

was descending the expedition trail alone 11 September when he made his sighting at about 2048 meters elevation. In a convincing memorandum to the Superintendent, Hawaii-Volcanoes National Park, Mr. Morrison reported seeing the unusual bird several times at distances varying from 8–10 to 12–15 meters. Size, bill shape, and coloration of this individual as described to me by Mr. Morrison were similar to those of the nukupuus I saw. In his letter to the Superintendent, Mr. Morrison described the “tremendously long, curved bill,” the upper mandible being “3–4 times the length of the lower” as was evident during a “yawn.” Mr. Morrison is interested in Hawaiian birds and familiar with their appearance. I consider his sighting of nukupuu valid, substantiating my own observations in this area. Thus two of the three races of *Hemignathus lucidus*, those of Kauai and now of Maui, have been rediscovered in recent years; only the Oahu race is now believed extinct.

Pseudonestor xanthophrys. Maui Parrotbill. Late in the afternoon on 29 August, the last day of expedition field work, I was seated at an overlook of the upper Kipahulu Valley at about 2000 meters elevation and prepared to photograph any of the various species of honeycreepers that might visit an ohia tree in bloom below. At 17:33 a smallish, but “big headed” bird was seen to fly into a nonblooming ohia tree, one of a stand below my lookout. Observation through the 7 × 35 binoculars made identification of this bird positive at the first viewing. It was *Pseudonestor xanthophrys* without a question. It flew toward me and alighted several times, finally perching directly overhead not more than 10 or 20 meters away. Body size and plumage color were not greatly different from the first nukupuu I saw, but the much shorter, more hooked upper mandible and massive lower one

left no doubt of its identity. This individual was actively moving in a more or less direct line through the ohia midstory. It was in sight for about 30 seconds and did not call. The only other sighting in the present century was that reported by Richards and Baldwin (*op. cit.*).

Sightings of the Maui Nukupuu at from 1740 to 1801 meters (and by George Morrison at 2048 meters), and of the Maui Parrotbill at 2000 meters extend the known altitudinal ranges of these birds considerably above the 1219 to 1372 meter levels previously reported for the Maui Nukupuu and the 1219 to 1524 meter levels ascribed to the Maui Parrotbill. More significantly, this upward extension of range places both of these rare birds in a forest dominated by ohia rather than by koa (*Acacia koa*). Conservation possibilities for both birds are therefore markedly increased since ohia is the dominant plant in the