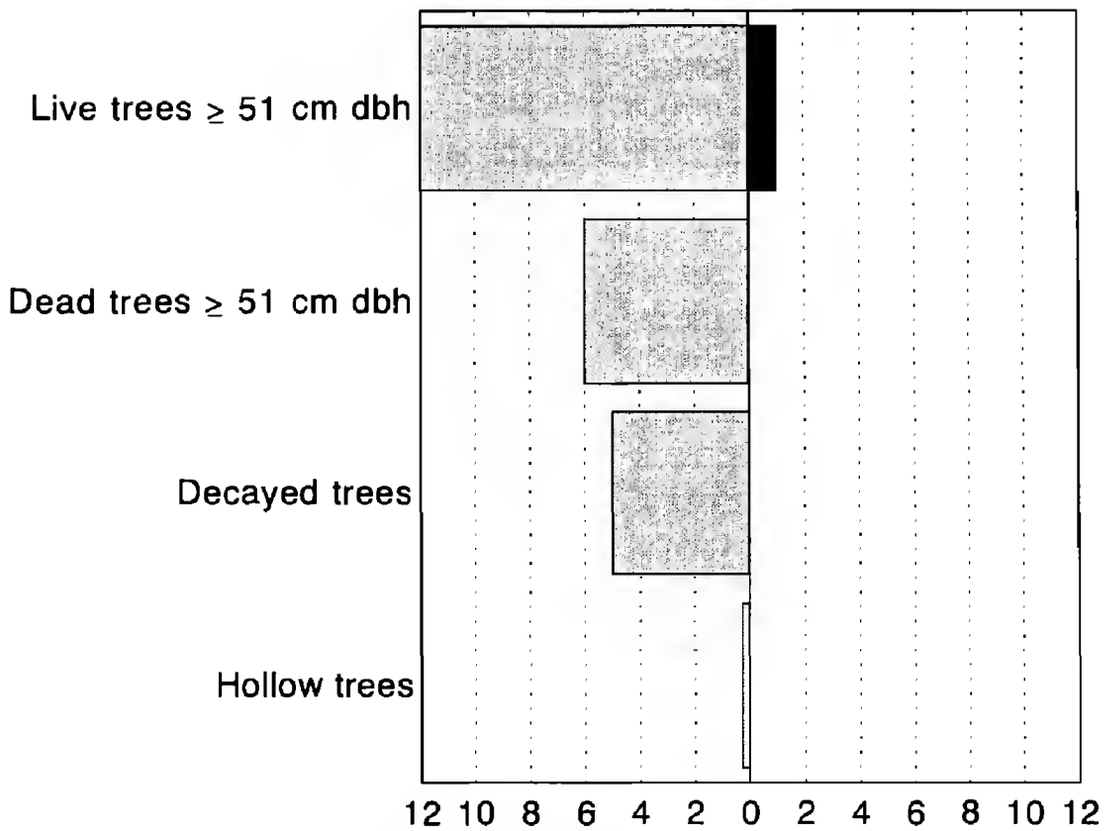


Figure 1. Habitat characteristics (mean number of trees/0.25 ha) of old-growth stands (shaded) and logged stands (black).

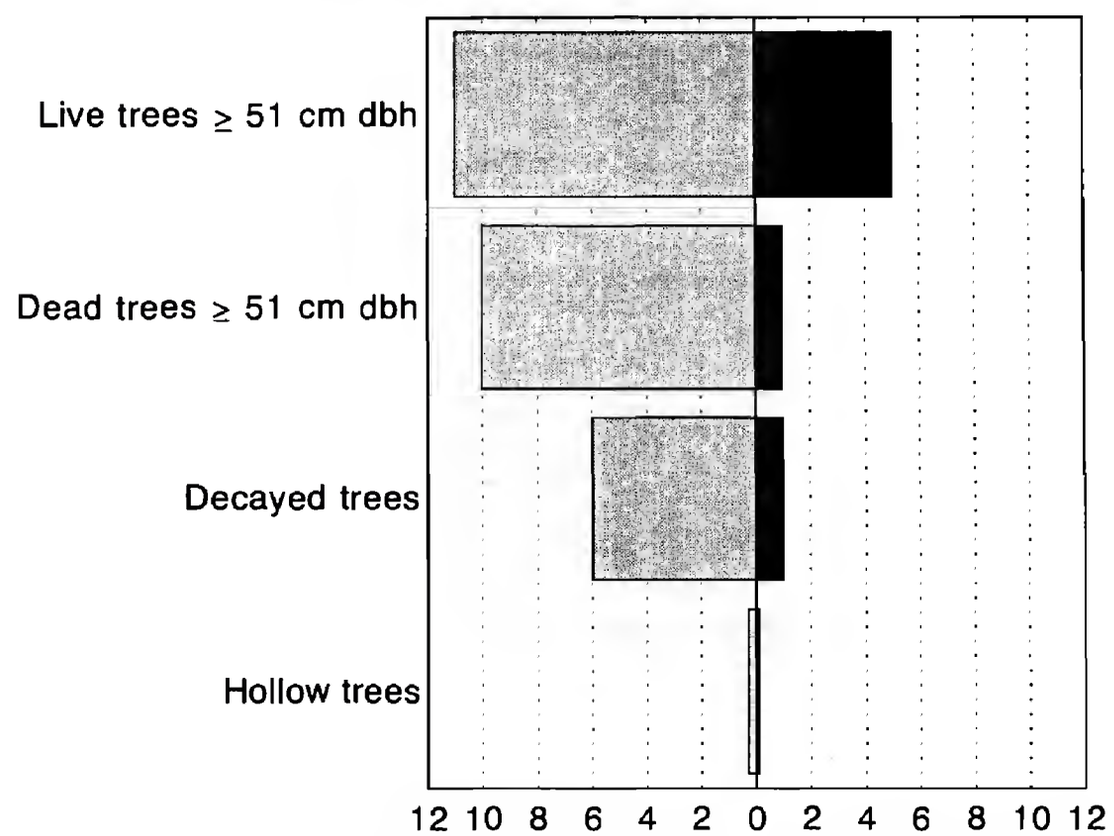


Figure 2. Habitat characteristics (mean number of trees/0.25 ha) of stands with swifts (shaded) and stands without swifts (black).

were in forests dominated by grand fir (92%), with a dense (73% canopy closure) and tall multi-layered canopy, and with little or no logging.

SUMMARY

We surveyed 160 forested stands in June 1991 for Vaux's Swifts; half the stands were old growth and half had been logged. Forty-one percent of the old-growth stands had swifts, while only 8% of the logged stand had swifts. The number of swifts was significantly higher in old growth than in logged stands, and the variables best able to predict swift occurrence were number of dead trees ≥51 cm dbh and number of trees with conks of Indian paint fungus. We think the association between swifts and old growth was partly due to the greater availability of suitable nest trees in old growth.

ACKNOWLEDGMENTS

We thank C. Kolmorgan and T. Millay for assistance with field work. D. Marx conducted the statistical analysis. Funding was provided by the USDA Forest Service, Pacific Northwest Research Station, and the Wallowa Valley Ranger District.

LITERATURE CITED

Baldwin, P. H., and Zaczkowski, N. K. 1963. Breeding biology of the Vaux's Swift. Condor 65:400–406.

Bull, E. L., and Cooper, H. D. 1991. Vaux's Swift nests in hollow trees. W. Birds 22:85–91.

Dawson, W. L. 1923. The Birds of California. South Moulton Co., San Diego.

Johnson, C. G., Jr., and Hall, F. C. 1990. Plant associations of the Blue Mountains. U.S. Dept. Agric. Forest Serv. R6, Ecol. Area 3.

Manuwal, D. A., and Huff, M. H. 1987. Spring and winter bird populations in a Douglas-fir forest sere. J. Wildlife Mgmt. 51:586–595.

Taylor, H. R. 1905. The nest and eggs of the Vaux Swift. Condor 7:177–179

Accepted 11 May 1992

DROUGHT AND PREDATION CAUSE AVOCET AND STILT BREEDING FAILURE IN NEVADA

JULIE A. R. ALBERICO, University of Nevada, Ecology, Evolution and Conservation Biology Program, 1000 Valley Rd., Reno, NV 89512

The Lahontan Valley wetlands of Nevada are critical breeding, wintering, and migratory stopover sites for shorebirds and waterfowl and have been classified as a Hemispheric Reserve within the Western Hemisphere Shorebird Reserve Network (Myers et al. 1987, Harrington et al. 1989). From 1905 through 1987, wetlands in the Lahontan Valley declined from 34,800 to 6150 ha (Hoffman et al. 1990:5). In 1991, these wetlands were reduced further as Nevada experienced its fifth consecutive year of drought (Schaefer 1991). During 1991, I monitored breeding by American Avocets (*Recurvirostra americana*) and Black-necked Stilts (*Himantopus mexicanus*) in the extremely limited suitable habitat available to them in the Lahontan Valley. Here I report numbers of breeding recurvirostrids and discuss possible reasons for their success or failure in 1991.

Avocets and stilts feed in shallow wetlands and nest together in loose colonies (Hamilton 1975). Neighboring pairs work together in voicing alarm, mobbing potential predators, and performing distraction displays (Sordahl 1986, 1990). Like the well-studied Pied Avocet (*R. avosetta*) in Europe and Black Stilt (*H. novaezealandiae*) in New Zealand, they probably first breed at an age of 2 or 3 years and are relatively long-lived (Cadbury and Olney 1978, Christine Reed pers. comm.). Sordahl (1984) marked individual American Avocets and Black-necked Stilts and observed 20–30% return in the following breeding season; 60–90% of these birds had previously bred successfully.

METHODS

I compiled count data for American Avocets and Black-necked Stilts from a variety of sources: Alcorn (1988), nesting season reports in *Audubon Field Notes* and *American Birds*, and unpublished data provided by Larry Neel of the Nevada Department of Wildlife and Bill Henry of Stillwater National Wildlife Refuge. I used only count data that distinguished breeding birds from nonbreeders or migrants because there is extreme variability in migration dates for these birds (Bill Henry unpubl. data; dates in *American Birds* regional reports), and I observed large numbers of resident nonbreeders during the 1991 breeding season. However, breeding birds can be undercounted if adults use alternate foraging sites (Yésou and Girard 1988), and incubating birds can be difficult to see at some sites (Gibson 1971, his Figure 3). They can also be overcounted because birds sounding an alarm attract others (pers. obs.).

In 1991, I monitored avocets and stilts at all Lahontan Valley wetlands with conditions potentially appropriate for breeding (Figure 1). I categorized birds as *prenesting* (defending feeding territories and copulating but without a nest), *nesting* (with nests and defending feeding territories), or *nonbreeding* (showing no defensive or copulatory behavior) (Gibson 1971,

Hamilton 1975). I found most nests during the laying period. For nests found after the clutch was complete, I estimated initiation dates by floating the eggs (Westerkov 1950). When possible, I identified nest predators from evidence left in the nest, tracks, and direct observation. Nests at Mahala Slough were checked every 2 days as part of behavioral monitoring, and nests at S-Line seep were monitored every 5 days. For nests at Mahala Slough, I took data on several variables I expected to influence the likelihood of nest predation: distance to land, number of avocets in the colony, number of stilts in the colony, and distance to nearest neighbor.

RESULTS AND DISCUSSION

Prior Breeding Numbers and Reproductive Success

During 18 of the years from 1949 to 1975, numbers of breeding recurvirostrids at Stillwater Wildlife Management Area (SWMA) were estimated and reported in SWMA Annual or Quarterly Narrative Reports (Figure 2). Kingery (1974) reported counts at SWMA of 2400, 2100,

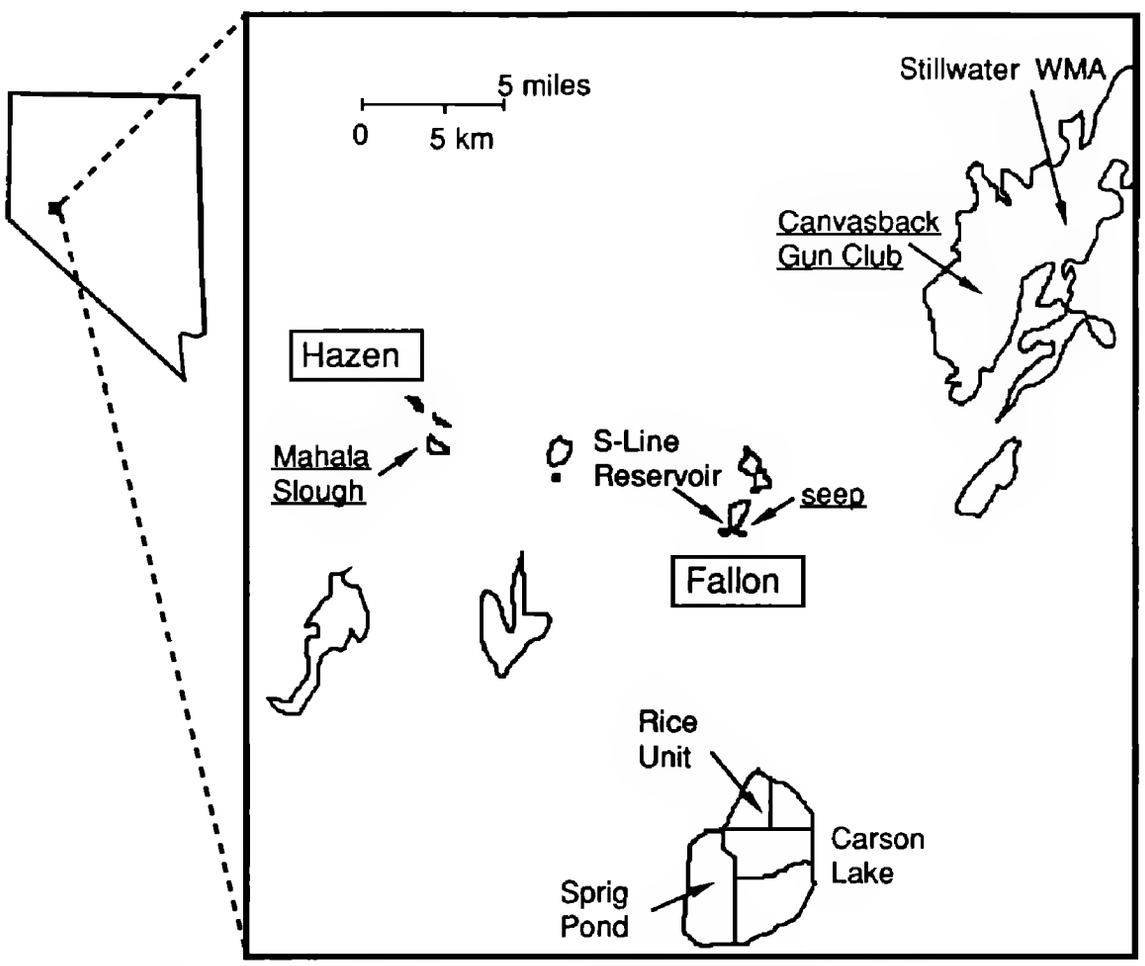


Figure 1. Map of Lahontan Valley wetlands near Fallon, Nevada, adapted from Hoffman et al. (1990) and U.S. Geological Survey maps. Labeled wetlands held water during all or part of the 1991 breeding season; underlined labels indicate wetlands with known recurvirostrid breeding attempts in 1991.

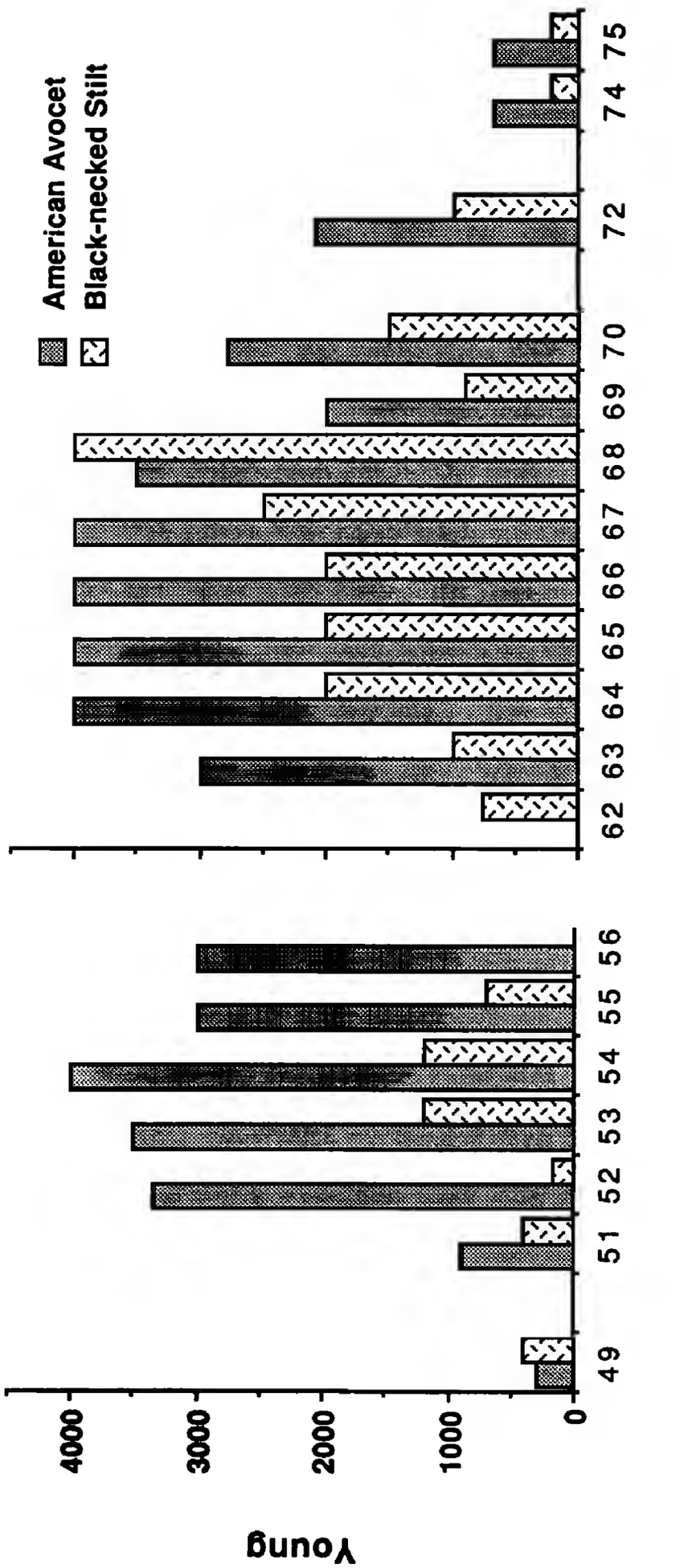


Figure 2. Estimated counts of young American Avocets and Black-necked Stilts at SWMA, 1949–1975. Only years when young were counted are shown. Source, SWMA Annual or Quarterly Narrative Reports. Because SWMA estimates were made uniformly in most of these years, data from other secondary sources, such as Kingery (1974), are not included here.

1800, and 675 avocet young and 1300, 1000, 720, and 225 stilt young from 1971 to 1974, respectively. Though actual counts are unavailable for these years, numbers of recurvirostrids in the Lahontan Valley declined during the 1976–1977 drought (Rogers 1977, Kingery 1977) and during the current drought (Bill Henry unpubl. data). In the 1976 and 1977 breeding seasons, recurvirostrids increased at Great Basin wetlands in Oregon and Utah, suggesting they had moved from drought-stricken areas such as the Lahontan Valley (Kingery 1977, Rogers 1977)

Limited data on breeding success in the Lahontan Valley suggest that few young shorebirds have been produced since the current drought began. Stanton (1988) observed "moderate" stilt hatching success at SWMA but no young later in the season. Stilts did not fledge at SWMA in 1989 (Kingery 1989), and "fared poorly" there in 1990 (Kingery 1990). Avocets established only four nests at SWMA in 1989, all of which failed (Kingery 1989). Thus it is surprising that Kingery (1990) reported "excellent nesting success" for 2700 avocets in the Lahontan Valley, though he gave no counts of young.

These data show that in many years thousands of avocet and stilt young are produced in the Lahontan Valley. During the drought years of 1988 to 1990, numbers of breeding recurvirostrids and their success were reduced, except in 1990, when avocets apparently had appreciable success in spite of the drought.

Recurvirostrid Breeding Numbers, 1991

Several wetlands where recurvirostrids nested in previous years (Bill Henry and Larry Neel unpubl. data) were dry in 1991, including Sheckler Reservoir, large portions of SWMA (including Stillwater National Wildlife Refuge), and much of Carson Lake (see Figure 1). Only about 52 avocets and 16 stilts nested.

At the Canvasback Gun Club on 27 May, I saw 22 prenesting avocets, an island with many scrapes, and two avocet nests on hummocks of cattail (*Typha latifolia*) detritus. However, by 14 June, nests had been depredated and avocets were no longer exhibiting breeding behavior. Behavior of a stilt pair suggested that they had a nest on 14 June, but the pair disappeared 8 days later.

At Carson Lake on 27 April, I counted 319 prenesting avocets on Sprig Pond, 179 on the east side of Rice Unit, and 30 along canal banks. Because no water was delivered to Carson Lake wetlands until mid-July, Rice Unit dried up by 29 May, preventing breeding there. Although I regularly searched for nests at Sprig Pond, I never found any. By 10 June all breeding behavior had ceased, and from 1240 to 3000 avocets remained as nonbreeders through June. Breeding behavior by avocets along canals ceased at approximately the same time. I counted 50 stilts at Carson Lake on 10 June but saw no evidence of reproduction.

The only other Lahontan Valley sites where recurvirostrids attempted breeding were Mahala Slough (between Fallon and Hazen) and a seep area behind S-Line Reservoir (Figure 1). Nest initiation chronology at these sites for nests with known clutch initiation dates is shown in Figure 3a. At Mahala

Slough there were 59 total avocet nests (including renestings) and 10 stilt nests. Mahala Slough began to dry up from 50 ha on 31 May; by 30 June

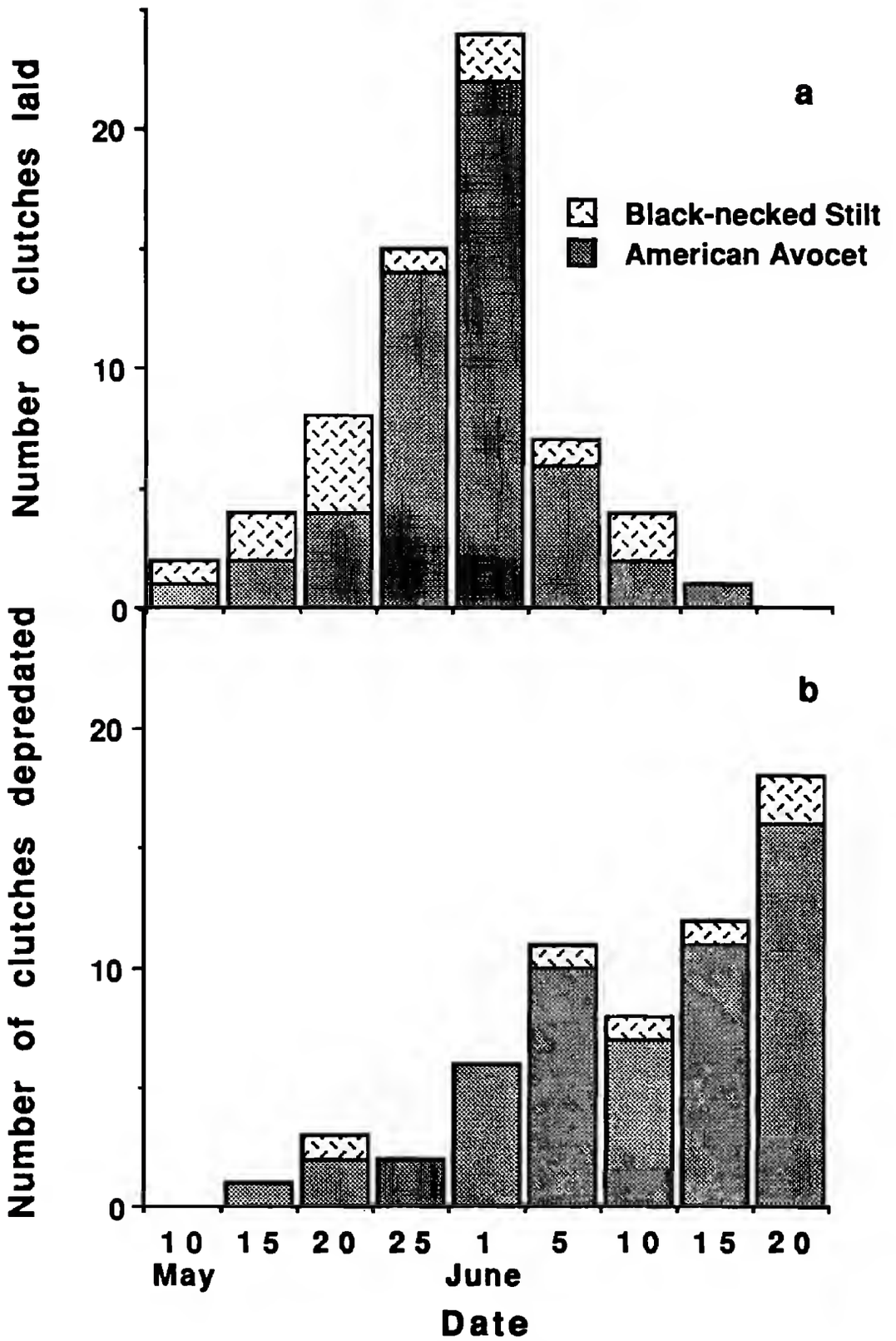


Figure 3. a, Clutch initiation dates; and b, depredation dates for American Avocets and Black-necked Stilts at Mahala Slough and S-Line Reservoir seep, 1991. Clutches included are those for which initiation or depredation dates could be approximated.

all but several roadside borrow pits (<100 m^2 in total area) were completely dry. At S-Line Reservoir seep, where water was stable at 4 ha, there were one avocet and six stilt nests.

It is difficult to assess how the drought will affect future recurvirostrid numbers in Nevada. Site fidelity of avocets and stilts (Sordahl 1984) suggests previous experience affects breeding site choices. If birds breed elsewhere during drought conditions and choose not to return, it may take many wet years before breeding populations are comparable to those of the 1960s and 1970s.

Recurvirostrid Breeding Success, 1991

All 59 avocet nests at Mahala Slough were unproductive. Of these, 13 were depredated by coyotes (*Canis latrans*), 42 were known or suspected to have been depredated by birds, three were abandoned, and in one the eggs failed to hatch. Of 10 stilt nests at Mahala Slough, two were depredated by birds, four were abandoned, and in four the eggs hatched. At S-Line seep the single avocet nest was depredated by a bird; of six stilt nests there, four were depredated by an unknown predator (probably a bird), and in two the eggs hatched. The Common Raven (*Corvus corax*) was the primary avian species that preyed on nests. California Gulls (*Larus californicus*) were probably occasional nest predators (e.g., Hill 1988), but I had no evidence confirming predation by gulls. Nest depredation chronology at Mahala Slough and S-Line seep combined is shown in Figure 3b.

Nest persistence time was not significantly correlated with distance to land, number of avocets in the colony, number of stilts in the colony, or distance to nearest neighbor (Spearman rank correlations, $P > 0.3$, $n = 50$ for all). Stilt nesting success was related to water depth, as five of six successful nests were surrounded by water deeper than 0.75 m. There was no change in nest depredation probability over the nesting cycle (constant slope of Figure 4), suggesting that depredation was independent of changes in incubation and defense behavior over the nesting cycle (e.g., Sordahl 1986). I resighted 11 of the 21 stilt chicks several weeks after hatching.

Effect of Drought on Predation

Several conditions associated with drought might have increased nest vulnerability and predation rates on recurvirostrid nests in the Lahontan Valley. As Mahala Slough dried up, I observed (from tracks and direct sightings) increasing coyote traffic around nesting areas, coupled with an increase in nest predation by coyotes. As the ponds dried up, nests initiated on hummocks surrounded by water soon became accessible via land or by shallow wading.

A drought-induced shortage of typical prey items may have prompted ravens to increase their predation on avocet and stilt eggs. In the Lahontan Valley, ravens are usually major predators of duck (*Anas* sp.) and Canada Goose (*Branta canadensis*) eggs and chicks (Herron 1986). In 1991, all goose nests were depredated early, and I knew of only three duck nests (two Cinnamon Teal, *A. cyanoptera*, and one Mallard, *A. platyrhynchos*) at Mahala Slough. It appears that predation pressure on recurvirostrid nests in

the Lahontan Valley varies from year to year. At Carson Lake in 1986 (Herron 1986), ravens preyed heavily on duck nests but not on recurvirostrid nests. By contrast, in 1991, most recurvirostrid nest depredations were attributable to ravens. Active management to create additional breeding habitat by releasing water into wetlands earlier in the season could have increased reproductive success of recurvirostrids and other wetland-dependent species in 1991. Many wetlands that were not used by breeding birds in 1991 began receiving water in late July and August. Although these fall releases create habitat for migratory shorebirds and waterfowl, spring releases would have enhanced breeding habitat and reduced overall predation pressure.

SUMMARY

I monitored breeding American Avocets and Black-necked Stilts in the Lahontan Valley, Nevada, during the fifth year of drought. There were few sites suitable for breeding, and at sites where birds did breed, nest depredation was extremely high. In a non-drought year there would be thousands of breeding recurvirostrids in the area I monitored; in 1991 there were fewer than 100. Only six pairs of stilts hatched chicks, and avocets failed entirely.

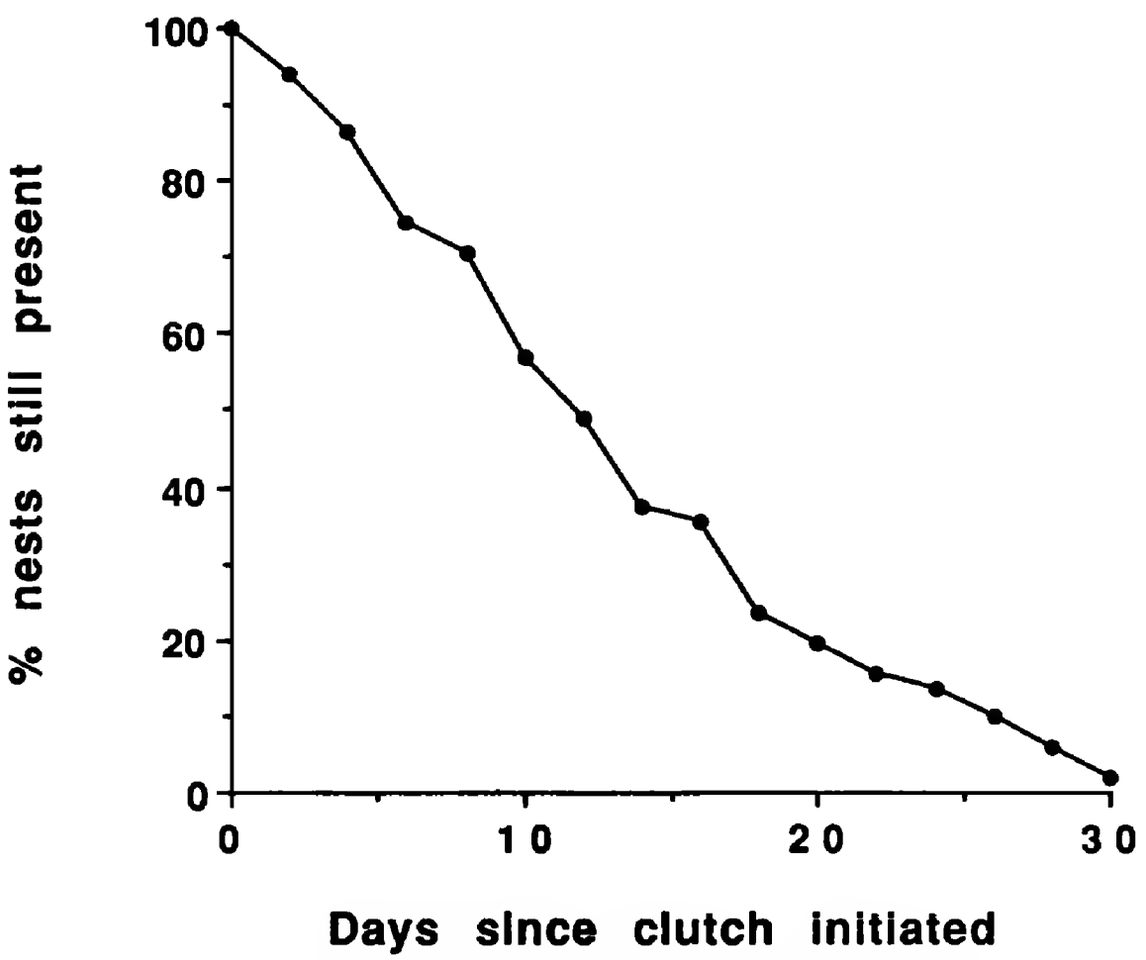


Figure 4. Proportion of total recurvirostrid nests remaining at Mahala Slough over the 1991 nesting period.

Nest predation pressure is probably higher in drought years because nests are more accessible to coyotes, and duck eggs and other prey items for ravens are limited. Antipredator behaviors seemed ineffective under such pressure.

ACKNOWLEDGMENTS

I thank Christine Fritz for field assistance, and Bob and Lida Ayers, Anne Janik, George Lott, Larry Neel, and Norm Sakke for logistical support. Larry Neel, Bill Henry, and Thomas H. Rogers, Sr., provided unpublished data. Michael C. Barber provided me with unpublished information from Hugh Kingery's archive at the Denver Museum of Natural History. I also thank John S. Luther, Larry Neel, Lew Oring, and Dave Shuford for reviewing earlier drafts of this manuscript. This research was supported by the Nevada Agricultural Experiment Station and a National Science Foundation Graduate Fellowship.

LITERATURE CITED

Alcorn, J. R. 1988. The Birds of Nevada. Fairview West, Fallon, NV.

Cadbury, C. J. and Olney, P. J. S. 1978. Avocet population dynamics in England. Br. Birds 71:102–121.

Gibson, F. 1971. The breeding biology of the American Avocet (*Recurvirostra americana*) in central Oregon. Condor 73:444–454.

Hamilton, R. B. 1975. Comparative behavior of the American Avocet and the Black-necked Stilt (Recurvirostridae). Ornithol. Monogr. 17.

Harrington, B. A., Myers, J. P., and Grear, J. S. 1989. Coastal refueling sites for global bird migrants, in Coastal Zone '89: Proceedings of the Sixth Symposium on Coastal and Ocean Management (O. T. Magoon, H. Converse, D. Miner, L. T. Tobin, and D. Clark, eds.), pp. 4293–4307. Am. Soc. Civil Engineers, New York.

Herron, G. B., ed. 1986. Raven predation on shorebird nests at Carson Lake, Churchill County, in Population surveys, species distribution and key habitats of selected nongame species. Job Performance Report, Federal Aid in Wildlife Restoration Project W-53-R-14, Study I, Jobs I through VI, pp. 9-12. Nev. Dept. Wildlife, 1100 Valley Rd., Reno, NV 89512.

Hill, D. 1988. Population dynamics of the Avocet (*Recurvirostra avosetta*) breeding in Britain. J. Anim. Ecol. 57:669–683.

Hoffman, R. J., Hallock, R. J., Rowe, T. G., Lico, M. S., Burge, H. L., and Thompson, S. P. 1990. Reconnaissance investigation of water quality, bottom sediment, and biota associated with irrigation drainage in and near Stillwater Wildlife Management Area, Churchill County, Nevada, 1986–87. U.S. Geol. Surv. Water-Resources Investigations Rep. 89-4105.

Kingery, H. E. 1974. The nesting season. Great Basin–central Rocky Mountain region. Am. Birds 28:929–933.

Kingery, H. E. 1977. The nesting season. Mountain West region. Am. Birds 31:1027–1031.

Kingery, H. E. 1989. The nesting season. Mountain West region. Am. Birds 43:1345–1349.

Kingery, H. E. 1990. The nesting season. Mountain West region. Am. Birds 44:1161–1164.

Myers, J. P., Morrison, R. I. G., Antas, P. Z., Harrington, B. A., Lovejoy, T. E., Sallaberry, M., Senner, S. E., and Tarak, A. 1987. Conservation strategy for migratory species. Am. Scientist 75:19–26.

Rogers, T. H. 1977. The nesting season. Northern Rocky Mountain–Intermountain region. Am. Birds 31:1162–1166.

Schaefer, E. 1991. Water shortage pits man against nature. Nature 350:180–181.

Sordahl, T. 1984. Observations on breeding site fidelity and pair formation in American Avocets and Black-necked Stilts. N. Am. Bird Bander 9:8–11.

Sordahl, T. 1986. Evolutionary aspects of avian distraction display: Variation in American Avocet and Black-necked Stilt antipredator behavior, in Deception: Perspectives on Human and Nonhuman Deceit, pp. 87–112. State Univ. N. Y. Press, Albany.

Sordahl, T. 1990. Sexual differences in antipredator behavior of breeding American Avocets and Black-necked Stilts. Condor 92:530–532.

Stanton, J. 1988. The general feeding and nesting ecology of Black-necked Stilts on the Stillwater Wildlife Management Area. Research report submitted to Stillwater Wildlife Management Area Biologist, Stillwater National Wildlife Refuge, P. O. Box 1236, Fallon, NV 89406.

Westerkov, K. 1950. Methods for determining the age of game bird eggs. J. Wildlife Mgmt. 14:56–67.

Yésou, P., and Girard, O. 1988. Effet de la chronologie de la reproduction sur le recensement d'une colonie d'avocettes (*Recurvirostra avosetta*). Gibier Faune Sauvage 5:459–466.

Accepted 12 June 1992

American Avocets

Photo by Kenneth W. Gardiner

NOTES

AN ARCTIC WARBLER IN BAJA CALIFORNIA, MEXICO

PETER PYLE and STEVE N. G. HOWELL, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

On 12 October 1991 we discovered an Arctic Warbler (*Phylloscopus borealis*) on Punta Eugenia, west of Guerrero Negro, Baja California. This sighting constitutes the first record of this primarily Old World species from Mexico and from North America south of Alaska.

The locality of the observation was Rancho San Miguel, 27°30' N, 114°31' W, at km-marker 122 on the road from Ejido Vizcaino to Bahía Tortugas and the tip of Punta Eugenia. The ranch, located about 100 m southwest of the road, consisted of two buildings and a small courtyard containing several shrubs and one flowering ornamental acacia (Leguminosae), 8 m tall. A natural spring in a canyon 300 m southwest of the buildings provided water for the vegetation at the ranch. The outer portion of Punta Eugenia, including the area surrounding the ranch, is arid, rocky, and barren, devoid of leafy vegetation; Rancho San Miguel and the nearby Rancho Santa Monica (2 km southeast of Rancho San Miguel) were small oases of greenery attracting migratory landbirds.

We studied the Arctic Warbler from 1220 to 1255 through binoculars, at ranges as close as 4 m, in sunny lighting. The sparse branches of the acacia allowed optimal viewing of the bird and double checking of all field marks. Also foraging in the tree were two Yellow Warblers (*Dendroica petechia*), a Magnolia Warbler (*D. magnolia*), a Yellow-rumped Warbler (*D. coronata*), two Townsend's Warblers (*D. townsendi*), and a Painted Redstart (*Myioborus pictus*).

The Arctic Warbler was similar in body size to the Townsend's Warblers but had a larger head and a shorter tail. The bill was significantly larger than that of the *Dendroica* warblers in the tree; its relative size and the bird's head shape suggested a Louisiana Waterthrush (*Seiurus motacilla*). The Arctic Warbler was active, continually hopping and flying short distances, at times swinging upright on vertical branches of the acacia. It foraged for insects primarily in the low to middle portions of the tree and upper portions of the surrounding shrubbery; on one occasion it foraged in the uppermost branches of the tree.

The bird was in fresh plumage. The upperparts were uniformly drab olive with a slight grayish cast. The tips of four or five outer greater coverts were pale creamy tinged lemon, forming a distinct lower wingbar. One or two median coverts had minute pale tips of the same color, forming a vague upper wing bar. The flight feathers were dusky, with narrow greenish-yellow edges on the outer webs of the primaries. A prominent wide creamy superciliary extended from the base of the bill to well behind the eye; its posterior end curved up toward the nape when the bird looked upward. Below the superciliary was a dusky eyeline extending evenly through the lores. A small indistinct whitish subocular crescent was present. The auriculars were dirty lemon with diffuse pale dusky streaking concentrated toward the rear. The underparts were primarily whitish or off-white unevenly tinged lemon. The paleness of the lower throat extended dorsally, posterior to the auriculars, to the sides of the nape. Pale dusky patches with diffuse dusky streaking were present on the sides of

the breast; a vague hint of this streaking extended across the center of the breast. The thigh feathers were mixed dusky and pale.

The wing tips were long with seven evenly spaced primary tips visible beyond the tertials. The tip of the tenth (outer) primary, visible when the bird drooped its wing, extended 1–2 mm beyond the tips of the primary coverts. The tips of the undertail coverts fell beyond the tips of the closed wing. The eye and maxilla were dark; the mandible was bright orangish on the basal four fifths, including the sides, becoming dusky at the tip. The legs were dusky flesh-colored, the soles of the feet slightly brighter. The Arctic Warbler did not vocalize while we watched it.

Both of us immediately recognized the bird as an Arctic Warbler from our previous field experience with the species in Southeast Asia, Britain, and Alaska, and with most of the other migratory *Phylloscopus* species in Eurasia. The combination of the shape, size, plumage characters, and the presence of a tenth primary rules out all species of North American warblers and vireos and is diagnostic of the genus *Phylloscopus*. Within this genus the lack of a crown stripe and presence of a single prominent wingbar rule out all species except the Arctic Warbler, Greenish Warbler (*P. trochiloides*), Green Warbler (*P. nitidus*), Two-barred Greenish Warbler (*P. plumbeitarsus*), northern races of the Chiffchaff (*P. collybita abietinus* and *P. c. tristis*), and perhaps worn individuals of the central Asiatic race of the Yellow-browed Warbler (*P. inornatus humei*) (Dean 1985). Features that distinguish the Arctic Warbler and the bird we observed from these include the combination of the large

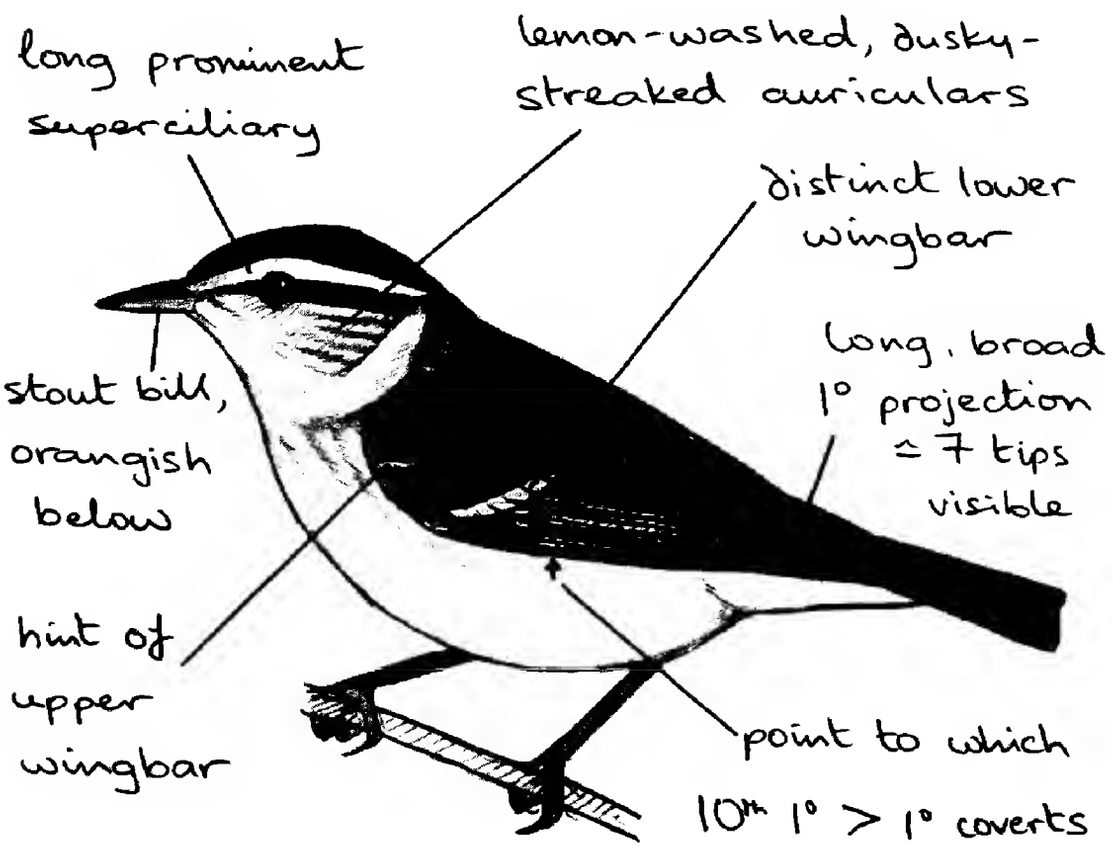


Figure 1. Arctic Warbler, Rancho San Miguel, Baja California, 12 October 1991. Drawing derived from field sketches and notes taken at the time of observation.

Sketch by Steve N.G. Howell

size and large bill, hint of an upper wing bar, long and prominent superciliary that tends to curve upward posteriorly, lemon auriculars streaked with pale dusky, extensive orange at the base of the mandible and, especially, the long wing tip and wing formula (Ticehurst 1938, Dement'ev et al. 1954, Williamson 1967, Marshall and Pantuwattana 1969, King et al. 1975, Robertson 1984, Svensson 1984, Dean 1985). The similar species have more delicate bills, fewer primary tips visible beyond the tertials (4–6; 7 in the Greenish Warbler), and a longer 10th primary, extending 4–10 mm beyond the tips of the primary coverts. We confirmed these differences and our identification by examining museum specimens at the California Academy of Sciences (CAS), San Francisco, and the American Museum of Natural History (AMNH), New York.

The Arctic Warbler breeds from arctic Scandinavia through Siberia to western Alaska, south to northern Mongolia and northern Japan, and winters primarily in southeastern China, the Philippine Islands, and the Malay Peninsula (Dement'ev et al. 1954, Vaurie 1959). The species is a regular vagrant to Britain (Rogers 1987); a July vagrant collected on Prince Patrick Island, Northwest Territories (Godfrey 1966), represents the only previous New World record outside Alaska. The only other published North American records of *Phylloscopus* warblers south of Alaska are of three Dusky Warblers (*P. fuscatus)* in central California (Pyle et al. 1983, Roberson 1986, Pyle and McCaskie 1992).

Vaurie (1959) recognized six subspecies of the Arctic Warbler, including the Alaskan *kennicotti* and five Asiatic forms. The bird we observed was large and had a very large bill, drab olive upperparts, lack of extensive yellow on the underparts, and a relatively long tenth primary, features suggesting one of the northern Asiatic subspecies, *borealis* or *xanthodryas*, rather than *kennicotti* (Ticehurst 1938, Dement'ev et al. 1954; Vaurie 1954, 1959; pers. obs.). As the taxonomy of northwestern populations of the Arctic Warbler is incompletely resolved (D. Gibson in Phillips 1991), an identification to subspecies should be considered tentative.

We thank Stephen F. Bailey and Mary LeCroy for assistance and permission to examine specimens at CAS and AMNH, respectively, and Daniel D. Gibson and Philip Unitt for comments that improved the manuscript. We especially thank the residents of Rancho San Miguel for permission to roam around in their garden and for their warm hospitality, so typical of Baja Californians secluded from major tourist routes. This is contribution 527 of the Point Reyes Bird Observatory.

LITERATURE CITED

Dean, A. R. 1985. Review of British status and identification of Greenish Warbler. Br. Birds 78:437–451.

Dement'ev, G. P., and Gladkov, N. A., eds. 1954. Birds of the Soviet Union. Vol. 4. Sovietska Nauka, Moscow.

Godfrey, W. E. 1966. The Birds of Canada. Natl. Mus. Can., Ottawa.

King, B., Woodcock, M., and Dickinson, E. C. 1975. A Field Guide to the Birds of South-East Asia. Collins, Glasgow, Scotland.

Marshall, J. T., and Pantuwattana, S. 1969. Identification of leaf warblers in Thailand. Nat. Hist. Bull. Siam Soc. 23:1–11.

Phillips, A.R. 1991. The Known Birds of North and Middle America, part 2. A. R. Phillips, Denver.

Pyle, P., DeSante, D. F., Boekelheide, R. J., and Henderson, R. P. 1983. A Dusky Warbler (*Phylloscopus fuscatus*) on Southeast Farallon Island, California. Auk 100:995–996.

Pyle, P., and McCaskie, G. 1992. Thirteenth report of the California Bird Records Committee. W. Birds 23:97–132.

Roberson, D. 1986. Ninth report of the California Bird Records Committee. W. Birds 17:49–77.

Robertson, I. S. 1984. Mystery photographs. 93. Arctic Warbler. Br. Birds 77:415–417.

Rogers, M. J., ed. 1987. Report on rare birds in Great Britain in 1986. Br. Birds 80:516–571.

Svensson, L. 1984. Identification Guide to European Passerines. 3rd Ed. L. Svensson, Stockholm.

Ticehurst, C.B. 1938. A Systematic Review of the Genus *Phylloscopus*. Br. Mus. (Nat. Hist.), London.

Vaurie, C. 1954. Systematic notes on Palearctic birds. No. 9. Sylviinae: The genus *Phylloscopus*. Am. Mus. Novitates 1685.

Vaurie, C. 1959. The Birds of the Palearctic Fauna. Passeriformes. H. F. & G. Witherby, London.

Williamson, K. 1967. Identification for Ringers 2. The Genus *Phylloscopus*. Rev. ed. Br. Trust for Ornithol., Oxford, England.

Accepted 19 February 1992

NEW AND NOTEWORTHY BIRD RECORDS FROM BAJA CALIFORNIA, MEXICO, OCTOBER 1991

STEVE N. G. HOWELL and PETER PYLE, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

From 9 to 16 October 1991 we visited Baja California, south to Punta Eugenia in northern Baja California Sur. During this period we encountered several notable species, including five previously unreported from the peninsula. Our most surprising discovery was of an Arctic Warbler (*Phylloscopus borealis*) at a remote desert ranch; we have detailed this remarkable record in another note in this issue (Pyle and Howell 1993). Here we discuss other species of interest seen on this trip.

Our itinerary was as follows. 9 October: Tijuana to Ensenada. 10 October: Ensenada to Cataviña, via La Bufadora and Estero de Punta Banda. 11 October: Cataviña to Punta Eugenia, via Guerrero Negro. 12 October: Punta Eugenia to Cataviña, via Guerrero Negro. 13 October: Cataviña to Ensenada, via Rancho San José. 14 October: Ensenada (including pelagic trip) to Laguna Hanson. 15 October: Laguna Hanson to Tijuana. 16 October: Tijuana area. Figure 1 locates place names mentioned in the species accounts.

Ashy Storm-Petrel *Oceanodroma homochroa*. On 14 October we saw one 8 km west of Islas de Todos Santos. Other than being a "very rare summer resident" on Islas Los Coronados (Jehl 1977), there are only two other records from Baja California, both in April (Wilbur 1987). The species is a rare autumn to spring visitor off San Diego County (Unitt 1984).

White-fronted Goose *Anser albifrons*. We saw two adults at El Descanso, 9 October, 11 birds flying over Bahía Tortugas, 12 October, and an immature at Laguna Hanson, 15 October. All other specified records from Baja California have been in January and February (Grinnell 1928, Wilbur 1987), and Unitt (1984) noted only three October records for San Diego County.

Baird's Sandpiper *Calidris bairdii*. We saw two at Laguna Ojo de Liebre on 12 October and two at the reservoir 8 km south of Ejido Héroes de la Independcia on 15 October. There are only five previous published records from Baja California (Wilbur 1987), but this likely reflects lack of observer coverage rather than true rarity. Baird's Sandpiper is an uncommon to fairly common autumn transient in southern California (Garrett and Dunn 1981).

Pectoral Sandpiper *Calidris melanotos*. At Estero de Punta Banda we saw one on 10 October; at Ensenada harbor, four on 10 October and one on 14 October; at Ejido Vizcaino, one on 12 October; at La Pinta Pond (see Palacios and Alfaro 1991), one on 13 October; and at the reservoir 8 km south of Ejido Héroes de la Independencia, 26 on 15 October. All were juveniles. Our observations and records such as "considerable numbers and nine specimens taken" at San José del Cabo (Brewster 1902) indicate that Pectoral Sandpipers are not "rare" transients in Baja California as suggested by Wilbur (1987). The species is an uncommon to fairly common autumn transient in southern California (Garrett and Dunn 1981).

Black Tern *Chlidonias niger*. On 10 October we saw one at Estero de Punta Banda. E. Palacios (pers. comm.) saw two at the same site in September 1991. Early in this century, Black Terns were fairly common autumn transients off the Pacific coast of southern California and Baja California (Garrett and Dunn 1981, Grinnell 1928), but today they are uncommon, becoming rare in coastal southern California after September (Garrett and Dunn 1981).

Vaux's Swift *Chaetura vauxi*. One flying back and forth over the international border fence at Tijuana, 16 October, is the first recorded in autumn for Baja California, there being no published evidence to support Wilbur's (1987) statement "apparently rare fall migrant" (cf. Grinnell 1928). The Tijuana record also appears to be fairly late for Vaux's Swift, the latest autumn date reported by Unitt (1984) for this species in San Diego County being 19 October.

Willow/Alder Flycatcher *Empidonax traillilalnorum*. Two birds at Bahía Tortugas on 12 October were clearly referable to this pair of very similar species. While one individual was distinctly brownish above and thus probably a northwestern Willow Flycatcher (*E. t. brewsteri*), a fairly common autumn transient in coastal southern California, the second bird was distinctly greener above and had a whiter throat, more typical of other subspecies of the Willow Flycatcher or of the Alder Flycatcher. Both birds were silent. There are no published autumn records of either species from Baja California (cf. Grinnell 1928, Wilbur 1987).

Least Flycatcher *Empidonax minimus*. We observed a Least Flycatcher at the Highway 1 crossing of the Río El Rosario on 13 October, and Pyle saw another at El Descanso on 15 October. The bold eye ring and wingbars, relatively broad bill, upward flicking of the shortish tail, and full "whit" call were all noted. The only prior report from Baja California is from Isla Guadalupe (Wilbur 1987); the lack of mainland records likely can be attributed to poor observer coverage and to identification problems in the genus *Empidonax*.

Hammond's Flycatcher *Empidonax hammondii*. Howell saw one at Laguna Hanson on 15 October, the first reported in autumn for Baja California (cf. Wilbur 1987). The small narrow bill (mostly dusky below), bright teardrop-shaped eye ring, and relatively long primary projection accentuating the relatively short tail were all noted. Hammond's Flycatcher is an uncommon autumn transient in southern California, mainly in the interior (Garrett and Dunn 1981).

Bank Swallow *Riparia riparia*. We saw one, flying south with Barn Swallows (*Hirundo rustica*), at La Bufadora on 10 October. This species has been previously reported only three times from Baja California (Bryant 1891, Howell and Pyle 1990) and is a rare autumn transient in coastal southern California, being reported only occasionally after early October (Garrett and Dunn 1981, Unitt 1984).

Cliff Swallow *Hirundo pyrrhonota*. We saw one with Barn Swallows at Ejido Héroes de la Independencia on 15 October. Cliff Swallows are very rare in southern California after early October (Garrett and Dunn 1981, Unitt 1984), and our observation constitutes the latest record for Baja California.

Red-throated Pipit *Anthus cervinus*. We recorded four individuals: one heard and seen at Cataviña on 13 October, single birds heard flying overhead on 10 October at Estero de Punta Banda and 8 km west of San Telmo de Abajo, and one heard over Ensenada on 14 October. The Cataviña bird was watched in the open by a roadside rain puddle for 15 minutes at ranges down to 6 m. We noted the boldly streaked upperparts, including two paler "braces," the lack of primary projection beyond the tertials, the bold blackish malar stripe and streaking on the underparts, and pink legs. The call, and those of the birds flying over, was a high thin hissing "tsssi" or "tzzzi" (Howell) or "pseeep" (Pyle). There are only two previous records of this species for Mexico (Grinnell 1928, Howell and Webb 1989). Our records in Baja California coincided with an unprecedented invasion of Red-throated Pipits to California in autumn 1991.

Bell's Vireo *Vireo bellii*. We saw a brightly marked individual at Punta Banda on 10 October 1991. Bell's Vireos are rarely noted in migration away from the breeding areas in southern California (Garrett and Dunn 1981, Unitt 1984) or northern Baja

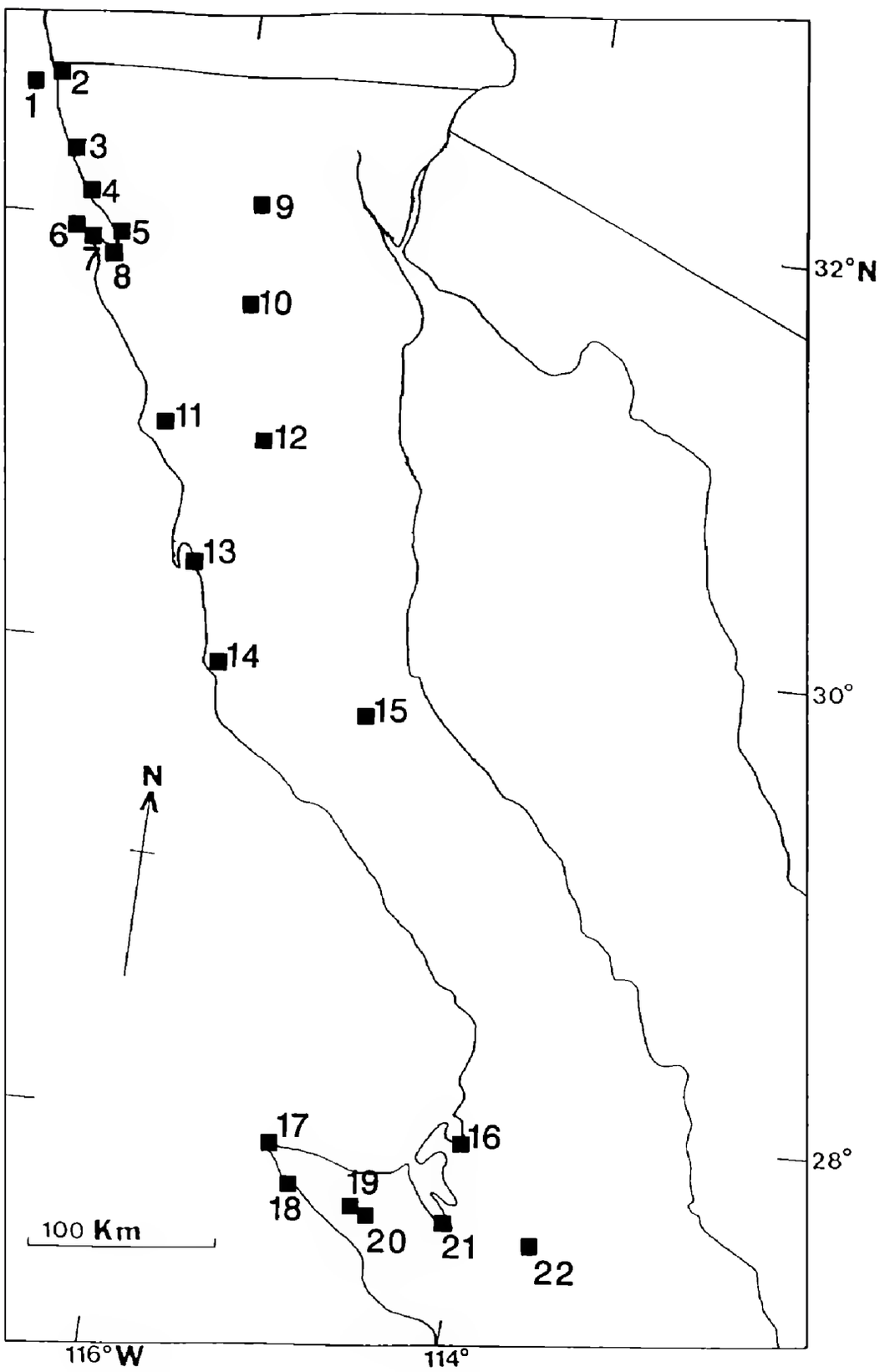


Figure 1. Locations mentioned in the species accounts. 1, Islas Los Coronados; 2, Tijuana; 3, El Descanso; 4, La Salina; 5, Ensenada; 6, Islas de Todos Santos; 7, La Bufadora; 8, Estero de Punta Banda; 9, Laguna Hanson; 10, Ejido Héroes de la Independencia; 11, San Telmo de Abajo; 12, Rancho San José; 13, La Pinta Pond, Bahía San Quintín; 14, Rio El Rosario crossing; 15, Cataviña; 16, Guerrero Negro; 17, Punta Eugenia; 18, Bahía Tortugas; 19, Rancho San Miguel; 20, Rancho Santa Monica; 21, Laguna Ojo de Liebre; 22, Ejido Vizcaino.

California (Grinnell 1928, Wilbur 1987). The brightness of the individual we saw suggests the possibility of a subspecies other than the gray *V. b. pusillus*, which breeds in northwestern Baja California.

Solitary Vireo *Vireo solitarius*. On 11 October we saw one at Cataviña. The bird's overall gray and white appearance and relatively large bill indicated it was *V. s. plumbeus*. Although neither Grinnell (1928) nor Wilbur (1987) listed this form for Baja California, Keith and Stejskal (1987) reported one at Guerrero Negro in October 1987, and Howell and S. Webb saw one at San José del Cabo on 6 February 1988.

Philadelphia Vireo *Vireo philadelphicus*. We saw one at Cataviña on 11 October, the first recorded for Baja California. We watched it for 30 minutes at ranges down to 5 m, at times in the same tree as three Warbling Vireos (*V. gilvus*). The Philadelphia was slightly smaller than the Warblings, with a rounder head and smaller hooked vireo bill. The crown was grayish, in slight contrast to the olive upperparts, which showed a narrow pale wingbar on the tips of the greater secondary coverts. The face was marked by a broad whitish superciliary and subocular crescent separated by a narrow but distinct dark loral stripe and dark eyestripe. The throat and underparts were bright pale lemon, slightly paler on the flanks and under tail-coverts, and becoming whitish only on the belly and vent. The Philadelphia Vireo is a rare autumn vagrant in southern California (Garrett and Dunn 1981).

Golden-winged Warbler *Vermivora chrysoptera*. On 10 October we found a male at La Bufadora, representing the first record of this species in Baja California. The bird fed within 8 to 10 m of us and was unmistakable. It was slightly larger than an adjacent Orange-crowned Warbler (*V. celata*) and had a sharply pointed dark bill. The crown was bright yellow, the rest of the upperparts gray with a bold yellow panel on wing coverts. The bold black mask and black bib were separated by a white moustache, and the rest of the underparts were grayish white. Golden-winged Warblers are rare autumn vagrants in southern California (Garrett and Dunn 1981).

Tennessee Warbler *Vermivora peregrina*. We saw single birds at Punta Banda on 10 October and at Rancho San José on 13 October. Six other Tennessee Warblers have been reported from Baja California (Howell and Webb in press, Keith and Stejskal 1987, Wilbur 1987); the species is probably a rare but regular transient or vagrant there, as it is in southern California (Garrett and Dunn 1981).

Lucy's Warbler *Vermivora luciae*. We saw one at a small ranch 12 km east of Bahía Tortugas on 12 October. Lucy's Warbler should be considered a vagrant, not a "transient" (Wilbur 1987) in Baja California away from its summer breeding range in the Río Colorado delta, and there are now four such records from the peninsula (cf. Wilbur 1987). This species is a rare autumn vagrant in coastal southern California (Garrett and Dunn 1981).

Nashville Warbler *Vermivora ruficapilla*. Howell saw a brightly marked individual, probably a male, at La Salina on 15 October. This constitutes the first published autumn occurrence for Baja California (cf. Wilbur 1987). Nashville Warblers are notably commoner in spring than in autumn in southern California (Garrett and Dunn 1981, Unitt 1984).

Magnolia Warbler *Dendroica magnolia*. We saw one at Rancho San Miguel, 122 km by road northwest of Ejido Vizcaino, on 12 October, and Howell saw singles at the Highway 1 crossing of the Río El Rosario on 13 October and at La Salina on 15 October. All birds were seen clearly at close range. The heads were gray with a white eye ring and indistinct short whitish superciliary. The backs were olive, the wings dark gray with two narrow white wingbars. The black tails had bold basal white tail spots so that, when viewed from below, they appeared as white tails boldly tipped black.

The throat and underparts were yellow, becoming white on the under tail coverts, with a slight gray extension from the nape onto the neck sides. The first two birds were notably dull, with indistinct dusky streaks on the flanks suggesting that they were immature females. The La Salina bird had distinct black back feather centers and bold black flank streaks suggesting it was a male; it also called once, giving a squeaky nasal "nyih." Surprisingly there are no previous published records of Magnolia Warblers from Baja California although the species is a regular autumn vagrant in southern California (Garrett and Dunn 1981).

Blackpoll Warbler *Dendroica striata*. On 13 October we found a Blackpoll Warbler associating with a small flock of Yellow Warblers (*D. petechia*) at Rancho San José. We watched it for 15 minutes at ranges down to 8 m. It was slightly larger than adjacent Yellow Warblers. The crown, nape, and upperparts were olive with indistinct darker streaking on the back. The face showed a narrow pale lemon superciliary and dark eyestripe suggesting an Orange-crowned Warbler. The dark wings had two distinct narrow white wingbars, and the blackish tail showed distal white tail spots, obvious when the tail was spread. The bright pale lemon throat and chest had indistinct dusky streaks on the chest extending slightly onto the paler flanks; the under tail-coverts were whitish. The bill was dark, the legs flesh-colored. There is only one other specific published record from Baja California, at Punta Banda on 16 October 1987 (Keith and Stejskal 1987). Although the A.O.U. (1983) mentioned this species' occurrence in northern Baja California, the source of that report is unclear (B. L. Monroe, Jr., pers. comm.). Blackpoll Warblers are rare to uncommon autumn vagrants in southern California (Garrett and Dunn 1981).

Painted Redstart *Myioborus pictus*. On 12 October we found a Painted Redstart at Rancho San Miguel. We watched the bird, at times as close to us as 3 m, feeding actively in the same tree as an Arctic Warbler, a Magnolia Warbler, two Yellow Warblers, an Audubon's Warbler (*Dendroica coronata*) and two Townsend's Warblers (*D. townsendi*)! The head, chest, flanks, and upperparts were black with a striking white panel on the wing coverts, white tertial edges, and a white subocular crescent; the white outer rectrices were often flashed conspicuously as the tail was spread. The belly was bright red. The bird called several times, giving a slightly nasal "sreeu" that suggested a common call of the Pine Siskin (*Carduelis pinus*). This is the first record of this unmistakable species in Baja California. Painted Redstarts are rare autumn vagrants in southern California (Garrett and Dunn 1981).

Scarlet Tanager *Piranga olivacea*. We saw an immature male at Rancho Santa Monica, 120 km by road northwest of Ejido Vizcaino, on 12 October. The bird's head and back were olive with a narrow pale broken eye ring. The wings and tail were darker, grayish, with contrastingly black greater secondary coverts. The throat and underparts were lemon yellowish, brightest on the under tail coverts. The stout bill was flesh-colored with a dark culmen. There are only two prior published records of this species in Baja California (Keith and Stejskal 1987, Wilbur 1987), the former at Punta Banda on 16 October 1987. Scarlet Tanagers are rare autumn vagrants in southern California (Garrett and Dunn 1981).

Great-tailed Grackle *Quiscalus mexicanus*. We saw 11 females flying south over Cataviña on 11 October and an immature female (age by dusky iris color) at Rancho San José on 13 October. In addition, P. Unitt (pers. comm.) saw four Great-tailed Grackles at the northeast corner of Bahía San Quintín on 1 December 1986, and R. A. Behrstock (pers. comm.) saw a female at Rancho San José on 28 and 29 November 1990. These are the first records in Baja California away from the Río Colorado drainage (cf. Wilbur 1987) and suggest that this species' range is still expanding, as has been noted in southern California (Garrett and Dunn 1981).

We thank Robert A. Behrstock, Burt L. Monroe, Jr., Eduardo Palacios, and Philip Unitt for helpful information and thank Philip Unitt for his thorough review of the manuscript. This is contribution 526 of Point Reyes Bird Observatory.

LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D.C.

Brewster, W. 1902. Birds of the Cape region of Lower California. Bull. Mus. Comp. Zool. 41:1–241.

Bryant, W. E. 1891. The Cape region of Baja California. Zoe 2:185–201.

Garrett, K. L., and Dunn, J. L. 1981. Birds of Southern California. Los Angeles Audubon Soc., Los Angeles.

Grinnell, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32:1–300.

Howell, S. N. G., and Pyle, P. 1990. Additional notes on birds in Baja California, May 1989. Aves Mexicanas 2(90-1):6-7.

Howell, S. N. G., and Webb, S. 1989. Red-throated Pipit (*Anthus cervinus*) in Michoacan. Aves Mexicanas 2(89-1):2.

Howell, S. N. G. and Webb, S. 1992. Noteworthy observations of birds in Baja California, Mexico. W. Birds 23.

Jehl, J. R. 1977. An annotated list of birds of Islas Los Coronados, Baja California, and adjacent waters. W. Birds 8:91–101.

Keith, A. R., and Stejskal, D. 1987. Two outstanding sites for vagrants in Baja California. Mexican Birding Association "Bulletin Board" 1(87-3):3.

Palacios, E., and Alfaro, L. 1991. Breeding birds of Laguna Figueroa and La Pinta Pond, Baja California, Mexico. W. Birds 22:27–32.

Pyle, P., and Howell, S. N. G. 1993. An Arctic Warbler in Baja California, Mexico. W. Birds 24:53-56.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Memoir 13.

Wilbur, S. R. 1987. Birds of Baja California. Univ. of Calif. Press, Berkeley.

Accepted 19 February 1992

PRESIDENT'S MESSAGE

The seventeenth annual meeting of the Western Field Ornithologists was held jointly with the San Francisco Bay Bird observatory from 18 through 20 September 1992 at the Holiday Inn in Sunnyvale, California. The annual meeting was a great success, with boat trips out of Monterey Bay (Streaked Shearwater!), field trips in the San Francisco Bay Area (Garganey, Ruff, etc.!), a well-prepared and excellent paper session, and a lively panel discussion of identification problems, not to mention a fine barbecue and banquet. The San Francisco Bay Bird Observatory was the host for the annual meeting, and its organization of the meeting was exceptional and very professional. One person who deserves special credit is Janet Hanson, who kept all things running smoothly. Thanks, Janet.

The eighteenth annual Western Field Ornithologists' meeting will be held from 30 July through 1 August 1993 in Tucson, Arizona. We expect this annual meeting to be excellent, as it is being held at a perfect time to observe the suite of avifauna specialties for which southern Arizona is famous.

Our WFO board meeting was very productive. Our financial condition is good, and, needless to say, the publication of *Western Birds* is very strong, thanks to the efforts of Editor Philip Unitt, associate editors, the editorial board, and contributors. WFO is embarking on a membership drive to strengthen the organization, so please let others who are interested in field ornithology know of the merits of belonging to WFO and enjoying our first-rate scientific journal. By generating a greater membership the organization will enlarge its base of field ornithologists and researchers and thereby add to our ability to publish more articles in *Western Birds*.

The membership elected Kimball Garrett, Bill Tweit, and Janet Witzeman to three-year terms as WFO Directors. The board elected Robert McKernan as President, Steve Summers as Vice-President, and Dori Myers as Treasurer/Membership Secretary. Peter Gent is our outgoing President who made the President's job appear so easy while devoting so much to WFO over his tenure. Thanks, Peter. Two members of WFO who deserve special mention are Howard L. Cogswell and John Luther. Howard has been our Treasurer/Membership Secretary for six years and deserves high praise for keeping WFO financially sound. The treasurer's is often a thankless job to which Howard has selflessly devoted his time throughout his tenure. Thanks, Howard. John Luther has been a cornerstone of WFO, serving in the past as President and continuously as a Director as far back as the era of *California Birds*. Both of these members of WFO deserve much thanks for years of service. I look forward to WFO growing as an organization as well as continuing as an important source of scientific information for professional and amateur field ornithologists.

We look forward to seeing you in Tucson in 1993. More details on this next meeting of WFO will be coming.

Robert McKernan
WFO President

WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

President: Robert McKernan, 1230 Friar Lane, Redlands, CA 92373

Vice-President: Steve Summers, P.O. Box 202, Silver Lake, OR 97638

Treasurer/Membership Secretary: Dorothy Myers, 6011 Saddletree Lane, Yorba Linda, CA 92686

Recording Secretary: Jean-Marie Spoelman, 4629 Diaz Drive, Fremont, CA 94536

Circulation Manager: William E. Haas, 10601-A Tierrasanta Blvd., Suite 127, San Diego, CA 92124

Directors: Bruce Deuel, Kimball Garrett, Peter Gent, Guy McCaskie, Robert McKernan, Steve Summers, Bill Tweit, Janet Witzeman, David Yee

Editor: Philip Unitt, 3411 Felton Street, San Diego, CA 92104

Associate Editors: Cameron Barrows, Tim Manolis, Thomas W. Keeney

Graphics Manager: Virginia P. Johnson, 4637 Del Mar Ave., San Diego, CA 92107

Photo Editor: Peter La Tourrette, 1019 Loma Prieta Ct., Los Altos, CA 94024

Secretary, California Bird Records Committee: Michael A. Patten, P. 0. Box 8612, Riverside, CA 92515

Editorial Board: Robert Andrews, Alan Baldridge, Andrew J. Berger, Laurence C. Binford, R. Wayne Campbell, David F. DeSante, Jon L. Dunn, Richard Erickson, William T. Everett, Kimball L. Garrett, Joseph R. Jehl, Jr., Ned K. Johnson, Virginia P. Johnson, Brina Kessel, Stephen A. Laymon, Paul Lehman, John S. Luther, Guy McCaskie, Joseph Morlan, Harry B. Nehls, Dennis R. Paulson, Gary H. Rosenberg, Oliver K. Scott, Ella Sorensen, Richard W. Stallcup, Charles Trost, Terence R. Wahl, Bruce Webb

Membership dues, for individuals and institutions, including subscription to Western Birds: Patron, $1000; Life, $350; Supporting, $50 annually; Contributing, $30 annually; Family, $22; Regular, U.S., $18 for one year, $35 for two years, $50 for three years; outside U.S., $23 for one year, $45 for two years, $65 for three years. Dues and contributions are tax-deductible to the extent allowed by law.

Send membership dues, changes of address, correspondence regarding missing issues, and orders for back issues and special publications to the Treasurer. Make checks payable to Western Field Ornithologists.

Back issues of *California Birds/Western Birds*: $20 per volume, $5.00 for single issues. Xerox copies of out of print issues (Vol. 1, No. 1; Vol. 2, Nos. 1 and 4; Vol. 6, No. 2): $5.50 each. *Checklist of the Birds of California:* $2.00 each, 10 or more $1.50 each. *Pelagic Birds of Monterey Bay, California*: $2.50 each, 10 or more $2.00 each, 40 or more $1.50 each.
All postpaid.

Published January 15, 1993 ISSN 0045-3897

WESTERN BIRDS

Vol. 24, No. 2, 1993

Volume 24, Number 2, 1993

Distribution, Migration, Ecology, and Relationships of the Five-striped Sparrow, *Aimophila quinquestriata* *Allan R. Phillips and Roberto Phillips Farfan* 65

North American Migrant Birds on Clipperton Atoll *Steve N. G. Howell, Peter Pyle, Larry B. Spear, and Robert L. Pitman* 73

Nesting Biology of the California Black Rail in Southwestern Arizona *Ronald E. Flores and William R. Eddleman* 81

Noteworthy Observations from Northeastern Baja California *Michael A. Patten, Kurt Radamaker, and Thomas E. Wurster* . . . 89

NOTES

A Little Bunting Reaches California *Guy McCaskie* 95

Northeastern Extension of the Breeding Range of the Arctic Loon in Northwestern Alaska *Hector Douglas and Kristine Sowl* 98

Vulnerability of Prey Stimulates Attacks by Jays and Shrikes on Adult Birds *Carla Cicero* 101

Mountain Chickadees Nest in Desert Riparian Forest *Stephen J. Myers* 103

Eurasian X American Wigeons in Western Oregon *Kathy Merrifield* . 105

A Markham's Storm-Petrel in the Northeastern Pacific *Peter Pyle* . . 108

Observations of Dark-rumped Petrels off Oregon and California *Peter Pyle, Larry B. Spear, and David G. Ainley* 110

Cover photo by © Rick & Nora Bowers of Tucson, Arizona: Five-striped Sparrow *(Aimophila quinquestriata)*, California Gulch, Arizona, July 1989

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Philip Unitt, 3411 Felton Street, San Diego, CA 92104. For matter of style consult the Suggestions to *Contributors to Western Birds* (8 pages available at no cost from the editor) and the *Council of Biology Editors Style Manual* (available for $24 from the Council of Biology Editors, Inc., 9650 Rockville Pike, Bethesda, MD 20814).

Reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

Volume 24, Number 2, 1993

DISTRIBUTION, MIGRATION, ECOLOGY, AND RELATIONSHIPS OF THE FIVE-STRIPED SPARROW, *AIMOPHILA QUINQUESTRIATA*

ALLAN R. PHILLIPS, Dept. of Zoology, Denver Museum of Natural History, City Park, Denver, Colorado 80205 (present address: Reforma 825-A, Col. Chapultepec, San Nicolás de los Garza, 66450 Nuevo León, México)

ROBERTO PHILLIPS FARFAN, Casilla 17-17-617, Quito, Ecuador

The Five-striped Sparrow, *Aimophila quinquestriata* (Sclater and Salvin), consists of two subspecies locally distributed in two parts of western Mexico. Until recently the paler northern subspecies, *A. q. septentrionalis* van Rossem, was largely restricted (in summer) to Sonora, while the darker *A. q. quinquestriata* was known only from northern Jalisco and vicinity. Like all little-known tropical or semi-tropical birds, the Five- striped Sparrow has generally been assumed to be sedentary (Wolf 1977, A.O.U. 1983).

DISTRIBUTION AND MIGRATION

The first hint of possible migration was by van Rossem (1945:274), who wrote that the only Sonora record below 1400 feet (425 m) altitude, and thus the only record for the coastal plain—from Camoa in southern Sonora—"may be seasonal in nature." Then in June 1957, an apparently accidental specimen was taken by Binford (1958) in southern Arizona, where the first breeding birds were found in 1969. These were followed by others in other places in 1977 and 1978 (Peter Hubbell pers. comm., Mills "1977"). By 1980 the Five-striped Sparrow was a "summer resident of thick brush of rocky canyon slopes in Lower Sonoran Zone along Mexican border . . . north to the west side of the Santa Rita Mountains, where very local. Apparently winters in same areas but in small numbers" (Monson and Phillips 1981:195). No winter specimen was cited, and the species is certainly very rare between 29 October and 25 March (Mills et al. 1980, contra A.O.U. 1983).

In Sonora, the limits of regular wintering remain unclear. A. R. P. did not find the species during his winter explorations, 1948–1957, but found it breeding north to about 100 km south of the international border (Phillips

et al. 1964). While he spent little time on brushy or grassy canyon slopes, his experience agreed with all others': all definite published winter records were from southernmost Sonora only. The Five-striped Sparrow probably winters regularly north to central Sonora, as indicated by a male (specimen in LSU; see acknowledgments for key to acronyms, which agree with Phillips 1991) taken by Joe T. Marshall, Jr., 24 November 1956, on a steep weedy rocky south- facing slope 25 km by road west of Batuc (i.e., about 90 km east of Hermosillo). A bit farther southeast, around El Novillo on the Río Yaqui, it certainly winters: David M. Niles (pers. comm.) took one on 27 January 1964 and saw two others together then in oak–grassland to the southeast. He saw no others in January, and none 1–2 April 1964, whereas in September the species had been "fairly conspicuous." But the Five-striped Sparrow may be very unobtrusive when not breeding, as noted by Mills et al. (1980).

Still, a remarkable concentration of about 40 (within about 200 m) was found by Stephen M. Russell (told to Gale Monson, pers. comm.) on the first (rocky) hills above the coastal plain in northwestern Sinaloa, north-northwest of San Blas, on 10 November 1965. Several specimens (ARIZ) were taken here on 10 and 14 November, at 200 feet (60 m) altitude, and another was taken on 28 December 1966 (R. S. Crossin, NMSU). This locality should be revisited in summer.

South of Sonora, *A. q. septentrionalis* is supposedly resident south to 25°N in western Durango and to "Quilá" (= Quila, Río San Lorenzo, south of Culiacán), central Sinaloa. All specimen records, however, are from winter only; thus none supports the claim that the species is resident. The Durango record is for 11 November (A. H. Miller, in Miller et al. 1957). The Quila dates, not given, are 6–7 January (15 miles = 25 km east at Arroyo Guayalito, RTM). And the southernmost Sinaloa record known to us, from south-central Sinaloa a bit north of 24°N on the road northeast and north to Cosalá, was for 10 January 1970 (C. A. Ely, LSU).

A much greater amount of study and collecting farther south, in southern Sinaloa and Nayarit, had never produced a record of this species. Then in 1978 we explored briefly two small islands just off (northwest of) Mazatlán, Sinaloa. Here, on a grassy east slope with sparse low bushes on Isla Pájaros, 29 March, A. R. P. flushed two sparrows, singly. They seemed unusually dark above for Lincoln's Sparrows (*Melospiza lincolnii*), the sparrow we might have expected, but promptly disappeared into the grass. We did not see their underparts. One was flushed, similarly, on 30 March. Finally, on 2 April, one lit inside a small *Agave* by a rather steep grass-edged rockslide on Isla Venados Norte, where R. P. F. succeeded in collecting it. What was our surprise to find it was *Aimophila quinquestriata*—unrecorded in the long ornithological history of Mazatlán!

Our specimen, an adult female with ovary not enlarged and little fat (weight about 18.9 grams), had traces of molt on the chin and lower back; it is deposited in CANA. Although a bit dark and reddish above (deeper, brighter colors are frequent in more recently collected birds), it is distinctly paler than a specimen from Zacatecas, and we refer it to *septentrionalis*. Additional comparisons with northern Mexican specimens at ARIZ (series) and RTM (series), including one female lent by SD, supported our identification.

Figure 1. Seasonal distribution of the races of the Five-striped Sparrow. Solid circles, *Aimophila q. septentrionalis*, late April to September; open circles, *A. q. septentrionalis*, October to early April only; squares, *A. q. quinquestriata*.

Our record doubtless represents migrant(s). The birds were silent, shy, and secretive, and none had been seen on previous visits to these islands by A. R. P. and others (31 May 1974; Isla Pájaros, 13–14 March 1977).

It seems unlikely that Five-striped Sparrows would reach these islets if none wintered in mainland Sinaloa south of 24°N. They probably weren't found sooner because, in the days of Andrew Jackson Grayson and other pioneer naturalists, the immediate vicinities of Mazatlán and Escuinapa were too densely wooded for these sparrows, and the woods, beaches, and marshes surely attracted more birds, and collectors, than did any difficult, unattractive slopes, which still await thorough exploration.

Besides the locality, the date of our specimen is noteworthy. It is only the second April specimen of *A. quinquestriata* for Sinaloa, where the latest was taken on 4 April at Los Leones, much higher and farther north. All others are from November to March, in striking contrast to the dates of those from Arizona and northern Sonora.

Breeding of the Five-striped Sparrow in northeastern Sinaloa would not be surprising, as shown by specimens from southeasternmost Sonora (Guirocoba), 21 May, and southwestern Chihuahua (Barranca del Cobre at "Uriqui River"), 18 May (both RTM). The species is common near Alamos, Sonora, in July and August (Short 1974), and has been taken at Guirocoba to 25 May (van Rossem 1945).

ECOLOGY

The Five-striped Sparrow's breeding habitat, in Arizona, is thick bushes, 1–2 meters high, and grasses on steep hillsides (Mills "1977"). But the A.O.U. (1983:704) modified this, adding "especially with acacia, mesquite, or riparian vegetation (Subtropical Zone)." Presumably they were influenced by Wolf's (1977) statements "often found in wetter sites along stream courses" or, in Arizona, "dense mesquite stands along Sonoita Creek" (1977:31).

But actually the Five-striped Sparrow, unlike so many birds, shows no real affinity for riparian vegetation. This "is not required except perhaps where hillsides are less densely vegetated," and "one could easily walk the riparian areas without being aware of Five-stripes on the neighboring slopes, especially if unfamiliar with the song" (Mills "1977":127–128); the true habitat is illustrated on page 126. And, contra A.O.U. (1983), steep hillsides do not have true riparian vegetation, which at times separates the populations of two slopes. These contain, in Arizona, shrubby mesquite (*Prosopis*), *Acacia*, chuparrosa (*Anisacanthis*), and kidneywood (*Eysenhardtia*), among other bushes. "Density of the shrubs is apparently more important than the species composition" (Mills "1977":128)—which would be expected to vary at different latitudes and altitudes.

Nor (contra A.O.U. 1983) are steep hillsides necessary for breeding of *Aimophila q. septentrionalis*. It was "quite common in an area with little relief" in northern Sonora in July, and was found "in areas of gently rolling hills," presumably in summer (Mills et al. 1980:97–98); "both areas are densely vegetated with shrubs and grasses." It is the concentration of low bushes that is favored for breeding in the north, at least. Breeding occurs in

Arizona at about 1000 to 1300 meters altitude (Gale Monson pers. comm.) and in Sonora from 1370 down to 50 meters (on a hill with a microwave relay southeast of Navojoa in July 1981, according to observations of S. M. Russell). According to Wolf (1977:30), the species' elevational range, at all seasons, "extends from around 240 m to about 1850 m."

In winter some, perhaps most, Five-striped Sparrows inhabit more open grassy or weedy areas, as shown by our observations and those of J. T. Marshall and D. M. Niles. (The habitat of the northwestern Sinaloa concentration is mainly thorn scrub, *fide* Russell.) As shown by our specimen, they may descend almost to sea level. Neither insular site had dense brush or riparian vegetation.

Short's (1974:30) report on the "thorn forest and short tree forest" birds of southern Sonora does not refer specifically to the haunts of the Five-striped Sparrow. Apparently everyone else's experiences disagree with those of Wolf (1977:30), who wrote "in general, I found *A. quinquestriata* in dense deciduous woodland averaging about 6 m tall." This requires substantiation. According to A.O.U. (1983:592), the "Subtropical Zone" is defined only in South America but extends to North Dakota, Minnesota, and Wisconsin. The actual records indicate that most of *A. q. septentrionalis* winters in what has always been known as the Tropical Zone but breeds in the Lower and Upper Sonoran zones. They apparently eschew strictly riparian vegetation at all seasons.

RELATIONSHIPS

From the start, the relationships of the Five-striped Sparrow have puzzled ornithologists. Influenced, presumably, by its sharply contrasting head stripes, early writers placed the species in *Zonotrichia*. When Ridgway (1901:232) merged the Five-striped Sparrow, with *Peucaea* and "*Ammodramus petenicus*," into *Aimophila*, he still found it to stand apart from the other four "more or less well-defined groups," writing "this species I once placed in *Amphispiza*, but I now find it wholly out of place there unless that genus also be merged into *Aimophila*, which I feel sure would be going quite too far."

Amphispiza was separated because of its lengthened distal primaries, modifying the birds' shapes. But this lengthening is related to time spent flying, and doubtless reflects present or past migrations more than fundamental relationships, just as the evolution of feeding habits affects bill size and shape. The more rounded-winged species of *Aimophila* are the nonmigratory, mainly tropical species. Thus we declined (Phillips et al. 1964, Mayr and Short 1970) to separate *Amphispiza*. Those who did, from Ridgway on, placed the two genera together, with *quinquestriata* in *Aimophila*. (*Aimophila*, even without *Amphispiza*, was unusually diverse, but no one could devise a satisfactory generic subdivision; see Ridgway 1901:231–233, Storer 1955, Wolf 1977.) The suggestion (Pitelka 1951) that the Rufous-winged Sparrow (*Aimophila carpalis*) is nearest *Spizella* remains unsupported by significant evidence.

The discovery of the juvenal plumage of the Five-striped Sparrow (Phillips 1961) only made matters worse. Ridgway (1901:27) supposed that, in all

the plain small-billed sparrows forming the major North American group, "the young always (?) streaked, even if the adults are plain colored." But a young male Five-striped, not yet full-grown but starting its first prebasic molt, was unstreaked below, lacking even the black central chest spot of the adult, and had a yellowish wash on the whitish breast and belly. Any close relationship to the Black- throated Sparrow (*Amphispiza bilineata*) became even more doubtful, and the Five-striped was thought probably "closer to a group of sparrows that includes *Melozone*" (Wolf 1977:199). *Melozone*, however, belongs to a group of stout-footed ground-scratching terrestrial genera, most of whose members have plain unstreaked olive to dull brown backs, wings, and tails. It has rectrices broader than in *Aimophila* or allied genera, and a more rounded wing; primaries 7 to 5 or 4 are longest, rather than 8 to 5.

Then the sixth edition of the A.O.U. Check-list (1983) introduced numerous undocumented changes in nomenclature and sequence. Not only was the Five-striped Sparrow returned to *Amphispiza*, but, still less accountably, five other genera were inserted between it and *Aimophila* (two of these, *Pooecetes* and *Chondestes*, had not even been included in Ridgway's Group *Zonotrichiae*). Widespread uncritical acceptance of this reclassification ensued; for example, Hoffman (1983), in a review, called the *American Birding Association Checklist* "not a good source of current taxonomic, nor nomenclatural, information," citing especially its rejection of the A.O.U.'s scrambling of the Five-striped Sparrow. Like the A.O.U. (1983) and the anonymous (1984) reviewer in *Condor*, he gave no references. We know of none, and found no hint in the *Zoological Record* or elsewhere.

This bit of A.O.U.'s (1983:xii) "adequately debated and widely accepted . . . published evidence" finally emerged to light at its 105th Stated Meeting. Here McKitrick and Fink (1987) wrote "several years ago McKitrick (unpubl. [MS thesis, University of Arizona]) revised the emberizine genus *Aimophila*.... Among the taxonomic conclusions of the paper was that *A. quinquestriata* should be transferred to *Amphispiza*, and this move was accepted by the A.O.U. Checklist Committee. The present paper attempts to apply a more rigorous methodology to a more comprehensive survey of the emberizine finches, and to clear up some faulty conclusions of the earlier effort."

We had best, then, follow Ridgway (1901), at least until "the imperfection of our knowledge concerning the internal structure" (p. VII) of the "very heterogeneous and probably unnatural genus *Aimophila*" (p. 36) is remedied.

SUMMARY

The northern race of the Five-striped Sparrow (*Aimophila quinquestriata septentrionalis*) is largely migratory. The known breeding range extends from southeastern Arizona (recently) south to southeasternmost Sonora (Guirocoba) and southwestern Chihuahua. The northern limit of the main winter (November–early April) range is probably in central Sonora, and at this season the species invades the coastal lowland, extending south at least to Isla Venados Norte, off Mazatlán, southern Sinaloa. The Five-

striped Sparrow's breeding habitat is dense brush, normally dry. The species does not use true riparian habitat, and in winter it spreads to dry grassy hillsides, habitat more open than it uses for nesting. It apparently eschews arboreal vegetation at all times.

The Five-striped Sparrow differs from the sparrows of the genus *Amphispiza* in its more rounded wing and from all its presumed relatives in its unstreaked juvenal plumage. There is no published basis for its inclusion in *Amphispiza*; since Ridgway found it "wholly out of place there," it is better retained in its traditional place in *Aimophila*. The pointed wing shape on which *Amphispiza* is based, being an adaptation for migration, seems a poor basis for separating it from *Aimophila*. *Amphispiza* should be returned to a position adjacent to, or united with, *Aimophila*.

ACKNOWLEDGMENTS

For the privilege of examining specimens, A. R. P. thanks Joe T. Marshall, the late W. J. Sheffler, and the authorities of the University of Arizona (ARIZ), California Academy of Sciences (CAS), Museum of Vertebrate Zoology, University of California (MVZ), New Mexico State University, Las Cruces (NMSU), Moore Laboratory of Zoology, Occidental College (RTM), and the United States National Museum of Natural History, Smithsonian Institution (US). A few specimens examined are now in the Canadian Museum of Nature, Ottawa, Canada (CANA), Louisiana State University Museum of Natural Science (LSU), and San Diego Natural History Museum (SD). We also thank, for help in assembling data, R. S. Crossin, J. C. Hafner, G. Monson, D. M. Niles, S. M. Russell (through Monson), and J. D. Webster. The manuscript was improved by the comments of K. D. Groschupf and P. Unitt.

LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American Birds. 6th ed. Am. Ornithol. Union, Washington, D.C.

Anonymous. 1984. Recent publications: Check-list of North American Birds, 6th edition. Condor 86:47.

Binford, L. C. 1958. First record of the Five-striped Sparrow in the United States. Auk 75:103.

Hoffman, W. 1983. [Review of] A.B.A. Checklist (Second ed.). Auk 100:767–768.

Mayr, E., and Short, L. L. 1970. Species Taxa of North American Birds. Publ. Nuttall Ornithol. Club 9.

McKitrick, M. C., and Fink, W. L. 1987. Phylogenetic puzzles in emberizine finches. No. 133, in Abstracts/Scientific Papers Presented at the One Hundred and Fifth Stated Meeting of the American Ornithologists' Union, 10–13 August 1987, San Francisco State University.

Miller, A. H., Friedmann, H., Griscom, L., and Moore, R. T. 1957. Distributional check-list of the birds of Mexico. Part II. Pac. Coast Avifauna 33.

Mills, G. S. "1977" (= 1978). New locations for the Five-striped Sparrow in the United States. W. Birds 8:121–130.

Mills, G. S., Silliman, J. R., Groschupf, K. D., and Speich, S. M. 1980. Life history of the Five-striped Sparrow. Living Bird 18:95–110.

Monson, G., and Phillips, A. R. 1981. Annotated Checklist of the Birds of Arizona, 2nd ed. Univ. of Ariz Press, Tucson.

Phillips, A. R. "1961" (= 1962). Notas sobre la chuparrosa *Thalurania* y ciertos plumajes de otras aves mexicanas. Anales Inst. Biol. Méx. 32:383:390.

Phillips, A. R. 1991. The Known Birds of North and Middle America. Part II. A. R. Phillips, Denver.

Phillips, A., Marshall, J., and Monson, G. 1964. The Birds of Arizona. Univ. of Ariz. Press, Tucson.

Pitelka, F. A. 1951. Generic placement of the Rufous-winged Sparrow. Wilson Bull. 63:47–48.

Ridgway, R. 1901. The Birds of North and Middle America. Part I. U.S. Natl. Mus. Bull. 50.

Short, L. L. 1974. Nesting of southern Sonoran birds during the summer rainy season. Condor 76:21–32.

Storer, R. W. 1955. A preliminary survey of the sparrows of the genus *Aimophila*. Condor 57:193–201.

Van Rossem, A. J. 1945. A distributional survey of the birds of Sonora, Mexico. Occ. Pap. Mus. Zool. La. State Univ. 21:1–379.

Webster, J. D. 1958. Further ornithological notes from Zacatecas, Mexico. Wilson Bull. 70:243–256.

Wolf, L. L. 1977. Species relationships in the avian genus *Aimophila*. Ornithol. Monogr. 23.

Accepted 26 June 1992

NORTH AMERICAN MIGRANT BIRDS ON CLIPPERTON ATOLL

STEVE N. G. HOWELL, PETER PYLE, AND LARRY B. SPEAR, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 92038

ROBERT L. PITMAN, National Marine Fisheries Service, Southwest Fisheries Center, P.O. Box 271, La Jolla, California 92038

Clipperton Atoll lies in the eastern Pacific Ocean about 1000 km southwest of Guerrero, Mexico, at 10° 18'N, 109° 13'W, and, like many remote islands, is visited rarely by biologists. Although known mostly as a major breeding ground for seabirds, 29 species of northern migrant birds have been reported from the island (Beck 1907, Ehrhardt 1971, Gifford 1913, Haeze et al. 1967, Howell 1959, Niaussat et al. 1968, Stager 1964).

We visited Clipperton on seven occasions: 19 August 1986 (Pitman), 6 May 1987 (Pitman), 1 November 1987 (Pyle and Spear), 24–25 October 1989 (Howell and Spear), 11 November 1990 (Pitman), 4 December 1990 (Howell, Spear, and S. Webb), and 23 October 1991 (Spear). During these visits we recorded a total of 80 species of North American migrants, 57 of them previously unreported from the atoll. Here we summarize records of

Figure 1. Clipperton Atoll, 23 October 1991. A view across the lagoon from the small coconut grove at the landing site on the atoll's northeast side; on the opposite shore note the large coconut grove, a major concentration point for vagrant land birds.

Photo by Larry B. Spear

migrant birds from Clipperton, with the exception of pelagic migrants and breeding seabirds. Previously unreported species whose identification we consider problematic are described.

The atoll, approximately 10.5 km in circumference and 50–300 m wide, surrounds a stagnant murky lagoon up to 1.5 km in diameter. Most of the land is bare coral rubble except for a few coconut palms (*Cocos nucifera*), the main groves of which (Figure 1) act as magnets for migrant landbirds. In addition, a few grassy islets in the lagoon and the muddy bay at Clipperton Rock (see map in Stager 1964) concentrate waterbirds. Except in 1991 (when only the north side of the atoll was visited briefly), we were able to make observations at all of these points, and walks around the entire island confirmed that very few migrants occurred away from them. We have considerable experience with all species encountered, and identifications were often facilitated by the birds' being tired and easily approached.

Several of the landbirds in October and November, and all of those in December, were weak and sickly-looking; this, together with the paucity of landbirds in December, suggests that many perish on the island. Some waterbirds, however, in particular herons and ducks, may be able to overwinter or at least survive longer on Clipperton. Common Moorhens have successfully colonized the atoll since 1968, but American Coots, reported as breeding commonly by Stager (1964), now occur in reduced numbers and may no longer nest on Clipperton. Relatively few shorebirds were found in December, suggesting that the majority occurring earlier in the autumn were transients or vagrants.

The following species accounts summarize the occurrence of all North American migrants recorded on Clipperton Atoll. The only other landbird known from Clipperton is the Dark-billed Cuckoo (*Coccyzus melacoryphus*), an austral migrant from South America (Stager 1964). In the list, lack of reference to other sources indicates a species previously unreported from Clipperton.

SPECIES ACCOUNTS

American Bittern, *Botaurus lentiginosus*. Nov 1987, 1.

Least Bittern, *Ixobrychus exilis*. Aug 1958, 1 female collected (Stager 1964).

Great Blue Heron, *Ardea herodias*. May 1987, 1; Nov 1987, 4; Nov 1990, 1.

Great Egret, *Casmerodius albus*. Nov 1987, 1.

Snowy Egret, *Egretta thula*. Nov 1987, 3.

Cattle Egret, *Bubulcus ibis*. Aug 1986, 1; May 1987, 2; Nov 1987, 100; Oct 1989, 32; Nov 1990, 25; Dec 1990, 3. Also reported by Haeze et al. (1967) and Niaussat et al. (1968).

Black-crowned Night-Heron, *Nycticorax nycticorax*. Nov 1987, 1 adult.

Yellow-crowned Night-Heron, *N. violaceus*. Nov 1987, 1 immature; Nov 1990, 1 first-year; Dec 1990, 1 second-year.

White-faced Ibis, *Plegadis chihi*. Oct 1989, 3; Dec 1990, 1. Identified by reddish irides and plain slaty gray lores (see Howell and de Montes 1989).

Plegadis sp. Nov 1987, 1; Nov 1990, 2. Also reported in Nov 1901 (Beck 1907).

White Ibis, *Eudocimus albus*. May 1987, 1 adult (Figure 2); Nov 1987, 1 adult.

Northern Pintail, *Anas acuta*. Nov 1987, 5; Nov 1990, 50; Dec 1990, 50. Also Nov 1901 (Beck 1907).

Blue-winged Teal, *A. discors*. Nov 1987, 16; Nov 1990, 30; Dec 1990, 9. Also Nov 1901 (Beck 1907).

Cinnamon Teal, *A. cyanoptera*. Dec 1990, 1. Carefully compared with accompanying Blue-winged Teal, identified by more spatulate bill, overall warm brown plumage including head and neck, plain face with whitish eye-crescents.

Blue-winged/Cinnamon Teal, *A. discors/cyanoptera*. Dec 1990, 55.

Northern Shoveler, *A. clypeata*. Nov 1990, 6; Dec 1990, 20. Also Nov 1901 (Beck 1907).

Eurasian Wigeon, *A. penelope*. Dec 1990, 1. Among 140+ ducks present, Howell and S. Webb found a female Eurasian Wigeon. The bird associated with a male American Wigeon which it resembled in shape and size. The head and neck were grayish chestnut, without a dark eye patch, and did not contrast with the chest. In flight the axillars were seen to be grayish.

American Wigeon, *A. americana*. Dec 1990, 1 male. Also reported by Beck (1907).

Canvasback, *Aythya valisineria*. Nov 1901, 1 seen (Beck 1907).

Ring-necked Duck, *A. collaris*. Dec 1990, 2 females.

Figure 2. Adult White Ibis at Clipperton, 6 May 1987.

Photo by Robert L. Pitman

Lesser Scaup, *A. affinis*. Dec 1990, 2 males, 2 females.

Unidentified scaup, *Aythya affinis/marila*. Nov 1990, 5.

Osprey, *Pandion haliaetus*. Nov 1987, 1; Oct 1989, 1; Dec 1990, 1. Also reported by Stager (1964).

Peregrine Falcon, *Falco peregrinus*. Nov 1987, 1 adult; Dec 1990, 1 juvenile.

Virginia Rail, *Rallus limicola*. Nov 1987, 1.

Sora, *Porzana carolina*. Nov 1987, 1; Oct 1989, 1; Dec 1990, 1.

Purple Gallinule, *Porphyrula martinica*. Oct 1989, 1 immature. Also reported by Haeze et al. (1967).

Common Moorhen, *Gallinula chloropus*. Aug 1986, 4; May 1987, 30; Nov 1987, 35 including chicks; Oct 1989, 15 including one small chick; Nov 1990, 20; Dec 1990, 40 including 5 or 6 small chicks. A recent and apparently successful colonist.

American Coot, *Fulica americana*. Nov 1987, 3. Nov 1990, 10; Dec 1990, 2. Uncommon and apparently irregular in recent years, but bred commonly at Clipperton from at least 1958 to 1968 (Stager 1964, Ehrhardt 1971).

Black-bellied Plover, *Pluvialis squatarola*. Aug 1986, 1; Nov 1987, 1; Nov 1990, 1. Also Nov 1901 (Beck 1907).

Pacific Golden Plover, *P. fulva*. Nov 1987, 1. Also Aug 1958, 1 collected (Stager 1964).

Unidentified golden plover, *P. dominica/fulva*. May 1987, 1; Oct 1989, 1.

Semipalmated Plover, *Charadrius semipalmatus*. Nov 1987, 8; Oct 1989, 4; Nov 1990, 6; Dec 1990, 12.

Killdeer, *C. vociferus*. Nov 1987, 1; Nov 1990, 1; Dec 1990, 3.

Greater Yellowlegs, *Tringa melanoleuca*. Nov 1987, 1; Oct 1989, 1. Also reported by Ehrhardt (1971).

Lesser Yellowlegs, *T. flavipes*. Nov 1987, 1; Oct 1989, 1. Also reported by Ehrhardt (1971).

Solitary Sandpiper, *T. solitaria*. Nov 1987, 1; Oct 1989, 1.

Wandering Tattler, *Heteroscelus incanus*. Aug 1986, 30; May 1987, 29; Nov 1987, 100; Oct 1989, 24, Nov 1990, 25; Dec 1990, 1. Also reported by Gifford (1913) and Stager (1964).

Spotted Sandpiper, *Actitis macularia*. Nov 1987, 1. Also Aug 1958, 1 collected (Stager 1964).

Whimbrel, *Numenius phaeopus hudsonicus*. May 1987, 2; Nov 1987, 4. Also Nov 1901 (Beck 1907).

Ruddy Turnstone, *Arenaria interpres*. Aug 1986, 1; Nov 1987, 17; Nov 1990, 1. Also Aug 1958, 7 (Stager 1964).

Sanderling, *Calidris alba*. Nov 1987, 2; Oct 1989, 6.

Western Sandpiper, *C. mauri*. Nov 1990, 1; Dec 1990, 1.

Least Sandpiper, *C. minutilla*. Nov 1990, 3; Dec 1990, 4.

Pectoral Sandpiper, *C. melanotos*. Nov 1987, 2; Oct 1991, 2.

Long-billed Dowitcher, *Limnodromus scolopaceus*. Nov 1990, 3.

Wilson's Phalarope, *Phalaropus tricolor*. Aug 1958, 1 collected (Stager 1964).

Red Phalarope, *P. fulicaria*. Dec 1990, 2.

Laughing Gull, *Larus atricilla*. May 1987, 23; Oct 1989, 4; Nov 1989, 4; Dec 1990, 2.

Franklin's Gull, *L. pipixcan*. Nov 1987, 1.

Common Tern, *Sterna hirundo*. Nov 1987, 1.

Arctic Tern, *S. paradisaea*. Nov 1987, 50.

Black Tern, *Chlidonias niger*. Nov 1987, 1 corpse found. Also Aug 1958, 1 collected (Stager 1964).

Mourning Dove, *Zenaida macroura*. May 1987, 2.

Yellow-billed Cuckoo, *Coccyzus americanus*. Reported by Niaussat et al. (1968).

Common Nighthawk, *Chordeiles minor*. May 1987, 1 female. Observed and photographed at close range, roosting on the coral rubble and in flight (Figure 3).

Belted Kingfisher, *Ceryle alcyon*. Nov 1987, 2; Oct 1989, 1; Nov 1990, 1; Dec 1990, 1.

Eastern Wood-Pewee, *Contopus virens*. Nov 1987, 1. Identified by olive-green upperparts; mostly pale underparts (including the median chest) with diffuse dusky streaking on the chest sides; bright, whitish to lemon wingbars and secondary edges; bright orange basal 4/5 (including the sides) of the lower mandible; and the song, a

Figure 3. Female Common Nighthawk at Clipperton, 6 May 1987. In spring the combination of a white wing band and the lack of a white tail bar rules out the Lesser Nighthawk (*Chordeiles acutipennis*); note also the position of the white wing band.

Photo by Robert L. Pitman

full, clear *peeew-weee* of 1–2 seconds duration. From extensive experience with both wood-pewees and the problems of their separation, Pyle considered the plumage and song outside the range of Western Wood-Pewee variation.

Unidentified pewee, *C. virens/sordidulus*. Oct 1989, 1.

Empidonax sp. Nov 1987, 1, probably a Yellow-bellied Flycatcher, *E. flaviventris*.

Purple Martin, *Progne subis*. Aug 1986, 15; Nov 1987, 1. Also Aug 1958 (Stager 1964) and 1968 (Ehrhardt 1971).

Progne sp. Nov 1987, 2; Oct 1989, 1. These birds were not Purple Martins and probably were Gray-breasted Martins, *P. chalybea*.

Tree Swallow, *Tachycineta bicolor*. Dec 1990, 2.

Bank Swallow, *Riparia riparia*. Nov 1987, 1; Oct 1989, 3.

Cliff Swallow, *Hirundo pyrrhonota*. Aug 1986, 1.

Barn Swallow, *Hirundo rustica*. Nov 1987, 100; Oct 1989, 2; Nov 1990, 2; Dec 1990, 3; Oct 1991, 100.

Troglodytes sp. Nov 1987, 1, probably a House Wren, *T. aedon*.

Gray-cheeked Thrush, *Catharus minimus*. Oct 1989, 2 or 3. These birds were tired and could be observed at close range. Identified by the gray-brown head and upperparts, including upper tail, the inconspicuous narrow whitish eyering that widened slightly behind the eye, and the whitish throat and underparts washed pale buff on the chest and spotted dark brown on the chest and sides of throat.

American Pipit, *Anthus rubescens*. Nov 1987, 1.

Golden-winged Warbler, *Vermivora chrysoptera*. Nov 1987, 1 male.

Tennessee Warbler, *V. peregrina*. Nov 1987, 2. Also Oct 1956, 1 collected (Howell 1959).

Yellow Warbler, *Dendroica petechia*. Nov 1987, 1. Also Aug 1958, 1 collected (Stager 1964).

Magnolia Warbler, *D. magnolia*. Nov 1987, 1; Oct 1989, 1.

Black-throated Green Warbler, *D. virens*. Oct 1991, 1.

Yellow-throated Warbler, *D. dominica albilora*. Aug 1958, 1 collected (Stager 1964).

Prairie Warbler, *D. discolor*. Nov 1987, 1.

Palm Warbler, *D. palmarum*. Nov 1987, 2.

Bay-breasted Warbler, *D. castanea*. Oct 1956, 1 collected (Howell 1959).

Blackpoll Warbler, *D. striata*. Oct 1989, 1; Nov 1990, 1; Oct 1991, 1.

American Redstart, *Setophaga ruticilla*. May 1987, 1; Nov 1987, 3; Oct 1989, 1. Also Aug 1958 (Stager 1964).

Prothonotary Warbler, *Protonotaria citrea*. Nov 1987, 1; Oct 1989, 2; Nov 1990, 1.

Ovenbird, *Seiurus aurocapillus*. Nov 1987, 2; Oct 1989, 1.

Northern Waterthrush, *S. noveboracensis*. Nov 1987, 3; Nov 1990, 1; Oct 1991, 1.

Connecticut Warbler, *Oporornis agilis*. Nov 1987, 1, probably an immature female. Studied walking under some shrubbery in the main grove. A large *Oporornis*

warbler, uniformly dull olive on the back and rather bright yellow on the lower underparts. The throat and breast were buffy brown. A full buffy-white eyering was present. The legs were bright pink. These characters plus the persistent walking habit are diagnostic of Connecticut among the *Oporornis* warblers (Pyle and Henderson 1990).

Common Yellowthroat, *Geothlypis trichas*. Nov 1987, 1.

Canada Warbler, *Wilsonia canadensis*. Nov 1987, 1.

Summer Tanager, *Piranga rubra*. Nov 1987, 3; Oct 1989, 1. Also Oct 1956, 1 collected (Howell 1959).

Scarlet Tanager, *Piranga olivacea*. Oct 1991, 1 immature male (Figure 4).

Piranga sp. Nov 1990, 1, probably a Summer Tanager.

Bobolink, *Dolichonyx oryzivorus*. Nov 1987, 3; Oct 1989, 6; Dec 1990, 2.

Icterus sp. Nov 1987, 1, probably a Northern Oriole, *I. galbula*.

Figure 4. Immature male Scarlet Tanager at Clipperton, 23 October 1991.

Photo by Larry B. Spear

ACKNOWLEDGMENTS

Research conducted by Point Reyes Bird Observatory (PRBO) on seabird ecology at sea, coordinated by David Ainley and Chris Ribic, enabled access to Clipperton by Howell, Pyle, and Spear. National Geographic Society grants 3321-86 and 4106-89 and National Science Foundation grants OCE 8515637 and OCE 8911125 supported the research cruises in which PRBO personnel participated. Pitman's visits coincided with studies by the National Marine Fisheries Service, during which field support was provided by J. and G. Friedrichsen, R. Rowlett, J. Cotton, J. Carretta, and J. Gilardi. Our visits to Clipperton were arranged and made possible by the National Oceanographic and Atmospheric Administration (NOAA), and we thank the officers and crew of the NOAA ships *Discoverer*, *Oceanographer*, *Malcolm Baldridge*, *David Starr Jordan*, and *McArthur* for logistical support. We thank David Ainley and Roger B. Clapp for helpful comments the manuscript. This is contribution 530 of Point Reyes Bird Observatory.

LITERATURE CITED

Beck, R. H. 1907. Notes from Clipperton and Cocos islands. Condor 9:109–110.

Ehrhardt, J. P. 1971. Census of the birds of Clipperton Island, 1968. Condor 73: 476–480.

Gifford, E. W. 1913. Expedition of the California Academy of Sciences to the Galapagos Islands, 1905–1906. VIII. The birds of the Galapagos Islands with observations on the birds of Cocos and Clipperton islands. (Columbiformes to Pelecaniformes). Proc. Calif. Acad. Sci., 4th ser., 2:1–132.

Haeze, G., Wissocq, J. C., Barloy, J., and Niaussat, P. 1967. Etude zoologique des espèces rapportées de la Mission Bougainville, Groupe Rouge. Rapport particulier du Centre de Recherches du Service de Santé des Armées (C.R.S.S.A.), Division de Biologie Générale et Ecologie (Biol. Ecol.) 25:16–18.

Howell, S. N. G., and de Montes, B. M. 1989. Status of the Glossy Ibis in Mexico. Am. Birds 43:43–45.

Howell, T. R. 1959. Land birds from Clipperton Island. Condor 61:155–156.

Niaussat, P., Barloy, J., and Haeze, G. 1963. Contribution a l'étude des oiseaux de l'atoll de Clipperton. Rapport particulier, C.R.S.S.A., Biol. Ecol. 32:1–17.

Pyle, P., and Henderson, P. 1990. On separating female and immature *Oporornis* warblers in fall. Birding 22:222-229.

Stager, K. E. 1964. The birds of Clipperton Island, Eastern Pacific. Condor 66:357–371.

Accepted 24 July 1992

NESTING BIOLOGY OF THE CALIFORNIA BLACK RAIL IN SOUTHWESTERN ARIZONA

RONALD E. FLORES and WILLIAM R. EDDLEMAN, Department of Natural Resources Science, 210B Woodward Hall, University of Rhode Island, Kingston, Rhode Island, 02881 (address reprint requests to first author)

The nesting requirements and reproductive biology of the California Black Rail (*Laterallus jamaicensis coturniculus*) are poorly known. The main reasons for this are that Black Rails inhabit dense marshes and their small size and secretive nature have made them difficult birds to study (Todd 1977). Additionally, inland breeding populations are sparsely distributed, relatively inaccessible, and declining (Snider 1969, Rosenberg et al. 1991, Evens et al. 1991). As a result, California and Arizona list the California Black Rail as threatened and endangered, respectively (California Department of Fish and Game 1988, Arizona Game and Fish Department 1988). Information on reproduction is essential to management and protection of this threatened subspecies.

Most of the information on nesting by California Black Rails is from clutches of eggs collected in the late 1800s and early 1900s in coastal habitat (Bent 1926). Egg dates for 29 nests range from 12 March to 23 May. The average clutch size for 31 egg sets in museum collections is 6.1 ± 1.4 (standard deviation), ranging from 3 to 8 (Wilbur 1974). Nests are "deeply cupped and placed on damp ground or elevated in vegetation" (Wilbur 1974). Heaton (1937b) stated that Black Rail chicks hatch one at a time, and both Heaton (1937a) and Huey (1916) concluded that adults readily abandon their nests. Further information on Black Rail nesting habitat, nest success, incubation period, brood survival, renesting and double-clutching potential, and reproductive behavior is lacking. Our study summarizes information obtained from five California Black Rail nests that we monitored along the lower Colorado River 27 km northeast of Yuma, Arizona, and relates this information to the ecology and management of this subspecies.

STUDY AREA AND METHODS

We monitored California Black Rail nests as a part of a general life history study of the species conducted at Mittry Lake Wildlife Management Area, Yuma County, Arizona, from March 1987 to December 1988. We studied Black Rails in 15.5 hectares in the northeast corner of the management area (south Yuma Proving Ground Slough), an old oxbow of the Colorado River. The slough's water level varies by no more than 7 cm annually. The marsh is recharged by a feeder canal from Imperial Dam that releases 10-15 cubic feet per second and seepage from the Gila Gravity Canal of about 3-4 cubic feet per second (Earl Burnett, U.S. Bureau of Reclamation, Yuma Projects Office, pers. comm.). Historically, several wildfires have burned the study area, most recently in November 1979. Most of the emergent vegetation was burned during the last fire but has since grown back (Todd 1980). The area received local scouring and slight flooding in

1983. Most emergent plants recovered in 1984–85, but an open channel still remained along the western edge of the study area.

Southern cattail (*Typha domingensis*) is the dominant emergent, encompassing 65% of the study area, with three-square bulrush (*Scirpus americanus*), California bulrush (*S. californicus*), and inland saltgrass (*Distichlis stricta*) distributed along the shoreline. The marsh is bordered by a desert upland with scattered stands of honey and screwbean mesquites (*Prosopis juliflora* and *P. pubescens*) and sections of arrowweed (*Tessaria sericea*), seepwillow (*Baccharis glutinosa*), and saltcedar (*Tamarix chinensis*) extending into the wetland.

We trapped Black Rails by using a modified version of a drop-door trap used by Zembal and Massey (1983) to catch Light-footed Clapper Rails (*Rallus longirostris levipes*). Traps were placed along drift fences constructed by stapling surveyor's stakes to 1-m-tall lengths of 1.8-cm-mesh black plastic bird netting. Drift fences were placed perpendicular to zones of shallow water where Black Rails vocalized or were known to occur, and the base of the fence was covered with mud or vegetation so that rails could not find their way around the fence. Birds encountering the drift fences were channeled into traps placed along the fencing.

We sexed Black Rails by plumage color (Russell 1966, Eddleman and Flores unpubl. data). Males had uniformly colored dark gray throats and ventral plumage, whereas females had light gray to dull white throats and medium to pale gray ventral plumage.

We glued 2-g radio transmitters (Model SOPB-1038-LD, Wildlife Materials, Inc., Carbondale, IL) to the backs of captured Black Rails with cyanoacrylic glue in combination with eyelash cement (Stenzel 1982). We located the tagged Black Rails from three fixed telemetry stations (two travel trailers and one plywood shed), each equipped with a dual 12-element null-peak Yagi antenna system placed on a mast projecting through the roof. Azimuths were determined from a needle fastened to the mast, which pointed to a compass rose on a table around the mast. Azimuths were taken from each station on three beacon transmitters at the beginning of each tracking session. The average deviation between measured and surveyed azimuths at each station was used to calibrate the compass rose prior to each tracking session. Bird locations were determined by plotting near-simultaneous azimuths obtained from telemetered birds by two assistants at different stations communicating via two-way radios. Tracking was conducted so that each daylight and crepuscular hour of the day was monitored for an equal amount of time during each week. Points where otherwise active birds generated radio signals of steady strength for long periods were where we searched for nests.

We searched for nests by locating incubating telemetered birds with a hand-held antenna, then looking in clumps of vegetation for the nest. In three cases, scolding adults indicated when nests were nearby. Information recorded on nests included location, description, habitat type, clutch size, fate, and hatching date. Incubation shifts were monitored by means of an automatic activity recorder with a Telonics TDP-2 data processor (Telonics, Inc., Mesa, AZ) connected to our telemetry system. The antennas were locked in position pointing in the general direction of the selected bird when

the activity recorder was used. The radio receiver was connected to the data processor, allowing peak signal amplitude and pulse interval to be recorded on a Rustrak strip-chart recorder. Movement of birds resulted in a variable signal amplitude and a wavy line on the chart paper, whereas stationary birds yielded a relatively straight line. All other data on nesting were recorded opportunistically. Data are expressed as means plus or minus standard deviations. Clutch sizes and water depth at nest sites and random sites were compared by means of Mann-Whitney *U* tests (Zar 1984).

RESULTS

We found five nests during nine nest searches, the first Black Rail nests described from Arizona. One pair was found incubating in one nest (both adults had been fitted with transmitters), two nests were located because telemetered males were incubating, one nest was located because a telemetered female was incubating, and one nest was found incidentally. Nests were found on 19 April, 17 June, 9 July, 13 July, and 23 July 1988, with the first suggestion of incubation by a telemetered bird on 30 March 1988. The latter nest was not located, however. Incubation began and hatching occurred at the five nests that were located on 18 April and 5 May, 14 June and 2 July, 25 June and 15 July, an unknown date and 21 July, and unknown date and 23 July, respectively. Clutch size averaged 4.8 ± 1.5, ranging from 3 to 7. While we were handling her, one female laid an egg, which weighed 9 g, or 29% of her body weight.

Nests varied in distance from upland habitat but were consistently placed over shallow water (Table 1). All nests were elevated above the mud substrate in clumps of vegetation (three in California bulrush, one in southern cattail, and one in three-square bulrush) and consisted of a well-defined bowl with a canopy and ramp. Four nests were constructed primarily of southern cattail, one of spikerush (*Eleocharis* sp.) Water depth at nest sites averaged 1.2 ± 1.2 cm and approached being significantly less

Table 1 Characteristics of Five California Black Rail Nests at Mittry Lake Wildlife Management Area and of two Eastern Black Rail Nests

	This study		
Measurement (cm)	Mean ± S.D.[a]	Range	Eastern Black Rails
Inside diameter	7.4 ± 0.6	7–8	8.3[b]
Outside diameter	12.6 ± 1.5	11–15	11.4[b]
Bowl depth	4.4 ± 1.7	3–7	6.4[b]
Height above substrate	6.4 ± 3.4	2–11	2.5[c]
Water depth at nest site	1.2 ± 1.2	0–3	—

[a]S.D., standard deviation.
[b]One nest; E. W. Nelson in Bent (1926).
[c]One nest; Harlow (1913).

than the average water depth at 272 randomly selected sites ($\bar{x}$ = 5.7 ± 7.7 cm; Mann-Whitney *U* test, *U* = 374.0, *P* = 0.07).

The incubation period recorded for three nests was 17 to 20 days, beginning with the first day of incubation as indicated by the activity recorded by the birds' transmitters and ending with the hatching date as confirmed by nest visits. Both sexes incubated the eggs. Two females spent 43.0 to 47.0% of their time during the day incubating, whereas one male spent 47.2% of his time incubating (Table 2). One female exhibited an unusual incubation pattern in that she sat only one or two very long incubation shifts during the daylight hours, whereas the other two sat 7-10 shifts of much shorter duration. No other bird was detected near her nest, so we assumed she had lost her mate or her mate did not assist in incubation. Black Rails aggressively defended three nests by giving scolding vocalizations (Reynard 1974:753), raising their wings, and attempting to charge us.

All clutches hatched successfully, and we found no evidence of partial clutch predation, egg abandonment, or egg infertility. Newly hatched broods were observed in two of the nests; both times the broods and parents left the nest within 24 hours after the clutches hatched completely. One female was recaptured with an egg in her oviduct 18 days after her clutch hatched, suggesting that Black Rails lay second or replacement clutches. One telemetered male seemed to be incubating in April, but we could not find his nest. He was found incubating another nest in July.

DISCUSSION

The timing of Black Rail nesting we observed was similar to that of previous studies (Huey 1916, Wilbur 1974), but extended further into the summer. The shorter nesting season in tidal marshes in California may reflect selection against nesting during the high summer tides of June and July, a selective pressure absent on the lower Colorado River. Alternatively, this apparent difference may be an artifact of the paucity of information on Black Rail nesting.

Nest-site selection by Black Rails at Mittry Lake was strongly influenced by water depth, and Black Rails are known to nest in water shallower than do other species of rails (Fredrickson and Reid 1986). We found no nests over water deeper than 2.5 cm. Nests of California Black Rails in southwestern Arizona resembled Black Rail nests from other locations. The measurements of the nests were similar to those recorded for Eastern Black Rails (*L. j. jamaicensis*) (Table 1), and their construction was typical of rallid nests in having a ramp, canopy, and well-defined nest bowl (Ripley 1977). At Mittry Lake Black Rails typically used dead southern cattail for nesting material, even though other emergents such as California bulrush and three-square bulrush were the dominant species at most nest sites.

The average clutch size of 4.8 ± 1.5 observed at Mittry Lake does not differ significantly from the 6.1 ± 1.4 for 31 California Black Rail clutches in museum collections (Wilbur 1974; Mann-Whitney *U* test, *U* = 56.0, *P* = 0.09) but is less than the 8 ± 1.4 recorded for 21 nests of Eastern Black Rails (Clark 1884, Bent 1926, Stone 1937) ($\bar{x}$ = 8.0 ± 1.4; Mann-Whitney

U test, $U = 23.0$, $P = 0.003$). The smaller clutch size noted in this study may have been an artifact of the late dates on which most nests were found. Three of the five nests were found in July and may have been renesting or second nesting attempts. In other rallids clutch size in later nests tends to be smaller (Fredrickson 1970). We observed that a Black Rail can lay an egg that is almost 30% of her body weight. Therefore, Black Rails may lay clutches weighing almost 200% of their body weight. Although little information exists on the time required to lay a clutch of eggs, one eastern individual laid 6 eggs in 6 to 8 days (Wayne 1905), implying that a tremendous energy demand on female Black Rails during the nesting season. The participation of both sexes in incubation follows the general pattern of rallids (Ripley 1977), although we observed one exception to this pattern with one female (Table 2).

From past accounts by oologists (Huey 1916, Heaton 1937a), we expected that Black Rails would readily abandon their nests, but no nests were abandoned during our study. Perhaps the collection of all or part of the clutch or disturbance of nesting birds early in incubation explains the abandonment of nests found in the past. Some previous reports suggest that Black Rails defend the nest site weakly (Huey 1916, Heaton 1937b). We found that some Black Rails were strongly aggressive in nest defense. Their behavior around the nest closely resembled that of the Galapagos Rail (*Laterallus spilonotus*), which also raises its wings and charges intruders near the nest (Franklin et al. 1979). We did not actively seek nests until our monitoring indicated incubation was well underway (at least 10-14 days), so nest defense may become stronger as incubation advances.

The high nest success was similar to that observed in many temperate rallids (Zimmerman 1977, Bateman 1977). The absence of predation on the nests reflected the lack of predation on Black Rails at Mittry Lake in general. No telemetered birds were lost to predation during the study and we think that this was due to the high density of the vegetation they inhabited.

Table 2 Incubation Patterns of Three California Black Rails at Mittry Lake Wildlife Management Area, April–July 1988[a]

	Sex		
	Male	Female	Female[b]
No. of days observed	3	4	4
No. of recesses per day	7.7 ± 0.5	9.0 ± 0.7	2.8 ± 0.4
No. of incubation shifts per day	7.2 ± 1.9	8.0 ± 0.7	1.8 ± 0.4
Length of shift (minutes)	48.6 ± 44.8	47.5 ± 43.4	256.3 ± 172.6
Percentage of time on nest	47.2 ± 6.8	43.0 ± 2.2	47.0 ± 4.4

[a]Data presented are means ± standard deviations except for number of days observed.
[b]Incubated alone.

The Black Rail broods we observed behaved like those observed by Heaton (1937b), with the parents and brood leaving the nest soon after all the eggs hatched. Chicks remained in the nest until all eggs hatched, but we could not determine exactly how long they stayed between hatching and the time they left with their parents. Adults and the brood remained in the general area of the nest and frequently returned to the nest site to roost for the evening.

MANAGEMENT IMPLICATIONS

The relatively large clutch size, long breeding season, and apparent low predation of California Black Rails in southwestern Arizona suggest this species has a high reproductive potential. The requirement for shallow water at suitable nest sites, however, limits this potential by restricting Black Rails to the shallower parts of marshes. Being placed over shallow water also makes Black Rail nests vulnerable to water-level fluctuations. Ingersoll (1909) reported finding at least 30 Black Rail eggs that had floated out of nests after high tides in a salt marsh near San Diego, California. The weekly and daily fluctuations in water flow on the Colorado River thus preclude Black Rails from nesting in most wetlands connecting to the river. The only sites where Black Rails occur on the lower Colorado River are where water levels are controlled by limiting inflow and/or outflow (such as Mittry Lake) or at seeps (Evens et al. 1991).

Enhancement of existing and potential nesting habitat at inland sites would be possible with structures to maintain or manipulate water levels (Fredrickson and Reid 1986). Potential sites for manipulation of habitat are available on several state and federal wildlife refuges in southern California and along the Colorado River (Eddleman et al. 1988). Acquisition of water rights where needed and inclusion of Black Rails as a management priority are needed before management programs can proceed. Then, improvement of existing water-control structures by maintenance of dikes and addition of reliable pumping capability could provide the tools for management of Black Rail habitat. Water could be added or removed as needed to maintain moist soil or shallow water for Black Rail nesting, with particular attention paid to minimizing water level changes during the March-July nesting period. Additional wetland management areas might be created in existing croplands adjacent to the river or near other water sources.

Additionally, the preservation of hydrologic regimes at existing nesting habitat such as seeps adjacent to canals or in isolated settings such as the Bill Williams River (Rosenberg et al. 1991) is needed to maintain small inland populations of Black Rails, which may be most subject to random extinction (Evens et al. 1991). Practices such as concrete lining of canals presumably disrupt or eliminate the seepage that provides shallow water needed for nesting habitat of Black Rails.

ACKNOWLEDGMENTS

We thank the U.S. Bureau of Reclamation and the Arizona Department of Game and Fish for funding this study. The staff of Imperial National Wildlife Refuge provided housing and the use of a house trailer. We also extend a special thanks to

the U.S. Army Yuma Proving Grounds for providing trailer space and base privileges, and to Cheryl Fought, Lance Vanderzyl, and Valerie Morrell from the environmental department of the Yuma Proving Ground for providing office space and lab facilities. The staff of the University of Wyoming and S. H. Anderson, leader of the Wyoming Cooperative Research Unit, provided logistical support for this study. We also thank the U.S. Fish & Wildlife Service, National Ecology Research Center, Fort Collins, Colorado, for lending us the activity recording system. We especially thank Gary L. Heller, Courtney J. Conway, Barbara A. Groshek, Sarah T. Hooper, and Jennifer L. Plympton for their dedicated field assistance. P. V. August, T. Corman, S. A. Laymon, T. Manolis, G. W. Page, J. Rorabaugh, and L. Z. Ward provided helpful comments that improved the manuscript. This is contribution 2695 of the Rhode Island Agricultural Experiment Station.

LITERATURE CITED

Arizona Game and Fish Department. 1988. Threatened native wildlife in Arizona. Ariz. Game & Fish Dept., 2222 W. Greenway Rd., Phoenix, AZ 85023.

Bateman, H. A., Jr. 1977. King Rail (*Rallus elegans*), in Management of Migratory Shore and Upland Game Birds in North America (G. C. Sanderson, ed.), pp. 93-104. Int. Assoc. Fish and Wildlife Agencies, Washington, D.C.

Bent, A. C. 1926. Life histories of North American marsh birds. U.S. Natl. Mus. Bull. 135.

California Department of Fish and Game. 1988. 1987 annual report on the status of California's state listed threatened and endangered plants and animals. Calif. Dept. Fish and Game, 1416 Ninth St., Sacramento, CA 95864.

Clark, J. N. 1884. Nesting of the Little Black Rail in Connecticut. Auk 1:393-394.

Eddleman, W. R., Knopf, F. L., Meanley, B., Reid, F. A., and Zembal, R. 1988. Conservation of North American rallids. Wilson Bull. 100:458-475.

Evens, J. G., Page, G. W., Laymon, S. A., and Stallcup, R. W. 1991. Distribution, relative abundance and status of the California Black Rail in western North America. Condor 93:952-966.

Franklin, A. B., Clark, D. A., and Clark, D. B. 1979. Ecology and behavior of the Galapagos rail. Wilson Bull. 91:202-221.

Fredrickson, L. H. 1970. Breeding biology of American Coots in Iowa. Wilson Bull. 82:445-457.

Fredrickson, L. H., and Reid, F. A. 1986. Wetland and riparian habitats: A nongame management overview, in Management of Nongame Wildlife in the Midwest: A Developing Art (J. B. Hale, L. B. Best, and R. L. Clawson, eds.), pp. 59-96. N. Cent. Sec. Wildlife Soc., Grand Rapids, MI.

Harlow, R. C. 1913. Nesting of the Black Rail (*Creciscus jamaicensis*) in New Jersey. Auk 30:269.

Heaton, H. L. 1937a. Disproving the rule: The Farallon Rail. Oologist 54:30-31.

Heaton, H. L. 1937b. Baby Farallon Rails. Oologist 54:102-103.

Huey, L. M. 1916. The Farallon Rails of San Diego County. Condor 18:58-62.

Ingersoll, A. M. 1909. The only known breeding ground of *Creciscus coturniculus*. Condor 11:123-127.

Reynard, G. B. 1974. Some vocalizations of the Black, Yellow, and Virginia Rails. Auk 91:747-756.

Ripley, S. D. 1977. Rails of the World. Godine, Boston.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. of Ariz. Press, Tucson.

Russell, S. M. 1966. Status of the Black Rail and Gray-breasted Crake in British Honduras. Condor 68:105-107.

Snider, P. R. 1969. The nesting season. Southwest region. Audubon Field Notes 23:681.

Stenzel, J. R. 1982. Ecology of breeding Yellow Rails at Seney National Wildlife Refuge. M.S. thesis, Ohio State Univ., Columbus.

Stone, W. 1937. Bird Studies at Old Cape May: An Ornithology of Coastal New Jersey, vol. 1. Delaware Valley Ornithol. Club and Acad. Nat. Sci. Philadelphia, Philadelphia.

Todd, R. L. 1977. Black Rail, Little Black Rail, Black Crake, Farallon Rail (*Laterallus jamaicensis*), in Management of Migratory Shore and Upland Game Birds in North America (G. C. Sanderson, ed.), pp. 71-83. Int. Assoc. Fish and Wildlife Agencies, Washington, D.C.

Todd, R. L. 1980. Publication of wildlife management information. Spec. Rept., Arizona Game & Fish Dept. Proj. W-53-R-30. Prog. Narr. Obj. XIII (WP5, J1). 2222 W. Greenway Rd., Phoenix, AZ 85023.

Wayne, A. T. 1905. Breeding of the Little Black Rail (*Porzana jamaicensis*) in South Carolina. Warbler 1:33-35.

Wilbur, S. R. 1974. The literature of the California Black Rail. U.S. Fish and Wildlife Serv. Spec. Sci. Rept.—Wildlife 179.

Zar, J. H. 1984. Biostatistical Analysis, 2nd ed. Prentice-Hall, Englewood Cliffs, NJ.

Zembal, R., and Massey. B. W. 1983. To catch a Clapper Rail—twice. N. Am. Bird Bander 8:144-148.

Zimmerman, J. L. 1977. Virginia Rail (*Rallus limicola*), in Management of Migratory Shore and Upland Game Birds in North America (G. C. Sanderson, ed.), pp. 46-56. Int. Assoc. Fish and Wildlife Agencies, Washington, D.C.

Accepted 19 September 1992

NOTEWORTHY OBSERVATIONS FROM NORTHEASTERN BAJA CALIFORNIA

MICHAEL A. PATTEN, P. O. Box 8561, Riverside, California 92515-8561
KURT RADAMAKER, 945 S. Idaho #132, La Habra, California 90631
THOMAS E. WURSTER, 278 Santa Anita Ct., Sierra Madre, California 91024-2648

Despite increased observer awareness of the Salton Sea and the United States portion of the lower Colorado River, coverage of adjacent areas in extreme northeastern Baja California remains low and our knowledge of the avifauna of that region remains slight. The Mexicali Valley contains a substantial amount of agricultural habitat resembling that found just north of the international border in the Imperial Valley. Because of the habitat similarity, the status of many species in northeastern Baja California should be very similar to that known for the Salton Sea or the lower Colorado River. Here we report on a number of species, in hopes that we may help fill some gaps in knowledge of the Baja California avifauna.

SPECIES ACCOUNTS

White-faced Ibis (*Plegadis chihi*). Wilbur (1987) listed this species as "apparently a rare transient, only a few having been reported in recent years. There are older records from the Río Colorado." On various occasions between April 1987 and January 1992, we observed hundreds (e.g., 300–400 on 29 December 1991) feeding in the agricultural areas near Mexicali. This species is common year round (although numbers are smaller in spring and summer) in the Imperial Valley and around the south end of the Salton Sea (Garrett and Dunn 1981, Patten pers. obs.). It is also an uncommon transient and rare winter visitor along the lower Colorado River (Rosenberg et al. 1991). The White-faced Ibis nested irregularly in the Imperial Valley until 1978 (Ryder 1967, Garrett and Dunn 1981) and was recently found nesting there again at Finney Lake, where "at least 100 pairs" bred in 1991 (Am. Birds 45:1160) and 370 pairs bred in 1992 (William R. Radke, fide G. McCaskie). Thus, the White-faced Ibis may be increasing in this area, and nesting should be watched for in the Mexicali Valley.

Greater White-fronted Goose (*Anser albifrons*). Wilbur (1987) called this species a "rare winter visitor," with "small numbers likely to show up at any wetland location." Twenty observed by Wurster on 14 January 1990 along the Río Colorado just south of Algodones were likely early spring transients, as the species begins to move through the Salton Sea and adjacent areas at this time. Up to 400 have been found along the Río Colorado in January (Saunders and Saunders 1981), further indicating a regular movement through this area. The Saunders' sighting, however, took place in 1964, when the species was more common in the West. The recent maximum in the Imperial Valley is 41 near Westmorland on 26 January 1992 (Patten pers. obs.).

Hooded Merganser (*Lophodytes cucullatus*). We observed two adult males and three females or immatures feeding and swimming in the marsh adjacent to Campo Mosquedo on 29 December 1991; a single female was seen here on 11 January 1992. The white hoods surrounded by a black stripe on the adult males were noticeable at a great distance, as were the warm orange-brown hoods of the others. The three previous records for Baja California are of a female collected by John Xantus at San José del Cabo in February 1860 (U.S. National Museum 31940), one

or more seen by Lyman Belding at La Paz on an unknown date (Belding 1883), and two observed by Rich Stallcup at the mouth of Río San Telmo on 24 January 1982 (Wilbur 1987). Hooded Mergansers are scarce anywhere in Mexico (Sada 1989) but are rare and nearly annual winter visitors to the Salton Sea and the Imperial Valley (Patten unpubl. data), so future records should be expected in the Mexicali Valley.

Black-shouldered Kite (*Elanus caeruleus*). Wurster observed two near Mexicali on 28 February 1987 and single birds near Algodones on 14 January 1989 and 14 January 1990. We observed six individuals between Ciudad Morelos and Victoria on 29 December 1991, including what appeared to be two mated pairs (suitable nesting trees exist around many of the rancherias in the Mexicali Valley). There is also a somewhat doubtful report of two along the Río Hardy in 1905 (Stone and Rhoads 1905). This species was not listed by Wilbur (1987) as occurring away from the Pacific coast in Baja California, although it is rare but regular at the Salton Sea and in the Imperial Valley and probably nested at Brawley in 1975 (Am. Birds 29:1030). The few noted on each of our visits suggest a small population near Mexicali.

Bald Eagle (*Haliaeetus leucocephalus*). Wilbur (1987) noted only two recent records away from Magdalena Bay, so an immature observed along the Río Hardy by Wurster on 14 January 1989 is of interest. S. N. Rhoads, an unreliable observer, reported seeing single birds twice along the upper Río Hardy in February 1905 (Stone and Rhoads 1905). One or two are found at the Salton Sea each winter (Patten unpubl. data), suggesting the species may occur regularly in very small numbers in the Mexicali Valley.

Swainson's Hawk (*Buteo swainsoni*). Wurster observed two at the Laguna Salada on 4 April 1987. Wilbur (1987) listed only two recent records for Baja California, although small numbers probably move through the Mexicali Valley each spring, as they do through the Imperial Valley, where records extend from 4 March (1989, nine near El Centro; Am. Birds 43:536) to 11 June (1983, one near Plaster City; Am. Birds 37:1027). The Laguna Salada sighting fits well within this time frame.

Ferruginous Hawk (*Buteo regalis*). Wilbur (1987) considered this species a winter visitor to the northwestern portion of the peninsula, but neither he nor Grinnell (1928) mentioned any records for northeastern Baja California. On 29 December 1991, we observed four in agricultural fields near the town of Nuevo León. Since this hawk is a rare to uncommon winter visitor in the vicinity of the Salton Sea (Garrett and Dunn 1981), it almost certainly winters regularly in the Mexicali Valley.

Ring-necked Pheasant (*Phasianus colchicus*). Wurster observed one near Algodones on 14 January 1989, we saw two males and three females feeding in a stubble field 20 km southeast of Mexicali on 29 December 1991, and Radamaker observed a male about 15 km southeast of Mexicali on 22 August 1992. In addition, Howell and Pyle (1988) reported observing five or six pheasants on 4 December 1983 a "few miles south of Mexicali on Route 5."

This species is rare in the Imperial Valley (Garrett and Dunn 1981), and Wilbur (1987) stated that it had not been recorded across the border in the northeastern portion of Baja California. Wilbur's statement is inaccurate, however, since Leopold (1959) indicated that pheasant stock from China was introduced into the Mexicali Valley beginning in 1912. By 1922, the Ring-necked Pheasant was established in the Mexicali Valley (Hart et al. 1956). Leopold (1959) estimated a density of 50 pheasants per square mile (about 19/km^2) between the Imperial and Mexicali valleys, although he indicated that there were more birds in the Mexicali Valley where the "habitat is better."

The Mexicali Valley was opened to pheasant hunting in 1929, with a bag limit of two birds and an estimated aggregate kill there of 1000 birds per year by 1948/49 and 1949/50 (Hart et al. 1956). Current Mexican hunting regulations specify a bag

limit of three birds and a seasonal limit of six birds (E. Mellink pers. comm.), implying that the species is quite common in the valley.

Lesser Yellowlegs (*Tringa flavipes*). Wilbur (1987) stated that this species is "apparently an irregular fall transient and winter visitor" with "only five records." On 29 December 1991, we observed at least ten in a flooded field roughly 25 km southeast of Mexicali. Since the Lesser Yellowlegs is an uncommon transient and rare winter visitor to the Imperial Valley and Salton Sea (Garrett and Dunn 1981), it almost certainly occurs in the Mexicali Valley on a regular basis.

Whimbrel (*Numenius phaeopus*). We observed one on 29 December 1991 in a flooded field roughly 25 km southeast of Mexicali. The short bill (compared to a Long-billed Curlew, *Numenius americanus*), the grayer tone of the plumage, and the distinct blackish head stripes identified the Whimbrel. The bird was smaller than a curlew but larger than the nearby Willets (*Catoptrophorus semipalmatus*). This observation is noteworthy because there are only four winter records for the Salton Sea area: one at the south end of the sea on 29 January 1989 (Am. Birds 43:366), three at the south end on 18 December 1990 (Am. Birds 45:999), one at the north end of the sea on 12 January 1991 (Radamaker pers. obs.), and up to two at the south end from 17 December 1991 to 23 February 1992 (Am. Birds 46:315).

Baird's Sandpiper (*Calidris bairdii*). Wilbur (1987) considered this species "apparently a rare transient, [with] five records to date," and it is a rare to uncommon migrant through the Salton Sea (Garrett and Dunn 1981, Patten pers. obs.). Wurster observed four in the Mexicali area on 9 September 1987.

Laughing Gull (*Larus atricilla*). This gull is considered a regular winter visitor, in small numbers, on both coasts of Baja California south of latitude 27° N (Wilbur 1987). Two observed by Wurster along the Río Hardy on 28 February 1991 and an adult observed by Radamaker at Campo Mosquedo on 11 January 1992 are probably the northernmost (both locations are at roughly 32.5° N) for the species in Baja California during this season, although there are over ten winter records for the Salton Sea (Patten unpubl. data). This species was recently discovered breeding in the Colorado delta (Palacios and Mellink 1992) and has been found in winter at Puerto Peñasco, Sonora (Am. Birds 45:1009), so future winter records for northeastern Baja California are likely.

Inca Dove (*Columbina inca*). Wurster observed one on 11 April 1987 at Algodones, and Radamaker saw four 4 km southeast of Mexicali on 22 August 1992. A report of a "few in the upper Hardy River region" by S. N. Rhoads (Stone and Rhoads 1905) is presumably in error (the Inca Dove did not extend west in Arizona to the Colorado River before 1942), so we believe the Algodones record to be the first valid one for Baja California, although Wilbur (1987) called the Inca Dove's addition to the peninsula's avifauna "only a matter of time." Rosenberg et al. (1991) called Inca Doves rare at Yuma, Arizona, stating that "they have not become established" there, so the Algodones sighting was somewhat unexpected. The species is probably resident in northeastern Baja California, since it has been resident in Calexico, California, since the discovery of 25+ there on 4 February 1984 (Am. Birds 38:358).

Yellow-bellied Sapsucker (*Sphyrapicus varius*). We carefully studied an adult male at Campo Mosquedo on 29 December 1991 for 20 minutes as it perched on a eucalyptus about 10 to 12 m above the ground. We watched the bird mostly with the sun to our backs (it was about 1430 we found it). At all angles, and in every light, the throat appeared to be wholly red; that is, we could not see even a trace of white feathering in the chin. Most interesting was the color of the red throat: the upper and lower throat were deep red (the "normal" color shown on these sapsuckers), but the middle section of the throat appeared to be a bit paler and pinker. We are not sure if this was because of feather placement or not. The black border to this red throat was

thick and unbroken and seemed to thicken as it reached the sides of the throat. The lower border of the throat was a wide black crescent across the upper breast. This crescent appeared to be complete (not mottled). The cheek was black, bordered below by a fairly thick whitish mustachial stripe; this stripe bent down along the posterior edge of the border to the throat, where it widened and blended into the sides of the breast. The anterior end of the mustachial stripe ran through the grayish nasal bristles at the base of the culmen. The bill was stout, straight, and wholly black. Wide whitish supercilia flared widely as they crossed the nape, which showed no trace of red. The supercilia were bordered above by black, which completely surrounded a bright red crown; this black border was thicker toward the nape. The back was largely black with golden-buff spangling running in distinct rows down each side and blending into the upper edge of the white rump. The scapulars were black, as were much of the wings. The secondary coverts were mostly white, forming a large patch along the front edge of the folded wing. The tail was mainly black. The underparts were dirty white, with bright yellow on the center of the breast and belly. The flanks were marked with black chevrons and bars.

The bird was still present on 11 January 1992. This species is a rare but regular fall and winter vagrant to southern California (Garrett and Dunn 1981), with several records for the Imperial Valley (Patten unpubl. data) and the lower Colorado River (Devillers 1970, Rosenberg et al. 1991). Even so, this record appears to be only the second for Baja California, following a juvenile observed by Rich Stallcup at the Meling Ranch at the west base of the Sierra San Pedro Mártir on 4 February 1984 (Mexican Birding Assoc. Bull. Board 1(87-3):7, 1987).

Hammond's Flycatcher (*Empidonax hammondii*). Even though this species was considered "apparently a sparse spring migrant" in Baja California by Wilbur (1987), it is a fairly common spring migrant along the Colorado River (Rosenberg et al. 1991) and through interior California (Garrett and Dunn 1981). Wurster observed one on 11 April 1987 at Algodones, and Grinnell (1928) listed two Río Colorado specimens, suggesting that the spring status of the Hammond's Flycatcher in northeastern Baja California is probably similar to that in interior Upper California.

Bendire's Thrasher (*Toxostoma bendirei*). Brian Daniels, Doug Willick, and Wurster observed one on 14 January 1989 at Algodones. The bird was studied for 20 minutes. Compared to the similar Curve-billed Thrasher (*T. curvirostre*), this bird had a straighter, shorter bill and had fine, although faint, spots on the breast. Since there are only three records of Bendire's Thrasher around the Salton Sea (England and Laudenslayer 1989) and the species is "rare and irregular" along the lower Colorado River (Rosenberg et al. 1991), the Algodones record is most interesting. Wilbur (1987) listed only five records for Baja California, none of which were for the extreme northeast. We feel, however, that all of the records listed by Wilbur are highly suspect and likely pertain to either the Gray Thrasher (*T. cinereum*) or the Sage Thrasher (*Oreoscoptes montanus*). Thus, we consider the Algodones record to be the first reliable one for Baja California.

Pine Siskin (*Carduelis pinus*). We observed one in a mesquite along the main road 10 km south of Algodones on 29 December 1991. It was calling (a buzzy, upslurred "jer-EET"). The bird was small and brown, with whitish underparts that were finely streaked with dark brown. The dark brown wings showed yellow stripes at the base of the remiges. This species is considered an occasional winter visitor to the lowlands by Wilbur (1987).

ACKNOWLEDGMENTS

We thank Deborah Davidson, Eric Mellink, and Philip Unitt for improving an early draft of this article. Brian E. Daniels, Guy McCaskie, and Douglas R. Willick provided helpful information regarding birds in northeastern Baja California and in southeastern California.

LITERATURE CITED

Belding, L. 1883. Second catalogue of a collection of birds made near the southern extremity of Lower California. Proc. U. S. Natl. Mus. 6:344–352.

Devillers, P. 1970. Identification and distribution in California of the *Sphyrapicus varius* group of sapsuckers. Calif. Birds 1:47–76.

England, A. S., and Laudenslayer, W. F., Jr. 1989. Distribution and seasonal movements of Bendire's Thrasher in California. W. Birds 20:97–123.

Garrett, K., and Dunn, J. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Grinnell, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32:1–300.

Hart, C. M., Glading, B., and Harper, H. T. 1956. The pheasant in California, in Pheasants in North America (D. L. Allen, ed.), pp. 90–158. Stackpole Co., Harrisburg, PA.

Howell, S. N. G., and Pyle, P. 1988. Additional notes of birds in Baja California. Aves Mexicanas 1(88-1):2–3.

Leopold, A. S. 1959. Wildlife of Mexico: The Game Birds and Mammals. Univ. Calif. Press, Berkeley.

Palacios, E., and Mellink, E. 1992. Breeding bird records from Montague Island, northern Gulf of California. W. Birds 23:41–44.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. Ariz. Press, Tucson.

Ryder, R. A. 1967. Distribution, migration and mortality of the White-faced Ibis (*Plegadis chihi*) in North America. Bird-Banding 38:257–277.

Sada, A. M. 1989. Mexican Birds: Codes for Ease of Observation. Andrés M. Sada, Apartado Postal 1124, Monterrey, Nuevo León 64000, México.

Saunders, G. B., and Saunders, D. C. 1981. Waterfowl and their wintering grounds in Mexico, 1937–64. U. S. Fish and Wildl. Serv., Resources Publ. 138.

Stone, W., and Rhoads, S. N. 1905. On a collection of birds and mammals from the Colorado delta, Lower California. Proc. Acad. Nat. Sci. Philadelphia 57:676–690.

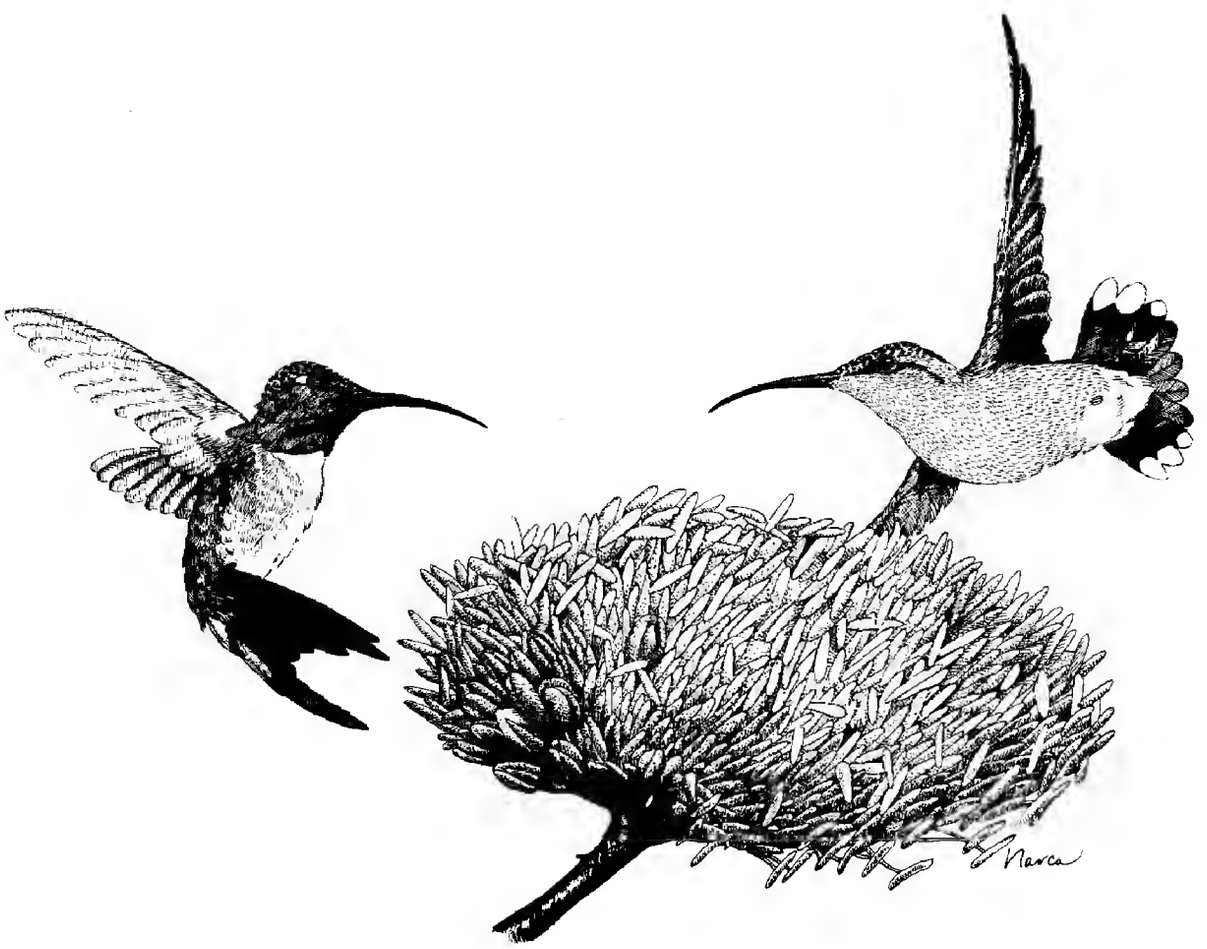
Wilbur, S. R. 1987. Birds of Baja California. Univ. Calif. Press, Berkeley.

Accepted 21 September 1992

Wing Your Way to . . .

Tucson, Arizona

Western Field Ornithologists
Annual Meeting
July 30 – August 1, 1993



Lucifer Hummingbirds *Sketch by Narca Moore-Craig*

NOTES

A LITTLE BUNTING REACHES CALIFORNIA

GUY McCASKIE, 954 Grove Street, Imperial Beach, California 91932

At mid-morning on 21 October 1991 I visited Fort Rosecrans National Cemetery on Point Loma in San Diego, California. While searching for a reported Scarlet Tanager (*Piranga olivacea*), I stopped to look through a small flock of Chipping Sparrows (*Spizella passerina*) feeding in the short grass. I was immediately attracted to a rusty-colored bird with prominent chestnut cheek patches that was about the size of the Chipping Sparrows. The flock was alarmed by my presence and flew up into the trees. As the bird flew I saw white on the outer tail feathers and heard a junco-like "tick" note, and when it landed I saw black streaks on the underparts. I felt the bird was one of the Asiatic buntings, and suspected it was probably a Rustic Bunting (*Emberiza rustica*), but had no books to consult for verification. Realizing I needed confirmation, I rushed to the nearest telephone and told Richard E. Webster of the bird's presence. Webster alerted birders in southern California before leaving his office for the cemetery.

I had relocated the bunting and was observing it from a distance when Webster arrived. After looking at it for a couple of minutes, Webster correctly recalled that the Little Bunting (*Emberiza pusilla*), not the Rustic Bunting, has chestnut cheek patches and that a Rustic Bunting should be noticeably larger than the Chipping Sparrows. We kept the bunting under observation for about half an hour, during which time I noted field marks and Webster took photographs. Once back in my office I contacted Kimball L. Garrett at the Los Angeles County Museum of Natural History and discussed the identification of the bunting with him. Garrett was able to compare winter specimens of a Little and a Rustic Bunting against my description and concluded the bird was most likely a Little Bunting.

When I returned to Fort Rosecrans National Cemetery in the afternoon about thirty observers had the bunting under observation. I then studied it at distances as close as 30 feet with the aid of a Kowa TSN-4 telescope for about 2 hours. That evening Brian E. Daniels, Michael A. Patten, and I compared our field notes with photographs, illustrations, and written accounts in the various books and journals in my library and concluded the bird was indeed a Little Bunting. The following is a summary of my notes on the bird.

The Little Bunting was a little smaller than a Chipping Sparrow. The head and upperparts were rusty brown, with the head being the brightest. The forehead, crown, and nape were dark chestnut brown, with a broad diffused paler chestnut-brown median crown stripe. A broad cinnamon-buff supercilium extended from above the eyes, over the ear coverts, and onto the sides of the nape. The ear coverts were a rich chestnut, with this color extending forward to encompass the lores. A blackish line framed the top, back, and rear portion of the lower edge of the ear coverts, this line broadening at the corners to form prominent dark patches. A fine buffy-white ring encircled each dark eye. The chestnut cheek patches were bordered below by broad pale cinnamon-buff to white stripes, this color extending a short way upward immediately behind the ear coverts. The chin and throat were white, bordered on the sides by thin but well defined blackish malar stripes. The bill was mostly blackish with some pale coloration at the base of the mandible, the culmen was straight or slightly concave, and the gonys angled upward.

The mantle, scapulars, back, rump, and uppertail coverts were dark brown to blackish, with each feather broadly fringed with chestnut brown, making the upper parts look chestnut brown with broad diffused blackish streaks, but with a slight grayish cast that made the upperparts appear less rusty than the head. The wings were the same color as the upperparts, but the greater and median coverts also were tipped with yellowish buff to form two indistinct wing bars, the yellowish buff being more extensive and paler on the median coverts, making the upper wing bar a little broader and paler than the lower. The tertials were blackish, broadly fringed with chestnut, and finely tipped with white. The primaries and secondaries were blackish, finely edged with chestnut, and with a thin line of white at the tip of each feather. The rectrices were blackish, finely edged with chestnut, except that the two central rectrices were mostly chestnut brown and the inner webs of the outermost rectrices were mostly white. The tail was notched.

The underparts were whitish tinged buff, with a pale cinnamon-buff wash across the breast, well defined black streaks across the breast and along the flanks, and with the vent and undertail coverts unmarked. The legs and feet were pale pink.

Although the identification of the Little Bunting is covered in most books on European and Asiatic birds, I found the accounts of Wallace (1980), Harris et al. (1989), and particularly Bradshaw (1991) to be the most useful. All three emphasized markings that separate the Little from the Rustic Bunting, and Wallace and Bradshaw also emphasized markings that separate it from the Common Reed Bunting (*Emberiza schoeniclus*).

Point Loma is heavily birded during the fall, and the weekend of 19 and 20 October was no exception. Flocks of sparrows are always of interest, and the flock of Chipping Sparrows was scrutinized by multiple observers on 20 October and by at least one observer early in the morning on 21 October, with no one seeing the Little Bunting. I therefore believe that the Little Bunting arrived in Fort Rosecrans National Cemetery shortly before being found on 21 October. It could be found with relative ease with the Chipping Sparrows through 24 October, and was seen and photographed by interested birders from throughout the United States. Although many observer hours were expended on 25 October and through the following weekend, and even though the Chipping Sparrow flock was under almost constant observation, there were no substantiated reports of the bunting, indicating it departed during the night of 24-25 October.

A long list of vagrant land-birds has been found on Point Loma during the past thirty years, and a remarkable variety, originating from a variety of directions, were present between 21 and 24 October 1991. The flock of Chipping Sparrows also contained an Indigo Bunting (*Passerina cyanea*) and a Clay-colored Sparrow (*Spizella pallida*). Scarcer vagrants present in Fort Rosecrans National Cemetery during these four days included a Magnolia Warbler (*Dendroica magnolia*), a Blackburnian Warbler (*Dendroica fusca*), a Hooded Warbler (*Wilsonia citrina*), and a Scarlet Tanager, along with more regular occurring Palm Warblers (*Dendroica palmarum*), Blackpoll Warblers (*Dendroica striata*), American Redstarts (*Setophaga ruticilla*), and a Rose-breasted Grosbeak (*Pheucticus ludovicianus*). However, the Little Bunting is the most unexpected vagrant found there to date.

The Little Bunting breeds from northeastern Siberia across northern Asia to northern Finland, and winters from southeast Asia west to northern India and occasionally to continental Europe and north Africa. A recently dead Little Bunting recovered near Rodgers Bay on Wrangel Island off the northeast coast of Siberia on 8 September 1933 (Portenko 1973) was northeast of the species' normal range. In Alaska, Watson et al. (1974) reported one collected on a U.S. Coast Guard icebreaker operating in the Chukchi Sea about 150 nautical miles northwest of Icy Cape on 6 September 1970, Gibson (1981) collected one on Shemya Island at the extreme western end of the Aleutian Islands on 8 September 1977, and M. E. (Peter)

Isleib (Am. Birds 38:235, 1984) saw a "flighty" individual on Attu Island at the extreme western end of the Aleutian Islands on 22 September 1983. The Point Loma bird is the only one yet found in North America outside extreme western Alaska. The record (CBRC 145-1991) was endorsed by the California Bird Records Committee. Eight descriptions and ten color photographs of the bird are archived at the Western Foundation of Vertebrate Zoology in Camarillo, California, and a color photograph of the bird has been published (Am. Birds 46:169, 1992).

LITERATURE CITED

Bradshaw, C. 1991. Identification of Little and Rustic Buntings. Birding World 4:309-313.

Gibson, D. D. 1981. Migrant birds at Shemya Island, Aleutian Islands, Alaska. Condor 83:65-77.

Harris, A., Tucker, L., and Vinicombe, K. 1989. The MacMillan Field Guide to Bird Identification. MacMillan, London.

Portenko, L. A. 1973. Birds of the Chukchi Peninsula and Wrangel Island. Nauka, Leningrad.

Wallace, D. I. M. 1980. Distinguishing Little and Reed Buntings, in Frontiers of Bird Identification (J. T. R. Sharrock, ed.), pp. 236-244. MacMillan Press, London.

Watson, G. E., Angle, J. P., and Browning, M. R. 1974. First North American record of Little Bunting in eastern Chukchi Sea. Auk 91:417.

Accepted 23 September 1992

NORTHEASTERN EXTENSION OF THE BREEDING RANGE OF THE ARCTIC LOON IN NORTHWESTERN ALASKA

HECTOR DOUGLAS, 660 Fuller Rd., Quilcene, Washington 98376
KRISTINE SOWL, P.O. Box 82764, Fairbanks, Alaska 99708

With the publication of the fourth edition of the AOU Check-list (AOU 1931), the Pacific Loon, *Gavia pacifica*, was submerged as a subspecies of the Arctic Loon, *Gavia arctica*. For the next 54 years little attention was given to distinction of the two in the field. In 1985, *G. arctica* and *G. pacifica* were again recognized as separate species with the publication of the sixth edition of the AOU Checklist (AOU 1983). Hence the recent upsurge of interest in *G. arctica*.

During the breeding season *G. a. viridigularis*, the eastern subspecies of the Arctic Loon, ranges in Siberia from the Lena River to the Chukotski Peninsula, north to Wrangel Island (Portenko 1972), and south to the Okhotsk coast and Sakhalin (Dement'ev and Gladkov 1951). Along the Siberian arctic coastal strip from the Chukotski Peninsula west to the Indigirka River *G. arctica* is replaced by *G. pacifica*, which ranges as far west as the mouth of the Yana River (Portenko 1972, Vaurie 1965). Arctic Loons are not known to breed on the Chukotski Peninsula east of Krest and Kolyuchin bays, where Pacific Loons nest commonly; Pacific Loons are replaced by Arctic Loons south and west of the Anadyr River basin. Arctic Loons nest on tundra lakes throughout the Anadyr River basin; Pacific Loons also breed in the lower part of this basin and are probably more common than Arctic Loons on the coast (Portenko 1972, Dement'ev and Gladkov 1951). For nesting, Arctic Loons select various sizes of tundra lakes according to the timing of the thaw, but they prefer large lakes (Portenko 1972). Pacific Loons may nest on ponds, large or small lakes, river banks, and lagoons (Vaurie 1965, Portenko 1972). Portenko (1972) stated "It has still to be ascertained whether the Arctic and Pacific loons build their nests alongside one another in small areas."

At least sixteen specimens of *G. a. viridigularis* have been collected in North America, all from Alaska. The first North American specimen, an alternate-plumaged male, was taken on St. George Island in the Pribilofs on 22 June 1873 (Preble and McAtee 1923). Subsequent alternate-plumaged males were taken at St. Michael on 24 August 1877 (Preble and McAtee 1923), at Nome on 20 August 1905 (Museum of Comparative Zoology, Harvard University), and at Savoonga, St. Lawrence Island, on 8 June 1953 (Bailey 1956). Arctic Loons have been observed several times in recent years near Nome and Wales, Seward Peninsula (Kessel 1989), and at Gambell, St. Lawrence Island (Dunn and Rose 1992). On 4 June 1992, J. L. Dunn (pers. comm.) recorded 28 alternate-plumaged adults flying northeast past Gambell, a record number for Alaska. A male taken on 13 May 1948 in Chatham Strait near Admiralty Island in southeast Alaska represents the only record for Alaska east of the Bering Sea coast (Bailey 1953).

Wales is the only locality where the Arctic Loon has been reported to nest in Alaska. Eleven adults and eight sets of eggs were collected there between 1923 and 1936 (Bailey 1948). An incubating bird was observed at Lopp Lagoon, Wales, on 10 July 1974 (Kessel 1989).

We observed at least three breeding pairs of Arctic Loons at Cape Krusenstern National Monument (67°08' N, 163°40' W), 260 km east-northeast of Wales in northwest Alaska between July and September 1991. Cape Krusenstern defines the northwest corner of Kotzebue Sound. Its 114 beach ridges fringe Krusenstern Lagoon and enclose numerous small brackish lakes and ponds. At Cape Krusenstern, the Arctic Loons were in the brackish lakes. We saw and photographed the first

brood on July 27 (transparencies are on file with the Univ. of Alaska Museum at Fairbanks and identification was corroborated by Dan Gibson). The two downy chicks were one-fourth adult size and capable of diving, suggesting the eggs were laid in early to mid-June. This schedule is typical of coastal waterbirds in northwestern Alaska, where the late availability of habitat necessitates synchronous laying to ensure that young can fly by the end of the short growing season.

The latter two broods consisted of but one chick each. They were first observed during the last week of August and on 7 September, respectively; the last chick was very small and not yet diving and probably hatched from a replacement clutch. *Gavia a. arctica* of northern Europe and northwestern Asia frequently lays replacement clutches (Cramp and Simmons 1977).

We found *G. pacifica* and *G. arctica* within 0.5 km of each other on two separate lakes of 0.14 km^2 each, with their respective broods. The three families of *G. arctica* were found on small lakes covering from 0.04 to 0.14 km^2; adults were also observed foraging in freshwater lakes adjacent to wet sedge meadows, up to 0.8 km inland. Pacific Loons nested on islands in lagoons as well as on small lakes.

We distinguished *G. arctica* from *G. pacifica* by its white flank patches, its white "chinstrap," its greater ratio of white to black in the stripes that adorn the side of the neck, and its uptilted bill. The neck of *G. arctica* appeared slimmer and longer than that of *G. pacifica*. The puffier, silver-white head and neck of *G. pacifica* appeared more rounded in profile, contrasting with the somewhat flat-topped gray head and crown of *G. arctica*. These characters have been discussed by McCaskie et al. (1990). We also noted that in *G. arctica* the dark plumage of the throat patch appeared to extend in a sharp V into the white breast, whereas in *G. pacifica* the line of demarcation seemed more even. The downy chicks of *G. arctica* were dark sooty, those of *G. pacifica*, drab gray-brown. On 17 August both the Arctic and Pacific Loon chicks were molting into their juvenile plumage. The Arctic Loons were acquiring a dark gray plumage on the neck and back that was paler than the down, a white face and neck, and white along the waterline.

The Pacific was the most abundant species of loon at Krusenstern Lagoon in 1991. During late August they congregated in flocks of up to 20 in the lower sloughs and lagoons and ranged far inland. We encountered single alternate-plumaged adults on the upper Kobuk River then. The Red-throated Loon (*G. stellata*) nests on the small lakes that fringe Krusenstern Lagoon. We observed Yellow-billed Loons (*G. adamsii*) throughout the breeding season, including one pair at Tulilik Lake, 2 km north of Krusenstern Lagoon and 2 km inland from the Chukchi coast. R. L. Bunn (pers. comm.) had seen two adult Yellow-billed Loons with two juveniles there on 23 August 1986. We observed the Common Loon near Krusenstern Lagoon infrequently, and did not find evidence of its breeding there.

LITERATURE CITED

American Ornithologists' Union. 1931. Check-list of North American Birds, 4th ed. Am. Ornithol. Union, Lancaster, PA.

American Ornithologists' Union. 1985. Thirty-fifth supplement to the American Ornithologists' Union Check-list of North American Birds. Auk 102:680–686.

Bailey, A. M. 1948. Birds of arctic Alaska. Denver Mus. Nat. Hist. Popular Ser. 8.

Bailey, A. M. 1953. The Green-throated Loon (*Gavia arctica viridigularis*) in southeastern Alaska. Auk 70:200.

Bailey, A. M. 1956. The Bean Goose and other birds from St. Lawrence Island, Alaska. Auk 73:560.

Cramp, S., and Simmons, K. E. L. (eds.). 1977. The Birds of the Western Palearctic, vol. 1. Oxford Univ. Press, Oxford, England.

Dement'ev, G. P., and Gladkov, N. A. (eds.). 1951. Birds of the Soviet Union, vol. 2. English translation, Israel Program for Scientific Translations, Jerusalem, 1969.

Dunn, J. L., and Rose, B. J. 1992. A further note on Arctic Loon identification. Birding 24:106-107.

Kessel, B. 1989. Birds of the Seward Peninsula, Alaska. Univ. of Alaska Press, Fairbanks.

McCaskie, G., Dunn, J. L., Roberts, C., and Sibley, D. A. 1990. Notes on identifying Arctic and Pacific Loons in alternate plumage. Birding 22:70-73.

Portenko, L. A. 1972. Ptitsy Chukotskogo poluostrova i ostrova Vrangelya [Birds of the Chukchi Peninsula and Wrangel Island]. Inst. Zool., Acad. Sci. USSR, Nauka Publ., Leningrad.

Preble, E. A., and McAtee, W. L. 1923. Birds and mammals of the Pribilof Islands, Alaska. N. Am. Fauna 46.

Vaurie, C. 1965. The Birds of the Palearctic Fauna, Non-Passeriformes. H. F. & G. Witherby, London.

Accepted 30 October 1992

VULNERABILITY OF PREY STIMULATES ATTACKS BY JAYS AND SHRIKES ON ADULT BIRDS

CARLA CICERO, Museum of Vertebrate Zoology, 1120 Life Sciences Building, University of California, Berkeley, California 94720

The ability of predators to kill prey depends on the ease of capture and handling, and therefore the issue of prey *vulnerability* becomes paramount. Temple (1987) revealed a direct relationship between the difficulty of prey capture and the proportion of "substandard individuals" in the predator's diet. Ullrich (1971) found that such individuals were more common in the diet when shrikes fed on birds than when they ate mice. Small avian predators such as jays and shrikes tend to ignore *healthy* adult birds under ordinary conditions because of the challenge of capture. However, predatory behavior appears to be stimulated by circumstances that render such birds vulnerable to attack (e.g., Balda 1965). A recent field incident I witnessed, in conjuction with a survey of similar published observations, shed further light on predation by jays and shrikes on adult birds.

On 27 May 1991, I was collecting Plain Titmice (*Parus inornatus*) near the south shore of Shasta Lake, Shasta County, California, as part of a study of geographic variation in this species. I heard a titmouse giving "pee too" calls from approximately 15–20 ft up in a live oak tree near camp (Backbone Ridge, 1200 feet, 3 miles north and 7 miles east of Project City) and shot the bird. It fluttered slightly and soon stopped moving, but remained suspended from a limb by its toes. After 5 minutes of my unsuccessfully trying to knock the bird from the tree, it again began moving. Suddenly, a Scrub Jay (*Aphelocoma coerulescens*) swooped in from a nearby oak and seized the vulnerable titmouse. The jay perched in the oak for approximately 30 seconds, then easily flew off with its prey. The probable mate of the titmouse had been chattering excitedly nearby but became silent when the jay arrived.

Jays commonly rob the nests of other passerine birds, preying on both eggs and young (Dawson 1923, Bent 1946, Ouellet 1970). Adult individuals are more difficult to capture because of their greater size, mobility, and experience, making them less vulnerable to predation by jays. Thus, there are few records of such predation on healthy mature passerines (e.g., Johnson and Johnson 1976, Ehrlich and McLaughlin 1988, Carmen in press). Most reports of jay predation on adult birds involve prey that were injured and unable to escape (Ouellet 1970, Curry 1990), weakened by severe snow conditions (Roth 1971, Carothers et al. 1972), or behaving in a vulnerable manner (e.g., dust bathing, Master 1979). Immature birds that are capable of flight also become susceptible if incapacitated (e.g., Ehrlich and McLaughlin 1988).

Prey vulnerability likewise seems to stimulate predation by shrikes on birds. Johnson (1949) reported a field incident in which a Loggerhead Shrike (*Lanius ludovicianus*) stole a Savannah Sparrow (*Passerculus sandwichensis*) seconds after it was shot and hit the ground, and Stewart (1990) witnessed a shrike seize and impale an immature Grasshopper Sparrow (*Ammodramus savannarum*) immediately after it was hit by a truck. Other instances involve adult birds that were feigning injury (Balda 1965), attending nests (Cade 1967), or vulnerable in an open area (Ingold and Ingold 1987).

The foregoing observations of predation by jays and shrikes on adult birds collectively underscore the probable role of prey *vulnerability* in specific attacks. Harsh weather (e.g., low temperatures, heavy snow, prolonged drought) may increase the vulnerability of such prey and and further stimulate predatory behavior of jays and shrikes (Roth 1971, Carothers et al. 1972, Mays 1988). Because such encounters are circumstantial and random, however, they probably constitute an inconsequential part of the feeding behavior and diet of these opportunistic predators.

NOTES

Discussions with Ned K. Johnson were very fruitful in developing the theme for this note. William Carmen provided information on predatory behavior of Scrub Jays at the Hastings Natural History Reservation, Monterey County, California, and permitted me to cite his unpublished work. I thank Harry Greene, Ned Johnson, Tom Scott, Philip Unitt, and Reuven Yosef for reviewing earlier drafts of this note and providing useful comments. The observation of predation on the titmouse was made while I was conducting field work supported by a dissertation improvement grant from the National Science Foundation (BSR-9001120).

LITERATURE CITED

Balda, R. P. 1965. Loggerhead Shrike kills Mourning Dove. Condor 67:359.

Bent, A. C. 1946. Life histories of North American jays, crows and titmice. U. S. Nat. Mus. Bull. 191.

Cade, T. J. 1967. Ecological and behavioral aspects of predation by the Northern Shrike. Living Bird 6:43-86.

Carmen, W. J. In press. Behavioral ecology of the California Scrub Jay (*Aphelocoma coerulescens californica*): A non-cooperative breeder with close cooperative relatives. Studies Avian Biol.

Carothers, S. W., Sharber, N. J., and Balda, R. P. 1972. Steller's Jays prey on Gray-headed Juncos and a Pygmy Nuthatch during periods of heavy snow. Wilson Bull. 81:204-205.

Curry, R. L. 1990. Florida Scrub Jay kills a mockingbird. Condor 92:256-257.

Dawson, W. L. 1923. The Birds of California, vol. 1. South Moulton Co., San Diego.

Ehrlich, P. R., and McLaughlin, J. F. 1988. Scrub Jay predation on starlings and swallows: Attack and interspecific defense. Condor 90:503-505.

Ingold, J. J., and Ingold, D. A. 1987. Loggerhead Shrike kills and transports a Northern Cardinal. J. Field Ornithol. 58:66-68.

Johnson, K. W., and Johnson, J. E. 1976. An incident of Blue Jay predation on a Yellow-rumped Warbler. Wilson Bull. 88:509.

Johnson, N. K. 1949. Loggerhead Shrike steals shot sparrow. Condor 51:233.

Master, T. L. 1979. An incident of Blue Jay predation on a House Sparrow. Wilson Bull. 91:470.

Mays, L. P. 1988. Loggerhead shrike preys on Horned Lark. Bull. Okla. Ornithol. Soc. 21:7.

Ouellet, H. 1970. Further observations on the food and predatory habits of the Gray Jay. Can. J. Zool. 48:327-330.

Roth, V. D. 1971. Unusual predatory activities of Mexican Jays and Brown-headed Cowbirds under conditions of deep snow in southeastern Arizona. Condor 73:113.

Stewart, M. E. 1990. Impaled Grasshopper Sparrow in Jefferson County, Oklahoma. Bull. Okla. Ornithol. Soc. 23:16.

Temple, S. A. 1987. Do predators always capture substandard individuals disproportionately from prey populations? Ecology 68:669-674.

Ullrich, B. 1971. Untersuchungen zur Ethologie und Ökologie des Rotkopfwürgers (*Lanius senator*) in Südwestdeutschland im Vergleich zu Raubwürgen (*L. excubitor*), Schwarzstirnwüger (*L. minor*) und Neuntötor (*L. collurio*). Vogelwarte 26:1-77.

Accepted 28 September 1992

MOUNTAIN CHICKADEES NEST IN DESERT RIPARIAN FOREST

STEPHEN J. MYERS, 15779 Dalscote St., Hesperia, California 92345

The breeding habitat of the Mountain Chickadee (*Parus gambeli*) throughout its range is coniferous forest at middle to high elevations (Grinnell and Miller 1944, Bent 1946, Behle 1956, Dixon 1961, Laudenslayer and Balda 1976, Garrett and Dunn 1981, Unitt 1984). This species is most typically associated with coniferous forests but can also occur in mixed stands of conifers and hardwoods, including Black Oak (*Quercus kelloggii*), Quaking Aspen (*Populus tremuloides*), and cottonwoods (*Populus* spp.) (Linsdale 1938, Grinnell and Miller 1944). At their lower elevational limit and in the mountain ranges of the Great Basin and eastern Mojave Desert, Mountain Chickadees nest in pinyon–juniper woodland (van Rossem 1936, Linsdale 1938, Johnson 1965, Cardiff and Remsen 1981, Garrett and Dunn 1981). Pinyon Pine (*Pinus monophylla*, *P. edulis*), Utah Juniper (*Juniperus osteosperma*), and White Fir (*Abies concolor*) are the dominant conifers of these ranges.

During the spring of 1987, while conducting field work for the San Bernardino County breeding bird atlas project, I confirmed nesting by Mountain Chickadees in cottonwood–willow riparian forest along the Mojave River, in Victorville, California. Victorville is located at 820 m elevation in the southwestern Mojave Desert, about 25 km north of the San Bernardino Mountains. Breeding was confirmed on 5 June, when an adult was observed feeding two fledglings. The first evidence of nesting at Victorville was during spring of 1984, when an adult was observed carrying food into a cavity in a White Alder (*Alnus rhombifolia*) (McCaskie 1984, S. Cardiff and D. Dittman pers. comm.).

Censuses in subsequent years (1988–1991) have suggested that at least five pairs nest each year along the river in the Victorville area. Four active nest cavities have been observed, two in Fremont Cottonwood (*Populus fremontii*) and two in White Alder.

The area is within a broad floodplain (about 1400 m wide), and contains large tracts of deciduous forest interspersed with open deciduous woodland and meadows. Mountain Chickadees are nesting within closed-canopy forest dominated by Fremont Cottonwood and Red Willow (*Salix laevigata*). Subdominants of the overstory include White Alder and Arizona Ash (*Fraxinus velutina*). Canopy height, as measured by clinometer, averages about 25 m. Along edges and where there are breaks in the canopy, there is a fairly well developed shrub understory consisting primarily of Narrowleaf Willow (*S. exigua*) and California Rose (*Rosa californica*). Herbaceous understory, mainly smartweeds (*Polygonum* spp.), alkali ryegrass (*Elymus triticoides*), and introduced brome grasses (*Bromus* spp.), becomes quite dense in the moister portions of the forest. Occasional patches of standing water support cattail (*Typha latifolia*) and bulrush (*Scirpus acutus*, *S. olneyi*) marsh.

Historically, the region surrounding the Mojave River as it passed through Victorville was sparse Creosote Bush (*Larrea divaricata*) scrub, saltbush (*Atriplex* spp.) scrub, and Joshua Tree (*Yucca brevifolia*) woodland. In recent decades much of this desert habitat has been replaced by urban and suburban development. Although plantings in these developments commonly include stands of pines and other conifers, I have never found Mountain Chickadees associated with even the most extensive of these stands.

The nearest previously known Mountain Chickadee nesting location is between Silverwood Lake and the community of Crestline, in the San Bernardino Mountains nearly 30 km south of Victorville. This area is about 1240 m in elevation, and is located at the edge of extensive mixed coniferous forest.

In reviewing the literature, the only instance I could find of Mountain Chickadees nesting in deciduous woodland or forest was Linsdale's (1938) report of them nesting in cottonwoods in the Toiyabe Mountains of central Nevada. In this case, however, the nesting occurred along streams bisecting coniferous habitats above 1980 m elevation.

Other montane nesting species have occasionally been noted nesting in the coastal lowlands of southern California. For example, Red-breasted Nuthatches (*Sitta canadensis*) have nested on Point Loma, San Diego County (Unitt 1984), and at Malibu, Los Angeles County, (K. Garrett pers. comm.), and Dark-eyed Juncos (*Junco hyemalis*) have nested at La Jolla, San Diego County (McCaskie 1986).

I thank Robert McKernan for encouraging me to prepare this note and for providing many helpful suggestions. Steven Cardiff and Donna Dittman graciously supplied data from their personal field notes. I also thank Chet McGaugh, William Wagner, Scott White, and Kimball Garrett for commenting on drafts of the manuscript.

LITERATURE CITED

American Ornithologists' Union. 1957. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D.C.

Behle, W. H. 1956. A systematic review of the Mountain Chickadee. Condor 58:51–70.

Bent, A. C. 1946. Life histories of North American jays, crows, and titmice. U.S. Natl. Mus. Bull. 191.

Cardiff, S. W., and Remsen, J. V. 1981. Breeding avifaunas of the New York Mountains and Kingston Range: Islands of conifers in the Mojave Desert of California. W. Birds 12:73–86.

Dixon, K. L. 1961. Habitat distribution and niche relationships in North American species of *Parus*, in Vertebrate Speciation (W. F. Blair, ed.), pp. 179–216. Univ. Tex. Press, Austin.

Garrett, K., and Dunn, J. 1981. Birds of Southern California. Los Angeles Audubon Soc., Los Angeles.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Johnson, N. K. 1965. The breeding avifaunas of the Sheep and Spring ranges in southern Nevada. Condor 67:93–124.

Laudenslayer, W. F., and Balda, R. P. 1976. Breeding bird use of a pinyon–juniper–ponderosa pine ecotone. Auk 93:571–586.

Linsdale, J. M. 1938. Environmental responses of vertebrates in the Great Basin. Am. Midland Nat. 19:1–206.

McCaskie, G. 1984. The nesting season. Southern Pacific coast region. Am. Birds 38:1060–1063.

McCaskie, G. 1986. The nesting season. Southern Pacific coast region. Am. Birds 40:1254–1257.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Memoir 13.

Van Rossem, A. J. 1936. Birds of the Charleston Mountains, Nevada. Pac. Coast Avifauna 24.

Accepted 20 September 1992

EURASIAN × AMERICAN WIGEONS IN WESTERN OREGON

KATHY MERRIFIELD, Department of Botany and Plant Pathology, 2082 Cordley Hall, Oregon State University, Corvallis, Oregon 97331-2902

In February and March 1991, while censusing American Wigeons (*Anas americana*) at Alsea Bay in Lincoln County along the coast of central Oregon and at McFadden's Marsh in Finley National Wildlife Refuge, Benton County, in the central Willamette Valley of western Oregon, I observed three Eurasian (*A. penelope*) × American Wigeons. I sketched each hybrid and noted its colors in detail. The birds were too distant for vermiculation, details of mottling, and axillars to be visible.

The first hybrid was at Alsea Bay on 3 and 10 February (Figure 1A). Its forehead and crown were bright cream. The bright iridescent rufous postocular band faded into the noniridescent cream of the cheek. The pinkish brown of the breast extended farther back along the sides than on a typical male Eurasian Wigeon. The back and sides were a homogeneous blend of gray and pinkish brown.

A second hybrid was also at Alsea Bay on 10 February (Figure 1B). Its forehead and crown were off-white. The postocular band was iridescent rufous but less intense than on a typical male Eurasian Wigeon. The cheek was noniridescent grayish brown, possibly resulting from black mottling over a brownish background. The breast was pinkish brown, and the sides were gray in front and back and pinkish brown in the middle.

The third hybrid was at McFadden's Marsh, Finley Refuge, on 13 March (Figure 1C). The forehead, crown, and cheek were light cream, fading to reddish brown toward the nape. The rufous postocular band became gradually darker toward the back. Iridescence was not discernable. The sides were gray above and pinkish brown below, and the back was gray.

In the three hybrids described in detail in the literature (Bailey 1919, Watson 1970, Hubbard 1971, Aubry 1981), the cheeks were lighter than described for Eurasian Wigeons (Kortright 1953, Johnsgard 1978, Madge and Burn 1988), and the postocular band contrasted with the cheek. Watson (1970), however, documented variation in cheek color within the Eurasian Wigeon. In addition, variants among thousands of Eurasian Wigeons observed in England exhibit several cheek colors and degrees of contrast between the postocular band and cheeks (John Kemp pers. comm.). Thus, although light or buffy cheeks and contrast of the postocular band with the cheek apparently occur often in hybrids, they appear to be within the normal range of variation of Eurasian Wigeon plumage. These unusual head patterns, however, may call attention to hybrids.

All three hybrids described in the literature also had some combination of both American (pinkish brown) and Eurasian Wigeon (gray) color on the back and/or sides, either as a blend or as discrete areas of gray and pinkish brown. Like these hybrids, the sides and back of the first hybrid seen at Alsea Bay appeared to be a blend of gray and pinkish brown, and the sides and backs of the other two hybrids I saw had discrete areas of both gray and pinkish brown. The literature contains no suggestion that any combination of American and Eurasian back and side color is within the range of variation of either species (Kortright 1953, Johnsgard 1978, Madge and Burn 1988). Mixed or blended gray and pinkish brown backs and/or sides thus appear to indicate hybrids reliably.

Several Eurasian × American Wigeons have been reported in western North America over the past decade (Mattocks 1985, Campbell et al. 1986, 1988, Force and Mattocks 1986, Weber and Cannings 1990, Yee et al. 1991), and these hybrids may be becoming more frequent (Force and Mattocks 1986, McCaskie 1989). Tweit

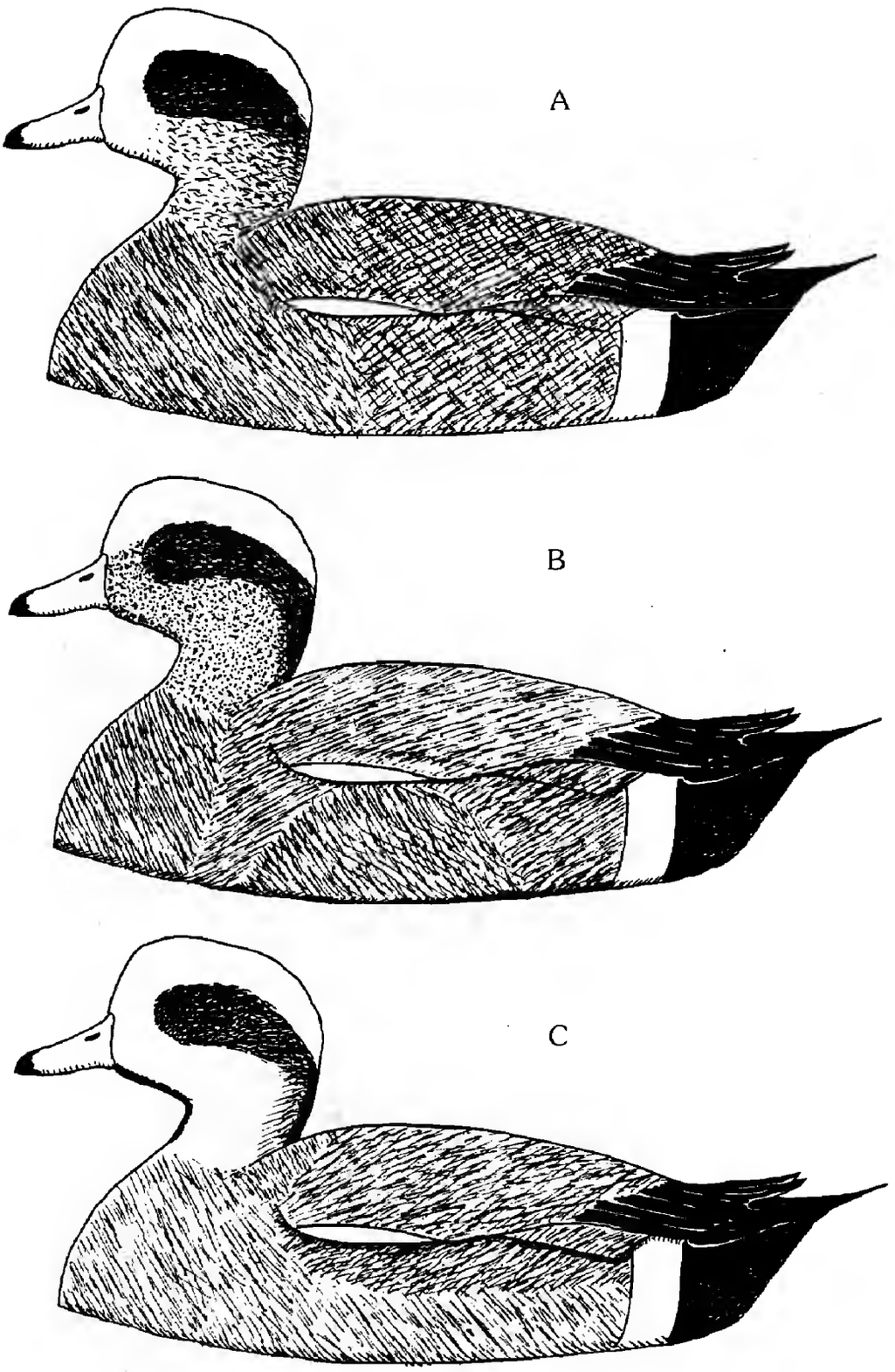


Figure 1. Hybrid wigeons seen in Oregon in 1991. A, Alsea Bay, 3 and 10 February; B, Alsea Bay, 10 February; C, Finley National Wildlife Refuge, 13 March.

and Johnson (1991) suspected that many observers are not checking for hybrids. Few guidelines for discerning hybrids are available, however.

I thank Jean Roch Guigere for references, John Kemp for descriptions of variant Eurasian Wigeons in England, and Range Bayer, Deborah Clark, John Hubbard, Guy McCaskie, Mary Powelson, and Philip Unitt for constructive criticism of earlier drafts of the manuscript.

LITERATURE CITED

Aubry, Y. 1981. Observation d'un hybride probable de *Anas americana* × *Anas penelope* à Lauzon (Québec); printemps 1981. Bull. Ornithol. (Québec) 26:41–42.

Bailey, H. H. 1919. An interesting hybrid of *Mareca penelope* (Widgon) [*sic*] and *Mareca americana* (Baldpate). Wilson Bull. 31:25.

Campbell, K. F., Bailey, S. F., Barron, A. D., and Erickson, R. A. 1986. The autumn migration. Middle Pacific Coast region. Am. Birds 40:329–333.

Campbell, K. F., Erickson, R. A., and Bailey, S. F. 1988. The winter season. Middle Pacific Coast region. Am. Birds 42:314–320.

Force, M. P., and Mattocks, P. W. 1986. The winter season. Northern Pacfiic Coast region. Am. Birds 40:317–321.

Hubbard, J. P. 1971. Comparison of two presumed European × American Widgeon hybrids. Auk 88:666–668.

Johnsgard, P. A. 1978. Ducks, Geese, and Swans of the World. Univ. of Nebr. Press, Lincoln.

Kortright, F. H. 1953. The Ducks, Geese, and Swans of North America. Stackpole, Harrisburg, PA.

Madge, S., and Burn, H. 1988. Waterfowl: An Identification Guide to the Ducks, Geese, and Swans of the World. Houghton Mifflin, Boston.

Mattocks, P. W. 1985. The winter season. Northern Pacific Coast region. Am. Birds 29:201–204.

McCaskie, G. 1989. The winter season. Southern Pacific Coast region. Am. Birds 43:364–369.

Tweit, B., and Johnson, J. 1991. The winter season. Oregon/Washington region. Am. Birds 45:312–315.

Watson, G. E. 1970. A presumed wild hybrid Baldpate × Eurasian Wigeon. Auk 87:353–357.

Weber, W. C., and Cannings, R. J. 1990. The autumn migration. British Columbia and Yukon region. Am. Birds 44:144–149.

Yee, D. G., Bailey, S. F., and Deuel, B. E. 1991. The winter season. Middle Pacific Coast region. Am. Birds 45:315–318.

Accepted 15 December 1992

A MARKHAM'S STORM-PETREL IN THE NORTHEASTERN PACIFIC

PETER PYLE, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

On 27 July 1991 I observed a Markham's Storm-Petrel (*Oceanodroma markhami*) at 29°59'N, 123°43'W, 293 nautical miles west-southwest of San Nicolas Island, California, and 416 nautical miles due west of Punta Baja, Baja California. I made the sighting at 1245 PST, while censusing birds and marine mammals from a research vessel, as part of a California Cooperative Oceanic Fisheries Investigations (CalCOFI) cruise. The wind was light and high clouds were overhead, resulting in excellent observation conditions. From the bridge of the northbound vessel, about 15 meters above the water surface, I watched the storm-petrel fly toward the bow of the ship from the northeast, zigzag back and forth across the path of the ship 3–5 meters in front of the bow, then fly down the west side of the ship. I had excellent views as the bird banked two or three times in front of me. I then went up to the flying bridge where I resumed watching it for 6–8 minutes as it glided back and forth over the wake, at times tending to follow the ship, until I lost sight of it far to the south. I wrote a complete description of the bird an hour after the observation.

The bird was close in size to a Black Storm-Petrel (*O. melania*), being much larger than a Leach's (*O. leucorhoa*) or Ashy (*O. homochroa*) Storm-Petrel. The wings were slightly shorter and broader than a Black's. The tail was quite long, with a deep notch extending about an inch from the tip of the tail. The feet did not extend beyond the tip of the tail. The color of the bird was brown, slightly browner than a dark-phase Leach's Storm-Petrel, and similar to the color of a Brown Noddy (*Anous stolidus*). Large and very prominent pale brown bars on the upper surface of the wings extended from the wrists to the base of the tail. The coloration was otherwise uniformly brown, including the shafts of the primaries, which I closely studied as the bird banked in front of the ship. The bird flew in a very languid, graceful, and looping fashion. Its flight style alternated between short 3– 6-meter glides on stiff wings and three-dimensional forays in the air, up to 2 meters above the water. When looping its flight style resembled that of Leach's Storm-Petrel except that it was noticeably slower and more graceful.

The bird was too big for all other dark storm-petrels except the Black, Matsudaira's (*O. matsudairae*), Tristram's (*O. tristrami*), and the rare dark-phase White-throated (*Nesofregetta fuliginosa*) Storm-Petrels (Harrison 1987). All criteria on the observed bird match those of Markham's while several marks eliminate each of the other species: the White-throated has more rounded wings, feet that extend beyond the tail, and a completely different flight style that includes kicking off of the water; Tristram's has grayer plumage, a paler rump, and a lower, faster flight style; Matsudaira's is blacker with prominent white primary shafts, a shorter tail, and a lower, more erratic flight style (Murphy 1936, Bailey et al. 1968, Harrison 1987, Pratt et al. 1987, pers. obs.).

Markham's and Black Storm-Petrels have been considered difficult to distinguish in the field (Murphy 1936, Harrison 1987); however, recent experience (Brown 1980, L. Spear pers. comm., D. Roberson pers. comm.) suggest that they are readily separated. I saw approximately 70 Black Storm-Petrels during the cruise, all within 20 km of the California coast, including 40 subsequent to my observation of the Markham's. These differed from the Markham's in being blacker and noticeably shorter-tailed, lacking prominent marks on the upper wing, and having a completely different flight style, remaining low to the water, looping up only when upon an item of food, and otherwise flying much more erratically, like a nighthawk, with deep wing beats interspersed with short glides. The different flight style and tail length seem to

be the best features to distinguish the Markham's from the Black Storm-Petrel, while differences in plumage color and prominence of the wing bar, marks that depend on the amount of feather wear, appear to be useful at least during the late summer.

In the area where the Markham's Storm-Petrel was observed (Scripps Institute of Oceanography 1992 for stations 90 120 to 93 120), the sea surface temperature was 18° C, sea surface salinity was about 33.6 parts per thousand, and the temperature–salinity curve was typical of the eastern Pacific transitional zone (Roden 1971, Lynn 1986, A. Mantyla pers. comm.). The frontal boundary between these subtropical waters and the colder and less saline subarctic water mass lay 20–30 nautical miles northeast of the observation locality. The position of this front was typical, and no major anomalous water patterns were noted during the cruise (A. Mantyla pers. comm.).

Markham's Storm-Petrel occurs in the cooler waters of the Peru Current, off western South America, from January to July but is scarce there during the rest of the year (Murphy 1936). From July to September it has been recorded in warm equatorial waters west to 111° W and north as far as 10° N, in the vicinity of Clipperton Island (Loomis 1918, Pitman 1986, L. Spear pers. comm., D. Roberson pers. comm.). My sight record of a Markham's Storm-Petrel, approximately 2500 km to the northwest of Clipperton, could have represented a vagrant that had overshot this normal dispersal pattern. Alternatively, it may indicate that the species occasionally but regularly visits waters of the transitional zone or frontal boundary well off California or Baja California in late summer, in an area poorly covered by ornithologists.

The CalCOFI program is jointly sponsored by the Scripps Institution of Oceanography (SIO), the Southwest Fisheries Center, and the National Oceanographic and Atmospheric Administration (NOAA). I thank George Hemmingway of SIO and the captain and crew of the NOAA ship *David Starr Jordan* for arranging and facilitating my participation. The bird and marine mammal censusing on these cruises is supported by National Science Foundation grant OCE 9019394 to J. A. McGowan and R. R. Veit. I also thank A. Mantyla and S. Gripp of SIO for assistance with the oceanographic analysis and R. G. B. Brown, D. Roberson, L. B. Spear, R. R. Veit, and P. Unitt for information and helpful comments on the manuscript. This is Point Reyes Bird Observatory contribution 540.

LITERATURE CITED

Bailey, R. S., Pocklington, P., and Willis, P. R. 1968. Storm-petrels *Oceanodroma* spp. in the Indian Ocean. Ibis 110:27–34.

Brown, R. G. B. 1980. The field identification of Black and Markham's storm-petrels *Oceanodroma melania* and *O. markhami*. Am. Birds 34:868.

Harrison, P. 1987. Seabirds of the World. A Photographic Guide. Chistopher Helm, London.

Loomis, L. M. 1918. A review of the albatrosses, petrels, and diving petrels. Proc. Cal. Acad. Sci. Ser. 2, part 2, 12:1–187.

Lynn, R. J. 1986. The subarctic and northern subtropical fronts in the eastern North Pacific Ocean in spring. J. Phys. Oceanogr. 16:209–222.

Murphy, R. C. 1936. Oceanic Birds of South America. Am. Mus. Nat. Hist., New York.

Pitman, R. L. 1986. Atlas of seabird distribution and relative abundance in the eastern tropical Pacific. Admin. Rep. LJ-86-02C, Southwest Fisheries Center, P.O. Box 271, La Jolla, CA 92038.

Pratt, D., Bruner, P. L., and Barrett, D. G. 1987. A Field Guide to the Birds of Hawaii and the Tropical Pacific. Princeton Univ. Press, Princeton, NJ.

Roden, G. I. 1971. Aspects of the transition zone in the northeastern Pacific. J. Geophys. Res. 76: 3462–3475.

Scripps Institute of Oceanography. 1992. Physical, chemical and biological data report. CalCOFI cruises 9108 and 9110. SIO Ref. 92-16.

Accepted 21 October 1992

OBSERVATIONS OF DARK-RUMPED PETRELS OFF OREGON AND CALIFORNIA

PETER PYLE, LARRY B. SPEAR, and DAVID G. AINLEY, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

We report two observations of the Dark-rumped Petrel (*Pterodroma phaeopygia*) off Oregon and California. Spear and Ainley made the first observation on 19 October 1986 at 0830 PST, while censusing birds from a southbound research vessel, at 44° 10' N, 130° 34' W, 500 km (270 nautical miles) off Cape Arago, Oregon. They watched the bird from the flying bridge as it flew west for about 45 seconds, as close as 150 meters, in good lighting. Pyle made the second observation on 2 August 1991 from a vessel conducting research as part of the California Cooperative Fisheries Investigations (CalCOFI) program, at 31° 55' N, 124° 11' W, 419 km (226 nautical miles) west-southwest of San Miguel Island, California, or 710 km (383 nautical miles) due west of Ensenada, Baja California. The bird was studied from the stern of the vessel, as close as 15 meters distance, at 0700 PST while the ship was collecting oceanographic data at CalCOFI station 83 110. The bird was attracted to a slick created behind the ship, over which it sallied for several minutes before departing.

Both birds were large long-winged *Pterodroma* petrels. Field marks noted on each included white underparts with bold black borders on the leading edge of the underwing, extending from the wrist to the center of the underwing coverts, dark gray to brownish gray upperparts with, at certain angles of lighting, an indistinct M-pattern across the upperwing coverts, black nape and crown that contrasted with the lighter back and extended below the eye and to the sides of the neck, and a large white patch at the base of the bill. The combination of these features is diagnostic of the Dark-rumped Petrel (Harrison 1987). The most similar Pacific *Pterodroma* petrels, the Juan Fernandez (*P. externa*) and White-winged (*P. leucoptera*), are ruled out by size and structure along with the combination of the bold underpart pattern, indistinct upperpart pattern, and ample amount of white on the forehead. All three observers had had extensive prior field experience with Dark-rumped and similar *Pterodroma* petrels.

Sea surface temperatures and salinities were similar at each observation locality: 16.4°C and 32.7 parts per thousand off Oregon, 16.5°C and 32.9 parts per thousand off California. The low salinities (<33.4 parts per thousand) combined with additional data collected on the CalCOFI cruise (Scripps Institution of Oceanography 1992) indicate that the birds were sighted over subarctic water (Roden 1971, A. Mantyla pers. comm.), in the extensive area where the California Current and central Pacific water masses intermingle (Peláez and McGowan 1986). Regions of this mixing, with temperatures and salinities similar to those where the Dark-rumped Petrels were observed, often extend within 185 km (100 nautical miles) of the North American coast.

The Dark-rumped Petrel, listed as endangered in the United States (Department of the Interior 1990), breeds in the Hawaiian and Galapagos islands (Simons 1985, Cruz and Cruz 1990). Away from the breeding grounds the species occurs primarily in equatorial waters of the eastern tropical Pacific, between 20° N and 10° S (Pitman 1982, 1986), where the pelagic ranges of the Hawaiian and Galapagos populations may overlap. In the central Pacific the species regularly ranges north of the Hawaiian Islands to 25° N in spring (King 1970) and to 50° N in July and August, where several birds have been sighted (Bourne 1965, Bourne and Dixon 1975, Wahl et al. 1989) and three specimens have been taken in drift nets (International North Pacific Fiseries Commission 1992). In the North Pacific the species forages primarily over the Eastern Subarctic Current and Southern Transitional Zone, in waters as cold as 12° C (Wahl et al. 1989, T. Wahl pers. comm., Gould and Piatt in press). These records and our observations suggest that the Dark-rumped Petrel may occur sparsely but regularly in late summer and fall over temperate waters throughout the northeastern Pacific, potentially to within 185 km of the North American coast.

We thank the captains and crews of the National Oceanic and Atmospheric Administration ships *Oceanographer* and *David Starr Jordan* for providing comfortable platforms from which our observations were made. The bird and marine mammal censusing on these cruises was supported by National Science Foundation grant OCE 8515637 and National Geographic Society grant 3321-86 to Ainley and National Science Foundation grant OCE 9019394 to J. A. McGowan and R. R. Veit. We also thank A. Mantyla and S. Gripp of Scripps Institution of Oceanography for assistance with the oceanographic analysis, P. J. Gould for information on specimens from the North Pacific, and C. S. Harrison and P. Unitt for helpful improvements to the manuscript. This is contribution 541 of the Point Reyes Bird Observatory.

LITERATURE CITED

Bourne, W. R. P. 1965. Observations of seabirds. Sea Swallow 17:10–39.

Bourne, W. R. P., and Dixon, T. J. 1975. Observations of seabirds 1967–1969. Sea Swallow 38:7–30.

Cruz, F., and Cruz, J. B. 1990. Breeding, morphology, and growth of the endangered Dark-rumped Petrel. Auk 107:317–326.

Gould, P. J., and Piatt, J. F. In press. Seabirds of the central North Pacific, in The Status, Ecology and Conservation of Marine Birds of the North Pacific (K. Vermeer, K. T. Briggs, K. H. Morgan, and D. Siegel-Causey, eds.). Can. Wildlife Serv. Spec. Publ.

Harrison, P. 1987. Seabirds of the World. A Photographic Guide. Christopher Helm, London.

International North Pacific Fisheries Commission. 1992. Final report of 1991 observations of the Japanese high seas squid driftnet fishery in the North Pacific Ocean. Driftnet Program Coordinator, Alaska Fisheries Science Center, 7600 Sand Point Way NE, Seattle, WA 98115-0070.

King, W. B. 1970. The Trade Wind Zone Oceanographic Pilot Study Part VII: Observations of sea birds March 1964 to June 1965. U.S. Fish and Wildlife Serv. Spec. Sci. Rep. 586.

Peláez, J., and McGowan, J. A. 1986. Phytoplankton pigment patterns in the California Current as determined by satellite. Limnol. Oceanogr. 31:927–950.

Pitman, R. L. 1982. Distribution and foraging habits of Dark-rumped Petrel (*Pterodroma phaeopygia*) in the eastern tropical Pacific. Bull. Pac. Seabird Group 9:72.

Pitman, R. L. 1986. Atlas of seabird distribution and relative abundance in the eastern tropical Pacific. Admin. Rep. LJ-86-02C, Southwest Fisheries Center, P.O. Box 271, La Jolla, CA 92038.

Roden, G. I. 1971. Aspects of the transition zone in the northeastern Pacific. J. Geophys. Res. 76:3462–3475.

Scripps Institute of Oceanography. 1992. Physical, chemical and biological data report. CalCOFI cruises 9108 and 9110. SIO Ref. 92-16.

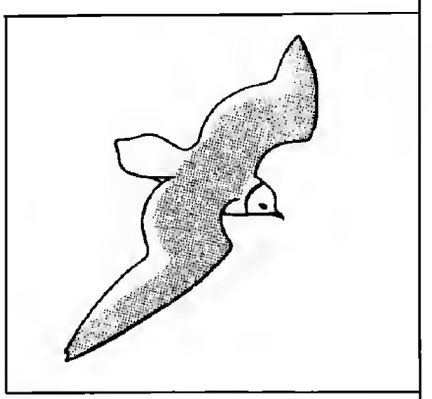
Simons, T. R. 1985. Biology and behavior of the endangered Hawaiian Dark-rumped Petrel. Condor 87:229–245.

Wahl, T. R., Ainley, D. G., Benedict, A. H., and DeGange, A. R. 1989. Associations between seabirds and water-masses in the northern Pacific Ocean in summer. Marine Biol. 103:1–11.

Accepted 21 October 1992

BIMONTHLY JOURNAL ON FIELD ORNITHOLOGY

DUTCH BIRDING



- ☐ Excellent papers on identification, distribution, occurrence, movements and behaviour of Palearctic birds
- ☐ Regular contributions on Asian-Pacific birds
- ☐ Latest news on rare and interesting birds in the Netherlands and the Western Palearctic
- ☐ Well produced with numerous high quality colour photographs
- ☐ Yearly report on rare birds in the Netherlands
- ☐ In English or with extensive English summaries

For information or a free sample issue, write to:
Dutch Birding, Postbus 75611, 1070 AP Amsterdam, Netherlands

Subscribers to Dutch Birding can claim 25% off a British Birds subscription

WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

President: Robert McKernan, 1230 Friar Lane, Redlands, CA 92373

Vice-President: Steve Summers, P.O. Box 202, Silver Lake, OR 97638

Treasurer/Membership Secretary: Dorothy Myers, 6011 Saddletree Lane, Yorba Linda, CA 92686

Recording Secretary: Jean-Marie Spoelman, 4629 Diaz Drive, Fremont, CA 94536

Circulation Manager: William E. Haas, 10601-A Tierrasanta Blvd., Suite 127, San Diego, CA 92124

Directors: Bruce Deuel, Kimball Garrett, Peter Gent, Guy McCaskie, Robert McKernan, Steve Summers, Bill Tweit, Janet Witzeman, David Yee

Editor: Philip Unitt, 3411 Felton Street, San Diego, CA 92104

Associate Editors: Cameron Barrows, Tim Manolis, Thomas W. Keeney

Graphics Manager: Virginia P. Johnson, 4637 Del Mar Ave., San Diego, CA 92107

Photo Editor: Peter La Tourrette, 1019 Loma Prieta Ct., Los Altos, CA 94024

Secretary, California Bird Records Committee: Michael A. Patten, P. 0. Box 8612, Riverside, CA 92515

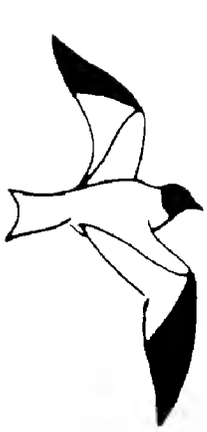
Editorial Board: Robert Andrews, Alan Baldridge, Andrew J. Berger, Laurence C. Binford, R. Wayne Campbell, David F. DeSante, Jon L. Dunn, Richard Erickson, William T. Everett, Kimball L. Garrett, Joseph R. Jehl, Jr., Ned K. Johnson, Virginia P. Johnson, Brina Kessel, Stephen A. Laymon, Paul Lehman, John S. Luther, Guy McCaskie, Joseph Morlan, Harry B. Nehls, Dennis R. Paulson, Gary H. Rosenberg, Oliver K. Scott, Ella Sorensen, Richard W. Stallcup, Charles Trost, Terence R. Wahl, Bruce Webb

Membership dues, for individuals and institutions, including subscription to Western Birds: Patron, $1000; Life, $350; Supporting, $50 annually; Contributing, $30 annually; Family, $22; Regular, U.S., $18 for one year, $35 for two years, $50 for three years; outside U.S., $23 for one year, $45 for two years, $65 for three years. Dues and contributions are tax-deductible to the extent allowed by law.

Send membership dues, changes of address, correspondence regarding missing issues, and orders for back issues and special publications to the Treasurer. Make checks payable to Western Field Ornithologists.

Back issues of *California Birds/Western Birds:* $20 per volume, $5.00 for single issues. Xerox copies of out of print issues (Vol. 1, No. 1; Vol. 2, Nos. 1 and 4; Vol. 6, No. 2): $5.50 each. *Checklist of the Birds of California:* $2.00 each, 10 or more $1.50 each. *Pelagic Birds of Monterey Bay, California:* $2.50 each, 10 or more $2.00 each, 40 or more $1.50 each.
All postpaid.

Published April 15, 1993 ISSN 0045-3897



WESTERN BIRDS

Vol. 24, No. 3, 1993

Volume 24, Number 3, 1993

Fourteenth Report of the California Bird Records Committee *Don Roberson* 113

Seabird Observations Off Western Mexico *Steve N. G. Howell and Steven J. Engel* 167

Screech-Owl Distribution in Wyoming *Sam Fitton* 182

An Arctic Loon in California *Dan L. Reinking and Steve N. G. Howell* 189

NOTES

Breeding of the Black Swift in the Great Basin *Owen A. Knorr* 197

Common Raven Populations in Joshua Tree National Monument, California *Richard J. Camp, Richard L. Knight, and Jerry Fretlich* 198

Nocturnal Foraging by Scissor-tailed Flycatchers Under Artificial Light *Jennifer K. Frey* 200

Bulletin Board 200

Cover photo by © Jack Jeffrey of Hilo, Hawaii: 'Akohekohe (Crested Honeycreeper) *(Palmeria dolei)*, Waikamoi Preserve, Maui, November 1991. In March of 1992, for the first time in 132 years, active nests of this rare and endangered species were located and studied by researchers from San Francisco State University.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Philip Unitt, 3411 Felton Street, San Diego, CA 92104. For matter of style consult the Suggestions to *Contributors to Western Birds* (8 pages available at no cost from the editor) and the *Council of Biology Editors Style Manual* (available for $24 from the Council of Biology Editors, Inc., 9650 Rockville Pike, Bethesda, MD 20814).

Reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

Volume 24, Number 3, 1993

FOURTEENTH REPORT OF THE CALIFORNIA BIRD RECORDS COMMITTEE

DON ROBERSON, 282 Grove Acre Avenue, Pacific Grove, California 93950

Western Field Ornithologists and the California Bird Records Committee (CBRC) are again pleased to thank Bushnell, a division of Bausch & Lomb, for its continued generous support in helping to sponsor the publication of these reports.

This report details 412 records from the California Bird Records Committee's review of older records, of which 276 (67%) were accepted. Both the number of records and the number of contributing observers (268) represent new highs for a Committee report. Our tenth report (Dunn 1988) described our attempt over the past decade to review not only all current reports of rarities in California, but available documentation on all published records of species on our Review List, no matter how long ago the bird occurred. We not only actively solicited written details and photographs from observers, we scoured the literature for additional information and attempted to locate and photograph for Committee files all extant specimens of vagrants to California. These data are now permanently archived. Reported here is our review of 42 specimens, some dating as far back as 1862, and our consideration of other documentation generated from 1935 to 1989.

Some of this report is the routine acceptance of long-cited records, but we have rejected some well-known older records that were wrong or inadequately documented. We also report here two species new to California: Murphy's Petrel (*Pterodroma ultima*) and White-tailed Ptarmigan (*Lagopus leucurus*); an introduced population of the latter has been established within the state. The acceptance of these species, briefly noted in our 13th report (Pyle and McCaskie 1992), brings the state list to 579 species.

For our review of old records, we sought details of all published records. We considered a record "published" if it appeared in the formal ornithological literature, major distributional works on California (e.g., Grinnell and Miller 1944, Yocum and Harris 1975, Cogswell 1977), *American Birds* or

its predecessors *Audubon Field Notes* and *Bird Lore*, or publications of government agencies. We excluded newletters of local bird clubs or Audubon societies. When this project began in the early 1980s, we had reviewed less than half of all published records. With this publication, we have now obtained documentation for 92% of all published records. A few remain in circulation (about 75 pre-1988 records).

Some written details from the distant past were excellent, but other were not acceptable under today's standards. In some cases, no original notes survived, and recent recollections, as might be expected, were hazy. These situations largely account for the 33% rejection rate of records considered in this report. Some records were rejected after the observer wrote us and requested that a published record be withdrawn.

One observer, who provided details of an old record in response to our request, stated, "I have always been astounded by the desire of your committee for a description of rare birds rather than a concern about the integrity of those who report them." In contrast, a letter to the editor in *Birding* 23:184, 1991, decried the "focus of [records] committees on judging the *birder* rather than (or in addition to) the *sighting*," contending that this practice is "a social or political game," and calling for "bird records committees [to get] back on track evaluating sight *records*." The evaluation of the documentation supporting a sight record requires Committee members to consider both the the written description and the experience and (occasionally) the credibility of the observer. Records supported by brief but persuasive details from experienced observers may be accepted, especially when the bird was seen at a time and place agreeing with other records of the same species. The committee has rejected some seemingly meticulous descriptions because the described circumstances (e.g., distance to bird, lighting) precluded the view claimed. In other instances it is apparent that the description has been enhanced by reference to the literature. For example, many Committee members are leery of descriptions that state a bird was, say, "6 to 6½ inches long," especially when a field guide gives the same range. Experienced observers estimate a bird's size in comparison to some common species (e.g., "it was about the size of a House Sparrow, but looked heavier"), and the way a report is written sometimes permits an evaluation of experience even though members may not personally know the observer.

Many descriptions came from the observer's field notes and were not written with a records committee review process in mind. Indeed, many of the records accepted in this report were of birds seen before the formation of this committee in 1970. Some were written from memory, sometimes supported by the briefest of jottings in the field. Each was considered separately on its merits. Some observers provided us with photographs many years old; Richard Genelly provided photos of specimens he took in 1935!

We list in an appendix all published records (through March 1990) for which we were unable to obtain documentation. Some records were supported by field notes describing the circumstances of the observation, but the written material did not include an actual description of the bird. In other cases documentation was provided to *American Birds*' regional

editors or other authorities, and reviewed positively by them, but the written details have since been lost. To suggest that these identifications, along with those of apparently missing or destroyed specimens, were likely correct, we set them apart in lists A and B of the Appendix. But even this gesture implies a conundrum, as certain other records were circulated upon a shred of a description and were rejected for inadequate details. The list of species we review was published by Roberson (1986) and updated by Langham (1991) and Pyle and McCaskie (1992). In general, the Review List comprises those species currently averaging less than four records a year and totalling less than 100 records for the state.

Format: Records are generally listed chronologically according to the first known date of occurrence, although in some circumstances another arrangement is more convenient. Species preceded by an asterisk are no longer on the Review List. Following the species name is a number in parentheses representing the total number of accepted records for California, including those in this report. For species no longer on our Review List, this number reflects only the records accepted during the years the species was reviewed. Double asterisks indicate that the total includes certain older "statistically accepted" records that were not formally reviewed (see Roberson 1986). As this report of older records essentially fills in the chronological list, the figure representing the total number of acceptable California records should be more accurate than in any previous CBRC report.

The concept of a "record" can be troubling, as some birds migrate solitarily but others migrate in pairs, family groups, or flocks. The Committee considers each individual a distinct "statistical" record unless it seems likely it was part of a pair, family, group, or flock. In these situations the assemblage represents but a single statistical record. For example, three Connecticut Warblers in a single grove of cypresses on Pt. Reyes would be considered to represent three records, as individuals of this species presumably migrate separately. In contrast, a family of three Emperor Geese at nearby Drakes Bay would represent but a single record, as they presumably arrived as a cohesive group. Pelagic birds offshore are usually considered separate statistical records. An offshore birder might encounter 40 Cook's Petrels and send in a single description of them, and the Committee might consider this documentation under a single record number. In compiling the number of Cook's Petrels recorded in the state, however, we would consider such an occurrence to represent 40 different statistical records, since each bird is likely to have traveled individually. These decisions (made by majority vote) account for the divergence between the total of record numbers and the "statistical" compilation of records of the species in California.

When individual birds return to a location after a lengthy seasonal absence, each occurrence is evaluated separately under a different record number. Committee members vote on whether they believe the same birds are involved. If a majority considers the birds undoubtedly or probably the same as ones occurring previously, for the statistical count they are

considered the same, whereas those considered only possibly the same are considered to be new individuals, increasing the total count.

Each record includes the locality, a standard county abbreviation (see below), and a full date span. In most cases, the date span is incorporated from the seasonal reports published in *American Birds* (hereafter *AB*) and its predecessors. We did not always list the full date span in our earliest reports, so we correct those here. If we have information that the *AB* date span is incorrect, the applicable date is italicized, indicating the correction. Enclosed in parentheses following the date are the initials of the reporting observer(s), listed alphabetically by last name, and followed by our CBRC record number. If the observer(s) who initially found and/or identified the bird is known, and those persons submitted documentation, their initials are listed first and are separated from the other observers' initials by a semicolon. If the contributor supplied a photograph, a dagger follows the initials. Records supported by specimens are followed by the acronym for the institution in which the specimen is housed and the specimen number, if available. The Committee reviewed specimens by circulating one or more photographs of the specimen, along with the label data, and often measurements.

Abbreviations: Ft., Fort; I., Island; nm, nautical miles; NM, National Monument; NP, National Park, NRA, National Recreation Area; NS, National Seashore; NWR, National Wildlife Refuge; Pt., Point; R., River; SB, State Beach; SR, State Reserve; SWA, State Wildlife Area.

The Committee uses standard county abbreviations: Alameda, ALA; Alpine, ALP; Amador, AMA; Butte, BUT; Calaveras, CLV; Colusa, COL; Contra Costa, CC; Del Norte, DN; El Dorado, ED; Fresno, FRE; Glenn, GLE; Humboldt, HUM; Imperial, IMP; Inyo, INY; Kern, KER; Kings, KIN; Lake, LAK; Lassen, LAS; Los Angeles, LA; Madera, MAD; Marin, MRN; Mariposa, MRP; Mendocino, MEN; Merced, MER; Modoc, MOD; Mono, MNO; Monterey, MTY; Napa, NAP; Nevada, NEV; Orange, ORA; Placer, PLA; Plumas, PLU; Riverside, RIV; Sacramento, SAC; San Benito, SBT; San Bernardino, SBE; San Diego, SD; Santa Barbara, SBA; San Francisco, SF; San Joaquin, SJ; San Luis Obispo, SLO; San Mateo, SM; Santa Clara, SCL; Santa Cruz, SCZ; Shasta, SHA; Sierra, SIE; Siskiyou, SIS; Solano, SOL; Sonoma, SON; Stanislaus, STA; Sutter, SUT; Tehama, TEH; Trinity, TRI; Tulare, TUL; Tuolumne, TUO; Ventura, VEN; Yolo, YOL; Yuba, YUB.

Acronyms for institutions housing specimens mentioned in this report are CAS, California Academy of Sciences, San Francisco; CM/EHS, Clarke Museum, Eureka High School, Eureka; HSU, Humboldt State Univ., Arcata; MVZ, Museum of Vertebrate Zoology, Univ. of California, Berkeley; PRBO, Point Reyes Bird Observatory, Bolinas; SBCM, San Bernardino County Museum, Redlands; SDNHM, San Diego Natural History Museum, San Diego; SDSU, San Diego State Univ., San Diego; UCD, Univ. of California, Davis (SFS, Sagehen Field Station); UCLA, Univ. of California, Los Angeles; UCSB, Univ. of California, Santa Barbara; USNM, United States National Museum, Washington, D.C.

RECORDS ACCEPTED

YELLOW-BILLED LOON *Gavia adamsii* (47). One on Tomales Bay, off Pierce Pt., MRN, 1 Jan 1968 was only the second for California (RS; 93-1987). One was at Moss Landing harbor, MTY, 26 Jan 1971 (RS; 66-1988). An immature was at the Berkeley fishing pier, ALA, 26 Jan 1973 (CBM; 191-1986). Single immatures were in the Monterey harbor, MTY, 3 Jan 1976 (TAC; 172-1987) and 28 Apr 1976 (RS; 94-1987). One was at the Marshall boatworks, MRN, 18 Dec 1982 (RJB, ARK, CSw; 99-1986). One, probably an immature, was in Drakes Estero, Pt. Reyes NS, MRN, 13 Apr 1983 (CH; 212-1986).

One at Monterey, MTY, 26 Jan–4 May 1972 (AB, GMcC; 7-1972/140-1985) was accepted in our first report as present only 11–12 March 1972 (Winter 1973). Additional details (circulated under 140-1985) indicated that a bird was present since January; the Committee agreed that only one bird was involved and adopted the date span published by Remsen and Binford (1975). We follow Harris (1991) in expanding the dates of one at King Salmon, HUM (242-1986; Bevier 1990) to *26* Aug–3 Oct 1982.

The four pre-1974 records were reviewed and accepted by Remsen and Binford (1975) in their summary of western United States records. Birds having light fringes or bars on the brownish back are immature, which retain juvenal plumage until late winter (see Godfrey 1962). Binford and Remsen (1974) remains the standard reference on the identification of this species.

LEAST GREBE *Tachybaptus dominicus* (2). Up to nine birds (5 adults and 4 downy young) were on a seepage pond (now known as West Pond) near Imperial Dam, IMP, 18–23 Oct 1946 (125-1988), and an adult male and a chick were collected on 23 Oct (USNM 393392 and 393393; McMurry and Monson 1947). As the species typically hatches four to six eggs (James 1962), all four young may have been produced by the same pair, but the presence of additional adults suggests that several pairs may have nested. This was the first record for California, the first evidence of breeding in the United States on the Pacific drainage, and it remains the only accepted report from the California side of the Colorado River valley, although there is an insufficiently documented report from 1948 (see Records Not Accepted) and an unsubmitted report from 1955 (West Pond; Rosenberg et al. 1991). These reports, along with one from nearby Mittry Lake, Arizona, in 1951 (Monson and Phillips 1981) suggest that a small population persisted prior to the extensive clearing of riparian habitat along the Colorado River in the 1950s (Rosenberg et al. 1991). Details of California reports from the 1950s or earlier, if they exist, would be welcome.

McMurry and Monson (1947) reported the specimens to be of the west Mexican race *bangsi*, but Alexander Wetmore labeled them *T. d. brachypterus*.

MOTTLED PETREL *Pterodroma inexpectata* (20). One found dead on San Simeon SB, SLO, 13 Mar 1976 was prepared as a skeleton (DGA; uncatalogued specimen at PRBO; 235-1987). A male in wing molt was found freshly dead 11 Aug 1976 two miles south of the Mad River mouth, HUM (HSU 3747; 306-1986). Both records, including a photo of the head of the San Simeon bird, were published by Ainley and Manolis (1979). Both Mottled Petrels were discovered during censuses of beached dead birds sponsored by PRBO. Ainley and Manolis (1979) opined that this species' occurrences off California might be related to periods of abundance of the Northern Fulmar (*Fulmarus glacialis*), but recent work well offshore suggests that the Mottled Petrel may simply be regular in migration during November and December and again in March and April. The Humboldt specimen remains our only record for the northern summer, when a substantial portion of the population is in the Gulf of Alaska.

*MURPHY'S PETREL *Pterodroma ultima* (102). One was seen at 40°24' N, 124°35' W, about 20 nm W of Cape Mendocino, HUM, 10 Apr 1986; two were present 11 Apr 1986 at 34°45' N, 121°37' W, about 50 nm W of Purisima Pt., SBA, and another was present that day at 34°31' N, 121°29' W, about 40 nm W of Pt. Arguello, SBA (TRW; 100-1989). Some 98 were counted from the M. V. "Blitzen" offshore central California, from 25 to 95 nm beyond the nearest point of land, 29–30 Apr 1989 (SFB†, PP, DGY; 65-1989), one of which was collected at 37°19' N, 124°35' W, about 80 nm SW of SE Farallon I., SF (CAS 84182). Of these, 71 were seen on 29 Apr from 70 to 90 nm offshore (124°15' W to 125°05' W) on an arc from SW of the Farallones to a point about 65 nm SW of Pt. Arena, MEN, and another 27 were observed on 30 Apr as the boat returned along a line roughly 80 to 25 nm west of the Farallones. All birds were over deep waters beyond the continental shelf, from 1300 to 2250 fathoms deep. This trip was summarized by Bailey et al. (1989), who also published color photographs of three of the birds and of the specimen.

Within the past five years it has become clear that Murphy's Petrel is a regular component of the spring/summer avifauna over deep water off California. The species never appeared on our Review List, so no unreviewed records appear in the Appendix, although other reports accumulated around the time of the records above. Some records remain under review. Murphy's Petrel has now been found in the eastern North Pacific from at least early April to late September, with the highest concentrations from April to June.

*COOK'S PETREL *Pterodroma cookii* (110). One was seen at 36°04' N, 124°06' W, about 105 nm west of Pt. Sur, MTY, 7 Oct 1979 (GLF, RLP; 88-1985). Another was 120 nm WSW of San Diego, SD, 16 Aug 1980 (FHe; 347-1987). At least 40 were between 140 and 150 nm WSW of San Diego, SD, 16 Aug 1980 (FHe; 348-1987), and another was 120 nm miles SW of Pt. Conception, SBA, 17 Aug 1980 (FHe; 349-1987). One was at about 32°40'N, 122°10' W, about 120 nm miles W of San Miguel I., SBA, 9 May 1987, and another was at about 33° N, 124°10' W, about 190 nm SW of Pt. Conception, SBA, 12 May 1987 (RRV; 189-1987). Two were at about 31° N, 123°45' W, about 200 nm SW of Santa Rosa I., SBA, 8 Sep 1987; others were photographed (4 of 14 seen this date) just outside the 200-mile limit on 13 Sep 1987 (RRV†; 101-1989). At least 25 were between 31° N, 121° W and 30°30'N, 122° W, some 150–200 nm SSW of San Nicolas I., VEN, 11 Aug 1988, with about 20 more between 32°30' N, 123° W and 32° N, 124° W, some 180–200 nm SW of Pt. Conception SBA, 18 Aug 1988, and one more was at about 33°30' N, 123°45' W, about 190 nm WSW of Pt. Arguello, SBA, 22 Aug 1988 (RRV; 98-1989).

The 1979–1980 records were accepted with the disclaimer that Defilippe's (*P. defilippiana*) and Pycroft's (*P. pycrofti*) petrels were eliminated on known range, not on description (see Roberson 1986, Dunn 1988). Since then, Roberson and Bailey (1991) reported characters distinguishing the three taxa in the field. Photos of birds in September 1987 clearly show dark-tipped central rectrices (eliminating *P. defilippiana*) and long wings (which help to eliminate *P. pycrofti*); records since that date have been accepted as *P. cookii*, without the disclaimer. Descriptions of the earlier *P. cookii* lacked detail sufficient to rule out *P. defilippiana* or *P. pycrofti*.

In addition to the Cook's Petrels listed above, the Committee re-evaluated three *Cookilaria* petrels seen 40–50 nm SW of Cape San Martin, MTY, and Pt. Buchon, SLO, 17 Nov 1979 (JLD, RAE, GMcC, DR, ASm, RS; 71-1979; nos. 2, 3, 5) and accepted them as belonging to the *P. cookii/defilippiana/longirostris/pycrofti* set of *Cookilaria* petrels (see Dunn 1988 for a discussion of this species group on our Review List). These had previously been published as not accepted (as Cook's Petrels; Binford 1983), but under new Committee policy are now accepted to the

proper species group (*Cookilaria* with nearly all-white underwings). Distance precluded more specific identification.

The Committee no longer reviews records of *Cookilaria* petrels (species group) or Cook's Petrel (after 1 Jan 1989), but reports of birds identified to other species will be reviewed. The Cook's Petrel has proven to be a regular component of the avifauna from April to November over deep waters of the warm Pacific gyre beyond the strong influence of the colder California current.

STEJNEGER'S PETREL *Pterodroma longirostris* (1). One at about 35°40' N, 122°30' W, some 55 nm SW of Pt.Sur, MTY, 17 Nov 1979 (JLD, RAE, KH, GMcC, DR, ASm, RS; 71-1979). McCaskie and Roberson (1992) reported full details of the occurrence and discussed the species' field identification. Three more Stejneger's Petrels recorded in California waters in November 1990 (one photographed, see *AB* 45: 146, 174) are currently under review. This species may prove to be regular far offshore during autumn migration.

*WILSON'S STORM-PETREL *Oceanites oceanicus* (109). One in a "great raft" of storm-petrels about 25 miles WNW of Pt. Loma, SD, 31 Aug 1935 (LM; 301-1988; specimen collected by Richard Fleming, UCLA 2222; Miller 1936) was the second recorded in the state. Another was between San Diego, SD, and San Clemente I., LA, 5 Sep 1962 (GMcC; 110-1988). Two were in a flock of 5000 storm-petrels on Monterey Bay, MTY, 4 Oct 1975 (GMcC; 192-1987). One was 6 miles W of Pt. Loma, SD, 3 Sep 1980 (DP; 330-1987). Five were in a storm-petrel raft less than 5 miles W of Pt. Estero, SLO, 22 Sep 1984 (BEDa, CM, BS; 308-1987).

The southern California birds were over fairly shallow inshore waters, often among large rafts of other storm-petrels, as the species occurs on Monterey Bay. Full dates of birds on Monterey Bay, MTY, were not always given in our early reports, so we correct the following here: one there 18 Aug–18 Oct 1972 (15-1973; correcting dates in Winter and McCaskie 1975), up to four present 24 Sep–23 Oct 1977 (99-1977; correcting number listed by Luther 1980), one there 30 Sep–24 Oct 1978 (124-1978; correcting dates in Luther et al. 1983), and up to two present 26 Aug–14 Nov 1982 (116-1982; correcting dates in Morlan 1985).

The Committee reconsidered record 58-1976, rejected in our fifth report (Luther et al. 1983). This bird was seen in the storm-petrel flock on Monterey Bay, MTY, 9 Oct 1976; the Committee unanimously agreed that it was the same bird accepted there 11 Oct 1976. The corrected record should read: one on Monterey Bay, MTY, 9–17 Oct 1976 (JHH, RS; 47-1976/58-1976). This species has been deleted from the Review List, but we continue to review all records through 1989.

RED-TAILED TROPICBIRD *Phaethon rubricauda* (6). An adult was at 33°44' N, 123°03' W, about 130 nm SW of Pt. Arguello, SBA, 8 Oct 1979 (GLF; 233-1987). Another was seen at about 31°30' N, 120°W, some 105 nm SSW of San Nicolas I., VEN, 16 Aug 1980 (FHe; 350-1987). A subadult was photographed at about 30°30' N, 122° W, approximately 200 nm SW of San Nicolas I., VEN, 11 Aug 1988 (RRV†; Figure 1; 99-1989), possibly slightly beyond our offshore limit. The Red-tailed Tropicbird may prove to be regular over the warm waters well beyond the continental shelf in the southwesternmost corner of our area of coverage, where the U.S. Fisheries Conservation Zone (our 200-nm limit) dips well south. This offshore area is west of northern Baja California but under international law is within U.S. jurisdiction, as the nearest points of land are San Nicolas and San Clemente islands. The Red-tailed Tropicbird is regular just south of this zone (Pitman 1986) and may disperse northward during years such as 1979, when warm water invades areas normally influenced by the colder California current.

R. L. Pitman and G. Friedrichsen saw another adult Red-tailed Tropicbird on 7 Oct 1979, about 147 nm SW of Pt. Sur, MTY, but did not describe it in their field notes (see Appendix, List B).

BLUE-FOOTED BOOBY *Sula nebouxii* (68**). An immature found grounded in a yard in San Gabriel, LA, 15 Oct 1974 (RC†, GSS; 65-1992) was captured and later appeared on the *Tonight Show* with Johnny Carson. A probable adult was seen around Gull I., an islet SW of Santa Cruz I., SBA, 22 June 1976 (RLP; 311-1987). One immature found on New Hogan Reservoir, CLV, 15 Sep 1976, died on 18 Oct (BGE, JML†, GGM†, DR†; 71-1987; CAS 69457; Elliott 1976). One immature was at Salton Sea Beach, IMP, 23 Aug 1977, and another was at the Whitewater R. mouth, north end of the Salton Sea, RIV, 24 Aug 1977, with ten there 4 Sep, nine there 5 Sep, and eleven there 9 Oct 1977 (SFB, GMcC, GSS; 193-1987). One was seen flying past Seal Rocks, San Francisco, SF, 1 Sep 1977 (PJM; 171-1987). One on Lake Havasu, SBE, 14–24 Sep 1977 (JLD; 170-1987) was also seen on the Arizona side of the lake. One was 2 miles W of Camp Pendleton, SD, 16 Mar 1980 (FHa; 328-1987). Two at the Whitewater R. mouth, north end of the Salton Sea, RIV, 12 Sep 1980 increased to four by 20 Sep; thereafter two to four were seen through 23 Oct 1980 (GMcC, BW; 335-1987). One was flying south past Pt. St. George, DN, 16 Jan 1981 (RAE, SSu; 84-1987).

Figure 1. Subadult Red-tailed Tropicbird (99-1989) at about 30°30' N, 122° W, approximately 200 nautical miles southwest of San Nicolas Island, Ventura County, 11 August 1988. Although the location is approximate and may be just beyond the CBRC's 200 nautical mile offshore limit, this is the first photograph of this species in or near California waters.

Photo by Richard R. Veit

The 1977 situation at the Salton Sea was somewhat complicated. The bird at Salton Sea Beach, erroneously published in *AB* 32:256 as a Brown Booby at Salton City and omitted by Garrett and Dunn (1981), is now accepted as a Blue-footed. As boobies at the Salton Sea tend to move north and concentrate at the north end, this bird may well have beeen among those that later appeared there. Also, a bird at the north end on 4 Sep, thought by the observer to be a Brown Booby, was seen too poorly to be identified conclusively.

Blue-footed Boobies occasionally wander north along the coast following their rare incursions to southern California, and the 1977 San Francisco bird might be attributed to this phenomenon. The coastal birds seen in 1976, 1980, and 1981, however, occurred during non-invasion years. The bird seen in 1981 at Pt. St. George represents the northernmost record for the state; only a Sep 1935 specimen from inside Puget Sound, Washington, whose natural occurrence has been questioned by some (Bill Tweit pers. comm.), is more northerly in North America. Coastal and offshore observers should be aware of both the Masked (*S. dactylatra*) and Red-footed (*S. sula*) boobies, and careful notes may be necessary to distinguish pelagic boobies. Both observers of the bird at Pt. St. George described the dusky face, white underparts, and three white dorsal patches (hind neck, lower back, uppertail coverts) characterizing the Blue-footed Booby. Some Red-footed Boobies may look similar, but by the time such birds show three white patches on the upperparts, they show extensive white on the upperwing coverts as well. The Pt. St. George bird had uniformly dark upperwings, ruling out a subadult Red-footed Booby with patchy upperparts.

This species has been on and off our Review List. It was on the original Review List in 1970, and records of 40 birds in 1972 were accepted in our second report (Winter and McCaskie 1975). After the 1972 invasion, the species was deleted from the list. Since then the species has averaged less than four records per year, and during the past five years we have diligently sought out all records from 1972 and later. Prior to 1972 many records for California had accumulated, most during irregular invasions (McCaskie 1970a).

BROWN BOOBY *Sula leucogaster* (45). An immature was collected at Headgate Rock Dam, SBE, on the California side of the Colorado R., 2 miles north of Parker, Arizona, 20 Nov 1957 (SDNHM 30080; 105-1988; Huey 1959). An immature on Ferguson Lake, Colorado River, IMP, 5 Sep 1958–7 Oct 1960 (GM†; GMcC; 96-1992) molted into adult plumage during its 3-year sojourn. It also frequented nearby Martinez Lake, Arizona; a photograph was published in *Audubon* magazine (May–June issue, 1961). An immature at the Whitewater R. mouth, north end of the Salton Sea, RIV, 28 July–13 Aug 1966 (GMcC; 395-1986) was collected on the latter date (SBCM 31470). One immature was diving off Rock Hill, south end of the Salton Sea, IMP, 29 Aug–18 Sep 1971 (GMcC; 137-1986). One was standing by a drainage ditch near the Alamo R., 7 miles E of Calexico, IMP, 15 July 1972 (BBu; 234-1986).

The species appears in southwestern California during irregular invasions, often associated with Blue-footed Boobies. The 1966, 1971, and 1972 records accepted here were during such invasion years. See McCaskie (1970a) for more information on this phenomenon.

From August to November 1977, an immature Brown Booby was on Lake Havasu, SBE (previously accepted; Luther et al. 1983), but the discussion in *AB* 32:240 cites a possible second bird there on 20 Nov 1977. Janet Witzeman has clarified this situation for us. The observers saw one bird near the harbor at Lake Havasu City, Arizona, and later saw on a sandbar in the lake a bird that looked the same. Because they never saw any boobies pass their boat, two birds might have been present.

REDDISH EGRET *Egretta rufescens* (41). An immature at Havasu Landing, Lake Havasu, SBE, 4–9 Sep 1954, collected on the latter date, was the first for California (GM; MVZ 135902; 250-1986; Monson 1958). Records of an immature at Newport Bay, ORA, 16 Nov 1961 to "May" 1962 (GMcC; 146-1986), an adult on San Diego Bay, SD, 5 May–27 June 1962 (GMcC; 147-1986), and an immature there 5 May–27 June 1962 (GMcC; 148-1986) were published by McCaskie (1964). An immature was at Bolsa Chica, ORA, 6–13 Oct 1963 (TAC; 261-1986). An immature was at the New R. mouth, south end of the Salton Sea, IMP, 8 Aug 1964 (GMcC; 149-1986). Two immatures were at Los Peñasquitos Lagoon, SD, 2–16 Sep 1968 (GMcC; 150 & 151-1986), one of which may have moved to nearby San Elijo Lagoon by late September (see Appendix, List B). Two immatures were at the Whitewater R. mouth, north end of the Salton Sea, RIV, 31 Aug–28 Sep 1969 (GMcC; JLD; 152 & 153-1986). Two immatures were on southern San Diego Bay, SD, 11–12 Oct 1969 (GMcC; 154 & 155-1986). Lone immatures were at the San Diego R. mouth, SD, 1 Nov–21 Dec 1969 (GMcC; 156-1986), and on southern San Diego Bay, SD, 26 July–29 Aug 1970 (GMcC; 157-1986). One was at Newport Bay, ORA, 31 July 1970 (GT; 233-1986). One commuted between San Diego Bay and the Tijuana R. mouth, SD, 6 Oct 1973–3 Apr 1974 (GMcC; JLD; 158-1986); by April it was in full breeding dress. One seen 13 Nov 1977–30 June 1978 in the Tijuana R. valley, SD (previously accepted 57-1978; Luther et al. 1983), moved to south San Diego Bay, SD, 16 July 1978, thus extending its dates of occurrence (GMcC; 194-1987). One was at Imperial Dam, IMP, 11 Feb–3 Mar 1979 (JLD, GMcC, KVR†; 104-1988). An immature was at the San Diego R. mouth, SD, 17 July–17 Sep 1981 (JC; GMcC; 201-1988). An adult was at the Tijuana R. mouth, SD, 8 Nov 1986–28 Feb 1987 (GMcC; MAP; 31-1987).

This species has been on and off our Review List. It was on the original Review List in 1970, delisted in 1981, then readmitted to the list in 1984 (Binford 1985). The Committee particularly thanks Guy McCaskie for help in reviewing the bulk of records for the state. He provided details of 32 of the 41 records now accepted by the CBRC. As is apparent from the foregoing records, the species is a scarce visitant to coastal San Diego County (24 accepted records for the 25-year period 1961–1985), with a few records scattered north to Orange County and in the interior at the Salton Sea. Birds farther north are exceptional, the northernmost being at Elkhorn Slough, MTY (Dunn 1988). Unfortunately, 15 published records of this species remain unsubmitted; the Committee welcomes details of the sightings (see Appendix).

YELLOW-CROWNED NIGHT-HERON *Nyctanassa violacea* (13). An adult at Venice, LA, "late June" 1951 (ENH†, KES; Figure 2; 70-1992) represents the first documented record for California. The photograph is previously unpublished.

ROSEATE SPOONBILL *Ajaia ajaja* (4**). One subadult at the New R. mouth, south end of the Salton Sea, IMP, 29 Jan–31 July 1978 (GMcC; 195-1987) was likely a bird lingering from the numbers present in summer 1977. Following this influx, an immature near Castroville, MTY, 1 Jan–13 Feb 1978, provided the northernmost record for the western United States (DES†,FS†; 83-1987). A subadult was at the Alamo R. mouth, south end of the Salton Sea, IMP, 27 July–7 Sep 1980 (GMcC; 368-1987). An immature was at the Wister Unit of the Imperial Wildlife Area, south end of the Salton Sea, IMP, 4–10 Sep 1983 (BBt; 366-1987).

This species has been on and off our Review List. It was on the original Review List, and records (of 7 birds) were accepted in our first and second reports (Winter 1973, Winter and McCaskie 1975). At least 70 birds reached California in 1973, and the species was thereafter deleted from the list. Since the incursion of 28 birds in 1977, however, Roseate Spoonbills have been very scarce in California, possibly owing to declines in northwestern Mexico. We now review all records from 1978 and later; the total records shown in parentheses above are those accepted since 1978.

For more information on earlier records see Roberson (1980) and Garrett and Dunn (1981).

BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis* (8). One was near Calipatria, IMP, 12 June 1951 (WA; 238-1987). This now constitutes the first confirmed record for the state, as the specimen shot in the Imperial Valley in the fall of 1912 (Bryant 1914), long considered the first acceptable record (Grinnell and Miller 1944), cannot be located (see Appendix, List A).

TRUMPETER SWAN *Cygnus buccinator* (15). Three were with a flock of 14 Tundra Swans (*C. columbianus*) seen in flight near the Sutter Buttes, SUT, 30 Dec 1986 (RLR, IJR; 18-1987). Descriptions of birds seen in flight, even in direct comparison with Tundra Swans, have presented difficulties to the Committee (see Langham 1991), and this record was not accepted until the third circulation. These birds were giving a "much louder, lower-pitched, richer, more musical, hollow honk that carried much better than the Tundra Swan calls," and the observers had experience with the range of the Tundra Swan vocalizations.

EMPEROR GOOSE *Chen canagica* (52**). One male shot at Eureka, HUM, 11 Dec 1927 (CM/EHS 538; 315-1986) may be previously unpublished, although it is among the statistical count of records cited by Harris (1991) and could be one of the

Figure 2. Adult Yellow-crowned Night-Heron (70-1992) in Venice, Los Angeles County, in late June 1951. This previously unpublished photograph represents the earliest documentation of this species in the state.

Photo by Ed N. Harrison

three said to have been collected on Humboldt Bay on "6 Dec 1927" (Davis 1940). Two were shot near Gustine, MER, 1 Dec 1935 (specimens at the Gustine Gun Club; 278-1986; Genelly 1955). One shot at Tule Lake, SIS, 10 Nov 1936 (USNM 588105; 127-1988) and a female shot there 29 Nov 1937 (USNM 588106; 128-1988) are previously unpublished. One was shot at Big Lagoon, HUM, 20 Oct 1945 (HSU 40; 314-1986). An adult shot on north Humboldt Bay, HUM, 12 Dec 1951 (HSU 2219; 316-1986) was one of two procured on that date (Yocum and Harris 1975), but the additional specimen is in private hands (S.W. Harris in litt.) and has not been reviewed. One was in the Crescent City harbor, DN, in "Dec" 1968 (JAR†; 279-1986). One at Laguna Beach, ORA, 15 Dec 1968 (JAJ; 10-1989) was among an unusual incursion of this species along the southern California coast in winter 1968–1969. Yet another was shot at Tule Lake, SIS, 15 Nov 1976 (HSU 3789; 317-1986). An immature shot 1/2 mile W of Dorris, SIS, 5 Nov 1983 (specimen at Tule Lake National Wildlife Refuge, Figure 3; 390-1987) is previously unpublished. One was at Tule Lake NWR, SIS, 19–21 Oct 1986 (MFR; 51-1987).

The last, an immature, was the subject of debate and extensive research. Some members were concerned with the possibility of a blue-morph Ross' Goose (*Chen*

Figure 3. Specimen of an immature Emperor Goose (390-1987) shot 1/2 mile west of Dorris, Siskiyou County, 5 November 1983. This previously unpublished specimen is now a life mount on public display at the Tule Lake National Wildlife Refuge visitor's center.

Photo by Don Roberson

rossi), one of which was at the Tule Lake refuge during winter 1986–1987. This Emperor Goose was described as plain blue-gray above and having blue-gray undertail coverts contrasting with a "pure" white tail. Some members pointed out that adult Emperor Geese are scaly above and not all have a "pure" white tail (though it may appear so in the field), while blue-morph Ross' may have extensively white tails. Michael J. Lippsmeyer's research with specimens at the Univ. of California, Davis, including those of blue-morph Ross' and hybrid Ross' × Snow (*C. caerulescens*) geese, addressed these concerns. The juvenal-plumaged Emperor Goose has a plainer plumage than the adult, and it molts into its adult-like first-winter plumage from October to December. The juvenal Ross' Goose does not begin molt until December, and the molt is not completed until April. During their entire first winter, dark-morph Ross' Geese should have white undertail coverts and extensive dark in the tail. The description is consistent with a molting juvenile Emperor Goose.

*TUFTED DUCK *Aythya fulgula* (54). This species has proved difficult to evaluate. Many California records are of birds that returned for successive winters, often wandering within an area rather than remaining at a single locale. One individual returned for nine winters and another returned for seven. With each winter's report the Committee evaluates whether a previously accepted record pertains to the same individual. In addition to publishing the results of our review of a number of old records, this report corrects and augments some of our previous decisions and (in combination with Records Not Accepted, q. v.) clarifies the status of several sets of confusing records.

A female on the Smith R. estuary, DN, 16 Nov 1986 (ADB, GSL; 52-1987) was considered only possibly the same as a female there 5–7 Feb 1988 (ADB; 99-1988). A male seen intermittently at Arcata, HUM, 10 Apr 1968–10 Apr 1969 (previously accepted 234-1984; Dunn 1988) was again observed 16 Apr–17 July 1970 (RHG; 454-1986). A male at Grenada, SIS, 7 Apr 1985, and at Lava Lakes, Yreka, SIS, 2–11 May 1985 (previously accepted 93-1985/294-1986; Dunn 1988) returned to Grenada 11 Mar–12 Apr 1986 (RE†; 391-1987).

Males at the Muddy Hollow pond, Limantour, Pt. Reyes NS, MRN, were difficult to evaluate. The Committee believes the recurrence of two birds most probable. The first male was present for five consecutive winters: 7 Jan–17 Apr 1978 (previously accepted 78-1978; Luther et al. 1983), 23 Nov 1978–10 Mar 1979 (previously accepted 12-1979; Luther et al. 1983), 29 Sep 1979–12 Jan 1980, 3 Oct–27 Dec 1980 (previously accepted 237-1980/44-1981; Binford 1985), and 26 Oct–14 Nov 1981, at nearby Drakes Bay, and then returning to Limantour 5–19 Dec 1981 (KH; 100-1983). The characterization of record 12-1979 by Luther et al. (1983) as representing an "immature male" is erroneous; it is now known that many adult males return to California in eclipse or partial eclipse plumage in the late autumn, when they are often misidentified as younger birds. The second male was at Limantour 9 Nov–2 Dec 1980 (previously accepted 237-1980/44-1981; Luther et al. 1983) and was seen with the first male at nearby Drakes Bay 8 Nov 1981 (KH; 100-1983), before reappearing at Limantour 5 Dec 1981–3 Jan 1982 (GMcC; 137-1988). An immature male at Abbotts Lagoon, Pt. Reyes NS, MRN, 5 Feb–3 Mar 1980 (JGE, DSh; 101-1983) is considered different from any of the individuals above. One additional Abbotts Lagoon report, of a bird returning for 2 or 3 years, remains in circulation.

A male returned to the Richardson Bay/Mill Valley/Tiburon area, MRN, for seven winters and was recorded on the following dates: 20 Dec 1976–6 Feb 1977 (previously accepted 4-1977; Luther 1980), 14 Jan 1979 (RS; 67-1988), 10 Feb–23 Mar 1980 (previously accepted 71-1980; Binford 1985), 12 Dec 1980–13 Feb 1981, and 7 Feb–8 Mar 1982 (previously accepted 46-1982; Morlan 1985). Although the bird was not found in winter 1977–1978, the Committee suggests that only a single bird was returning.

A male at Aquatic Park, Berkeley, ALA, 17 Feb 1980 returned 6–25 Feb 1981 (BJ; JM, JMR; 82-1987). A female was off the Hyde St. Pier, San Francisco, SF, 13 Feb 1984 (DK†; 115-1988). A male was at Coyote Hills Regional Park, ALA, 19 Jan– 12 Feb 1980 (AG†; 81-1987). An adult male was on Belmont Slough, Foster City, SM, 19 Apr 1987 (SEF; 129-1987).

Full dates now available for a male that returned to Quail Lake, LA, and vicinity for probably nine winters, although it was not seen every winter. It was on Quail Lake 4 Dec 1978–26 Feb 1979 (previously accepted 49-1980; Binford 1985) and 10 Nov 1979–8 Jan 1980, moving to Cuddy Valley, KER, 15 Jan 1980 (previously accepted 80-1982; Morlan 1985), and returning to Quail Lake 29 Dec 1983–7 Mar 1984 (previously accepted 73-1984; Roberson 1986), 15 Oct 1985–"winter" 1986, and 19 Nov 1986–5 Mar 1987 (previously accepted 15-1987; Pyle and McCaskie 1992).

A female was at the Imperial County Warm Water Fish Hatchery, near Niland, IMP, 1–3 and 22 Feb 1986 (EAC†; GH, CM, GMcC; 202-1986/199-1986). A female on southern San Diego Bay, SD, 18 Feb 1985 (REW; 51-1985) was the southernmost recorded in western North America.

A number of these records elicited extensive debate about the identification of possible hybrid immature males and females of the Tufted Duck with other *Aythya* species. Some adult male Tufted Duck × scaup hybrids have been identified in California by the gray vermiculation on their black backs (see Dunn 1988), and some concern was expressed about the "brownish black" back described on the Belmont Slough adult, but the backs of some Tufted Ducks may appear brownish black rather than jet black. A full discussion of this problem is beyond the scope of this report, but see Gillham et al. (1966) and Gillham (1987). Most members considered records acceptable if the documentation showed no evidence of hybridization, even if some features of the bird (e.g., exact bill pattern) were not well described. The Committee urges observers to consider this problem and to describe the whole bird (not just the tuft), including the bill pattern and the wing stripe.

The bird at Arcata from 1968 to 1970 was the first recorded in summer in the state. In July and August 1968 it, along with several summering scaups, underwent a complete molt, including a flightless period (Harris and Gerstenberg 1970). It was known to be present 10 Apr–17 May 1968, 28 Jul–4 Nov 1968, 8 Mar and 10 Apr 1969, 16–20 Apr 1970, and 4– 17 Jul 1970 (Harris 1991). We also follow Harris (1991) in expanding the dates of a male at Arcata, HUM (19-1986; Bevier 1990) to *6 Mar*–10 May 1986.

KING EIDER *Somateria spectabilis* (26). A female shot on the Eel R. estuary, HUM, 20 Nov 1940 (specimen at Humboldt County Fairgrounds; 59-1990) and an immature male shot on Humboldt Bay, near Eureka, HUM, 23 Apr 1941 (CM/EHS 961; 313-1986) were discussed by Harris (1991), who corrected previously published dates (e.g., in Yocum and Harris 1975). An immature male at Moss Landing, MTY, mid-Feb to 26 Aug 1961 (GMcC; 94-1986) was considered different from the immature male off Cypress Point 21–26 Mar 1959, which reappeared in the Monterey harbor, MTY, 24–25 June 1959 (Dunn 1988), because the plumage had not changed over the two years. This interpretation (followed by Roberson 1985) differs from that published in *AFN* 16:70, in which but one bird was credited for both records. Another immature male was at Moss Landing, MTY, 18 Dec 1982 (RD†; 112-1988).

ZONE-TAILED HAWK *Buteo albonotatus* (28). An adult male collected 20 miles N of San Diego, SD, 23 Feb 1862 (MVZ 4375; 26-1990) represents the first California record. An immature was collected "near the coast" about 30 miles N of San Diego, 10 Sep 1907 (MVZ 5494; 27-1990; Grinnell 1909). An immature shot at Chula Vista, SD, 10 Oct 1932 (SDNHM 16137; 106-1988) was reported by

Huey (1933) to have been "present for several days" and to have been a female, but the specimen is labeled a male. One was at Ft. Piute, SBE, 17 June 1978 (GMcC; 196-1987). One was seen from Mt. Palomar, SD, 26 Feb–2 Mar 1983 (RH; 359-1987).

The Committee received much additional documentation of birds along the coastal slope of San Diego County and reviewed the situation. The decisions below supersede prior discussions of this topic (Roberson 1986, Dunn 1988). One at Whelan Lake, Oceanside, SD, 13 Jan 1979 (previously accepted 40-1979; Binford 1985) probably returned to the same general vicinity near Vista, SD, including at Guajome Regional Park and along Highway 76 over the next eight years as follows: 1–29 Feb 1980 (FHa; 325-1987), 7 Dec 1982–27 Feb 1983 (previously accepted 5-1983; Roberson 1986), 10 Dec 1983–14 Feb 1984 (previously accepted 135-1983; Roberson 1986), 19 Oct 1984–1 Jan 1985 (previously accepted 279-1984; Dunn 1988), 21–27 Feb 1986, 13–25 Sep 1986 (CW; 35-1987), and 7 Jan–1 Mar 1987 (CW; 108-1988). Although no Zone-tailed Hawk was seen during winter 1980–1981 and 1981–1982, and the dates could suggest the presence of two birds, a plurality of the Committee felt it more likely that one wide-ranging wintering bird accounted for all the sightings. However, one seen at the Highway 76 bridge over the San Luis Rey R., 3 miles N of Vista, SD, 9– 27 June 1984 (CW; 309-1987) was considered more likely a different bird, because of the summer date. Sightings of single individuals some distance away near Lake Poway, SD, 3 Sep 1979 (JWM; 336-1987) and near Fallbrook, SD, 26 Dec 1982–8 Jan 1983 (previously accepted 27-1984; Roberson 1986) are also thought more likely to be of different birds.

Zone-tailed Hawks in the mountains of San Diego County may originate in the Sierra San Pedro Mártir of Baja California. Range expansion is possible, as pairs have nested for successive years on Hot Springs Mountain, SD (Langham 1991), and on Santa Rosa Mountain, RIV (Binford 1983).

*SHARP-TAILED GROUSE *Tympanuchus phasianellus*. "Resident and formerly abundant (up to about 1880) on suitable parts of the northeastern plateau region. Persisted, in lessening numbers, up to about 1915; nothing better than rumors of occurrence since then. Now thought to be extinct within the boundaries of this State" (Grinnell and Miller 1944). The Committee knows of seven specific records (151–157-1985, including superseded 118-1984) from 1855 to 1915. Three are supported by specimens, photos of which we have seen: a male near Ft. Bidwell, MOD, 28 Sep 1877 (USNM 77604; Henshaw 1880), and two males at Ft. Crook, now Dana, SHA, 17 Apr, exact year not recorded (USNM 16292 and 16293), which are previously unpublished. Additional published reports are of birds near Lookout, MOD, about 8 August 1855 (Newberry 1857), with a pair and six young seen at Lookout, MOD, around 1901 and birds last noted there in the fall of 1915 (Grinnell et al. 1918, Grinnell and Miller 1944), up to 50 at the mouth of Juniper Creek, LAS, prior to 1906; and one pair apparently nesting at Timbered Hill, MOD, in April and May 1915 (Grinnell et al. 1918). Details in the cited literature range from comparison to the Sage Grouse (*Centrocercus urophasianus*) and descriptions of the calls to anecdotal hearsay accounts.

YELLOW RAIL *Coturnicops noveboracensis* (63**). One was collected near the Freshwater Creek mouth, Humboldt Bay, HUM, "in 1884" (CM/EHS 908; 312-1986). Another was collected at Shandon, SLO, 9 Oct 1917 (MVZ 30727; 25-1990). In addition to the nest records and lost specimens listed by Dunn (1988), the Committee accepted for statistical purposes the following: a lost specimen from near Pajaro, MTY, Nov 1905; a nest found in Long Valley, MNO, 4 June 1939, and birds heard in Bridgeport Lake Valley, MNO, June 1939. The latter two records were discussed by Heaton (1940). The undated specimen listed by Dunn (1988) for "Berryessa" was actually near Alviso, SCL. As the Yellow Rail formerly nested in the

state and occurred regularly in coastal marshes during winter, we now review only records postdating 1940.

The old Humboldt Bay specimen, which is prepared as a life mount, presented an interesting exercise in detection. Yocum and Harris (1975) said, "Two were recorded on a marsh near Freshwater Creek, Humboldt County, in 1884. One of these was collected and mounted as part of the C. Fiebig collection (Townsend 1886). We assume that the mounted Yellow Rail in the Fiebig collection at the Clarke Museum, Eureka in 1974 is this same bird." Yet the specimen itself bears no data. Townsend's (1886) note provided a potential answer: the specimen had been mounted on wood, a very unusual preparation method. Gary S. Lester examined the specimen at our request and, with the use of a needle, was able to confirm it was indeed mounted on wood. The Committee accepted this specimen as the bird collected in 1884, but the second bird said to be present could not be reviewed for lack of details.

The Shandon specimen was designated by Bailey (1935) as the holotype of *C. n. emersoni*, a subspecies that is now generally recognized as invalid.

WILSON'S PLOVER *Charadrius wilsonia* (4). Three eggs were collected by E. E. Sechrist from a nest on Mullet I., south end of the Salton Sea, IMP, 20 May 1948 (SBCM 19108; 356-1987). This represents the second record and only nesting attempt known for California (Garrett and Dunn 1981). Sechrist's notes state, "Nest—small hollow in ground, lined with few bits of short sticks near sea, many Snowy Plover around." We presume at least one adult was present, and probably a pair, as both sexes incubate the eggs (Bergstrom 1986).

The review of this record presented the Committee with an unusual task, since few members were trained in the identification of eggs. We reviewed photographs of the egg set in comparison to egg sets of the Killdeer *(C. vociferus)*, Snowy Plover (*C. alexandrinus*), and others of Wilson's Plover, and reviewed measurements (e.g., one egg measured 38 × 27 mm) and Sechrist's tag. The eggs were nearer the size of Killdeer eggs but differed in shape, being rounder and less truncated on one end than Killdeer eggs of the 39 sets compared. The background color and markings matched those shown by west Mexican sets of Wilson's Plover. Lloyd Kiff of the Western Foundation of Vertebrate Zoology independently confirmed the identification.

AMERICAN OYSTERCATCHER *Haematopus palliatus* (11). One collected at San Diego, SD, 16 May 1862 (MVZ 4488; 59-1985) and another collected on Santa Barbara I., SBA, 2 June 1863 (MVZ 4489; 60-1985; Cooper 1868) were the first California records and were assigned to the west Mexican race *frazari*. Both birds provoked questions about possibile hybridization with the Black Oystercatcher (*H. bachmani*).

Jehl (1985) devised a scoring system ranking ten characters (e.g., color of uppertail coverts, extent of white wing stripe) on a scale from 0 to 4 or 0 to 6. Under this system, scores below 10 specify *H. bachmani*, those above 30 *H. p. frazari*, and those between suggest introgression. Joseph Morlan and John Trochet studied the specimens and scored them independently; Joseph R. Jehl, Jr., also provided his original scores of these two specimens. The San Diego bird was scored 35 by Jehl, 35 by Morlan, and 33 by Trochet; it is clearly an American Oystercatcher. The Santa Barbara Island bird was scored 27 by Jehl, about 29 by Morlan, and about 26 by Trochet, scores borderline and problematic. Jehl considers the bird to be *frazari*. Jehl (1985) hypothesized that widespread collecting around the turn of the century on the islands off Baja California led to hybridization; Cooper's birds were taken prior that collecting.

UPLAND SANDPIPER *Bartramia longicauda* (9). One was watched in flight at Pt. Mugu, VEN, 9 Sep 1979 (REW; 338-1987). This fits well within the span of other coastal fall records (22 Aug–13 Sep).

BAR-TAILED GODWIT *Limosa lapponica* (8). A female found on Humboldt Bay, near Arcata, HUM, on 11 July 1968 was collected on 17 July 1968 (HSU 1475; 304-1986; Gerstenberg and Harris 1970). The bird, identified as the Siberian race *baueri*, was molting from a worn basic plumage into fresh basic plumage, and the ovary showed no signs of recent enlargement. This individual was likely in its first summer and may have summered locally, but no primarily Siberian-nesting shorebirds are known to have summered in California.

CURLEW SANDPIPER *Calidris ferruginea* (14). A juvenal-plumaged bird at Rodeo Lagoon, MRN, 7 Sep 1966 (HJ†; 59-1989) was the first recorded for the state.

*BUFF-BREASTED SANDPIPER *Tryngites subruficollis* (59). Juveniles were at the Gualala R. mouth, SON, 1–3 Sep 1980 (TLC†; 425-1986), on the Oxnard Plain near Pt. Mugu, VEN, *19*–25 Sep 1980 (HS, NS, KLG; 334-1987), inland at Lake Shastina, SIS, 27–28 Sep 1981 (RE†; 125-1990), at the Arcata bottoms, HUM, 21–26 Sep 1985 (JCS; 184-1986), and at the Mad R. mouth, HUM, 11–12 Sep 1979 (RLeV†; 208-1989).

The Oxnard record illustrates a problem the Committee sometimes faces. *AB* 35:226 states that "1–3 [were] found around Pt. Mugu Sept. 13–25 and the species may prove to occur annually on the sod farms in this area." Three birds were reported on 13 Sep, with but one on 19 Sep and again 25 Sep. The Committee received details of only one bird on 19 Sep. Our usual policy is, once the identification is accepted, to adopt the entire date span published in *Am. Birds*, unless there is some reason to question it. Since we received no details, however, of the three birds on 13 Sep, half of the Committee felt only one bird was documented and thus only one bird could be accepted. We would welcome details of the 13 Sep sighting, which now appears in the Appendix (List D). A similar problem arose with the Arcata bird, as we had only one brief description of a bird seen by many over a week. If observers would forward details of all rarities they see, even if the bird is a stake-out, uncertainties over the date span or the number of birds could be reduced.

COMMON BLACK-HEADED GULL *Larus ridibundus* (14). A breeding-plumaged adult was at Larkspur Landing, MRN, 26–29 Apr 1968 (RS; 95-1987). This second state record has been overlooked by several authors (e.g., McCaskie et al. 1979, Roberson 1980).

THICK-BILLED MURRE *Uria lomvia* (18). A winter-plumaged bird was in the Monterey harbor, MTY, 6 Sep 1969 (GMcC; 129-1986), and another was there 19 Jan–22 Feb 1975 (RAE, JM, GSS; 210-1986).

Our third report (Luther et al. 1979) cites two Thick-billed Murres on Monterey Bay, MTY, 11 Aug 1974. The Committee obtained additional details and now accepts a total of four birds: two oiled birds, both in breeding plumage, just outside the Coast Guard pier, Monterey harbor, 11 Aug, with one remaining until 7 Sep, a winter-plumaged bird at this same locale 5–13 Oct; and another winter-plumaged individual a bit farther offshore on inner Monterey Bay 13 Oct 1974 (SFB; JLD, PEL, GMcC; 75-1974). Both birds seen on 11 Aug were actively preening their oiled bellies and thus ingesting oil. The ingestion of even small amounts of oil can cause alcids considerable physiological stress (Nettleship and Birkhead 1985, Ehrlich et al. 1988). Given the gap of a month between sightings, the Committee felt it more likely that the October birds were new arrivals, rather than the presumably stressed oiled individuals, which were unlikely to have completed their postbreeding molt. Inner Monterey Bay has hosted most of the state's Thick-billed Murres to date.

PARAKEET AUKLET *Cyclorrhynchus psittacula* (34). One in breeding plumage crashed ashore at Eureka, HUM, 7 Feb 1909 (HSU 2261; 309-1986). A breeding-plumaged female was taken 3 miles N of Samoa, on the ocean side of Humboldt Bay,

HUM, 5 Apr 1924 (HSU 3127; 310-1986; Davis 1940). Of three found dead at La Jolla, SD, 28 Jan 1937, one was preserved as a specimen (USNM 529104; 126-1988) and two were briefly described (KWK; 293 & 294-1988; Kenyon 1937). One found dead on Stinson Beach, MRN, 9 Apr 1944 (MVZ 89469; 56-1989) was preserved as a skeleton and was identified (by K. L. Garrett) from its skull. An immature male was found alive on Samoa Beach, HUM, 20 Nov 1983 (HSU 5483; 311-1986); a photograph of the beached bird was published by Harris (1991).

Clay (1912) told the story of the 1909 specimen in the picturesque terms of the time: "Buzz-z-z-z-z—Bang! Was the way one Andy Aiton described the first appearance of this little auklet. . . . It was a dark stormy night; the drizzling rain growing into a dense fog, with a strong wind blowing, turned the night into a dreary haze. The auklet was evidently lost, and, probably attracted by the street lights, flew blindly against an overhead telephone wire, thereby stunning itself and causing it to fall to the street below. On picking it up, Mr. Aiton found the bird alive. He gave it to a local taxidermist."

Twenty-eight specimens were secured in the 50 years between 1895 and 1944, when the species must have been much more common inshore than it is now. Only four birds (including one record in circulation and another unsubmitted; Appendix, List A) have been found beach-cast or inshore in the 48 years since then.

SNOWY OWL *Nyctea scandiaca* (68**). A sick male was captured by California Fish and Game personnel in the Yolo Bypass, south of Davis, YOL, 4 Jan 1967 (230B-1988); it died shortly thereafter from having eaten ducks infected with fowl cholera (the carcass was incinerated because of the cholera bacilli). A minor incursion of Snowy Owls reached northwestern California (see that winter Harris and Yocum 1968, Bevier 1990).

The species invaded on a much larger scale during winter 1973–1974. Reports of ten birds were accepted in our third report (Luther et al. 1979), including seven from the coastal northwest. During our review of old records, Richard A. Erickson and Gary S. Lester compiled as much documentation for us as could now be gathered. Some birds were extensively documented, photographs being printed in various newspapers, but others were only briefly described. The Committee concurred that at least 32 individuals occurred in coastal Del Norte and Humboldt counties from 23 Nov 1973 to 27 Mar 1974 (DA†, JBa†, NBa†, SFB, JLD, RAE, REG, NG†, GSL†, RLeV†, GMcC, PMcL†, NJM†; specimens listed below; 400-1986). All previous records (6, 7, and 8-1974) are now subsumed under this single record number. The specific occurrences, listed from north to south: one on the beach at the Oregon border, DN, 6 Jan 1974; one at the Smith R. mouth, DN, 23 Nov 1973; five in the Lake Talawa/Lake Earl area, DN, 10 Dec 1973–10 Feb 1974 (previously accepted as 7-1974; HSU 3249); one at Pt. St. George, DN, 30 Dec 1973 (previously accepted as 8-1974); one at McKinleyville, HUM, 20 Dec 1973; one found dead at the Mad R. mouth, HUM, on either 13 or 14 Dec 1973; one seen alive at the Mad R. mouth, HUM, 6 Jan 1974; one in the Arcata bottoms, HUM, in early Mar 1974; three on the Lanphere Dunes, HUM, 20 Dec 1973–20 Jan 1974; one picked up wounded at Manila, HUM, 2 Jan 1974; one north of Samoa, HUM, 18–20 Dec 1973; one at the Samoa Coast Guard station, in Jan 1974; one shot southeast of Arcata, HUM, 3 Jan 1974; another shot at Murray Field, Eureka, HUM, 12 Dec 1973; another seen alive there 28 Feb 1974; at least six on the south spit of Humboldt Bay, HUM, 15 Dec 1973–27 Mar 1974 (some were previously accepted as 6-1974); five in the Centerville beach/Eel R. mouth area, HUM, 10 Dec 1973-30 Jan 1974 (including HSU 3241).

Additional birds occurred farther south, including three previously accepted (Luther et al. 1979) from Bodega Bay, SON (30 Jan–9 Feb 1974), Pt. Reyes NS, MRN (6–7 Jan 1974), and Alameda, ALA (9–18 Feb 1974). One in Berkeley, ALA, 16 Feb

1974, was accepted in our eleventh report (Bevier 1990). One was on a roof in San Francisco, SF, 2 Jan 1974 (HF†; AP; 76-1989), and another was at Pt. Año Nuevo, SM, 9-14 Jan 1974 (LCB; 397-1986). The southernmost was a male found dead by David G. Ainley at the Salinas R. mouth, MTY, 11 Jan 1974 (CAS 83690; 12-1987). The carcass contained shotgun pellets.

The Committee now accepts 39 birds in California during the winter 1973–1974 incursion, by far the largest number in the state since the "flocks" in Humboldt County during the winter of 1896–1897 and the 20 or more present in 1916 (Grinnell and Miller 1944). We acknowledge that some birds may have moved to different sites and thus may account for more than one record, but many seemed to frequent the same locales for months. Many were killed or wounded by illegal shooting. It is likely that others were shot but never recovered. All appear to have been immatures. Our minimum count of 39 acceptable records is similar to the total of 43 reported by Sadie Brown in summarizing the reports for the season (*AB* 28: 685). She included three more in Del Norte and Humboldt counties than we accept, likely a discrepancy in the interpretation of the data (we used a rather conservative approach to maximum numbers), and one more for Pt. Reyes NS, MRN, on 22 Dec 1973. We have no details on this latter report, but would welcome them (see Appendix, List D).

BROAD-BILLED HUMMINGBIRD *Cynanthus latirostris* (34). A male was at Pt. Mugu, VEN, 16–17 Sep 1978 (HLJ; 150-1987). An immature male was at the Clark Ranch, 14 miles N of Blythe, RIV, *28 Sep*–30 Nov 1979 (SG†; 84-1988).

GREATER PEWEE *Contopus pertinax* (23). One collected from a row of tamarisks near the SE edge of the Salton Sea, IMP, 4 Oct 1952 (E. A. Cardiff 1907; 354-1987), was the first recorded in California (Cardiff and Cardiff 1953). The specimen is now a life mount on public display at the San Bernardino County Museum. One was at Blythe, RIV, *28–29* Nov 1979 (SG†; 83-1988); the date span reported here is from Rosenberg et al. (1991) and not from information in our file.

GREAT CRESTED FLYCATCHER *Myiarchus crinitus* (30). Single birds were measured and banded on SE Farallon I., SF, 25 Sep 1967 (HR†; 198-1987), 4 Oct 1970 (DFD†; 16-1989), 6 Oct 1980 (KH†; 199-1987), and 2 Oct 1983 (KH†; 200-1987); another was seen but not caught 9 Oct 1978 (JGE†; 389-1986). One was observed at Goleta, SBA, 27 Sep 1974 (BS; 269-1987).

THICK-BILLED KINGBIRD *Tyrannus crassirostris* (8). One was at Lost Lake, RIV, south of Earp, SBE, *late Nov–23 Dec* 1979 (KVR†; 103-1988); a photograph was published by Rosenberg et al. (1991).

SCISSOR-TAILED FLYCATCHER *Tyrannus forficata* (58). One was at Pt. Reyes NS (RCA station), MRN, 18 Aug–12 Sep 1967 (DG†, RS, MGZ; 68-1988). One was at the Vigo St. marsh, Eureka, HUM, 6 June 1969 (TE†, RHG; 355-1986). One was at Covington Park, Morongo Valley, SBE, 11–13 Oct 1971 (GSS; 460-1986). One was at Yucca Valley, SBE, 23 May 1971 (JAJ; 76-1987). A first-year female was banded on SE Farallon I., SF, 18–19 May 1973 (DGA†, RHa; 202-1987). One was collected at Blythe, RIV, 13 June 1974 (specimen at Arizona State University's Blythe Field Station; 207-1988). One at Ventura, VEN, 4–8 Apr 1976 (DSt; 280-1986) was reported to have been present "for several months." One was at Salt Creek, 30 miles N of Baker, SBE, 18 July 1978 (ASE; 281-1986). A worn adult was at Patricks Point SP, HUM, 19–24 July 1980 (GJS†; 393-1986).

Although details of the Ventura bird prior to early April were not obtained, the date suggests that the bird wintered, only the second to do so in California.

EURASIAN SKYLARK *Alauda arvensis* (1). An adult returned for its sixth winter at Pt. Reyes NS, MRN, 3–8 Nov 1983 (DHE; 193-1988); this record fills the gap

mentioned by Dunn (1988). This individual returned annually from 1978–1979 through 1984–1985 but during this sixth winter was located about 0.8 miles south of its usual location. Morlan and Erickson (1983) discussed the bird's discovery and identification.

GRAY-CHEEKED THRUSH *Catharus minimus* (12). One was on SE Farallon I., SF, 28 May–8 June 1971 (DFD†; 21-1989); another was there 11 June 1975 (DFD†; 22-1989); an immature was there 12–14 Sep 1975 (RPH†;102-1987). All were measured and banded. One was watched near the Pt. Reyes NS lighthouse, MRN, 31 Oct 1978 (RS; 69-1988). One was at Pt. Loma, SD, 2–10 Oct 1987 (GMcC; JLD, PEL, CM, MAP, DR, LS†; Figure 4; 252-1987).

The first two Farallon birds represent the only spring records for the state. The 1971 individual was first identified as a Swainson's Thrush (*C. ustulatus*) when banded on 28 May but was correctly identified upon recapture on 8 June. During the week it appeared to be residing in Cassin's Auklet (*Ptychoramphus aleuticus*) burrows and became very ragged and dirty. It was kept in captivity until released on the mainland on 15 June.

Wing length identified the Farallon immature to the expected nominate race; it was aged by skull pneumatization and the prominent buffy tips to the greater coverts (see Pyle et al. 1987). The Pt. Loma bird was the first in the state to linger long enough for many observers to enjoy it. It was interesting to note that flash photographs of the bird (Figure 4) caused an illusion of a large prominent eyering and white edges to the

Figure 4. Gray-cheeked Thrush (252-1987) at Pt. Loma, San Diego County, 2–10 October 1987. Some flash photographs of the bird caused an illusion of a prominent eyering and white edges to the outer rectrices, illustrating how written descriptions are needed to supplement photographs.

Photo by Larry Sansone

outer rectrices. All observers forwarding descriptions to the Committee described a much reduced eyering that appeared broken anteriorly, causing the dark eye to stand out prominently on the otherwise unmarked gray face, and an unmarked tail. The photos, while excellent in other respects, illustrate how flash photography can misrepresent fine details; it tends to overemphasize pale areas of a bird and wash out shades of green and yellow.

WOOD THRUSH *Hylocichla mustelina* (8). An adult male in Herman Gerhardt's backyard in Glendale, LA, 1–*11* Aug 1968, was killed by a cat on the latter date (GSS, LACM 77806; 390-1986). This was only the second record from California.

GRAY CATBIRD *Dumetella carolinensis* (47). One was at Oasis, MNO, 10 June 1964 (GMcC; 107-1986), and a singing male was at nearby Deep Springs, INY, that same day (GMcC; 106-1986). One was in Santa Barbara, SBA, 16 Oct–3 Dec 1971 (NM; 342-1987). One was in John Derby's garden at Mammoth Lakes, MNO, 19–23 Sep 1974 (DAG; 320-1987). An adult was measured and banded on SE Farallon I., SF, 15 Oct 1974 (RPH†; 103-1987), and another was seen there 15 Oct 1982 (MA, RPH; 104-1987).

CURVE-BILLED THRASHER *Toxostoma curvirostre* (12). Laurence M. Huey took California's first specimen at Bard, IMP, on 31 Dec 1916 (adult female, SDNHM 32771; 318-1987; Huey 1920), and he, May Canfield, and Marvin Jones took four additional specimens 2 miles N of there on 29 Oct 1924 (SDNHM 32770; 316-1987), 14 Jan 1925 (SDNHM 9707; 319-1987), 16 Jan 1925 (SDNHM 9722; 315-1987), and 18 Jan 1925 (SDNHM 32769; 317-1987; McCaskie and Prather 1965). All are of the expected western Arizona race *palmeri*.

This concentration of early records suggests the Curve-billed Thrasher has been disfavored by the massive habitat changes along the Colorado River since 1925, nearly complete replacement of native willows and cottonwoods by the introduced saltcedar (*Tamarix chinensis*) (Rosenberg et al. 1991).

*RED-THROATED PIPIT *Anthus cervinus* (62). One at Pt. Reyes NS (Mendoza Ranch), MRN, 30 Sep 1978 (RS; 70-1988) was considered by a majority as probably one of three rediscovered at nearby Hall Ranch 7–13 Oct 1978 (accepted 111-1978; Luther et al. 1983). One was at the Santa Clara R. mouth, VEN, 28 Sep 1980 (BEDa; 225-1987). One was at Furnace Creek Ranch, Death Valley NM, INY, 5 Oct 1985 (JA; 83-1986)

The Furnace Creek bird, the first far inland in the state, was followed by another at this locale two autumns later (Pyle and McCaskie 1992). While the Red-throated is the most frequent fall vagrant pipit in California, it is unrecorded in Nevada (DeSante and Pyle 1986), where there is a mid-May specimen of the Olive-backed Pipit, *A. hodgsoni* (Burleigh 1968).

YELLOW-THROATED VIREO *Vireo flavifrons* (35). One was measured and banded on SE Farallon I., SF, 12–13 June 1969 (HR†; 426-1986). A singing male at Big Morongo Reserve, Morongo Valley, SBE, 13 June 1977 (SG; 85-1988) was possibly the same bird there from 30 Apr to *14 May* 1977 (accepted record 30-1977; Luther 1980; late date corrected here). Another singing male was at Ft. Piute, SBE, 28 May 1978 (GA, CC, KVV; 158-1987). One was at Twin Pines Ranch near Banning, RIV, 29 Apr 1980 (RLMcK; 326-1987). One was at the Big Canyon Country Club, Newport Beach, ORA, 23 Sep 1984 (DRW; 307-1987).

PHILADELPHIA VIREO *Vireo philadelphicus* (69). One was at Bodega Bay, SON, 28 Sep 1974 (EM, MLR; 345-1986). One was seen on SE Farallon I., SF, 12 June 1975 (DFD; 346-1986), and single birds were measured and banded there 25 Sep 1976 (RPH†; 106-1987) and 12 Oct 1976 (HH; 19-1988). One was at Cabrillo Beach, San Pedro, LA, 17 Oct 1980 (BEDa; 226-1987).

YELLOW-GREEN VIREO *Vireo flavoviridis* (25). An immature female hit a window in San Diego, SD, 7 Oct 1967 (SDNHM 36247; 122-1988).

GOLDEN-WINGED WARBLER *Vermivora chrysoptera* (36). A male collected by Donald R. Medina on SE Farallon I., SF, 26 May 1963 (MVZ 160114; 249-1987) furnished the second state record. A male was measured and banded on SE Farallon I., SF, 18–20 June 1980 (HH, LBS†; 40-1988), and another was seen there 2 Sep 1980 (RJB, JN; 108-1987). A female was at Thousand Palms Oasis, RIV, 3 Oct 1980 (RLMcK; 333-1987).

We follow Harris (1991) in revising the dates of the male at Fairhaven, HUM (32-1975; Luther et al. 1979), to *21–22* Sep 1975 (collected on latter date; HSU 7179) and of another at Fairhaven (196-1980; Binford 1985) to 8–*16* Oct 1979.

YELLOW-THROATED WARBLER *Dendroica dominica* (59). One was at Scottys Castle, INY, 30 May 1971 (RSG; RAE; 345-1987). One was near Fairhaven, HUM, 24 Sep 1974 (RLeV; 246-1986). One was on Pt. Loma, SD, 26 Apr 1980 (CWS, ES; 327-1987). One collected by Steven W. Cardiff at Needles, SBE, 28 Feb 1984 (SBCM 39419; 55-1992) was of the white-lored western race *albilora*, as most Yellow-throated Warblers in California have been, and provided the first winter record in the state. The second winter record was of a yellow-lored bird at Olema, MRN, in Dec 1984 and Jan 1985 (see Dunn 1988).

We follow Harris (1991) in revising the dates of a pair at Eureka, HUM (27-1983; Roberson 1986), to *11* Jun–1 Jul 1982.

GRACE'S WARBLER *Dendroica graciae* (22). A female collected in the Tijuana R. valley, SD, 29 Oct 1966 (GMcC; SDNHM 36047; 49-1992; Craig 1970) was the first recorded for California. A singing male was on Clark Mt., SBE, 23 May 1981 (BEDa; 324-1987).

Three of California's accepted records are from the small grove of White Fir (*Abies concolor*) at 7000 feet elevation on Clark Mountain, isolated in the Mojave Desert near the Nevada border, and there are two more unreviewed records in the literature. Grace's Warblers nest in the Charleston Mountains, Nevada, just 70 miles to the northeast. The observer of the Clark Mt. bird described watching a singing Grace's Warbler and hearing, in response, an "identical" song from the next ridge. He concluded there were two Grace's Warblers present, although the second bird was not seen. Committee members, however, pointed out that vocal mimicry is well known in the Parulinae (Kroodsma et al. 1983, Payne et al. 1984, van Buskirk 1984), and the second bird was not accepted. Committee member Bailey, in fact, had watched a Black-throated Gray Warbler (*D. nigrescens*) countersing to a Virginia's Warbler (*Vermivora virginiae* on this very mountain. Members Garrett and Morlan commented that the song of the Yellow-rumped Warbler (*D. coronata*) is highly variable and closely approaches that of Grace's.

PINE WARBLER *Dendroica pinus* (36). An immature male was on Pt. Loma, SD, 28 Oct 1967 (JRJ†; GMcC; 34-1986). Another immature male was on SE Farallon I., SF, 19 Oct 1974 (RPH†; 41-1988).

Pine Warblers have been misidentified as Prairie Warblers (*D. discolor*). Both species wag their tails. The Pine Warbler is larger, shows white undertail coverts (pale yellow on the Prairie); and has two prominent white wingbars (dull and poorly defined on the Prairie). The long tail extension beyond the tip of the longest undertail covert helps distinguish the Pine Warbler from the similar Blackpoll (*D. striata*) and Bay-breasted (*D. castanea*) warblers (J. Dunn, in comments).

CERULEAN WARBLER *Dendroica cerulea* (12). An immature was collected at the "southeastern edge" of the Salton Sea, IMP, 1 Oct 1947 (SBCM 37584; 353-1987). An immature female was measured and banded on SE Farallon I., SF, 23–24 Oct 1981 (BBn, RSn†; 394-1986).

The site of the Salton Sea bird, the first for California (Hanna and Cardiff 1947), is now under water with the rise of the Salton Sea. The bird was originally reported to be an immature female, but the specimen (reviewed by the Committee via five color photographs of the specimen at different angles) shows considerable bluish above and slightly veiled blackish scapular streaks, both characters of an immature male. Committee members believe it an immature male, perhaps missexed when prepared.

*PROTHONOTARY WARBLER *Protonotaria citrea* (85). A male was at Furnace Creek Ranch, Death Valley NM, INY, 12 Sep 1971 (RS; TM; 341-1987). A male was at Kelso, SBE, 27–28 Aug 1978 (EAC†; 351-1987). A female, probably immature, hit a window at McKinleyville, HUM, 29 Sep 1978 (HSU 7226; 305-1986). A tailless bird present on the Clark Ranch, 14 miles north of Blythe, RIV, 8–16 Oct 1979 (RJD; 101-1988) was apparently photographed, but we have not located the picture. One was at Morongo Valley, SBE, 27 Sep 1980 (MP; 329-1987). A female, probably immature, was at the Carmel R. mouth, MTY, 18 Oct 1980 (DLD, JSL; 234-1987). A male was at Furnace Creek Ranch, INY, 18 Oct 1980 (BEDa; 227-1987). An immature male was measured and banded on SE Farallon I., SF, 12–16 Sep 1981 (KH; RJB†; 109-1987). A female was at Baker, SBE, 13–14 Oct 1984 (EAC†; 352-1987). A male was at Lee Vining, MNO, 15 Sep 1985 (KH; 305-1987). A female came to a hummingbird feeder in Roseanne Abnet's yard, San Diego, SD, 25 Jan–20 Mar 1987 (GMcC, MAP; 185-1987).

We follow Harris (1991) in revising the dates of one at McKinleyville, HUM (434-1986; Langham 1991) to 11–*16* Sep 1986. Records of this species after 1989 are no longer reviewed by the Committee.

WORM-EATING WARBLER *Helmintheros vermivorus* (53). Single birds were on SE Farallon I., SF, 4–6 June 1973 (BC; 203-1987) and 20 June 1974 (BP†; 250-1987). One was on the Yucca Valley golf course, SBE, 14–16 May 1977 (LRBe; 263-1987).

We follow Harris (1991) in revising the dates of a male that wintered at Sunnybrae, HUM (3-1978; Luther et al. 1979), to 29 Dec 1977–*18* Mar 1978. The bird, which was in Harris' yard, was singing on its final date of occurrence.

KENTUCKY WARBLER *Oporornis formosus* (51). An adult male was collected on SE Farallon I., SF, 3 July 1972 (CAS 69647; 11-1987), and another male at Eureka, HUM, 21–23 Nov 1972, was collected on the latter date (HSU 7188; 303-1986). Additional males were on SE Farallon I., SF, 11–12 May 1979 (RJB†; 110-1987), 23 June 1982 (CSt; 111-1987), and 23–24 May 1983 (RPH†; 112-1987), and a female was there 16 June 1975 (DFD†; 14-1989). All but the 1982 bird were measured and banded. Another male was banded at Palomarin, near Bolinas, MRN, 13 May 1987 (PRBO†; 25-1989).

CONNECTICUT WARBLER *Oporornis agilis* (48). Single birds were on SE Farallon I., SF, as follows: a male 16 June 1958 (CAS 84321; 273-1986), a male 22 Sep 1965 (CAS 84322; 274-1986), a female 22 Sep 1965 (CAS 84323; 275-1986), an immature 13 Sep 1968 (HR†; 207-1987), a female 18 June 1969 (HR; 27-1988), and immatures 11 Sep 1974 (DW; 113-1987), 1–5 Sep 1980 (RJB†; 42-1988), 23 Sep 1982 (RPH; 29-1988), 15 Sep 1983 (HRC, RPH; 31-1988), and 11 Oct 1983 (HH; 30-1988). Another immature was measured and banded at Palomarin, Pt. Reyes NS, MRN, 12 Sep 1980 (DFD, JSL†; 392-1986).

Over half (26) of the state's accepted records have been from SE Farallon Island, and of those listed here, all but the one in 1974 were confirmed in hand by measurements (see Lanyon and Bull 1967). The 1958 specimen was the first recorded for California (Bowman 1961), and the 1965 specimens were the third and fourth (Tenaza 1967, who miscited the sex of the 1958 bird and overlooked the second state record in 1963; see Bevier 1990).

MOURNING WARBLER *Oporornis philadelphia* (60). Single birds were on SE Farallon I., SF, as follows: breeding-plumaged males 3 June 1978 (LBS†; 116-1987) and 15 June 1987 (PP†; 210-1987), immatures 14 Sep 1979 (RPH; 23-1988), 9–10 Sep 1980 (RPH; 24-1988), 10 Oct 1980 (PP; KH†; bird 1; 209-1987), 10 Oct 1980 (PP; bird 2; 117-1987), 13–14 Sep 1981 (RPH; 25-1988), and 14 Sep 1981 (RPH; 26-1988). An immature collected at Baker, SBE, 10 Nov 1979 was the latest fall migrant recorded in California and constitutes the only autumn record for the state's interior (SBCM 30529; 355-1987). Immatures were observed at Carpinteria, SBA, 17 Sep 1984 (LRBa; 96-1988) and Los Osos, SLO, 7 Sep 1986 (JEMcD; GPS; 366-1986)

Half (30) of the state's accepted records of the Mourning Warbler have been from SE Farallon Island. Of these, all but the second individual on 10 Oct 1980 and the second one in 1981 were banded and confirmed via measurments (especially wing minus tail; see Lanyon and Bull 1967). The birds only seen were identified by the combination of a yellow throat merging (without a hooded effect) into the yellow underparts and a thin often yellowish eyering only slightly broken fore or aft (see Pyle and Henderson 1990). The Los Osos bird had darker gray scalloping on a lighter gray incomplete breastband, suggesting an immature male (P. Pyle, in comments).

SCARLET TANAGER *Piranga olivacea* (71). A singing male was at Squaw Flat, Sespe Wildlife Area, VEN, 31 May 1958 (GMcC; 213-1986). A female was at Dana Pt., ORA, 23 Aug 1964 (GMcC, EAP; 108-1986). An immature female was banded at a campsite just east of Bard, IMP, 18 Oct 1970 (HR†; 306-1987). An immature male was at Emigrant Ranger Station, Death Valley NM, INY, 11 Nov 1970 (RLeV†; 244-1986). An immature was at Pt. Reyes NS ("road forks pool"), MRN, 26 Sep 1971 (RS; 71-1988). One, probably an immature male, was at Kelso, SBE, 26 Oct 1975 (PU; 53-1987). A male, age unknown, was on the Univ. of California campus, Santa Barbara, SBA, 12 Nov 1976 (SIR; 228-1987), and another was at Oxnard, VEN, 7 Oct 1978 (REW; 201-1986). A breeding-plumaged male was banded on SE Farallon I., SF, 18–22 June 1980 (RJB, HH, JK, CSt; 32-1988). A male, possibly an adult, was at Pt. Loma, SD, 24 Oct 1980 (JRO†; 103-1989). A breeding-plumaged male was at Los Osos, SLO, 15 June 1981 (HJB, MHJB; 277A-1986). A female was at Big Morongo Reserve, Morongo Valley, SBE, 24 Oct 1981 (EAC†, SJM†; 228-1986). An immature male was measured and banded on SE Farallon I., SF, 6 Nov 1981 (RPH†; 120-1987).

The 1981 Morongo Valley record initially presented a difficult review, since the only evidence originally submitted was a multi-generation copy of a single slide. One member thought the identification could be based on the maxillary tooth, lacking in the Summer Tanager (*P. rubra*) (see Ridgway 1887), but other members pointed out that there is overlap in this character and that the the apparent "tooth" was in the wrong location, likely an artifact of the photograph. Additional photos were discovered and added after two circulations, but no written details were ever submitted. Features that could be seen among the final four photos reviewed, and which clinched the identification, included contrastingly blackish-centered tertials with pale whitish edges, dark shaft streaks to the median coverts, and the greenish tone to the upperparts visible in an original photo. The review illustrated how much colors can change during the slide-duplication process; second- or third-generation copies may show a color much too warm and yellowish. We later learned that the bird met with a predator, as a half-eaten carcass was discovered (E. A. Cardiff pers. comm; SBCM 53453; we have not examined the specimen).

PYRRHULOXIA *Cardinalis sinuatus* (11). A female was in Chemehuevi Wash, SBE, 14 May 1983 (KK, JCW; 313-1987), at the same spot where the female of a pair was on a nest in July 1977 (see Luther 1980). The outcome of that breeding attempt (the only one for the state) was never known, but this 1983 bird might have

been the same female or offspring of the pair. It is considered "possibly the same" (thus statistically a different bird) by the Committee.

PAINTED BUNTING *Passerina ciris* (29). Birds in immature or female plumage were in the Tijuana R. valley, SD, 13–14 Sep 1962 (GMcC; 100-1986), 11 Oct 1962 (GMcC; 101-1986), and 22 Sep 1963 (GMcC; 104-1986). A first-year male, in green plumage with only a scattering of blue feathers on its head, was singing 8 miles W of Santa Rosa, SON, 24 June 1966 and subsequently collected (CAS 69789; 139-1985). A female, possibly an adult, was at Deep Springs, INY, 31 Aug 1971 (RS; 339-1987). An immature female was measured and banded on SE Farallon I., SF, 10 Sep 1975 (RPH†; 121-1987). A female or immature male was 10 miles N of Blythe, RIV, 13 Nov 1978 (RJD; 102-1988).

As Painted Buntings are rather common in captivity in Mexico (M. J. Lippsmeyer, L. Santaella in litt.) and are smuggled across the border (Nilsson 1981), evaluating records of this species, especially near the border (e.g., Tijuana R. valley) can be difficult. Farallon records from September to November (see Bevier 1990) strongly suggest that wild vagrants reach California.

The Santa Rosa bird, providing the first record for northern California, was originally considered an escape by some (Bolander and Parmeter 1978) but more likely wild by others (Roberson 1980). The specimen shows no cage wear or abnormalities in feet or claws, and it is the west Mexican race *pallidior* that is more often kept in captivity (L. Baptista pers. comm. to S. F. Bailey). Bailey examined the specimen and identified it as the eastern race *ciris* . Subsequently, Thompson (1991) cast doubt on the currently recognized criteria for subspecific identification, but Bailey recently noted (in litt.) that the brightness of the plumage and the short wing chord suggest that the bird was from an eastern population, even if racial separation is uncertain. The Committee unanimously considered the bird more likely wild than an escapee.

CASSIN'S SPARROW *Aimophila cassinii* (33). A skylarking male was 1 mile E of El Cajon, SD, 15-30 May 1970 (TAO, SFO; 75-1988). An immature was measured and banded on SE Farallon I., SF, 12 June 1975 (DFD†; 15-1989).

The El Cajon bird was at the same location, in sage scrub, frequented by singing males in May 1976 (Luther et al. 1979) and June 1978 (Binford 1983). It is possible that the same bird was responsible for all three records, the only ones for San Diego County. The song of the 1970 bird was tape-recorded on a child's toy recorder, and later played for J. Dunn and G. McCaskie, but this tape documentation is now lost. See also under Records Not Accepted, below.

SNOW BUNTING *Plectrophenax nivalis* (38). An immature female of the nominate race was collected on the south jetty of Humboldt Bay, HUM, 25 Nov 1945 (MVZ 94376; 90-1987); it represents the first record for California (Sholes 1946). One was with a large flock of Lapland Longspurs *Calcarius lapponicus* at Lower Klamath NWR, SIS, 25 Nov 1960 (GMcC; 92-1986), and a female was collected 2 miles E and 7 miles S of Tulelake, SIS, 22 Dec 1965 (GMcC; SDNHM 35513; 314-1987; McCaskie 1966). A female at the Arcata oxidation ponds, HUM, 20–21 Nov 1969 was collected on the latter date (S. W. Harris 627, specimen in HSU; 307-1986). Two were on the shore of Hartson Reservoir, LAS, 27–28 Dec 1973, with one remaining to *16 Feb 1974* (TDM, RS; 197-1987). Up to four birds were at Lake Talawa, DN, 13 Dec 1974 (3 birds) to 15 Feb 1975 (4 birds) (PFS, SLF; 243-1987). Three more were together at Lake Talawa, DN, 6 Nov 1977, with one remaining to 11 Nov (RSW; 352-1986). One was at Bodega Bay, SON, 13 Nov 1976 (ALE; 218-1986). One was at Tule Lake NWR, SIS, 27 Oct 1978 (BEDe; 240-1986). One was at the Garcia R. mouth, Pt. Arena, MEN, 16 Nov 1978 (KVV; 159-1987). One was on SE Farallon I., SF, 22–25 Oct 1979 (DT; 124-1987). One was on the north jetty of Humboldt Bay, HUM, 10–12 Nov 1982 (BBk; 113-1988).

COMMON GRACKLE *Quiscalus quiscula* (21). An adult male was collected along La Cresta Road, about 1 mile ENE of El Cajon, SD, 20 Nov 1967 (SDSU 2052; 357-1987). A male was at 7000 feet elevation along McGee Creek, MNO, 12 Apr 1987 (DAG; 127-1987).

The El Cajon bird, originally mislabeled as a Brewer's Blackbird (*Euphagus cyanocephalus*), was discovered in the SDSU teaching collection in 1975 by Wayne Arendt and reidentified by Jon Dunn. The specimen represents the first California record, as cited by Roberson (1980) and Garrett and Dunn (1981), both of whom reported an incorrect date of 1969. The date was corrected by Unitt (1984), but he mistakenly called the specimen mounted. It is a study skin.

STREAK-BACKED ORIOLE *Icterus pustulatus* (4). A male was in the Tijuana R. valley, SD, 22 Sep 1962 (GMcC; 102-1986). Although there was concern about possible captive origin, three of the four records accepted to date have been from the coastal slope, and nine of ten CBRC members felt this was more likely a wild vagrant than an escapee.

COMMON REDPOLL *Carduelis flammea* (4). Jim Cowling collected a male at Manila, HUM, 22 May 1969 (S. W. Harris 500, specimen at HSU; 308-1986), the first redpoll in California since the "large flocks" in winter 1899 (Grinnell and Miller 1944).

POPULATIONS ACCEPTED

In addition to maintaining an archive of reviewed records, the Committee maintains a California state list, including established exotic as well as native species (Jones et al. 1981, Binford 1986). In 1986 the Committee established a permanent subcommittee on introduced species and adopted criteria for the acceptance of established populations. The subcommittee compiles information on these populations and proposes adding introduced species to the state list if it has information sufficient to prove the identification of the species and the viability of its population. To be judged viable, a population must have bred in the state for 15 consecutive years, must be increasing or stabilized after an initial period of increase, must occupy enough geographically contiguous suitable habitat to sustain itself, and must occupy an environment similiar enough to the species' natural habitat or to that of other successful introductions that permanent establishment seems likely. Populations maintained primarily by recurrent releases (intentional or accidental) or that require intense management for survival are not considered viable.

The subcommittee recommended and the full Committee accepted the addition of one species new to the California list.

*WHITE-TAILED PTARMIGAN *Lagopus leucurus*. A population established along the crest of the Sierra Nevada, first introduced in August 1971 (NBi, CEB, DFD†, HAG, GMcC; 231-1980). Photographs by DeSante and several feathers picked up by McCaskie establish the identification; Clarke and Johnson (1990) subsequently published a photo of a California bird. Clait E. Braun, formerly of the Colorado Division of Game, Fish, and Parks, provided the Committee with the entire governmental agency file on the California introduction, whose purpose was "to introduce another game bird in an area lacking a huntable species" (see Gaines 1988).

Some 73 birds (including 16 chicks) were trapped in the Rocky Mountains of Colorado in August and September 1971 and April and September 1972 and were

shipped by air express to California for release. These were swapped for 250 "Afghan white-winged" Ring-necked Pheasants from California (whose introduction in Colorado, incidentally, was not successful; C. E. Braun pers. comm.). Ten ptarmigans were released at 11,000 feet elevation near Mono Pass, west of Bridgeport, MNO, on 26 Aug 1971, where they "immediately went to feeding and seemed contented and at home" (letter to Braun from H. T. Harper, upland game coordinator for California Dept. Fish and Game). An additional 28 were released in late September 1971, some 23 more in May 1972, and another 12 in September 1972.

The ptarmigans' breeding at the Hall Natural Area, MNO, northeast of Tioga Pass, has now been confirmed for over 15 years. The population has spread north to Matterhorn Peak, TUO, west to Mt. Hoffman, TUO, and south to the Ritter Range, MAD (Gaines 1988), over about 300 square miles, though breeding is confined to alpine habitats over 10,000 feet elevation, less than half this area. Lower elevations at Sonora Pass (9628 feet) to the north and around the Minaret Summit (9175 feet) to the south may present barriers to further expansion, although the population has not yet reached these points. The ptarmigans' habitat is confined to the willows *Salix nivalis*, *S. anglorum*, and *S. planifolia* (Johnsgard 1973). Jennifer A. Clarke, who provided information from 87 banded birds during a 4-year study of the population at the Hall Natural Area, considers the species to be established. The average productivity is about 30%, with an average of 18 chicks per spring (70% survival rate to the fall), and the average density was about 5 adult birds per square kilometer, rates similar to those of native populations in Colorado and Montana (Clarke and Johnson 1990). Extrapolating this density over the apparent current range suggests a population of about 1800 birds. The California Dept. of Fish and Game opened a hunting season on the White-tailed Ptarmigan in September 1989.

Some environmentalists expressed concern that the introduction might "bode danger to the world's smallest willow" (*AB* 31:1184), but no significant impacts on the alpine flora and fauna have yet been detected (J. A. Clarke in litt.). Yet concern over the introduction of non-native species and their impact on the environment is warranted. In a departmental memo, Clait Braun expressed concerns as early as 1972: "I believe that both California and our [Colorado] Division were extremely lax in not doing serious evaluation of the habitats where the birds were released.... Before additional transplants of any animal are conducted, I urge that adequate planning, pre-transplant habitat evaluation, and follow-up studies be conducted. We owe it to ourselves and the public."

CORRIGENDA TO RECORDS ACCEPTED

A Little Gull (*Larus minutus*) at Kelly Lake, Watsonville, SCZ (44-1982), accepted in Morlan (1985), was actually present 1–*3* Jan 1981 (not 1–2 Jan). A Curve-billed Thrasher at Brock Research Center, IMP (80-1973), accepted in Winter and McCaskie (1975), was actually present *24 June* 1973 (not 24 July). We thank David L. Suddjian and Jon L. Dunn, respectively, for these corrections.

We follow Harris (1991) in revising the following dates of occurrence: an Emperor Goose at Eureka, HUM, 11 Nov 1972 (23-1977) and another at the south spit, Humboldt Bay, HUM, 14 Nov 1972 (43-1977), both accepted in Luther (1980), were present until *30 Dec 1972*; an adult Little Gull near Arcata, HUM (68-1978), accepted in Luther et al. (1983), was present 21 Feb–*5 Mar* 1978 (not 26 Feb); an adult Little Gull at Arcata, HUM (477-1986), accepted in Langham (1991), was actually present 11–*16* Nov (not 13 Nov) 1982. A Dusky-capped Flycatcher (*Myiarchus tuberculifer*) at Arcata, HUM (55-1984), accepted in Roberson (1986), was present 13 Jan–*14 Mar* (not 12 Mar) 1984 and was collected (HSU 5733). A Blue Jay (*Cyanocitta cristata*) at Fieldbrook, HUM (66-1978), accepted in Luther et

al. (1983), was present *16 Jan* (not just "mid Jan") –9 Mar 1978. A male Golden-winged Warbler at Fairhaven, HUM (32-1975), accepted in Luther et al. (1979), was present 21–*22* Sep (not just to 21 Sep) 1975 and was collected (HSU 7179); the female accepted under that same record number was present 19–21 Sep only. Another male Golden-winged Warbler at Fairhaven, HUM (196-1980), accepted in Binford (1985), was present *8–16* Oct (not just to 15 Oct) 1979. A singing male Scarlet Tanager at Fairhaven (219-1987), accepted in Langham (1991), was actually present *9* June 1987 (not 7 June). We thank Stanley W. Harris and Richard A. Erickson for providing these corrections.

We have also received additional documentation on two important records and correct our previously published data. California's first Dusky-capped Flycatcher, accepted in Roberson (1986), is corrected to read: "A male at Furnace Creek, Death Valley NM, INY, 23 Nov 1968 (NBB; GMcC, GSS; 84-1984) was collected (LACM 66519; Suffel 1970)." California's second Trumpeter Swan, accepted in Dunn (1988), is corrected to read: "An adult was present at Abbotts Lagoon, Pt. Reyes NS, MRN, *25 Dec 1961*–9 March 1962 (PDeB, GMcC, GMM†; 193-1984). Details of this sighting, but with an incomplete date span, were published by Williams and Miller (1963)."

The locality of California's first Blue Jay (Binford 1985), "Igos," SBE, is now known as Mountain Home Village.

RECORDS NOT ACCEPTED, IDENTIFICATION QUESTIONABLE

YELLOW-BILLED LOON *Gavia adamsii*. One at Monterey, MTY, 25 Jan–22 Feb 1969 (39-1985). One at Moss Landing, MTY, 25 Jan 1969 (398-1986). One at Drakes Bay, Pt. Reyes NS, MRN, 1 Jan 1973 (190-1986). One at Bodega Bay, SON, 10 Dec 1973 (192-1986). One on Humboldt Bay, HUM, *late Dec 1973–2 Jan 1974* (193-1986). One at King Salmon, Humboldt Bay, HUM, 15-17 Nov 1987 (401-1987). Upon our request for details, the observer of one at Pt. Reyes NS, MRN, 3 Oct 1977 (AB 32:251) requested that the record not be accepted. In addition, Remsen and Binford (1975) found no or insufficient evidence to support the following records: Stinson Beach, MRN, 28 Apr 1965; Limantour, MRN, 4 Mar 1969; Big Lagoon, HUM, 19–23 Mar 1969; Bodega Bay, SON, 26 Dec 1970; Bodega Bay, SON, 21 Jan 1971 (2); Bodega Bay, SON, 25 Feb 1971; Bodega Bay, SON, 13 Feb 1972.

LEAST GREBE *Tachybaptus dominicus*. One at Winterhaven on the Colorado River, IMP, 2 May 1948 (338-1986) and one at the Mission Bay flood channel, SD, 20 Dec 1959 (337-1986; Stott and Selsor 1960). In both cases no descriptions were taken at the time of observation and the recollected details were insufficient to establish only the second and third records for the state.

SHORT-TAILED ALBATROSS *Diomedea albatrus*. One following a ship at 37°08' N, 124°29' W, about 50 nm W of Pt. Año Nuevo, SM, 17 Feb 1946 (396-1987; Traylor 1950). Three on the Sharpe Park golf course, Pacifica, SM, 5 Feb 1968 (143-1989).

Concerning the former, Traylor (1950) wrote, "Although there were no Laysan Alabatrosses (*D. immutablis*) present for direct comparison, two were seen the next day, and the difference between the two forms was striking. The white back of the Short-tailed is a most conspicuous field mark and can be seen almost as far as the bird. This individual had the white of the back extending a few inches up the wing. In the air *albatrus* appears larger than the Black-footed Albatross (*D. nigripes*) and the body is much stouter. Its flight is more deliberate, with less swinging and wheeling. The bill appeared to be yellow, although Mayr (Birds Southwest Pacific, 1945: 4) gives 'pinkish' as the color of the bill in the adult." The majority of the Committee felt

RECORDS NOT ACCEPTED, identification questionable, Cont.

these details did not rule out the possibility of either the Wandering (*D. exulans*) or the Royal (*D. epomophora*) Albatross, both of which have plumages meeting this description. Of course, these southern albatrosses are strictly vagrants in the north Pacific, and, as none had occurred by 1946, it is not surprising they were not considered by the observer. But Wandering Albatross has now occurred in California (Paxton 1968) and Japan (Brazil 1991), and the Tasmanian race of the Shy Albatross (*D. cauta*) has been collected off Washington (Slipp 1952), indicating long-distance vagrancy by southern species. A yellow bill is incorrect for a Short-tailed Albatross at any age, and a bird with white "extending a few inches up the wing" is not an adult. Subadult Short-tailed Albatrosses have large white patches well out on the wing as well as near the back (see Roberson 1980, Harrison 1983).

The Short-tailed Albatross, victim of hunting and volcanic eruptions on its single nesting island of Torishima, Japan, was feared extinct by the end of World War II (Austin 1949). Under protection, however, the population slowly returned from fewer than ten adults in 1950 to several hundred today (Hasegawa 1984). Concomitantly, first-year birds have been seen again off California, within the species' historic pelagic range, in August 1977, December 1983, November 1985, and April 1987 (Luther 1980, Roberson 1986, Dunn 1988, Langham 1991).

SOLANDER'S PETREL *Pterodroma solandri*. One photographed off Pt. Arena, MEN, 21 May 1981 (45-1981). The Committee is reconsidering this record as of a Murphy's Petrel, now known to occur regularly off California from April to June. The standard reference for identifying the large dark *Pterodroma* is Bailey et al. (1989).

*COOK'S PETREL *Pterodroma cookii*. One seen from SE Farallon I., SF, 21 Sep 1970 (6-1970) and another 12 nm WSW of the Cordell Bank, MRN, 7 June 1986 (304-1988). The 1970 report was not accepted in our first report (Winter 1973) but was reviewed again as a "*Cookilaria*" (see Dunn 1988), as was the 1986 report. The Committee felt that the details of both were too scanty to support even the more liberal designation.

BLUE-FOOTED BOOBY *Sula nebouxii*. One seen from a sailboat just off Pt. Loma, SD, 26 Aug 1977 (343-1987) and another by the same observer in the surf at Manhattan Beach, LA, 30 Aug 1977 (344-1987). Neither was seen with binoculars. One from a ship about 20 miles E of San Clemente I., LA, 27 Oct 1983 (310-1987) was likely a booby, but the sketch suggested a Red-footed or Masked Booby more than this species.

RED-FOOTED or BROWN BOOBY *Sula sula* or *S. leucogaster*. One photographed at dusk at Pt. Pinos, MTY, 3 Dec 1987 (360-1987). This all-dark booby with white underwing coverts was initially identified and submitted as an immature Brown Booby, but some observers later reidentified it as a dark-morph Red-footed Booby. The Committee felt that the fuzzy dark photographs were insufficient to identify this booby to species.

REDDISH EGRET *Egretta rufescens*. One on San Diego Bay, near Coronado, SD, 25 Sep 1937 (395-1987; Delareuelle 1938). One near Otay Lake, SD, 20 Sep 1943 (266-1986). One at Pt. Mugu lagoon, VEN, 18 Aug 1969 (461-1986).

Most members felt that the brief published description of the 1937 bird did not eliminate the Tricolored Heron (*E. tricolor*): "light-colored undersurface of the wings and body." There are no original field notes supporting the 1943 report; we do not know if this species was always as regular around San Diego Bay as it is now. Despite the observer of the birds at Pt. Mugu describing the staggering foraging behavior characteristic of the Reddish Egret, the record was defeated by the narrowest of margins (8–2), the dissenters stressing the need for caution in identifying the species north of San Diego County.

RECORDS NOT ACCEPTED, identification questionable, Cont.

YELLOW-CROWNED NIGHT-HERON *Nyctanassa violacea*. An immature at Solana Beach, SD, 1–11 Nov 1963 (249-1986; McCaskie 1964). The identification was based entirely on apparent leg length in flight and was not supported by other features, such as the color of the base of the bill (black on the Yellow-crowned, greenish-yellow on the Black-crowned Night-Heron, *Nycticorax nycticorax* (see Blom 1985).

TRUMPETER SWAN *Cygnus buccinator*. One at Wards Lake, Litchfield, LAS, "*about the end of Jan*" 1957 (109-1984). An immature photographed at Pescadero, SM, 22 Feb–25 Mar 1967 (82-1989). An adult and two immatures photographed in flight at the Santa Clara R. mouth, VEN, 17 Nov 1974 (198-1988). One adult at Shingletown, LAS, 15 July 1975 (194-1986). One at the Antelope Valley sewage ponds, LA, 5 Dec 1983 (47-1990). One at Colusa NWR, COL, 21 Mar 1986 (70-1987). The Committee continues to struggle with details of this rare species that are too brief. For example, the Colusa bird was described by a waterfowl biologist as seen in flight with a Tundra Swan (*C. columbianus*) and "clearly larger," with a "very deep, resonant, and trumpet-like call." Unfortunately, the observer did not respond to a request for further details on the age of the bird, the bare-part color, his experience with swans, and a better definition of the word "larger." Male swans are larger than females, and adults' voices differ from those of younger birds. A full appreciation of the variation within the common species is necessary for identification.

The 1957 bird was found dead with a band and was reported to the U. S. Fish and Wildlife Service's Bird Banding Lab as a Trumpeter Swan. Danny Bystrak located the original documents on this bird, which had been banded 21 Mar 1954 as a second-year bird at Lakesle Lake, British Columbia. After it was found dead and published as a Trumpeter (on the mistaken understanding it had been banded as a cygnet), an autopsy by California Fish and Game personnel found that the breast bone and trachea were definitely those of a Tundra Swan. Although this was corrected in 1957, the erroneous identification still appeared on the government's computerized database until our review.

The angle of the photograph of the family group at the Santa Clara R. mouth precluded comparison of both neck length and bill shape, two important characters identifying adult swans. The Committee was unanimous that the photograph of the Pescadero bird showed an immature Tundra Swan. For good discussions on the identification of immature swans, see Bailey (1991) and Tobish (1991).

EMPEROR GOOSE *Chen canagica*. One at Staten I., SJ, 14 Feb 1957 (231-1984). One at Goose Lake, MOD, 7 Sep 1969 (141-1989). One at Lower Klamath NWR, SIS, 15 Mar 1981 (Figure 5; 237-1986).

The photograph of the last shows an anomalous whitish stripe on the flank, plus apparently broad and muted dorsal barring and a black hindneck, and the majority of the Committee felt that the bird might be a hybrid Emperor × Greater White-fronted Goose (*Anser albifrons*). Those accepting the record pointed to the typical Emperor Goose bill and white tail and noted that the proposed hybrid combination is apparently unknown in the wild (Palmer 1976). We welcome comments from readers having expertise with North American dark geese.

AMERICAN BLACK DUCK *Anas rubripes*. One at Newport Bay, ORA, 25 Feb–3 Mar 1980 (366-1987). The bird was very tame. Most members felt that the description did not eliminate a domesticated Mallard (*A. platyrhynchos*). Eight members further indicated that the natural occurrence of this species at this urban location would have been questionable, even if the identification had been correct.

RECORDS NOT ACCEPTED, identification questionable, Cont.

*TUFTED DUCK *Aythya fulvigula*. Two at Limantour, Pt. Reyes NS, MRN, 7 Nov 1981 (420-1986). One reported at Tiburon, MRN, 19 Jan 1979 (AB 33: 309), was requested withdrawn by the observer when contacted for details and is thus not accepted.

COMMON EIDER *Somateria mollissima*. One at Ft. Point, San Francisco, SF, 12 Dec 1982 (73-1988), was a single-observer report of a species not yet on the California list, a situation that the Committee views with much caution. Furthermore, the bird was initially published as an "apparent female King Eider" (*AB* 37: 333). The color described ("grayish") was incorrect for the ruddier plumage typical example of the western race *v-nigra* of the Common Eider. The southernmost Pacific coast record of this species is of a specimen taken at Hardy Bay, northeastern Vancouver Island, British Columbia, on 27 Oct 1934 (Campbell et al. 1990).

KING EIDER *Somateria spectabilis*. Two "adult males" at Willits, MEN, 10 Nov 1944 (142-1989). One female at Pismo Beach, SLO, 17-18 Apr 1983 (322-1987).

ZONE-TAILED HAWK *Buteo albonotatus*. One at Cottonwood Springs, Joshua Tree NM, RIV, 14 May 1960 (94-1988). One at Mt. Palomar, SD, 8 July 1984 (312-1987). Both reports may well have been correct, but members were concerned about documentation consisting of only a 28-year recollection (the former) or very brief details (the latter).

Figure 5. Goose, submitted as Emperor Goose (237-1986), photographed at Lower Klamath National Wildlife Refuge, Siskiyou County, 15 March 1981. This record was not accepted, as the majority of the Committee thought the bird might be a hybrid betwen the Emperor and Greater White-fronted Goose. The Committee welcomes comments on this or any other decision.

Photo by Ray Ekstrom

RECORDS NOT ACCEPTED, identification questionable, Cont.

CRESTED CARACARA *Polyborus plancus*. One at Seal Rocks, Pebble Beach, MTY, in "Feb" 1916 (155-1988; Heath 1919) was said to have been photographed, but the published details do not contain a useful description. Even if correctly identified, the bird may have been an escapee from captivity (see below).

GYRFALCON *Falco rusticolus*. One "white-gray phase" bird at Pt. Reyes NS lighthouse, MRN, 28 Feb 1965 (140-1989).

YELLOW RAIL *Coturnicops noveboracensis*. One reported on the Santa Barbara, SBA, Christmas Bird Count, 26 Dec 1914 (322-1986), was questioned by Dawson (1923), and no details survive.

AMERICAN OYSTERCATCHER *Haematopus palliatus*. One at Pebble Beach, MTY, between 3 and 6 Apr 1955 (123-1990). This very intriguing record included a sketch in the observer's notes of an oystercatcher with a white wing stripe. Although it is clear that the bird was not a typical Black Oystercatcher, the details are insufficient to eliminate a hybrid (see Jehl 1985 and under Records Accepted, above).

*BUFF-BREASTED SANDPIPER *Tryngites subruficollis*. One at Arcata, HUM, 25 Aug 1970 (243-1986).

COMMON BLACK-HEADED GULL *Larus ridibundus*. Two at Bodega Bay, SON, 9 Aug 1972 (198-1986).

LESSER BLACK-BACKED GULL *Larus fuscus*. One "adult" at the Red Hill marina, south end of the Salton Sea, IMP, 7 Jan 1988 (141-1988). Most members considered the California Gull (*L. californicus*) not eliminated, and some felt it was indicated.

SNOWY OWL *Nyctea scandiaca*. One at Wilson Valley, MOD, 14 Apr 1967, three at Lower Klamath NWR, SIS, 17 Apr 1967, and one at Table Bluff, 5 miles S of Eureka, HUM, 24 Apr 1967 (230C-1988) were described too sketchily to be accepted, even at the end of the minor 1967 invasion (see Accepted Records). These five birds were cited by Harris and Yocom (1968) and Harris (1991) as the latest California sightings. Several members noted that four of these were reported in "white" not "barred" plumage, suggesting adult males, a plumage unrecorded in the state. The latest date for a Snowy Owl in California appears to be 27 Mar 1974 (see Records Accepted).

Two on Potato Slough, San Joaquin delta, SJ, 16 Oct 1974 (81-1989) were thought by some members to have been Black-shouldered Kites (*Elanus caeruleus*).

RUBY-THROATED HUMMINGBIRD *Archilochus colubris*. An immature hummingbird measured and banded on SE Farallon I., SF, 12 Sep 1986 (5-1987) was identified in hand by its rather bright green back, buffy flanks, short bill, and outer rectrix tips slightly broader than those of an immature Black-chinned Hummingbird (*A. alexandri*), which the Ruby-throated closely resembles. The shape of the tenth primary, now thought to be the best character (Baltosser 1987), was not examined in hand nor was it apparent in the photographs, even when enlarged sixteen times under a stereo microscope (enlargements provided by M. J. Lippsmeyer). We asked Nancy J. Newfield of Louisiana to examine the photographs and measurements independently. She opined (in litt.) that the back, while brighter than usual in the Black-chinned, was still not emerald green enough for the Ruby-throated, that the crown was too dull, that the flanks looked rather typical of the Black-chinned, that the shape of the outermost primary (seen in a photo) was more like the Black-chinned's, that the shape of the outermost rectrix suggested hybridization, and that the short bill suggested immaturity or hybridization.

RECORDS NOT ACCEPTED, identification questionable, Cont.

DUSKY-CAPPED FLYCATCHER *Myiarchus tuberculifer*. One at Deep Springs, INY, 7 June 1986 (373-1986). The Dusky-capped Flycatcher's distinctive down-slurred whistle was not heard, and some other useful characters, such as rusty-edged secondaries, were not described. All accepted California records of this species are for late fall or winter.

One published as occurring "near Walters Camp, RIV," 9–14 Nov 1977, collected on the latter date (*AB* 32:259), was actually on the Arizona side of the Colorado River (K. V. Rosenberg pers. comm.).

THICK-BILLED KINGBIRD *Tyrannus crassirostris*. One reported on SE Farallon I., SF, 14 Sep 1975 (201-1987) had "extremely dark brown" upperparts, clean white underparts, cinnamon-edged remiges, and lacked a white tip to the tail. Fall Thick-billed Kingbirds have strongly yellow-washed underparts.

SCISSOR-TAILED FLYCATCHER *Tyrannus forficatus*. Single birds at La Mirada, LA, 3 Jan 1947 (81-1985; Hall 1947), Indio, RIV, 24 Oct 1948 (80-1985; Tinkham 1949), Imperial Valley, IMP, 26 July 1969 (48-1990), and Pt. Reyes NS, MRN, 20 July 1971 (342-1986). Details published in the first two records were exceedingly brief, and the report from the Imperial Valley was second-hand, lacking details.

BLUE JAY *Cyanocitta cristata*. One heard, but not seen, at Pt. Diablo, Golden Gate NRA, MRN, 27 Oct 1977 (137-1977). One at a feeder at Willow Creek, HUM, 6 Oct 1983 (257-1986).

Documentation of the bird at Willow Creek consisted only of recollections written three years after the observation. The record for Pt. Diablo was accepted in our fourth report (Luther 1980) but was recirculated after we received details (from JWr) of a Steller's Jay (*C. stelleri*) in Yosemite NP giving apparently perfect imitations of Blue Jay calls. Although the Pt. Diablo bird was heard giving perhaps 40 times a strident descending "jay" call, characteristic of the Blue Jay, corvids are renowned mimics, and the Blue and Steller's Jays have hybridized (Williams and Wheat 1971). In winter 1977–1978, however, a small influx of Blue Jays (4 accepted records) reached the coast of far northern California. The report received a 4–6 vote on rereview, the bare majority needed to overturn a previously accepted record.

BRIDLED TITMOUSE *Parus wollweberi*. One reported at Weott, HUM, 3 Dec 1987 (97-1988) was likely an escaped Black-crested Finch (*Lophospingus pusillus*), a rather commonly kept native of Argentina that bears an uncanny resemblance to the titmouse and likely accounts for reports of the titmouse from as far north as Saskatchewan (see *Blue Jay* 39:199). The Bridled Titmouse is generally resident but was collected on the Arizona side of the Colorado River in winter 1977 (Rosenberg et al. 1991).

GRAY-CHEEKED THRUSH *Catharus minimus*. One on SE Farallon I., SF, 18 Sep 1975 (62-1988). This individual was not caught, banded, and measured, unlike many Farallon Gray-cheeked Thrushes. No details were written at the time of observation and 13-year-old recollections were insufficient to convince the Committee of this difficult identification, even though fall records from the Farallones account for over 60% of California's Gray-cheeked Thrushes.

RUFOUS-BACKED ROBIN *Turdus rufopalliatus*. One at Parker Dam, SBE, 4 Jan 1982 (39-1990). This report is previously unpublished.

GRAY CATBIRD *Dumetella carolinensis*. One on Santa Cruz I., SBA, 7 Oct 1979 (88-1988). One reported second-hand from Deep Springs, INY, 14–15 May 1982 (182-1986).

RECORDS NOT ACCEPTED, identification questionable, Cont.

CURVE-BILLED THRASHER *Toxostoma curvirostre*. One photographed at the Salton Sea NWR headquarters, IMP, 1 Nov 1964–25 Jan 1965 (113-1986); one at Black Meadow Wash, Lake Havasu, SBE, 26 Dec 1952 (195-1988; McCaskie and Prather 1965); one in the Tijuana R. valley, SD, 6–15 Sep 1965 (116-1986). At least the Salton Sea and San Diego records appear to have been of Bendire's Thrashers (*T. bendirei*). These identifications relied heavily on eye color, now known to be variable in the latter species, and the color of the base of the mandible (black on Curve-billed, pale on Bendire's) was overlooked.

WHITE/BLACK-BACKED WAGTAIL *Motacilla alba/lugens*. One at San Joaquin Marsh, Irvine, ORA, 27 Oct 1985 (85-1986) was seen too briefly to be identified conclusively.

BLACK-BACKED WAGTAIL *Motacilla lugens*. One at Long Valley, MOD, 5 July 1987 (173-1987).

*RED-THROATED PIPIT *Anthus cervinus*. Single birds at Asilomar SB, Pacific Grove, MTY, 17 Nov 1976 (353-1986) and on SE Farallon I., SF, 21 Oct 1979 (105-1987). One reported at Arcata, HUM, 3 Nov 1976 (Harris 1991) was requested withdrawn by the observer when contacted for details.

SPRAGUE'S PIPIT *Anthus spragueii*. One at Goleta, SBA, 8 Oct 1964 (303-1988).

PHILADELPHIA VIREO *Vireo philadelphicus*. Single birds on Pt. Reyes NS, MRN, 26 Sep–5 Oct 1970 (344-1986), on SE Farallon I., SF, 21 Sep 1978 (187-1986), at the Carmel R. mouth, MTY, 21 Oct 1980 (432-1986), and near Imperial Dam, IMP, 27 May 1983 (321-1987). A black-and-white photo of the Farallon bird appears in Roberson (1980). Most of these records stirred substantial debate, as the Philadelphia and Warbling (*V. gilvus*) vireos vary more widely in loral pattern and underpart color than has been described. There are problem birds with intermediate characters (e.g., yellow center of breast but whitish throat or reduced dark loral stripe).

YELLOW-GREEN VIREO *Vireo flavoviridis*. One at Gaviota SP, SBA, 2 Oct 1982 (301-1986).

BLUE-WINGED WARBLER *Vermivora pinus*. Single birds at Golden Gate Park, San Francisco, SF, 13 Sep 1963 (302-1988), Pt. Loma, SD, 19 Sep 1964 (109-1986), Arcata, HUM, 13 Jan 1975 (215-1987; Yocum and Harris 1975), Ft. Piute, SBE, 28 May 1977 (63-1988), and Pt. Loma, SD, 22 Oct 1980 (331-1987). In addition, the Committee voted not to accept one reported in the Tijuana R. valley, SD, 19 Sep 1965; it had been questioned by Unitt (1984) and rejected by Garrett and Dunn (1981).

Although there has been an upsurge in records during the past decade, there are only two accepted records prior to 1983. Most of these rejected records were of birds seen briefly or described poorly, or seen by observers unaware of the species' extreme rarity.

GRACE'S WARBLER *Dendroica graciae*. One at Scottys Castle, Death Valley NM, INY, 30 May 1971 (346-1987).

PINE WARBLER *Dendroica pinus*. Single birds at Pt. Reyes NS (Mendoza ranch), MRN, 5 Oct 1970 (348-1986), Tijuana R. valley, SD, 18 Sep 1971 (139-1986), Mad R. mouth, HUM, 22–23 Sep 1976 (216-1987); and Eureka, HUM, 31 Jan 1977 (217-1987). One reported at Riverside, RIV, 6 Dec 1969 (AFN 24:100c), was requested withdrawn by the observer when contacted for details. The observer of one

RECORDS NOT ACCEPTED, identification questionable, Cont.

reported near Ferndale, HUM, 15 Sep 1975 (Harris 1991) now considers the bird to have been a Blackpoll Warbler (*D. striata*).

CERULEAN WARBLER *Dendroica cerulea*. An "immature male" at Pt. Loma, SD, 26 Oct 1967 (121-1986) was seen too briefly for this extremely rare species to be identified confidently. An immature male Cerulean may be confused with a female Black-throated Gray Warbler (*D. nigrescens*), and an immature female may be confused with a Blackburnian Warbler (*D. fusca*); see Lehman (1987).

*PROTHONOTARY WARBLER *Protonotaria citrea*. One in the Tijuana R. valley (Dairy Mart ponds), SD, 23 Oct 1986 (37-1987). The Committee obtained details of one that circled a boat "off San Diego" 21 May 1967 (*AFN* 21:541) that showed conclusively the location was inside Mexican waters, as suspected by Unitt (1984).

WORM-EATING WARBLER *Helmintheros vermivorus*. One at the Mad R. mouth, HUM, 14–15 Sep 1975 (349-1986). The very brief and ambiguous description submitted was inadequate to document the occurrence.

KENTUCKY WARBLER *Oporornis formosus*. One near the Otay R. mouth, SE corner of San Diego Bay, SD, 24 Oct 1979 (337-1987). One at Cambria, SLO, 14 Sep 1980 (276-1986).

CONNECTICUT WARBLER *Oporornis agilis*. One at Pacific Grove, MTY, 6 Oct 1978 (24-1992); one at Pebble Beach, MTY, 27 Sep 1964; one at the Carmel R. mouth, MTY, 31 Aug 1981. In no case did the observers note the "walking" behavior characterisic of the Connecticut Warbler, and the 1964 and 1978 birds were described as gray-hooded. All fall records of the Connecticut Warbler in California have been of brown-hooded immatures. Some members felt the tail-wagging described for the 1978 bird might have been that of a Nashville Warbler (*Vermivora ruficapilla*).

MOURNING WARBLER *Oporornis philadelphicus*. An adult female collected by Helen Strong at Deep Springs, INY, 12 June 1968 (MVZ 15929; 101-1984; McCaskie 1970b). One at Pt. Reyes NS (Drakes Bay), MRN, 19 Sep 1975 (351-1986).

The identification of the Deep Springs specimen as a Mourning Warbler (confirmed by Wesley Lanyon) was based entirely on the "wing minus tail" formula set out by Lanyon and Bull (1967), who were able to separate 98% of specimens they reviewed (Mourning with a difference of 10 mm or more; MacGillivray's, *O. tolmiei*, with 11 mm or less). Other specimens, however, have shown greater variation in the formula (Hall 1979, Kowalski 1983), and the specimen has a mostly white throat, rather bold eye-arcs, and a rather broad grayish breast band, all characteristics of MacGillivray's Warbler (Pyle et al. 1987; Pyle and Henderson 1990).

Wing and tail measurements were taken independently by preparator Henry Robert (wing 59, tail 48, difference 11 mm), Lanyon (wing 60, tail 47, difference 13 mm), and by myself (wing 60, tail 48, difference 12 mm). These results are nearer the mean for Mourning Warbler, but many members felt they did not conclusively eliminate MacGillivray's Warbler. The Committee requested that the specimen be examined independently by F. Jay Pitocchelli at the American Museum of Natural History (who, with Dr. Lanyon, is working on a revision of the *Oporornis* key). Dr. Pitocchelli informs us (in litt.) that on the basis of the measurements, eye-arcs, date, and locale he considers the specimen a rare extreme example of MacGillivray's Warbler. California's first Mourning Warbler is now the specimen taken at Pt. Loma on 3 October 1968 (Bevier 1990).

RECORDS NOT ACCEPTED, identification questionable, Cont.

RED-FACED WARBLER *Cardellina rubrifrons*. One at Old Mission Dam, SD, 26 Aug 1974 (340-1987).

SCARLET TANAGER *Piranga olivacea*. Two at Saratoga Springs, Death Valley NM, SBE, 30 May 1970 (359-1986). One "adult male" about 12 miles E of Los Osos, SLO, 3 June 1981 (277B-1986). One "adult male" along Alpers Creek, near Lee Vining, MNO, 11 Sep 1980 (286-1987). One at Goleta, SBA, 20 Oct 1980 (332-1987).

PYRRHULOXIA *Cardinalis sinuatus*. One at Escondido, SD, 2 Apr 1988 (117-1988).

PAINTED BUNTING *Passerina ciris*. One male on the Clark ranch, 14 miles north of Blythe, RIV, 2–31 July 1982 (397-1987). One "female" on San Clemente I., LA, 9 Sep 1986 (34-1987). The record for near Blythe was accepted by Rosenberg et al. (1991), but the CBRC has only brief second-hand details.

CASSIN'S SPARROW *Aimophila cassinii*. A pair in Hidden Valley, Joshua Tree NM, SBE, 9 Apr 1960 (74-1988). One on SE Farallon I., SF, 25 Sep 1967 (96-1987). Either record, had it been accepted, would have represented the first for California.

The Joshua Tree report was of a male skylarking and courting a female. Although the sighting was reported to the park naturalist and noted in the park's files, no detailed descriptions of the song or plumage were retained. Most members were reluctant to accept a first state record on incomplete details, and some were concerned about the April date (a month earlier than other California spring records). The record remains intriguing, however, as the Cassin's Sparrow responds to favorable environmental conditions by irregular and impressive range extensions, north to Wyoming and west to California (see Hubbard 1977, Faanes et al. 1979).

Although the bird on SE Farallon was observed from only 20 feet for 15 minutes and was identified from literature on the island, no detailed description was taken. The brief extant notes do not describe the exact tail pattern, the presence of flank streaks, or the state of molt, all important to the identification of nondescript *Aimophila* (Kaufman 1990). Since 1967 there have been six more fall Cassin's Sparrows on the Farallones, all occurring between 13 September and 3 October.

FIELD SPARROW *Spizella pusilla*. One in the Lanfair Valley, SBE, 11 Dec 1982 (323-1987).

SNOW BUNTING *Plectrophenax nivalis*. Up to three on SE Farallon I., SF, 29 Oct–10 Nov 1974 (35-1988), one there 11 Nov 1975 (33-1988), and another there 17 Nov 1975 (34-1988). No descriptions of these birds were taken.

STREAK-BACKED ORIOLE *Icterus pustulatus*. Single birds in the Tijuana R. valley, SD, 13 Oct 1962 (214-1986) and 8 Oct 1963 (105-1986); one on the Palos Verdes Peninsula, LA, 19 Sep 1983 (304-1987). Although the San Diego records have been long accepted (e.g., Roberson 1980, Garrett and Dunn 1981, Unitt 1984), in all cases the details were insufficient to support the identification of this extremely rare species.

RECORDS NOT ACCEPTED, NATURAL OCCURRENCE QUESTIONABLE (IDENTIFICATION ACCEPTED)

BLACK-BELLIED WHISTLING-DUCK *Dendrocygna autumnalis*. One at San Joaquin Marsh, Irvine, ORA, 18–28 July 1970 (GMcC, GSS; 358-1986). This

RECORDS NOT ACCEPTED, natural occurrence questionable (identification accepted), Cont.

species is commonly kept in captivity (Todd 1979), and the Committee was unanimous in rejecting in an urban area along the southern California coast.

FALCATED TEAL *Anas falcata*. Males in Golden Gate Park, San Francisco, SF, 5 Apr–21 May 1953 (JTH, ASp; 458-1986; Hedgpeth 1954) and at Newport Bay, ORA, 2 Jan-21 Feb 1969 (RByt, GMcC; 128-1986).

The Committee was rather evenly split over the natural occurrence of both birds. The species is migratory and has reached Alaska (Roberson 1980), but it is also regular in captivity (Todd 1979) and there are records of presumed escapes in the eastern United States (AOU 1983). The Falcated Teal has occurred also at Vernon, British Columbia (5 Apr 1932) and Willapa Bay, Washington (3 Jan 1979), but the majority of the Committee was concerned about the lateness of the spring record and the urban locations of both birds, warranting caution pending additional records.

BAIKAL TEAL *Anas formosa*. A male collected on the Toyon duck club, near Brentwood, CC, 13 Dec 1931 (MVZ 61006; 106-1983; Moffitt 1932) would have represented the first state record. Moffitt (1932) believed this to be a wild bird, whereas Swarth (1932) considered it an escapee because the species was commonly imported by live-duck dealers in San Francisco. At least 527 were known to have been imported between 1928 and 1932, making the Baikal Teal, after the Mandarin Duck (*Aix galericulata*), the species most commonly imported. The specimen itself shows no unusual wear. Five additional late fall/early winter records (all shot by hunters) in the past 50 years have been accepted (see Morlan 1985, Pyle and McCaskie 1992).

CRESTED CARACARA *Polyborus plancus*. One was at Alameda, ALA, 7–10 Aug 1972 (JM; 369-1987). An adult was in the Mono Basin about 6 miles S of Lee Vining, MNO, 13 Sep–16 Oct 1987 (RS; CA, LRBat, JLD, GMcC, PP, NGT, 267-1987). One, either a freshly molted adult or a second-year individual, was on rangeland along Machado Lane, Shasta Valley, SIS, 21 Oct 1988–26 Mar 1989 (BByt, ADB, NEC, RE, MFR; 45-1989). One was on a ranch near Ft. Dick, DN, 28–30 Apr 1989 (GSL, LPL; 96-1989). It is possible that a single bird was responsible for the Shasta Valley and Ft. Dick sightings, less than 100 miles apart (ranchers at Shasta Valley said the bird disappeared "a couple weeks" prior to late April 1989, so the last date there is not precisely known; G. S. Lester in litt.). The Ft. Dick bird is also thought responsible for a later report at Gold Beach, Oregon (R. A. Erickson, in comments).

The AOU Check-list (1983) described the northern edge of the species' range as northern Baja California, southern Arizona, central Texas, and central Florida and cited extralimital records of apparently wild birds for central New Mexico and Oklahoma. There are three rather recent records from the Arizona side of the Colorado River, and the species was resident at Yuma, Arizona, until 1905 (Rosenberg et al. 1991), but Arizona populations have drastically declined in this century (Rea 1983) and now provide much less of a source population for vagrants. There are no acceptable Great Basin records, as birds in southwestern Colorado and at Yellowstone NP, Wyoming, have been thought to be escapees. Although the number of captive caracaras in private hands is unknown, and the species is not commonly kept in zoos, zoo birds have escaped and have traveled a least short distances; e.g., an escape from the Norfolk zoo in Virginia was observed in North Carolina (Potter et al. 1980).

The Committee believes that caracaras seen near coastal cities are all escapees, including ones reported at Monterey (Oct–Nov 1837; Grinnell and Miller 1944), Pebble Beach, MTY (1916; record 155-1988; see Records Not Accepted, identifica-

RECORDS NOT ACCEPTED, natural occurrence questionable (identification accepted), Cont.

tion questionable, above), and recent birds at Alameda, ALA (above), Laguna Beach, ORA (early 1960s, with jesses on legs; G. McCaskie, in comments), Montaña de Oro SP, SLO (mid-1960s; G. McCaskie, P. Lehman, in comments), and Orinda, CC (Sep 1988, J. Morlan, in comments).

The CBRC recognizes that the likelihood of any bird's natural occurrence is usually judged from insufficient data. Its bylaws now permit a record to be accepted (if there is no question as to the identification) when but 8 of 10 members support natural occurrence, whereas acceptance of an identification requires 9 of 10 votes.

While the CBRC has not accepted any certain records of Crested Caracara for California, there is little doubt that the species has occurred within the state. There is an undocumented sight record from 1853 at Ft. Yuma (Grinnell and Miller 1944), and a specimen was taken on 15 Mar 1928 at Pilot Knob, just 1 mile south of the border into Baja California (Friedmann 1950). There are Pleistocene fossils of caracaras from California at the McKittrick and La Brea tar pits (Miller 1925, 1935, Friedmann 1950).

GRAY CATBIRD *Dumetella carolinensis*. One found dead at an Interstate 5 rest area near Los Baños, MER, 25 Mar 1973 (JL; 399-1986). This flattened and desiccated specimen was considered too damaged to be retrieved but was reviewed via the observer's description. The late winter date (when the species is exceptionally rare in California) and the condition of the dead bird along a major highway convinced most members that the occurrence was more likely the result of a bird killed by a vehicle and carried into this state on the grill.

PAINTED BUNTING *Passerina ciris*. A male collected at the University of California's Sagehen Creek field station, near Hobart Mills, NEV, 17–18 Apr 1972 (UCD/SFS 252; 229-1988; Hawthorne 1972). A male at a feeder in Los Osos, SLO, 18–27 Nov 1972 (270-1986). The former, collected in pine–fir forest at 6500 feet elevation on the eastern slope of the Sierra Nevada, bore a significant scar on its forecrown, likely generated in captivity. The underparts were faded to dull yellow-orange, likely from inadequate nutrition in captivity, as happens with the red plumage of many birds. The Los Osos bird was in brighter plumage, but the majority of the Committee considers males at urban feeders to be prime candidates for captive origin.

CONTRIBUTORS

The initials of contributors of accepted records are listed in the text. The following is a list of all contributors to this report: MacGill Adams, David G. Ainley, Cindy Alberico, Jean Allen, Larry W. Allen, Garth Alton, Bertin W. Anderson, David Anderson, William Anderson, Merle Archie, Jon Atwood, Keith Axelson, Stephen F. Bailey, Brian Bainbridge (BBn), Alan Baldridge, John Ball (JBa), Norman Ball (NBa), Larry R. Ballard (LRBa), Bill Balfrey (BBy), Bruce Barrett (BBt), Alan D. Barron, H. J. Bender, Margaret H. W. Bender, Louis R. Bevier (LRBe), D. Bilek, Laurence C. Binford, Nancy Bittner (NBi), Robert J. Boekelheide, Jeff Boyd, Richard Bradley (RBy), Ronald L. Branson, Clait E. Braun, N. Bruce Broadbooks, Bill Brock (BBk), Fred J. Broerman, Betty Burridge (BBu), Eugene A. Cardiff, Chris Carpenter, Harry R. Carter, Theodore A. Chandik, Lawrence H. Clark, Neal E. Clark, Terry Clark, Herb Clarke, Fran Clever, Billy Clow, Jim Coatsworth, Terry L. Coddington, Howard L. Cogswell, Clay Coler, Robert Copper, Alan R. Craig, Nancy J. Crawford, Brian E. Daniels (BEDa), Paul DeBenedictis, R. R. DeLareuelle, David F. DeSante, Bruce E.

Deuel (BEDe), Pierre Devillers, Donna L. Dittmann, Linda Doerflinger, Jane Donley, John P. Dow, Robert J. Dummer, Jon L. Dunn, Alfred T. Driscoll, Robert Dyer, Arthur L. Edwards, Claude P. Edwards, D. H. Edwards, Ray Ekstrom, Tom Eley, Bruce G. Elliott, A. Sidney England, Richard A. Erickson, Jules G. Evens, William T. Everett, Jim Fairchild, Shawneen E. Finnegan, Bob Florand, Harriet Fraser, Gary L. Friedrichsen, Steve L. Funderburk, David A. Gaines, Kenneth Gammon, Frank F. Gander, Kimball L. Garrett, Richard E. Genelly, Ron H. Gerstenberg, Albert Ghiorso, Neil Gilchrist, L. Goldstein, Sharon Goldwasser, Arthur Gralapp, L. W. Gralapp, Helen A. Green, Douglas Greenberg, Joe Greenberg, Russell S. Greenberg, Terry Grosz, Mike W. Guest, Edward M. Hall, Jan Hamber, Fred Hamer (FHa), Keith Hansen, Rob Hansen (RHa), Tina Hargis, Stanley W. Harris, Tonna Harris, Ed N. Harrison, Lew Hastings, Marjorie Hastings, Gjon Hazard, Fred Heath (FHe), Joel T. Hedgpeth, Tom Heindel, R. Philip Henderson, Roger Higson (RHi), Craig Hohenberger, John Hollis, Joel H. Hornstein, Arthur L. Howe, Harriet Huber, Laurence M. Huey, Joseph R. Jehl, Jr., Hans Johansen, Jerome A. Johnson, Ned K. Johnson, Bill Jones, H. Lee Jones, John Kelly, Paul R. Kelly, Karl W. Kenyon, Andrea R. Kieserrman, Walter D. Koenig, Theodore Koundakjian, Karla Kramer, David Krause, Jeri M. Langham, Stephen A. Laymon, Paul E. Lehman, Gary S. Lester, Lauren P. Lester, Ron LeValley, T. James Lewis, Michael J. Lippsmeyer, William E. Lofthouse, Ruth Lohr, Nils Lunnerdal, John S. Luther, Eugene Makishima, N. J. Manetas, Tim Manolis, Curtis Marantz, Dave Mauser, C. B. Maynard, Pat McLaughlin, Guy McCaskie (GMcC), John W. McColm, Jr., Robert L. McKernan, Nelson Metcalf, Peter J. Metropulos, Grace M. Miller, Loye Miller, Gale Monson (GM), Joseph Morlan, Arthur G. Morley, Gerald G. Mugele, Stephen J. Myers, Jerry Nusbaum, Steven F. Oberbauer, Thomas A. Oberbauer, Jerry R. Oldenettel, Gary Page, Benjamin D. Parmeter, Bill Parsons, Michael A. Patten, Michael Perrone, Eileen Pierson, Robert L. Pitman, Point Reyes Bird Observatory, Dave Povey, Robert R. Prather, Eleanor A. Pugh, Peter Pyle, Sylvia Ranney, Robert R. Reid, Jr., J. Van Remsen, Jr., Jean M. Richmond, John P. Rieger, Michael F. Robbins, Don Roberson, Robin Roberson, Henry Robert, James A. Rooney, Mary Louise Rosegay, Kenneth V. Rosenberg, Stephen I. Rothstein, Ivy J. Ryno, Ronnie L. Ryno, Larry Sansone, Barry Sauppe, Phillip R. Sayre, Charles T. Schick, Donald E. Schmoldt, Thomas S. Schulenberg, Christine W. Schomaker, Eric Schomaker, Brad Schram, Debra L. Shearwater, Leonard A. Shelton, Jay Sheppard, Dave Shuford (DSh), Arnold Small (ASm), Dick & Bea Smith, Frank Sonzeri, Hal Spear, Larry B. Spear, Nancy Spear, Steve Speich (SSp), Jean-Marie Spoelman, Paul F. Springer, Alexander Sprunt IV (ASp), Louise G. Squibb, Kenneth E. Stager, Rich Stallcup (RS), John C. Sterling, Don Sterba (DSt), Roger Stone (RSn), Kenhelm W. Stott, Jr., Gary J. Strachan, Craig Strong (CSt), Brian W. Sturges, G. Shumway Suffel, Steve Summers (SSu), Philip G. Swan, Chris Swarth (CSw), Nathan Sweet, Fern R. Tainter, Dan Taylor, Leora Taylor, Richard Tenaza, Margaret Thornburgh, Neal G. Thorpe, Ernest R. Tinkham, Francis Toldi, Gerald Tolman, Melvin A. Traylor, Jr., Steve Umland, Philip Unitt, Kent Van Vuren, Richard R. Veit, Bill Wagner, Terrance R. Wahl, John F. Walters, Richard E. Webster, Ralph S. Widrig, Douglas R. Willick, Cora Wilson, John C. Wilson, Russ & Marion Wilson, Dave Winkler, Jon Winter (JWr), Janet Witzeman (JWz), Vernal L. Yadon, David G. Yee, Margarent G. Zeff.

ACKNOWLEDGMENTS

We are very thankful for the efforts of the contributors listed above. Occasionally we solicit opinions from experts outside the Committee, and sometimes useful outside commentary is sent to us unsolicited. We are always grateful for these comments, offered on the records herein by Clait E. Braun, Jennifer A. Clarke, Peter J. Grant, David J. James, Joseph R. Jehl, Jr., Lloyd Kiff, Alan McBride, Nancy J.

Newfield, F. Jay Pitocchelli, J. Van Remsen, Jr., Richard R. Veit, and Jon Winter. Danny Bystrak graciously provided information from the U.S. Fish and Wildlife Service's Bird Banding Lab, Luis F. Baptista provided information on avicultural holdings, and Thomas L. Huels provided information from the files of the Arizona Bird Records Committee housed at Arizona State University. Howard L. Cogswell, Jon L. Dunn, and Kenneth V. Rosenberg helpfully supplied the details behind their summaries on California birds, and Kimball L. Garrett unearthed details from observer notes on file at LACM. The *AB* editors for both regions covering California provided access to their files, and we especially appreciate the help from Guy McCaskie. Stanley W. Harris was very cooperative in providing missing documentation and corrected date spans from northwestern California.

We are very appreciative of the efforts of Peter Pyle, R. Philip Henderson, and David F. DeSante in obtaining Farallon Islands records, often accompanied by copies of voucher photographs. Through Pyle's efforts, we have received details of all but seven published reports from the Farallones. E. A. T. Blom, John McCormick, and especially Gary S. Lester sought out unreviewed specimens for us and photographed them; their help was invaluable. Lester tracked down the vast majority of missing Humboldt County records. Committee members Stephen F. Bailey, Michael A. Patten, and Don Roberson supplied photographs of other specimens.

The following curators or collections managers provided us access to specimens in their care: Mary LeCroy (American Museum of Natural History, New York), Luis Baptista and Stephen F. Bailey (CAS), Stanley W. Harris (HSU), Kimball L. Garrett (LACM), Ned K. Johnson and Barbara Stein (MVZ), Eugene A. Cardiff (SBCM), Wayne Arendt (SDSU), Amadeo M. Rea and Stephen Gustafson (SDNHM), and M. Ralph Browning (USNM). The Western Foundation of Vertebrate Zoology (WFVZ) continues to archive the Committee's files, and we are grateful to Jon C. Fisher and Lloyd F. Kiff for their invaluable help in maintaining these archives. Requests for copies of any of our records should be directed to the WFVZ, 439 Calle San Pablo, Camarillo, CA 93010.

Committee members who voted on some or all of these records were Stephen F. Bailey, Louis R. Bevier, Laurence C. Binford, Jon L. Dunn, Richard A. Erickson, Kimball L. Garrett, Matthew T. Heindel, Jeri M. Langham, Paul E. Lehman, Michael J. Lippsmeyer, Curtis Marantz, Guy McCaskie, Joseph Morlan, Benjamin D. Parmeter, Michael A. Patten, Peter Pyle, Don Roberson, and Rich Stallcup. I appreciate the useful comments on an earlier draft received from Rita Carratello and Committee members Bailey, Dunn, Erickson, Garrett, Heindel, Lehman, Morlan, Patten, and Pyle.

LITERATURE CITED

Ainley, D. G., and Manolis, B. 1979. Occurrence and distribution of the Mottled Petrel. W. Birds 10:113–123.

American Ornithologists' Union. 1983. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D.C.

Austin, O. L., Jr. 1949. The status of the Steller's Albatross. Pacific Sci. 3:283–295.

Bailey, H. H. 1935. A new subspecies of *Coturnicops noveboracensis*. Bailey Mus. and Lib. Nat. Hist. Bull. 10:2.

Bailey, S. F. 1991. Bill characters separating Trumpeter and Tundra swans: A cautionary note. Birding 23:89–91.

Bailey, S. F., Pyle, P., and Spear, L. B. 1989. Dark *Pterodroma* petrels of the North Pacific: Identification, status, and North American occurrence. Am. Birds 43:400–415.

Baltosser, W. H. 1987. Age, species, and sex determination of four North American hummingbrids. N. Am. Bird Bander 12:151–166.

Bevier, L. R. 1990. Eleventh report of the California Bird Records Committee. W. Birds 21:145–176.

Bergstrom, P. W. 1986. Daylight incubation sex roles in Wilson's Plover. Condor 88:113–115.

Binford, L. C. 1983. Sixth report of the California Bird Records Committee. W. Birds 14:127–145.

Binford, L. C. 1985. Seventh report of the California Bird Records Committee. W. Birds 16:29–48.

Binford, L. C. 1986. Checklist of California birds—1986. W. Birds 17:1–16.

Binford, L. C., and Remsen, J. V., Jr. 1974. Identification of the Yellow-billed Loon (*Gavia adamsii*). W. Birds 5:111–126.

Blom, R. 1985. Immature Black-crowned and Yellow-crowned night-herons. Birding 17:149.

Bolander, G., and Parmeter, B. D. 1978. Birds of Sonoma County. B. D. Parmeter, Napa, CA.

Bowman, R. I. 1961. Late spring observations on birds of South Farallon Island, California. Condor 63:410–416.

Brazil, M. A. 1991. The Birds of Japan. Smithsonian Inst. Press, Washington, D.C.

Bryant, H. C. 1914. Occurrence of the Black-bellied Tree-Duck in California. Condor 16:94.

Burleigh, T. 1968. The Indian Tree Pipit (*Anthus hodgsoni*) recorded for the first time in North America. Auk 85:323.

Campbell, R. W., Dawe, N. K., McTaggart-Cowan, I., Cooper, J. M., Kaiser, G. W., and McNall, M. C. E. 1990. The Birds of British Columbia. Vol 1. Royal British Columbia Museum, Victoria.

Cardiff, E., and Cardiff, B. 1953. Records of the Coues Flycatcher and Chestnut-sided Warbler in California. Condor 55:217.

Clarke, J. A., and Johnson, R. E. 1990. Biogeography of White-tailed Ptarmigan (*Lagopus leucurus*): Implications from an introduced population in the Sierra Nevada. J. Biogeogr. 17:649–565.

Clay, C. I. 1912. Paroquet Auklet in Humboldt County. Condor 14:196.

Cogswell, H. L. 1977. Water Birds of California. Univ. of Calif. Press, Berkeley.

Cooper, J. G. 1868. Some recent additions to the fauna of California. Proc. Calif. Acad. Sci. 4:3–13.

Craig, A. M. 1970. Two California records of Grace's Warbler. Calif. Birds 1:77–78.

Davis, J. M. 1940. Random notes from the Humboldt Bay area. Condor 42:222.

Dawson, W. L. 1923. The Birds of California. South Moulton Co., San Diego.

Delareuelle, R. R. 1938. Reddish Egret again seen near San Diego. Condor 40:183.

DeSante, D. F., and Pyle, P. 1986. Distributional Checklist of North American Birds. Artemisia Press, Lee Vining, CA.

Dunn, J. L. 1986. Tenth report of the California Bird Records Committee. W. Birds 19:129–163.

Ehrlich, P. R., Dobkin, D. S., and Wheye, D. 1988. The Birder's Handbook. Simon and Schuster, New York.

Elliott, B. G. 1976. Blue-footed Booby in northern California. W. Birds 7:155–157.

Faanes, C. A., Hanson, B. A., and Kantrud, H. A. 1979. Cassin's Sparrow—first record from Wyoming and recent range extensions. W. Birds 10:163–164.

Friedmann, H. 1950. The birds of North and Middle America, Part XI. Bull. U. S. Natl. Mus. 50:1–793.

Gaines, D. A. 1988. Birds of Yosemite and the East Slope. Artemisia Press, Lee Vining, CA.

Garrett, K., and Dunn, J. 1981. Birds of Southern California. Los Angeles Audubon Soc., Los Angeles.

Genelly, R. E. 1955. Additional records of Emperor Goose from California. Condor 57:63.

Gerstenberg, R. H., and Harris, S. W. 1970. A California specimen of the Bar-tailed Godwit. Condor 72:112.

Gillham, E. H. 1987. Tufted Ducks in a Royal Park. E. Gillham, Romney Marsh, Kent, England.

Gillham, E. H., Harrison, J. M., and Harrison, J. G. 1966. A study of certain *Aythya* hybrids. Wildfowl Trust Annual Rep. 17:49–65.

Godfrey, W. E. 1962. Yellow-billed Loon, in Handbook of North American Birds (R. S. Palmer, ed.), vol. 1, pp. 35–41. Yale Univ. Press, New Haven, CT.

Grinnell, J. 1909. The Zone-tailed Hawk in California. Condor 11:69.

Grinnell, J. 1915. A distributional list of the birds of California. Pac. Coast Avifauna 11.

Grinnell, J., Bryant, H. C., and Storer, T. I. 1918. Game Birds of California. Univ. of Calif. Press, Berkeley.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Hall, E. M. 1947. Additional records of the Scissor-tailed Flycatcher in California. Condor 49:132.

Hall, G. 1979. Hybridization between Mourning and MacGillivray's warblers. Bird-Banding 50:101–107.

Hanna, W. C., and Cardiff, E. E. 1947. Cerulean Warbler in California. Condor 49:245.

Harris, S. W. 1991. Northwestern California Birds. Humboldt State Univ., Arcata, CA.

Harris, S. W., and Yocum, C. F. 1968. Records of Snowy Owl in California. Condor 70:392.

Harris, S. W., and Gerstenberg, R. H. 1970. Common Teal and Tufted Duck in northwestern California. Condor 72:108.

Harrison, P. 1983. Seabirds: An Identification Guide. Houghton Mifflin, Boston.

Hasegawa, H. 1984. Status and conservation of seabirds in Japan, with special attention to the Short-tailed Albatross, in Status and Conservation of the World's Seabirds (J. P. Croxall, P. G. H. Evans, and R. W. Schreiber, eds.), pp. 487–500. ICBP Tech. Publ. 2.

Hawthorne, V. M. 1972. Painted Bunting record for northeastern California. Calif. Birds 3:91–92.

Heath, H. 1919. The Caracara in California. Condor 21:125.

Heaton, H. L.. 1940. Finds Yellow Rail difficult. Oologist 57: 39–41.

Hedgpeth, J. T. 1954. Falcated Teal at San Fransciso, California. Condor 56:52.

Henshaw, H. W. 1880. Ornithological report from observations and collections made in portions of California, Nevada, and Oregon. Annu. Rep. Geogr. Surv. W. 100th Meridian, Appendix L in Annu. Rep. Chief of Engineers for 1879 (G. M. Wheeler), pp. 282–335.

Hubbard, J. P. 1977. The status of Cassin's Sparrow in New Mexico and adjacent states. Am. Birds 31:933–941.

Huey, L. M. 1920. Two birds new to the lower Colorado River region. Condor 22:73.

Huey, L. M. 1933. Further occurrence of sporadic visitors in southern California. Condor 35:125–126.

Huey, L. M. 1959. The second occurrence of a Brown Booby near Parker Dam on the Colorado River. Condor 61: 223–224.

Ingersoll, A. M. 1895. Wilson's Plover in California. Nidiologist 2:87.

Ingersoll, A. M. 1918. Second occurrence of Wilson Plover in California. Condor 20:187.

James, P. 1962. Least Grebe, in Handbook of North American Birds (R. S. Palmer, ed.), vol. 1, pp. 87–94. Yale Univ. Press, New Haven, CT.

Jehl, J. R., Jr. 1985. Hybridization and evolution of oystercatchers on the Pacific coast of Baja California. Ornithol. Monogr. 36:484–504.

Johnson, J. A., and Ziegler, F. A. 1978. A Violet-crowned Hummingbird in California. W. Birds 9:91–92.

Johnson, N. K., and Garrett, K. L. 1974. Interior bird species expand breeding ranges into southern California. W. Birds 5:45–56.

Johnsgard, P. A. 1973. Grouse and Quails of North America. Univ. of Nebr. Press, Lincoln.

Jones, H. L., Garrett, K. L., and Small, A. 1981. Checklist of the birds of California. W. Birds 12:57–72.

Kaufman, K. 1990. A Field Guide to Advanced Birding. Houghton Mifflin, Boston.

Kenyon, K. W. 1937. Two sea-bird records from southern California. Condor 39:257–258.

Kowalski, M. P. 1983. Identifying Mourning and MacGillivray's warblers: Geographic variation in the MacGillivray's Warbler as a source of error. N. Am. Bird Bander 8:56–57.

Kroodsma, D. E., Meservey, W. R., and Pickert, R. 1983. Vocal learning in the Parulinae. Wilson Bull. 95:138–140.

Langham, J. M. 1991. Twelfth report of the California Bird Records Committee. W. Birds 22:97–130.

Lanyon, W. E., and Bull, J. 1967. Identification of Connecticut, Mourning, and MacGillivray's warblers. Bird-Banding 38:187–194.

Lehman, P. 1987. Immature Blackburnian and Cerulean warblers: A cautionary note. Birding 19:22–23.

Lensink, C. J. 1968. Family bonds as a factor in the migration of geese. Wildlife Mgmt. Studies 2, Clarence Rhodes Natl. Wildlife Range, Bethel, AK.

Luther, J. S. 1980. Fourth report of the California Bird Records Committee. W. Birds 11:161–173.

Luther, J. S., McCaskie, G., and Dunn, J. L. 1979. Third report of the California Bird Records Committee. W.Birds 10:169–187.

Luther, J. S., McCaskie, G., and Dunn, J. L. 1983. Fifth report of the California Bird Records Committee. W. Birds 14:1–16.

McCaskie, G. 1964. Three southern herons in California. Condor 66:442–443.

McCaskie, G. 1966. The occurrence of longspurs and Snow Buntings in California. Condor 68:597–598.

McCaskie, G. 1970a. The occurrence of four species of Pelecaniformes in the southwestern United States. Calif. Birds 1:117–142.

McCaskie, G. 1970b. Occurrence of the eastern species of *Oporornis* and *Wilsonia* in California. Condor 72:373–374.

McCaskie, G., and DeBenedictis, P. 1966. Birds of Northern California: An Annotated Field List. Golden Gate Audubon Soc., Berkeley.

McCaskie, G., DeBenedictis, P., Erickson, R., and Morlan, J. 1979. Birds of Northern California: An Annotated Field List, 2nd ed. Golden Gate Audubon Soc., Berkeley.

McCaskie, G., and Prather, R. R. 1965. The Curve-billed Thrasher in California. Condor 67:443–444.

McCaskie, G., and Roberson, D. 1992. First record of the Stejneger's Petrel in California. W. Birds 23:145–152.

McMurry, F. B., and Monson, G. 1947. Least Grebe breeding in California. Condor 49:125–126.

Miller, L. 1925. The birds of Rancho La Brea, in Studies on the fossil flora and fauna of the western United States. Contr. Palaeontol. Carnegie Inst. Washington 349:1–130.

Miller, L. 1935. A second avifauna from the McKittrick Pleistocene. Condor 37:72–79.

Miller, L. 1936. Some maritime birds observed off San Diego, California. Condor 38:9–16.

Moffitt, J. 1932. The Baikal Teal taken in California. Condor 34:193.

Monson, G. 1958. Reddish Egret and Bronzed Cowbird in California. Condor 60:191.

Monson, G., and Phillips, A. R. 1981. Annotated Checklist of the Birds of Arizona, 2nd ed. Univ. of Ariz. Press, Tucson.

Morlan, J. 1985. Eighth report of the California Bird Records Committee. W. Birds 16:105–122.

Morlan, J., and Erickson, R. A. 1983. An Eurasian Skylark at Pt. Reyes, California, with notes on skylark identification and systematics. W. Birds 14:113–126.

Nettleship, D. N., and Birkhead, T. R., eds. 1985. The Atlantic Alcidae. Academic Press, London.

Newberry, J. S. 1857. Report upon the zoology of the route. U.S. Pac. Railroad Rep., vol. 6, pt. 4:35–110.

Nilsson, G. 1981. The Bird Business: A Study of the Commercial Cage Bird Trade. Animal Welfare Inst., Washington, D.C.

Palmer, R. S. 1976. Emperor Goose, in Handbook of North American Birds (R. S. Palmer, ed.), vol. 2, pp. 171–182. Yale Univ. Press, New Haven, CT.

Paxton, R. O. 1968. Wandering Albatross in California. Auk 85:502–504.

Payne, R. B., Payne, L. L., and Doehlert, S. M. 1984. Interspecific song learning in a wild Chestnut-sided Warbler. Wilson Bull. 96:292–294.

Pitman, R. L. 1986. Atlas of seabird distribution and relative abundance in the eastern tropical Pacific. Admin. Rep. LJ-86-02C, Southwest Fisheries Center, P. O. Box 271, La Jolla, CA 92038.

Potter, E. F., Parnell, J. F., and Teulings, R. P. 1980. Birds of the Carolinas. Univ. of North Carolina Press, Chapel Hill.

Pyle, P., and Henderson, P. 1990. On separating female and immature *Oporornis* warblers in fall. Birding 22:222–229.

Pyle, P., Howell, S. N. G., Yunick, R .P., and DeSante, D. F. 1987. Identification Guide to North American Passerines. Slate Creek Press, Bolinas, CA.

Pyle, P., and McCaskie, G. 1992. Thirteenth report of the California Bird Records Committee. W. Birds 23:97–132.

Rea, A. M. 1983. Once a River. Univ. of Ariz. Press, Tucson.

Remsen, J. V., Jr., and Binford, L. C. 1975. Status of the Yellow-billed Loon (*Gavia adamsii*) in the western United States and Mexico. W. Birds 6:7–20.

Ridgway, R. 1887. A Manual of North American Birds. J. B. Lippincott, Philadelphia.

Roberson, D. 1980. Rare birds of the West Coast of North America. Woodcock Publ., Pacific Grove, CA.

Roberson, D. 1985. Monterey Birds. Monterey Peninsula Audubon Soc., Carmel, CA.

Roberson, D. 1986. Ninth report of the California Bird Records Committee. W. Birds 17:49–77.

Roberson, D., and Bailey, S. F. 1991. *Cookilaria* petrels in the eastern Pacific Ocean: Identification and distribution. Am. Birds 45:399–403; 1067–1081.

Rosenberg, K. V., Ohmart, R. D., Hunter, W. C., and Anderson, B. W. 1991. Birds of the Lower Colorado River Valley. Univ. of Ariz. Press, Tucson.

Sholes, W. H., Jr. 1946. A record of the Snow Bunting in California. Condor 48:93.

Slipp, J. W. 1952. A record of the Tasmanian White-capped Albatross, *Diomedea cauta*, in American North Pacific waters. Auk 69:458–459.

Stott, K., Jr., and Selsor, C. J. 1960. Least Grebe on the coast of southern California. Condor 62:223.

Suffel, G. S. 1970. An Olivaceous Flycatcher in California. Calif. Birds 1:79–80.

Swarth, H. S. 1932. Status of the Baikal Teal in California. Condor 34:259

Tenaza, R. R. 1967. Recent records of land birds from South Farallon Island, California. Condor 69:579–585.

Thompson, C. W. 1991. Is the Painted Bunting actually two species? Problems determining species limits between allopatric populations. Condor 93:987–1000.

Tinkham, E. R. 1949. A record of the Scissor-tailed Flycatcher from the Colorado Desert. Condor 51:98.

Tobish, T. 1991. Notes on immature swans in spring. Birding 23:88–89.

Todd, F. S. 1979. Waterfowl: Ducks, Geese, and Swans of the World. Sea World Press, San Diego.

Townsend, C. H. 1886. Four rare birds in northern California. Auk 3:490–491.

Traylor, M. A. 1950. A record of the Short-tailed Albatross. Condor 52:90.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Memoir 13.

Van Buskirk, J., Jr. 1984. Vocal mimicry of Nashville Warblers by Yellow-rumped Warblers. Wilson Bull. 96:477–482.

Wilbur, S. R., and Yocum, C. F. 1971. Unusual geese in the Pacific coast states. Murrelet 52:16–19.

Williams, A., and Miller, G. M. 1963. The Trumpeter Swan in Marin County, California. Condor 65:69.

Williams, O., and Wheat, P. 1971. Hybrid jays in Colorado. Wilson Bull. 83:343–346.

Winter, J. 1973. The California Field Ornithologists' Records Committee report 1970–1972. W. Birds 4:101–106.

Winter, J., and McCaskie, G. 1975. 1973 report of the California Field Ornithologists' Records Committee. W. Birds 6:135–144.

Yocum, C. F., and Harris, S. W. 1975. Status, Habitats, and Distribution of Birds of Northwestern California. Humboldt State Univ., Arcata, CA.

APPENDIX

This appendix lists all records published through March 1990 of species on our Review List for which a description has not been submitted to the CBRC. Most appeared in *American Birds* or its predecessor *Aububon Field Notes*. A few cited references do not specify the record listed but contain a summary of records, and we learned, by corresponding with the authors, which particular records had been summarized.

Several species listed here are no longer on the Review List: Cook's Petrel, Wilson's Storm-Petrel, Tufted Duck, Buff-breasted Sandpiper, Barred Owl, Red-throated Pipit, and Prothonotary Warbler. The CBRC reviews all records of birds that occurred prior to the date of deletion of the species from the Review List; we still desire documentation for these records. For a few other species (e.g., Blue-footed Booby, Roseate Spoonbill) the CBRC began reviewing records only after a specified date, as noted below.

This Appendix consists of four lists stratified by the apparent strength of the missing documentation. In a few cases, the Committee voted to follow a cited author and reject an undocumented record; these examples are listed in the main text (see Records Not Accepted, above).

We appreciate the efforts of all observers who provided information to us (lists B and C), and we acknowledge them in the list of contributors. We welcome and solicit details of any of these records if the reader observed the bird or can help us locate documentation from another source. We would also appreciate correspondence regarding any published record overlooked in this listing and not currently in circulation (see the Committee's definition of a "published record" in the introduction to this report). Please direct all correspondence to the CBRC secretary, Michael A. Patten, P. O. Box 8612, Riverside, CA 92515.

List A: Specimens that cannot be located (9 records). Certain other missing specimens of the Emperor Goose and Yellow Rail, including a number destroyed in the 1906 San Francisco earthquake and fire, were discussed in previous reports (Roberson 1986, Dunn 1988; see also under Yellow Rail accepted records, above). All were apparently examined by competent ornithologists. We are still attempting to locate and obtain documentation for these specimens.

BLACK-BELLIED WHISTLING-DUCK: Imperial Valley, IMP, fall of 1912 (Condor 16:94).

KING EIDER: Suisun Bay, SOL, between 15 Oct 1902 and 1 Feb 1903 (Grinnell and Miller 1944).

MISSISSIPPI KITE (*Ictinia mississippensis*): Goleta, SBA, 18 June 1933 (Grinnell and Miller 1944).

ZONE-TAILED HAWK: National City, SD, 26 Nov 1906 (Condor 11:69); Chula Vista, SD, "Apr or May" 1945 (Unitt 1984). The latter is no longer in the Santa Cruz museum where Chester Bell had told Guy McCaskie it was (Unitt 1984).

UPLAND SANDPIPER: Tule Lake, SIS, 8 Aug 1896 (Grinnell and Miller 1944).

HUDSONIAN GODWIT (*Limosa haemastica*): north end of Salton Sea, RIV, 11 Oct 1980 (AB 35:226).

PARAKEET AUKLET: found dead on San Simeon beach, SLO, 6 Feb 1955 (Murrelet 38:24).

YELLOW-GREEN VIREO: Riverside, RIV, 29 Sep 1887 (Auk 5:210).

List B: Records for which one or more observer or compiler has informed us that no details are extant (64). In six cases, written details were forwarded to *American Birds*' regional editors, who found them acceptable, but the details cannot now be located. In others, prolonged views of an unambiguous species or extensive observer experience supplemented by contemporaneous field notes suggest the identification was probably correct. In still others, the observer is deceased and a surviving spouse checked the extant field notes without finding a reviewable description.

YELLOW-BILLED LOON: Moss Landing, MTY, 11 Jan 1976 (summarized in AB 30:760).

MOTTLED PETREL: 40 nm SW of Trinidad Head, HUM, 10 Apr 1986 (AB 40: 518). The bird was "seen relatively well in relatively good light for a few seconds" by two very experienced seabird researchers (LBS, TRW) during scientific surveys.

*COOK'S PETREL: 32 nm SW of Cape Mendocino, HUM, 10 Apr 1986 (4 birds, not "2" as listed in AB 40:518). These birds were "seen relatively well in relatively good light for a few seconds" by two seabird researchers (LBS, TRW) having much experience with this species. Cook's Petrel is regular off the continental shelf from April to October.

RED-TAILED TROPICBIRD: 35°34' N, 124°21' W, some 147 nm SW of Pt. Sur, MTY, 7 Oct 1979 (summarized in AB 32:500, Roberson 1985). Both observers (GLF, RLP) were very experienced in pelagic survey work and stated that the bird was seen well, for "tropicbirds were not identified to species unless they flew close enough" for field marks to be observed. Details of three other Red-tailed Tropicbirds seen during this same cruise have been accepted by the CBRC (see Records Accepted).

BROWN BOOBY: Imperial Dam, IMP, 20 Sep 1958 (AFN 13: 53). The experienced observer (GM) "saw it ... perched on the abutment between the 2 spillway gates on the California side, apparently quite oblivious of several fisherman close by. It ... was an immature." Earlier that same day the observer had seen on Martinez Lake, Arizona, another immature Brown Booby that was present from 5 Sep 1958 to 7 Oct 1960 (see Records Accepted). He also had photographed another immature Brown Booby on the Arizona side of the Colorado River (Auk 63:96), all lending support to the probable identity of the 1958 bird.

REDDISH EGRET: Imperial NWR, IMP, 1 Oct 1954–3 Mar 1955 (AFN 9:275; McCaskie 1964). The experienced observer (GM), who had collected one just a month before on Lake Havasu (see Records Accepted), wrote in his field notes that this second individual was "a replica of the one I collected September 9th" but took no further description. The same observer, in discussing another Reddish Egret seen on 2 Sep 1960, on the Colorado River 31 miles above Imperial Dam, IMP (AFN 15:63; McCaskie 1964), wrote that his notes say it was an "immature bird." Mission Bay, SD, 19–30 Apr 1958 (AFN 12:385, a report criticized by Unitt 1984); 29 Sep 1968, San Elijo Lagoon, SD, 29 Sep 1968 (AFN 23:107; this bird might have been one of the Reddish Egrets seen at Los Peñasquitos Lagoon earlier that month, see Records Accepted); NE corner of Salton Sea, RIV, 10 July 1972 (AB 26:904); San Diego Bay, SD, 19 Feb 1982 (AB 36:330).

YELLOW-CROWNED NIGHT-HERON: Claremont, LA, 27 Mar–6 Apr 1963 (AFN 17: 434). This adult was approached close enough to photograph, but the pictures have not yet been located, either by the photograher (LAS) or at SDNHM, where McCaskie (1964) reported they were deposited. However, the photos were reviewed by competent field ornithologists, and this may have been the same bird present May–June 1963 at Harbor Lake, LA (accepted record; Roberson 1986).

EMPEROR GOOSE: Tomales Bay, MRN, 18 Dec 1948 (summarized by Cogswell 1977); Avila Beach, SLO, 12 Dec 1966 (AFN 21:457); Morro Bay, SLO, 15–16 Dec 1968 (AFN 23:520); Limantour, MRN, 27–31 Dec 1967 (AFN 22:473); San Simeon, SLO, 18–30 Dec 1968 (AFN 23: 520). Tule Lake, SIS, 5 Nov 1973 (AB 28:100). The experienced observer of the last (BEDe) forwarded a description to *AB* and took photos, but neither can now be located.

KING EIDER: San Pedro, LA, 29 Jan–early Feb 1983 (AB 37:338).

MISSISSIPPI KITE: Santa Barbara, SBA, 3 June 1970 (AFN 24:644).

MONGOLIAN PLOVER (*Charadrius mongolus*): Moss Landing SB, MTY, 3 Oct 1980 (AB 35:221). In *AB* this was considered the late date of one present at the nearby salt ponds 13–19 Sep 1980 (previously accepted; Luther et al. 1983), but there was a substantial gap between sightings and the bird "did not appear to be as bright" as the earlier bird (the only "description" available). It is best considered a separate and undocumented record.

WILSON'S PLOVER: Imperial Beach, SD, 11 May 1918. The observer had collected California's first Wilson's Plover in 1894 (Ingersoll 1895) and set out the circumstances of this second sighting in detail (Ingersoll 1918), but the published note does not include a description. Ingersoll suspected, from the bird's behavior, that it was mated to an unseen brooding female, but the nest was not found. Although there are no coastal breeding records of this bird in California, the details ring true, particularly in light of the egg set from the Salton Sea (see Records Accepted, above).

UPLAND SANDPIPER: Needles Landing, Lake Havasu, SBE, 11 Sep 1952 (AFN 7:29). The very experienced observer (GM) sent us his field notes, which describe the behavior and call, but not the plumage: "I could scarce believe my eyes, even though I have fancied seeing one on the refuge some day! It flushed, flew off a short ways, then lighted, folding its wings in the graceful way so typical of Upland Plovers [= Sandpipers], an act I witnessed many a time during my young North Dakota days. That was enough really to cinch identification, so I rushed back to the campground for my .410. However, the Plover had other ideas, for no matter how carefully I stalked it, it always flew off while I was still ... out of range.... I finally gave up, without feeling too sorry.... It gave a short, rolling call a couple of times."

*BUFF-BREASTED SANDPIPER: Arcata, HUM, 26 Aug 1978 (AB 33:210); Salinas R. mouth, MTY, 3 Sep 1978 (AB 33:210); Arcata bottoms, HUM, 11–12 Sep 1979 (2) (AB 34:196); Oxnard plain, VEN, 16–18 Sep 1979 (7) (AB 34:201).

BROAD-BILLED HUMMINGBIRD: Spring Valley, SD, 8–10 Mar 1979 (AB 33:314). The observer (MT) wrote that it was a male watched coming to a neighbor's

feeder over several days and was first discovered when its "chattering caught my attention"; this species does have a chatter recalling the Ruby-crowned Kinglet's (*Regulus calendula*). The observer recognized it from Arizona experience but wrote no description. Cabazon, RIV, 24 Sep 1979 (AB 34:202).

VIOLET-CROWNED HUMMINGBIRD (*Amazilia violiceps*): Santa Paula, VEN, 29 June–5 July 1977 (Johnson and Ziegler 1978, Roberson 1980; said to be same bird as accepted under CBRC 36-1976 returning for its second summer).

SCISSOR-TAILED FLYCATCHER: Trinidad, HUM, 7 May 1969 (AFN 23:622). Calexico, IMP, 26 Mar 1974 (Garrett and Dunn 1981). The Committee has from *AB* files the observer's (JPD) written details stating that this bird was photographed from 30 feet and watched for 30 minutes, but it has been unable to locate the observer or the photograph. Furnace Creek Ranch, Death Valley NM, INY, 24 May 1974 (AB 28:853). Chiriaco Summit, RIV, 30–31 Jan 1976 (AB 30:768). The observer (JPR), conducting surveys with four other biologists, watched the bird on a fence post only 20 feet from the car for 3 minutes. He wrote a description and forwarded it at the time to *AB*, but it cannot now be located. Westgard Pass, INY, 4 June 1978 (AB 32:1056). The notes of the very experienced observer (REW) state that the bird had a "full tail" and was "very bright," which he recalls referring to the intensity of "the salmon color," and that it was "moving from conifer to conifer across the pass area," but no further details were taken. Woodside, SM, 7 June 1983 (AB 37:1025).

GRAY CATBIRD: Balboa Park, San Diego, SD, 16 Dec 1972 (Unitt 1984).

SPRAGUE'S PIPIT: Furnace Creek Ranch, INY, 2 Oct 1979 (AB 34:202).

YELLOW-THROATED VIREO: Cambria, SLO, 24 May 1966 (AFN 20:547).

PHILADELPHIA VIREO: Furnace Creek Ranch, INY, 25 Oct 1975 (AB 30:128); Pt. Reyes NS, MRN, 3 Oct 1983 (AB 38:244). The experienced observer of the latter (BDP) had good views and forwarded a description at the time to *AB*, but it cannot now be located.

YELLOW-GREEN VIREO: Goleta, SBA, 11 Oct 1982 (second bird; first bird accepted; Langham 1991) (AB 37:225).

GOLDEN-WINGED WARBLER: San Bernardino, SBE, 8 Dec 1962 (Garrett and Dunn 1981); Honey Lake, LAS, 10 Oct 1976 (McCaskie et al. 1979). The latter bird was watched to within 10 feet in large cottonwoods around the headquarters building and "had bright dramatic markings," but no description was written nor was possible hybridization considered.

YELLOW-THROATED WARBLER: Santa Barbara, SBA, 9–14 June 1979 (AB 33:806). The good observer (BS) recalled the trees it was in (same spot as the 1981 Yellow-throated Warbler previously accepted from this locale; see Binford 1985) and recalled seeing it well enough to determine it was of the white-lored race, but took no actual description.

GRACE'S WARBLER: Clark Mt., SBE, 30 May 1974. The published details (Johnson and Garrett 1974) state that Johnson "found a steadily singing male in the mixed forest of White Fir and pinyon at 7100 feet elevation on the north slope.... The bird stayed within close range and was watched for over one hour as it sang and infrequently foraged in both firs and pinyon." Three other May records from the firs on Clark Mt. have been accepted by the Committee.

*PROTHONOTARY WARBLER: Pt. Loma, SD, 4 Nov 1967 (AFN 22:91); Pt. Loma, SD, 25 Oct 1987 (AB 42:138).

WORM-EATING WARBLER: Oasis, MNO, 26 May 1981 (AB 35:864).

KENTUCKY WARBLER: SE Farallon I., SF, 2 June 1969 (AFN 23:693).

CONNECTICUT WARBLER: SE Farallon I., SF, 28–30 May 1965 (Condor 69:582); SE Farallon I., SF, 4 Oct 1968 (AFN 23:105).

MOURNING WARBLER: Goleta, SBA, 23 Sep 1982 (AB 37:225). The experienced observer (LRBe) forwarded a description at the time to *AB*, but it cannot now be located.

SCARLET TANAGER: Otay Mesa, SD, 21 Oct 1979 (AB 34:203); Carpinteria, SBA, 14 Sep 1982 (AB 37:225). The experienced observer of the latter (LRBe) forwarded a description at the time to *AB*, but it cannot now be located.

PYRRHULOXIA: Mecca, RIV, 10 Feb–29 Mar 1953 (AFN 7:236); near south end of Salton Sea, IMP, 28 Apr 1974 (AB 28:854).

VARIED BUNTING *(Passerina versicolor)*: Arcadia, LA, 7 Aug 1966 (Garrett and Dunn 1981).

PAINTED BUNTING: Tijuana R. valley, SD, 17–24 Sep 1967 (AFN 22:92); Kelso, SBE, 21 Oct 1972 (Garrett and Dunn 1981); Tijuana R. valley, SD, 12 Oct 1974 (AB 29:124). Although no details of these birds apparently exist, the former two reports were of adult males whose natural occurrence might have been questioned.

RUSTIC BUNTING *(Emberiza rustica)*: Upland, SBE, 18 Nov 1965 (*AFN* 20:461).

SNOW BUNTING: Arcata, HUM, 19–20 Nov 1975 (AB 30:124); Sand I., Humboldt Bay, HUM, 9 Nov 1977 (3) and Cape Mendocino, HUM, 9–14 Nov 1977 (both summarized in AB 32:255); Salmon Creek beach, SON, 23 Oct 1982 (AB 37:222).

STREAK-BACKED ORIOLE: Rancho Park, LA, 2–5 Jan 1966 (AFN 20:461).

List C: Records for which the observer was written one or more times with a request for details, but the Committee has received no response to our request (60). We can only presume that no description is available and that these are undocumented reports. We welcome the submission of any details subsequently discovered.

YELLOW-BILLED LOON: Inverness, MRN, 25 Jan 1971 (AB 25:620; record accepted by Remsen and Binford 1975).

*COOK'S PETREL: off southern California on a California Cooperative Fisheries Investigation cruise, 13–14 Oct 1988 (13) (AB 43:167). These were in the same area in which the species has proved to be regular.

STREAKED SHEARWATER (*Calonectris leucomelas*): Monterey Bay, MTY, 14 Oct 1978 (AB 33:209).

*WILSON'S STORM-PETREL: off Morro Bay, SLO, 7 Sep 1969 (AFN 24:196).

REDDISH EGRET: Imperial Beach, SD, 6–8 Aug 1989 (AB 44:161).

EMPEROR GOOSE: Pescadero, SM, 13 Apr 1960 (AFN 14:417); Aptos, SCZ, 19 Apr 1964 (AFN 18:483).

*TUFTED DUCK: Inverness, MRN, 15 Feb 1987 (AB 41:323).

MISSISSIPPI KITE: Furnace Creek, INY, 21 May 1973 (second bird; first bird accepted; Winter and McCaskie 1975) (AB 27:819); Imperial Beach, SD, 5 June 1983 (AB 37:912).

ZONE-TAILED HAWK: Oceanside, SD, 13 Jan 1978 (AB 32:399); Pt. Loma, SD, 20 Sep 1980 (AB 35:226).

YELLOW RAIL: San Jacinto Lake, RIV, 15–19 Apr 1978 (AB 32:1054); Tuolumne Meadows, Yosemite NP, TUO, 15 July 1980, (Gaines 1988).

UPLAND SANDPIPER: Furnace Creek Ranch, INY, 29 May 1984 (AB 38:960).

*BUFF-BREASTED SANDPIPER: Oxnard plain, VEN, 23 Sep–6 Oct 1979 (AB 34:201); Pt. Mugu, VEN, 25 Sep 1980 (AB 35:226); Lake Talawa, DN, 17 Aug 1986 (AB 41:139); Lake Talawa, DN, 29 Aug–12 Sep 1988 (one more during this span than the two already accepted here; see Pyle and McCaskie 1992) (AB 43:163).

BROAD-BILLED HUMMINGBIRD: Chimney Creek, KER, 24–27 Apr 1983 (AB 37:913).

GREATER PEWEE: Imperial Dam, IMP, "Dec" 1967 (AFN 22:479); Riverside, RIV, 19 Dec 1975 (AB 30: 768).

THICK-BILLED KINGBIRD: Pt. Loma, SD, 3 Dec 1966 (AFN 21:78).

SCISSOR-TAILED FLYCATCHER: Los Angeles, LA, 12 Dec 1956 (Garrett and Dunn 1981); Smith R. mouth, DN, 1 May 1982 (AB 36:891); Moss Beach, SM, 28 May 1983 (AB 37:1025)

GRAY CATBIRD: Furnace Creek Ranch, INY, 30 May 1974 (AB 28:950); Ft. Piute, SBE, 31 May 1978 (AB 32:1056).

*RED-THROATED PIPIT: Oxnard plain, VEN, 19 Oct 1979 (2) (AB 34:202); Tijuana R. valley, SD, 4 Oct 1982 (AB 37:225).

PHILADELPHIA VIREO: Kelso, SBE, 3 Oct 1970 (AB 25:110); Kelso, SBE, 5 Oct 1975 (AB 30:128); Furnace Creek Ranch, INY, 27–30 May 1976 (AB 30:892); Tijuana R. valley, SD, 15 Oct 1977 (AB 32:262); Pt. Reyes NS, MRN, 18 Sep 1987 (AB 42:132).

YELLOW-GREEN VIREO: Pt. Loma, SD, 12 Oct 1988 (AB 43:170).

BLUE-WINGED WARBLER: Deep Springs, INY, 27 May 1975 (AB 29:910).

YELLOW-THROATED WARBLER: Deep Springs, INY, 25 June 1989 (AB 43:1369). The citation states the bird was of a yellow-lored race, but there are no details in *AB* files.

GRACE'S WARBLER: Clark Mt., SBE, 29 May 1984 (2) (AB 38:962); Pt. Loma, SD, 27 Sep 1987 (AB 42:138); Pt. Loma, SD, 11 Nov 1987 (AB 42:138).

*PROTHONOTARY WARBLER: Pt. Loma, SD, 18 May 1985 (AB 39:351).

WORM-EATING WARBLER: Pacific Grove, MTY, 21 Oct 1972 (AB 27:117); Riverside, RIV, 30 Oct–6 Nov 1975 (AB 30:129); Pt. Loma, SD, 27 May 1985 (AB 39:351); near Fairhaven, HUM, 9 June 1987 (Harris 1991).

CONNECTICUT WARBLER: Furnace Creek Ranch, INY, 20 Sep 1980 (AB 35:228).

MOURNING WARBLER: Pt. Reyes NS, MRN, 21 Sep 1984 (AB 39:100); Pt. Loma, SD, 2 Oct 1985 (AB 40:160).

SCARLET TANAGER: Pt. Loma, SD, 29 Sep 1987 (AB 42:139); Pt. Loma, SD, 7 Nov 1987 (AB 42:139); Pt. Loma, SD, 16 Oct 1988 (AB 43:170); Pt. Loma, SD, 29 Oct 1988 (AB 43:170); Deep Springs, INY, 30 Sep 1989 (AB 44:164).

PYRRHULOXIA: Brock Ranch, IMP, 23 Dec 1977 (AB 32:401).

PAINTED BUNTING: Vallecitos, SD, 4 Oct 1977 (AB 32:264).

SNOW BUNTING: SE Farallon I., SF, 24 Oct 1981 (AB 36:216).

COMMON GRACKLE: near Blythe, RIV, 9 June 1979 (AB 33:898); California City, KER, 21 May 1988 (AB 42:483).

List D: Published records for which we have been unable to contact any observer (a minimum of 114). This list includes records said to be supported by specimens that were either not reviewed by any ornithologists (mostly waterfowl shot by hunters) or reports that may be erroneous entries in the literature.

YELLOW-BILLED LOON: Bodega Bay, SON, 20 Oct 1968 (AFN 23:99); this record was accepted by Remsen and Binford (1975), who said the bird was photographed, but we cannot locate the photo.

LEAST GREBE: West Pond, Imperial Dam, IMP, 14 May–22 June 1955 (Rosenberg et al. 1991).

BLUE-FOOTED BOOBY (records 1972 and later only): Lake Henshaw, SD, 18 Aug 1977 (AB 32:256).

BROWN BOOBY: Prince Islet off San Miguel I., SBA, 10 July 1956, 25–26 July 1961, and 5 June and 20 July 1968 (AFN 15:492, AFN 22: 647, and information from Don Bleitz found in AB files); this might be the same bird photographed here in 1965, already accepted (see Roberson 1986); Salton City, IMP, 4 Sep 1972 (AB 27:120); Imperial Dam, IMP, 26 Aug 1973 (AB 28:87).

REDDISH EGRET: San Diego Bay, SD, 12 Feb 1931 (Condor 33:125; no description in the published note); Ferguson Lake, Colorado River, IMP, 19 Nov 1955 (AFN 10:45; McCaskie 1964); Morro Bay, SLO, 9 July 1962 (AFN 16:507,

McCaskie 1964); San Elijo Lagoon, SD, 11–18 Sep 1962 (AFN 17:67; McCaskie 1964); Salton City, IMP, 15 Aug 1981 (AB 36:217). A photograph of the last was said to have been deposited at SDNHM, but the picture has not been found.

WHITE IBIS (*Eudocimus albus*): Palo Verde, Colorado River, IMP, Mar 1914 (Condor 25:181). The record was accepted by Grinnell and Miller (1944), but Garrett and Dunn (1981) noted that it "lacks supporting details." The published note stresses only the observer's Mexican experience.

ROSEATE SPOONBILL (records 1978 and later only): Pt. Mugu, VEN, "Dec 1977–Jan 1978" (AB 32:398).

BLACK-BELLIED WHISTLING-DUCK: Bakersfield, KER, 19 Nov 1973 (3) (AB 28:691); there was speculation these birds were the same as those accepted from the Salton Sea earlier that fall (Luther et al. 1979).

TRUMPETER SWAN: Pt. Reyes NS, MRN, 29 Dec 1963 (2) (AFN 18:321). In addition, Grinnell and Miller (1944) listed several other unverifiable, mostly 19th-century records.

EMPEROR GOOSE: "Humboldt County," 23 Dec 1920 (Lensink 1968); Buhne Pt., King Salmon, HUM, "mid-Feb"–26 Apr 1925 (initially 6 birds; 1 taken and at MVZ is currently in circulation; two more were said to have been shot (Condor 42: 222) and another was found dead (C. Clay's unpublished notes, summarized by Harris 1991); Klamath Basin, SIS, "1932" (Wilbur and Yocum 1971); Humboldt Bay, HUM, 27 Jan 1933 [second bird; specimen record of first bird published by Grinnell and Miller (1944) is in circulation]; Gridley, BUT, 21 Nov 1940 (Condor 50:271); Sacramento NWR, GLE, 27 Nov 1941 (Lensink 1968); Tule Lake, SIS, 8 Dec 1941–1942 (4) (Wilbur and Yocum 1971); Eureka ship channel, Humboldt Bay, HUM, 3 Dec 1942 (shot; Condor 48:282); Buhne Pt., King Salmon, HUM, 1–27 Feb 1947 (3 to 6) (some shot; Condor 49:172–173); Bay Bridge toll plaza, ALA, 26 Oct 1947, (Condor 50:133); Cayucos, SLO, 2 Dec 1951 (summarized by Cogswell 1977); N. Humboldt Bay, HUM, 12 Dec 1951 (second specimen; see Records Accepted); Tule Lake NWR, SIS, 18 Apr 1955 (Lensink 1968); Lower Klamath NWR, SIS, "Oct" 1955 (Lensink 1968); Crescent City, DN, 31 Dec 1957–4 Jan 1958 (up to 5) (Lensink 1968; summarized by Harris 1991); Lower Klamath NWR, SIS, "Nov" 1958 (Wilbur and Yocum 1971); Lower Klamath NWR, SIS, 21 Oct 1961 (AFN 16:60); Elk R. mouth, Humboldt Bay, HUM, 8 Nov 1961 (Lensink 1968); Klamath Basin, SIS, "1962" (Wilbur and Yocum 1971); Klamath Basin, SIS, "Nov" 1964 (flock of 25, two said to have been taken) (Wilbur and Yocum 1971); Klamath Basin, SIS, "Nov" 1965 (9) (Wilbur and Yocum 1971); Woodland, YOL, 8 Feb 1965; Klamath Basin, SIS, "1966" ("more than one") (Wilbur and Yocum 1971); Limantour, Pt. Reyes NS, MRN, 7 Dec 1966 (AFN 21:453); Eel R. delta, HUM, 10 Dec 1967 (2, 1 shot) (summarized by Harris 1991); Crescent City, DN, 18–31 Dec 1967 (summarized by Harris 1991); Lake Earl, DN, 4 Jan 1968 (2) (summarized by Harris 1991); Eel R. delta, HUM, 7 Dec 1968 (summarized by Harris 1991); Tule Lake, SIS, 11 Oct 1969 (5) (summarized by Cogswell 1977); Tule Lake, SIS, 10 Oct 1971 (summarized by Cogswell 1977); Big Lagoon, HUM, 11 Nov 1972 (AB 27:114); Pismo Beach, SLO, 15 Dec 1977 (AB 32:399); Sand I., Humboldt Bay, HUM, 23 Dec 1977 (shot; summarized by Harris 1991); coastal Del Norte and Humboldt counties, "Jan" 1982 (7 more than the 1 already accepted, including 3 shot by hunters on Big Lagoon, HUM) (summarized in AB 32:326 and by Harris 1991); Lower Klamath NWR, SIS, 20 Oct 1982 (shot, AB 37:219); Hunter Rocks, DN, 13–16 Jan 1984 (AB 38:352).

There is a possibility that some of the Klamath Basin birds were in Oregon, although it seems likely most were from California; few details exist (beyond the year reported) for many of these. A high percentage (40%) of Emperor Goose published records remains unreviewable. Presumably many birds were retained by hunters. Given the possibility of confusion with dark Ross' Geese (see discussion under

Records Accepted), we may never know the historical extent of the Emperor Goose in northeastern California.

AMERICAN BLACK DUCK: Biggs, BUT, 17 Dec 1960; Lower Klamath NWR, SIS, "Nov" 1962; Lower Klamath NWR, SIS, "Sep" 1963 (McCaskie and DeBenedictis 1966). All were said to have been either shot or found dead, but apparently none was deposited in a museum.

*TUFTED DUCK: Pt. Mugu, VEN, 18 Apr 1978 (AB 32:1054).

KING EIDER: Blackpoint, San Francisco, SF, "winter 1879-1880" (Grinnell and Miller 1944; this specimen was apparently never examined by an ornithologist); Bolinas Lagoon, MRN, 26 Oct and 2 Nov 1973 (both said by AB 28:100 to have been found dead or dying and preserved, but we have not located the specimens).

ZONE-TAILED HAWK: Furnace Creek Ranch, INY, 11 Jan 1934 (Condor 37:240); Corte Madera Lake, SD, 10 Jan 1980 (AB 35:335).

YELLOW RAIL (1940 and later only): Tomales Bay, MRN, 13 Feb 1961 (McCaskie et al. 1979).

AMERICAN OYSTERCATCHER: Whites Landing, Santa Catalina I., LA, 12 Feb 1910 (Condor 13:76). No description accompanies the published note, although the bird was said to be "positively identified" as it left the shore and "circled the boat." Grinnell and Miller (1944) considererd the record "somewhat doubtful."

WILSON'S PLOVER: San Diego, SD, 29 Dec 1956 (AFN 11:231); Sorrento Valley, SD, 19 Apr 1961 (3) (AFN 15:43).

UPLAND SANDPIPER: Furnace Creek Ranch, INY, 13 May 1959 (Garrett and Dunn 1981).

*BUFF-BREASTED SANDPIPER: Furnace Creek, INY, 1–5 July 1935 (Condor 38:40); Pt. Mugu, VEN, 13 Sep 1980 (3) (AB 35:226; see discussion under Accepted Records).

LITTLE GULL: south end of Salton Sea, IMP, 3 Dec 1972 (AB 27:663).

BLACK-BILLED CUCKOO (*Coccyzus erythropthalmus*): Fresno, FRE, "March" 1918 (McCaskie and DeBenedictis 1966; specimen said to be at Washington State Univ., but it is not there and the reference may be in error).

SNOWY OWL: Pt. Reyes NS, MRN, 22 Dec 1973 (AB 28:685; see discussion under Records Accepted); aboard a boat 20 mi. W of Eureka, HUM, 17 Nov 1977 (Harris 1991).

*BARRED OWL (*Strix varia*): Somes Bar, SIS, "May" 1986 (AB 40:1252); NE of Zenia, TRI, Apr–June and Sep 1988 (pair), returning 17 Apr–13 June 1989 (AB 43:1364); Wheel Gulch, Ten Mile R., MEN, July 1989 (2 birds) (AB 43:1364).

SCISSOR-TAILED FLYCATCHER: La Jolla, SD, 24 Nov 1933 (Grinnell and Miller 1944); Cayucos, SLO, 28 Nov–5 Dec 1934 (Grinnell and Miller 1944); Anaheim, ORA, "Apr" 1947 (AFN 1:165); Playa del Rey, LA, 20 June 1949 (AFN 3:252); Santa Cruz, SCZ, 18 Nov 1955 (AFN 10:52); El Cerrito, CC, 24 June 1956 (AFN 10:407); Bolinas, MRN, 2 June 1974 (summarized in Roberson 1980); El Monte, LA, 23 July 1975 (AB 29:1033); Dos Palmas Springs, RIV, 14 July 1976 (Garrett and Dunn 1981); Palo Verde, IMP, 3–8 Oct 1977 (AB 32:259); Pt. Reyes NS, MRN, 7 Aug 1980 (AB 35:222); Pt. Reyes NS, MRN, 6 Aug 1983 (AB 38:243).

CURVE-BILLED THRASHER: Ramer Lake, IMP, 18 Dec 1973 (AB 28:535; published only as a "Bendire's/Curve-billed"); Brawley, IMP, 28 Nov 1974 (AB 29:123).

SPRAGUE'S PIPIT: near Westmorland, IMP, 6 Dec 1986 (AB 41:331).

PHILADELPHIA VIREO: San Pedro, LA, 13 Oct 1975 (AB 30:128).

YELLOW-GREEN VIREO: Costa Mesa, ORA, 3 Oct 1967 (AFN 22:91).

YELLOW-THROATED WARBLER: Pt. Loma, SD, 19 Sep 1973 (AB 28:110); Pt. Loma, SD, 3 June 1979 (AB 33:806); Furnace Creek, INY, 24 May 1980 (Garrett and Dunn 1981).

*PROTHONOTARY WARBLER: Morongo Valley, SBE, 6 May 1963 (AFN 17:435); San Diego, SD, 29 May–2 June 1978 (AB 32:1056); San Pedro, LA, 21 Sep 1981 (AB 36:219); Pasadena, LA, 27 Sep 1981 (AB 36:219); Santa Monica Canyon, LA, 29 Sep 1983 (AB 38:248).

KENTUCKY WARBLER: SE Farallon I., SF, 18 June 1976 (AB 30:1001).

PYRRHULOXIA: Cottonwood Springs, RIV, 6–7 May 1961 (AFN 15:440).

PAINTED BUNTING: Oakland, ALA, 9–11 Mar 1969 (male; AFN 23:518); Ventura, VEN, 17 Oct 1980 (male; AB 35:228). Both were considered escapees *AB* regional editors.

LE CONTE'S SPARROW (*Ammodramus leconteii*): Little Lake, INY, 23–24 Oct 1976 (AB 31:225).

SNOW BUNTING: Sand I., Humboldt Bay, HUM, 26 Nov 1968 (summarized by Harris 1991); Bodega Bay, SON, 9 Nov 1969 (2) (AFN 24:95); Saratoga Springs, Death Valley NM, SBE, 15 Nov 1971 (AB 26:124); Samoa, HUM, 4 Nov 1975 (2) (AB 30:124; one of these might have been the lone bird present here 7–17 Nov 1975, previously accepted; Roberson 1985); Cape Mendocino, HUM, 19–20 Nov 1978; Mad R. mouth, HUM, 26 Oct 1980; Arcata, HUM, 7 Nov 1981; Eel R. mouth, HUM, 11 Nov 1981 (2); Big Lagoon, HUM, 22 Dec 1981 (AB 36:329); Arcata, HUM, 30 Nov–3 Dec 1986 (said to have been photographed); King Salmon, HUM, 24 Nov 1988 (last six records summarized by Harris 1991).

Accepted 15 October 1992

SEABIRD OBSERVATIONS OFF WESTERN MEXICO

STEVE N. G. HOWELL, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970

STEVEN J. ENGEL, 1324 Second Street, Bismarck, North Dakota 58501

Southern Mexico's offshore Pacific avifauna has been rather little studied. Murphy (1958) and Jehl (1974) reported observations from cruises that passed through Mexican waters in November and December 1956 and in April 1973, respectively. Pitman (1986) mapped the relative abundance of 57 species of seabirds in the eastern tropical Pacific on the basis on 4333 hours of observation between 1974 and 1984; only a small number of these 4333 hours (81 noon positions, 55 of which were off Baja California), however, pertain to Mexican waters (i.e., within 200 nautical miles of Mexican territory), and 74% of the 81 noon positions were between October and March (R. L. Pitman pers. comm.). Pitman's atlas provides an excellent large-scale picture but lacks data on seasonal status of species, and the scale employed does not enable one to interpret local distributions. Other records of seabirds off western Mexico are widely scattered and mostly derive from nearshore land-based trips of a day or less (e.g., Binford 1970, 1989).

The Middle American Trench runs from the vicinity of the Islas Tres Marias, Mexico, to the Cocos Ridge, south of Costa Rica. The trench lies some 55–110 km (mean distance 75 km) offshore between Jalisco and Guerrero and is 15–50 km (mostly 20–30 km) wide. The trench is at least 3600 m deep, mostly 4300–4650 m deep from central Jalisco south, and increases to 5000–5200 m deep off central Guerrero; submarine mountains in the trench off Colima (Manzanillo) and Guerrero (Zihuatanejo) reduce depths to 3600 m. On either side of the trench waters quickly shallow to 2700–3200 m, and inshore the 1000-fathom (1800-m) contour line lies 20–55 km (mostly 35–55 km) off the coast.

From 28 April to 6 May 1992 we observed seabirds off western Mexico out to 100 km from shore, that is, from just offshore of to well inshore of the Middle American Trench, between the vicinity of Cabo Corrientes, Jalisco, and Acapulco, Guerrero. Here we describe the birds observed during our visit.

ITINERARY AND METHODS

We began observations at dawn on 28 April at 19°51' N, 106°28' W, about 110 km west-southwest of Cabo Corrientes and just offshore of the northern end of the trench. Figure 1 shows the routes of our daylight transits off western Mexico relative to the Middle American Trench. Other than 29 April and 4 May, when we made stops for supplies, daily transits were 85–145 km, with variation due to time spent observing feeding flocks and the effect of currents on our cruising speed. On 3 May we circled Las Rocas Potosí (17°32' N, 101°31' W), 13 km southeast of Zihuatanejo, and on 4 May we checked various islets 10–18 km west of Zihuatanejo (including Las Islas Blancas and Isla Grande).

SEABIRD OBSERVATIONS

We made observations with 8 × 30 binoculars throughout the day from the deck of the 14.5-m ketch *Enchantress*. Our eye level was about 3 m above sea level, giving a visible horizon of 5.5–7 km. For 30 continuous minutes of every hour of transit we counted all birds within 200 m of the vessel within a 90° sector (ahead to either port or starboard, depending on light, wind, and/or sail conditions). The radius of 200 m was chosen since beyond that distance, in winds of more than 10–15 km/h, we often were unable to identify to species smaller birds such as storm-petrels or phalaropes. Our speed over the ground averaged 11 km/h and was rarely below 9 or above 13 km/h.

We frequently changed course to observe feeding flocks within 5 km of our course more closely, and we noted the composition and behavior of species in each flock (from 5 to 45 minutes were spent at each feeding flock). We discontinued any 30-minute observation period interrupted by such course changes since it no longer represented a random transit.

One or both of us were on deck during all daylight hours and maintained a nonstandardized watch for seabirds (i.e., anything we could see from the vessel regardless of distance and direction) when not making 30-minute censuses or observing feeding flocks.

We took the surface water temperature at the start of each 30-minute observation period and at the location of each feeding flock. Positions were determined by means of a Magellan Global Positioning System; depths were interpolated to the nearest 50 m from Defense Mapping Agency chart numbers 21017 and 21020. The warmest waters were consistently those inshore of the trench (in depths of 900–3000 m), which averaged 0.5–1.0°C warmer than waters from the inshore edge of the trench to offshore of the trench. Monthly mean sea-surface temperatures for these waters are 1.0–2.5°C cooler in April and 0.5–2.0°C cooler in May than the temperatures we recorded (Robinson 1976). The relatively warm waters of our cruise probably reflect a well-developed El Niño–Southern Oscillation.

Winds were generally light (1–10 km/h), although for brief periods on 29 and 30 April they increased to 20–25 km/h. Wind direction was mostly from south to west off Jalisco, Colima, and Michoacan, and mostly northwest to west off Guerrero.

RESULTS AND DISCUSSION

Table 1 presents the results of our standardized daily censuses as birds per hour (total individuals recorded per day during census periods divided by total daily hours of census). The following species accounts describe the abundance and distribution of the 30 species of seabirds recorded more than 3 km from shore and other species of note. Common coastal species such as the Brown Pelican (*Pelecanus occidentalis*) and Laughing Gull (*Larus atricilla*) are thus omitted from the accounts.

While terms such as "rare," "common," etc., will always be subjective, we consider them useful; data for each species indicate the basis for our assessments of abundance. The numbers given in parentheses after each species' name indicate the total number observed (including standardized and nonstandardized observations and feeding flocks, but not individuals at

inshore rocks and islets), maximum number recorded per day, and number of days recorded. An asterisk after the daily maximum indicates that the high total was recorded on two days. Water temperature ranges are given at the end of each species account.

Species Accounts

Laysan Albatross, *Diomedea immutabilis* (1; 1/1). Rare. We saw one on 28 Apr associating with a feeding flock over the northern end of the trench; 29.4°C. This species has colonized islands off western Mexico in recent years (Howell and Webb 1992); Isla San Benedicto is the breeding site nearest our observation.

Pink-footed Shearwater, *Puffinus creatopus* (481; 160/8). Common to fairly common; less common in the southern half of our study area (Table 1). We recorded Pink-footed Shearwaters to within 20 km of shore but most were more than 25 km offshore over waters more than 1000 m deep. This species often was a common member of feeding flocks over midshore and offshore waters. 25.6–29.4°C.

Wedge-tailed Shearwater, *P. pacificus* (124; 75/5). Fairly common to uncommon in southern waters warmer than 27.5°C, with only one seen north of Michoacan. Wedge-tailed Shearwaters occurred to within 3.5 km of shore but most were 20–75

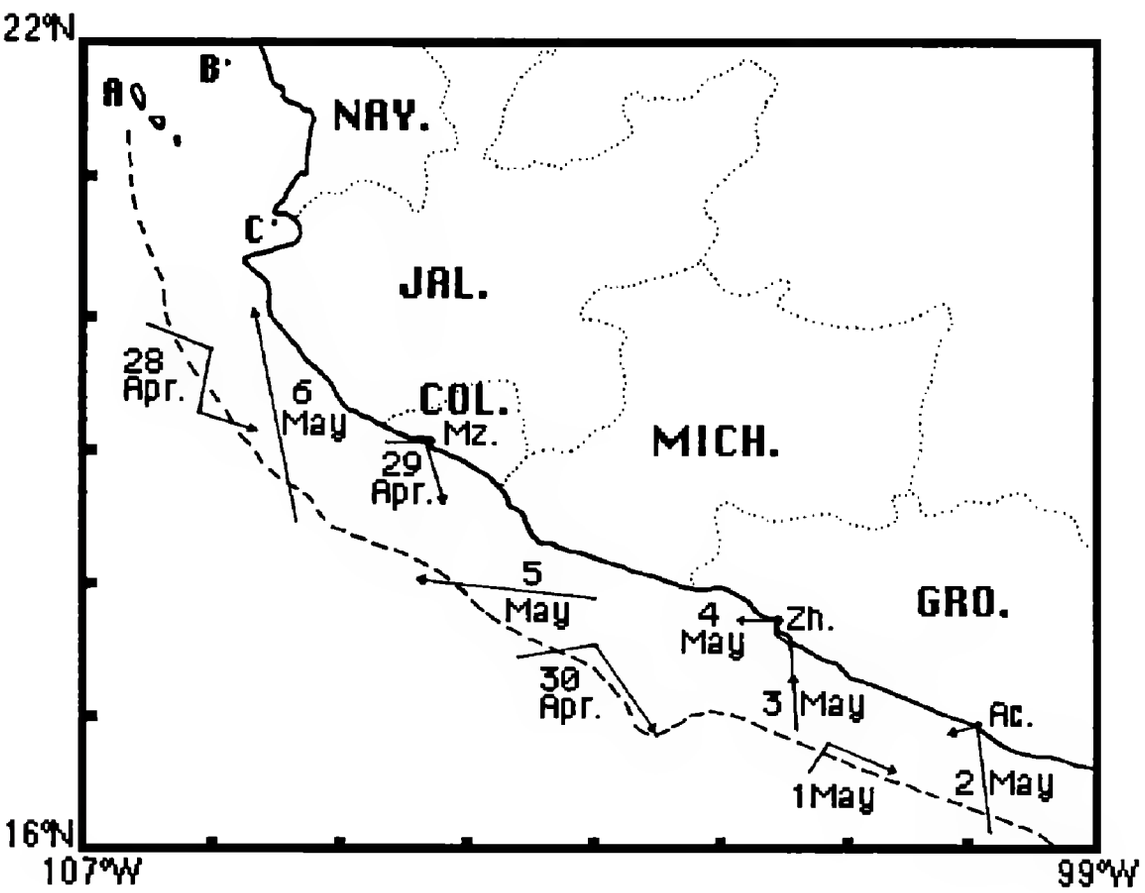


Figure 1. Routes of seabird observations off western Mexico (solid lines with arrows), 28 April–6 May 1992. Dashed line indicates bottom of the Middle American Trench. A, Islas Tres Marias; B, Isla Isabel; C, Islas Tres Marietas; Ac, Acapulco; Mz, Manzanillo; Zh, Zihuatanejo.

Table 1 Seabirds Observed (to Nearest 0.1) per Hour During 30-Minute Counts of 90° Sectors off Western Mexico, 28 April–6 May 1992

	28 Apr	29 Apr	30 Apr	1 May	2 May	3 May	4 May	5 May	6 May
Pink-footed Shearwater	3.0	2.0	0.2	0.8	0.6	1.1	—	1.7	2.2
Wedge-tailed Shearwater	*[a]	—	—	0.3	0.9	1.4	—	0.2	—
Sooty Shearwater	+	—	0.2	+	+	0.6	—	0.5	0.2
Christmas Shearwater	—	—	—	0.5	+	0.6	—	+	—
Townsend's Shearwater	0.3	0.5	+	—	0.6	2.9	—	0.5	8.7
Audubon's Shearwater	—	—	—	—	+	2.0	1.0	—	0.2
Leach's Storm-Petrel	2.9	0.5	+	—	—	0.3	—	0.8	9.1
Galapagos Storm-Petrel	4.8	0.5	0.4	1.3	3.4	1.4	2.0	0.2	5.5
Black Storm-Petrel	6.1	5.0	1.6	1.3	2.8	4.0	6.0	2.0	3.5
Least Storm-Petrel	—	1.0	—	—	1.5	0.3	11.0	*	0.5
Red-billed Tropicbird	—	+	—	+	+	—	—	+	0.2
Masked Booby	—	—	0.2	0.5	0.3	—	—	*	—
Brown Booby	5.6	2.0	6.2	8.0	3.1	19.7	5.0	0.7	12.5
Red-footed Booby	—	—	0.7	2.0	+	+	—	0.2	+
Magnificent Frigatebird	+	+	0.2	*	+	—	—	*	*
Red-necked Phalarope	3.8	1.0	0.4	1.0	5.2	6.6	—	1.2	0.7
Red Phalarope	1.3	2.5	0.2	0.7	6.2	2.0	2.0	1.5	5.6
Phalarope sp.	1.3	1.0	0.2	4.0	1.9	0.9	3.0	3.7	6.2
Pomarine Jaeger	0.2	1.5	0.4	+	0.3	0.3	+	0.3	0.5
Parasitic Jaeger	0.6	—	+	+	+	—	—	*	*
Long-tailed Jaeger	—	*	+	*	*	0.9	+	+	*
Jaeger sp.	0.2	—	—	—	—	+	+	—	—
Sabine's Gull	0.2	1.0	—	0.5	0.9	1.1	+	+	+
Common Tern	+	+	—	—	*	*	+	—	0.4
Arctic Tern	*	1.0	+	1.0	+	—	—	0.2	—
Common/ Arctic Tern	0.3	+	—	—	—	——	—		
Least Tern	—	*	—	—	+	+	+	+	0.4
Bridled Tern	—	+	—	+	—	13.1	24.0	—	+
Black Tern	0.8	6.0	0.4	1.5	10.8	4.0	1.0	0.3	6.5
Brown Noddy	—	—	—	—	—	3.1	+	—	*
Hours of observation	6.25	2.0	5.5	4.0	3.25	3.5	1.0	6.0	5.5
Sea surface temperature (range in °C)	25.6–28.5	27.5–27.6	27.0–28.4	27.7–29.4	28.5–29.4	28.0–29.3	28.4	27.7–30.2	27.2–28.8

[a] +, seen outside census periods; *, seen outside census periods and only with feeding flocks.

km offshore over waters 900–5000 m deep. We found most birds with feeding flocks, and except for two or three dark-morph birds on 2 May we saw only the light morph, agreeing with the results of Pitman (1986). 27.7–29.5°C.

Sooty Shearwater, *P. griseus* (29; 5*/7). Uncommon, seen mostly as single birds flying northwest, but a few birds associated loosely with feeding flocks. Sooty Shearwaters occurred 18–95 km (mostly beyond 35 km) offshore over waters greater than 1000 m deep. 27–29.5°C.

Christmas Shearwater, *P. nativitatis* (47; 27/4). Fairly common over waters warmer than 28.0°C and 2700–5000 m deep in a belt 35–55 km offshore of Guerrero; uncommon off Michoacan, where we saw the northernmost bird at 17°53' N, 103°41' W. We found most Christmas Shearwaters with feeding flocks. 27.7–29.4°C.

The A.O.U. (1983) considered this species "accidental at sea between Clipperton Island and the mainland of Mexico," presumably on the basis of an undated specimen collected at 12°05' N, 107° W (Loomis 1918), about 315 km northeast of Clipperton. Pitman (1986), however, reported seeing this species at rates of 0.75–2.0 per hour off western Mexico (from Michoacan to Oaxaca) between June and September; he collected a specimen (Los Angeles County Museum) on 2 June 1982 at 15°20' N, 99°22' W, about 180 km south-southeast of Acapulco. In addition, D. G. Ainley and L. B. Spear (pers. comm.) observed four Christmas Shearwaters 102–192 km offshore from Guatemala to Oaxaca, Mexico, on 9 and 10 April 1992. This species appears to be a fairly common visitor, at least during some years from April to September, to waters off southern Mexico.

Townsend's Shearwater, *P. auricularis* (404; 133/7). Fairly common, occurring 25–95 km offshore over waters 1000–4500 m deep. We detected most birds in feeding flocks or as rafting groups of up to 45 birds. The morning of 28 April we noted ones and twos steadily flying east, i.e., on a direct route from the species' nesting grounds on Isla Socorro to coastal waters off Jalisco. The plumage of most of the birds we saw in the feeding flocks was worn and faded, and several birds were molting flight feathers; we noted only 15–20 birds (including those on 28 April mentioned above) that appeared to be in fairly fresh plumage. 25.6–29.4°C.

Jehl (1982) concluded that young Townsend's Shearwaters fledge between late May and late July. Thus, while some of the birds we saw may have been failed breeders, and others breeding adults ranging to feeding grounds off western Mexico, the majority probably were immatures and nonbreeders. Jehl (1982), in plotting this species' seasonal distribution, cited only one record from waters off western Mexico from April to June, and saw none off western Mexico in early April 1973 or April 1976. Immature and nonbreeding Townsend's Shearwaters may arrive regularly off southwestern Mexico in late April.

Townsend' Shearwaters associated with Audubon's Shearwaters at feeding flocks, enabling direct comparison of these two species. While most guides emphasize the white patches on the flanks of Townsend's, most birds we saw were sitting on the water and made only short feeding flights, so the flank patches often were not visible. In addition, many Townsend's were very worn, faded, and brownish above, and the white flank patches often were inconspicuous. The features we found useful in separating these two species apply only to nominate Townsend's and the sympatric subspecies of Audubon's Shearwater (*P. l. subalaris*, nesting in the Galapagos).

Townsend's is larger and longer winged than Audubon's, and this was obvious in direct comparison. Although the National Geographic Society (1987) and Naveen (1983) mentioned the long tail of Audubon's, we did not notice this, and Murphy (1936) pointed out that "the tail in the Galapagos race is both relatively and absolutely shorter" than in Atlantic populations. The quicker wingbeats of Audubon's usually identified it in prolonged flight, but in feeding flocks flight manner was not

very useful since both species mostly made short rapid flights. We also were unable to discern on birds in feeding flocks reported differences in underwing pattern (e.g., Harrison 1983, 1987), although this pattern may be seen briefly when birds flush from the water (Figure 2).

When the birds were sitting on the water the most striking difference was the white sides of Townsend's, suggesting a Tufted Duck (*Aythya fuligula*), versus the mostly dark sides of Audubon's (Figure 3). This difference may be due in part to a tendency of Audubon's to hold its wings more drooped, since 41 of 100 specimens of *P. l. subalaris* at the California Academy of Sciences have clean white flanks; the other 59 have distinct dark streaking on their flanks.

Face and neck pattern was useful in flight and at rest: Audubon's has a clean-cut dark cap that extends to just below the eyes and may show indistinct white eye-crescents; Townsend's has a more extensive and not clean-cut blackish cap that extends well below the eyes and over the auriculars (Figure 3). Townsend's has a dark half collar on the sides of the lower neck; Audubon's has a cleaner-cut and smaller patch (Figure 3). Atlantic populations of Audubon's, however, have a dark half collar similar to Townsend's (Murphy 1936, Howell pers. obs.).

The feet of Audubon's appeared dusky flesh, those of Townsend's flesh pink, not black (*contra* Harrison 1983, Ridgely and Gwynne 1989). This is evident in photographs of Townsend's taken by Howell (unpubl.) and Jehl (1982). Six specimens of Townsend's at the California Academy of Sciences have obviously pale legs and feet with blackish only on the outer side of the outer two toes, as did two live Newell's Shearwaters [*P. (a.) newelli*] examined near Hawaii (Howell and L. B. Spear field notes). Thus the feet of Townsend's (and Newell's) appear mostly flesh at sea, perhaps brighter and pinker than the feet of Audubon's.

Figure 2. Townsend's Shearwater off Jalisco, 28 April 1992. Note extensive dusky smudging on sides of face and neck, relatively faded and brownish upperwings, white flank patch, and extensively clean white underwing.

Photo by Steve N. G. Howell

Because of plumage wear and variable lighting conditions we found the color of the upperparts (usually considered blackish on Townsend's and dark brown on Audubon's) to be of little use in field identification.

Audubon's Shearwater, *P. lherminieri* (126; 95/4). Fairly common 20–35 km off Guerrero over waters 500–1800 m deep; we also saw five birds 20–45 km off Jalisco over waters 500–1000 m deep, north to 19°51' N, 105°37' W. Our lack of records between Guerrero and Jalisco probably reflects our lack of observations in these waters. 27.6–29.5°C.

The A.O.U. (1983) reported Audubon's Shearwater as ranging north in the eastern Pacific to Oaxaca, and Pitman (1986) reported up to 2–10 birds per hour north to waters off Colima. Our reports off Jalisco represent the northernmost records of Audubon's Shearwater in the region.

Leach's Storm-Petrel, *Oceanodroma leucorhoa* (125; 75/6). Common off Jalisco in waters cooler than 27.5°C; uncommon to rare south from there in waters warmer than 27.5°C, where we saw only 14 birds. Of the 13 dark-morph birds we saw, 60%

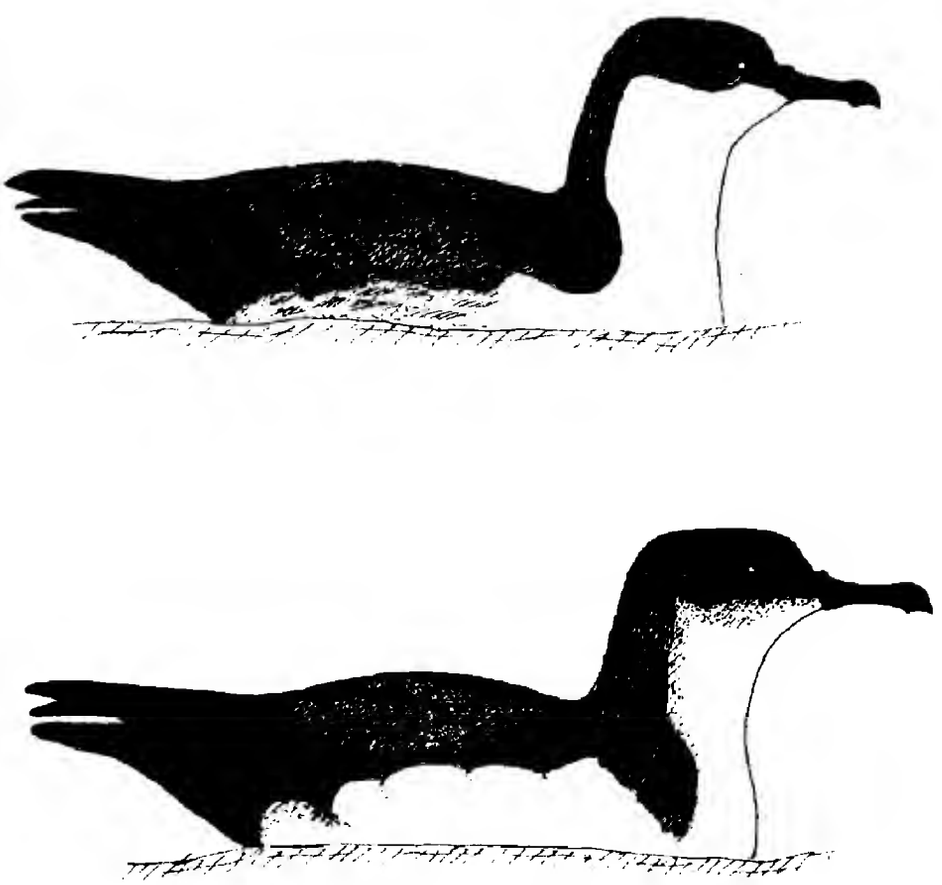


Figure 3. Comparison of Audubon's Shearwater, *Puffinus lherminieri subalaris* (upper) and Townsend's Shearwater, *P. a. auricularis* (lower).

Sketch by Steve N. G. Howell

were over waters warmer than 27.5°C, while 96% of light-morph birds were over waters cooler than 27.5°C. All Leach's Storm-Petrels were at least 45 km offshore over waters 2500–5000 m deep. 25.6–30.2°C.

Although Leach's was the commonest storm-petrel on 6 May both immediately before and after a feeding flock that included 50+ Galapagos and 90+ Black storm-petrels, only three Leach's associated with this flock.

Galapagos (Wedge-rumped) Storm-Petrel, *O. tethys* (321; 130/9). Common to fairly common throughout the cruise. We recorded it to within 9 km of shore, but most were at least 25 km offshore over waters 1000–5000 m deep. Notable concentrations were 130 birds rafting with 20 Black Storm-Petrels at 17°03' N, 101°26' W on 3 May, and 50+ rafting and feeding over Bottlenose Dolphins (*Tursiops truncatus*) on 6 May. In 45 minutes, ten birds came to a slick of cod liver oil laid at 19°42' N, 105°35' W, 6 May. 25.6–29.5°C.

Black Storm-Petrel, *O. melania* (487; 166/9). Common to fairly common throughout, occurring 2–95 km from shore over waters 75–5000 m deep. Up to 12 birds often followed the boat and scavenged galley scraps after meals. A notable concentration was 90+ birds rafting and feeding over Bottlenose Dolphins on 6 May. In 45 minutes, 26 birds came to the same slick of cod liver oil that attracted the Galapagos Storm-Petrels on 6 May. 25.6–30.2°C.

Least Storm-Petrel, *O. microsoma* (134; 46/6). Common within 35 km (and mostly within 25 km) of shore over waters less than 1000 m deep. The species' abundance in this zone is masked in Table 1 by the inclusion of hours farther offshore when none was seen. The slick of cod liver oil laid on 6 May attracted five. 27.7–28.8°C.

Red-billed Tropicbird, *Phaethon aethereus* (6; 2/5). Uncommon to rare. Even on 29 April when we passed within a few kilometers of Peña Blanca, a large colony of Red-billed Tropicbirds 18 km west of Manzanillo, we saw only two single tropicbirds. None associated with feeding flocks, and we noted only one in our census periods. Apparently this species disperses widely and is mostly solitary at sea; Au and Pitman (1986) recorded only one tropicbird in 134 feeding flocks in the northeastern tropical Pacific. 27.4–28.9°C.

Peña Blanca appears to be a previously unreported colony, although it has been known to local fishermen for many years. Howell and S. Webb visited the rock on 1 January 1987 and observed 900–1000 tropicbirds with many pairs engaged in noisy courtship flights and some birds entering crevices. Subsequent observations by Howell are of 50+ birds on 16 March 1989, 100+ on 15 March 1990, and 80–100 on 13 March 1992; on each of these dates Howell saw some courtship flights and several birds entering and leaving crevices.

At Las Rocas Potosí, Guerrero, we saw four or five pairs of Red-billed Tropicbirds engaged in screaming courtship flights and saw one bird enter a crevice in the rocks. The A.O.U. (1983) recorded breeding by Red-billed Tropicbirds along Mexico's Pacific coast south only to Las Islas Tres Marias, Nayarit, but clearly the species' breeding range is more extensive.

Masked Booby, *Sula dactylatra* (83; 40/4). Fairly common 45–100 km offshore from Michoacan south, over waters deeper than 2500 m. Most were associated with feeding flocks or attracted to the boat. All 70 adults and subadults we saw clearly had the bright yellow-orange to pinkish-orange bills characteristic of *S. d. granti* of the Galapagos, suggesting they originated there, although this subspecies also nests in small numbers on Las Islas Revillagigedo (Howell and Webb 1990). 27–28.2°C.

Blue-footed Booby, *S. nebouxii*. We saw one at Zihuatanejo on 3 May and two or three at Las Islas Blancas and 11 or 12 at Isla Grande (18 km west of Zihuatanejo) on

4 May. This species is notably sedentary about its nesting areas (south in Mexico to Las Islas Tres Marietas) and rarely wanders south to waters off Colima (Howell pers. obs.). We are aware of no previous records from Guerrero, although there is one hypothetical record from Oaxaca (Binford 1989).

Brown Booby, *S. leucogaster* (5555; 1480*/9). Common to fairly common out to 100 km from mainland. The two high counts reflect 1310 birds (99% adult) heading offshore from the large colony at Peña Blanca, Colima, between 0700 and 0730 on 29 April, and probably a large component (1000+ birds) of the colony at Las Rocas Potosí, Guerrero (100–120 km distant), on 1 May. The Brown Booby was a common member of feeding flocks and a conspicuous indicator of them at distances up to 5 km. Adults constituted 60–95% of birds seen on all days but 2 May; most were commuting to and from the mainland because usually we saw few or none at dawn when we often saw the more pelagic Masked and Red-footed boobies. On 1 and 2 May, however, we saw numerous Brown Boobies at dawn, 75–85 km offshore, and on 2 May 90% of the 175 Brown Boobies seen were juveniles and immatures. 25.6–30.2°C.

At Las Rocas Potosí we counted 6000–6500 birds, including many recently fledged juveniles, on or around the rocks, 1430–1510 on 3 May. The A.O.U. (1983) recorded breeding by the Brown Booby along Mexico's Pacific coast south only to Las Islas Tres Marias, Nayarit, thus overlooking the two colonies mentioned here, although Goldman (1951) photographed the Guerrero colony. At Las Islas Blancas (17°40' N, 101°38' W), apparently not a breeding site, we counted 200 roosting Brown Boobies.

Red-footed Booby, *S. sula* (203; 120/6). Fairly common 35–100 km offshore from Michoacan south over waters deeper than 1500 m; uncommon north to Jalisco. We also saw one brown-plumaged bird roosting at Las Islas Blancas. This species was more commonly attracted to the boat than to feeding flocks, and up to ten birds often accompanied us, outmaneuvering the less agile juvenile Brown Boobies in pursuit of flying fish flushed by the boat. Of the birds we saw, 99% were brown-plumaged and at least 80% of these were immatures; we noted only one white-morph adult and three or four brown adults. 27.6–29.5°C.

Magnificent Frigatebird, *Fregata magnificens* (40; 16/7). Uncommon. Of the total, we saw 15 on the approach to Manzanillo on 29 April and 16 at sea with feeding flocks on 5 May. Although we noted Magnificent Frigatebirds as far as 95 km offshore, most were less than 45 km from land. 26.9–28.6°C.

Wilson's Phalarope, *Phalaropus tricolor*. One flew northwest at 17°53' N, 103°35' W, on 5 May.

Red-necked Phalarope, *P. lobatus* (2990; 1500/8). Common to fairly common. We recorded Red-necked Phalaropes up to 95 km offshore but most were less than 45 km from land, and large concentrations occurred within 15 km of shore. 25.6–29.5°C.

Red Phalarope, *P. fulicaria* (487; 190/9). Common to fairly common, occurring 9–95 km offshore but mostly 20–55 km from land. 25.6–29.5°C.

Pomarine Jaeger, *Stercorarius pomarinus* (86; 24/9). Common. We saw 43 birds with feeding flocks but the only kleptoparasitic chases noted were single chases of Masked and Brown boobies and of a Christmas Shearwater. Immatures were commoner than adults at feeding flocks, and most of the 27 adults (all light-morph) were heading northwest. Pomarine Jaegers occurred 4–95 km offshore. 25.6–29.4°C.

Parasitic Jaeger, *S. parasiticus* (14; 8/6). Uncommon. After eight (including four light-morph adults) on 28 April, this species was notably uncommon, with ones and

twos (mainly immatures) seen mostly at feeding flocks, where we noted two chases of Black Terns. All Parasitic Jaegers were 25–95 km offshore. 25.6–29.2°C.

Long-tailed Jaeger, *S. longicaudus* (25; 7/8). Fairly common 25–95 km offshore, with one noted 9 km from land. The 25 birds (18 at feeding flocks) included 17 adults and 6 immatures, all of the light morph. We noted 23 chases, all of terns: 21 of the Black Tern, and one each of Arctic and Common terns. 27.5–29.4°C.

None of the adults had the long tail streamers of alternate plumage, although one showed slender streamers apparently half-grown; the rest had the shorter and thicker streamers of basic plumage. In contrast to this species' highly variable juvenile plumage, the immatures were consistent in appearance, and the available literature (e.g., Cramp and Simmons 1983, Harrison 1983) suggests the immature Long-tailed Jaegers we saw were second-summer birds. Since the immature plumages of the Long-tailed Jaeger are poorly known, we describe this plumage briefly. The head and underbody were whitish with a smudgy dark cap suggesting an adult, a buffy-yellow wash on the sides of the neck, and an obvious dark chest band. The underwings were dark with a distinct but narrow white flash along the bases of the primaries and strong pale barring on the coverts. The upperparts resembled those of the adults, but the brownish-gray upper wing coverts did not contrast as strongly with the dark remiges, and the upper tail coverts were barred whitish. We were unable to discern any projecting tail streamers.

Franklin's Gull, *Larus pipixcan* (3; 1/2). Rare. We saw only three, all in alternate plumage, 9–65 km offshore, although this species was fairly common in coastal bays and harbors. 27.5–29.2°C.

Sabine's Gull, *L. sabini* (112; 38/8). Fairly common to common 4–75 km (mostly 10–55 km) offshore. Most were seen in transit, but ones and twos occasionally associated with feeding flocks and 11 were with one flock. In this flock we observed up to two Sabine's Gulls at a time (and at least five individuals in all) making seven kleptoparasitic chases of Black Terns; at least two chases were successful. 25.8–29.4°C.

Fewer than 10% of the Sabine's Gulls we saw were fully alternate-plumaged adults, the rest apparently being first-year birds with partial hoods or mostly dark hoods flecked whitish. Some of these may have been adults that had not completed their prealternate molt, although this reportedly occurs before northward migration (Grant 1986). Alternatively, some may have been adults that wintered locally and had not yet completed their molt. Although the A.O.U. (1983) described the winter range of Sabine's Gull as "Panama south to central Chile," the species winters, at least in some years, north to waters off western Mexico, as indicated by the following: Howell and P. Pyle saw four adults between Cabo San Lucas, Baja California Sur, and Puerto Vallarta, Jalisco, on 17 December 1983; J. C. Arvin (pers. comm., Figure 4) saw 200–250 Sabine's Gulls, mainly basic-plumaged adults, over the Gorda Banks approximately 10–20 km south of San Jose del Cabo, Baja California Sur, on 2 March 1984 and 28 February 1985. Grant (1986) published photographs, taken off El Salvador in March 1980, of adult and first-year Sabine's Gulls showing extensive flight feather molt.

Common Tern, *Sterna hirundo* (30; 9/6). Uncommon to fairly common 2–80 km (mostly less than 45 km) offshore. The majority were with feeding flocks, and the 30 birds included 15 adults and 12 first-year birds. 27.1–29.5°C.

Arctic Tern, *S. paradisaea* (74; 26/6). Fairly common 30–95 km offshore, with most at least 55 km from shore over waters more than 1800 m deep. The majority were with feeding flocks, and the 74 birds included 62 adults and two first-year birds. 26.9–29.4°C.

Jehl (1974) stated, "The northward migration route of the Arctic Tern . . . is unknown," and certainly for the Pacific the literature on this subject appears to be rather vague. Our observations indicate that some Arctic Terns move north off western Mexico in spring but that they occur far offshore.

Least Tern, *S. antillarum* (41; 23/6). Uncommon to fairly common 2–30 km (mostly less than 18 km) offshore over waters less than 1500 m deep. Like other terns, this species usually associated with feeding flocks. We noted only one first-year bird. 27.5–29.5°C.

Bridled Tern *S. anaethetus* (325; 260/5). Locally common. Within 35 km (mostly within 18 km) of land over waters less than 1200 m deep off Zihuatanejo we saw 60 adult Bridled Terns on 3 May and 260 adults on 4 May. Uncommon away from this area, with single adults off Jalisco and Colima, and three adults about 55 km off Guerrero on 1 May. 27.6–29.2°C.

Howell et al. (1990) considered it "likely that Zihuatanejo was, and may still be, the site of a breeding colony" (of Bridled Terns). K. L. Garrett (pers. comm.) recently found at the Los Angeles County Museum a specimen of a Bridled Tern mislabeled as a Sooty Tern. This bird was collected at "White Friars, Mexico" (17°28' N, 101°31' W) on 7 May 1939, and the label reads "nesting from surf to summit." From the coordinates, White Friars appears to be synonymous with Las Rocas Potosí (there are no rocks 4 nautical miles south of Las Rocas Potosí). On 3 May 1992 we circled Las Rocas Potosí, 1330–1410, and saw a few Bridled Terns around the rocks but no sign of nesting: year-to-year variation in nesting chronology, El Niño, or simply time of day could account for the apparent absence of birds at the rocks.

A previously unreported nesting site for this species (and its northernmost in the eastern Pacific) is Isla Isabel, Nayarit, where we estimated 20–30 pairs on 9 May

Figure 4. Sabine's Gulls 10 km south of San Jose del Cabo, Baja California, Sur, 28 February 1985. This species occurs off Mexico during some winters, perhaps regularly.

Photo by John C. Arvin

1992, including birds displaying, copulating, and entering and leaving crevices in the rocky stacks off the eastern side of the island.

Sooty Tern, *S. fuscata* (8; 5/3). Uncommon. We saw only four adult and four first-year Sooty Terns, all with feeding flocks 40–55 km offshore over waters 1300–3600 m deep. 27.9–29.2°C.

Black Tern, *Chlidonias niger* (2061; 522/9). Common to fairly common. We saw Black Terns up to 80 km offshore, but most were within 35 km of land over waters less than 2000 m deep. Black Terns were characteristic of inshore waters, where they were a dominant component of feeding flocks. In feeding flocks off Guerrero, 80–90% of the Black Terns were immatures, and only 10% were alternate-plumaged adults; off Jalisco and Colima, 60–90% were alternate-plumaged adults. 26.0–29.5°C.

Brown Noddy, *Anous stolidus* (41; 25/3). Fairly common off Zihuatanejo within 35 km of shore over waters less than 1000 m deep. We saw only one noddy away from this area. 27.5–29.4°C.

Brown Noddies have not been reported breeding along the Mexican coast south of Las Islas Tres Marietas, Nayarit (A.O.U. 1983), but they may nest at Las Rocas Potosí, where we counted 200–250 adults on 3 May.

Brewer's Blackbird, *Euphagus cyanocephalus*. A male circled the boat at 19°36' N, 106°05' W on 28 April.

Brown-headed Cowbird, *Molothrus ater*. A male circled the boat at 17°27' N, 103°20'W on 30 April, and a female circled the boat at 19°15'N, 105°28' W on 6 May.

Species Not Seen

Pterodroma petrels were notable by their absence. At least at this season few or none apparently occur within 75–95 km of shore in the region, despite the deep waters of the Middle American Trench. Pitman (1986) mapped several species of *Pterodroma* as occurring off western Mexico (mostly between May and October; R. L. Pitman pers. comm.), but, given the scale and format employed, none may have been within 95 km of the mainland.

Feeding Flocks

Feeding flocks, predominately of shearwaters, boobies, and terns, were conspicuous during our cruise. Up to 16 jaegers (three species) occurred, but only Long-tailed Jaegers made regular kleptoparasitic chases. Small numbers of storm-petrels (particularly the Black Storm-Petrel) associated with 16 of the flocks but rarely were noted feeding. Seventy percent of one feeding flock, however, consisted of Black and Galapagos storm-petrels; this was the only feeding flock associated with Bottlenose Dolphins.

Seventeen of the 34 flocks observed, including the most diverse (average 10.8 species per flock), occurred between the inner edge of the trench and 25 km of shore over depths of 1000–4500 m; 16 of these flocks were associated with dolphins. The commoner species at these flocks were the Pink-footed, Wedge-tailed, and Townsend's shearwaters, Brown Booby, Pomarine Jaeger, and Black Tern, sometimes with with smaller numbers of Christmas and Audubon's shearwaters and Masked and Red-footed boobies.

Five feeding flocks (average 7.2 species per flock) occurred over the trench over water 4200–5200 m deep; four of these flocks were associated with dolphins. The Pink-footed and Townsend's shearwaters and Brown Booby were the commoner species in these flocks.

The remaining 12 flocks (average 3.8 species per flock) were over inshore waters less than 1000 m deep. Only one of these flocks was associated with dolphins, but nine others were over schooling fish apparently feeding at the surface. Terns, particularly the Black, dominated these flocks, with smaller and/or more local numbers of the Brown Booby, Sabine's Gull, Least and Bridled terns, and Brown Noddy.

Several species, notably terns and shearwaters, were detected commonly at feeding flocks but rarely (or not at all in the case of Sooty Tern) during censuses in transit.

Au and Pitman (1986) discussed seabird interactions with dolphins and tuna in the eastern tropical Pacific. Both seabirds and dolphins commonly

Table 2 Composition of Seabird Feeding Flocks Associated with Schools of Spotted and Mixed Spotted and Spinner Dolphins in the Eastern Tropical Pacific

	Au and Pitman (1986)[a]		This cruise[b]	
	n	%	*n*	%
Laysan Albatross	0		1	0.02
Pterodroma petrels	99	0.6	0	
Pink-footed Shearwater	?[c]		277	6.3
Wedge-tailed Shearwater	5184	31.0	84	1.9
Townsend's Shearwater	?		222	5.0
Other shearwaters	237	1.4	99	2.3
Storm-Petrel spp.	29	0.2	60	1.4
Masked Booby[d]	371	2.2	44	1.0
Brown Booby	1130	6.8	2632	61.1
Red-footed Booby + Booby sp.	5583	33.4	85	1.9
Tropicbird spp.	1	0.01	0	
Frigatebird spp.	617	3.7	19	0.4
Red Phalarope	0		55	1.3
Jaeger spp.	2168	13.0	62	1.4
Franklin's Gull	0		1	0.02
Sabine's Gull	0		25	0.6
Sooty Tern	955	5.7	9	0.2
Black Tern	?		613	14.0
Noddy terns	175	1.0	8	0.2
Other terns	161	1.0	90	2.0
Total	16710		4386	

[a]134 flocks, January–March.
[b]20 flocks, April–May.
[c]Species possibly included in "other" categories by Au and Pitman (1986).
[d]Includes Blue-footed Booby in Au and Pitman (1986).

associate with yellowfin tuna (*Thunnus albacares*) and feed on smaller fish and other prey forced near the surface by the tuna, a relationship most pronounced in the northeastern tropical Pacific.

Our observations agree with Au and Pitman's (1986) in that the Spotted (*Stenella attenuata*) and Spinner (*S. longirostris*) were the common dolphin species associated with the flocks. Bird species composition of feeding flocks associated with dolphins, however, differed strikingly (Table 2). Some of these differences can be readily explained by our cruise being closer inshore: compare proportions of the more coastal Brown Booby and Black Tern with those of the more pelagic Red-footed Booby and Sooty Tern. The season also explains some of the differences: Au and Pitman's flocks were observed from January though March when several northbound transients we noted in April and May (e.g., Sabine's Gull, Arctic Tern) would have been rare or absent and when many wintering Pomarine Jaegers were still present. Both seasonal and inshore effects probably apply in some cases, as with the Pink-footed Shearwater and Black Tern, and year-to-year variation and El Niño may be other factors.

SUMMARY

From 28 April to 6 May 1992 we cruised along the coast of southwestern Mexico from Jalisco to Guerrero, observing seabirds. This area is important for non-breeding Townsend's Shearwaters. We found Christmas Shearwaters to be fairly common. We noted Long-tailed Jaegers and Arctic Terns as fairly common spring migrants. Feeding flocks of up to 15 species were conspicuous, the most diverse flocks being in a belt 25–55 km offshore over waters 1100–3250 m deep, inshore of the Middle American Trench; most were associated with Spotted Dolphins. We report previously unpublished coastal breeding colonies of the Brown Booby, Red-billed Tropicbird, and Bridled Tern.

ACKNOWLEDGMENTS

We thank the Kelton Foundation for making possible our cruise off western Mexico. To captain Richard Kelton and fellow crew members Bob Chappel, Fred Geller, and Mary Nicholls we extend our thanks for making the trip run smoothly. Robert L. Pitman and Larry B. Spear kindly made available certain unpublished data. Kimball L. Garrett provided data on specimens housed at the Los Angeles County Museum, and Jim Cunningham and Betsey Cutler allowed access to specimens at the California Academy of Sciences. The Secretaría de Desarrollo Urbano y Ecología, through the offices of Dra. Graciela de la Garza Garcia, granted us permission to visit Isla Isabel. David G. Ainley and Larry B. Spear provided a thermometer and advice on data collection; they and J. R. Jehl, Jr., made helpful comments on the manuscript. This is contribution 578 of Point Reyes Bird Observatory.

LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D.C.

Au, D. W. K., and Pitman, R. L. 1986. Seabird interactions with dolphins and tuna in the eastern tropical Pacific. Condor 88:304–317.

Binford, L. C. 1970. Audubon's Shearwater, Hudsonian Godwit, and Long-tailed Jaeger in Oaxaca, Mexico. Condor 72:366.

Binford, L. C. 1989. A distributional survey of the birds of the Mexican state of Oaxaca. Ornithol. Monogr. 43.

Cramp, S., and Simmons, K. E. L. (eds.). 1983. Handbook of the Birds of Europe, the Middle East, and North Africa, vol. 3. Oxford Univ. Press, Oxford, England.

Goldman, E. A. 1951. Biological investigations in Mexico. Smithsonian Misc. Coll. 115:1–476.

Grant, P. J. 1986. Gulls, a Guide to Identification, 2nd ed. Buteo Books, Vermillion, SD.

Harrison, P. 1983. Seabirds, an Identification Guide. Houghton Mifflin, Boston.

Harrison, P. 1987. Seabirds of the World, a Photographic Guide. Christopher Helm, London.

Howell, S. N. G., and Webb, S. 1990. The seabirds of Las Islas Revillagigedo, Mexico. Wilson Bull. 102:140–146.

Howell, S. N. G., and Webb, S. 1992. Changing status of the Laysan Albatross in Mexico. Am. Birds 46:220–223.

Howell, S. N. G., Webb, S., and de Montes, B. M. 1990. Notes on tropical terns in Mexico. Am. Birds 44:381–383.

Jehl, J. R., Jr. 1974. The near-shore avifauna of the Middle American west coast. Auk 91:681–699.

Jehl, J. R., Jr. 1982. The biology and taxonomy of Townsend's Shearwater. Gerfaut 72:121–135.

Loomis, L. M. 1918. Expedition of the California Academy of Sciences to the Galapagos Islands, 1905–1906. 12. A review of the albatrosses, petrels, and diving petrels. Proc. Calif. Acad. Sci., 4th ser., 2 (12):1–187.

Murphy, R. C. 1936. Oceanic Birds of South America, vol. 2. Am. Mus. Nat. Hist., New York.

Murphy, R. C. 1958. The vertebrates of SCOPE, November 7–December 16, 1956, in Physical, chemical, and biological oceanographic observations obtained on expedition SCOPE in the eastern tropical Pacific, November–December 1956 (R. C. Holmes, ed.), pp. 101–111. U.S. Dept. Interior Spec. Sci. Rept., Fisheries 279.

National Geographic Society. 1987. Field Guide to the Birds of North America. 2nd ed. Natl. Geogr. Soc., Washington, D.C.

Naveen, R. 1983. Audubon's Shearwater, in The Audubon Society Master Guide to Birding (J. Farrand, Jr., ed.), vol. 1, p. 68. Knopf, New York.

Pitman, R. L. 1986. Atlas of seabird distribution and relative abundance in the eastern tropical Pacific. Natl. Marine Fisheries Service Admin. Rep. LJ 86-02C. Southwest Fisheries Center, P.O. Box 271, La Jolla, CA 92038.

Ridgely, R. S., and Gwynne, J. A. 1989. A Guide to the Birds of Panama, 2nd ed. Princeton Univ. Press, Princeton, N.J.

Robinson, M. K. 1976. Atlas of North Pacific Ocean monthly mean temperatures and mean salinities of the surface layer. Naval Oceanogr. Office Reference Publ. 2. Dept. of the Navy, Washington D.C.

Accepted 12 January 1993

SCREECH-OWL DISTRIBUTION IN WYOMING

SAM FITTON, 3007 Skyline Blvd, Bakersfield, California 93305

The discovery that the Eastern (*Otus asio*) and Western (*O. kennicottii*) Screech-Owls are incipient (Marshall 1967) if not full species (AOU 1983) motivated field ornithologists along the presumed Rocky Mountain contact zone to learn how to distinguish the two and to determine their distributions. Progress toward this determination has been slow in Wyoming because there are few field ornithologists available to do the necessary studies. With this in mind, I sought to find evidence for these species from previous work and surveyed appropriate habitat to contribute original information.

Authors writing about Wyoming's bird life have mentioned Screech-Owls sparingly. Cary (1901) reported seeing a single Eastern Screech-Owl (*Otus asio maxwelliae*) in the Black Hills, part of which extends into northeastern Wyoming. Knight (1902:82) lamented, in the first popular treatment of birds of the state, that after 18 years of extensive travel throughout Wyoming he had "never heard any kind of screech owl," but he also mentioned two specimens of the Eastern Screech-Owl, one collected in Douglas in 1897 and the other in Cheyenne (no date). Neilson (1923) reported finding and collecting the eggs of an Eastern Screech-Owl in Wheatland. Skinner (1925), Bailey (1930), and Kemsies (1930) reported observations of Eastern Screech-Owls in Yellowstone National Park without describing what they had seen or heard. By the time McCreary (1937) summarized the species' distribution in Wyoming no additional information had been accumulated. Broderick (1952) was the first author to dispute the conventional wisdom that Yellowstone National Park is occupied by Eastern Screech-Owls. On the basis of range and the alleged presence of two color phases he asserted that the Western Screech-Owl (*O. k. macfarlanei*) is the resident species. Broderick gave no details of his observations, however, and did not refer to specimens. In their monumental work, Craighead and Craighead (1956) reported finding three Screech-Owl nests in 1947 and two in 1948 north of Jackson. Unfortunately, Frank Craighead (pers. comm.) could not identify those Screech-Owls to species. On the basis of known specimens, Marshall (1967) included Wyoming in the range of only the Eastern Screech-Owl. Pettingill and Whitney (1969) referred to the Screech-Owl as an uncommon resident in the Black Hills. Their evidence was several sight records and a male specimen (Nathaniel R. Whitney 207) of an Eastern Screech-Owl found dead near Canyon Lake, Rapid City, South Dakota. Whitney (pers. comm.) retrieved another dead Eastern Screech-Owl in February 1991 in Rapid City. The specimen was identified by Joe T. Marshall Jr. and is now in the Smithsonian collection.

In the Wyoming Avian Atlas, Oakleaf et al. (1982) reported the Screech-Owl as a common resident throughout the state below 2150 m elevation with its numbers greatly reduced in the winter. Out of 28 latilong blocks the atlas shows seven with confirmed breeding, two with probable breeding, and ten with observations only. Unfortunately, because no details are on file

with the Wyoming Game and Fish Department, these records can not be ascribed to either the Eastern or the Western Screech-Owl.

Several recent publications distinguishing two species of Screech-Owl refer to Wyoming. McEneaney (1988) listed the Western Screech-Owl as a rare confirmed breeder and resident in Yellowstone National Park. He (pers. comm.) reports that at least two separate observers made Screech-Owl identifications based on voice. Johnsgard's (1988) maps of the species' distributions in Wyoming are extrapolations (P. Johnsgard pers. comm). Kaufman (1990) showed three data points for Wyoming in a map of these two species. From his familiarity with the observers, Kaufman (pers. comm.) believes the two records of the Eastern Screech-Owl to be valid. The basis for the record of the Western Screech-Owl near Sheridan is unknown to Kaufman (pers. comm.). Dorn and Dorn (1990) repeated the latilong style of the "Wyoming Avian Atlas" without adding any original Screech-Owl reports. They segregated records for the two species, without citing supporting documentation. Most recently, the Wyoming Game and Fish Department (1991) published a "Draft Distribution and Status of Wyoming Birds and Mammals." Again, the historical records were allocated to the two species without supporting details.

The data in existing literature are thus insufficient to define the distribution of the two species in Wyoming, and further research was needed. Therefore, I searched for specimens and identifiable photographs of Screech-Owls from Wyoming, and surveyed appropriate habitat to determine the current distributions of the species.

METHODS

Search for Physical Evidence of Occurrence

I inquired of 32 institutions for information on skins, skeletons, tissues, or egg sets of Screech-Owls from Wyoming. I searched the bird collection at the Zoological Museum, University of Wyoming, Laramie, for Screech-Owl specimens. I asked knowledgeable observers for the location of specimens or identifiable photographs.

Screech-Owl identification in the hand requires practice with a large sample of museum skins. The subspecies of Eastern Screech-Owl reported for Wyoming, *O. a. maxwelliae*, is characterized by its large size, yellow to grayish-green bill, and extremely pale coloration (Marshall 1967). Rare red and intermediate morphs exist but are not likely to be seen in Wyoming (Joe T. Marshall Jr. pers. comm.). No subspecies of the Western Screech-Owl has been verified in Wyoming. There are two possibilities suggested from occurrence in neighboring states. In Idaho and Montana, *O. k. macfarlanei* is characterized by its large size, greenish-gray bill, brown dorsal plumage, and distinct dorsal pattern (Marshall 1967). A rare intermediate red morph is found in this subspecies (Marshall 1967). In Utah, *O. k. inyoensis* is characterized by its medium size, black bill, and pale gray dorsal plumage (Marshall 1967). All specimens and photographs for Wyoming listed in Table 1 have been identified to subspecies by Joe T. Marshall, Jr., National Museum of Natural History.

Surveys

The purpose of the surveys was to determine the presence of either or both Screech-Owl species and not to census the population. I surveyed for Screech-Owls at locations of previous collections or reliable observations, and in other areas of suitable habitat. Assuming that Screech-Owls in Wyoming occupy habitats similar to those they occupy elsewhere (Marshall 1967, AOU 1983, Holt and Hillis 1987), I concentrated night-time survey effort in cottonwood- (*Populus* spp.) dominated riparian woodland and Quaking Aspen (*Populus tremuloides*) groves. Because these two habitats are often linear and near or briefly interrupted by other tree-dominated habitats, I was able to survey these habitats as well. In addition, while surveying at higher elevations for other species of owls, I often called for Screech-Owls. Cottonwood or aspen dominated at 63% of the survey locations; however, surveys were usually conducted in areas with more than one habitat type.

My surveys were conducted at 50 locations, 16 west and 34 east of the continental divide. These locations were visited a total of 56 times, 18 west and 38 east of the continental divide. Surveys were conducted from June to September 1988 and from March to May 1989, between 2000 and 2400 hr MST. I imitated each species once every 30 to 60 seconds for the first 5 minutes and once every 5 minutes for up to 40 minutes thereafter in appropriate habitat. In localities with sufficient habitat, survey points were located approximately 0.25 miles apart for up to six points total, but usually only two or three call points were surveyed. I identified the birds by their calls (Marshall 1967, Cavanagh 1986).

Screech-Owl identification on the basis of voice can be difficult, requiring patience and practice. Depending on the subspecies, season (Marshall 1967), sex, age, level of agitation, or interruptions due to usually unseen intra- or interspecific interactions (pers. obs.), a variety of calls is possible. Both species in Wyoming give a primary and a secondary call. The Western's primary call is a series of short notes on one pitch that start off slowly and rapidly speed up. Marshall (1967) describes this call's pattern as being like a "bouncing ball." The Western's secondary call is a short trill followed by a longer trill, all on one pitch. The Eastern's primary call is a quivering wail that starts slightly rising then gradually drops in pitch. This is often refered to as the "whinny call." The Eastern's secondary call is a long, low trill on one pitch. Although birds of both species emitted a variety of calls during the surveys, only primary or secondary calls were used to identify the owls.

RESULTS

Eastern Screech-Owl

The search for physical evidence resulted in 12 specimens (skins) from three institutions and two identifiable photographs (Figure 1 and Table 1). All specimens and photographs were from locations east of the continental divide. No information on habitat or elevation accompanies these records.

Table 1 Specimens and Identifiable Photographs of Eastern Screech-Owls in Wyoming[b]

County	Date	Collector or Photographer	Museum catalog number[a]
Converse	29 Jul 1895	?	UK 8737
Park	5 Jun 1910	A. Wetmore	USNM 208182
Park	27 Jun 1910	M. Cary	USNM 208183
Park	28 Jun 1910	A. Wetmore	USNM 208184
Park	28 Jun 1910	A. Wetmore	USNM 208178
Bighorn	16 Jun 1910	A. Wetmore	USNM 208176
Bighorn	16 Jun 1910	A. Wetmore	USNM 208177
Bighorn	16 Jun 1910	A. Wetmore	USNM 208185
Converse	10 Feb 1960	?	UW 1267
Sheridan	29 Dec 1983	H. Downing	UW C-07655[b]
Sheridan	9 Jan 1984	H. Downing	UW C-04045[b]
Sheridan	31 Dec 1984	H. Downing	WGFD[c]
Sheridan	Mar 1989	H. Downing	USNM 596887
Sheridan	Spring 1990	H. Downing	—[c]

[a]UK, University of Kansas, Lawrence; USNM, United States National Museum, Washington, D.C.; Uw, University of Wyoming, Laramie; WGFD, Wyoming Game and Fish Department, Cheyenne.
[b]In museum freezer.
[c]Photograph.

Unfortunately, neither of the specimens referred to by Knight (1902) nor Neilson's (1923) egg set were among them.

I found Eastern Screech-Owls at four locations (Figure 1 and Table 2), all east of the continental divide and all in riparian woodland dominated by Plains Cottonwood (*Populus sargentii*) between 1500 and 1980 m elevation. I did not find the species in the Wind River Basin or along the upper reaches of the Laramie or North Platte rivers despite the existence of Plains Cottonwood riparian habitat there. Farther upstream of both the Laramie and North Platte rivers the dominant species of cottonwood changes rather abruptly from Plains Cottonwood to Narrow-leaved Cottonwood (*Populus angustifolia*). I surveyed for Screech-Owls along the transitional portions of these rivers and in nine attempts could locate neither species of Screech-Owl. Documentation of the first three sightings was submitted to and accepted by the Wyoming Bird Records Committee.

Western Screech-Owl

No specimens or identifiable photographs of this species in Wyoming were found. My surveys revealed the species at two localities, both in the Wind River Mountains (Figure 1 and Table 2). The dominant tree in this area was Quaking Aspen; Douglas Fir (*Pseudotsuga menziesii*) was second in abundance. The elevation was 2400 m. Documentation of the first sighting was submitted to and accepted by the Wyoming Bird Records Committee.

DISCUSSION

It is probably adequate to continue regarding open habitats with tree cavities on the east side of the continental divide as the primary haunts of the Eastern Screech-Owl in Wyoming. The species appears to prefer cottonwood riparian habitat (Table 2). I believe that the Eastern Screech-Owl can be found along most major watercourses on the east side of the continental divide provided they have cottonwood groves. A possible exception to this is the Wind River Basin. Future research on this species should be focused on habitat use, occurrence in Yellowstone National Park, seasonal movements, and the extent of the distribution upstream along watercourses.

Obviously, very little is known of the abundance, habitat use, and distribution of the Western Screech-Owl in the state. Because this species occurs in aspens, there is no reason to assume the high mountains are an insurmountable physical barrier. Because the Western is found along the Wind

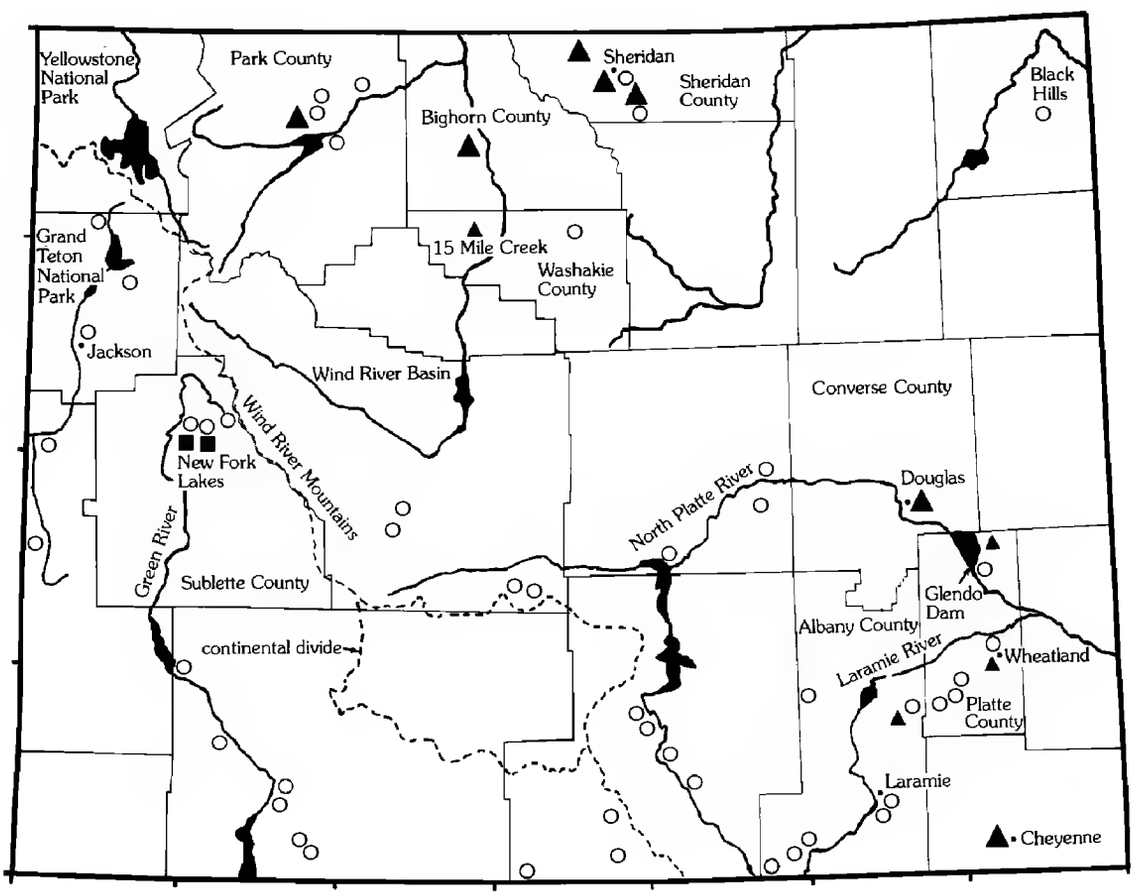


Figure 1. Location of Screech-Owl specimens, photographs, survey points, and observations in Wyoming. Open circles, no response; closed square, Western Screech-Owl survey response; closed small triangle, Eastern Screech-Owl survey repsonse; large closed triangle, Eastern Screech Owl specimen or photograph; dashed line, continental divide.

Table 2 Location of Screech-Owls Found During Night-time Surveys, Wyoming

Location	Date (*n*)	Habitat
Western Screech-Owl		
New Fork Lakes, Sublette Co.	13 Jul 1988 (2)	Quaking Aspen, Douglas Fir
New Fork Lakes Boy Scout Camp, Sublette Co.	13 May 1989 (1)	Quaking Aspen, Lodgepole Pine
New Fork Lakes Campground, Sublette Co.	14 May 1989 (1)	Quaking Aspen, Douglas Fir
Eastern Screech-Owl		
15 Mile Creek, Washakie Co.	5 May 1989 (2)	Plains Cottonwood, sagebrush
Wheatland City Park, Platte Co.	16 May 1989 (1)	Plains Cottonwood
1.5 miles west of Sibille Canyon Facility of Wyoming Game and Fish Department, Albany Co.	16 May 1989 (1)	Plains Cottonwood, willow
North of Glendo Dam, Platte Co.	17 Jun 1989 (1)	Plains Cottonwood

River Mountains, it may occur to the east of the continental divide, as the aspen habitat is nearly continuous. The Western Screech Owl's status in Grand Teton and Yellowstone national parks remains unclear. There are several older undocumented sight records of Screech-Owls for the Green River, so further searching may reveal the species there, although I could not find it and the habitat is highly fragmented.

The potential for furthering the knowledge of Screech-Owl distribution in Wyoming is tremendous. Every field ornithologist working in the state has an opportunity to contribute. In order to increase the value of Screech-Owl sightings, it is imperative that observers carefully record details of their observations and send them to the Nongame Bird Biologist, Wyoming Game and Fish Department, 260 Buena Vista Dr., Lander, WY 82520. This agency serves as secretary to the Wyoming Bird Records Committee, whose primary function is to curate and review documentation of bird sightings. Anyone finding a specimen of Screech-Owl in Wyoming should note the location, color of flesh parts, and details of the discovery. The Wyoming Bird Records Committee should be notified of the discovery and given an opportunity to assist the collector in getting the specimen to a competent taxidermist and museum. Only through the careful work of many field ornithologists will a clearer understanding of Screech-Owl distribution in Wyoming be gained.

ACKNOWLEDGMENTS

I thank Oliver K. Scott and Jon Winter for comments on a previous draft, Helen Downing for providing photographs and specimens and for taking Terri Fitton and

me to historic Screech-Owl locations. This project would not have been possible without the generous effort, guidance, and encouragement of Joe T. Marshall Jr. Terri Fitton contributed greatly to all aspects of this study.

LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Lawrence, KS.

Bailey, V. 1930. Animal life of Yellowstone National Park. C. C. Thomas, Springfield, IL.

Broderick, H. J. 1952. Birds of Yellowstone National Park. Yellowstone Library and Museum Association. Yellowstone Interpretive Series 2.

Cary, M. 1901. Birds of the Blackhills. Auk 18:231–238.

Cavanagh, P. M. 1986. The bounce call of the Eastern Screech-Owl (*Otus asio*): Its structure and possible use in neighbor–stranger discrimination. M.S. thesis, Eastern Kentucky Univ., Richmond.

Craighead, J. J., and Craighead, F. C., Jr. 1956. Hawks, Owls and Wildlife. Stackpole, Harrisburg, PA, and Wildlife Mgmt. Inst., Washington, D. C.

Dorn, J. L., and Dorn, R. D. 1990. Wyoming Birds. Mountain West Publishing, Cheyenne.

Holt, D. W., and Hillis, J. M. 1987. Current status and habitat associations of forest owls in western Montana, in Biology and Conservation of Northern Forest Owls: Symposium Proceedings (R. W. Nero, R. J. Clark, R. J. Knapton, and R. H. Hamre, eds.). Gen. Tech. Rep. RM-142, Rocky Mountain Forest and Range Experiment Station, U.S. Dept. of Agriculture, Forest Service.

Johnsgard, P. 1988. North American Owls. Smithsonian Inst. Press, Washington, D.C.

Kaufman, K. 1990. A Field Guide to Advanced Birding. Houghton Mifflin, Boston.

Kemsies, E. 1930. Birds of the Yellowstone National Park, with some recent additions. Wilson Bull. 42:198–210.

Knight, W. C. 1902. The birds of Wyoming. Univ. Wyo. Agr. Exp. Sta. Bull. 55.

McCreary, O. 1937. Wyoming Bird Life. Burgess, Minneapolis, MN.

McEneaney, T. 1988. Birds of Yellowstone. Roberts Rinehart, Boulder, CO.

Marshall, J. T., Jr. 1967. Parallel variation in North and Middle American screech owls. W. Found. Vert. Zool. Monogr. 1:1–72.

Neilson, J. A. 1923. Screech Owl's eggs. Oologist 40:156.

Oakleaf, B., Downing, H., Raynes, B., and Scott, O. K. 1982. Wyoming Avian Atlas. Wyoming Game and Fish Dept., Cheyenne.

Pettingill, O. S., Jr. and Whitney, N. R., Jr. 1965. Birds of the Black Hills. Cornell Lab. Ornithol. Spec. Publ. 1.

Skinner, M. P. 1925. The birds of the Yellowstone Park. Roosevelt Wild Life Bull. 3:1–192.

Wyoming Game and Fish Department. 1991. Draft distribution and status of Wyoming birds and mammals. Game Division, Wyo. Game and Fish Dept., 5400 Bishop Blvd., Cheyenne, WY 82006.

Accepted 7 January 1993

AN ARCTIC LOON IN CALIFORNIA

DAN L. REINKING and STEVE N. G. HOWELL, Point Reyes Bird Observatory, 4990 Shoreline Highway, Stinson Beach, California 94970 (current address of Reinking: George M. Sutton Avian Research Center, P. O. Box 2007, Bartlesville, Oklahoma 74005-2007)

At 1415 on 2 November 1991 we found an Arctic Loon (*Gavia arctica sensu stricto*) at Abbott's Lagoon, Point Reyes National Seashore, in Marin County, California. We observed the bird for about an hour at ranges down to about 250 m with binoculars and spotting scopes. It was a clear day, and we had the sun at our backs. After completing field notes and sketches, we returned home to consult the literature and notify other birders. We returned the following morning and, with several other birders, soon located the loon and observed it for over 2 hours. Additional notes were taken as the bird swam intermittently to within 100 m and then farther out into the fog. The following description and Figures 2 and 3 are derived from our notes and sketches taken from 1415 to 1515 on 2 November and from 0845 to 1100 on 3 November. The bird was last reliably reported on 17 November. Other observers photographed and videotaped (Figure 1) the bird, and the identification has been accepted by the California Bird Records Committee.

The bird initially suggested a Common Loon (*G. immer*), owing to its steep forehead, somewhat flattened crown, and largish bill, but was obviously smaller with plumage more variegated than a Common Loon, two of which were present during the observation. The crown, nape, and hindneck were pale slaty gray in contrast to the blackish upperparts and forehead. Pale-tipped mantle feathers formed whitish barring on the upperparts, which is characteristic of juvenal plumage. On 2 November, and for much of the time on 3 November, the lower face, throat, foreneck, and chest appeared white. From closer views on 3 November, however, we noted that the throat and foreneck were clouded with pale gray; seen in good light, the white face contrasting subtly with the pale gray throat recalled the pattern of an Arctic Tern (*Sterna paradisaea*). The chest and underbody were white, with head-on views revealing a slight contrast between the dusky foreneck and white chest. Shadowing suggested a chinstrap, but seen in direct light the foreneck lacked this feature.

The most striking feature of the bird was the amount of white showing on its flanks. When it was actively swimming and diving, the white was limited to patches flaring up at the rear, suggesting those of a Townsend's Shearwater (*Puffinus auricularis*) or Violet-green Swallow (*Tachycineta thalassina*), as shown in Figures 1 and 2, figure 1 of McCaskie et al. (1990), figure 4 of Appleby et al. (1986), and plate 42 of Harrison (1987). When the bird was more relaxed or sleeping, its whole side up to and along the folded wing showed white above the waterline, like a Tufted Duck (*Aythya fuligula*), as shown by Figure 3, plates 187 and 190 of Appleby et al. (1986), and plate 10 of Walsh (1988). This pattern was in obvious contrast to that shown by relaxed or sleeping Pacific Loons (*G. pacifica*), one adult and one juvenile of which were also present on the lagoon. These only rarely showed any white

above the waterline, and that was restricted to a relatively small area of their midsection.

The crown, nape, hindneck, and upperparts of the Arctic Loon were noticeably darker than those of the juvenile Pacific Loon, with the Pacific Loon also showing less contrast between the hindneck and back. The upperparts of the adult Pacific Loon were similar in shade to those of the Arctic Loon.

On one occasion the Arctic Loon could be seen with the two Pacific Loons in the same spotting scope field, allowing a direct size comparison. The Arctic Loon appeared about 10% larger than the juvenile Pacific Loon, but was only slightly larger than the adult. The head and bill appeared larger in the Arctic Loon but the differences were not striking, perhaps because of a similar bill-to-head proportion. McCaskie *et al.* (1990) noted that this difference was not a particularly useful one for separating Arctic and Pacific loons.

TAXONOMY AND DISTRIBUTION

Until recently, the Pacific and Arctic loons have usually been considered conspecific, with the breeding ranges of the three subspecies distributed in a broken ring around the North Pole: *G. a. arctica*, breeding from northern Europe to western Siberia, *G. a. viridigularis*, breeding in eastern Siberia and locally in western Alaska, and *G. a. pacifica*, breeding in northwestern North America (west from Hudson Bay) and northeastern Siberia (AOU 1983, Cramp and Simmons 1977, Walsh 1988). Thus *viridigularis* and *pacifica* are sympatric in eastern Siberia and western Alaska (Wales and Cape Krusenstern, Douglas and Sowl 1993).

Figure 1. Arctic Loon at Abbott's Lagoon, Marin County, California, 4 November 1991. Note head shape and white flank patch.

Videotape by Leslie Lieurance

Portenko (1981) reported no intergrades between *viridigularis* and *pacifica* in their zone of sympatry in eastern Siberia, although he recognized that the two forms occur "under different ecological environments," the former occupying more inland locations in the forest belt and tundra, the latter areas close to the coast. Bailey (1943) reported both *viridigularis* and *pacifica* from western Alaska but noted two specimens that "are not typical and may be intergrades." Storer (1978) discussed reasons for not considering *pacifica* specifically distinct, including evidence of intergrades between *viridigularis* and *pacifica*. The general trend, however, since Portenko (1981) has been to consider *pacifica* specifically distinct, a view adopted by the AOU (1985).

In winter, Arctic Loons occur south to southwestern Europe, the Aral Sea (nominate *arctica*), and Japan (*viridigularis*) (AOU 1985, Cramp and Simmons 1977, Dement'ev and Gladkov 1951; see map in Walsh 1988).

We believe the Arctic Loon at Abbott's Lagoon to represent the first valid record of the species in North America south of Alaska, except possibly for

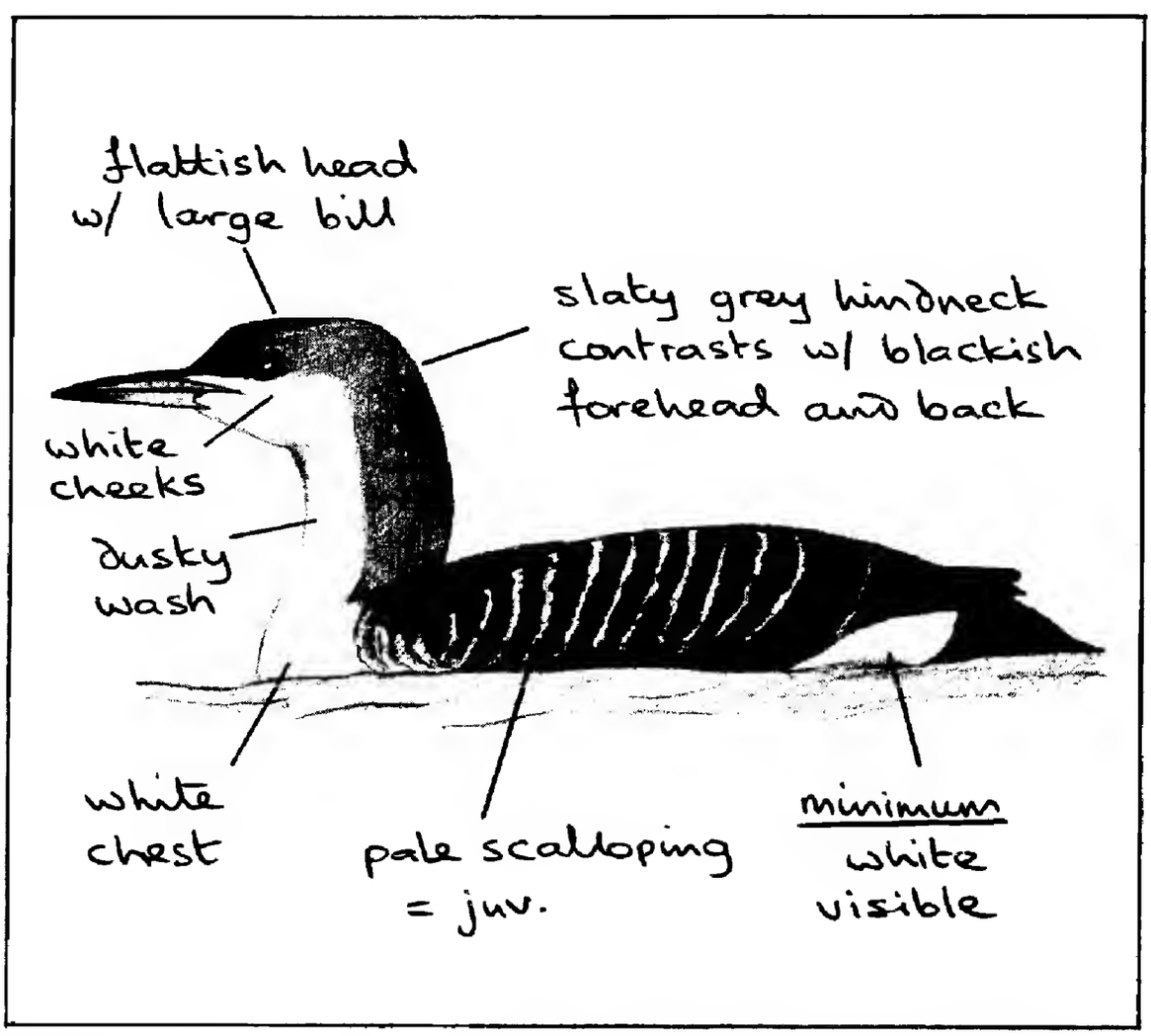


Figure 2. Arctic Loon at Abbott's Lagoon, Marin County, California, 3 November 1991.

Sketch by Steve N. G. Howell

one sketched and described from Massachusetts (Evered 1985). The only previous valid extralimital record for the Arctic Loon is of one collected near Admiralty Island, Alaska, in 1948 (Walsh 1988). The identification of supposed Arctic Loons from British Columbia has been discredited (Campbell *et al.* 1990). A second Arctic Loon was reported from Morro Bay, California, from 7 to 23 December 1991 (T. Edell and G. Smith pers. comm.). This record is still under consideration by the California Bird Records Committee (McCaskie 1992).

IDENTIFICATION SUMMARY

Loon identification has been the subject of numerous publications in recent years (e.g., Stallcup 1983, Walsh 1984, 1988, Evered 1985,

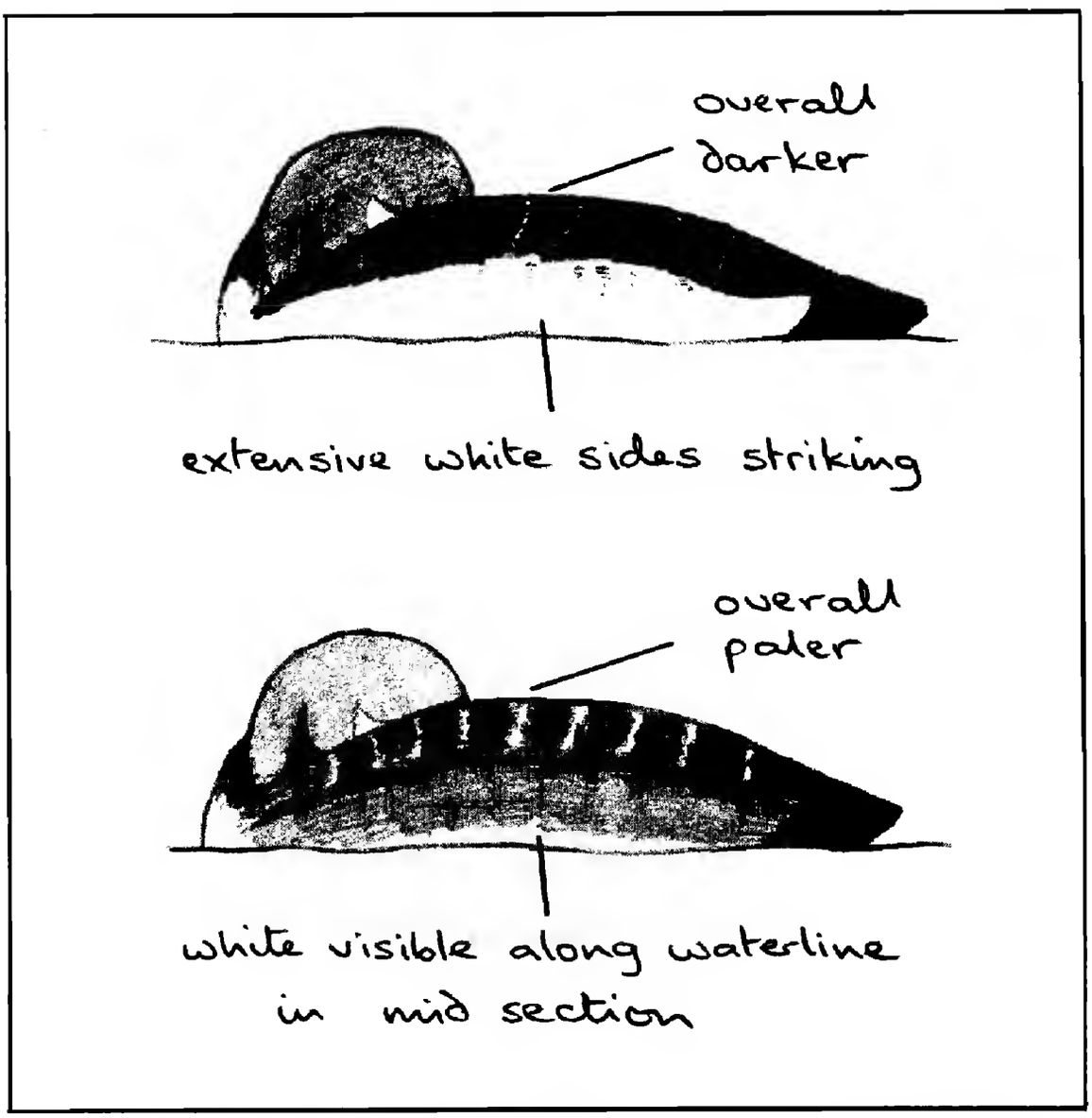


Figure 3. Comparison of sleeping juvenile Arctic Loon (upper) and juvenile Pacific Loon (lower) at Abbott's Lagoon, 3 November 1991.

Sketch by Steve N. G. Howell

Appleby et al. 1986, Harrison 1987, Harris et al. 1989, Roberson 1989, Schulenberg 1989, Kaufman 1990, McCaskie et al. 1990). Separation of Arctic and Pacific loons, however, has remained somewhat poorly defined. We here discuss separation of these two forms in juvenal and basic plumages.

The Arctic Loon averages larger than the Pacific, but the two do overlap (Walsh 1988, Schulenberg 1989). Size, therefore, is of limited use for field identification, although when several birds of two or more species are together it may be of some value.

The head of an Arctic Loon tends to be flatter than that of a Pacific, which is puffy and rounded (McCaskie et al. 1990). This characteristic is ephemeral, however, depending on the activity of an individual bird (such as neck-craning before a dive), but often may be useful.

In alternate plumage, the crown and nape of the Pacific Loon appear pale silvery gray, paler than in the Arctic Loon. Whether or not this trait is of use for separation of birds in juvenal or basic plumages has not been addressed in the literature, although such a difference between the juvenile Arctic and juvenile Pacific loons at Abbott's Lagoon was apparent.

The most striking plumage feature distinguishing the Arctic and Pacific loon is the extent and purity of white visible on the flanks: in all comparable postures, significantly more white is visible on Arctic Loons. A Pacific Loon

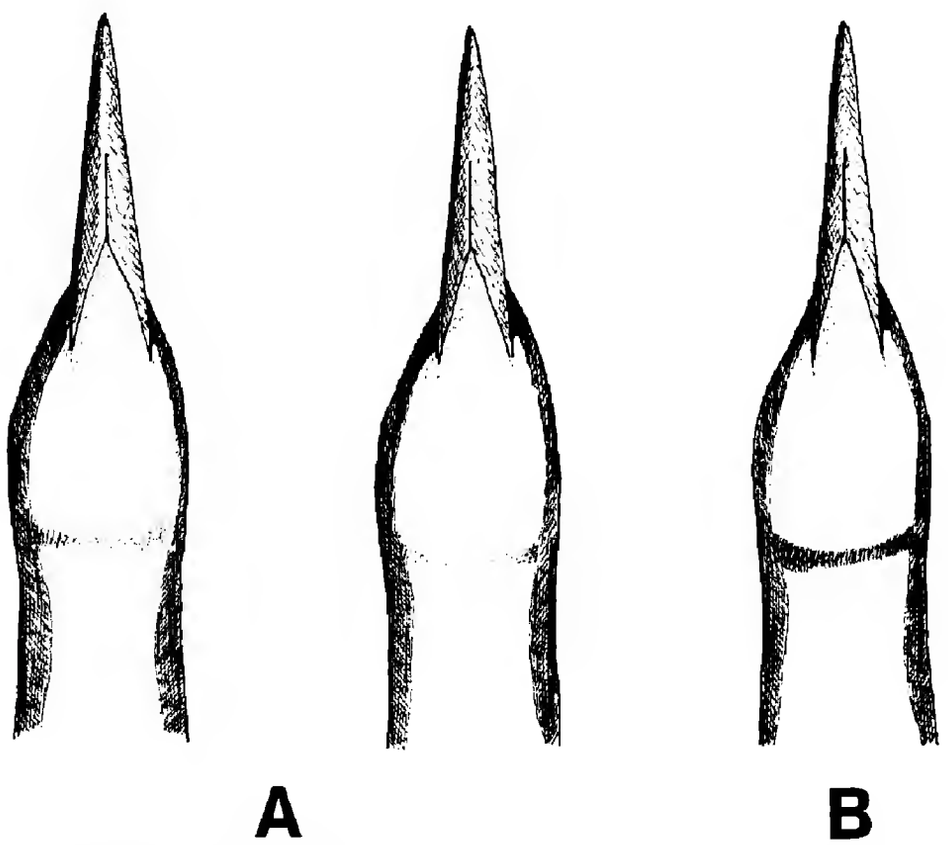


Figure 4. Categories of chinstrap on basic and juvenal-plumaged loons. A, indistinct (two examples); B, distinct.

Sketch by Steve N. G. Howell

riding high in the water or preening can show a moderate amount of white above the waterline (see figure 3 in McCaskie et al. 1990), but its flanks are mostly sooty brownish, in contrast to the clean unbroken white flanks of the Arctic Loon, in which the white extends up to the line of the closed wing. Note also the upward flaring of the white at the rear of Arctic Loon (see plate 10 in Walsh 1988). The bird's posture must be assessed, as loons often roll on the water and then may appear to show extensively white sides.

Other plumage characteristics separating the Arctic and Pacific loons are the band of dark feathers forming a chinstrap on most Pacific Loons in basic plumage, absent on most if not all Arctics, and the dark band across the vent of the Pacific Loon in all plumages, faint or absent in the Arctic Loon (Walsh 1988).

Roberson's (1989) photographs of Pacific and Arctic loon specimens illustrate these features. We found, however, that one of the "Arctic" Loons in these photographs is actually a Pacific Loon. This bird is the top "Arctic" Loon in figures 1 and 4, the bottom "Arctic" Loon in figure 2, and the right-hand "Arctic" Loon in figure 3. We reidentified the bird by using Walsh's (1988) measurements. Its exposed culmen measured 55.3 mm, closer to Walsh's mean of 52.7 mm for *G. pacifica* than to that of 64 mm for *G. a. viridigularis*. The bill depth of 13.6 mm approximates the mean of 14 mm given by Walsh for the Pacific while falling below the range (15–

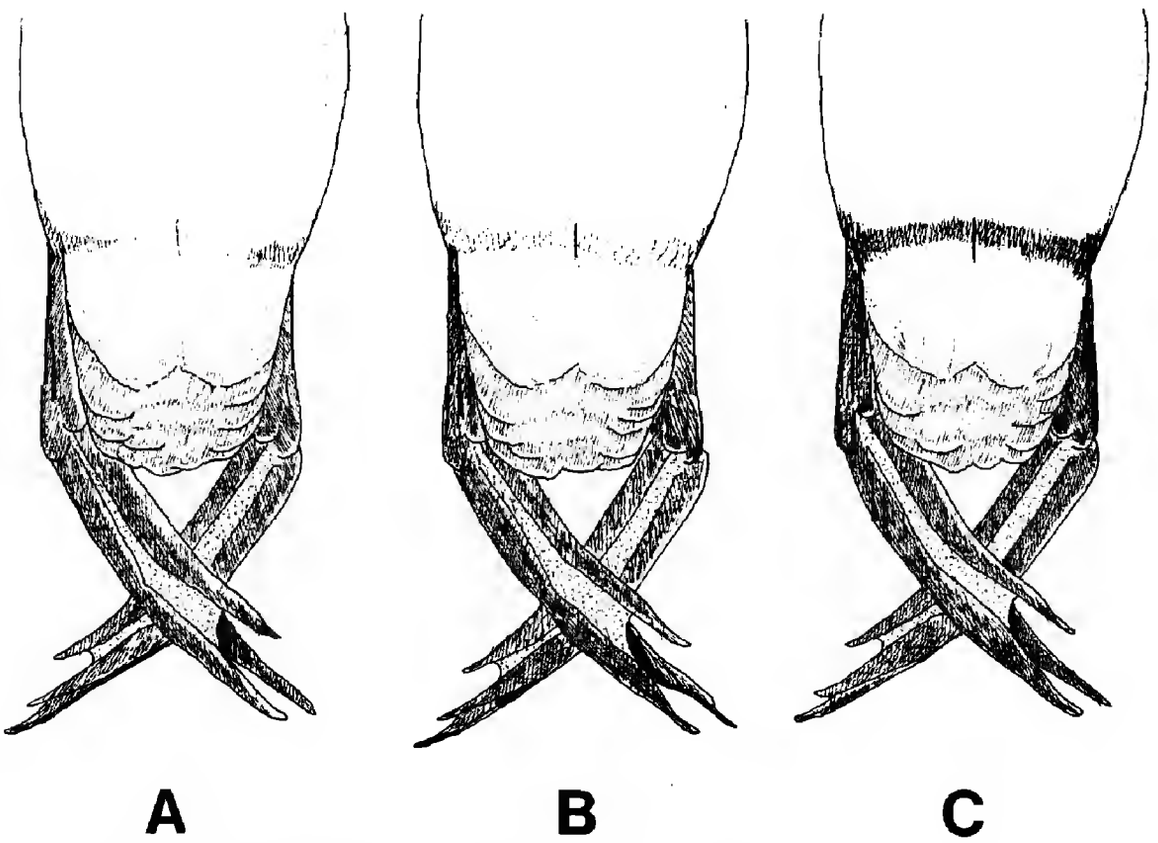


Figure 5. Categories of ventstrap on basic and juvenile-plumaged loons. A, partial; B, complete (pale brown); C, complete (dark brown).

Sketch by Steve N. G. Howell

20 mm) listed for the Arctic. Similarly, the tarsus measurement of 71.6 mm agrees with the mean of 70 mm for the Pacific and falls just below the range (72–91 mm) for *viridigularis*. Also note the indistinct chinstrap on this bird in Roberson's (1989) figure 2 and the partial ventstrap visible in figure 3. His figure 2 and especially figure 4 show that the bird also lacks white flank patches.

Our examination of nearly 150 Pacific Loon and 6 Arctic Loon specimens at the California Academy of Sciences, San Francisco, and the Museum of Vertebrate Zoology, University of California, Berkeley, sheds further light on the usefulness of the chinstrap and ventstrap for identification. (Determining the presence or absence of a ventstrap on a loon is extremely difficult in the field.) We classified birds in juvenal, basic, and alternate plumages as having no, indistinct, or distinct chinstraps, as well as having no, partial, complete pale brown, or complete dark brown ventstraps (Figures 4 and 5). We found that 91% of Pacific Loons in basic plumage and 54% of those in juvenal plumage had indistinct or distinct chinstraps. All Pacific Loons examined had at least a partial ventstrap, and 90% of these showed a complete ventstrap; 93.5% of juveniles had a complete pale brown ventstrap, whereas 69.5% of Pacific Loons in basic or alternate plumage had a complete dark brown ventstrap. No Arctic Loons had even an indistinct chinstrap, whereas 5 of 6 showed a partial strap at the sides of the vent. Table 1 summarizes the presence and extent of these characteristics on the specimens we examined.

Now that criteria for the identification of Pacific and Arctic Loons in all plumages have been established, it will be interesting to see if Arctic Loons are more regular on the West Coast than the two records from late fall 1991 would indicate.

Table 1 Plumage Characteristics of Pacific and Arctic Loons

	Pacific Loon			Arctic Loon	
Feature	Juv. $n = 46$	Basic $n = 44$	Alt. $n = 51$	Basic $n = 5$	Alt. $n = 1$
Chinstrap[a]					
None	21	4	—	5	—
Faint	25	14	—	0	—
Obvious	0	26	—	0	—
Ventstrap[b]					
None	0	0	0	1	0
Partial	0	4	10	4[c]	1[c]
Complete (pale brown)	43	12	3	0	0
Complete (dark brown)	3	28	38	0	0

[a]See Figure 4 for examples of chinstraps.
[b]See Figure 5 for examples of ventstraps.
[c]Ventstraps in Arctic Loons were limited to 3 cm or less on the sides of the vent and were relatively indistinct.

ACKNOWLEDGEMENTS

We thank Stephen F. Bailey at the California Academy of Sciences and Ned K. Johnson at the Museum of Vertebrate Zoology for access to loon specimens. Jon Dunn and Michael Patten provided helpful comments on an earlier draft of this paper. Leslie Lieurance provided the videotaped image.

LITERATURE CITED

American Ornithologists' Union. 1983. Check-list of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D.C.

American Ornithologists' Union. 1985. Thirty-fifth supplement to the A.O.U. Check-list of North American Birds. Auk 102:680–686.

Appleby, R. H., Madge, S. C., and Mullarney, K. 1986. Identification of divers in immature and winter plumages. Br. Birds 79:365–391.

Bailey, A. M. 1943. The birds of Cape Prince of Wales, Alaska. Proc. Colo. Mus. Nat. Hist. 18:1–113.

Campbell, R. W., Dawe, N. K., McTaggart-Cowan, I., Cooper, J. M., Kaiser, G. W., and McNall, M. C. E. 1990. The Birds of British Columbia, vol. 1. Royal Br. Columbia Mus., Victoria.

Cramp, S., and Simmons, K. E. L. (eds.). 1977. Handbook of the Birds of Europe, the Middle East, and North Africa, vol. 1. Oxford Univ. Press, Oxford, England.

Dement'ev, G. P., and Gladkov, N. A. 1951. Birds of the Soviet Union. English translation, Israel Program for Scientific Translations, Jerusalem, 1966.

Douglas, H., and Sowl, K. 1993. Northeastern extension of the breeding range of the Arctic Loon in northwestern Alaska. W. Birds 24:98–100.

Evered, D. S. 1985. Pacific (and Arctic) Loon identification: Difficulty, unfamiliarity and a little bit of confusion. Bird Obs. E. Mass. 13:10–14.

Harris, A., Tucker, L., and Vinicombe, K. 1989. The Macmillan Field Guide to Bird Identification. Macmillan, London.

Harrison, P. 1987. Seabirds of the World. Christopher Helm, London.

Kaufman, K. 1990. A Field Guide to Advanced Birding. Houghton Mifflin, Boston.

McCaskie, G. 1992. The winter season. Southern Pacific Coast region. Am. Birds 46:313–318.

McCaskie, G., Dunn, J. L., Roberts, C., and Sibley, D. 1990. Notes on identifying Arctic and Pacific loons in alternate plumage. Birding 22:70–73.

Portenko, L. A. 1981. Birds of the Chukchi Peninsula and Wrangel Island, vol. 1. English translation, Amerind Publ., New Dehli, for the Smithsonian Institution.

Roberson, D. 1989. More on Pacific versus Arctic loons. Birding 21:154–157.

Schulenberg, T. 1989. More on Pacific versus Arctic loons. Birding 21:157–158.

Stallcup, R. 1983. Loons. Point Reyes Bird Obs. Newsletter, summer, pp. 8–11.

Storer, R. W. 1978. Systematic notes on the loons (Gaviidae: Aves). Brevoria 448.

Walsh, T. 1984. The field identification of Arctic Loon. Bird Obs. 12:309–314.

Walsh, T. 1988. Identifying Pacific Loons. Birding 20:12–28.

Accepted 6 March 1993

NOTES

BREEDING OF THE BLACK SWIFT IN THE GREAT BASIN

OWEN A. KNORR, Institute of Alpine Ecology, 4535 Lakewood Court, Reno, Nevada 89509

The Black Swift (*Cypseloides niger*) has an extensive albeit somewhat disjunct range in western North America from southern Canada south to southern California (Foerster and Collins 1990) and Arizona (Knorr 1989) and east to Colorado (Knorr 1950, 1961). Its range in the Great Basin has been unclear. I found several breeding colonies on the eastern margin in Provo Canyon, Utah (Knorr 1962), but until 1986 my subsequent attempts to locate Black Swift colonies elsewhere in the Great Basin were unsuccessful. Even so, observations by Ridgway (1874) suggested that there might be other sites located along the western margin of the Great Basin.

On 14 July 1986, while searching for Black Swift nesting habitat from an aircraft, I found a likely waterfall at 2400 meters elevation in Cloudburst Canyon, a tributary of the West Fork of the Carson River in the Carson Range of Alpine County, California. It is located at 38°45' N, 119°51' W, 12 km southwest of the Nevada state line. Proceeding on foot to the site, which cannot be seen from any existing road or trail, the following day I found a colony of Black Swifts, estimated at four to six pairs. After a climb up one side of the canyon flanking the waterfall, I was able to see only two nests—one in a crevice behind a thin curtain of water and another about 1 meter from the nearest water. Subsequently, I visited the site a half dozen times or more each summer through the 1992 nesting season to determine the size of the colony and approximate arrival and departure dates. The greatest number of adults I saw in the air at one time was 11. Arrival dates ranged from 5 to 10 May, departure dates from 30 August to 5 September. Because of the difficult terrain and precarious observation point, I was unable to collect any data on incubation and raising of the young.

The ecological characteristics previously described for Black Swift nest sites (Knorr 1961, Hunter and Baldwin 1962, Foerster and Collins 1990) were all present in Cloudburst Canyon. When this colony was discovered in 1986, 6 years of severe drought in California and western Nevada were just beginning. By the end of each summer, the Cloudburst Canyon waterfall was reduced to a mere trickle. Nevertheless, the birds returned each year. Fidelity of Black Swifts to their nesting sites appears to be very strong, as no known site has ever been found to be abandoned (Knorr 1989). Similarly, my statement (Knorr 1961) that Black Swifts do not nest on truly intermittent streams seems to be holding its validity.

The unique combination of ecological factors characterizing Black Swift nesting sites does not occur in many places, presumably explaining the wide scattering of colonies. The Black Swift's known nesting sites nearest Cloudburst Canyon are at Tenaya Gorge in Yosemite National Park, 115 km south (Michael 1927), and at Feather Falls, Butte County, 150 km northwest (Knorr pers. obs. 1968).

LITERATURE CITED

Foerster, K. S., and Collins, C. T. 1990. Breeding distribution of the Black Swift in southern California. W. Birds 21:1–9.

Hunter, W. F., and Baldwin, P. H. 1962. Nesting of the Black Swift in Montana. Wilson Bull. 74:409–416.

Knorr, O. A. 1950. First breeding record of the Black Swift, *Nephoecetes n. borealis*, in Colorado. Auk 67:516.

Knorr, O. A. 1961. The geographical and ecological distribution of the Black Swift in Colorado. Wilson Bull. 73:155–170.

Knorr, O. A. 1962. Black Swift breeds in Utah. Condor 64:79.

Knorr, O. A. 1989. The Black Swift in the Chiricahua Mountains of Arizona. Southw. Nat. 34:559–560.

Michael, C. M. 1927. Black Swift nesting in Yosemite National Park. Condor 29:89–97.

Ridgway, R. 1874. United States geological exploration of the fortieth parallel. Part III—Ornithology. U.S. Government Printing Office, Washington, D.C.

Accepted 23 February 1993

COMMON RAVEN POPULATIONS IN JOSHUA TREE NATIONAL MONUMENT, CALIFORNIA

RICHARD J. CAMP and RICHARD L. KNIGHT, Colorado State University, Department of Fishery and Wildlife Biology, Fort Collins, Colorado 80523

JERRY FREILICH, Joshua Tree National Monument, 74485 National Monument Drive, Twentynine Palms, California 92277-3597

Common Raven (*Corvus corax*) numbers in the Mojave Desert have grown substantially, with increases ranging from 5 to 15% annually over the past 20 years (Robbins et al. 1986, USDI 1990). These population increases, and the location of Desert Tortoise (*Gopherus agassizii*) shells near raven nests and perches, have resulted in ravens being suggested as a cause of the decline of tortoise populations (Berry 1985, Berry et al. 1986).

The conclusion that raven populations have increased is based on Breeding Bird Surveys, in which birds are counted from roadsides (Robbins et al. 1986). Estimates of raven populations are thus based on data from areas of diverse human land uses including agriculture, livestock grazing, and urban/suburban development. Knight and Kawashima (in press), however, found that raven numbers can be considerably greater along highways than away from them. Currently, there is no information on raven numbers in areas away from roads and not grazed by livestock.

Accordingly, we surveyed raven numbers in native desert scrub away from roads. Our goal was to determine a baseline estimate of raven population density in a part of the Mojave Desert suitable for nesting ravens but free from contemporary land-use changes.

Our study area was heterogenous and located in the Pinto Basin and Eagle Mountains of Joshua Tree National Monument and U.S. Bureau of Land Management wilderness and natural lands, San Bernardino County, California (33°55' N, 115°30' W). Elevations ranged from 420 to 1210 m. Rain (< 110 mm annually) falls predominantly in the winter, though there are occasional summer thundershowers. The dominant vegetation consisted of widely spaced shrubs, including creosote bush (*Larrea divaricata*) and shadscale (*Atriplex brevifolia*) (Munz and Keck 1959). The

area was free of anthropogenic nest-site structures although suitable nesting sites in cliffs were abundant.

We counted ravens from 15 May through 18 June 1992 by walking 32 transects comprising 176.04 km (mean transect length 5.50 km, standard deviation [SD] 1.35 km) between 0530 and 1745 hours. Transects began along Big Wash, ran parallel to each other 1.61 km apart, and followed a compass azimuth (true north) of either 49° or 229°. Ten and 22 transects lay in the Pinto Basin and the Eagle Mountains, respectively. The total area covered by the transects was 283 km^2 with 108 km^2 and 174 km^2 in basin and mountain habitat, respectively. Starting and ending points of the transects were located by means of a Magellan Global Positioning System (GPS) unit (2D Mode) and altimeter. Navigation along transects was maintained with the GPS unit and compass. For each transect, the number of ravens per kilometer was calculated. These numbers were then used to calculate means and standard deviations (SD) of ravens per 100 km.

Only eight ravens were seen for a density of 4.63 per 100 km (SD 9.78). Six ravens were seen along mountain transects for a density of 4.38 per 100 km (SD 9.84). Two ravens were seen along basin transects for a density of 2.49 per 100 km (SD 5.24). All sightings were of solitary birds; no ravens were seen in flocks.

As a basis for comparison, Knight and Kawashima (in press) reported a mean (± SD) per 100 km along paved highways in the Mojave Desert of 36.5 ± 92.4 ravens. Their estimate of ravens per 100 km in grazing land away from highways was 6.6 ± 18.1, not unlike what we found in the present study. These results suggest that ravens may not have increased uniformly in the Mojave Desert and that in natural areas without linear right-of-ways ravens are still uncommon.

Funding and field assistance were provided by Joshua Tree National Monument, National Park Service. William I. Boarman, Kathleen A. Engel, and Philip Unitt substantially improved the manuscript.

LITERATURE CITED

Berry, K. H. 1985. Avian predation on the desert tortoise (*Gopherus agassizii*) in California. Report from the U.S. Bureau of Land Management to Southern California Edison Co., P.O. Box 800, 2244 Walnut Grove Ave., Rosemead, CA 91770.

Berry, K. H., Shields, T., Woodman, A. P., Campbell, T., Roberson, J., Bouski, K., and Karl, A. 1986. Changes in desert tortoise populations at the Desert Tortoise Research Natural Area between 1979 and 1985. U.S. Bureau of Land Management, 6221 Box Springs Blvd., Riverside, CA 95207

Knight, R. L., and Kawashima, J. Y. In press. Responses of raven and Red-tailed Hawk populations to linear right-of-ways. J. Wildlife Mgmt.

Munz, P. A., and Keck, D. D. 1959. A California Flora. Univ. of Calif. Press, Berkeley.

Robbins, C. S., Bystrak, D., and Geissler, P. H. 1986. The breeding bird survey: Its first fifteen years, 1965–1979. U.S. Fish and Wildlife Service Resource Publ. 157, U.S. Fish and Wildlife Service, Washington, D.C. 20708.

United States Department of Interior. 1990. Raven management plan for the California Desert Conservation Area. U.S. Bureau of Land Management, California Department of Fish and Game, and U.S. Fish and Wildlife Service, 6221 Box Springs Blvd., Riverside, CA 92507.

Accepted 4 February 1993

Knorr, O. A. 1950. First breeding record of the Black Swift, *Nephoecetes n. borealis*, in Colorado. Auk 67:516.

Knorr, O. A. 1961. The geographical and ecological distribution of the Black Swift in Colorado. Wilson Bull. 73:155–170.

Knorr, O. A. 1962. Black Swift breeds in Utah. Condor 64:79.

Knorr, O. A. 1989. The Black Swift in the Chiricahua Mountains of Arizona. Southw. Nat. 34:559–560.

Michael, C. M. 1927. Black Swift nesting in Yosemite National Park. Condor 29:89–97.

Ridgway, R. 1874. United States geological exploration of the fortieth parallel. Part III—Ornithology. U.S. Government Printing Office, Washington, D.C.

Accepted 23 February 1993

COMMON RAVEN POPULATIONS IN JOSHUA TREE NATIONAL MONUMENT, CALIFORNIA

RICHARD J. CAMP and RICHARD L. KNIGHT, Colorado State University, Department of Fishery and Wildlife Biology, Fort Collins, Colorado 80523

JERRY FREILICH, Joshua Tree National Monument, 74485 National Monument Drive, Twentynine Palms, California 92277-3597

Common Raven (*Corvus corax*) numbers in the Mojave Desert have grown substantially, with increases ranging from 5 to 15% annually over the past 20 years (Robbins et al. 1986, USDI 1990). These population increases, and the location of Desert Tortoise (*Gopherus agassizii*) shells near raven nests and perches, have resulted in ravens being suggested as a cause of the decline of tortoise populations (Berry 1985, Berry et al. 1986).

The conclusion that raven populations have increased is based on Breeding Bird Surveys, in which birds are counted from roadsides (Robbins et al. 1986). Estimates of raven populations are thus based on data from areas of diverse human land uses including agriculture, livestock grazing, and urban/suburban development. Knight and Kawashima (in press), however, found that raven numbers can be considerably greater along highways than away from them. Currently, there is no information on raven numbers in areas away from roads and not grazed by livestock.

Accordingly, we surveyed raven numbers in native desert scrub away from roads. Our goal was to determine a baseline estimate of raven population density in a part of the Mojave Desert suitable for nesting ravens but free from contemporary land-use changes.

Our study area was heterogenous and located in the Pinto Basin and Eagle Mountains of Joshua Tree National Monument and U.S. Bureau of Land Management wilderness and natural lands, San Bernardino County, California (33°55' N, 115°30' W). Elevations ranged from 420 to 1210 m. Rain (< 110 mm annually) falls predominantly in the winter, though there are occasional summer thundershowers. The dominant vegetation consisted of widely spaced shrubs, including creosote bush (*Larrea divaricata*) and shadscale (*Atriplex brevifolia*) (Munz and Keck 1959). The

NOCTURNAL FORAGING BY SCISSOR-TAILED FLYCATCHERS UNDER ARTIFICIAL LIGHT

JENNIFER K. FREY, Department of Biology and Museum of Southwestern Biology, University of New Mexico, Albuquerque, New Mexico 87131

I observed nocturnal foraging by Scissor-tailed Flycatchers (*Tyrannus forficatus*) on 27 April 1992 at College Station, Brazos County, Texas. Sunset was at 2001 central daylight time. At approximately 2130 I saw an adult Scissor-tailed Flycatcher perched on a utility wire below a street light adjacent to a busy four-lane highway. A second Scissor-tailed Flycatcher arrived at approximately 2200. It perched on the utility wire about 1 m from the first bird. Both flycatchers hunted flying insects attracted to, or illuminated by, the street light. The flycatchers were not observed to chase insects beyond the lighted area. After pursuing an insect the birds returned immediately to their perch. Insect species that the birds were preying on were not identified but included several moths. The two birds continued foraging until at least 2300 when I discontinued my observations.

F. W. Davis, W. L. Gannon, and two anonymous reviewers commented on an earlier version of this note.

Accepted 27 January 1993

BULLETIN BOARD

REQUEST FOR INFORMATION ON THE PURPLE MARTIN

I am documenting the historical and current distribution of the Purple Martin in California as part of a study initiated by the California Department of Fish and Game. This information will be used to determine the status of the Purple Martin in California as well as for my own research. I would greatly appreciate as much information as you can provide concerning Purple Martin nest sites and migratory staging areas: dates, location including county, nearest town, elevation, landowner, detailed directions to the site (photocopied topographic maps are excellent), number of individuals, pairs, or nests, stage of the breeding cycle, nest substrate, reproductive success, habitat type including condition and proximity to water, presence of starlings, and any other comments you believe may be useful. Please send information to Brian Williams, P. O. Box 605, Loomis, CA 95650, or phone (916) 624-4861.

RAPTOR RESEARCH FOUNDATION 1993 ANNUAL MEETING

will be held 3–7 November at Marriot City Center, Charlotte, North Carolina. Seminars, papers, and awards will be presented. For information, contact the sponsoring organization, the Carolina Raptor Center, at (704) 875-6521. For hotel reservations call (800) 228-9290.

WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

President: Robert McKernan, 1230 Friar Lane, Redlands, CA 92373

Vice-President: Steve Summers, P.O. Box 202, Silver Lake, OR 97638

Treasurer/Membership Secretary: Dorothy Myers, 6011 Saddletree Lane, Yorba Linda, CA 92686

Recording Secretary: Jean-Marie Spoelman, 4629 Diaz Drive, Fremont, CA 94536

Circulation Manager: Marnie S. Crook, P.O. Box 10483, San Bernardino, CA 92423

Directors: Bruce Deuel, Kimball Garrett, Peter Gent, Guy McCaskie, Robert McKernan, Steve Summers, Bill Tweit, Janet Witzeman, David Yee

Editor: Philip Unitt, 3411 Felton Street, San Diego, CA 92104

Associate Editors: Cameron Barrows, Tim Manolis, Thomas W. Keeney

Graphics Manager: Virginia P. Johnson, 4637 Del Mar Ave., San Diego, CA 92107

Photo Editor: Peter La Tourrette, 1019 Loma Prieta Ct., Los Altos, CA 94024

Secretary, California Bird Records Committee: Michael A. Patten, P. 0. Box 8612, Riverside, CA 92515

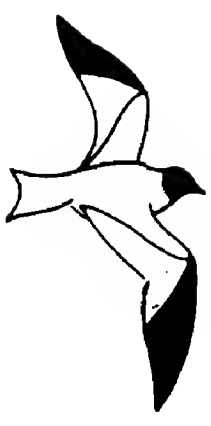
Editorial Board: Robert Andrews, Alan Baldridge, Andrew J. Berger, Laurence C. Binford, R. Wayne Campbell, David F. DeSante, Jon L. Dunn, Richard Erickson, William T. Everett, Kimball L. Garrett, Joseph R. Jehl, Jr., Ned K. Johnson, Virginia P. Johnson, Brina Kessel, Stephen A. Laymon, Paul Lehman, John S. Luther, Guy McCaskie, Joseph Morlan, Harry B. Nehls, Dennis R. Paulson, Gary H. Rosenberg, Oliver K. Scott, Ella Sorensen, Richard W. Stallcup, Charles Trost, Terence R. Wahl, Bruce Webb

Membership dues, for individuals and institutions, including subscription to Western Birds: Patron, $1000; Life, $350; Supporting, $50 annually; Contributing, $30 annually; Family, $22; Regular, U.S., $18 for one year, $35 for two years, $50 for three years; outside U.S., $23 for one year, $45 for two years, $65 for three years. Dues and contributions are tax-deductible to the extent allowed by law.

Send membership dues, changes of address, correspondence regarding missing issues, and orders for back issues and special publications to the Treasurer. Make checks payable to Western Field Ornithologists.

Back issues of *California Birds/Western Birds:* $20 per volume, $5.00 for single issues. Xerox copies of out of print issues (Vol. 1, No. 1; Vol. 2, Nos. 1 and 4; Vol. 6, No. 2): $5.50 each. Ten-column *Field List of California Birds:* $1.00 each, 10 to 39 $0.80 each, 40 or more $0.70 each. *Checklist of the Birds of California:* $2.00 each, 10 or more $1.50 each. *Pelagic Birds of Monterey Bay, California:* $2.50 each, 10 or more $2.00 each, 40 or more $1.50 each.
All postpaid.

Published July 15, 1993 ISSN 0045-3897



WESTERN BIRDS

Vol. 24, No. 4, 1993

Volume 24, Number 4, 1993

Breeding Birds of Four Isolated Mountains in Southern California
Joan Easton Lentz 201

First Record of the Common Pochard in California
Michael A. Patten 235

Comments on the Taxonomy of *Empidonax traillii* (Willow Flycatcher) *M. Ralph Browning* 241

President's Message *Robert McKernan* 258

NOTES

Additional Records of Breeding Birds from Montague Island, Northern Gulf of California *Eduardo Palacios and Eric Mellink* 259

Observations on Esteros El Coyote and La Bocana, Baja California Sur, Mexico, in September 1991 *Gustavo D. Danemann and Roberto Carmona* 263

Anna's Hummingbirds with Hymenoptera Impaled on Bills
Michael C. Long 267

Index *Mildred Comar* 270

Cover photo by © Mike Danzenbaker of Mountain View, California: Loggerhead Shrike *(Lanius ludovicianus)*, Mountain View Shoreline Park, California, December 1988. This strikingly beautiful and once common West Coast resident appears to have suffered a precipitous population decline in recent years.

Western Birds solicits papers that are both useful to and understandable by amateur field ornithologists and also contribute significantly to scientific literature. The journal welcomes contributions from both professionals and amateurs. Appropriate topics include distribution, migration, status, identification, geographic variation, conservation, behavior, ecology, population dynamics, habitat requirements, the effects of pollution, and techniques for censusing, sound recording, and photographing birds in the field. Papers of general interest will be considered regardless of their geographic origin, but particularly desired are reports of studies done in or bearing on the Rocky Mountain and Pacific states and provinces, including Alaska and Hawaii, western Texas, northwestern Mexico, and the northeastern Pacific Ocean.

Send manuscripts to Philip Unitt, 3411 Felton Street, San Diego, CA 92104. For matter of style consult the Suggestions to *Contributors to Western Birds* (8 pages available at no cost from the editor) and the *Council of Biology Editors Style Manual* (available for $24 from the Council of Biology Editors, Inc., 9650 Rockville Pike, Bethesda, MD 20814).

Reprints can be ordered at author's expense from the Editor when proof is returned or earlier.

Good photographs of rare and unusual birds, unaccompanied by an article but with caption including species, date, locality and other pertinent information, are wanted for publication in Western Birds. Submit photos and captions to Photo Editor. Also needed are black and white pen and ink drawings of western birds. Please send these, with captions, to Graphics Manager.

WESTERN BIRDS

Volume 24, Number 4, 1993

BREEDING BIRDS OF FOUR ISOLATED MOUNTAINS IN SOUTHERN CALIFORNIA

JOAN EASTON LENTZ, 433 Pimiento Ln., Santa Barbara, California 93108

The breeding avifaunas of Figueroa Mountain and Big Pine Mountain in Santa Barbara County and Pine Mountain and Mount Pinos in Ventura and Kern counties are of great ornithological interest. These four mountains support islands of coniferous forest separated by other habitats at lower elevations. Little information on the birds of the first three has been published previously.

From 1981 to 1993, I, with the help of a number of observers, censused the summer resident birds of these four mountains, paying particular attention to the species restricted to high elevations. By comparing these avifaunas with each other, as well as with those of the San Gabriel, San Bernardino, and San Jacinto mountains, and the southern Sierra Nevada, I hope to add to current knowledge of the status and distribution of montane birds in southern California.

VEGETATION AND GEOGRAPHY

The pattern of vegetation in the survey areas is typical of that found on many southern California mountains. Generally, the south- and west-facing slopes of the mountains are covered with chaparral or pinyon–juniper woodland almost to the summits. On the north-facing slopes, however, cooler temperatures and more mesic conditions support coniferous forest, which often reaches far down the mountainsides. Because the climate is arid, few creeks or streams flow at high elevations, and most water is available in the form of seeps or small springs.

Both Figueroa (4528 feet, 1380 m) and Big Pine (6828 feet, 2081 m) mountains are located in the San Rafael Range, the southernmost of the Coast Ranges (Figure 1, Norris and Webb 1990). The San Rafael Mountains are bordered by the Sierra Madre, a low chaparral-covered range, to the north and the Cuyama Valley to the northeast. The Sisquoc River drains west from the San Rafael Mountains and Sierra Madre to the Santa Maria River. To the south lies the foothill grassland of the Santa Ynez Valley.

The vegetation of the Figueroa Mountain area (including Ranger Peak, 4652 feet, 1396 m) is a mixed forest of oaks and conifers with patches of chaparral and foothill grassland (Barbour and Major 1988). Above 3500 feet (1067 m) the forest is dominated by Ponderosa Pine (*Pinus ponderosa*) and Coulter Pine (*P. coulteri*), heavily interspersed with Canyon Live Oak (*Quercus chrysolepis*), Coast Live Oak (*Q. agrifolia*), and California Bay (*Umbellularia californica*). On the north sides of Figueroa Mountain and Ranger Peak stands of Big-Cone Spruce or Douglas-Fir (*Pseudotsuga macrocarpa*) grow on the steep slopes and in shaded canyons. Most of the understory shrubs are chaparral species such as manzanita (*Arctostaphylos* sp.), Toyon (*Heteromeles arbutifolia*), and Coffeeberry (*Rhamnus californica*) (Figures 2 and 3).

Big Pine Mountain is 19 miles (30 km) east of Figueroa Mountain and possesses more extensive coniferous forest (Figure 4). Chaparral covers the south-facing slope almost to the summit, but the vegetation near the summit and on the north slope is a mixed montane coniferous forest. Here, Jeffrey Pine (*Pinus jeffreyi*), Sugar Pine (*P. lambertiana*), White Fir (*Abies concolor*), and Incense Cedar (*Calocedrus decurrens*) furnish a dense canopy of tall conifers at elevations above approximately 5800 feet (1768 m). Within the coniferous forest are patches of montane chaparral: Bitter Cherry (*Prunus emarginata*), Western Chokecherry (*Prunus virginiana* var. *demissa*), Deer Brush (*Ceanothus integerrimus*), and Chaparral Whitethorn (*C. leucodermis*). On the east and west-facing slopes, [e.g., on

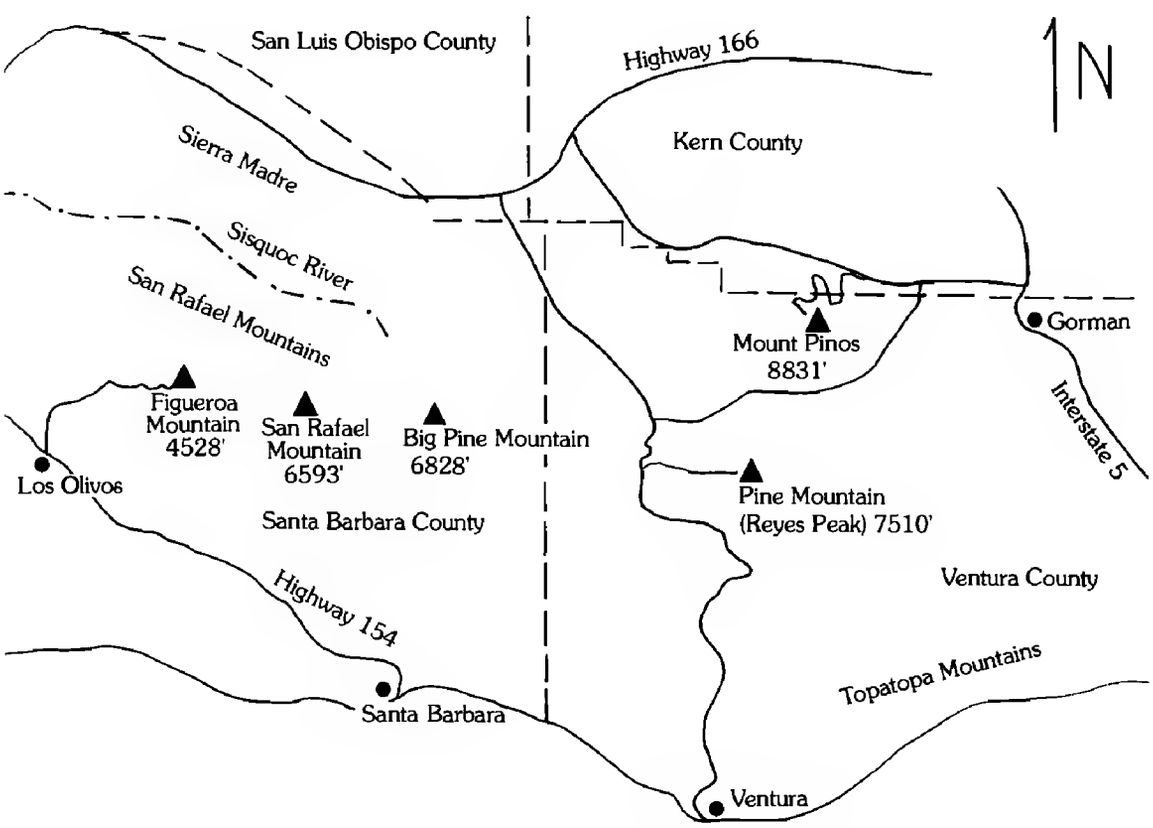


Figure 1. The four isolated mountains surveyed in Santa Barbara, Ventura, and Kern counties.

West Big Pine (6490 feet, 1978 m) and toward Madulce Peak], a drier Jeffrey Pine woodland predominates. Down a deep canyon on the north slope, the trail to Lower Bear Campground winds through a mesic area of mostly Incense Cedar with Canyon Live Oak and some Ponderosa Pine. A forest of Coulter Pine stretches across the southeast flank of the mountain in the vicinity of Alamar Saddle (Figure 5).

Approximately 19 miles (30 km) east of Big Pine Mountain, the narrow forested ridge of Pine Mountain extends east–west for approximately 9 miles (14.4 km) (Figure 6). It is a succession of summits, the highest being Reyes Peak (7510 feet, 2289 m). Bordered to the south by the Sespe Creek drainage and to the north by portions of the Cuyama and Lockwood valleys, Pine Mountain is surrounded by chaparral and pinyon–juniper woodland that reaches almost to the summit on south-facing slopes. Above 6000 feet (1829 m), Jeffrey and scattered Ponderosa pines grow in a dry, open forest along the boulder-strewn ridgetop. Down the steep north slope, several of the narrow canyons support a more mesic forest of Sugar Pine and White Fir, (e.g., along the Raspberry Spring trail and on the north side of Reyes Peak). Bitter Cherry, Chaparral Whitethorn, and Deer Brush mingle with Wax Currant (*Ribes cereum*) and Mountain Snowberry

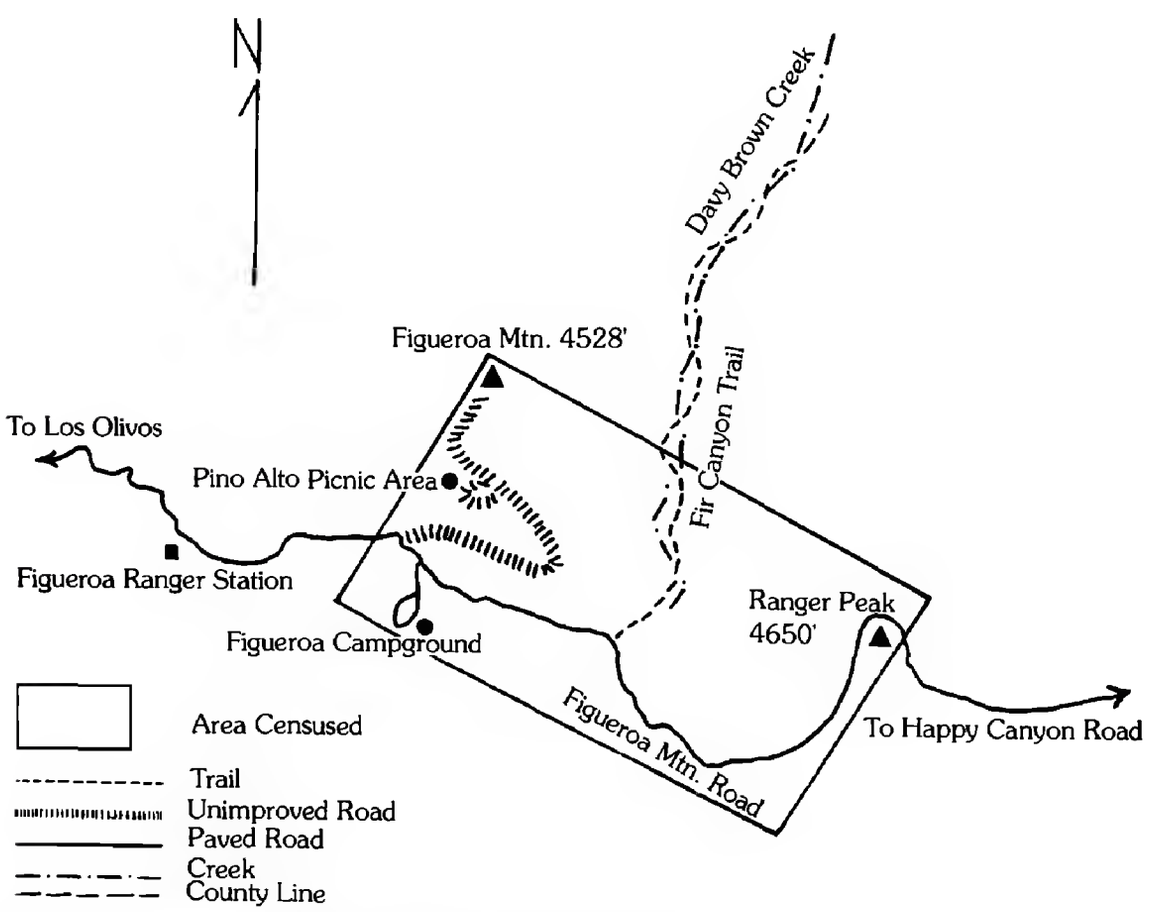


Figure 2. Detail of Figueroa Mountain, Santa Barbara County. The total area surveyed, above 3500 feet elevation, was about 1.3 square miles (3.4 km^2), out of a total forested area of about 2 square miles (5.2 km^2).

(*Symphoricarpos parrishii*) in a few forest openings, but the understory is never dense (Figure 7).

Mount Pinos (8831 feet, 2692 m) lies 16 miles (26 km) northeast of Pine Mountain. It is the highest point in a mass of mountains—including Mount Abel, Sawmill Mountain, and Grouse Mountain—separated from other ranges by intervening low divides and elevated valleys covered with sagebrush (*Artemisia tridentata*). The Mount Pinos region provides an ecological link with the Sierra Nevada and Tehachapi Mountains to the northeast and the Transverse Ranges of southern California to the southeast.

The Mount Pinos area (Figure 8) has the most montane habitat in the survey area. At approximately 6250 feet (1905 m), the lower slopes of pinyon–juniper mixed with sagebrush give way to a Jeffrey Pine woodland on the south and east slopes. On the north slopes, White Fir and Jeffrey Pine form a moister forest, as along the trail to Grouse Mountain and along Fir Ridge Road on Mount Pinos. California Black Oak (*Quercus kelloggii*) and Canyon Live Oak mix with the pine–fir forest in the canyons, particularly along the McGill trail on Mount Pinos. Above 8000 feet (2438 m), the vegetation resembles the montane subalpine forest found in the Transverse and Peninsular ranges of southern California (Barbour and Major 1988).

Figure 3. Coniferous forest on Figueroa Mountain. Note the typical conifer and oak mixture with Big-Cone Spruce and Canyon Live Oak making a dense canopy down north-facing canyons.

Photo by Joan Easton Lentz

The summit of Mount Pinos supports an open woodland of Limber Pine (*Pinus flexilis*) and Jeffrey Pine (Barbour and Major 1988).

Montane chaparral here generally occurs in dense patches on exposed, steep, or rocky areas and is very similar to that found in the southern Sierra Nevada, San Gabriel, San Bernardino, and San Jacinto ranges (Barbour and Major 1988). The common shrubs are currants and gooseberries (*Ribes* spp.), Snow Bush (*Ceanothus cordulatus*), and manzanita. Very small meadows grow at Iris Meadow on Mount Pinos, Sheep Camp on Sawmill Mountain and at occasional roadside seeps on Mount Pinos and Mount Abel. These sustain a number of grasses and herbs also found in alpine meadows in the southern Sierra Nevada and the San Gabriel, San Bernardino, and San Jacinto mountains (Figure 9).

CLIMATE

The climate of the areas studied is Mediterranean, with dry, warm summers and wet, cool winters. With the exception of an occasional thunderstorm, very little rain falls during the summer. Average annual precipitation for Figueroa Mountain is 21 inches, for Big Pine Mountain, 34 inches, for Pine Mountain, 23 inches, and for Mount Pinos 23 inches

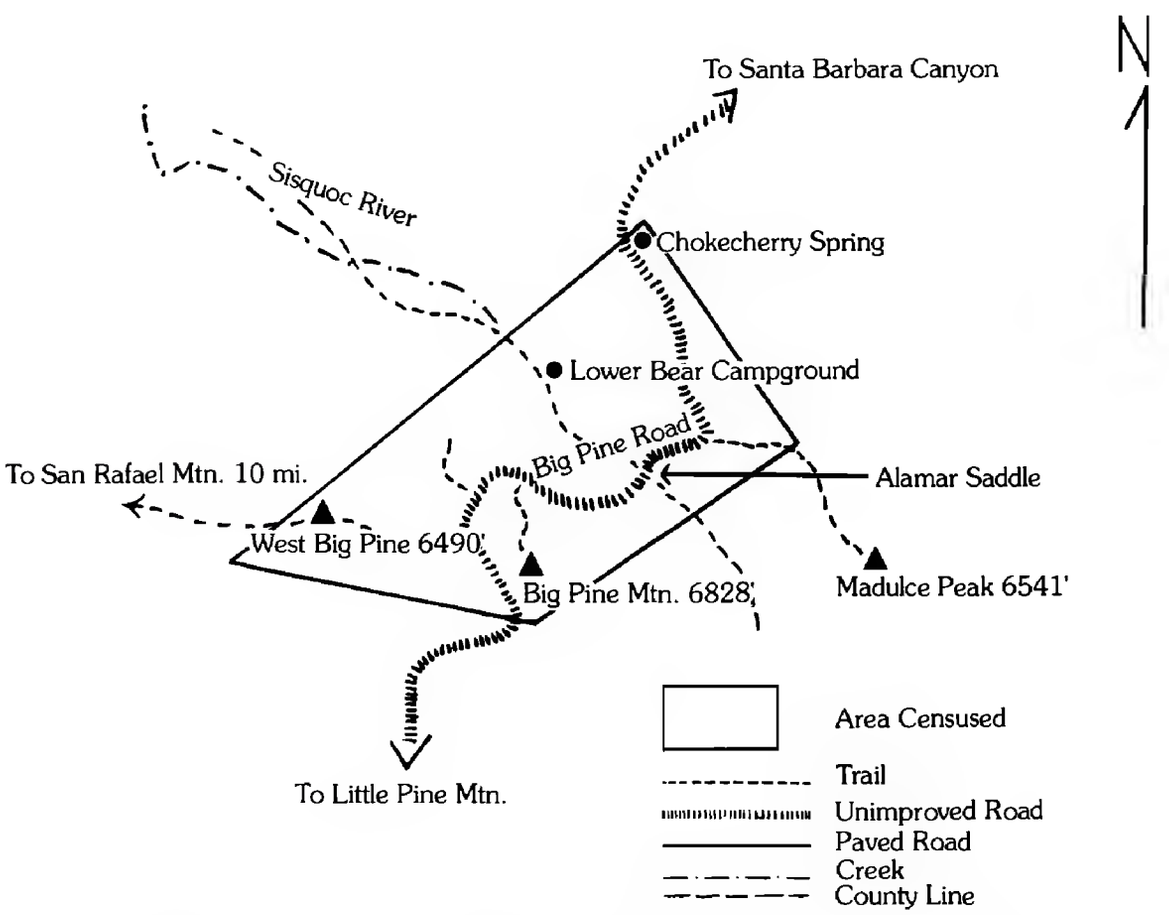


Figure 4. Detail of Big Pine Mountain, Santa Barbara County. The total area surveyed, above 5300 feet elevation, was about 4.5 square miles (11.7 km^2), out of a total forested area of about 5 square miles (13 km^2).

(Santa Barbara and Ventura County Flood Control personnel, pers. comm.). On Big Pine Mountain, Pine Mountain, and Mount Pinos, much of the precipitation falls in the form of winter snow. Average summer temperatures range from daytime highs of 80 to 85°F (27–29°C) to nighttime lows of 52–56°F (11–13°C) (U. S. Forest Service personnel, Santa Barbara District, pers. comm.).

From 1984 through 1990, precipitation in Santa Barbara and Ventura Counties—as in much of southern California—was well below average, possibly affecting both the diversity and abundance of montane species frequenting the areas studied.

Figure 5. Coniferous forest on Big Pine Mountain. This view is along the Big Pine Mountain Road, showing Sugar Pine, White Fir, and Incense Cedar at approximately 6200 feet elevation.

Photo by Joan Easton Lentz

ORNITHOLOGICAL HISTORY

Mount Pinos has received considerable attention since Joseph Grinnell camped in the area in June and July 1904 (Grinnell 1905). Grinnell and Swarth (1913) described the boreal fauna of the San Jacinto Mountains and compared it with that of other mountains of southern California, including Mount Pinos. Alden H. Miller and Seth Benson (1930) reported on additional species observed on Mount Pinos during the 1920s, recording eight boreal birds not encountered by Grinnell. Willett (1933) summarized the status and distribution of southern California's birds, including records from the Mount Pinos area. Grinnell and Miller (1944) mapped many records from Mount Pinos. Finally, Miller (1951) analyzed the bird geography of California, incorporating the Mount Pinos region.

The wealth of information available for the Mount Pinos region is in sharp contrast to the paucity of knowledge about the other mountains I surveyed. William Leon Dawson, author of *The Birds of California* (1923),

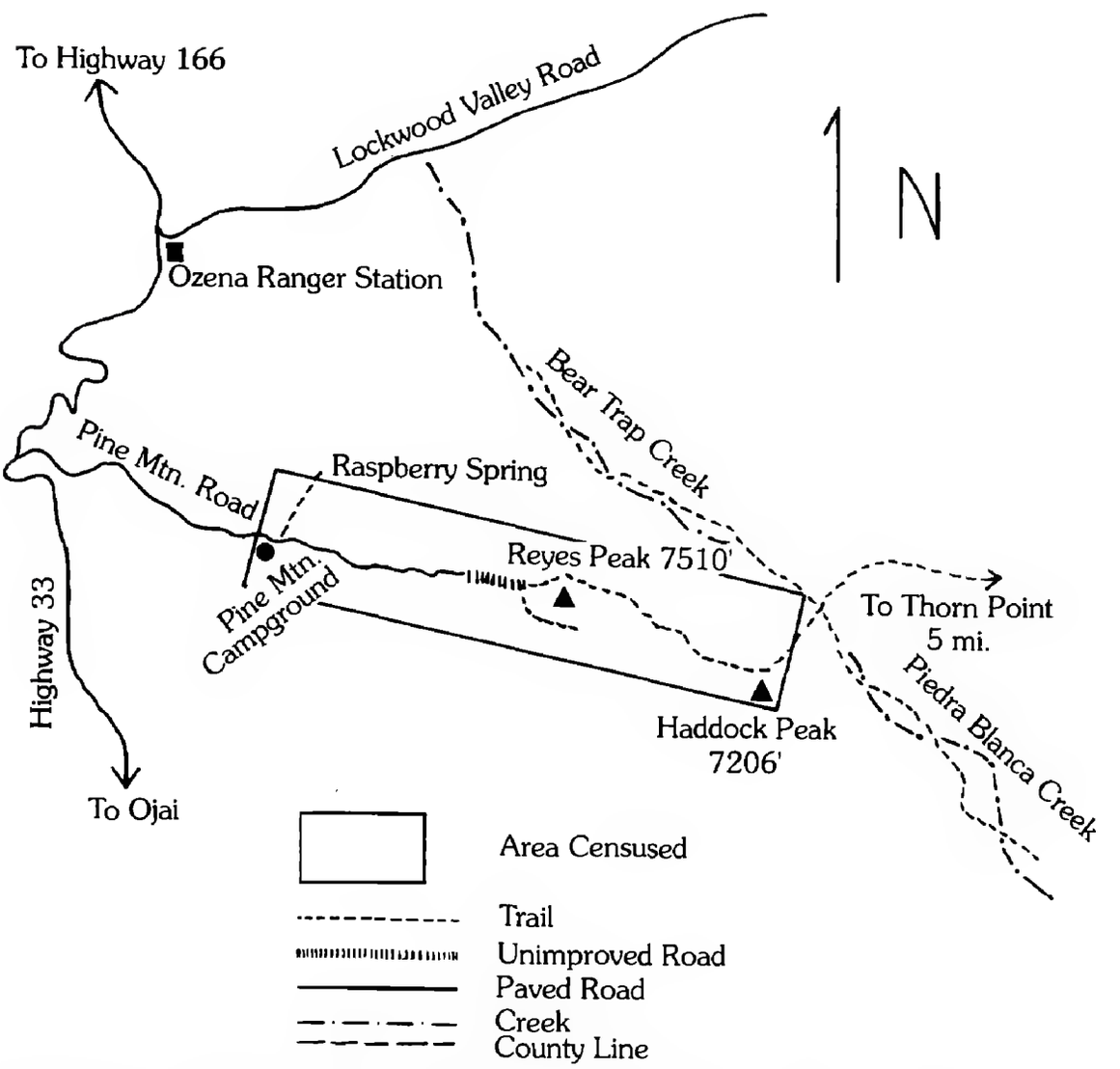


Figure 6. Detail of Pine Mountain, Ventura County. The total area surveyed, above 6000 feet elevation, was about 5.5 square miles (14.3 km^2), out of a total forested area of about 10 square miles (26 km^2).

worked in the Santa Barbara/Ventura region but almost exclusively on the coastal plain. Neither Willett (1933) nor Grinnell and Miller (1944) gave details of bird distribution in the higher mountains of Santa Barbara or Ventura counties other than Mount Pinos. Miller (1951:588) indicated the Big Pine Mountain area on a map of boreal districts of California, but he did not include such "very small detached boreal areas" in his analysis.

It was not until the 1960s that local observers finally began visiting Figueroa Mountain (Lehman 1982) and Pine Mountain on a regular basis. Several annotated checklists of the birds of Santa Barbara and Ventura

Figure 7. Coniferous forest on Pine Mountain showing the trail down to Raspberry Spring at 6750 feet elevation with Jeffrey Pine and scattered White Fir. Note the lack of understory even on the steep north-facing slope.

Photo by Joan Easton Lentz

counties (Metcalf 1967, 1972, Webster et al. 1980) reflected the increased observer coverage of the region, although their format precluded detailed descriptions of the mountains' avifauna. In the 1970s, quarterly reports in *American Birds* (*AB*) and seasonal reports of local observers on file at the Santa Barbara Museum of Natural History showed more frequent visits to the mountains of Santa Barbara and Ventura counties; Mount Pinos still received the most attention. Garrett and Dunn (1981) added greatly to our knowledge of the distribution of montane species in southern California, and Lehman (1982) furnished the most detailed account ever of Santa Barbara County's birds.

Although the California Condor had been observed carefully in the San Rafael Mountains since at least the 1930s, no reliable reports on other aspects of the mountains' bird life were published. The Big Pine Mountain region, largely because of its ruggedness and inaccessibility, was not comprehensively censused until our field work on this survey began in the summer of 1981. The idea for this paper originated as a result of that first visit to Big Pine Mountain, with the discovery of nine species not previously known to breed in Santa Barbara County.

SURVEY METHODS AND STUDY AREAS

Historical data were obtained from the published literature; additionally, several observers who had been active in the study areas since the 1970s contributed their records. The most important resource was field notes and

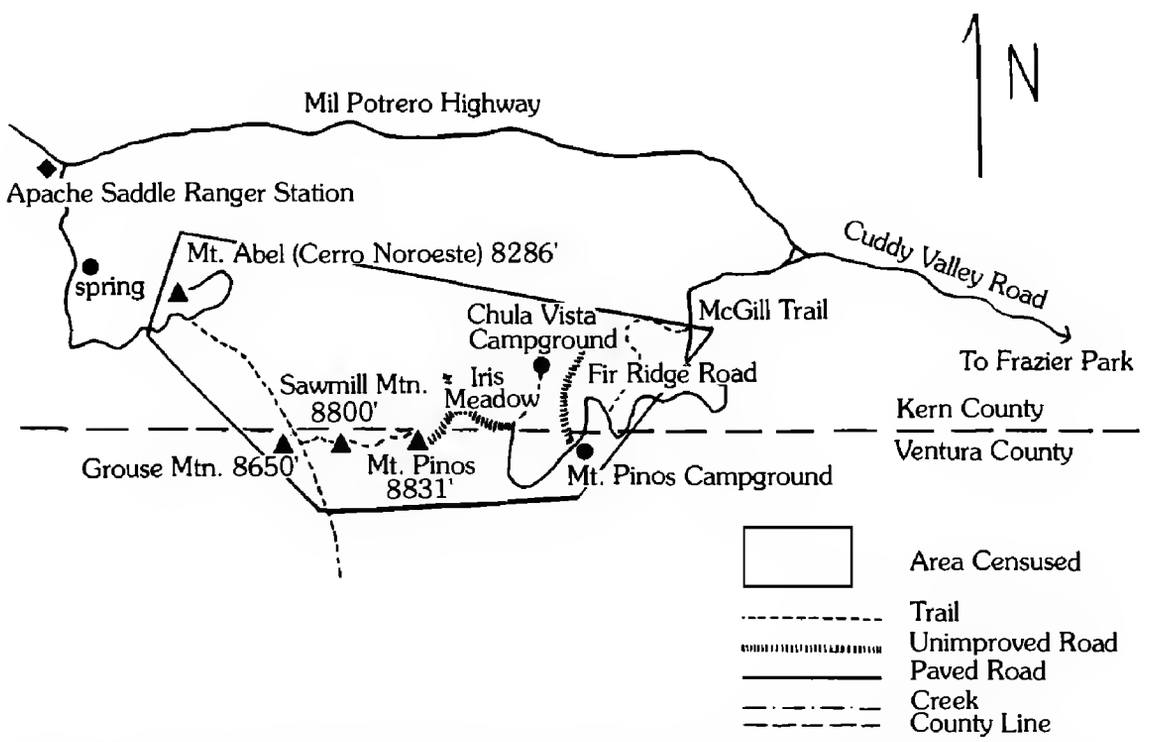


Figure 8. Detail of Mount Pinos and vicinity, Ventura and Kern counties. The total area surveyed, above 6250 feet elevation, was about 7 square miles (18.2 km^2), out of a total forested area of about 20 square miles (52 km^2).

sightings from observers who participated with me in the current survey: Louis Bevier, Allyn Bissell, Paul Collins, Jon Dunn, Shawneen Finnegan, Hank and Jan Hamber, George and Joan Hardie, Mark Holmgren, Paul Lehman, Barbara Millett, Jean Okuye, Florence Sanchez, John Schmitt, Brad Schram, Guy Tingos, and T. Dion Warren.

Our field work extended from 1981 to 1993, except at Mount Pinos, which was surveyed only from 1988 to 1992. Most records, both recent and historic, are from the period 15 May to 15 August, and mainly June and July. Occasionally, I have cited records from other times of the year from observers outside this survey.

Censused study areas were subsets of the entire montane habitat on each of the mountaintops. I attempted to keep the study area size roughly proportional to the amount of montane habitat on each mountain, although accessibility was sometimes a factor in coverage.

On Figueroa Mountain, we spent a total of 120 hours observing on 17 May 1982, 6 July 1983, 11, 21 June, and 12 July 1989, 18 June 1990, 29 June, 17 July and 4 August 1991 and 27 May 1992.

On Big Pine Mountain, total observer hours were 1304: 30 June–1 July 1981, 19–22 July 1982, 19–21 July 1983, 30 May 1985, 18–20 June 1986, 2 July 1987, 21–25 June and 23–24 July 1988, 21–23 June 1989,

Figure 9. Coniferous forest on Mount Pinos showing the open, park-like stands of Jeffrey Pine around a meadow at about 8300 feet elevation near Chula Vista Campground.

Photo by Joan Easton Lentz

21–23 June 1990, 25–27 June 1991, 5–7 June and 25–27 June 1992, and 10–12 June 1993. Big Pine Mountain is difficult to reach, owing to its isolation in the San Rafael Wilderness Area. The nearest trailhead, Santa Barbara Canyon, is a 16-mile hike away. Motorized travel is prohibited in the wilderness area and vehicle access is only by special permission of the U. S. Forest Service, Los Padres National Forest.

San Rafael Mountain (6593 feet, 2009 m) was not in the Big Pine Mountain study area, but pertinent records from this peak are occasionally included in the species accounts. Lying 10 miles (16 km) west of Big Pine Mountain in the San Rafael Range, it supports about 2 square miles of coniferous forest near Mission Pine Spring, which we censused 18–20 June 1982, 10–12 June 1989, 16–18 June 1990, and 21–23 June 1991. Access is via a 12-mile hike from Cachuma Saddle.

We surveyed Pine Mountain on 6 June 1981, 10 August 1983, 29 June 1984, 1 July 1986, 18 July 1988, 9–10 June 1989, 5 August 1990, 7–8 June 1991, and 11–12 June 1992 for a total of 376 observer hours.

On Mount Pinos we spent a total of 520 observer hours on 12 July 1988, 3, 10–11, 16, and 25 June and 6 July 1989, 24 May, 1–3 June, 8, 14 June 1990, 12–13 July 1991, 5 and 19 June and 23 July 1992. (Visits 12–14 May 1991 and 11 September 1992 to search for Blue Grouse were included in the observer hours.)

SPECIES ACCOUNTS

I focused my attention on the species defined as boreal by Miller (1951), although many species widespread also at lower elevations occur on the four mountains. I refer to these boreal species as "montane," rather than "boreal"; the former is more pertinent to an avifauna which exists in southern California generally above 5000 feet (1500 m) and is associated with oaks and conifers. These montane species are indicated by a ▲. Other species are only briefly annotated, except those of particular interest.

All uncredited sightings are from my personal observations or those of observers who accompanied me in the field; they are on file with me and at the Santa Barbara Museum of Natural History (SBMNH). Sightings of observers connected with this survey but who were not accompanied by me at the time, and sightings of observers not connected with the survey, are credited individually. I defined "common" as over 10 individuals seen or heard per day, "fairly common" as 5–10 individuals seen or heard per day, "uncommon" as 1–5 individuals seen or heard per day, and "rare" as species not seen or heard every day and, when found, usually in small numbers.

TURKEY VULTURE (*Cathartes aura*). Uncommon on Figueroa Mountain, rare on Big Pine Mountain, Pine Mountain, and Mount Pinos.

CALIFORNIA CONDOR (*Gymnogyps californianus*). Extirpated. As recently as the early 1980s it was rare on Big Pine and Pine mountains, uncommon on Mount Pinos/Mount Abel, and a rare visitor to Figueroa Mountain. By 1981, the total population had dwindled to less than 30 and by 1986 only 5 birds remained in the wild. In 1987, the last wild bird was captured, and a remnant flock of California

Condors now resides in captivity. Reintroduction to the mountains of Ventura County is in progress.

Around Big Pine Mountain, California Condors were formerly quite numerous, e.g., 20 were at San Rafael Mountain 14–15 July 1940 and 11 were at West Big Pine in August 1946 (Koford 1953). From at least 1976 (Snyder and Hamber 1985) through 1985 (J. Hamber pers. comm.), a pair of condors nested regularly near Big Pine Mountain. Until 1983, condors also bred in the Pine Mountain area (J. Hamber pers. comm.). On both Big Pine and Pine mountains, condors nested on cliff ledges or in caves.

In the Mount Pinos/Mount Abel area, California Condors were seen from at least 1904, when Grinnell (1905) reported a single individual flying over the summit, through the 1980s. Although nesting was never documented in the area, the birds were frequently observed foraging there or while passing to and from roosting sites in late summer and early fall.

SHARP-SHINNED HAWK (*Accipiter striatus*). No confirmed records, although the Sharp-shinned Hawk is a scarce summer resident in the San Gabriel, San Bernardino, and San Jacinto ranges (no documented evidence of nesting, Garrett and Dunn 1981).

COOPER'S HAWK (*Accipiter cooperii*). Rare to uncommon on all of the mountains surveyed.

▲NORTHERN GOSHAWK (*Accipiter gentilis*). Rare, occurring in the Mount Pinos area only. The goshawk is a rare resident in the San Jacinto Mountains (*AB* 41:1486) and possibly the San Bernardino Mountains, but with no evidence of nesting (Garrett and Dunn 1981).

Prior to 1989, there was only one nesting record for the Northern Goshawk in southern California: an egg set taken at Mount Pinos on 6 May 1904 (Garrett and Dunn 1981). Other records from Mount Pinos are of individuals 1 August 1953 and 18 June 1976 (Garrett and Dunn 1981). On 10 June 1989 we discovered an active nest with 2 adults and 2 juveniles, which later fledged, in the vicinity of Mount Abel. In the same year, a pair of goshawks was seen near Mount Pinos, where nesting was suspected (*AB* 43:1367). The Mount Abel pair attempted nesting again in May–June 1990 (R. Moore pers. comm.), but the nest was abandoned. On 19 and 20 July 1991, F. Sanchez saw an adult and 1 (possibly 2) immature(s), but no nest, at Mount Pinos.

RED-TAILED HAWK (*Buteo jamaicensis*). Uncommon on all of the mountains surveyed.

GOLDEN EAGLE (*Aquila chrysaetos*). Rare to uncommon on all four mountains.

AMERICAN KESTREL (*Falco sparverius*). Uncommon on Figueroa Mountain, Big Pine Mountain, and Pine Mountain, rare on Mount Pinos.

▲BLUE GROUSE (*Dendragapus obscurus*). This species may still persist as a very rare resident of the Mount Pinos area, but further field work is necessary to determine its status accurately. It is absent from the other mountains surveyed. No reliable records exist south of the study region (Garrett and Dunn 1981).

The Blue Grouse was first recorded from Mount Pinos by Grinnell (1905), who saw a female and juvenile and several dust-wallows and reported that local residents captured the birds frequently. Dickey and van Rossem (1923) described the grouse of the southern Sierra Nevada and Mount Pinos as a subspecies, *D. o. howardi*, citing eight specimens from Mount Pinos and selecting one as the type. Willett (1933) wrote of a set of five eggs taken from the north slope of Mount Pinos 21 May 1928. The last certain records for grouse in this area were in the 1970s, e.g., 1 on Mount

Abel on 23 September 1976 (J. Hamber pers. comm.) and 5 between Sawmill Mountain and Mount Pinos on 30 September 1979 (M. Hinz, U. S. Forest Service, Mount Pinos District, pers. comm.). Weiss (1979) and Bendell and Zwickel (1984) found no evidence of the species in the Mount Pinos area during surveys conducted in the spring of 1979. A report of 1 or 2 individuals on 10 July 1991 (*AB* 45:1161) lacked adequate documentation; however, an unconfirmed sighting on 2 August 1992 of a bird flushed near Sawmill Mountain (L. Allen pers. comm.) is intriguing.

On 1 May 1993, R. and M. Chichester were hiking in snow near Sawmill Mountain when the former flushed 2 birds, allegedly Blue Grouse, which disappeared. Then they heard 3 to 5 "booming" calls followed by a few low "clucks." The steep north slopes of Mount Pinos, Mount Abel, and Sawmill Mountain still seem to provide suitable habitat, but we were unable to locate this species there from 1988 to 1992.

For Big Pine Mountain, there is a single record of a sighting by U. S. Forest Service personnel of 2 Blue Grouse chicks on 8 June 1938 (Bartholomew 1940).

CALIFORNIA QUAIL (*Callipepla californica*). Rare to uncommon on all of the mountains surveyed. We usually found California Quail near the lowest elevations of each study area. The California Quail evidently coexists in small numbers with the Mountain Quail, but the former is restricted to the south-facing slopes where chaparral predominates, e.g., we saw 2 at McGill trailhead (6250 feet, 1905 m) on Mount Pinos, 5 June 1992.

▲MOUNTAIN QUAIL (*Oreortyx pictus*). Common on Big Pine Mountain, fairly common on Figueroa Mountain, Pine Mountain, and Mount Pinos. It occurs in all of the mountain ranges west of the deserts in southern California (Garrett and Dunn 1981).

Big Pine Mountain, with its brushy patches of Bitter Cherry, Western Chokecherry, and *Ceanothus*, attracts good numbers of Mountain Quail. A high count here is 50 individuals including young 30 June and 1 July 1981 (Lehman 1982). Low rainfall probably affects this species, as numbers declined somewhat from 1984 to 1990 on all the mountains surveyed.

BAND-TAILED PIGEON (*Columba fasciata*). Common on Big Pine Mountain, fairly common on Figueroa Mountain, Pine Mountain, and Mount Pinos. In February and March 1982 near Big Pine Mountain, J. Schmitt observed many concentrated in canyons south of Madulce Peak. He noted birds in all phases of reproduction: nest construction, nests and fresh eggs, young (fledged and nestlings). In February he observed a well-feathered young pigeon that must have hatched from an egg laid in early to mid-January. An enormous acorn crop that year may have stimulated winter breeding.

MOURNING DOVE (*Zenaida macroura*). Uncommon on all the mountains surveyed.

▲FLAMMULATED OWL (*Otus flammeolus*). Rare on Mount Pinos and Big Pine Mountain. There are no records for Figueroa Mountain and Pine Mountain, although with further field work the species may be found on the latter. It breeds in the San Gabriel and San Bernardino mountains (*AB* 39:962; Grinnell and Miller 1944) and possibly in the San Jacinto Mountains (*AB* 42:1339).

Flammulated Owls were first recorded on Mount Pinos 24–25 July 1935 (Miller 1936). On 1 June 1990, on Fir Ridge Road on the north slope of Mount Pinos, we had a bird respond to taped calls. B. Broadbooks heard 1 calling at the same location on 8 June 1990. K. Garrett found a dying juvenile bird in the town of Frazier Park on 7 August 1992 (specimen in Los Angeles County Museum of Natural History).

On Big Pine Mountain, Flammulated Owls were unrecorded until J. Schmitt found 1 on 21 April 1989. Later that year, on the nights of 21 and 22 June 1989, we had 3 individuals respond to taped calls at locations $\frac{1}{4}$ to $\frac{1}{2}$ mile apart along Big Pine Road in the dense north-facing coniferous forest. Records since then at the same general location are 1 on 21 June 1990, 2 on 25 June 1991 (seen well), and 2 on 25 and 26 June 1992.

On Pine Mountain, we had no response to several hours of taped calls played on the nights of 7 June 1991 and 11 June 1992.

GREAT HORNED OWL (*Bubo virginianus*). Uncommon on all four mountains.

▲NORTHERN PYGMY-OWL (*Glaucidium gnoma*). Uncommon on Figueroa and Big Pine mountains, rare to uncommon on Pine Mountain, and rare on Mount Pinos. It breeds in the San Gabriel, San Bernardino, and San Jacinto mountains with a general decrease in abundance from north to south (Garrett and Dunn 1981).

On Big Pine Mountain and West Big Pine, M. Holmgren counted up to 9 individuals, including 3 fledged young, from 21 to 25 June 1988. In the Figueroa Mountain area, our high count was 3, including a pair, on 14 April 1989.

On Pine Mountain, there is a record of 1 in the "summer of 1980" (R. Webster, unpubl. report in SBMNH), and we saw 1 on 10 June 1989 and 8 June 1991 at the same location on Reyes Peak and 1 near Haddock Peak on 11 June 1992. The only recent record from Mount Pinos is of a family group at Mount Pinos Campground 1–2 August 1980 (K. Garrett pers. comm.).

▲SPOTTED OWL (*Strix occidentalis*). Uncommon on Big Pine Mountain, rare to uncommon on Figueroa Mountain, Pine Mountain, and Mount Pinos. The species breeds in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

Spotted Owls were observed regularly on Big Pine Mountain, being found more commonly at lower elevations in shaded, narrow canyons where Canyon Live Oaks provide shelter for roosting and nesting. U. S. Forest Service censuses since 1988 indicate this owl is more widespread than previously thought (Nancy Sandburg, U.S. Forest Service, Santa Barbara District, pers. comm.). Near Figueroa Mountain, Spotted Owls frequent canyons on the north slopes, where a pair fledged 2 young in July 1985 (P. Lehman, unpubl. report on file at SBMNH) and 2 were heard calling in June 1991 (*fide* G. Tingos).

On Pine Mountain, there is one record from the elevations surveyed, of an individual we heard calling downslope from Reyes Peak on 11 June 1992. However, Spotted Owls can be found in nearby north-facing canyons at lower elevations, e.g., R. Moore heard up to 4 there in summer 1989. On Mount Pinos, Grinnell (1905) recorded a Spotted Owl at 5500 feet and Willett (1933) cited 1 at 6300 feet, but the absence of oaks and riparian woodlands contributes to the scarcity of the species there.

LONG-EARED OWL (*Asio otus*). Rare in the Mount Pinos region; no records for the other mountains surveyed. Grinnell (1905) recorded the species on Mount Pinos at 5000 feet; a pair with 3 or 4 young were at 7500 feet on 1 August 1981 (*AB* 35:979).

▲NORTHERN SAW-WHET OWL (*Aegolius acadicus*). Rare to uncommon on all of the mountains surveyed. It breeds in the San Gabriel (*AB* 38:1060), San Bernardino, and San Jacinto mountains, where it is uncommon and local (Garrett and Dunn 1981).

The Northern Saw-whet Owl was first recorded on Mount Pinos by Miller and Benson (1930). Hall (1940) located a nest there with 4 eggs and 1 chick, and in early July 1972 a juvenile was on Mount Pinos (*AB* 26:907). During the night of 1 June

1990, we had 2 individuals of this species respond to taped calls, 1 at Mount Pinos Campground and 1 at Fir Ridge Road. We had another response to taped calls on 12 July 1991 at the same location on Fir Ridge Road as the previous year. From 22 to 26 July 1991, L. Sansone saw 1 roosting near Mount Pinos Campground.

On Big Pine Mountain, Northern Saw-whet Owls were first recorded from 29 June through 1 July 1981 (Lehman 1982). That year 4 were heard calling persistently from the coniferous forest along the north slope. On subsequent visits to Big Pine Mountain, we heard 1 on 22 June 1989, and M. Holmgren had 2 respond to taped calls on 6 June 1992. On San Rafael Mountain, G. and J. Hardie observed 1 on 11 June 1989.

On Figueroa Mountain, the Northern Saw-whet Owl is found irregularly on the north slopes in the pine–fir forest above 4000 feet (Lehman 1982). In the Pine Mountain area, we observed an individual when it responded to taped calls on 11 June 1992 on the north slope of Reyes Peak, a first record for the species on this mountain.

COMMON POORWILL (*Phalaenoptilus nuttalli*). Although this species inhabits the drier chaparral on the lower slopes of all the mountains, there are no records of it at the elevations surveyed except the following: Grinnell (1905) observed 2 on Mount Pinos, including 1 at the summit, in June and July 1904, and we observed single birds on Big Pine Mountain in the Alamar Saddle area on 20 July 1982 and 12 July 1991.

WHITE-THROATED SWIFT (*Aeronautes saxatalis*). Uncommon to fairly common on all the mountains surveyed.

BLACK-CHINNED HUMMINGBIRD (*Archilochus alexandri*). One at the summit of Big Pine Mountain on 22 July 1982 is likely to have been a postbreeding upslope wanderer.

ANNA'S HUMMINGBIRD (*Calypte anna*). Common on Figueroa, Pine, and Big Pine mountains, and fairly common in the Mount Pinos region.

COSTA'S HUMMINGBIRD (*Calypte costae*). Probably a rare to uncommon but regular visitor, particularly in high-elevation chaparral, on all the mountains surveyed, but there are records only for Pine Mountain, where we saw 1 on 9 June 1989, and Big Pine Mountain, where we saw 1 on 1 July 1981, 1 on 2 July 1987, 6 on 22 June 1989, and 1 on 22 June 1991 and M. Holmgren saw 1 on 6 June 1992. In addition, we saw 2 on San Rafael Mountain 19 June 1982.

▲CALLIOPE HUMMINGBIRD (*Stellula calliope*). Uncommon in the Mount Pinos area, rare visitor on Big Pine Mountain, unrecorded on Figueroa Mountain, and status unclear on Pine Mountain. The species nests on the north side of the San Gabriel Mountains (rare) and in the San Bernardino and San Jacinto (rare) mountains (Garrett and Dunn 1981).

Grinnell (1905) described this hummingbird as fairly common on Mount Pinos, but I did not find it so. Our high count in the Mount Pinos/Mount Abel area was 5 from 11 to 13 July 1991. Calliope Hummingbirds frequent currants (especially *Ribes cereum*) near Iris Meadow, at Sheep Camp meadow, and along the McGill trail.

In the Pine Mountain area, Garrett and Dunn (1981:228) reported that Calliope Hummingbirds "nest on Reyes Peak," but I have not been successful in locating any records. There is one specimen at the University of California at Santa Barbara (UCSB), an immature male 13 August 1989, from the headwaters of Piedra Blanca Creek, near Pine Mountain but east of the study area. Although small patches of currants are found along a 4-mile segment of Pine Mountain ridge from Reyes Peak to Haddock Peak, we observed no Calliope Hummingbirds there 8 June 1991 and 12 June 1992.

For Big Pine Mountain, there are three records: we saw an immature at Chokecherry Spring on 19 July 1982, and on 10 June 1993 we observed a male displaying along the Big Pine Road. In addition, M. Holmgren collected 2 on 30 August 1989 (specimens in UCSB), which were probably migrants.

RUFOUS HUMMINGBIRD (*Selasphorus rufus*). Common fall (July–August) transient on all the peaks except Figueroa Mountain, where it is only fairly common (Lehman 1982).

ALLEN'S HUMMINGBIRD (*Selasphorus sasin*). Uncommon fall (July–August) transient on all the peaks surveyed. Because of the difficulty of distinguishing immature Rufous and Allen's hummingbirds in the field, the status of these two species remains somewhat unclear.

ACORN WOODPECKER (*Melanerpes formicivorus*). Common on Figueroa Mountain, uncommon on Big Pine Mountain, and rare to uncommon on Pine Mountain and Mount Pinos.

▲RED-BREASTED SAPSUCKER (*Sphyrapicus ruber*). Although this species is uncommon to fairly common on Big Pine and Pine mountains, it is rare to uncommon on Mount Pinos. There are no summer records for Figueroa Mountain. It breeds in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

The Red-breasted Sapsucker was one of the species found nesting on Big Pine Mountain from 29 June to 1 July 1981 (Lehman 1982), a first summer and breeding record for Santa Barbara County, with 12 individuals tallied including an adult feeding a juvenile. Numbers there have declined somewhat since. We saw 2 on San Rafael Mountain on 19 June 1982, indicating the westernmost summer occurrence of this species in southern California.

On Mount Pinos, the bird was first recorded by Miller and Benson (1930). It is surprisingly rare in the Mount Pinos/Mount Abel area, and, although known to breed there (Hall 1940; Garrett and Dunn 1981), since the late 1970s there have been records of only a handful of individuals: single birds on 1 July 1978 (R. Webster pers. comm.) and 8 June 1991 (R. Moore pers. comm.) at Iris Meadow on Mount Pinos; 1 on 25 June 1989 on Mount Abel (B. Schram pers. comm.), and 1 on 15 May 1992 along McGill trail on Mount Pinos (F. Sanchez pers. comm.). Possibly the species is more numerous at lower elevations where Black Oaks predominate (J. Dunn pers. comm.). Red-breasted Sapsuckers may be as scarce as Williamson's Sapsuckers in the Mt. Pinos region.

▲WILLIAMSON'S SAPSUCKER (*Sphyrapicus thyroideus*). Rare on Mount Pinos; one record for Pine Mountain; no summer records exist for Big Pine or Figueroa mountains. Williamson's Sapsuckers breed in the San Gabriel (scarce), San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

On Mount Pinos, neither Grinnell (1905) nor Miller and Benson (1930) recorded this species. Later, Miller (1951) listed the Williamson's Sapsucker as one of the boreal species occurring on Mount Pinos. Garrett and Dunn (1981) gave its status there as rare with nesting evidence needed. Records from 1988 through 1992 are of 1 on Mount Pinos on 8 July 1988 (A. Bissell pers comm.), 1 on Mount Abel 3 June 1990 and 22 June 1991 (both L. Sansone pers. comm.), 1 on Mount Abel on 16 June 1991 (H. Brodkin pers. comm.), and "a pair" at Iris Meadow on Mount Pinos 8 June 1991 (R. Moore pers. comm.).

On Pine Mountain, an adult Williamson's Sapsucker accompanied by 2 immatures in the vicinity of Reyes Peak on 30 July 1980 (*AB* 34:930) provided the only known occurrence of breeding there. I observed no Williamson's Sapsuckers there from 1981 through 1992.

NUTTALL'S WOODPECKER (*Picoides nuttalli*). Fairly common on Figueroa Mountain, uncommon on Big Pine Mountain; no records for Mount Pinos and Pine Mountain at the elevations surveyed.

HAIRY WOODPECKER (*Picoides villosus*). Uncommon on all of the mountains surveyed.

▲WHITE-HEADED WOODPECKER (*Picoides albolarvatus*). Fairly common to common on Mount Pinos, Pine Mountain, and Big Pine Mountain; one summer record for Figueroa Mountain. The northern, nominate subspecies occurs south to the southern Sierra Nevada and the Piute Mountains (Grinnell and Miller 1944). Birds of the southern subspecies *gravirostris* are resident in the San Gabriel, San Bernardino, and San Jacinto mountains.

Grinnell (1905) first recorded this species on Mount Pinos. He suggested that the birds there are intergrades between the small-billed northern *albolarvatus* and the large-billed southern *gravirostris*. Our high count in the Mount Pinos/Mount Abel area was 28 from 11 to 13 July 1991.

Dawson (1923:1003) reported that *P. a. albolarvatus* was resident "on Mount Pinos and west through the San Rafaels." Not until the exploration of the Big Pine Mountain/San Rafael Mountain area in the early 1980s, however, was a sizeable population of these birds found. Our high counts were 19 on Big Pine Mountain from 25 to 27 June 1992 and 13 on San Rafael Mountain from 18 to 20 June 1982. The latter is the westernmost known location for summering of the species in southern California.

P. Lehman found a single individual on Figueroa Mountain on 17 June 1981.

NORTHERN FLICKER (*Colaptes auratus*). Fairly common on all the mountains surveyed.

▲OLIVE-SIDED FLYCATCHER (*Contopus borealis*). Fairly common to common on Big Pine and Pine mountains; only fairly common on Mount Pinos and Figueroa Mountain. It breeds in all the major ranges west of the deserts in southern California (Garrett and Dunn 1981).

The dry, open Jeffrey pine forest found along the Pine Mountain ridge and in the Big Pine Mountain area, (e.g., West Big Pine and Madulce Peak) is well suited for Olive-sided Flycatchers. High counts are 16 on Pine Mountain, 9 and 10 June 1989, and 30 on Big Pine Mountain, 30 June and 1 July 1981 (Lehman 1982), although numbers on the latter have since declined.

Grinnell (1905) first recorded this species as relatively numerous on Mount Pinos. Our highest count on Mount Pinos was 7 on 5 June 1992.

WESTERN WOOD-PEWEE (*Contopus sordidulus*). Common on all the mountains surveyed.

▲DUSKY FLYCATCHER (*Empidonax oberholseri*). Fairly common on Mount Pinos and Big Pine Mountain, uncommon to fairly common on Pine Mountain, absent from Figueroa Mountain. The species breeds throughout the major mountain ranges of southern California (Garrett and Dunn 1981).

On Mount Pinos, Dusky Flycatchers were first recorded by Miller and Benson (1930). We found them associated there with montane chaparral (*Ribes* spp. and *Ceanothus* spp.) adjacent to conifers, particularly near the summit and along the McGill trail.

On Big Pine Mountain, Dusky Flycatchers were discovered 30 June and 1 July 1981, a first Santa Barbara County summer breeding record (Lehman 1982, P. Collins, specimen in breeding condition in SBMNH). Here, this species frequents patches of *Ceanothus*, Bitter Cherry, or Western Chokecherry, usually near pines or firs. M. Holmgren had an unusually high count of 21 in the Big Pine Mountain/West

Big Pine area on 6 and 7 June 1992. Dusky Flycatchers may also breed farther west on San Rafael Mountain, where we recorded 15 from 18 to 20 June 1982.

On Pine Mountain, Dusky Flycatchers are not as common, perhaps because the montane chaparral there is less extensive. Our high count there was 6 on 7 and 8 June 1991.

PACIFIC-SLOPE FLYCATCHER (*Empidonax difficilis*). Uncommon to fairly common on Figueroa Mountain, Big Pine Mountain, and Pine Mountain. There is only one summer record for Mount Pinos, of an individual we saw at the McGill trailhead on 5 June 1992.

BLACK PHOEBE (*Sayornis nigricans*). Two records, probably of postbreeding upslope wanderers: 1 on Mount Pinos 14 June 1980, 1 on Big Pine Mountain 1 July 1981 (Lehman 1982).

ASH-THROATED FLYCATCHER (*Myiarchus cinerascens*). Fairly common on Figueroa and Big Pine mountains, uncommon on Pine Mountain, and rare on Mount Pinos at the elevations surveyed.

HORNED LARK (*Eremophila alpestris*). Two birds we saw flying over San Rafael Mountain on 19 June 1982 represent our only summer record of this species from the mountains surveyed. However, a specimen at the University of California at Los Angeles (UCLA) was collected by A. J. van Rossem on Mount Pinos at "9000 feet" on 3 July 1921.

PURPLE MARTIN (*Progne subis*). Rare and irregular on Big Pine Mountain; no records from the other mountains surveyed, although the species formerly nested near Mount Pinos at lower elevations (Garrett and Dunn 1981). On Big Pine Mountain, a pair nested on the summit in 1979 (Lehman 1982), and there have been scattered records since. Our high count was 2 pairs in the West Big Pine area on 1 July 1981 (Lehman 1982). Farther west, G. and J. Hardie observed 6 on San Rafael Mountain on 10 June 1989. Also, we found 14 Purple Martins nesting in holes in Ponderosa Pines 3 miles northeast of San Rafael Mountain on 19 June 1982.

VIOLET-GREEN SWALLOW (*Tachycineta thalassina*). Common on all the mountains surveyed except Figueroa Mountain, where the species is fairly common.

CLIFF SWALLOW (*Hirundo pyrrhonota*). Fairly common on all the mountains surveyed except Mount Pinos, for which I have no records at the elevations surveyed.

▲STELLER'S JAY (*Cyanocitta stelleri*). Common on all of the mountains surveyed. Steller's Jay occurs in southern California throughout montane areas with conifers (Garrett and Dunn 1981).

SCRUB JAY (*Aphelocoma coerulescens*). Uncommon on all of the mountains surveyed.

▲CLARK'S NUTCRACKER (*Nucifraga columbiana*). Fairly common to common in the Mount Pinos area; only one summer record for Pine and Big Pine mountains; absent from Figueroa mountain. Clark's Nutcracker breeds in the higher portions of the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

On Mount Pinos, Grinnell (1905) found Clark's Nutcrackers abundant, and Willett (1933:118) wrote, "As full-grown young are plentiful in late May and early June, nesting must be early, probably in the latter part of March." Our high count for the Mount Pinos/Mount Abel area was 30 on 2 June 1990.

The only records from Big Pine and Pine mountains are of 2 on the former on 21 August 1979 (Lehman 1982), and 2 in the Thorn Point area (elevation 6900 feet, 2092 m, 5 miles east of Haddock Peak) of the latter on 30 July 1980.

COMMON RAVEN (*Corvus corax*). Uncommon on all the mountains surveyed.

▲MOUNTAIN CHICKADEE (*Parus gambeli*). Common on all but Figueroa Mountain, where it is fairly common. It occurs in all of the forested mountains of southern California (Garrett and Dunn 1981).

PLAIN TITMOUSE (*Parus inornatus*). Fairly common on Big Pine and Figueroa mountains; no records for Pine Mountain or Mount Pinos at the elevations surveyed.

BUSHTIT (*Psaltriparus minimus*). Common on Figueroa Mountain, fairly common on Big Pine Mountain, uncommon on Pine Mountain, and rare in the Mount Pinos region.

▲RED-BREASTED NUTHATCH (*Sitta canadensis*). Fairly common on Big Pine Mountain, but uncommon and local on Mount Pinos and Pine Mountain, and rare and irregular on Figueroa Mountain. The species breeds in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

Prior to our survey of Big Pine Mountain, Red-breasted Nuthatches were not known to breed in Santa Barbara County (Lehman 1982). They are fairly numerous in the pine–fir forest along the Big Pine Road and in the mesic Incense Cedar forest along the trail to Lower Bear Campground, where we saw a family group on 26 June 1992. We had a high count of 24 in the Big Pine Mountain area from 18 to 20 June 1986, but totals seem to fluctuate from year to year.

Not until July 1929 was this species observed on Mount Pinos (Miller and Benson 1930), where it continues to be rather difficult to find. A high count there was 6 on 27 July 1983 (P. Lehman, unpubl. report on file at SBMNH). On Pine Mountain, Red-breasted Nuthatches are found sparingly along the Raspberry Spring trail and on the north slope of Reyes Peak, possibly as scarce breeders. Our high count was 4 on 9 and 10 June 1989.

On Figueroa Mountain, the species possibly breeds in some years, [e.g., up to 6 there 23 April–27 June 1981 (Lehman 1982), 3 there 14 April–12 July 1989]. We saw up to 8 at the head of Fir Canyon between 29 June and 4 August 1991, and 2 were there 27 May 1992.

WHITE-BREASTED NUTHATCH (*Sitta carolinensis*). Fairly common on Big Pine and Figueroa mountains, uncommon to fairly common on Mount Pinos and Pine Mountain.

▲PYGMY NUTHATCH (*Sitta pygmaea*). Common on all of the mountains studied. It is also common in all of the major mountain ranges of southern California (Garrett and Dunn 1981).

▲BROWN CREEPER (*Certhia americana*). Common on Big Pine Mountain, fairly common on Figueroa and Pine mountains and Mount Pinos. It breeds in all the major forested ranges in southern California (Garrett and Dunn 1981).

Brown Creepers are common on Big Pine Mountain in the mesic sections of the pine–fir forest north of Big Pine Road and in the predominantly Incense Cedar forest near Lower Bear Campground. We had a high count of 39 in the area from 10 to 12 June 1993. *C. a. zelotes* is the subspecies found on Mount Pinos (Grinnell and Miller 1944) and presumably occurs on the other peaks surveyed, e.g., P. Unitt (pers. comm.) collected *zelotes* on Pine Mountain on 12 October 1987 (specimen in San Diego Natural History Museum).

ROCK WREN (*Salpinctes obsoletus*). Uncommon and local on all of the mountains surveyed. On 25 June 1992, we counted 10 near West Big Pine in the Big Pine Mountain area, an unusually high number.

CANYON WREN (*Catherpes mexicanus*). Uncommon on Figueroa and Big Pine mountains, rare at the elevations surveyed on Pine Mountain and Mount Pinos.

BEWICK'S WREN (*Thryomanes bewickii*). Uncommon to fairly common on Figueroa, Big Pine, and Pine mountains, rare to uncommon on Mount Pinos.

HOUSE WREN (*Troglodytes aedon*). Common on Big Pine Mountain and in the Mount Pinos area; fairly common on Figueroa and Pine mountains.

AMERICAN DIPPER (*Cinclus mexicanus*). There are no records of this species at the elevations surveyed owing to the lack of permanent streams. However, American Dippers are rare and local permanent residents at lower elevations nearby, e.g., we saw 1 at Upper Sisquoc Falls near Big Pine Mountain at 5000 feet (1500 m) on 19 July 1982.

▲GOLDEN-CROWNED KINGLET (*Regulus satrapa*). Fairly common on Big Pine Mountain and Mount Pinos, uncommon and local on Pine Mountain, and absent from Figueroa Mountain. It is an uncommon and very local breeder in the higher portions of the San Bernardino and San Jacinto mountains (Garrett and Dunn 1981) and a rare summer visitor and possible breeder in the San Gabriel Mountains (*AB* 41:1488, K. Garrett pers. comm.).

Golden-crowned Kinglets were first recorded on Mount Pinos in the fir trees on the north slope (Miller and Benson 1930). Here, along Fir Ridge Road and Grouse Mountain Trail, is still the most reliable spot for the species in the Mount Pinos/Mount Abel area.

On Big Pine Mountain, we tallied a high count of 30, including fledglings, for a first breeding record for Santa Barbara County, on 30 June and 1 July 1981 (Lehman 1982). Subsequently, the population there appears to have decreased: 8 from 21 to 23 June 1989 and 12 from 21 to 23 June 1990 are recent totals.

On Pine Mountain, Golden-crowned Kinglets are scarce and generally can be found only in the firs along the north slopes, (e.g., Raspberry Spring Trail and the north slope of Reyes Peak), where we observed a high count of 8 on 7 and 8 June 1991.

▲RUBY-CROWNED KINGLET (*Regulus calendula*). This species no longer breeds in the Mount Pinos area, where it once was rare (Garrett and Dunn 1981). There are no summer records for the other mountains surveyed. The species formerly summered in small numbers in the San Gabriel (J. Dunn pers. comm.), San Bernardino, and San Jacinto mountains, but there are no recent records from the San Gabriel Mountains (K. Garrett pers. comm.) and it is possibly extirpated in the San Jacinto range (Garrett and Dunn 1981).

Miller and Benson (1930:102) first observed the Ruby-crowned Kinglet on Mount Pinos on 9 June 1919 "in fir timber on the north slope of the mountain," hearing and seeing it on succeeding days up to 13 June. "The birds were in full song. They were less numerous than the Golden-crowned Kinglets." The most recent record for the Mount Pinos region is of a singing male on 18 June 1978 on Fir Ridge Road (R. Webster pers. comm.). I found none of this species on Mount Pinos or Mount Abel from 1988 through 1992.

Gaines (1988:238) reported the Ruby-crowned Kinglet to be "one of the scarcest of our summer resident songbirds" in the Sierra Nevada.

BLUE-GRAY GNATCATCHER (*Polioptila caerulea*). Fairly common to common on Big Pine Mountain, uncommon on Pine and Figueroa mountains. There are no records for Mount Pinos at the elevations surveyed.

WESTERN BLUEBIRD (*Sialia mexicana*). Fairly common to common on all of the mountains surveyed.

▲MOUNTAIN BLUEBIRD (*Sialia currucoides*). Uncommon and local only in the Mount Pinos/Mount Abel area at lower elevations. Elsewhere in southern California it breeds in the eastern San Bernardino Mountains (Garrett and Dunn 1981).

The status of Mountain Bluebird on Mount Pinos is somewhat unclear. Garrett and Dunn (1981:284) stated, "The Mountain Bluebird breeds on Mount Pinos and in neighboring high sagebrush valleys." Two immatures were at the summit of nearby Frazier Mountain on 7 July 1979 (R. Webster pers. comm.). However, we found no Mountain Bluebirds above 6250 feet (1890 m) in the Mount Abel/Mount Pinos area from June through late July from 1988 through 1992. Only Western Bluebirds were in pairs and feeding young in the open terrain at the Mount Pinos summit. Perhaps Mountain Bluebirds breed at lower elevations (as in Lockwood Valley, where F. Sanchez observed a male on 1 June 1990), then many wander upslope.

▲TOWNSEND'S SOLITAIRE (*Myadestes townsendii*). Uncommon on Mount Pinos, rare to uncommon on Pine Mountain, and unrecorded on Big Pine and Figueroa mountains. It breeds in all the major mountain ranges of southern California (Garrett and Dunn 1981).

Benson and Miller (1930) first recorded Townsend's Solitaires on Mount Pinos. We observed them in the summit area of Mount Pinos along rocky ridges above the steep north slope, as well as on Fir Ridge Road and along the McGill trail.

On Pine Mountain, a small breeding population of this species inhabits the steep canyons of the north slope. On 5 August 1990, M. Holmgren recorded a high count there of 6, including adults with juveniles.

▲HERMIT THRUSH (*Catharus guttatus*). Rare to uncommon in the Mount Pinos region; two summer records from Big Pine Mountain. The species is absent in summer from Figueroa and Pine mountains. It is an uncommon and local breeder in the San Gabriel and San Bernardino mountains and possibly the San Jacinto Mountains, where verification is needed (Garrett and Dunn 1981).

The Hermit Thrush is another of the species first recorded on Mount Pinos by Miller and Benson (1930). It is rather uncommon on the shady north slope of Mount Pinos and on nearby Grouse Mountain, where our high count was 5 singing males along the Grouse Mountain trail on 3 June 1990. Two singing males were north of Iris Meadow on Mount Pinos on 14 June 1990.

On Big Pine Mountain, we heard an individual singing from the north slope on 20 June 1986 and again on 11 June 1993.

AMERICAN ROBIN (*Turdus migratorius*). Uncommon to fairly common on Big Pine Mountain and Mount Pinos, but uncommon on Figueroa and Pine mountains.

VARIED THRUSH (*Ixoreus naevius*). On Mount Pinos, K. Garrett photographed a singing male near McGill Campground on 20 July 1979 (*AB* 33:898). On Big Pine Mountain, we observed a male near Lower Bear Campground on 11 June 1993, a first summer record for Santa Barbara County.

WRENTIT (*Chamaea fasciata*). Fairly common on all of the mountains studied, except Mount Pinos, where there are no records for the elevations surveyed.

CALIFORNIA THRASHER (*Toxostoma redivivum*). Rare to uncommon on all of the mountains studied except Mount Pinos, where there are no records at the elevations surveyed.

PHAINOPEPLA (*Phainopepla nitens*). There are two records for Big Pine Mountain: 2 on 20 June 1986 and 2 on 22 June 1989, both at Alamar Saddle, where chaparral abuts the Coulter Pine forest.

▲SOLITARY VIREO (*Vireo solitarius*). Uncommon on Figueroa and Big Pine mountains. The species' status on Mount Pinos and Pine Mountain is unclear; it

probably breeds at lower elevations nearby. The race *cassinii* of the Solitary Vireo occurs on the coastal slopes of the major mountains of southern California. Here, "its present breeding range is imperfectly known, and the subspecies appears to be absent from large tracts of suitable habitat" (Garrett and Dunn 1981:301).

Solitary Vireos are encountered on Figueroa and Big Pine mountains in shaded areas where oaks and conifers form a canopy, often near riparian vegetation. On Figueroa Mountain our high count was 4 on 27 May 1992 at the head of Fir Canyon, and on Big Pine Mountain 5 each on 19 July 1982 and 26 June 1992, with most occurring along the trail to Lower Bear Campground (P. Collins, specimen in breeding condition in SBMNH).

Grinnell (1905) wrote of a single pair of Solitary Vireos near his camp on Mount Pinos at 6500 feet (1981 m). The only recent record is of 1 F. Sanchez saw near Iris Meadow on 23 July 1992.

On Pine Mountain, there are records of single birds on 5 August 1990 (M. Holmgren pers. comm.) and 17 June 1992 (L. Ballard pers. comm.). At lower elevations along nearby Beartrap and Piedra Blanca creeks, riparian vegetation provides suitable nesting habitat.

HUTTON'S VIREO (*Vireo huttoni*). Uncommon on Figueroa Mountain, rare on Big Pine Mountain. No records exist for the elevations surveyed on Pine Mountain and Mount Pinos.

WARBLING VIREO (*Vireo gilvus*). Uncommon on Figueroa and Big Pine mountains; no records for the elevations surveyed on Pine Mountain and Mount Pinos.

ORANGE-CROWNED WARBLER (*Vermivora celata*). Common on Big Pine Mountain and in the Mount Pinos region, but only fairly common on Figueroa and Pine mountains.

▲NASHVILLE WARBLER (*Vermivora ruficapilla*). Rare to uncommon and somewhat irregular on Big Pine Mountain; rare summer visitor, possibly breeding in some years, on Mount Pinos. There are two summer records for the Pine Mountain vicinity and none for Figueroa Mountain. The Nashville Warbler breeds in small numbers in the San Gabriel (*AB* 37:1028) and San Bernardino mountains; in the San Jacinto Mountains nesting is suspected (Garrett and Dunn 1981; *AB* 41:1487).

Since at least 1979 (*AB* 33:898), Nashville Warblers have been reported irregularly on Mount Pinos with no evidence of nesting. In 1990, we observed 2 singing males in two separate areas along the McGill trail 24 May and again on 2 June. F. Sanchez found a male along a different part of the trail on 8 June 1990. On 18 July 1990, we found no sign of the birds, and none were observed in 1991 and 1992. The habitat here, a mixture of Black Oaks and Jeffrey Pines with open patches of *Ceanothus*, appears suitable for nesting.

On Big Pine Mountain, we located a family group of 2 adult and 2 juvenile Nashville Warblers on 21 July 1982, a first summering and breeding record for this species in Santa Barbara County. Since then, Nashville Warblers have been found as follows: a pair and a singing male on 19 and 20 June 1983, a singing male 30 May 1985, a singing male 22 and 23 June 1990, 4 adults (at least 1 pair) from 25 to 27 June 1991, 5 (at least 1 pair) from 25 to 27 June 1992, and a total of 9 singing males from 10 to 12 June 1993. They frequent the patches of montane chaparral, particularly near Canyon Live Oaks, along Big Pine Road.

In the Pine Mountain vicinity, there are two records: a singing male 24 May 1980 at Thorn Meadows area (5000 feet, 1500 m), approximately 5 miles east of Haddock Peak, and 1 on 10 August 1983 at Raspberry Spring, the latter probably a fall migrant.

NORTHERN PARULA (*Parula americana*). An out-of-range vagrant. G. and J. Hardie observed a singing male on San Rafael Mountain on 17 June 1990.

YELLOW WARBLER (*Dendroica petechia*). There are two records: 1 on Big Pine Mountain on 30 May 1985 and 1 on Pine Mountain on 10 August 1983, both probably representing migrants.

▲YELLOW-RUMPED WARBLER (*Dendroica coronata*). The subspecies *D. c. auduboni* is fairly common to common on Pine Mountain and Mount Pinos, and uncommon to fairly common on Big Pine Mountain, but there is only one record for Figueroa Mountain. It breeds in montane forests through the Transverse Ranges to the San Jacinto Mountains (Garrett and Dunn 1981).

Grinnell (1905:390) noted that Yellow-rumped Warblers were "common in the Jeffrey pine belt above 6500 feet" on Mount Pinos. On Pine Mountain, our high count was 15 on 9 and 10 June 1989.

On Big Pine Mountain, the first summer record of this species in Santa Barbara County was established 29 June–1 July 1981 (Lehman 1982); subsequently, we observed a female feeding a fledgling on 20 June 1983. An unusually high count for the area was 17 from 25 to 27 June 1991. Yellow-rumped Warblers also breed farther west on San Rafael Mountain. On all the mountains surveyed, this species occurs in the more open, dry stretches of Jeffrey Pine forest.

On Figueroa Mountain, Lehman (1982) observed on 16 May 1982 a singing male, either a late spring transient or possibly on territory.

BLACK-THROATED GRAY WARBLER (*Dendroica nigrescens*). Uncommon to fairly common on Figueroa and Big Pine mountains; status is poorly understood on Pine Mountain and Mount Pinos. Two records on Pine Mountain: 1 each on 5 August 1990 (M. Holmgren pers. comm.) and 11 July 1992 (F. Sanchez pers. comm.). We did not observe any in the Mount Pinos region at the elevations surveyed, but Grinnell (1905:390) noted "this species from 5500 feet to the summit," finding it "best represented, numerically, in the golden oaks (i. e., Canyon Live Oaks) of the canyons between 6000 and 7000 feet altitude."

TOWNSEND'S WARBLER (*Dendroica townsendi*). Two records: 1 near Sawmill Mountain on 3 June 1990 and 2 on Pine Mountain on 10 August 1983, undoubtedly late spring and early fall migrants, respectively.

▲HERMIT WARBLER (*Dendroica occidentalis*). Absent as a summer resident from the mountains surveyed. It has been recorded in small numbers annually in recent years in the San Gabriel (where it probably nests, K. Garrett pers. comm.) and San Bernardino mountains (where nesting is known, Garrett and Dunn 1981). Two records from Pine Mountain: 4 on 10 August 1983, and 1 on 5 August 1990 (M. Holmgren pers. comm.). One was on Mount Pinos 22 July 1978 (Webster et al. 1980). All were probably fall migrants.

▲MACGILLIVRAY'S WARBLER (*Oporornis tolmei*). Rare and irregular summer visitor (possibly breeding); no records on Figueroa Mountain. Uncommon summer resident in the San Gabriel and San Bernardino mountains with nesting documented in both ranges (K. Garrett pers. comm.); recently observed in the San Jacinto Mountains (*AB* 41:1489).

The records for the survey area: on Big Pine Mountain, 2 singing males 30 June and 1 July 1981 (Lehman 1982), a first Santa Barbara County summer record, and 2 singing males there again on 6 June 1992 (M. Holmgren pers. comm.), which we could not relocate from 25 to 27 June of that year; in upper Quatal Canyon (west of Mount Abel below coniferous forest), a singing male with a female on 16 June 1980; on Mount Pinos at Iris Meadow, a female on 23 July 1992 (F. Sanchez pers. comm.);

at Thorn Meadows (5 miles east of Haddock Peak at 5000 feet, 1500 m) near Pine Mountain, a singing male with a female on 22 May 1980.

▲WILSON'S WARBLER (*Wilsonia pusilla*). Rare and irregular on Mount Pinos; two records for Pine Mountain; absent from the other mountains surveyed. An uncommon nester mostly in willow thickets around montane meadows in the San Gabriel, San Bernardino and, at least formerly, San Jacinto mountains (Garrett and Dunn 1981).

In the Mount Pinos area, Wilson's Warblers breed irregularly in suitable habitat such as Iris Meadow. The most recent records are from the 1970s: a singing male 30 June 1970 on Fir Ridge Road (J. Dunn pers. comm.); 2 males, both singing, on 18 and 30 June 1978 at Iris Meadow; 2 there 1 July 1978, and an adult and an immature there 22 July 1978 (all R. Webster pers. comm.). One on Fir Ridge Road on 30 July 1991 (R. Moore pers. comm.) could well have been a fall migrant.

The two records for Pine Mountain, of 1 each on 19 June 1984 and 5 August 1990 (M. Holmgren pers. comm.), probably represent a late spring and an early fall migrant, respectively.

▲WESTERN TANAGER (*Piranga ludoviciana*). Common on Big Pine Mountain, fairly common on Mount Pinos, uncommon on Figueroa and Pine mountains. The species breeds in all the major mountain ranges west of the deserts (Garrett and Dunn 1981).

On Big Pine Mountain, where the Western Tanager frequents oak-coniferous woodland, our high count was 35 from 18 to 20 June 1986.

BLACK-HEADED GROSBEAK (*Pheucticus melanocephalus*). Common on Big Pine Mountain, fairly common on Figueroa Mountain and Mount Pinos, and uncommon on Pine Mountain.

LAZULI BUNTING (*Passerina amoena*). Uncommon to fairly common fall transient (mid-July through August) on all four mountains and uncommon and irregular summer resident on all except Mount Pinos. In 1992, unusually high numbers were singing on territory in montane chaparral on Big Pine Mountain (e.g., 10 on 6 June, M. Holmgren pers. comm.) and Pine Mountain (6 on 11 June). Adequate seasonal rainfall may have influenced their abundance that year.

▲GREEN-TAILED TOWHEE (*Pipilo chlorurus*). Common on Mount Pinos, fairly common on Pine Mountain, a rare visitor on Big Pine Mountain, and absent from Figueroa Mountain. It breeds on all the major mountain ranges west of the deserts in southern California (Garrett and Dunn 1981).

Green-tailed Towhees are plentiful on Mount Pinos, where they were first recorded by Grinnell (1905). On Pine Mountain, they frequent open rocky chaparral of Wax Currant, Bitter Cherry, Manzanita, and *Ceanothus* along Pine Mountain Road. Our high count here was 13 on 9 and 10 June 1989.

From Big Pine Mountain, Bartholomew's (1940:18) record of "five birds in chokecherry thickets on Big Pine Mountain June 7 and July 7, 1938" precedes Lehman's (1982:328) cited vague record of "2 or 3 individuals during the late 1950s or early 1960s." We found none from 1981 through 1990. On 27 June 1991, we located a singing male in the West Big Pine area, on a rocky slope with scattered shrubs of Rabbitbrush (*Chrysothamnus* sp.), *Ceanothus*, Sierra Gooseberry (*Ribes roezlii*), and Elderberry (*Sambucus mexicanus*). P. Collins could not find it on 12 July 1991. On 6 June 1992, M. Holmgren observed a singing male in the Bitter Cherry–Western Chokecherry thicket north of the Big Pine Road, but we could not relocate it between 25 and 27 June of that year. On 12 June 1993 we saw a singing male in the same location.

RUFOUS-SIDED TOWHEE (*Pipilo erythrophthalmus*). Common on Big Pine Mountain, fairly common on Figueroa and Pine mountains, and uncommon on Mount Pinos.

CALIFORNIA TOWHEE (*Pipilo crissalis*). Rare, occurring regularly on Figueroa Mountain only. On Big Pine Mountain, we observed 3 in the Alamar Saddle area on 19 July 1982.

RUFOUS-CROWNED SPARROW (*Aimophila ruficeps*). Uncommon on Figueroa Mountain. Two records for Big Pine Mountain: P. Collins saw 1 on 2 July 1987, and we saw 1 on 22 June 1990. Unrecorded on Pine Mountain and Mount Pinos at elevations surveyed.

CHIPPING SPARROW (*Spizella passerina*). Fairly common to common on all the mountains surveyed.

BLACK-CHINNED SPARROW (*Spizella atrogularis*). Fairly common summer resident on Pine Mountain; no records for Figueroa Mountain and Mount Pinos at the elevations surveyed. The only Big Pine Mountain record between 1981 and 1991 was of 1 on 22 June 1989; then, in 1992, large numbers arrived: 23 were along the Big Pine Road in patches of montane chaparral on 6 June 1992 (M. Holmgren pers. comm.), and on 10 June 1993 we observed a male and female carrying food on West Big Pine. On Pine Mountain, we counted 15 on 11 and 12 June 1992, the high total there. Variation in the abundance of the species appears to be tied to variation in rainfall totals.

LARK SPARROW (*Chondestes grammacus*). Fairly common on Figueroa Mountain, but there are no records for the other mountains at the elevations surveyed.

SAGE SPARROW (*Amphispiza belli*). Rare to uncommon summer visitor on all the mountains surveyed. It breeds at lower elevations, and its occurrence during June and July in montane habitats is likely due to postbreeding upslope movement. Two were on Big Pine Mountain in open pine forest on 30 June 1981 (Lehman 1982), and we saw 1 there in montane chaparral on 27 June 1992.

▲FOX SPARROW (*Passerella iliaca*). Common on all the mountains surveyed except Figueroa Mountain, from which it is absent. The species breeds commonly in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

From Big Pine Mountain, Bartholomew's (1940:19) record of Fox Sparrows nesting "in numbers" on Big Pine Mountain precedes our visit of 29 June to 1 July 1981, when our discovery of a sizeable population of Fox Sparrows was thought to be the first summering record of the species for Santa Barbara County (Lehman 1982). Thirty individuals from 21 to 25 June 1988 (M. Holmgren pers. comm., specimen in breeding condition in UCSB) is the high count for the Big Pine Mountain area. Fox Sparrows inhabit the thickets of Bitter Cherry, Western Chokecherry, and *Ceanothus* bordered by coniferous forest. The species also breeds farther west on San Rafael Mountain, where our high count was 26 from 18 to 20 June 1982, although numbers there have since declined.

On Pine Mountain, Fox Sparrows frequent patches of montane chaparral within the coniferous forest in more shaded locations on the north slope, in contrast to the Green-tailed Towhees, which reside in thickets in the sunnier areas of the mountain.

Grinnell (1905:388) first recorded Fox Sparrows on Mount Pinos as "fairly numerous." We found them most commonly from Iris Meadow to the summit of Mount Pinos and along the Grouse Mountain trail. The nesting birds of all three mountains are the large-billed race, *P. i. stephensi*, which breeds in the mountains of southern California.

▲LINCOLN'S SPARROW (*Melospiza lincolni*). Rare and irregular only on Mount Pinos. It breeds sparingly in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981) (*AB* 39:963).

Lincoln's Sparrows were first found nesting on Mount Pinos at Iris Meadow on 18 June 1978 (*AB* 32:907). Subsequently, 1 or 2 pairs have bred there irregularly: we observed 5 including juveniles on 12 July 1988. No nesting occurred from 1989 through 1992.

▲DARK-EYED JUNCO (*Junco hyemalis*). The subspecies *J. h. thurberi* is common on all of the mountains studied, as it is throughout montane areas of southern California (Garrett and Dunn 1981).

BREWER'S BLACKBIRD (*Euphagus cyanocephalus*). Uncommon in the Mount Pinos area only. There are no records for the other mountains surveyed.

BROWN-HEADED COWBIRD (*Molothrus ater*). Uncommon on Mount Pinos and rare to uncommon on Big Pine Mountain. I have no records for Figueroa and Pine mountains.

NORTHERN ORIOLE (*Icterus galbula*). One sighted on Big Pine Mountain on 1 July 1981 (Lehman 1982) was undoubtedly an early fall migrant.

▲PURPLE FINCH (*Carpodacus purpureus*). Common on Big Pine Mountain, fairly common on Figueroa Mountain, and uncommon on Pine Mountain and Mount Pinos. It breeds in all the major mountain ranges of southern California (Garrett and Dunn 1981).

On Big Pine Mountain, Purple Finches are common, with 30 on 30 June and 1 July 1981 being the high count (Lehman 1982). Numbers have declined somewhat in recent years: we saw 10 there from 21 to 23 June 1990.

Farther east, on Pine Mountain and Mount Pinos, Purple Finches are greatly outnumbered by Cassin's Finches. Where both species overlap, Purple Finches occupy the more mesic sections of the coniferous forest, such as along the Raspberry Spring trail on Pine Mountain and along the McGill and Grouse Mountain trails in the Mount Pinos region.

▲CASSIN'S FINCH (*Carpodacus cassinii*). Common on Mount Pinos, fairly common on Pine Mountain, uncommon and irregular on Big Pine Mountain; one summer record for Figueroa Mountain. The species breeds at higher elevations in the San Gabriel, San Bernardino, and San Jacinto mountains (Garrett and Dunn 1981).

On Mount Pinos, Cassin's Finches have been recorded commonly since Grinnell's visit in 1904 (Grinnell 1905). On Pine Mountain, they breed in moderate numbers in the open coniferous forest along the Pine Mountain Road.

On Big Pine Mountain, 7 individuals were noted on 30 June and 1 July 1981 (Lehman 1982). For the next 10 years, sightings there were occasional, until 12 July 1991 when P. Collins observed 13 of the species, chiefly on Big Pine summit and at West Big Pine (specimen in breeding condition in SBMNH). He observed juveniles being fed by an adult, a first breeding record for Santa Barbara County. Farther west, on San Rafael Mountain, our high count was 9 on 18 and 19 June 1982. Lehman (1982) observed 2 on Figueroa Mountain on 17 June 1981.

HOUSE FINCH (*Carpodacus mexicanus*). Fairly common on Figueroa Mountain, uncommon on Big Pine and Pine mountains, and rare on Mount Pinos.

▲RED CROSSBILL (*Loxia curvirostra*). Uncommon and somewhat irregular on Mount Pinos and a rare and irregular summer visitor on the other mountains surveyed. The species is believed to nest in the San Gabriel, San Bernardino, and San Jacinto mountains, but nonbreeding individuals have been collected in midsummer on all of these mountain ranges (Garrett and Dunn 1981).

Red Crossbills have bred irregularly in small numbers on Mount Pinos since 1904, when Grinnell collected an adult pair (Grinnell 1905). The high count is 50 on Mount Pinos on 4 July 1984 (*AB* 38:1063). We noted 10 including juveniles at Iris Meadow on 12 July 1988; more recently, we counted 28 in the Mount Pinos/Mount Abel area from 11 to 13 July 1991.

There are a few summer records for this species on the other three mountains: on Pine Mountain, 2 on 10 June 1989, 3 on 5 August 1990 (M. Holmgren pers. comm.), and 8 on 8 June 1991; on Big Pine Mountain, 2 on 21 July 1982, 4 from 21 to 25 June 1988 (M. Holmgren pers. comm., specimen in nonbreeding condition in UCSB), and 1 immature on 21 June 1989 (P. Collins pers. comm., specimen in SBMNH); on Figueroa Mountain, 1 on 6 July 1983 and 2 on 26 July 1984 (P. Lehman pers. comm.). Also, a flock of 15 was on San Rafael Mountain on 17 June 1990 (G. and J. Hardie pers. comm.).

▲PINE SISKIN (*Carduelis pinus*). Uncommon to fairly common on Mount Pinos, two summer records for Figueroa Mountain, and none for Pine Mountain or Big Pine Mountain. Siskins breed fairly commonly in the San Gabriel, San Bernardino, and San Jacinto Mountains (Garrett and Dunn 1981).

First noted by Grinnell (1905), this species is fairly common on Mount Pinos/Mount Abel, our high count being 11 on Mount Pinos on 6 July 1989. On Figueroa Mountain, 1 was seen on 24 June 1981 (Lehman 1982) and 2 were there on 4 June 1988 (P. Lehman pers. comm.).

LESSER GOLDFINCH (*Carduelis psaltria*). Fairly common on Figueroa Mountain, uncommon summer resident on Big Pine Mountain, and rare on Pine Mountain. There are no records for Mount Pinos.

LAWRENCE'S GOLDFINCH (*Carduelis lawrencei*). Uncommon and irregular on Mount Pinos, Pine Mountain, and Big Pine Mountain, and rare on Figueroa Mountain.

▲EVENING GROSBEAK (*Coccothraustes vespertinus*). Rare and irregular summer visitor on Mount Pinos, Big Pine Mountain, and Figueroa Mountain; no records for Pine Mountain. The species is an irregular transient in the mountain ranges of southern California west of the deserts (Garrett and Dunn 1981), the closest breeding area being in the southern Sierra Nevada at Badger, Tulare County (Grinnell and Miller 1944).

The records for Mount Pinos/Mount Abel are of 2 on 31 May 1930 (Willett 1933), 1 on 24 July 1986 on Mount Pinos (*AB* 40:1256), and 1 on 8 June 1991 on Mount Abel (R. Moore pers. comm.). Four were on Big Pine Mountain on 1 July 1981 (Lehman 1982). Two were on Figueroa Mountain on 17 June 1981, and 2 were there on 15 and 16 May 1982 (both Lehman 1982).

DISCUSSION

Tables 1–4 compare the occurrence of montane (boreal) species at the four study areas and at selected major mountain ranges in southern California and the southern Sierra Nevada. Although obtaining breeding evidence for a species was not the primary purpose of the survey, I noted breeding by most of the montane birds observed. The breeding criteria are those recommended for North American breeding bird atlases (Smith 1990).

Johnson (1975) suggested several variables contributing to the presence or absence of a species on biogeographical islands like these: the island's total size, the extent of forest, the width of the barrier between one island

Table 1 Breeding Status of Montane Species in Four Areas of Santa Barbara, Ventura, and Kern Counties[a]

	Mt. Pinos	Pine Mtn.	Big Pine Mtn.	Figueroa Mtn.
N. Goshawk	B+	—	—	—
Blue Grouse	E?	—	—	—
Mountain Quail	B	B	B	B
Flammulated Owl	B	—	B′	—
N. Pygmy-Owl	B	B	B	B
Spotted Owl	B	B	B	B
N. Saw-whet Owl	B	B″	B	B
Calliope Hummingbird	B	SV	SV	—
Red-breasted Sapsucker	B	B	B	—
Williamson's Sapsucker	B″	B+	—	—
White-headed Woodpecker	B	B	B	SV
Olive-sided Flycatcher	B	B	B	B
Dusky Flycatcher	B	B	B	—
Steller's Jay	B	B	B	B
Clark's Nutcracker	B	SV	—	—
Mountain Chickadee	B	B	B	B
Red-breasted Nuthatch	B	B″	B	B″
Pygmy Nuthatch	B	B	B	B
Brown Creeper	B	B	B	B
Golden-crowned Kinglet	B	B′	B	—
Ruby-crowned Kinglet	E	—	—	—
Mountain Bluebird	SV	—	—	—
Townsend's Solitaire	B	B	—	—
Hermit Thrush	B	—	SV	—
Solitary Vireo	B	B″	B	B
Nashville Warbler	B″	—	B+	—
Yellow-rumped Warbler	B	B	B	—
Hermit Warbler	SV	—	—	—
MacGillivray's Warbler	B″	—	B″	—
Wilson's Warbler	B+	SV	—	—
Western Tanager	B	B	B	B
Green-tailed Towhee	B	B	B″	—
Fox Sparrow	B	B	B	—
Lincoln's Sparrow	B+	—	—	—
Dark-eyed Junco	B	B	B	B
Purple Finch	B	B	B	B
Cassin's Finch	B	B	B+	SV
Red Crossbill	B	SV	SV	SV
Pine Siskin	B	—	—	SV
Evening Grosbeak	SV	—	SV	SV

[a]B, confirmed breeding; B+, breeding confirmed but irregular, not annual; B′, probably breeding; B″, possibly breeding; SV, summer visitor, no breeding evidence; E, extirpated, formerly bred.

Table 2 Breeding Status of Montane Species in the Southern Sierra Nevada and Five Areas of Southern California[a]

	S. Sierra Nevada	Mt. Pinos	San Rafael Mtns.	San Gabriel Mtns.	San Bernardino Mtns.	San Jacinto Mtns.
N. Goshawk	B	B+	—	—	SV	B″
Blue Grouse	B	E?	—	—	—	—
Mountain Quail	B	B	B	B	B	B
Flammulated Owl	B	B	B′	B	B	B′
N. Pygmy-Owl	B	B	B	B	B	B
Spotted Owl	B	B	B	B	B	B
N. Saw-whet Owl	B	B	B	B	B	B
Calliope Hummingbird	B	B	SV	B	B	B
Red-breasted Sapsucker	B	B	B	B	B	B
Williamson's Sapsucker	B	B″	—	B	B	B
White-headed Woodpecker	B	B	B	B	B	B
Olive-sided Flycatcher	B	B	B	B	B	B
Dusky Flycatcher	B	B	B	B	B	B
Steller's Jay	B	B	B	B	B	B
Clark's Nutcracker	B	B	—	B	B	B
Mountain Chickadee	B	B	B	B	B	B
Red-breasted Nuthatch	B	B	B	B	B	B
Pygmy Nuthatch	B	B	B	B	B	B
Brown Creeper	B	B	B	B	B	B
Golden-crowned Kinglet	B	B	B	SV	B	B
Ruby-crowned Kinglet	B	E	—	E	SV	E
Mountain Bluebird	B	SV	—	—	B	—
Townsend's Solitaire	B	B	—	B	B	B
Hermit Thrush	B	B	SV	B	B	B″
Solitary Vireo	B	B	B	B	B	B
Nashville Warbler	B	B″	B+	B+	B′	B′
Yellow-rumped Warbler	B	B	B	B	B	B
Hermit Warbler	B	SV	—	B′	B	SV
MacGillivray's Warbler	B	B″	B″	B	B	B′
Wilson's Warbler	B	B+	—	B	B	—
Western Tanager	B	B	B	B	B	B
Green-tailed Towhee	B	B	B″	B	B	B
Fox Sparrow	B	B	B	B	B	B
Lincoln's Sparrow	B	B+	—	B	B	B
White-crowned Sparrow	B	—	—	—	B	—
Dark-eyed Junco	B	B	B	B	B	B
Purple Finch	B	B	B	B	B	B
Cassin's Finch	B	B	B+	B	B	B
Red Crossbill	B	B	SV	B	B	B
Pine Siskin	B	B	—	B	B	B
Evening Grosbeak	B	SV	SV	SV	SV	SV

[a]B, confirmed breeding; B+, breeding confirmed but irregular, not annual; B′, probably breeding; B″, possibly breeding; SV, summer visitor, no breeding evidence; E, extirpated, formerly bred. The list for the southern Sierra Nevada includes only those species currently or formerly occurring in southern California.

Table 3 Comparison of Numbers of Montane Species Occurring in Summer in Four Areas of Santa Barbara, Ventura, and Kern Counties[a]

	Mt. Pinos	Pine Mtn.	Big Pine Mtn.	Figueroa Mtn.
Total montane species recorded	38	28	29	19
Confirmed, probable and possible breeders	35	24	25	14
Confirmed breeders only	32	20	22	13

[a]Data from Table 1.

and another, elevation of the highest peak, latitude of the highest peak, and diversity of habitat.

On the mountains I studied, the single most important factor influencing the distribution of montane birds appeared to be the extent of habitat suitable for a species. Three key variables—extent of coniferous forest, elevation, and rainfall—contributed to habitat suitability. Another factor—nearness to other mountaintops—seemed to influence distribution, but its effect on the various species was much more difficult to measure. Figure 10 shows approximate distances between the study areas and the extent of coniferous forest found on each.

Table 3 compares the numbers of species of montane birds on the four mountains studied. It shows that Mount Pinos has 11 confirmed or likely breeders not known to have attempted breeding on Pine Mountain 16 miles to the southwest (Northern Goshawk, Flammulated Owl, Calliope Hummingbird, Clark's Nutcracker, Hermit Thrush, Nashville Warbler, MacGillivray's Warbler, Wilson's Warbler, Lincoln's Sparrow, Red Crossbill, and Pine Siskin).

The lack of sufficient high-elevation coniferous woodland on Pine Mountain probably contributes to the absence of the Northern Goshawk and

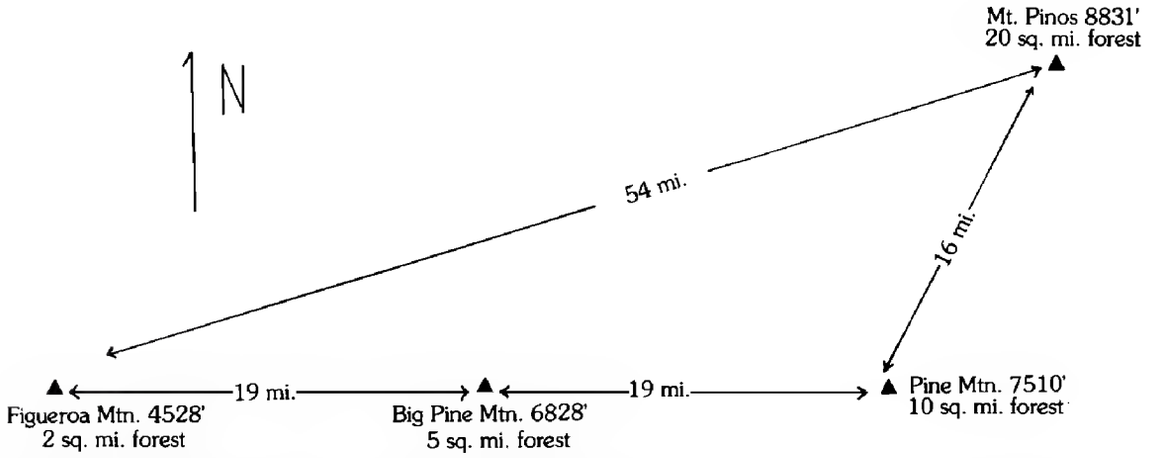


Figure 10. Comparison of relative distances between and extent of coniferous forest on the four isolated mountaintops.

Clark's Nutcracker there. Very few patches of White Fir exist, and the high, open Limber Pine habitat at the summit of Mount Pinos, which is attractive to the nutcrackers, is not found on Pine Mountain. The absence of moist chaparral and wet meadows (due to edaphic conditions) on Pine Mountain may preclude the Hermit Thrush, Nashville Warbler, MacGillivray's Warbler, Wilson's Warbler, and Lincoln's Sparrow from attempting to breed there. Small tracts of habitat on Pine Mountain appear suitable for the Calliope Hummingbird, Red Crossbill, and Pine Siskin, but they are not extensive enough to induce these species to nest there.

Pine Mountain and Big Pine Mountain are very close in number of breeding montane species. Pine Mountain, though higher and supporting nearly twice as much coniferous forest, has one fewer species of montane breeder than does Big Pine Mountain. Of the montane species possibly breeding on Pine Mountain, only Williamson's Sapsucker and Townsend's Solitaire do not occur on Big Pine Mountain. Likely these two species have altitudinal requirements that cannot be met by the comparatively low-elevation forest on Big Pine. There is only one record of Williamson's Sapsucker on Pine Mountain, and Townsend's Solitaire would not find on Big Pine Mountain the steep, high canyons it favors for breeding. In contrast, on Big Pine Mountain, the Flammulated Owl, Nashville Warbler and MacGillivray's Warbler are present, though absent from Pine Mountain. The paucity of the moist chaparral understory on Pine Mountain probably contributes to the absence of these species there. The confirmed breeding of Nashville Warbler and the possible breeding of MacGillivray's Warbler on Big Pine Mountain attest to the more mesic conditions fostering dense montane chaparral in certain locations there. The presence of the Flammulated Owl on Big Pine Mountain (and on Mount Pinos but not on intervening Pine Mountain) shows this species may be absent from suitable habitat for no apparent reason or that the mix of coniferous and oak woodland on Big Pine Mountain is somehow more attractive.

The Green-tailed Towhee, which is fairly common on Pine Mountain, has attempted breeding on Big Pine Mountain in the past three years and may have been more numerous there formerly. Perhaps it is a rare and irregular

Table 4 Comparison of Numbers of Montane Species Occurring in Summer in the Southern Sierra Nevada and Five Areas of Southern California[a]

	S. Sierra Nevada	Mt. Pinos	San Rafael Mtns.	San Gabriel Mtns.	San Bernardino Mtns.	San Jacinto Mtns.
Total montane species recorded	41	38	29	36	40	36
Confirmed, probable, and possible breeders	41	35	25	34	37	34
Confirmed breeders only	41	32	22	33	36	29

[a]Data from Table 2. The list for the southern Sierra Nevada includes only those species currently or formerly occurring in southern California.

breeder on Big Pine, preferring the more arid climate and higher elevations found on Pine Mountain.

Eleven species have attempted breeding on Big Pine Mountain but are absent from Figueroa Mountain (Flammulated Owl, Red-breasted Sapsucker, White-headed Woodpecker, Dusky Flycatcher, Golden-crowned Kinglet, Nashville Warbler, Yellow-rumped Warbler, MacGillivray's Warbler, Green-tailed Towhee, Fox Sparrow and Cassin's Finch). Of these, all but the Golden-crowned Kinglet, Nashville Warbler, MacGillivray's Warbler, and Green-tailed Towhee are found as far west as San Rafael Mountain, only 10 miles east of Figueroa Mountain.

In the Figueroa Mountain area, the lower elevation entails coniferous forest and montane chaparral being less extensive and the number of montane species being much lower. Most of the montane birds breeding on Figueroa Mountain are generalists tolerating oaks extensively mixed with lower-elevation conifers such as Coulter and Ponderosa pines.

An exception appears to be the Red-breasted Nuthatch, which has been present in summer in small numbers in the Figueroa Mountain area for the past three years, attracted by the rather mesic conditions there. Red-breasted Nuthatches and Golden-crowned Kinglets are examples of montane species whose habitat preferences are more affected by rainfall and humidity than by elevation. They are dependent upon a moist forest habitat and both are much more common on Big Pine Mountain than they are farther east on the more arid Mount Pinos and Pine Mountain, despite the latter peaks' supporting much more coniferous forest—and at higher elevation—than does Big Pine Mountain.

Thus, although the number of montane species generally declines from east to west and from the highest mountain to the lowest, the drop-off is not uniform.

Table 4 compares species totals of the Mount Pinos region, the San Rafael Mountains (including Big Pine and Figueroa mountains), the southern Sierra Nevada, and three southern California mountain ranges. Evidently, the San Bernardino Mountains have the most extensive montane avifauna in southern California and that of the San Rafael Mountains is somewhat impoverished in comparison.

SUMMARY

From 1981 to 1993, I and others censused the breeding avifaunas of four mountaintops in Santa Barbara, Ventura, and Kern counties, emphasizing the montane species. Because much had already been published concerning the montane species of the Mount Pinos region of nearby Ventura and Kern counties, most of the field work focused on the San Rafael Mountains, particularly the Big Pine Mountain area. Because of their inaccessibility, the San Rafael Mountains had received very little ornithological exploration prior to our work there.

Ten montane species not previously known to breed in Santa Barbara County were discovered in the Big Pine Mountain area: Flammulated Owl, Red-breasted Sapsucker, White-headed Woodpecker, Dusky Flycatcher,

Red-breasted Nuthatch, Golden-crowned Kinglet, Nashville Warbler, Yellow-rumped Warbler, Fox Sparrow and Cassin's Finch. We also located on Big Pine Mountain three montane species previously thought to be unrecorded in summer in Santa Barbara County: Calliope Hummingbird, MacGillivray's Warbler, and Green-tailed Towhee (although a newly discovered record for the towhee shows it was present there in the 1930s).

Comparison of the summering avifaunas of the four high mountains in Santa Barbara, Ventura, and adjacent Kern counties with those of the major mountain ranges in southern California suggests that extent of suitable habitat (governed by elevation, rainfall, and soil type) is the primary factor influencing the distribution of montane species on these mountaintops.

ACKNOWLEDGMENTS

I am greatly indebted to the following individuals who generously shared their notes and observations and who visited the survey area in the 1970s or helped with the current study: Larry Allen, Larry R. Ballard, Louis Bevier, Allyn Bissell, Bruce Broadbooks, Hank Brodkin, Mark O. Chichester, Paul W. Collins, Jon L. Dunn, Robert O. Easton, Shawneen E. Finnegan, Kimball L. Garrett, Jesse Grantham, Hank and Jan Hamber, George and Joan Hardie, Mark A. Holmgren, Paul E. Lehman, Barbara Millett, Randy J. Moore, Jean Okuye, Florence Sanchez, Nancy Sandburg, Larry Sansone, John Schmitt, Brad Schram, Guy Tingos, T. Dion Warren, and Richard E. Webster. I am especially grateful to Larry Ballard, Louis Bevier, Paul Collins, Jon Dunn, Kimball Garrett, Paul Lehman, Mark Holmgren, and Richard Webster, who read and commented on the manuscript and without whose cooperation and encouragement this project would not have been possible.

LITERATURE CITED

Barbour, M. G., and Major, J. (eds.) 1988. Terrestrial Vegetation of California, 2nd ed. Spec. Publ. Ser. 9, Calif. Native Plant Soc., Sacramento.

Bartholomew, P. S. 1940. Bird life of the Gibraltar study area. Los Padres National Forest, California Region, U. S. Forest Service.

Bendell, J. F., and Zwickel, F. C. 1984. A survey of the biology, ecology, abundance, and distribution of the Blue Grouse (genus *Dendragapus*), in Third International Grouse Symposium, pp. 163–192. World Pheasant Assoc., Reading, England.

Dawson, W. L. 1923. The Birds of California. South Moulton Co., San Diego.

Dickey, D. R., and van Rossem, A. J. 1923. Description of a new grouse from southern California. Condor 25:168–169.

Gaines, D. 1988. Birds of Yosemite and the East Slope. Artemisia Press, Lee Vining, CA.

Garrett, K., and Dunn, J. 1981. Birds of Southern California: Status and Distribution. Los Angeles Audubon Soc., Los Angeles.

Grinnell, J. 1905. Summer birds of Mount Pinos, California. Auk 22:378–391.

Grinnell, J., and Miller, A. H. 1944. The distribution of the birds of California. Pac. Coast Avifauna 27.

Grinnell, J., and Swarth, H. S. 1913. Boreal fauna of San Jacinto Peak compared with that of other mountains of southern California. Univ. Calif. Publ. Zool. 10:383–387.

Hall, E. M. 1940. Saw Whet Owl nest on Mount Pinos. Condor 42:306.

Johnson, N. K. 1975. Controls of number of bird species on montane islands in the Great Basin. Evolution 29:545–567.

Koford, C. B. 1953. The California Condor. Natl. Audubon Soc. Res. Rep. 4. Natl. Audubon Soc., New York.

Lehman, P. 1982. The status and distribution of the birds of Santa Barbara County, California. Master's thesis, Univ. of Calif., Santa Barbara.

Metcalf, T. N. 1967, 1972 (rev.). The birds of Santa Barbara and Ventura Counties, California. Santa Barbara Mus. Nat. Hist. Occ. Paper 8.

Miller, A. H. 1951. An analysis of the distribution of the birds of California. Univ. Calif. Publ. Zool. 50:531–644.

Miller, A. H., and Benson, S. B. 1930. The summer resident birds of the boreal and transition life-zones of Mount Pinos, California. Condor 32:101–104.

Miller, L. 1936. The Flammulated Screech Owl on Mount Pinos. Condor 38:228–229.

Norris, R. M., and Webb, R. W. 1990. Geology of California, 2nd ed. Wiley, New York.

Smith, C. R. (ed.) 1990. Handbook for Atlasing American Breeding Birds. Vt. Inst. Nat. Sci., Woodstock, VT.

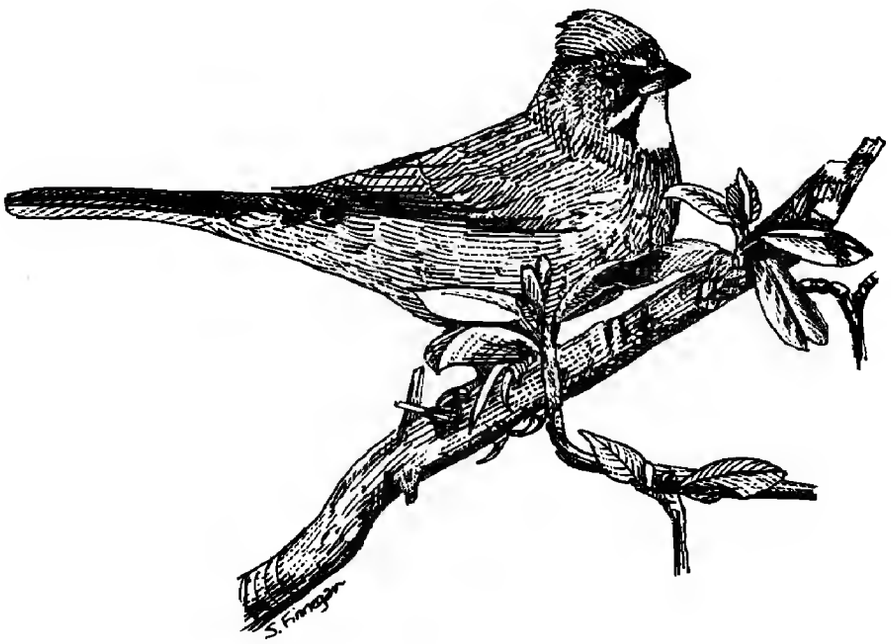
Snyder, N. F., and Hamber, J. A. 1985. Replacement-clutching and annual nesting of California Condors. Condor 87:374–378.

Webster, R., Lehman, P., and Bevier, L. 1980. Birds of Santa Barbara and Ventura counties, California. Santa Barbara Mus. Nat. Hist. Occ. Paper 10.

Weiss, S. 1979. Mount Pinos Blue Grouse study report. U. S. Forest Service, Los Padres National Forest, Mount Pinos District, Frazier Park, CA 93225.

Willett, G. 1933. A revised list of the birds of southwestern California. Pac. Coast Avifauna 21.

Accepted 25 June 1993



Green-tailed Towhee *Sketch by Shawneen Finnegan*

FIRST RECORD OF THE COMMON POCHARD IN CALIFORNIA

MICHAEL A. PATTEN, P. O. Box 8561, Riverside, California 92515-8561

Robert Potvliege discovered a male Common Pochard (*Aythya ferina*) at Silver Lakes, San Bernardino County, California, on 11 February 1989. Silver Lakes, a small housing development with two man-made lakes and a golf course, is located adjacent to the town of Helendale, about 24 km north of Victorville. Following the report of the bird, the pochard was observed and photographed by others, including myself, through 17 February 1989.

As roughly one-third (22 of 69) of the Tufted Ducks (*A. fuligula*) recorded in California have returned for subsequent winters (Patten unpubl. data) and California's only Smew (*Mergellus albellus*) returned for three successive winters (Roberson 1986), observers made an effort to relocate the Common Pochard in following years. Much searching during the winter of 1989/90 failed to reveal it, but there are similar lakes nearby along the Mojave River that could support the bird. It returned to Silver Lakes during the winter of 1990/91, when it was discovered by Eugene A. Cardiff on 18 January and remained until 23 February, during which time it was photographed and observed by many. The bird returned again in the winter of 1991/92, when it was first observed and photographed by Curtis A. Marantz on 14 January and was seen sporadically through 8 February. During the winter of 1992/93, I located the bird on 26 November, after which it was observed until 29 November, but apparently not thereafter.

The following description is based on my field notes, on those of various observers who submitted documentation to the California Bird Records Committee (CBRC), and on photographs of the bird.

The pochard was an adult male. It was slightly smaller than a Redhead (*A. americana*) and substantially smaller than a Canvasback (*A. valisineria*), both of which were compared directly to the bird on various occasions. It tended to flock with either Redheads or American Coots (*Fulica americana*) but seemed to avoid the Canvasbacks. The head was deep rufous, lacking the black around the base of the bill shown by a male Canvasback. The irides were deep scarlet, closely matching a Canvasback's.

A gentle slope evident on the forehead was not nearly so dramatic as the slope of a Canvasback's forehead, particularly since the bill was "average" in proportions, rather than being comparatively large as on a Canvasback. A small bump near the base of the culmen gave the bill a slightly less smooth profile than a Canvasback's. The bill was black except for a distinct pale grayish blue saddle on the maxilla that lay closer to the tip than the base. The ends of the saddle curved back toward the head as they approached the tomia, so the saddle was not "cut off" straight at either end. The black nail was smaller than a Redhead's.

Like a male Canvasback or Redhead, the pochard had a jet black breast, tail, and upper- and under-tail coverts. The gray on the back and flanks was uniform, slightly darker than the grayish white of a male Canvasback but much paler than the medium gray of a male Redhead. Slightly darker gray vermiculation could be seen on the back and flank feathers at close range, again bringing to mind a Canvasback. The inner edges of the tertials were a darker gray than the back and flanks.

Its flight was powerful and direct, with rapid wingbeats. The flying pochard looked basically like a Canvasback, showing a mostly pale wing with only a hint of a paler

stripe on the secondaries. The legs and feet were uniformly black and unbanded. No one could determine the presence or absence of the halluces, which are often removed on captive waterfowl (J. Morlan pers. comm.).

A color photograph of this bird, taken on 14 February 1989, was published in *American Birds* (43:230, 1989). The record (CBRC 30-1989), the first for California and North America outside of Alaska, was accepted by the CBRC (Patten 1991) and, with seven color photographs, is archived at the Western Foundation of Vertebrate Zoology, Camarillo, Calif. The winter 1990/91 record (CBRC 7-1991) was accepted as the same individual by the CBRC. Records from the winters of 1991/92 (CBRC 106-1992) and 1992/93 (CBRC 287-1992) are currently under review.

DISTRIBUTIONAL SUMMARY

Common Pochards breed throughout the Palearctic, ranging from Iceland, the British Isles, southern Scandinavia, central Russia, and southern Siberia south through the Iberian Peninsula, central Europe, the Black and Caspian seas, Turkey, and Lake Baikal (AOU 1983). They winter through much of their breeding range and south to northern Africa, the Middle East, India, eastern China, Japan (AOU 1983), and, rarely, to the Azores, the Cape Verde and Canary islands, and the Philippines (Cramp and Simmons 1977). Small numbers are now apparently regular in winter in Hong Kong, where the species was formerly considered a vagrant (Chalmers 1986).

Cramp and Simmons (1977) considered the Common Pochard a vagrant on the Kamchatka Peninsula and Commander Islands, but the status there is likely the same as it is in the Aleutian Islands. This species appears regularly in the western Aleutians and fairly regularly on the Pribilofs (Kessel and Gibson 1978, J. L. Dunn pers. comm.). An adult male pochard observed at St. Lawrence Island on 1 June 1989 was found dead on the 6th (specimen to Univ. Alaska Museum); it provides the northernmost Alaska record of the species (D. D. Gibson pers. comm.). A female observed at Beluga Lake at Homer on 22 March 1981 is the only Common Pochard recorded on the Alaska mainland, and was also a month earlier than any other Alaska record (*Am. Birds* 35:853, 1981). I suspect that the Homer bird wintered in the New World, perhaps well south of Alaska.

Vagrant Common Pochards have reached Gambia and Tanzania (Brown et al. 1982), Thailand (Lekagul and Round 1991), and Guam (Maben and Wiles 1981). In addition, a female at Sand Island, Midway Atoll, Hawaii, from 22 November to 10 December 1979 was photographed (Grant and Pettit 1981, Pyle 1983). A pair reported on 11 June 1977 at Stonybeach Lake, Saskatchewan (Brazier 1978), has been considered hypothetical (Houston et al. 1981), although it is still cited in checklists by both the AOU (1983) and the ABA (1990).

As do many reports of vagrant waterfowl in California, this record engendered debate over the bird's natural occurrence. Todd (1979) indicated that the Common Pochard was "almost nonexistent in America" in waterfowl collections. Richard Ryan (in litt. to D. Roberson; now in CBRC

files) opined that the "odds on an escape are rather slim" with regard to this record. Simon Tarsnane, a waterfowl aviculturist from California, indicated (in litt.) that the species is exceedingly scarce in captivity in North America, and because of the close similarity between Common Pochards, Canvasbacks, and Redheads, there is little demand to keep Common Pochards in this country. Tarsnane knew of only two collections recently holding any; one (Sea World in San Diego) no longer has any in its care, and the other (in North Carolina) apparently has only a "couple of pairs." Acceptance of this record by the CBRC reflects the belief that there is a much higher probability of natural occurrence than of captive origin.

IDENTIFICATION SUMMARY

The Common Pochard is closely related to the Canvasback and the Redhead, the first two sometimes being treated as a superspecies (AOU 1983). All three species show the same general color scheme and plumage pattern (rusty head, black breast and hindquarters, and gray back and flanks). Differences in shape and size, back and flank color, iris color, and, especially, bill pattern make males in non-eclipse plumage a straightforward identification that is well-covered in standard field guides and Madge and Burn (1988). Males in eclipse plumage are duller, but iris color (yellow in the Redhead, scarlet in the Common Pochard and Canvasback) easily sexes them, as females of all three species have dark eyes. Distinctive bill patterns are still evident on eclipse males, with the Canvasback having a massive all-

Figure 1. An adult male Common Pochard (*Aythya ferina*), California's first, at Silver Lakes, San Bernardino County, 12 February 1991. Note the bill pattern and head shape.

Photo by Ed Greaves

black bill, the Common Pochard having a black bill with a grayish blue saddle, and the Redhead having a grayish blue bill with a black "dipped-in-ink" tip and a whitish subterminal band.

Females are more problematic. All three species have a rather tawny brown head, a darker brown breast, and grayish brown on the back and flanks. As with males, the Redhead is the darkest, the Canvasback is the palest. The Common Pochard is intermediate in coloration, though closer to the Canvasback. The sloping forehead and massive all-black bill of a female Canvasback are typically striking. This species is also substantially larger and paler on the back and flanks than the other two. The Redhead shows a distinctly rounded head, a steep forehead, and a bill typically "duck-like" in proportions. The female's bill tends to be darker gray than the male's, but the same pattern is generally evident. In shape as in plumage, the female Common Pochard is intermediate between the Canvasback and Redhead. The forehead slopes into the bill, although not nearly so dramatically as it does on Canvasback. Bill proportions are more like those of the Redhead. The black bill often shows an obscure grayish saddle, which can be difficult to see. In late summer and fall, female Common Pochards may have an "all blackish bill" (Madge 1991), making assessment of head shape, body size (the Common Pochard is slightly smaller than the Redhead), and plumage critical to identification.

Complicating identification of these three species is the high incidence of hybrids in *Aythya* (Gillham et al. 1966, Madge and Burn 1988, Harris et al. 1989). Practically every conceivable hybrid combination within the genus has been recorded in the wild, and several hybrids have been identified as or closely resemble pure individuals of a different species. For example, a Tufted Duck × Common Pochard resembling a male Redhead was found in Britain (Kemp 1991), a male Common Pochard bred with a pinioned female Canvasback in Britain and raised six young that resembled pochards except in shape (Bristow 1992), and Ferruginous Duck (*A. nyroca*) × Common Pochard hybrids often resemble Redheads in plumage and shape (Harris et al. 1989).

Since the Common Pochard is intermediate between the Canvasback and Redhead in shape and plumage, Canvasback × Redhead hybrids could cause real identification problems. This hybrid combination has been reported in the wild in Wisconsin, Virginia (twice), Maryland (twice), and New York (Haramis 1982). More recently, there have been reports from Quebec (Yank and Aubry 1985) and Oregon (Anon. 1989). The Oregon bird, a female, was considered a Common Pochard by some observers, underscoring the need for caution in the identification of females. Haramis (1982) noted the "close resemblance particularly in head and bill structure between hybrid and *A. ferina* specimens" and that "the scapular plumage of *A. ferina* specimens was found to be particularly close to that of the 'Canvasback-type' hybrids." Yank and Aubry (1985) described a "probable hybrid" that closely matched the findings of Haramis. Size is the primary distinction, since hybrids are intermediate between the Canvasback and Redhead, whereas the Common Pochard is smaller than either of those. Culmen lengths of four hybrids were much closer to the mean for the Canvasback than to the mean for the Redhead or Common Pochard (Haramis 1982). In

an encounter with a suspected Common Pochard, particularly a female, pay close attention to bill size and pattern, overall body size and coloration (generally darker in hybrids), and head shape.

ACKNOWLEDGMENTS

Simon Tarsnane graciously supplied information regarding the status of the Common Pochard in captivity in the United States and Europe. Jon L. Dunn and Joseph Morlan provided information about the status of the Common Pochard in Alaska and waterfowl aviculture, respectively. Ed Greaves kindly allowed me to publish his photograph and Matthew T. Heindel supplied the black and white print of it. This paper benefited from reviews by Kurt F. Campbell, Daniel D. Gibson, Guy McCaskie, and Philip Unitt.

LITERATURE CITED

American Birding Association (ABA). 1990. ABA Checklist: Birds of the Continental United States and Canada, 4th ed. Am. Birding Assoc., Colorado Springs, CO.

American Ornithologists' Union (AOU). 1983. Check-List of North American Birds, 6th ed. Am. Ornithol. Union, Washington, D. C.

Anon. 1989. Commonwealth Park mystery duck was a Redhead × Canvasback hybrid. Ore. Birds 15:140–142.

Brazier, F. 1978. A possible record of Common Pochards for southern Saskatchewan. Blue Jay 36:216–217.

Bristow, P. 1992. Pochard × Canvasback hybrids in Britain. Birding World 4:437.

Brown, L. H., Urban, E. K., and Newman, K. 1982. The Birds of Africa, vol. I. Academic Press, London.

Chalmers, M. L. 1986. Annotated Checklist of the Birds of Hong Kong, 4th ed. Hong Kong Bird Watching Soc., Hong Kong.

Cramp, S., and Simmons, K. E. L., eds. 1977. The Birds of the Western Palearctic, vol. I. Oxford Univ. Press, Oxford, England.

Gillham, E., Harrison, J. M., and Harrison, J. G. 1966. A study of certain *Aythya* hybrids. Wildfowl Trust Annu. Rep. 17:49–65.

Grant, G. S., and Pettit, T. N. 1981. Birds on Midway and Kure atolls during the winter of 1979–1980. 'Elepaio 41:81–85.

Haramis, G. M. 1982. Records of Redhead × Canvasback hybrids. Wilson Bull. 94:599–602.

Harris, A., Tucker, L., and Vinicombe, K. 1989. The MacMillan Guide to Bird Identification. MacMillan Press, London.

Houston, C. S., Houston, M. I., and Gollop, J. B. 1981. Saskatchewan bird species—hypothetical and rejected. Blue Jay 39:196–201.

Kemp, J. 1991. Hybrid Pochards resembling Redheads. Birding World 4:353.

Kessel, B., and Gibson, D. D. 1978. Status and distribution of Alaska birds. Studies Avian Biol. 1.

Lekagul, B., and Round, P. D. 1991. A Guide to the Birds of Thailand. Saha Karn Bhaet Co., Bangkok.

Maben, A. F., and Wiles, G. J. 1981. Nine new bird records for Guam and Rota. Micronesica 17:192–195.

Madge, S. 1991. Separation of Canvasback and Redhead from Pochard. Birding World 4:365–368.

Madge, S., and Burn, H. 1988. Waterfowl: An Identification Guide. Houghton Mifflin, Boston.

Patten, M. A. 1991. An update from the California Bird Records Committee. W. Birds 22:95.

Pyle, R. L. 1983. Checklist of the birds of Hawaii. 'Elepaio 44:47–58.

Roberson, D. 1986. Ninth report of the California Bird Records Committee. W. Birds 17:49–77.

Todd, F. S. 1979. Waterfowl: Ducks, Geese, and Swans of the World. Sea World, San Diego.

Yank, R., and Aubry, Y. 1985. The autumn migration: Quebec region. Am. Birds 39:29–31.

Accepted 22 May 1993

COMMENTS ON THE TAXONOMY OF *EMPIDONAX TRAILLII* (WILLOW FLYCATCHER)

M. RALPH BROWNING, U.S. Fish and Wildlife Service, Biological Survey, National Museum of Natural History, Washington, D.C. 20560

Traill's Flycatcher (sensu American Ornithologists' Union [A.O.U.] 1957) is now recognized (A.O.U. 1973) as two species, *Empidonax traillii* (Audubon, 1828) (Willow Flycatcher) and *E. alnorum* Brewster, 1895 (Alder Flycatcher). The two species do not interbreed (Stein 1958, 1963, Gorski 1970), differ genetically (Zink and Johnson 1984, Seutin and Simon 1988), are usually though not always separated ecologically (Stein 1958, 1963, Barlow and McGillivray 1983, Zink and Fall 1981, Ewert 1981), and differ in song and calls (Stein 1958, LeGrand 1979, Lehman 1985). *Empidonax traillii* vocalizes the "fitz-bew" song and breeds in swamps and willow thickets, usually along streams, in the conterminous United States and southern Canada. *Empidonax alnorum* vocalizes the "fee-bee-o" song and breeds in shrubs and alder thickets of the northeastern United States, Canada, and Alaska.

Empidonax traillii and *E. alnorum* are similar in size and proportions (Hussell 1990, Seutin 1991). Although some specimens and birds in the hand may be identified to species by means of Stein's (1963) formula (Phillips et al. 1966, Pyle et al. 1987), the reliability of the formula was questioned by Seutin (1991). The back in *E. traillii* is dull and gray or brownish olive whereas in *E. alnorum* it is usually a brighter greenish (Phillips et al. 1966).

Eugene Eisenmann discussed the reasons for assigning the specific name *traillii* to the Willow Flycatcher in a paper he read at the A.O.U meeting in 1969 (fide Bull 1974). The only more recent comments on the status of the name are brief statements by Eisenmann (1970:108) that "Audubon's name *traillii* belongs to the Arkansas prairie population, which is a 'fitz-bew' vocalizer" and by the A.O.U. (1973) that Audubon's (1828, 1831) description of *traillii* was based on unpreserved specimens of an apparently mated pair. Details to support these conclusions were never published. Because the status of Audubon's birds and therefore the application of the name *traillii* have been questioned (e.g., Aldrich 1951, James and Neal 1986), I discuss these issues here in more detail.

I also discuss the taxonomic status of *E. t. campestris*, a name synonymized with nominate *traillii* by Unitt (1987). Because I agree with most of Unitt's conclusions about the western populations, my comments on those birds are limited mostly to reported zones of intergration between the western subspecies.

APPLICATION OF THE NAME *TRAILLII*

The Identity of Audubon's Birds

Audubon (1831) obtained two flycatchers from the "woods along prairie lands of Arkansas" (= Arkansas Post, about 42 miles southeast of Pine Bluff, in Arkansas County, southeastern Arkansas) in April 1822. The

original painting of the flycatcher was inscribed "Fort of Arkansas April 17, 1822" (Durant and Harwood 1980: 198), three days before Audubon returned to Natchez, Mississippi (Arthur 1937). Audubon (1831) reported that the female contained five eggs about the size of green peas, and he suspected, but did not find, a nest. He also reported that the length of the birds as 5¾ inches and their flight call as "wheet, wheet."

The bird illustrated by Audubon (1828) has wing-bars and an eye-ring typical of *Empidonax*. Five species of *Empidonax* occur in Arkansas (James and Neal 1986): *flaviventris*, *virescens*, *minimus*, *alnorum*, and *traillii*. Compared with Audubon's illustration, *flaviventris* and *virescens* are greener above and more yellow below, and *minimus* is grayer above. The bird illustrated is similar in color to both *alnorum* and *traillii*. James and Neal (1986) listed *alnorum* as a transient infrequently reported in spring and very rarely in fall, and *traillii* as a migrant and now becoming extirpated as a breeding bird. The flight call of "wheet, wheet" (Audubon 1831) resembles the "whit" call (Stein 1963) of birds that sing the "fitz-bew" song. Although the "whit" call is given during migration (Lehman 1985), the call is also given in response to an intruder near a nest (Stein 1963). Even though calls by other species in *Empidonax* might be rendered "wheet" or "whit" (J. P. Hubbard in litt.), most authors (e.g., Lehman 1985) usually equate "whit" with *E. traillii*.

The earliest arrival of *E. traillii* in Arkansas is early May (James and Neal 1986), and the earliest paired birds are on their territory is 10 May (Meanley 1952). Aldrich (1951) believed that the date 17 April of Audubon's birds was too early for breeding. However, April sight records of the species at other localities suggest that breeding of *E. traillii* could occur earlier than normal (mid-May to June). Willow Flycatchers have arrived north of Arkansas as early as 24 April in Indiana (Mumford and Keller 1984) and 18 April in Ohio (Peterjohn 1989). The earliest arrival in Oklahoma, just west of Arkansas, is 20 April (Sutton 1967). An early arrival date of 21 April has been reported from western Oregon (Gabrielson and Jewett 1940), of 29 April from eastern Oregon (Littlefield 1990a). Oberholser (1918) reported a specimen ([U.S. National Museum (USNM) 109499)] collected 8 April 1885 at San Angelo, Tom Green County, central Texas. Although identified as *E. t. campestris* by Aldrich and as *E. t. adastus* by A. R. Phillips, neither author mentioned the specimen in his publications on *E. traillii*. Males arrive on their breeding grounds, on an average, earlier than females (Hussell 1991), and pair formation occurs on the breeding grounds (Holcomb 1974). It is implausible that a female would be migrating with a full clutch of developing eggs.

Because Audubon's (1828) illustration can be identified with either *E. alnorum* or *E. traillii*, and because the female must have been on the breeding grounds, several conclusions about the identity of Audubon's birds are possible: the birds are Alder Flycatchers because the breeding range of *alnorum* 165 years ago extended to Arkansas; a pair of *E. alnorum* bred unusually far south of the species' present breeding range; the two birds are an unknown species; Audubon fabricated the dates and/or the reproductive condition of the female; the birds are E. *traillii* that arrived and bred earlier than the average for the species. Although any one of these conclusions is

possible, only the last is reasonable. Because the holotype of *traillii* is lost (see below), it is not possible to prove that Audubon's birds were Willow Flycatchers. However, *E. traillii* is the only species that resembles Audubon's illustration and breeds in Arkansas. I conclude that nomenclatural stability is best served by retaining the name *traillii* Audubon as the specific name for the Willow Flycatcher.

Audubon's (1828) illustration is of a bird darker above than *E. t. adastus* and *extimus* from western North America and *E. t. campestris* from the northeastern and north-central United States. Compared with *E. t. brewsteri* from west of the Cascade Range and Sierra Nevada, the back and head are more concolorous; in *brewsteri* the top of the head is darker than the back. Audubon's birds are identifiable with the population of *E. traillii* that breeds in the southeastern range of the species (Brewster 1895, Phillips 1948).

The Alleged Lectotype of *Empidonax traillii*

Ridgway (in Brewster 1895) labeled as types three specimens (USNM) of *E. traillii* that Spencer F. Baird had received from Audubon. Oberholser (1918) reidentified two of the specimens as belonging to the Columbia River population (*E. t. brewsteri*); Audubon (1839) listed that locality and may have received specimens from there collected by John K. Townsend or Thomas Nuttall (Graustein 1967). Oberholser (1918) concluded that the third specimen, USNM 1865, was collected by Audubon on the Arkansas River and belongs to the eastern subspecies. Neither Ridgway nor Oberholser actually designated (International Commission on Zoological Nomenclature [ICZN] 1985, Art. 74) USNM 1865, or any other specimen, as a type or lectotype of *traillii*. Phillips (1948), however, did formally designate USNM 1865 as the lectotype of *Muscicapa traillii* Audubon and it was referred to by Aldrich (1951) and Deignan (1961) as the type specimen of the Willow Flycatcher. (A lectotype is a single name-bearing type specimen designated subsequent to the original description; lectotypes are designated from specimens of a type series that are called syntypes.)

Aldrich (1951) identified USNM 1865 as a migrant resembling longer-winged and darker populations from Alaska (now *E. alnorum*); he believed that the breeding population of central-eastern Arkansas belonged to the paler subspecies *E. t. campestris*. Two of the specimens he examined are from near Stuttgart, Arkanasas (about 35 miles northwest of Arkansas Post), an area ecologically distinct from the type locality of *traillii* (G. Graves pers. comm.). The two specimens are intermediate between nominate *traillii* and *campestris* (see beyond for taxonomic comments on *campestris*). Snyder (1953:23) pointed out that the wing chord of USNM 1865 is in the size range of *campestris* and concluded that its identification "is not beyond doubt."

The subspecific identity of USNM 1865 is nomenclaturally important only if the specimen can be associated with Audubon and his description of *E. traillii*. According to Eugene Eisenmann (in a letter to J. W. Aldrich, 20 January 1969, U.S. Fish and Wildlife Service files, Division of Birds, Smithsonian Institution), Audubon was unaware of the importance of

preserving specimens in 1822 and possibly did not begin to preserve birds until sometime in 1830. Eisenmann based his suggestion on Audubon's not mentioning preserved specimens in his journals and his receiving in 1830 from Swainson a letter that contained passages (see Deane 1905) on the importance of preserving specimens. But Audubon had at least been exposed to the idea of preserving specimens by 1820, when he was a taxidermist at Cincinnati (Ford 1988), and had met Titian Peale and Thomas Say, who preserved specimens on the Long Expedition of 1819–1820 (Brodhead 1978). There is no evidence, however, to indicate when Audubon began preserving specimens.

Even if Audubon preserved specimens of *E. traillii* from Arkansas in 1822, no collection data can be associated with USNM 1865. Measurements of the specimen do not conform with those given by Audubon (1831). Furthermore, because of the specimen's worn plumage, it is highly probable that USNM 1865 was not collected in April. Willow Flycatchers molt in their winter range and are in fairly fresh plumage when they arrive in the United States (Unitt 1987). Thus USNM 1865 was not from a type series and therefore does not fulfill the requirements for a lectotype (see ICZN 1985, Article 74). Because Audubon's Arkansas birds are apparently lost, and may never have been preserved, the plate itself offers the only evidence of the subspecific identity of the population. The bird illustrated (Audubon 1828) must stand as a lectotype of *E. t. traillii.*

SUBSPECIES OF *EMPIDONAX TRAILLII*

Taxonomic History

Traylor (1979) stated that the subspecific taxonomy of *E. traillii* cannot be worked out without long series of fresh specimens of known song type. Although perhaps it was not his intent, Traylor implied that because the original descriptions of subspecies of *E. traillii* did not include information on song and thus specific identity, each of the subspecific names could be construed as being a *nomen dubium* (i.e., name of unknown or doubtful application).

The type locality of *E. t. campestris* (Oakes, Dickey County, North Dakota) is within the breeding range of the species *E. traillii* (Stewart 1975) but is near localities where C. T. Clark (in litt.) reported *E. alnorum* singing and calling. After examining the holotype of *campestris* (USNM 259504), I conclude that its plumage and measurements (e. g., Stein 1963, Pyle et al. 1987) agree with those of the species *E. traillii* rather than with those of *E. alnorum*. The holotypes of four named subspecies of *E. traillii* from west of the Rocky Mountains were collected hundreds of miles from the nearest breeding populations and migration routes of *E. alnorum*. The sight records of the Alder Flycatcher near the type locality of *E. t. adastus*, of a single bird in northeastern Oregon (Roberson 1980) and a small population breeding (songs recorded) at Malheur National Wildlife Refuge, southeastern Oregon (Whitney and Kaufman 1986), are likely erroneous. The Oregon Bird Records Committee rejected the northeastern record because the documentation was insufficent to support the identification (Watson

1981), accepted the two Malheur reports (Watson 1984, Irons and Watson 1985), and did not mention breeding. However, J. A. Sedgwick and C. D. Littlefield (pers. comm.), both of whom have spent considerable time working at the refuge (Sedgwick and Knopf 1989, Littlefield 1990a, b) doubt the authenticity of these records.

Regardless of the possible occurrence of other species of *Empidonax* at their localities, the holotypes of the subspecies of *E. traillii* are morphologically identifiable as Willow Flycatchers and represent breeding populations that sing the typical song of E. *traillii* (e. g., King 1955, Green 1978, Phillips et al. 1964; pers. obs.). Nomenclatural stability is best served by regarding the names of subspecies of *E. traillii* as representing that species.

Brewster (1895) proposed the name *Empidonax traillii alnorum* for a subspecies that breeds in the Maritime provinces of Canada, New England, New York, and Michigan. He gave the breeding range of nominate *traillii* as from central Alaska to British Columbia, western United States west of the Great Plains, and the southern Mississippi Valley, including Arkansas. Brewster (1895) characterized *alnorum* as more olivaceous above than nominate *traillii*. Oberholser (1918) concluded that northeastern populations and those from Arkansas were not distinct from one another, synonymized the name *alnorum* with nominate *traillii*, and proposed the name *brewsteri* (type locality Cloverdale, Nye County, Nevada) for the Willow Flycatchers breeding from southwestern British Columbia and much of the western United States east to eastern Oklahoma and northeastern Texas. He characterized *brewsteri* as more brownish above than *traillii*. He did not include eastern Oregon in the range of *brewsteri*, and later (Oberholser 1932) proposed the name *adastus* (type locality Hart Mountain, northern end of Warner Valley, 20 miles northeast of Adel, Oregon) for a subspecies that breeds from eastern Washington and Oregon to northeastern California, Idaho, northern Nevada, Wyoming, western Montana, and central Colorado. He referred to birds from northern Utah, central Colorado, and north-central California as intergrades between *brewsteri* and *adastus*. Oberholser (1947) named as *zopholegus* (type locality "South Vancouver Island," British Columbia) the subspecies breeding from southwestern British Columbia to western Washington, Oregon, and Marin County, California. He characterized *zopholegus* as smaller, darker, and browner (above) than *adastus*; he did not contrast *zopholegus* with *brewsteri*.

Phillips (1948) recognized nominate *traillii*, with *alnorum* as a synonym, synomymized *zopholegus* with *brewsteri* (its type specimen being a migrant "*zopholegus*"), and recognized *adastus*. He also proposed the subspecific name *extimus* (type locallty lower San Pedro River, Arizona) for a pale subspecies of *E. traillii* breeding from southern Nevada to southwestern Utah, central and central-eastern Arizona, southwestern New Mexico, and western Texas. Aldrich (1951) recognized the same western subspecies as Phillips (1948) and proposed the name *campestris* for the pale greenish populations that breed from Mackenzie to the Great Plains and east to western New York. Specimens from Mackenzie and all but the southern portions of the Canadian prairie provinces that Aldrich (1951) identified as *campestris* represent allopatric populations of *E. alnorum* (see Godfrey 1986). The A.O.U. (1957) included *adastus* and *extimus* in the subspecies

brewsteri and included most of the range of *campestris* in nominate *traillii*.

Unitt's (1987) taxonomic assessment of *E. traillii* resembles that of others (e. g., Phillips 1948, Aldrich 1951, Wetmore 1972) for the western subspecies, with the exception of extending the breeding range of *extimus* to Baja California and southern California and including in *adastus* birds from the purported (Burleigh 1972, Behle 1985) zones of intergradation between *extimus* and *adastus*. He synonymized the name of the midwestern subspecies *campestris* with nominate *traillii* (contra Sutton 1967 and others). However, Unitt's (1987: tables 1 and 2) series of nominate *traillii*, according to the localities he reported, were from the range of *campestris* rather than from the range of nominate *traillii* (sensu Aldrich 1951).

Methods

To reevaluate the taxonomic status of *campestris* and the other subspecies, I examined 270 adult breeding specimens of *E. traillii* and the holotypes of *brewsteri* and *campestris*. I had earlier (Browning 1979) examined the holotype of *adastus*. Specimens collected north of about 37°N latitude in June and July I considered to have been on their breeding grounds. Durations of migration and breeding overlap, especially south of 37°N (see Phillips et al. 1964, Unitt 1987). Examples of breeding durations (nest building to fledging) north of 37°N are late May to mid-July in Washington (Jewett et al. 1953), June to mid-July in eastern Oregon (Littlefield 1990a), early June to mid-July in Idaho (Burleigh 1972), June to late July in North Dakota (Stewart 1975), early June to mid-July in Indiana (Mumford et al. 1984), and mid-June to mid-July in Ohio (Peterjohn 1989). Egg dates in Ontario extend from 13 June to 20 July (James 1991). Because the identifications of *adastus* and *brewsteri* are well established by others (e.g., Phillips 1948, Aldrich 1951, Unitt 1987), with whom I agree, I considered dark-backed specimens from the southwestern parts of the breeding range of *E. traillii* as migrants. In order to exclude potential migrants, specimens from regions of alleged intergradation between subspecies and those used for determining the taxonomic status and ranges of *campestris* and nominate *traillii* were collected from mid-June to mid-July unless otherwise stated. I compared both old and new specimens, bearing in mind that geographically similar samples collected in the last three decades average slightly darker and greener (less brownish) than those collected earlier. Specimens with heavily worn or foxed plumages were not included in the study.

Evaluation of plumage colors by Smithe's (1975) color standard was not possible because his color swatches generally do not match actual colors (Pratt and O'Neill 1976) and specifically do not match plumage colors of Willow Flycatchers (Unitt 1987). Furthermore, the criteria that a color standard should have the same texture, gloss, and colorants (dyes, pigments) as that being compared (Hale 1987), are not met when color swatches are compared with birds. Although Munsell Color Charts (1990) present many of the same problems, I used Munsell's standards to deter-

mine relative values (pale vs. dark) for the crown and backs of most specimens (Figure 1). Value for other specimens was determined visually by direct comparisons of specimens. Analysis of measurements (e. g., wing chord, tail, bill) revealed no taxonomically important differences in size between populations. Because Stein's (1963) wing formula for identifying *E. trailii* and *E. alnorum* is not reliable for all specimens (Seutin 1991), I excluded specimens of E. *alnorum* from the sample of *E. traillii* by using a combination of plumage color and pattern discussed under *E. t. traillii* (below).

Results

Comparison of specimens revealed that there are five recognizable subspecies of *E. traillii*. Nominate *traillii* is similar in plumage to *E. alnorum* (see below); other subspecies (*brewsteri*, *adastus*, *extimus*, and *campestris)* are much browner and less greenish than Alder Flycatchers.

Empidonax t. traillii. Unworn specimens of *E. alnorum* are usually brighter green (less brownish) on the back and crown than specimens of *E. traillii*. The crown feathers of *alnorum* usually have brownish centers, whereas these feathers in nominate *traillii* are usually more solid in color.

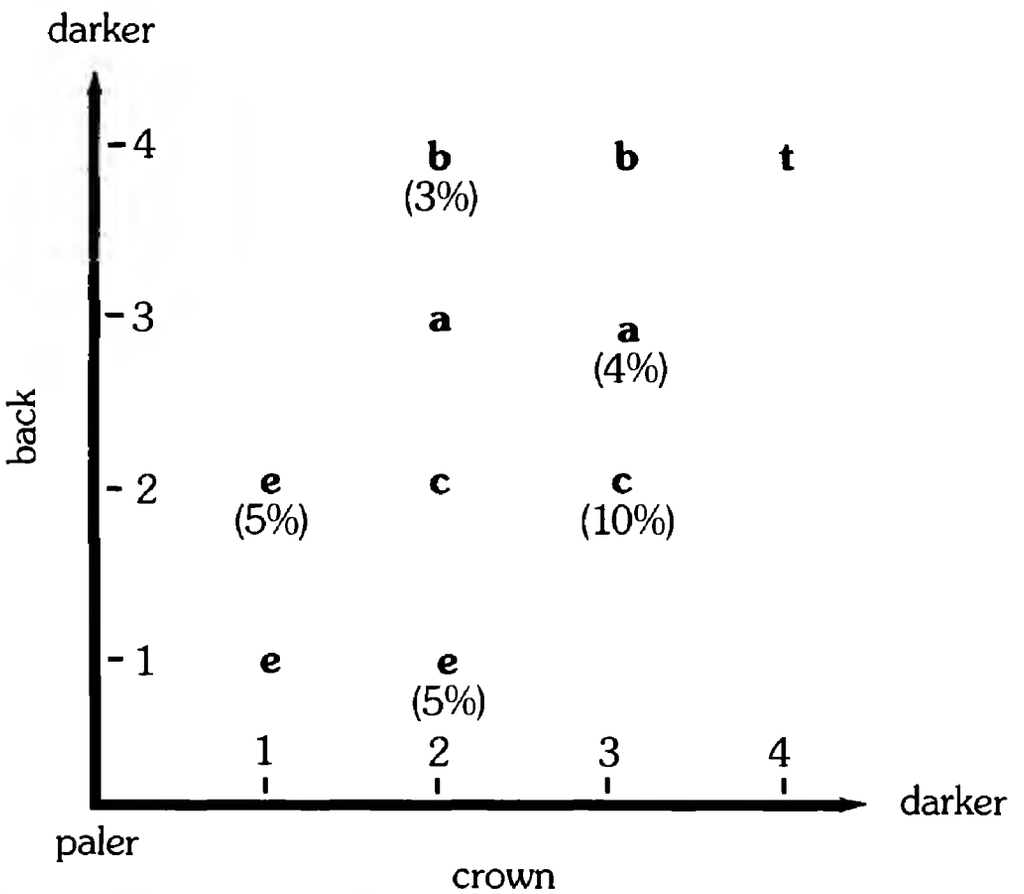


Figure 1. Relative values of back and crown color of unworn adult *Empidonax traillii*. Letters represent 100% of a sample, unless otherwise indicated, as follows: t, nominate *traillii* (sample size, 11); c, *campestris* (20); b, *brewsteri* (62); a, *adastus* (125); e, *extimus* (18).

These differences, as with Stein's (1963) wing formula, are not 100% reliable.

The nominate subspecies is darker and less greenish (more brownish) on the back and crown than *campestris*. Although *traillii* and *campestris* each have similar values for back and crown colors (Figure 1), the hues of the back and crown are more similar to each other in nominate *traillii* than in *campestris*; the back in *campestris* is greenish and the crown is grayish. Males of nominate *traillii* and *campestris* differ slightly in relative lengths of primaries 10 and 5: P10 > P5 in 73% of *traillii* (n = 11) and 94% of *campestris* (n = 17); P10 = P5 in 27% of *traillii* (n = 4) and 6% of *campestris* (n = 1). Although the results for *campestris* are remarkably similar to those Unitt (1987) reported for his sample of *traillii*, my small sample sizes indicate considerable overlap between the two subspecies for P10 > 5.

Specimens of nominate *traillii* are much darker above than *extimus* and *adastus* and greener above than *brewsteri*. Nominate *traillii* breeds from eastern Arkansas to southern Wisconsin, southern Illinois and Indiana, eastern New York (Syracuse), and Maine (Figure 2). Birds from eastern Tennessee (Stedman 1987, Tanner 1988), West Virginia (Hall 1983), and North Carolina (Potter et al. 1980), where the species is expanding its range, probably belong to the nominate subspecies.

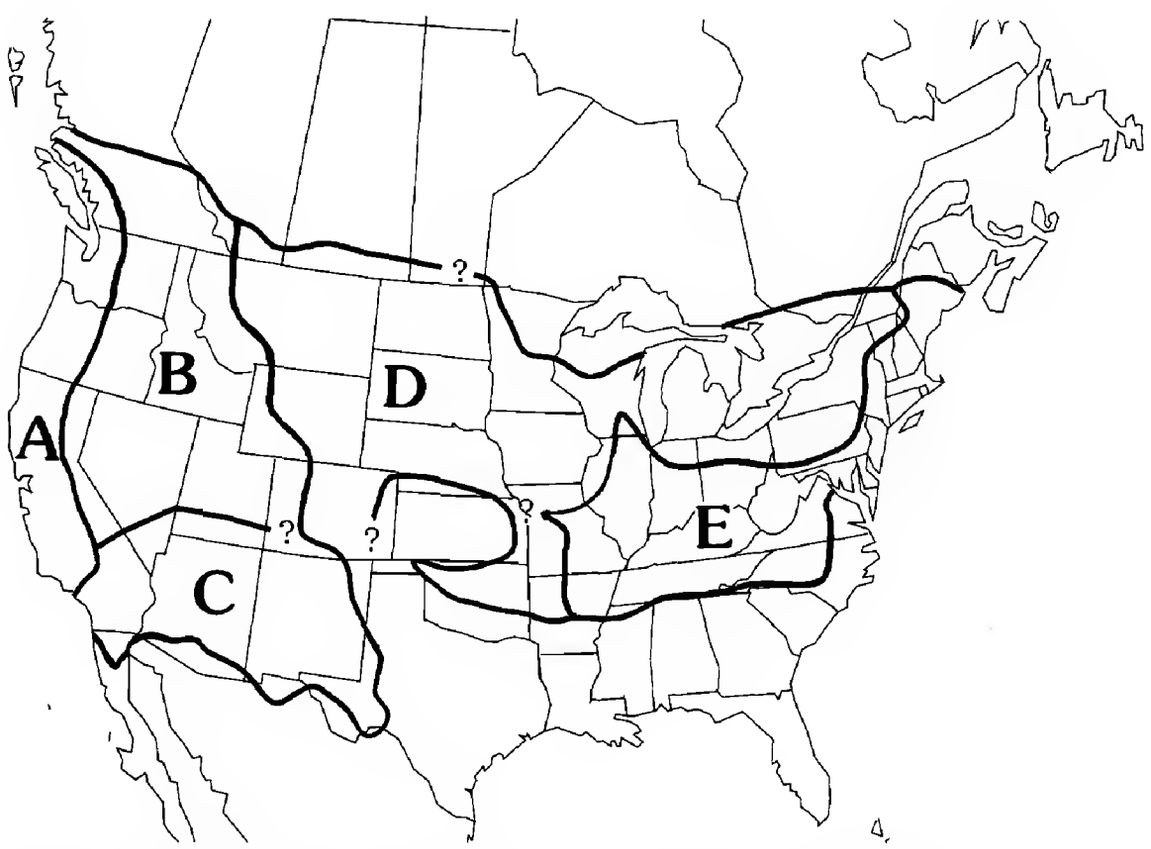


Figure 2. Approximate breeding ranges of subspecies of *Empidonax traillii*: A, *brewsteri*; B, *adastus*; C, *extimus*; D, *campestris*; E, *traillii*. *Empidonax alnorum* breeds north to Alaska.

Empidonax t. campestris. Stein's specimens of known song type from New York that sang fitz-bew (*E. t. campestris, n* = 6) are consistently much grayer on the crown and paler and grayish-green on the back than specimens that he indicated sang fee-bee-o (*E. alnorum, n* = 4).

Aldrich (1951) characterized *campestris* as darker and more greenish (less grayish or brownish) above than *extimus*, paler and greener (less brownish) above than *adastus*, and "considerably paler" than nominate *traillii*. Most authors (e.g., Bailey and Niedrach 1965, Sutton 1967, Oberholser 1974) who also recognized *campestris* characterized the subspecies as definitely paler above than *traillii*.

I compared the holotype of *campestris* and 32 other specimens from the range of the subspecies (Aldrich 1951) with 20 specimens of *traillii* from the northeastern and south-central U.S. I found that all specimens of *campestris* are paler and greener on the back, with paler crowns and cheeks, than specimens of *traillii* (Figure 1). Specimens of *campestris* from western New York are darker above and on the breast than birds from North Dakota but are closer to *campestris* than to *traillii*. The back of *campestris* is darker and slightly greener (less grayish brown) than that of *extimus*, and is paler and greener (less brownish) than that of *adastus*. I conclude that *campestris* should be recognized as a distinct subspecies.

According to Aldrich (1951), the breeding range of *campestris* includes central-eastern Arkansas, near the type locality of *traillii*. Aldrich identified two breeding specimens from Stuttgart, Arkansas, only 37 miles northeast of the type locality of *traillii*, as more similar to *campestris* than to *traillii*. The two specimens are darker on the back, crown, and cheeks than *campestris* from North Dakota but paler and less brownish than specimens of *traillii*. Fewer than 12 pairs breed near Stuttgart (James 1974). Willow Flycatchers no longer breed at the type locality of the nominate subspecies (D. James pers. comm., 1990), and additional specimens from Arkansas are not available. However, on the basis of specimens of *traillii* from more eastern localities, I judge that the two Stuttgart specimens are intermediate between *campestris* and *traillii*. The eastward expansion of the range of *campestris* (e. g., Aldrich 1953, Parkes 1954) may explain the intermediacy of specimens near the type locality of *E. t. traillii*.

Bailey and Niedrach (1965:522–523) believed that *campestris* was a migrant on the plains and foothills in Colorado east.of the Rockies. Aldrich (in Bailey and Niedrach 1965) stated that there was no evidence of breeding on the plains of eastern Colorado, and identified specimens from the eastern slope of the Rocky Mountains as *adastus* that show a "tendency toward intergradation" with *campestris* in their "slightly paler and brownish" color. The species is now known to breed in Arapaho National Wildlife Refuge in north-central Colorado (Sedgwick and Knopf 1989). Available specimens from east of the Rockies in Colorado were collected in May and June and may not been on their breeding grounds. Such specimens from near the eastern slope of the Rockies, particularly from the Denver region, are slightly darker green above than most specimens of *campestris* from North Dakota and are more similar to but less grayish above than *adastus*. I tentatively consider specimens from Denver to represent *adastus*. Specimens from northeastern and southeastern Colorado, collected in late May,

resemble *campestris* from North Dakota. Specimens from just west of the Rocky Mountains in Summit County and from Garfield and Mesa counties, Colorado, are possibly intergrades between *adastus* and *extimus* (see beyond). I have been unable to locate two specimens from southeastern Idaho that Burleigh (1972) identified as breeding examples of *campestris*, but the specimens available from the same region are *adastus*.

Empidonax t. campestris breeds from southern Alberta and Saskatchewan to southern Ontario and Quebec south to probably central Texas, east-central Arkansas, northern Wisconsin, west-central Illinois, northern Indiana and Ohio, and eastern New York (Ithaca) (Figure 2). The western limit of *campestris* probably lies near the eastern slope of the Rocky Mountains from Montana to Colorado. Birds breeding in southern Manitoba (de Smet and Conrad 1988) and in the southern peninsula of Michigan (Pinkowski 1976) probably belong to this subspecies.

Empidonax t. extimus. Phillips (1948) characterized *extimus* as differing from *adastus* by being paler above, especially on the head, with the crown distinctly paler, the cheeks paler, the chestband less pronounced, and belly and crissum paler yellow. Many authors (e. g., Aldrich 1951, Behle 1985, Unitt 1987) have recognized this southwestern subspecies.

Two specimens from the southwestern U. S. collected since 1960 are pale grayish-green and older specimens are pale brownish above, usually with a breast band less distinct and paler gray than in the other subspecies. Specimens of *extimus* are paler above than those of other subspecies (Figure 1). Nominate *traillii* is much darker above than *extimus*. Specimens of *extimus* resemble those of *campestris* but are more grayish and paler above in newer specimens and paler brown in older specimens.

A singing male from Pahrump Valley, Nye County, Nevada, collected 21 June, is referable to *extimus*. Two nonbreeding (N. K. Johnson pers. comm.) males from Ash Meadows, Nye County, collected on 15 June, are pale above but within the range of variation in *adastus*.

The breeding range of *extimus* is from northern Baja California (Unitt 1987) to southern California, southern Nevada (southern Nye and Clark counties), extreme southern Utah, Arizona, and New Mexico (Figure 2). I have not seen breeding specimens of *extimus* from Texas; *extimus* probably breeds (or bred) in western Texas between the Pecos River and the Rio Grande (Unitt 1987, but see Oberholser 1974).

Empidonax t. adastus. Oberholser (1932) characterized *adastus* as more grayish or greenish-brown above than *brewsteri*. Miller (1941a) concluded that the range of variation in dorsal color in topotypical *adastus* was within that of *brewsteri* and he, followed by Behle (1948), synonymized *adastus* with *brewsteri*. On the other hand, Twomey (1942) and Behle (1958), the latter following Aldrich (1951) and others, recognized *adastus* as a distinct subspecies.

Miller (1941a:259) concluded that specimens from Oregon near the type locality of *adastus* and other birds from the Blue Mountains to the north were "exceedingly variable individually." I compared 26 specimens that likely were available to Miller (1941a) with other specimens of E. *traillii*. Three specimens from Plush, Oregon (18 miles north of Adel), collected on 6 and 7 June, and a specimen from Wildcat Mountain, Crook County,

Oregon, collected on 16 June, are darker above and below than other birds from the series, and resemble specimens of *brewsteri* from western Washington and Oregon. Testes of the three specimens ranged in length from 4 to 7 mm (mean 5.3 mm); testes of 8 paler specimens from the same regions ranged from 7 to 9 mm (mean, 7.9 mm). Because of the earlier dates, smaller testes, and darker color of the three specimens, I suspect that the birds were migrant *brewsteri*. Although I agree with Miller (1941a) that individuals in the series vary from brownish to greenish above, the brownish birds are nonetheless paler and greener than specimens of *brewsteri* (Figure 1). Furthermore, the crowns and edges of the tertials and secondaries are paler and the upper breasts are more grayish (less brownish) than in *brewsteri* from western Washington and Oregon. Specimens from throughout the range of *adastus* vary somewhat in back color (Phillips 1948, pers. obs.); the colors of the rest of the plumage is constant. The subspecies is darker than *extimus*, especially on the crown and back. Linsdale (1951) reported that *brewsteri* is a summer resident in Nevada, but the breeding specimens I examined, except from the extreme southern part of the state, are *adastus*.

The breeding range of *adastus* is from southeastern British Columbia to eastern California, and the Great Basin to the Rockies north of extreme southern Utah (Figure 2).

Empidonax t. brewsteri. The northwestern subspecies *brewsteri* is darker above than other western subspecies (Phillips 1948, Aldrich 1951, Unitt 1987, Figure 1). It differs from nominate *traillii* by its browner back. Three males from southwestern British Columbia, two of which are near-topotypes of *zopholegus* (= *brewsteri*), average slightly greener on the back and crown and browner on the upper breast than other specimens of *brewsteri* from Washington to northern California. *Empidonax t. brewsteri* breeds from southwestern British Columbia to western Washington and Oregon and the Sierra Nevada of Fresno County, California (Unitt 1987) (Figure 2).

Intergrades between *extimus* and *adastus*. Sites of reported intergradation between *extimus* and *adastus* include Clearwater and Nez Perce counties in central Idaho (Burleigh 1972), southern Idaho and northern Utah (Aldrich in Levy 1962), from southern Idaho and all but extreme southern Utah (Behle 1985), and probably the Rocky Mountains (Aldrich in Bailey and Niedrach 1965). Behle (1985) believed that birds from southern Idaho and Utah (excluding the extreme south) were intergrades but that these populations were more similar to *adastus* than to *extimus*. Unitt (1987:150–151) stated that the "reason for the varying identifications is that the intergradation between *extimus* and *adastus* in the Great Basin/Rocky Mountain area is much more gradual than that between *extimus* and *brewsteri* in California." Although he cited Behle (1985), who concluded that there was a smooth cline from darker to paler birds in Utah, Unitt did not further discuss the zones of intergradation and included all of those populations under the subspecies *adastus*.

I compared 35 specimens from Utah, most of which were available to Behle, and 33 specimens from Idaho, most of which were examined by Burleigh, with 14 specimens of *extimus* from Arizona and New Mexico and

51 specimens of *adastus* from eastern Washington and Oregon. All of the specimens from north of extreme southern Utah are equally darker above than specimens of *extimus*. There is a geographic hiatus in Utah between the localities of the northernmost specimens of *extimus* and southernmost specimen of *adastus*. This hiatus is approximately 200 miles wide in western Utah and about 100 miles wide in the eastern part of the state. Thus, a gradual cline between *extimus* and *adastus* cannot be demonstrated.

Bailey and Niedrach (1965:522) listed five specimens from western Colorado collected in August under the subspecies *extimus* and, quoting Aldrich (in litt.), stated that *extimus* "probably enters some parts of western Colorado and intergrades with *adastus* in the Rocky Mountains." One of the August birds, from Garfield County, is *adastus*; although slightly worn, August specimens of *extimus* are usually paler than most August specimens of *adastus*. On the other hand, a bird from Summit County and one from Mesa County are pale above; they may be faded or represent intergrades between *extimus* and *adastus*.

Intergrades between *adastus* and *brewsteri*. Phillips (1948) reported intergradation between *adastus* and *brewsteri* from several localities in Oregon and stated that the area of intergradation occurs in "a good part" of western Oregon and California. In addition to the localities specified by Phillips (1948), I found intergrades between *adastus* and *brewsteri* from Oregon at Lookingglass (near Roseburg) in Douglas County (pale back and crown, with dark upper breast and edges of the tertials), several localities in Jackson County, and from northern California, in Siskiyou County from Hornbrook (two specimens with the edges of the tertials and upper breast dark, one with pale crown and dark back, and one with pale crown and paler back), and one from six miles northwest of Callahan on the Scott River (pale back with dark upper breast and edges of the tertials). In eastern Oregon, specimens from Ft. Klamath, Oregon, are browner above than *adastus* from Harney and Malheur counties but paler above and below than *brewsteri* from western Oregon. Because the specimens from Ft. Klamath are very old, I hesitate to identify them to subspecies. Although intergrades between *brewsteri* and *adastus* are known from a long north-to-south zone, I believe that interbreeding between the two subspecies is relatively limited and is similar to variation between currently recognized subspecies of other species that breed on both slopes of the Cascade Mountains and Sierra Nevada (see Miller 1941b, Browning 1974).

Phillips (1948) referred to the "headwaters of Drew Creek, Lake County, Oregon," as a place where darker and browner birds approach *brewsteri*. As noted by Phillips, this locality is "not far" (= ca. 60 miles) from the type locality of *adastus*. The subspecific characters of the only specimen from the headwaters of Drew Creek, collected in July, that I examined agree with Phillips' identification. However, this specimen is not geographically intermediate between the ranges of *adastus* and *brewsteri*; it is darker and browner than birds from Klamath Falls to the west and darker than birds to the east from the type locality of adastus. I believe that the bird from Drews Creek is either an extremely dark individual of *adastus* or possibly an example of *brewsteri* that was not on its breeding grounds.

SUMMARY

Audubon's *Muscicapa* (= *Empidonax*) *traillii* is identifiable with the southeastern subspecies of the Willow Flycatcher. Five subspecies of *E. traillii* are recognizable. Two breed east of the Rocky Mountains, *campestris*, with paler upperparts, in the Great Plains and Great Lakes regions, and nominate *traillii*, with darker upperparts, to the southeast of this. Three breed west of the Rockies, dark brownish *brewsteri* from the Pacific Northwest south through the Sierra Nevada, intermediate *adastus* from the Rocky Mountains and intermountain regions, and pale grayish *extimus* from the southwest. Reports of intergradation between *adastus* *extimus* in the Great Basin are incorrect. The breeding ranges of the five subspecies are not well known because of lack of known breeding specimens, both in the East, where the species is apparently expanding its range, and in the West, where ranges are contracting.

ACKNOWLEDGMENTS

I thank the staffs of following museums for access to or the loan of specimens: American Museum of Natural History, Canadian Museum of Nature (Ottawa), Carnegie Museum of Natural History, Cleveland Museum of Natural History, Delaware Museum of Natural History, Denver Museum of Natural History, Museum of Vertebrate Zoology, New York State Museum, Oregon State University, Southern Oregon State College, University of Nevada–Reno, and University of Utah. I thank N. K. Johnson for information on specimens he collected in Nevada, Charles T. Clark for information on sight records from North Dakota, and Claudia Angle for preparing Figure 1. I extend appreciation to J. W. Aldrich, C. Dove, A. R. Phillips, J. A. Sedgwick, and especially thank R. C. Banks, for their helpful comments on an earlier version of the manuscript. J. P. Hubbard and P. Unitt contributed many useful comments on a later version.

LITERATURE CITED

Aldrich, J. W. 1951. A review of the races of the Traill's Flycatcher. Wilson Bull. 63:192–197.

Aldrich, J. W. 1953. Habits and habitat differences in two races of Traill's Flycatcher. Wilson Bull. 65:8–11.

American Ornithologists' Union. 1957. Check-list of North American Birds. 5th ed. Am. Ornithol. Union, Baltimore.

American Ornithologists' Union. 1973. Thirty-second supplement to the American Ornithologists' Union checklist of North American birds. Auk 90:411–419.

Arthur, S. C. 1937. Audubon: An intimate life of the American woodsman. Harmanson, New Orleans.

Audubon, J. J. 1828. Birds of America. Folio ed. Edinburgh.

Audubon, J. J. 1831. Ornithological Biography. . . . Philadelphia.

Audubon, J. J. 1839. A Synopsis of the Birds of North America. Adam and Charles Black, Edinburgh.

Bailey, A. M., and Niedrach, R. J. 1965. Birds of Colorado, vol. 2. Denver Mus. Nat. Hist., Denver.

Barlow, J. C., and McGillivray, W. B. 1983. Foraging and habitat relationships of the sibling species Willow Flycatcher (*Empidonax traillii)* and Alder Flycatcher (*E. alnorum*) in southern Ontario. Can. J. Zool. 61:1510–1516.

Behle, W. H. 1948. Systematic comments on some geographically variable birds occurring in Utah. Condor 50:71–80.

Behle, W. H. 1958. The birds of the Raft River Mountains, northwestern Utah. Univ. Utah Biol. Ser. 11, No. 6.

Behle, W. H. 1985. Utah birds: Geographic distribution and systematics. Utah Mus. Nat. Hist., Occas. Publ. 5.

Brewster, W. 1895. Notes on certain flycatchers of the genus *Empidonax*. Auk 12:157–163.

Brodhead, M. J. 1978. The work of Charles Lucien Bonaparte in America. Proc. Am. Philos. Soc. 122:198–203.

Browning, M. R. 1974. Taxonomic remarks on recently described subspecies of birds that occur in the northwestern United States. Murrelet 55:32–38.

Browning, M. R. 1979. Type specimens of birds collected in Oregon. Northw. Sci. 53:132–140.

Bull, J. 1974. Birds of New York State. Comstock, Cornell Univ. Press, Ithaca, N.Y.

Burleigh, T. D. 1972. Birds of Idaho. Caxton, Caldwell, ID.

Deane, R. 1905. William Swainson to John James Audubon. (A hitherto unpublished letter). Auk 22:31–34.

Deignan, H. G. 1961. Type specimens of birds in the United States National Museum. U. S. Natl. Mus. Bull. 221.

De Smet, K. D., and Conrad, M. P. 1988. First documented nesting record and status of the Willow Flycatcher in Manitoba. Blue Jay 46:149–154.

Durant, M., and Harwood, M. 1980. On the road with John James Audubon. Dodd, Mead, New York.

Eisenmann, E. 1970. [Review of] A distributional survey of the birds of Honduras. Wilson Bull. 82:106–109.

Ewert, D. N. 1981. The occurrence of closely related species-pairs in central Michigan: Willow and Alder flycatchers and Golden-winged and Blue-winged warblers. Jack-Pine Warbler 59:95–98.

Ford, A. 1988. John James Audubon: A biography. Abbesville Press, New York.

Gabrielson, I. N., and Jewett, S. G. 1940. Birds of Oregon. Ore. State College, Corvallis.

Godfrey, W. E. 1986. The Birds of Canada, rev. ed. Natl. Mus. Canada, Ottawa.

Gorski, L. J. 1970. Banding the two songforms of Traill's Flycatcher. Bird-Banding 41:204–206.

Graustein, J. E. 1967. Thomas Nuttall naturalist explorations in America 1808–1841. Harvard Univ. Press, Cambridge, MA.

Green, G. A. 1978. Summer birds of the Alvord Basin, Oregon. Murrelet 59:59–69.

Hale, W. N., Jr. 1987. Visual assessment of appearance, instruments cannot do everything. Am. Soc. Testing and Materials Standardization News, February 1987, pp. 46–49.

Hall, G. A. 1983. West Virginia Birds. Spec. Publ. Carnegie Mus. Nat. Hist. 7.

Holcomb, L. C. 1974. The influence of nest building and egg laying behavior on clutch size in renests of the Willow Flycatcher. Bird-Banding 45:320–325.

Hussell, D. J. T. 1990. Implications of age-dependent bill length variation in *Empidonax* for identification of immature Alder and Willow flycatchers. J. Field Ornithol. 61:54–63.

Hussell, D. J. T. 1991. Spring migrations of Alder and Willow Flycatchers in southern Ontario. J. Field Ornithol.; 62:69–77.

International Commission on Zoological Nomenclature. 1985. International Code of Zoological Nomenclature. 3rd ed. Int. Trust Zool. Nomenclature, London.

Irons, D., and Watson, C. 1985. OBRC report. Committee action 1978–1983. Ore. Birds 11:18–68.

James, D. J., and Neal, N . C . 1986 . Arkansas Birds . Univ. Ark. Press, Fayetteville.

James, F. C. 1974. Threatened native birds of Arkansas, in Arkansas Natural Area Plan, pp. 107–122. Ark. Dept. Planning, Little Rock.

James, R. D. 1991. Annotated checklist of the birds of Ontario, 2nd ed. Royal Ont. Mus. Life Sci. Misc. Publ., Toronto.

Jewett, S. G., Taylor, W. P., Shaw, W. T., and Aldrich, J. W. 1953. Birds of Washington State. Univ. Wash. Press, Seattle.

King, J. R. 1955. Notes on the life history of Traill's Flycatcher (*Empidonax traillii*) in southeastern Washington. Auk 72:148–173.

LeGrand, H. E., Jr. 1979. Comments on the call notes of Alder and Willow Flycatchers . Chat 43: 66.

Lehman, P. 1985. Calls of Alder and Willow flycatchers. W. Birds 16:189 .

Levy, S. H. 1962. Additional summer southern Idaho bird notes. Murrelet 43:10–14.

Linsdale, J. M. 1951. A list of the birds of Nevada. Condor 53: 228–249 .

Littlefield, C. D. 1990a. Birds of Malheur National Wildlife Refuge, Oregon. Ore. State Univ. Press, Corvallis.

Littlefield, C. D. 1990b. Bird surveys of the Little Blitzen River in southeast Oregon, summer 1987. Ore. Birds 16: 147–169.

Meanley, B. 1952. Notes on nesting Traill's Flycatcher in eastern Arkansas. Wilson Bull. 64:111–112.

Miller, A. H. 1941a. A review of centers of differentiation for birds in the western Great Basin region. Condor 43:257–267.

Miller, A. H. 1941b. Speciation in the avian genus *Junco*. Univ. Calif. Publ. Zool. 44:173–434.

Mumford, R. E., and Keller, C. E. 1984. The Birds of Indiana. Ind. Univ. Press, Bloomington.

Munsell Color Charts. 1990. Ed. rev. Munsell Color, Baltimore.

Oberholser, H. C. 1918. New light on the status of *Empidonax traillii* (Audubon). Ohio J. Sci. 18:85–98.

Oberholser, H. C. 1932. Descriptions of new birds from Oregon, chiefly from the Warner Valley region. Cleveland Mus. Nat. Hist. Sci. Publ. 4:1–12.

Oberholser, H. C. 1947. A new flycatcher from the western United States. Proc. Biol. Soc. Washington 60:77–78.

Oberholser, H. C. 1974. The Bird Life of Texas., vol. 2. Univ. Tex. Press, Austin.

Parkes, K. C. 1954. Traill's Flycatcher in New York. Wilson Bull. 66:89–92.

Peterjohn, B. G. 1989. The Birds of Ohio. Ind. Univ. Press, Bloomington.

Phillips, A. R. 1948. Geographic variation in *Empidonax traillii*. Auk 65:507–514.

Phillips, A. R., Howe, M. A., and W. E. Lanyon. 1966. Identification of the flycatchers of eastern North America, with special emphasis on the genus *Empidonax*. Bird-Banding 37:153–171.

Phillips, A. R., Marshall, J. T., and Monson, G. 1964. The Birds of Arizona. Univ. Ariz. Press, Tucson.

Pinkowski, B. C. 1976. Michigan bird survey, summer 1976. Jack-Pine Warbler 54:160–167.

Potter, E. F., Parnell, J. F., and Teulings, R. P. 1980. Birds of the Carolinas. Univ. N. C. Press, Chapel Hill.

Pratt, H. D., and O'Neill, J. P. 1976. [Review of] Naturalist's color guide: Part I, the Color Guide; Part II, the color guide supplement. Auk 93:404–406.

Pyle, P., Howell, S. N. G., Yunick, R. P., and DeSante, D. F. 1987. Identification Guide to North American Passerines. Slate Creek Press, Bolinas, CA.

Roberson, D. 1980. Rare Birds of the West Coast of North America. Woodcock Publ., Pacific Grove, CA.

Sedgwick, J. A., and Knopf, F. L. 1989. Regionwide polygyny in Willow Flycatchers. Condor 91:473–475.

Seutin, G., and Simon, J.-P. 1988. Genetic variation in sympatric Willow Flycatchers (*Empidonax traillii*) and Alder Flycatchers (*E. alnorum*). Auk 105:235–243.

Seutin, G. 1991. Morphometric identification of Traill's Flycatchers: An assessment of Stein's formula. J. Field Ornithol. 62:308–313.

Smithe, F. B. 1975. Naturalist's Color Guide. Am. Mus. Nat. Hist., New York.

Snyder, L. L. 1953. On eastern empidonaces with particular reference to variation in *E. traillii*. Contrib. Royal Ont. Mus. Zool. Palaeontol. 35.

Stedman, S. J. 1987. Nesting habitat of Willow Flycatcher in Tennessee. Migrant 58:49–50.

Stein, R. C. 1958. The behavioral, ecological and morphological characteristics of two populations of the Alder Flycatcher, *Empidonax traillii* (Audubon). N. Y. State Mus. Sci. Serv. Bull. 371.

Stein, R. C. 1963. Isolating mechanisms between populations of Traill's Flycatchers. Proc. Am. Philos. Soc. 107:21–50.

Stewart, R. E. 1975. Breeding Birds of North Dakota. Tri-Coll. Center Environ. Studies, Fargo, N. D.

Sutton, G. M. 1967. Oklahoma Birds. Univ. Okla. Press, Norman.

Tanner, J. T. 1988. Changing ranges of birds in Tennessee. Migrant 59:73–87.

Traylor, M. A., Jr. 1979. Subfamily Fluvicolinae, in Check-list of Birds of the World (M. A. Traylor, Jr., ed.), vol. 8, pp. 112–186. Mus. Comp. Zool., Cambridge, MA.

Twomey, A. C. 1942. The birds of the Uinta Basin, Utah. Ann. Carnegie Mus. 28:341–490.

Unitt, P. 1987. *Empidonax traillii extimus*: An endangered subspecies. W. Birds 18:137–162.

Watson, C. 1981. Oregon Bird Records Committee report: April 1980–June 1981. Ore. Birds 7:75–87.

Watson, C. 1984. OBR Committee report: July 1983–July 1984. Ore. Birds 10:51–55.

Wetmore, A. 1972. The Birds of the Republic of Panama, part 3. Smithsonian Misc. Coll. 150.

Whitney, B., and Kaufman, K. 1986. The *Empidonax* challenge. Looking at *Empidonax*, part 3. "Traill's" Flycatcher: The Alder/Willow problem (*Empidonax alnorum* and *E. traillii*). Birding 18:153–159.

Zink, R. M., and Fall, B. A. 1981. Breeding distribution, song and habitat of the Alder Flycatcher and Willow Flycatcher in Minnesota. Loon 53:208–214.

Zink, R. M., and Johnson, N. K. 1984. Evolutionary genetics of flycatchers. I. Sibling species in the genera *Empidonax* and *Contopus*. Syst. Zool. 33:205–216.

Accepted 9 March 1993

WESTERN FIELD ORNITHOLOGISTS
19TH ANNUAL MEETING

23–25 SEPTEMBER 1994
IN MORRO BAY, CALIFORNIA

Specific information will be in the next Western Birds

PRESIDENT'S MESSAGE

The eighteenth annual meeting of the Western Field Ornithologists was held jointly with the Arizona Field Ornithologists and Tucson Audubon Society from 30 July through 1 August 1993 at the Quality Inn in Tucson, Arizona. The Arizona folks organized a great meeting. Our field trips to all the southern Arizona haunts were exceptional. The Saturday paper session, banquet, and banquet speaker, Irene Pepperberg, were excellent. The local host committee—Joan and Bob Tweit, Shirley Davis, Tim Helentjaris, Barbara Koenig, Emery Froelich, Judy Edison, and Cherie Lazaroff—organized an outstanding meeting. I hope the WFO membership realizes how much time and effort are required to host one of our meetings—a special thanks to our Arizona members. During the planning, organizing, and operation of the Tucson meeting, one person deserves special credit, Joan Tweit, who gave so much of her time to oversee all activities, even the smallest detail, making the meeting very professional. In addition to the local committee, WFO appreciates the generosity of Wings, Inc., for its $200 contribution toward the meeting.

The WFO board meeting held in Tucson was very productive, with many issues discussed relating to the organization and the journal. An important topic was an agreement to solicit advertising for *Western Birds*. By allowing certain advertising within the journal, the board hopes to facilitate financial growth, with the goals of strengthening the organization, expanding the journal's size, and enabling us to publish more articles. Included in this issue of *Western Birds* are the current advertising rates and policy. I would appreciate receiving from the WFO membership any constructive comments related to this matter. I am committed to strengthening the organization through membership, so please make friends, colleagues, and others interested in field ornithology aware of the benefits of belonging to WFO, including our first-rate scientific journal.

The membership elected David Stejskal, and reelected Guy McCaskie and David Yee, to 3-year terms as WFO directors. The board reelected Robert McKernan as president, Steve Summers as vice-president, and Dori Myers as treasurer/membership secretary. David Stejskal is replacing as a WFO director Janet Witzeman, who has served us in that capacity for more than 10 years, contributing countless hours. Thanks, Janet. I feel the health of an organization can be directly measured by those people who in the past and present have given so much of their time toward the organization's success.

The nineteenth annual WFO meeting will be held in Morro Bay, California, from 23 to 25 September 1994. Look for more details on this meeting in upcoming issues of *Western Birds*. I hope to see you all in Morro Bay in 1994.

Robert McKernan
WFO President

NOTES

ADDITIONAL RECORDS OF BREEDING BIRDS FROM MONTAGUE ISLAND, NORTHERN GULF OF CALIFORNIA

EDUARDO PALACIOS and ERIC MELLINK, Centro de Investigación Científica y Educación Superior de Ensenada, B. C., Apartado Postal 2732, Ensenada, Baja California, México (U.S. mailing address: P.O. Box 434844, San Diego, CA 92143)

Compared with the rest of Mexico's, the avifauna of Baja California has been studied extensively (e.g., Grinnell 1928, Wilbur 1987). Nevertheless, within Baja California certain areas such as the Río Colorado delta have not been explored in detail. Knowledge of the bird life in this area is particularly important because of the striking changes in bird habitat along the Río Colorado and in its delta area (see Leopold 1970).

Recently, in a preliminary reconnaissance of the birds of Montague Island (in the Río Colorado delta), we found six species of waterbirds breeding or probably breeding on the island (Palacios and Mellink 1992). In this note we report additional breeders or probable breeding species discovered during a short trip to the island on 1 May 1992 (10:30–13:00 hours). We visited Estero del Chayo (from 31°39'39" N and 114°41'49" W to 31°43'24" N and 114°43'02" W) and the area around the lighthouse (about 3 km west of the mouth of Estero del Chayo).

In addition to the species we discuss below, we observed the Laughing Gull (*Larus atricilla*) and Snowy Egret (*Ardea thula*) colonies already reported by Palacios and Mellink (1992), but we did not attempt to estimate their size since our visit was too early in the breeding season.

Black-crowned Night-Heron (*Nycticorax nycticorax*). We saw two pairs in breeding plumage on the east bank of Estero del Chayo. We continue to suspect that this species breeds on the island but could not confirm it. These herons likely nest on the ground somewhere on the island, as they do on some islets of Laguna Ojo de Liebre, Baja California Sur (Bancroft 1927, E. Palacios and L. Alfaro pers. obs.).

Great Blue Heron (*Ardea herodias*). We found two nests, with three eggs each, on the ground on the western bank of Estero del Chayo, confirming their suspected breeding on Montague Island (Palacios and Mellink 1992).

Gull-billed Tern (*Sterna nilotica*). Friedmann et al. (1950) considered this species "probably breeding" on Montague Island. We found five subcolonies, each containing about 30–40 pairs, in the half of Estero del Chayo nearest its mouth. We examined more closely 21 nests in patches of open saltgrass (*Distichlis palmeri*). The nests were in groups of 4 to 7, and were placed on bare ground surrounded with dry saltgrass. Minimum distance between nests was 1.2 m. Five nests had one egg, 12 had two, and 4 had three.

Least Tern (*Sterna antillarum*). As we suspected in 1991, Least Terns breed on Montague Island. We found 20 pairs on two islets (4 and 16 pairs, respectively), about 130 m north of the lighthouse. We confirmed breeding by finding one nest with two eggs. To reduce disturbance, we did not search for more nests. W. R. Eddleman and B. A. Groshek (in U.S. Bureau of Reclamation and U.S. Fish and

Wildife Service 1989) observed, on 20 April 1987, "four to six Least Terns at Santa Clara Slough," about 40 km northeast of Montague Island, but considered them to be migrants because they did not see any on the next day. They suspected the species to breed in the delta, since Snowy Plovers (*Charadrius alexandrinus*), which have similar nesting habits, nest on nearby salt flats. Least Terns nest on similar salt flats in La Salina Oasis, northwestern Sonora (Mellink and Palacios 1993) and together with Snowy Plovers at Laguna Figueroa, Baja California (Palacios and Alfaro 1991).

Elegant Tern (*Sterna elegans*) and Royal Tern (*Sterna maxima*). We found a mixed colony of about 550 pairs of Elegant and Royal Terns, distributed in two subcolonies separated by about 200 m. The Elegant:Royal Tern ratio was approximately 1:1 (275 pairs of each species). The substrate in both subcolonies consisted of shell fragments. The first subcolony was on an islet surrounded by low marsh vegetation, about 300 m southeast of the lighthouse. There were approximately 350 nests within 20 m^2. All but three nests had one egg; three had two. The other colony was on an islet about 100 m north of the lighthouse. It had approximately 200 nests occupying 10 m^2 but was being inundated by the high tide, and some eggs were already in the water. Since the tide had not yet reached its maximum, most nests of this colony were doomed to failure. Measurements of five Elegant Tern eggs were length, 49.1-55.5 mm, width, 33.3-38.6 mm. The weights of the eggs ranged from 31 to 42 g. Measurements of seven Royal Tern eggs were length, 63.9-69.6 mm, width, 43.6-46.1 mm. The weight of four of these eggs ranged from 70 to 74 g.

Collins et al. (1991) discussed the current status and distribution of the Elegant Tern. Only three breeding colonies of this species have been known in recent years. The largest is of about 23,000 pairs on Isla Rasa, Gulf of California (Tobón-García 1992). Since 1959, a colony of 600-860 pairs has nested in southern San Diego Bay, California (Unitt 1984, Schaffner 1986). In 1987 a colony of 25 pairs established itself at Bolsa Chica Ecological Reserve, Orange County, California, growing to more than 450 pairs in 1988 and 1200 in 1989 (Collins et al. 1991, C. Collins pers. comm.). In the Gulf of California, Elegant Terns formerly nested on Isla Cerralvo (Banks 1963) and San Jorge Island (Mailliard 1923, Mellink and Palacios 1993). On the Pacific coast they have nested at Laguna Ojo de Liebre and at Isla San Roque (Bancroft 1927). Laguna Ojo de Liebre has not had colonies in recent years (E. Palacios pers. obs.). Elegant and Royal Terns may still breed at Isla San Roque, since E. Palacios and L. Alfaro observed a flock of 150 Elegant and 20 Royal Terns roosting at Punta Asunción (7 km east of Isla San Roque) on 26 May 1992. The Elegant Tern colony of Isla Montague represents the only currently known active breeding colony in Mexico in addition to Isla Rasa.

Although the Royal Tern is fairly common along both coasts of Baja California (Wilbur 1987, Everett 1989, Everett and Anderson 1991), it has been recorded breeding at only five locations: Laguna Ojo de Liebre (Bancroft 1927, Kenyon 1947, Palacios and Alfaro pers. obs.), Isla San Roque (Bancroft 1927), Islas San Jorge (Mailliard 1923), Isla Rasa (Boswall and Barrett 1978), and Isla Ballena, Laguna San Ignacio (E. Palacios and L. Alfaro unpubl. data). The breeding colony at Laguna San Ignacio, Baja California Sur, reported by Everett (1989) on the basis of personal communication from R. Carmona, was a misidentification of a colony of Caspian Terns (see Danemann 1991, Danemann and Guzmán 1992).

Black Skimmer (*Rynchops niger*). We saw a flock of 430 individuals roosting at the mouth of Estero del Chayo and several groups of three or more individuals flew out to meet us or circled around in flocks, emitting their characteristic notes of protest. Other groups of three individuals flew in zigzags in close pursuit of each other. We believe this behavior precedes mating. Skimmers arrive on the breeding grounds in late April or early May, and courtship and pair formation begin immediately on the Atlantic coast (Bent 1921) though later in southern California (Schew and Collins 1991). Skimmers commonly form mixed-species colonies, with Gull-billed Terns in

North Carolina (Soots and Parnell 1975) and Caspian and Elegant Terns at Bolsa Chica (Schew and Collins 1991). Considering the behavior, habitat, time of the year, and the association with other nesting birds, we suspect that Black Skimmers breed on Montague Island. They have bred at the Salton Sea, about 180 km north of Montague Island, since 1972 (McCaskie et al. 1974). The Black Skimmer is locally common year round in northwestern Baja California and is increasing in numbers on the peninsula (Palacios and Alfaro 1992), but there are still no confirmed nesting records in this area.

With these findings, seven waterbirds are confirmed to use the Isla Montague for breeding, and Black-crowned Night-Herons and Black Skimmers probably also nest there. Additionally, Morrison et al. (1992) found the Río Colorado delta to be the third most important wetland in northwest Mexico for wintering shorebirds. The area also is the main site for the endemic saltgrass *Distichlis palmeri*. It sustains the main populations of the endangered game fish the Totoaba (*Totoaba macdonaldi*) and of the Vaquita or Gulf of California Harbor Porpoise (*Phocoena sinus*). The delta is an important shrimp hatching area and includes the Ciénega de Santa Clara, site of the largest population of the endangered Yuma Clapper Rail (*Rallus longirostris yumanensis*). These features make the area a worthwhile target for extended conservation efforts. Indeed, despite the severe changes in the last 60 years and being one of the most endangered bioregions in the Sea of Cortés (D. Anderson pers. comm.), the area retains a lot of its original uniqueness. The dynamic nature of the delta and Río Hardy and the potential threats from agriculture in this area emphasize the importance of documenting the wildlife using it and ensuring its long-term protection.

We thank the kind assistance of Arturo Dena ("Chaca") and Martín Córdoba ("Cava"), who transported us to the island. S. Landham provided readings of the Global Positioning System for Estero del Chayo. D. W. Anderson, C. T. Collins, W. T. Everett, S. N. G. Howell, C. Jiménez, and P. Unitt kindly commented on this article.

LITERATURE CITED

Bancroft, G. 1927. Breeding birds of Scammon's Lagoon, Lower California. Condor 29:29–57.

Banks, R. C. 1963. Birds of Cerralvo Island, Baja California. Condor 65:300–312.

Bent, A. C. 1921. Life histories of North American gulls and terns. U.S. Natl. Mus. Bull. 113.

Boswall, J., and Barrett, M. 1978. Notes on the breeding birds of Isla Raza, Baja California. W. Birds 9:93–108.

Collins, C. T., Schew, W., and Burkett, E. 1991. Elegant Terns breeding in Orange County, California. Am. Birds 45:353–355.

Danemann, G. D. 1991. Amplitud y sobreposición de nichos ecológicos de aves ictiófagas anidantes en Isla Ballena, Laguna San Ignacio, Baja California Sur. Bachelor's Thesis, Universidad Autónoma de Baja California Sur, La Paz.

Danemann, G. D., and Guzmán, J. R. 1992. Notes on the birds of San Ignacio Lagoon, Baja California Sur, Mexico. W. Birds 23:11–19.

Everett, W. T. 1989. Historic and present distribution of breeding marine birds of Baja California Pacific coast. Simposio Int. Biol. Mar. 7:97–106.

Everett, W. T., and Anderson, D. W. 1991. Status and conservation of the breeding seabirds on offshore islands of Baja California and the Gulf of California, in Seabird Status and Conservation: A Supplement. (J. Croxall ed.), pp. 115–139. ICBP Tech. Publ. 11.

Friedmann, H., Griscom, L., and Moore, R. T. 1950. Distributional check-list of the birds of Mexico, part I. Pac. Coast Avifauna 29:1–202.

Grinnell, J. 1928. A distributional summation of the ornithology of Lower California. Univ. Calif. Publ. Zool. 32:1–300.

Kenyon, K. W. 1947. Notes on the ocurrence of birds in Lower California. Condor 49:210–211.

Leopold, A. 1970. A Sand County Almanac. Ballantine, New York.

Mailliard, J. 1923. Expedition of the California Academy of Sciences to the Gulf of California in 1921: The birds. Proc. Calif. Acad. Sci. 12:443–456.

McCaskie, G., Liston, S., and Rapley, W. A. 1974. First nesting of the Black Skimmer in California. Condor 3:337–338.

Mellink, E., and Palacios, E. 1993. Notes on breeding coastal waterbirds in northwestern Sonora. W. Birds 24:29–37.

Morrison, R. I. G., Ross, R. K. and Torres M., S. 1992. Aerial surveys of neartic shorebirds wintering in Mexico: Some preliminary results. Can. Wildlife Serv., Progress Note 201.

Palacios, E., and Alfaro, L. 1991. Breeding birds of Laguna Figueroa and La Pinta Pond, Baja California, Mexico. W. Birds 22:27–32.

Palacios, E., and Alfaro, L. 1992. Occurrence of Black Skimmers in Baja California. W. Birds 23:173–176.

Palacios, E., and Mellink, E. 1992. Breeding bird records from Montague Island, northern Gulf of California. W. Birds 23:41–44.

Schaffner, F.C. 1986. Trends in Elegant Tern and Northern Anchovy populations in California. Condor 88:347–354.

Schew, W. A., and Collins, C. T. 1991. Annual and within-year variability in growth patterns of Black Skimmer (*Rynchops niger*) chicks. Proc. Int. Symp. Mar. Biol. 8:87–94.

Soots, R., and Parnell, J. 1975. Ecological succession of breeding birds in relation to plant succession on dredge islands in North Carolina. North Carolina Sea Grant Publ. UNC-56-75–27.

Tobón-García, E. D. 1992. Biología reproductiva de la Golondrina Marina Elegante (*Sterna elegans*) con énfasis en la conducta dentro de las guarderías en la colonia de Isla Rasa, Golfo de California, México. Bachelor's thesis, Universidad Nacional Autónoma de Mexico, Mexico, D.F.

U.S. Bureau of Reclamation and U.S. Fish and Wildlife Service. 1989. Yuma Clapper Rail survey; northern Sonora and Baja California. Biology of the Yuma Clapper Rail in the southwestern U.S. and northwestern Mexico; final report, Appendix I, pp.119–127. Yuma, Arizona.

Unitt, P. 1984. The birds of San Diego County. San Diego Soc. Nat. Hist. Mem. 13.

Wilbur, S. R. 1987. Birds of Baja California. Univ. Calif. Press, Berkeley.

Accepted 29 May 1993

OBSERVATIONS ON ESTEROS EL COYOTE AND LA BOCANA, BAJA CALIFORNIA SUR, MEXICO, IN SEPTEMBER 1991

GUSTAVO D. DANEMANN and ROBERTO CARMONA, Departamento de Biología Marina, Universidad Autónoma de Baja California Sur, Apartado 19-B, La Paz, Baja California Sur 23000, México

The coast of the southern Vizcaino Desert, Baja California Sur, includes three lagoons: La Bocana, El Coyote, and San Ignacio (Figure 1). The avifauna of La Bocana and San Ignacio lagoons was first described by Huey (1927). Since then, the only ornithological research in the area has been by Reitherman and Storrer (1981), Danemann (1991), and Danemann and Guzmán (1992), who studied various aspects of the avifauna of San Ignacio Lagoon. No ornithological information from La Bocana or El Coyote has been published since Huey's early account.

In September 1991 we surveyed El Coyote and La Bocana lagoons, usually referred as "esteros." Here we summarize observations recorded during those surveys.

El Coyote (also known as La Escondida), located between 26°48' and 26°50' N, and 113°24' and 113°29' W, has two main arms that reach depths from 2 to 4 m and is separated from the ocean by a narrow sand bar. The shoreline of the lagoon consists of sand beaches (along the bar), mud flats, mangroves, and salt marshes. Most of the lagoon is covered by mangrove islands separated by narrow channels. In the open areas of the lagoon, low tides expose large shoals. Human activities in El Coyote include some commercial and sport fishing, mainly in the deeper channels.

Estero La Bocana, known to Huey (1927) as Pond Lagoon, is located between 26°42' and 26°47' N, and 113°34' and 113°42' W. It is a narrow lagoon separated from the ocean by a sand bar extending northwest–southeast. Averaging 600 m, its width ranges from 150 to 1250 m. This estero holds some mangrove islands and salt marshes, and its shoreline includes sand beaches along the bar, and mud flats, marshes, and mangroves along the mainland coast.

Both lagoons are included in the "El Vizcaino" National Reserve of the Biosphere (Gobierno de los Estados Unidos Mexicanos 1988).

We surveyed Estero El Coyote from 8 to 12 September 1991, La Bocana on 13 and 14 September 1991. We used an inflatable 7-foot boat that allowed us to cover most of the lagoons, including the shallow channels among the mangroves. Observations during low tide were made from the shore or mud flats. We used 10× binoculars and a 40× spotting scope.

We recorded 45 species in El Coyote (EC) and 36 in La Bocana (LB), for a total of 47 species over both areas.

Magnificent Frigatebird (*Fregata magnificens*). EC, 3 juveniles. The nearest colony is at Santa Margarita Island, Magdalena Bay.

Brown Pelican (*Pelecanus occidentalis*). EC, 1300 to 1500; LB, several groups of fewer than 30 individuals each. No evidence of nesting.

Double-crested Cormorant (*Phalacrocorax auritus*). EC, 200 to 250; LB, a few groups up to 30 individuals each.

Black-crowned Night Heron (*Nycticorax nycticorax*). EC, 3 ad., 1 juv.; LB, 2 ad.

Yellow-crowned Night Heron (*N. violaceus*). EC, 13 ad., 3 juv.; LB, 1 ad.

Green-backed Heron (*Butorides striatus*). EC, 14; LB, 2.

Tricolored Heron (*Egretta tricolor*). EC, 11; LB, 5.

Little Blue Heron (*E. caerulea*). EC, 11 ad., 1 juv.

Reddish Egret (*E. rufescens*). EC, 14; LB, 6.

Snowy Egret (*E. thula*). EC, 39; LB, 5.

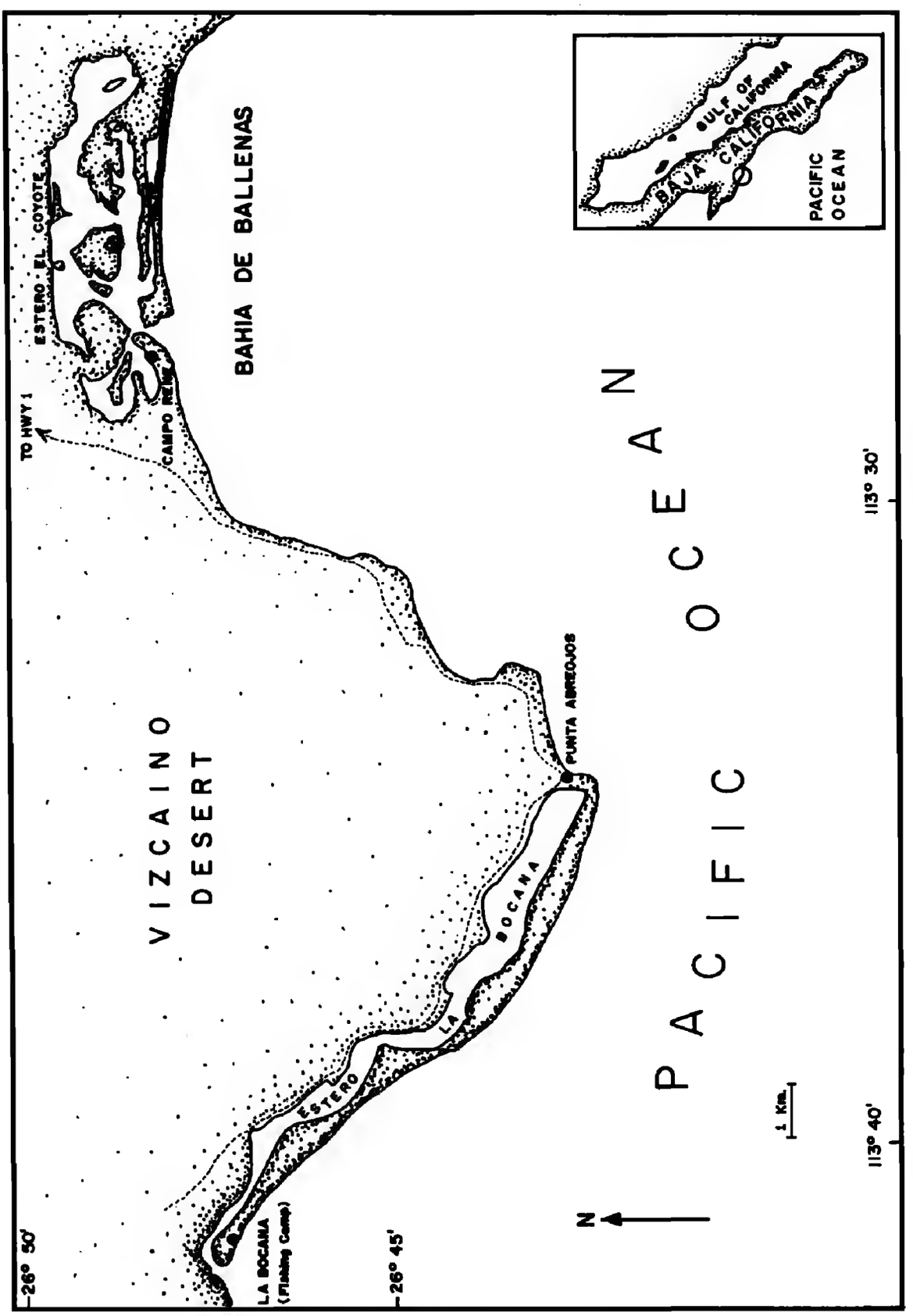


Figure 1. Southern Vizcaino Desert area, showing location of esteros El Coyote and La Bocana.

Great Egret (*Casmerodius albus*). EC, 1.
Great Blue Heron (*Ardea herodias*). EC, 17; LB, 10.
White-faced ibis (*Plegadis chihi*). EC, 1.
White Ibis (*Eudocimus albus*). EC, 15 ad., 3 juv,; LB, 4.

Local fishermen reported large concentrations of ducks and geese, especially the Brant (*Branta bernicla*), in both EC and LB during the winter. We saw no waterfowl during our visit.

Semipalmated Plover (*Charadrias semipalmatus*). LB, 3.
Snowy Plover (*C. alexandrinus*). EC, 11; LB, 2.
Wilson's Plover (*C. wilsonia*). EC, 5; LB, 3.
Black-bellied Plover (*Pluvialis squatarola*). EC, 15; LB, 1.
Marbled Godwit (*Limosa fedoa*). EC, 900 to 1200; LB, 1000.
Willet (*Catoptrophorus semipalmatus*). EC, 150 to 300; LB, 100.
Dowitchers (*Limnodromus* sp.). EC, 500 to 600; LB, 1000.
Whimbrel (*Numenius phaeopus*). EC, 16; LB, 1.
Long-billed Curlew (*N. americanus*). EC, 26; LB, 16.
Greater Yellowlegs (*Tringa melenoleuca*). EC, 23; LB 68.
Spotted Sandpiper (*Actitis macularia*). EC, 1; LB, 1.
Red-necked Phalarope (*Phalaropus lobatus*). EC, 2; LB, 1.
Ruddy Turnstone (*Arenaria interpres*). EC, 1; LB, 4.
Sanderling (*Calidris alba*). EC, 38.
Western Sandpiper (*C. mauri*). EC, 2000; LB, 200.
Least Sandpiper (*C. minutilla*). EC, 200.
Heermann's Gull (*Larus heermanni*). EC, 53; LB, 1.
Ring-billed Gull (*L. delawarensis*). EC, 16; LB, 29.
Western Gull (*L. occidentalis*). EC, 30; LB, 16.
Elegant Tern (*Sterna elegans*). EC, 800 to 850; LB, 400.
Royal Tern (*S. maxima*). EC, 100 to 120, including 2 fledglings; LB, 13.
Forster's Tern (*Sterna forsteri*). EC, 7; LB, 12.
Least Tern (*S. antillarum*). EC, 12 ad., 5 juv.
Caspian Tern (*S. caspia*). EC, 14; LB, 3.
Osprey (*Pandion haliaetus*). EC, 12; LB, 15.
Belted Kingfisher (*Ceryle alcyon*). EC, 3.
Horned Lark (*Eremophila alpestris*). EC, 20; LB, 12.
Northern Rough-winged Swallow (*Stelgidopteryx serripenis*). EC, 12.
Common Raven (*Corvus corax*). EC, 2.
Loggerhead Shrike (*Lanius ludovicianus*). EC, 7; LB, 1.
Northern Mockingbird (*Mimus polyglottos*). LB, 1.
Mangrove Warbler (*Dendroica petechia castaneiceps*). Common in mangroves of both lagoons.
Savannah Sparrow (*Passerculus sandwichensis*). EC, S; LB, 3.

Most of the species reported by Huey (1927) were present during our visit. The most important difference was the absence of waterfowl, of which Huey noted several species during his mid-April visit but had not arrived by our early September visit.

Thirty-seven of the 52 species reported for San Ignacio Lagoon (Danemann and Guzmán 1992) were observed in El Coyote and/or La Bocana. The high similarity of the avifauna of these lagoons reflects their physical similarities: absence of permanent fresh water flow, high rate of tidal flushing, possessing extensive shores and mud flats, and similar vegetation and climate. Differences in bird diversity between El Coyote and La Bocana are presumably a result of the larger size and more extensive habitat of the former.

Given their position along the Pacific flyway, suitability of habitat, and the numbers of migratory shorebirds recorded during our visit, these esteros may be considered

important areas for these species, and probably for waterfowl. Including Ojo de Liebre (Scammon's) and San Ignacio, this group of coastal lagoons should be included in any research and conservation program regarding migratory birds in Baja California.

This research was supported by the Seabird Program coordinated by Dr Juan R. Guzmán Poo at the Universidad Autónoma de Baja California Sur, through a grant from the Secretaría de Educación Pública de México. Kodak of México donated the film used in the research. Philip Unitt greatly assisted in editing this paper.

LITERATURE CITED

Danemann, G. D. 1991. Amplitud y sobreposición de nichos ecológicos de aves ictiófagas anidantes en Isla Ballena, Laguna San Ignacio, Baja California Sur. Thesis, Universidad Autónoma de Baja California Sur, La Paz.

Danemann, G. D., and Guzmán-Poo, J. R. 1992. Notes on the birds of San Ignacio lagoon, Baja California Sur, México. W. Birds 23:11–19.

Gobierno de los Estados Unidos Mexicanos. 1988. Decreto por el que se declara la Reserva de la Biósfera "El Vizcaíno," ubicada en el Municipio de Mulegé, B.C.S. Diario de la Federación 1729(22):2–27.

Huey, L. 1927. The bird life of San Ignacio and Pond lagoons on the western coast of Lower California. Condor 29:239–243.

Reitherman, B., and Storrer, J. 1981. A preliminary report on the reproductive biology and ecology of the Whale Island Osprey (*Pandion haliaetus*) population, San Ignacio Lagoon, Baja California Sur, México. Unpublished report to the Western Foundation of Vertebrate Zoology, 1100 Glendon Ave., Suite 1407, Los Angeles, CA 90024, U.S.A.

Accepted 21 April 1993

ANNA'S HUMMINGBIRDS WITH HYMENOPTERA IMPALED ON BILLS

MICHAEL C. LONG, Eaton Canyon Nature Center, 1750 N. Altadena Dr., Pasadena, California 91107

In November 1989, Nancy Fraser, Eaton Canyon Nature Center staff, observed at her feeder in Altadena, Los Angeles County, California, a male Anna's Hummingbird (*Calypte anna*) in an apparently weakened condition and with a dark "lump" on its bill. The bird was observed for more than a week, perching at the feeder for periods of up to several hours. On 19 November the hummingbird was increasingly lethargic and harassed by other hummingbirds when it attempted to feed. I suggested that Fraser attempt to capture the bird to provide aid and examine the bill. She was able to remove the bird from its perch by hand, but it expired within minutes. Examination of the lump on the bill revealed the intact head of yellowjacket wasp (*Vespula pensylvanica*), pierced from front to back directly between the compound eyes. The wasp head lay toward the distal end of the bill, approximately 4 mm from the tip (Figure 1).

In early 1990, Russ Anderson brought to Eaton Canyon Nature Center a dead male Anna's Hummingbird with a dark, rounded mass impaled about halfway down the bill. The bird had been found dead in spring 1989 (precise date not noted) in a yard at 324 Foothill Avenue, Sierra Madre, Los Angeles County. The hummingbird was mummified, still clinging with both feet to a branch of an acacia (?) tree. Roy Snelling (Section of Entomology, Los Angeles County Natural History Museum) examined the mass, determining it to be the thorax of a bumblebee (*Bombus* sp.) (Figure 2).

Figure 1. Head of a yellowjacket wasp (*Vespula pensylvanica*) impaled on the bill of a male Anna's Hummingbird.

Photo by Dede Gilman

Body fluids from the insects and perhaps dried sugar solution from the feeder (noted by Fraser) apparently "glued" the heads to the bills and the birds were unable to remove them. Both hummingbirds probably died because of an inability to feed properly with the mandibles held tightly together by the insects' hard, chitinous exoskeletons. Both specimens have been deposited at the Los Angeles County Natural History Museum (107527 and 107528).

A literature search revealed no mention of insects or insect parts being found on hummingbird bills. Hummingbirds are well known to supplement their diet of flower nectar with small insects and other arthropods such as aphids, gnats, and spiders. Bees and wasps are not generally appropriate hummingbird prey items because of their large size and difficulty of handling relative to the hummingbird's bill size and shape. Hummingbirds do, however, "zealously guard" their feeding territories, driving off hawk moths, butterflies, other hummingbirds, and even bees that might compete for nectar (Carpenter et al. 1983). Miller and Gass (1985) summarized the relatively few known predators of hummingbirds, listing among insects only praying mantids (two instances) and referring to Grant's (1959) description of attacks on hummingbirds by wasps. Bent (1940:382–383) discussed hummingbird and bee interactions and related his observations of an Anna's Hummingbird seen to "thrust its bill through a struggling mass of the insects" to reach sugar syrup. He also "watched one attack bees flying around an agave stalk, darting at one after another with open bill as if trying to bite them." Interestingly, Luis Baptista (pers. comm.) described a female Anna's Hummingbird that died of starvation impaled on a rose leaf. He surmised that the bird impaled itself on the leaf during an aggressive chase of an enemy.

Figure 2. Thorax of a bumblebee (*Bombus* sp.) impaled on the bill of a male Anna's Hummingbird.

Photo by Dede Gilman

An antagonistic encounter is one explanation for these bee and wasp parts impaled on hummingbird bills. It would seem that to generate the force necessary for its bill to pierce a bee or wasp the hummingbird would have to have pinned the insect against a hard surface. If struck in flight, whether intentionally or by accidental collision, the insect presumably would be deflected rather than impaled. Alternatively, a hummingbird might accidentally pierce a hymenopteran by inserting its beak into a flower corolla or feeder tube containing the insect.

I thank Nancy Fraser and Russ Anderson for careful observations and submitting the hummingbird specimens. I gratefully acknowledge the insect identifications by Roy Snelling and the careful review of the manuscript and helpful comments of Kimball Garrett, Tim Manolis, and Luis Baptista. Dede Gilman, photographer extraordinaire, kindly photographed the specimens.

LITERATURE CITED

Bent, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds, and their allies. U.S. Natl. Mus. Bull. 176.

Carpenter, F. L., Paton, D. C., and Hixon, M. A. 1983. Weight gain and adjustment of feeding territory size in migrant hummingbirds. Proc. Natl. Acad. Sci. U.S.A. 80:7259–7263.

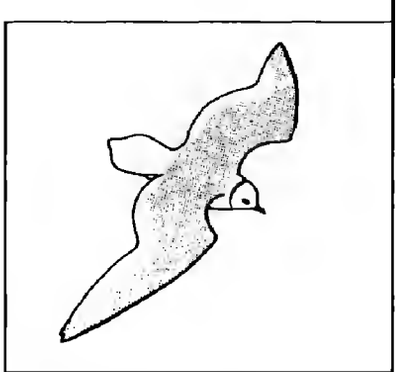
Grant, J. 1959. Hummingbirds attacked by wasps. Can. Field-Nat. 73:174.

Miller, R. S., and Gass, C. L. 1985. Survivorship in hummingbirds: Is predation important? Auk 102:175–178.

Accepted 9 March 1993

BIMONTHLY JOURNAL ON FIELD ORNITHOLOGY

DUTCH BIRDING



- ☐ Excellent papers on identification, distribution, occurrence, movements and behaviour of Palearctic birds
- ☐ Regular contributions on Asian-Pacific birds
- ☐ Latest news on rare and interesting birds in the Netherlands and the Western Palearctic
- ☐ Well produced with numerous high quality colour photographs
- ☐ Yearly report on rare birds in the Netherlands
- ☐ In English or with extensive English summaries

For information or a free sample issue, write to:
Dutch Birding, Postbus 75611, 1070 AP Amsterdam, Netherlands

Subscribers to Dutch Birding can claim 25% off a British Birds subscription

WESTERN BIRDS, INDEX, VOLUME 24, 1993

Compiled by Mildred Comar

Accipiter cooperii, 7, 14, 212
gentilis, 212, 228, 229, 230
striatus, 7, 14, 212
Actitis macularia, 8, 76, 265
Aegolius acadicus, 214, 215, 228, 229
Aeronautes saxatalis, 215
Aimophila carpalis, 69
cassinii, 137, 148
quinquestriata, 65–72
ruficeps, 225
Ainley, David G., see Pyle, P.
Ajaia ajaja, 122, 123, 158, 164
Alauda arvensis, 131, 132
Albatross, Black-footed, 140
Laysan, 4, 169, 179
Royal, 141
Short-tailed, 140, 141
Shy, 141
Wandering, 141
Alberico, Julie A. R., Drought and Predation Cause Avocet and Stilt Breeding Failure in Nevada, 43–51
Amazilia violiceps, 161
Ammodramus leconteii, 166
savannarum, 101
Amphispiza belli, 225
bilineata, 70
Anas acuta, 75
americana, 75, 105–107
clypeata, 75
cyanoptera, 48, 75
discors, 75
discors/cyanoptera, 75
falcata, 149
formosa, 149
penelope, 75, 105–107
penelope × *americana*, 105–107
platyrhynchos, 48
rubripes, 142, 165
Ani, Groove-billed, 10, 14
Anous stolidus, 9, 15, 108, 170, 178, 179
Anser albifrons, 57, 89
Anthus cervinus, 58, 133, 146, 158, 163
hodgsoni, 133
(*spinoletta*) *rubescens*, 11, 78
spragueii, 146, 161, 165
Aphelocoma coerulescens, 101–102, 218
Aphriza virgata, 8
Aquila chrysaetos, 212
Aratinga holochlora, 9, 10
Archilochus alexandri, 144, 215
colubris, 144
Ardea herodias, 6, 30, 32, 33, 35, 74, 259, 265
ibis, 6, 14, 15, 33, 74
Arenaria interpres, 76, 265
Asio otus, 214
Auklet, Cassin's, 132
Parakeet, 129–130, 159
Avocet, American, 34, 43–51
Pied, 43
Aythya affinis, 76
affinis/marila, 76
americana, 235, 237, 238
collaris, 75
ferina, 235, 240
fuligula, 125, 126, 143, 158, 162, 165, 172, 189, 235
fuligula × *ferina*, 238
nyroca × *ferina*, 238
valisineria, 75, 235, 237
valisineria × *americana*, 238

Bartramia longicauda, 128, 159, 160, 162, 165
Bittern, American, 74
Least, 74
Blackbird, Brewer's, 138, 178, 226
Yellow-headed, 13
Bluebird, Mountain, 220, 221, 228, 229
Western, 220
Bobolink, 79
Bombycilla cedrorum, 12
Booby, Blue-footed, 30, 31, 120, 121, 141, 158, 163, 174, 175
Brown, 6, 29, 30, 31, 36, 121, 141, 159, 163, 170, 175, 178, 179, 180
Masked, 5, 121, 141, 170, 174, 175, 178, 179
Red-footed, 6, 121, 141, 170, 175, 178, 179, 180
Botaurus lentiginosus, 74
Brant, 265
Branta bernicla, 265
canadensis, 48
Browning, M. Ralph, Comments on the Taxonomy of *Empidonax traillii* (Willow Flycatcher), 241–257
Bubo virginianus, 214
Bubulcus ibis, 6, 14, 15, 33, 74

Bull, Evelyn L., and Janet E. Hohmann, The Association between Vaux's Swifts and Old Growth Forests in Northeastern Oregon, 38–42
Bunting, Common Reed, 96
Indigo, 13, 96
Lazuli, 224
Little, 95–97
Painted, 137, 148, 150, 162, 163, 166
Rustic, 95, 162
Snow, 137, 148, 162, 163, 166
Varied, 162
Bushtit, 219
Buteo albonotatus, 126, 127, 143, 159, 162, 165
jamaicensis, 7, 14, 212
regalis, 90
swainsoni, 90
Butorides striatus, 263

Calidris alba, 8, 76, 265
bairdii, 57, 91
ferruginea, 129
mauri, 8, 35, 76, 265
melanotos, 57, 76
minutilla, 35, 76, 265
Callipepla californica, 213, 228, 229
Calonectris leucomelas, 162
Calypte anna, 215, 267–269
costae, 215
Camp, Richard J., Richard L. Knight, and Jerry Freilich, Common Raven Populations in Joshua Tree National Monument, California, 198–199
Canvasback, 75, 235, 237, 238
Canvasback × Redhead, 238
Caracara, Crested, 144, 149, 150
Cardellina rubrifrons, 148
Cardinalis sinuatus, 136, 137, 148, 162, 163, 166
Carduelis flammea, 138
lawrencei, 227
pinus, 61, 92, 227, 228, 229, 230, 231
psaltria, 227
Carmona, Roberto, see Danemann, G. D.
Carpodacus cassinii, 226, 228, 229, 232, 233
mexicanus, 226
purpureus, 226, 228, 229
Casmerodius albus, 6, 74
Castellanos Vera, Aradit, see Wehtje, W.
Catbird, Gray, 133, 145, 150, 161, 163
Cathartes aura, 211
Catharus guttatus, 221, 228, 229, 230, 231
minimus, 78, 132, 133, 145
ustulatus, 11, 132
Catherpes mexicanus, 220
Catoptrophorus semipalmatus, 7, 91, 265
Centrocercus urophasianus, 127
Certhia americana, 219, 228, 229
Ceryle alcyon, 10, 77, 265
Chaetura vauxi, 38–42, 58
Chamaea fasciata, 221
Charadrius alexandrinus, 30, 33, 36, 128, 260, 265
mongolus, 160
semipalmatus, 7, 76, 265
vociferus, 7, 30, 34, 76, 128
wilsonia, 30, 33, 34, 35, 128, 160, 165, 265
Chen canagica, 115, 123, 124, 139, 142, 143, 159, 160, 162, 164, 165
canagica × *Anser albifrons*, 142, 143
rossii, 164
Chickadee, Mountain, 103–104, 219, 228, 229
Chiffchaff, 54
Chlidonias niger, 57, 77, 170, 176, 178, 179, 180
Chondestes grammacus, 13, 225
Chordeiles acutipennis, 77
minor, 77
Cicero, Carla, Vulnerability of Prey Stimulates Attacks by Jays and Shrikes on Adult Birds, 101–102
Cinclus mexicanus, 220
Circus cyaneus, 7, 14
Coccothraustes vespertinus, 227, 228, 229
Coccyzus americanus, 17–28, 77
erythropthalmus, 165
melacoryphus, 74
Colaptes auratus, 217
Columba fasciata, 213
livia, 9
Columbina inca, 91
passerina, 9, 14
Condor, California, 209, 211, 212
Contopus borealis, 217, 228, 229
pertinax, 131, 162
sordidulus, 217
virens, 77–78
virens/sordidulus, 78
Coot, American, 74, 76, 235
Cormorant, Double-crested, 30, 32, 33, 34, 36, 263
Corvus corax, 48, 49, 50, 198–199, 219, 265
Coturnicops noveboracensis, 127–128, 144, 162, 165

Cowbird, Brown-headed, 14, 15, 178, 226
Creeper, Brown, 219, 228, 229
Crossbill, Red, 226, 227, 228, 229, 230, 231
Crotophaga sulcirostris, 10, 14
Cuckoo, Black-billed, 165
Dark-billed, 74
Yellow-billed, 17–28, 77
Curlew, Long-billed, 91, 265
Cyanocita cristata, 139, 140, 145
stelleri, 145, 218, 228, 229
Cyclorrhynchus psittacula, 129, 130, 159
Cygnus buccinator, 123, 140, 142, 164
columbianus, 123
Cynanthus latirostris, 131, 160, 161, 162
Cypseloides niger, 197–198

Danemann, Gustavo D., and Roberto Carmona, Observations on Esteros El Coyote and La Bocana, Baja California Sur, Mexico, in September 1991, 263–266
Dendragapus obscurus, 211, 212, 213, 228, 229
Dendrocygna autumnalis, 123, 148, 149, 159, 164
Dendroica castanea, 78, 134
cerulea, 134, 135, 147
coronata, 12, 14, 53, 61, 134, 223, 228, 229, 232, 233
discolor, 78, 134
dominica, 78, 134, 161, 163, 165
fusca, 96
graciae, 134, 146, 161, 163
magnolia, 53, 60, 61, 78, 96
nigrescens, 134, 223
occidentalis, 223, 228, 229
palmarum, 78, 96
petechia, 12, 53, 61, 78, 223, 265
pinus, 134, 146
striata, 13, 61, 78, 96, 134, 147
townsendi, 12, 53, 61, 223
virens, 12, 61, 78
Diomedea albatrus, 140, 141
cauta, 141
epomophora, 141
exulans, 141
immutabilis, 4, 169, 179
nigripes, 140
Dipper, American, 220
Dolichonyx oryzivorus, 79
Douglas, Hector, and Kristine Sowl, Northeastern Extension of the Breeding Range of the Arctic Loon in Northwestern Alaska, 98–100
Dove, Common Ground, 9, 14
Inca, 91
Mourning, 9, 15, 77, 213
Rock, 9
Socorro, 9, 14, 15
Dowitcher, Long-billed, 76
sp., 265
Dryocopus pileatus, 40
Duck, American Black, 142, 165
Black-bellied Whistling, 123, 148, 149, 159, 164
Ferruginous × Common Pochard, 238
Ring-necked, 75
Tufted, 125, 126, 143, 158, 162, 165, 172, 189, 235, 238
Tufted × Common Pochard, 238
Dumetella carolinensis, 133, 145, 150, 161, 163

Eagle, Bald, 90
Golden, 212
Eddleman, William R., see Flores, R. E.
Egret, Cattle, 6, 14, 15, 33, 74
Great, 6, 74, 265
Reddish, 122, 141, 160, 162, 163, 164, 263
Snowy, 6, 15, 74, 259, 263
Egretta caerulea, 263
rufescens, 122, 141, 160, 162, 163, 164, 263
thula, 6, 15, 74, 259, 263
tricolor, 141, 263
Eider, Common, 143
King, 126, 143, 159, 160, 165
Elanus caeruleus, 90, 144
Emberiza pusilla, 95–97
rustica, 95, 162
schoeniclus, 96
Empidonax alnorum, 241, 242, 243, 244, 245, 247, 249
difficilis, 218
flaviventris, 78, 242
hammondii, 58, 92
minimus, 58, 242
oberholseri, 217, 218, 228, 229, 232
traillii, 58, 241–257
virescens, 242
Engel, Steven J., see Howell, S. N. G.
Eremophila alpestris, 218, 265
Eudocimus albus, 75, 164, 265
Euphagus cyanocephalus, 138, 178, 226

Falco peregrinus, 7, 14, 76
rusticolus, 144
sparverius, 7, 14, 212
Falcon, Peregrine, 7, 14, 76

Finch, Cassin's, 226, 228, 229, 232, 233
House, 226
Purple, 226, 228, 229
Fitton, Sam, Screech-Owl Distribution in Wyoming, 182–188
Flicker, Northern, 217
Flores, Ronald E., and William R. Eddleman, Nesting Biology of the California Black Rail in Southwestern Arizona, 81–88
Flycatcher, Acadian, 242
Alder, 58, 241, 242, 243, 244, 245, 247
Ash-throated, 218
Dusky, 217, 218, 228, 229, 232
Dusky-capped, 139, 140, 145
Great Crested, 131
Hammond's, 58, 92
Least, 58, 242
Olive-sided, 217, 228, 229
Pacific-slope, 218
Scissor-tailed, 131, 145, 161, 163, 165, 200
Willow, 58, 241–257
Yellow-bellied, 78, 242
Franzreb, Kathleen E., and Stephen A. Laymon, A Reassessment of the Taxonomic Status of the Yellow-billed Cuckoo, 17–28
Fregata magnificens, 6, 170, 175, 179, 263
minor, 6
Freilich, Jerry, see Camp, R. J.
Frey, Jennifer K., Nocturnal Foraging by Scissor-tailed Flycatchers under Artificial Light, 200
Frigatebird, Great, 6
Magnificent, 6, 170, 175, 263
sp., 179
Fulica americana, 74, 76, 235
Fulmar, Northern, 117
Fulmarus glacialis, 117

Gallinula chloropus, 76
Gallinule, Purple, 76
Gavia adamsii, 99, 117, 140, 159, 162, 163
arctica, 98–100, 189–196
immer, 99, 189
pacifica, 98, 99, 189, 190, 192, 194, 195
stellata, 99
Geothlypis trichas, 79
Glaucidium gnoma, 214, 228, 229
Gnatcatcher, Blue-gray, 220
Godwit, Bar-tailed, 129
Hudsonian, 159
Marbled, 265
Golden Plover, Pacific, 76
sp., 76
Goldfinch, Lawrence's, 227
Lesser, 227
Goose, Canada, 48
Emperor, 115, 123, 124, 139, 142, 143, 159, 160, 162, 164, 165
Emperor × Greater White-fronted, 142, 143
Greater White-fronted, 57, 89
Ross', 164
Goshawk, Northern, 212, 228, 229, 230
Grackle, Common, 138, 163
Great-tailed, 61
Grebe, Least, 117, 140, 163
Pied-billed, 4
Grosbeak, Black-headed, 224
Evening, 227, 228, 229
Rose-breasted, 13, 96
Ground-Dove, Common, 9, 14
Grouse, Blue, 211, 212, 213, 228, 229
Sage, 127
Sharp-tailed, 127
Gull, California, 8, 14, 48, 144
Common Black-headed, 129, 144
Franklin's, 8, 77, 176, 179
Glaucous-winged, 8
Heermann's, 8, 29, 30, 34, 265
Herring, 8
Laughing, 8, 77, 91, 168, 259
Lesser Black-backed, 144
Little, 139, 165
Ring-billed, 8, 14, 265
Sabine's, 64, 170, 176, 177, 179, 180
Western, 8, 265
Yellow-footed, 29, 30
Gygis alba, 9
Gymnogyps californianus, 209, 211, 212
Gyrfalcon, 144

Haematopus palliatus, 30, 34, 128, 144, 165
bachmani, 128, 144
Haliaeetus leucocephalus, 90
Harrier, Northern, 7, 14
Hawk, Cooper's, 7, 14, 212
Ferruginous, 90
Red-tailed, 7, 14, 212
Sharp-shinned, 7, 14, 212
Swainson's, 90
Zone-tailed, 126, 127, 143, 159, 162, 165
Helmitheros vermivorus, 135, 147, 161, 163

Heron, Black-crowned Night, 74, 142, 256, 259, 261, 263
Great Blue, 6, 30, 32, 33, 35, 74, 259, 265
Green-backed, 263
Little Blue, 263
Tricolored, 141, 263
Yellow-crowned Night, 6, 14, 74, 122, 123, 142, 160, 263
Heteroscelus incanus, 7, 14, 76
Himantopus mexicanus, 43–51
novaezealandiae, 43
Hirundo pyrrhonota, 58, 78, 218
rustica, 10, 58, 78
Hohmann, Janet E., see Bull, E. L.
Howell, Steve N. G., and Peter Pyle, New and Noteworthy Bird Records from Baja California, Mexico, October 1991, 57–62; and Peter Pyle, Larry B. Spear, and Robert L. Pitman, North American Migrant Birds on Clipperton Atoll, 73–80; and Steven J. Engel, Seabird Observations off Western Mexico, 167–181; see Pyle, P.; see Reinking, D. L.
Hummingbird, Allen's, 216
Anna's, 215, 267–269
Black-chinned, 144, 215
Broad-billed, 131, 160, 161, 162
Calliope, 215, 216, 228, 229, 230, 231, 233
Costa's, 215
Ruby-throated, 144
Rufous, 216
Violet-crowned, 161
Hylocichla mustelina, 133

Ibis, White, 75, 164, 265
White-faced, 74, 89, 265
Icterus galbula, 79, 226
pustulatus, 138, 148, 162
sp., 79
Ictinia mississippiensis, 159, 160, 162
Ixobrychus exilis, 74
Ixoreus naevius, 221

Jaeger, Long-tailed, 170, 176, 178, 180
Parasitic, 170, 175, 176
Pomarine, 8, 170, 175, 178, 180
sp., 170, 179
Jay, Blue, 139, 140, 145
Scrub, 101–102, 218
Steller's, 145, 218, 228, 229
Junco, Dark-eyed, 104, 226, 228, 229
Junco hyemalis, 104, 226, 228, 229

Kestrel, American, 7, 14, 212
Killdeer, 7, 30, 34, 76, 128
Kingbird, Thick-billed, 131, 145, 162
Kingfisher, Belted, 10, 77, 265
Kinglet, Golden-crowned, 220, 228, 229, 232, 233
Ruby-crowned, 161, 220, 228, 229
Kite, Black-shouldered, 90, 144
Mississippi, 159, 160, 162
Knight, Richard L., see Camp, R. J.
Knorr, Owen A., Breeding of the Black Swift in the Great Basin, 197–198

Lagopus leucurus, 113, 138–139
Lanius ludovicianus, 101–102, 265
Lark, Eurasian Sky, 131, 132
Horned, 218, 265
Larus argentatus, 8
atricilla, 8, 77, 91, 168, 259
californicus, 8, 14, 48, 144
delawarensis, 8, 14, 265
fuscus, 144
glaucescens, 8
heermanni, 8, 29, 30, 34, 265
livens, 29, 30
minutus, 139, 165
occidentalis, 8, 265
pipixcan, 8, 77, 176, 179
ridibundus, 129, 144
sabini, 170, 176, 177, 179, 180
Laterallus jamaicensis, 81–88
spilonotus, 85
Laymon, Stephen A., see Franzreb, K. E.
Lentz, Joan Easton, Breeding Birds of Four Isolated Mountains in Southern California, 201–234
Limnodromus scolopaceus, 76
sp., 265
Limosa fedoa, 265
haemastica, 159
lapponica, 129
Llinas, Jorge, see Wehtje, W.
Long, Michael C., Anna's Hummingbirds with Hymenoptera Impaled on Bills, 267–269
Loon, Arctic, 98–100, 189–196
Common, 99, 189
Pacific, 98, 99, 189, 190, 192, 193
Red-throated, 99
Yellow-billed, 99, 117, 140, 159, 162, 163
Lophodytes cucullatus, 89, 90
Loxia curvirostra, 226, 227, 228, 229, 230, 231

Mallard, 48
Martin, Gray-breasted, 78

Purple, 78, 200, 218
McCaskie, Guy, A Little Bunting Reaches California, 95–97
McKernan, Robert, President's Message, 63, 258
Melanerpes formicivorus, 216
Mellink, Eric, and Eduardo Palacios, Notes on Breeding Coastal Waterbirds in Northwestern Sonora, 29–37; see Palacios, E.
Melospiza lincolnii, 66, 226, 228, 229, 230, 231
Merganser, Hooded, 89, 90
Mergellus albellus, 235
Merrifield, Kathy, Eurasian × American Wigeons in Western Oregon, 105–107
Micrathene whitneyi, 10, 15
Mimodes graysoni, 11, 12, 14
Mimus polyglottos, 11, 15, 265
Mockingbird, Northern, 11, 15, 265
Socorro, 11, 12, 14
Molothrus ater, 14, 15, 178, 226
Moorhen, Common, 74, 76
Motacilla alba/lugens, 146
lugens, 146
Murre, Thick-billed, 129
Murrelet, Craveri's, 29
Myadestes townsendi, 221, 228, 229, 231
Myers, Stephen J., Mountain Chickadees Nest in Desert Riparian Forest, 103–104
Myiarchus cinerascens, 218
crinitus, 131
tuberculifer, 139, 140, 145
Myioborus pictus, 53, 61

Nesofregetta fuliginosa, 108
Nighthawk, Common, 77
Lesser, 77
Night-Heron, Black-crowned, 74, 142, 259, 261, 263
Yellow-crowned, 6, 14, 74, 122, 123, 142, 160, 263
Noddy, Brown, 9, 15, 170, 178, 179
Nucifraga columbiana, 218, 228, 229, 230, 231
Numenius americanus, 91, 265
phaeopus, 8, 14, 76, 91, 265
Nutcracker, Clark's, 218, 228, 229, 230, 231
Nuthatch, Pygmy, 219, 228, 229
Red-breasted, 104, 219, 228, 229, 232, 233
White-breasted, 219
Nyctanassa violacea, 6, 14, 74, 122, 123, 142, 160, 263
Nyctea scandiaca, 130, 144, 165
Nycticorax nycticorax, 74, 142, 259, 261, 263
violaceus, 6, 14, 74, 122, 123, 142, 160, 263

Oceanites oceanicus, 119, 158, 162
Oceanodroma homochroa, 57, 108
leucorhoa, 5, 108, 170, 173, 174
markhami, 108–110
matsudairae, 108
melania, 108, 109, 170, 174, 178
microsoma, 170, 174
tethys, 5, 170, 174, 178
tristrami, 108
Oporornis agilis, 78, 79, 135, 147, 161, 163
formosus, 135, 147, 161, 166
philadelphia, 136, 147, 161, 163
tolmiei, 147, 223, 224, 228, 229, 230, 231, 232, 233
Oreortyx pictus, 213, 228, 229
Oreoscoptes montanus, 92
Oriole, Northern, 79, 226
Streak-backed, 138, 148, 162
Osprey, 6, 7, 32, 76, 265
Otus asio, 182–188
flammeolus, 213, 214, 228, 229, 230, 231, 232
kennicottii, 182–188
Ovenbird, 78
Owl, Barn, 10, 14, 15
Barred, 158, 165
Eastern Screech, 182–188
Elf, 10, 15
Flammulated, 213, 214, 228, 229, 230, 231, 232
Great Horned, 214
Long-eared, 214
Northern Pygmy, 214, 228, 229
Northern Saw-whet, 214, 215, 228, 229
Snowy, 130, 131, 144, 165
Spotted, 214, 228, 229
Western Screech, 182–188
Oystercatcher, American, 30, 34, 128, 144, 165
Black, 128, 144

Palacios, Eduardo, and Eric Mellink, Additional Records of Breeding Birds from Montague Island, Northern Gulf of California, 259–262; see Mellink, E.
Pandion haliaetus, 6, 32, 76, 265

Parakeet, Green, 9, 10
Parula americana 223
pitiayumi, 12, 13
Parula, Northern, 223
Tropical, 12, 13
Parus gambeli, 103–104, 219, 228, 229
inornatus, 101, 219
wollweberi, 145
Passer domesticus, 14
Passerculus sandwichensis, 101, 265
Passerella iliaca, 225, 228, 229, 232, 233
Passerina amoena, 224
ciris, 137, 148, 150, 162, 163, 166
cyanea, 13, 96
versicolor, 162
Patten, Michael A., and Kurt Radamaker and Thomas E. Wurster, Noteworthy Observations from Northeastern Baja California, 89–93; First Record of the Common Pochard in California, 235–240
Pelecanus occidentalis, 168, 263
Pelican, Brown, 168, 263
Petrel, Cook's, 115, 118, 119, 141, 158, 159, 162
Dark-rumped, 110–112
Juan Fernandez, 110
Mottled, 117, 159
Murphy's, 113, 118, 141
Solander's, 141
Stejneger's, 119
White-winged, 110
Pewee, Eastern Wood, 77–78
Greater, 131, 162
Western Wood, 217
Phaethon aethereus, 5, 29, 30, 31, 32, 119, 170, 174, 180
rubricauda, 119, 120, 159
Phainopepla, 221
Phainopepla nitens, 221
Phalacrocorax auritus, 30, 32, 33, 34, 36, 263
Phalaenoptilus nuttallii, 215
Phalarope, Northern, 8, 170, 175, 265
Red, 77, 170, 175, 179
Red-necked, 8, 170, 175, 265
sp., 170
Wilson's, 77, 175
Phalaropus fulicaria, 77, 170, 175, 179
lobatus, 8, 170, 175, 265
sp., 170
tricolor, 77, 175
Phasianus colchicus, 90
Pheasant, Ring-necked, 90
Pheucticus ludovicianus, 13, 96
melanocephalus, 224
Phillips, Allan R., and Roberto Phillips Farfan, Distribution, Migration, Ecology, and Relationships of the Five-striped Sparrow, *Aimophila quinquestriata*, 65–72
Phoebe, Black, 218
Phylloscopus borealis, 53–56, 57, 61
Picoides albolarvatus, 217, 228, 229, 232
nuttalli, 217
villosus, 217
Pigeon, Band-tailed, 213
Pintail, Northern, 75
Pipilo chlorurus, 224, 228, 229, 231, 232, 233
crissalis, 225
erythrophthalmus, 13, 225
Pipit, American (Water), 11, 78
Olive-backed, 133
Red-throated, 58, 133, 146, 158, 163
Sprague's, 146, 161, 165
Piranga ludoviciana, 224, 228, 229
olivacea, 61, 79, 95, 96, 136, 140, 148, 162, 163
rubra, 13, 79, 136
Pitman, Robert L., see Howell, S. N. G.
Plectrophenax nivalis, 137, 148, 162, 163, 166
Plegadis chihi, 74, 89, 265
sp., 75
Plover, Black-bellied, 7, 76, 265
Mongolian, 160
Pacific Golden, 76
Semipalmated, 7, 76, 265
Snowy, 30, 33, 36, 128, 260, 265
Wilson's, 30, 33, 34, 35, 128, 160, 165, 265
Pluvialis fulva, 76
fulva/dominica, 76
squatarola, 7, 76, 265
Pochard, Common, 235–240
Podilymbus podiceps, 4
Polioptila caerulea, 220
Polyborus plancus, 144, 149, 150
Poorwill, Common, 215
Porphyrula martinica, 76
Porzana carolina, 76
Progne chalybea, 78
subis, 78, 218
Protonotaria citrea, 78, 135, 147, 158, 161, 163, 166
Psaltriparus minimus, 219
Ptarmigan, White-tailed, 113, 138, 139
Pterodroma cookii, 115, 118, 119, 141, 158, 159, 162

externa, 110
inexpectata, 117, 159
leucopter, 110
longirostris, 119
phaeopygia, 110–112
solandri, 141
ultima, 113, 118
Ptychoramphus aleuticus, 132
Puffinus auricularis, 5, 170, 171, 173, 178, 179
creatopus, 169, 170, 178, 179, 180
griseus, 170, 171
lherminieri, 5, 170, 171, 172, 173, 178
nativitatis, 170, 171, 175, 178, 180
pacificus, 5, 169, 170, 171, 178, 179
Pygmy-Owl, Northern, 214, 228, 229
Pyle, Peter, A Markham's Storm-Petrel in the Northeastern Pacific, 108–110; and Steve N. G. Howell, An Arctic Warbler in Baja California, Mexico, 53–56; and Larry B. Spear and David G. Ainley, Observations of Dark-rumped Petrels off Oregon and California, 110–112; see Howell, S. N. G.
Pyrrhuloxia, 136, 148, 162, 163, 166

Quail, California, 213
Mountain, 213, 228, 229
Quiscalus mexicanus, 61
quiscula, 138, 163

Radamaker, Kurt, see Patten, M. A.
Rail, Black, 81–88
Clapper, 261
Galapagos, 85
Virginia, 76
Yellow, 127, 128, 144, 159, 162, 165
Rallus limicola, 76
longirostris, 261
Raven, Common, 48, 49, 50, 198–199, 219, 265
Recurvirostra americana, 34, 43–51, 64
avosetta, 93
Redhead, 235, 237, 238
Redpoll, Common, 138
Redstart, American, 13, 78, 96
Painted, 53, 61
Regulus calendula, 161, 220, 228, 229
satrapa, 220, 228, 229, 232, 233
Reinking, Dan L., and Steve N. G. Howell, An Arctic Loon in California, 189–196
Riparia riparia, 58, 78
Roberson, Don, Fourteenth Report of the California Bird Records Committee, 113–166
Robin, American, 221
Rufous-backed, 145
Rodriguez Estrella, Ricardo, see Wehtje, W.
Rynchops niger, 260, 261

Salpinctes obsoletus, 219
Sanderling, 8, 76, 265
Sandpiper, Baird's, 57, 91
Buff-breasted, 129, 144, 158, 160, 162, 165
Curlew, 129
Least, 35, 76, 265
Pectoral, 57, 76
Solitary, 76
Spotted, 8, 76, 265
Upland, 128, 159, 160, 162, 165
Western, 8, 35, 76, 265
Sapsucker, Red-breasted, 216, 228, 229, 232
Red-naped, 10
Williamson's, 216, 228, 229, 231, 232
Yellow-bellied, 91, 92
Sayornis nigricans, 218
Scaup, Lesser, 76
Screech-Owl, Eastern, 182–188
Western, 182–188
Seiurus aurocapillus, 78
motacilla, 53
noveboracensis, 78
Selasphorus rufus, 216
sasin, 216
Setophaga ruticilla, 13, 78, 96
Shearwater, Audubon's, 5, 170, 171, 172, 173, 178
Christmas, 170, 171, 175, 178, 180
Newell's, 172
Pink-footed, 169, 170, 178, 179, 180
Sooty, 170, 171
Streaked, 162
Townsend's, 5, 9, 170, 171, 172, 173, 178, 179, 180, 189
Wedge-tailed, 5, 169, 170, 171, 178, 179
Shoveler, Northern, 75
Shrike, Loggerhead, 101, 265
Sialia currucoides, 221, 228, 229
mexicana, 220
Siskin, Pine, 61, 92, 227, 228, 229, 230, 231
Sitta canadensis, 104, 219, 228, 229, 232, 233
carolinensis, 219
pygmaea, 219, 228, 229

Skimmer, Black, 260, 261
Skylark, Eurasian, 131–132
Smew, 235
Solitaire, Townsend's, 221, 228, 229, 231
Somateria mollissima, 143
spectabilis, 126, 143, 159, 160, 165
Sora, 76
Sowl, Kristine, see Douglas, H.
Sparrow, Black-chinned, 225
Black-throated, 70
Cassin's, 137, 148
Chipping, 95, 96, 225
Clay-colored, 96
Field, 148
Five-striped, 65–72
Fox, 225, 228, 229, 232, 233
Grasshopper, 101
House, 14, 114
Lark, 13, 225
Le Conte's, 166
Lincoln's, 66, 226, 228, 229, 230, 231
Rufous-crowned, 225
Rufous-winged, 69
Sage, 225
Savannah, 101, 265
White-crowned, 228, 229
Spear, Larry B., see Howell, S. N. G.; see Pyle, P.
Sphyrapicus nuchalis, 10
ruber, 216, 228, 229, 232
thyroideus, 216, 228, 229, 231, 232
varius, 91, 92
Spizella atrogularis, 225
pallida, 96
passerina, 95, 96, 225
pusilla, 148
Spoonbill, Roseate, 122, 123, 158, 164
Stelgidopteryx serripennis, 10, 265
Stellula calliope, 215, 216, 228, 229, 230, 231, 233
Stercorarius longicaudus, 170, 176, 178, 180
parasiticus, 170, 175, 176
pomarinus, 8, 170, 175, 178, 180
Sterna anaethetus, 170, 177, 178, 179, 180
antillarum, 30, 33, 34, 35, 36, 170, 177, 179, 259, 260, 265
caspia, 265
elegans, 29, 30, 34, 36, 260, 261, 265
forsteri, 265
fuscata, 8, 9, 15, 178, 179, 180
hirundo, 77, 170, 176
maxima, 29, 30, 34, 260, 265
nilotica, 259
paradisaea, 77, 170, 176, 177, 180, 189
Stilt, Black, 43
Black-necked, 43–51, 64
Storm-Petrel, Ashy, 57, 108
Black, 108, 109, 170, 174, 178
Galapagos, 5, 170, 174, 178
Leach's, 5, 108, 170, 173, 174
Least, 170, 174
Markham's, 108–110
Matsudaira's, 108
Tristram's, 108
White-throated, 108
Wilson's, 119, 158, 162
Strix occidentalis, 214, 228, 229
varia, 158, 165
Sula dactylatra, 5, 121, 141, 170, 174, 175, 178, 179
leucogaster, 6, 29, 30, 31, 36, 121, 141, 159, 163, 170, 175, 178, 179, 180
nebouxii, 30, 31, 120, 121, 141, 163, 174, 175
sula, 6, 121, 141, 170, 175, 178, 179, 180
Surfbird, 8
Swallow, Bank, 58, 78
Barn, 10, 58, 78
Cliff, 58, 78, 218
N. Rough-winged, 10, 265
Tree, 78
Violet-green, 189, 218
Swan, Trumpeter, 123, 140, 142, 164
Tundra, 123
Swift, Black, 197–198
Vaux's, 38–42, 58
White-throated, 215
Synthliboramphus craveri, 29

Tachybaptus dominicus, 117, 140, 163
Tachycineta bicolor, 78
thalassina, 189, 218
Tanager, Scarlet, 61, 79, 95, 96, 136, 140, 148, 162, 163
Summer, 13, 79, 136
Western, 224, 228, 229
Tattler, Wandering, 7, 14, 76
Teal, Baikal, 149
Blue-winged, 75
Blue-winged/Cinnamon, 75
Cinnamon, 48, 75
Falcated, 149
Tern, Arctic, 77, 170, 176, 177, 180, 189
Black, 57, 77, 170, 176, 178, 179, 180
Bridled, 170, 177, 178, 179, 180
Caspian, 265

Common, 77, 170, 176
Elegant, 29, 30, 34, 36, 260, 261, 265
Forster's, 265
Least, 30, 33, 34, 35, 36, 170, 177, 179, 259, 260, 265
Royal, 29, 30, 34, 260, 265
Sooty, 8, 9, 15, 178, 179, 180
White, 9
Thrasher, Bendire's, 92
California, 221
Curve-billed, 92, 133, 139, 146, 165
Gray, 92
Sage, 92
Thrush, Gray-cheeked, 78, 132, 133, 145
Hermit, 221, 228, 229, 230, 231
Swainson's, 11, 132
Varied, 221
Wood, 133
Thryomanes bewickii, 220
sissonii, 11
Titmouse, Bridled, 145
Plain, 101, 219
Toxostoma bendirei, 92
cinereum, 92
curvirostre, 92, 133, 139, 146, 165
redivivum, 221
Towhee, California, 225
Green-tailed, 224, 228, 229, 231, 232, 233
Rufous-sided, 13, 225
Tringa flavipes, 76, 91
melanoleuca, 76, 265
solitaria, 76
Troglodytes aedon, 78, 220
Tropicbird, Red-billed, 5, 29, 30, 31, 32, 119, 170, 174, 180
Red-tailed, 119, 120, 159
Tryngites subruficollis, 129, 144, 158, 160, 162, 165
Turdus migratorius 221
rufopalliatus, 145
Turnstone, Ruddy, 76, 265
Tympanuchus phasianellus, 127
Tyrannus crassirostris, 131, 145, 162
forficatus, 131, 145, 161, 163, 165, 200
Tyto alba, 10, 14, 15

Uria lomvia, 129

Vermivora celata, 61, 222
chrysoptera, 60, 78, 134, 140, 161, 163
luciae, 60
peregrina, 12, 60, 78
pinus, 146, 163
ruficapilla, 60, 147, 222, 228, 229, 230, 231, 232, 233
Virginiae, 134
Vireo bellii, 58, 60
flavifrons, 133, 161
flavoviridis, 134, 146, 159, 161, 163, 165
gilvus, 60, 222
huttoni, 222
philadelphicus, 60, 133, 146, 161, 163, 165
solitarius, 60, 221, 222, 228, 229
Vireo, Bell's, 58, 60
Hutton's, 222
Philadelphia, 60, 133 146, 161, 163, 165
Solitary, 60, 221, 222, 228, 229
Warbling, 60, 222
Yellow-green, 134, 146, 159, 161, 163, 165
Yellow-throated, 133, 161
Vulture, Turkey, 211

Wagtail, Black-backed, 146
White/Black-backed, 146
Walter, Hartmut S., see Wehtje, W.
Warbler, Arctic, 53–56, 57
Bay-breasted, 78, 134
Blackburnian, 96
Blackpoll, 13, 61, 78, 96, 134, 147
Black-throated Gray, 134, 223
Black-throated Green, 12, 78
Blue-winged, 146, 163
Canada, 79
Cerulean, 134, 135, 147
Connecticut, 78, 79, 135, 147, 161, 163
Golden-winged, 60, 78, 134, 140, 161
Grace's, 134, 146, 161, 163
Hermit, 223, 228, 229
Hooded, 96
Kentucky, 135, 147, 161, 166
Lucy's, 60
MacGillivray's, 147, 223, 224, 228, 229, 230, 231, 232, 233
Magnolia, 53, 60, 61, 78, 96
Mangrove, 265
Mourning, 136, 147, 161, 163
Nashville, 60, 147, 222, 228, 229, 230, 231, 232, 233
Orange-crowned, 61, 222
Palm, 78, 96
Pine, 134, 146, 147
Prairie, 78, 134
Prothonotary, 78, 135, 147, 158, 161, 163, 166
Red-faced, 148
Tennessee, 12, 60, 61, 78
Townsend's, 12, 53, 223

Virginia's, 134
Wilson's, 13, 224, 228, 229, 230, 231
Worm-eating, 135, 147, 161, 163
Yellow, 12, 53, 61, 78, 223, 265
Yellow-rumped, 12, 14, 53, 61, 223, 228, 229, 232, 233
Yellow-throated, 78, 134, 161, 163, 165
Waterthrush, Louisiana, 53
Northern, 78
Waxwing, Cedar, 12
Wehtje, Walter, Hartmut S. Walter, Ricardo Rodriguez Estrella, Jorge Llinas, and Aradit Castellanos Vera, An Annotated Checklist of the Birds of Isla Socorro, Mexico, 1–16
Whimbrel, 8, 14, 76, 91, 265
Whistling-Duck, Black-bellied, 123, 148, 149, 159, 164
Wigeon, American, 75, 105
Eurasian, 75
Eurasian × American, 105–107
Willet, 7, 91, 265
Wilsonia canadensis, 79
citrina, 96
pusilla, 13, 224, 228, 229, 230, 231
Woodpecker, Acorn, 216
Hairy, 217
Nuttall's, 217
Pileated, 40
White-headed, 217, 228, 229, 232
Wood-Pewee, Eastern, 77, 78
Western, 217
Wren, Bewick's, 220
Canyon, 220
House, 78, 220
Rock, 219
Socorro, 11
Wrentit, 221
Wurster, Thomas E., see Patten, M. A.

Xanthocephalus xanthocephalus, 13
Xema sabini, 64, 170, 176, 177, 179, 180

Yellowlegs, Greater, 76, 265
Lesser, 76, 91
Yellowthroat, Common, 79

Zenaida graysoni, 9, 14, 15
macroura, 9, 15, 77, 213
Zonotrichia leucophrys, 228, 229

ADVERTISING IN *WESTERN BIRDS*

WFO is soliciting advertising for *Western Birds*. Our policy is to accept advertising which relates to the study of natural history and field ornithology, including equipment, natural-history publications, and organized natural-history excursions. Advertisements in black and white are available at the rates listed below. Color copy can be accommodated although at higher rates. Please contact the editor for further details.

Western Birds Advertising Rate Schedule

Size	Width × Length (inches)	One issue	Four issues
Full page	5 × 8	$125	$350
Half page	5 × 4	$75	$225
Quarter page	2.5 × 4 or 5 × 2.5	$40	$135

Please send camera-ready advertising copy to *Western Birds'* graphics manager, Ginger Johnson, 4637 Del Mar Ave., San Diego, CA 92107.

WESTERN BIRDS

Quarterly Journal of Western Field Ornithologists

President: Robert McKernan, 1230 Friar Lane, Redlands, CA 92373

Vice-President: Steve Summers, P.O. Box 202, Silver Lake, OR 97638

Treasurer/Membership Secretary: Dorothy Myers, 6011 Saddletree Lane, Yorba Linda, CA 92686

Recording Secretary: Jean-Marie Spoelman, 4629 Diaz Drive, Fremont, CA 94536

Circulation Manager: Marnie S. Crook, P.O. Box 10483, San Bernardino, CA 92423

Directors: Bruce Deuel, Kimball Garrett, Peter Gent, Guy McCaskie, Robert McKernan, Steve Summers, Bill Tweit, Janet Witzeman, David Yee

Editor: Philip Unitt, 3411 Felton Street, San Diego, CA 92104

Associate Editors: Cameron Barrows, Tim Manolis, Thomas W. Keeney

Graphics Manager: Virginia P. Johnson, 4637 Del Mar Ave., San Diego, CA 92107

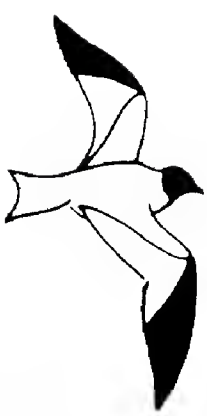
Photo Editor: Peter La Tourrette, 1019 Loma Prieta Ct., Los Altos, CA 94024

Secretary, California Bird Records Committee: Michael A. Patten, P. 0. Box 8612, Riverside, CA 92515

Editorial Board: Robert Andrews, Alan Baldridge, Andrew J. Berger, Laurence C. Binford, R. Wayne Campbell, David F. DeSante, Jon L. Dunn, Richard Erickson, William T. Everett, Kimball L. Garrett, Joseph R. Jehl, Jr., Ned K. Johnson, Virginia P. Johnson, Brina Kessel, Stephen A. Laymon, Paul Lehman, John S. Luther, Guy McCaskie, Joseph Morlan, Harry B. Nehls, Dennis R. Paulson, Gary H. Rosenberg, Oliver K. Scott, Ella Sorensen, Richard W. Stallcup, Charles Trost, Terence R. Wahl, Bruce Webb

Membership dues, for individuals and institutions, including subscription to Western Birds: Patron, $1000; Life, $350; Supporting, $50 annually; Contributing, $30 annually; Family, $22; Regular, U.S., $18 for one year, $35 for two years, $50 for three years; outside U.S., $23 for one year, $45 for two years, $65 for three years. Dues and contributions are tax-deductible to the extent allowed by law.

Send membership dues, changes of address, correspondence regarding missing issues, and orders for back issues and special publications to the Treasurer. Make checks payable to Western Field Ornithologists.

Back issues of *California Birds/Western Birds:* $20 per volume, $5.00 for single issues. Xerox copies of out of print issues (Vol. 1, No. 1; Vol. 2, Nos. 1 and 4; Vol. 6, No. 2): $5.50 each. Ten-column *Field List of California Birds:* $1.00 each, 10 to 39 $0.80 each, 40 or more $0.70 each. *Checklist of the Birds of California:* $2.00 each, 10 or more $1.50 each. *Pelagic Birds of Monterey Bay, California:* $2.50 each, 10 or more $2.00 each, 40 or more $1.50 each.
All postpaid.

Published October 15, 1993 ISSN 0045-3897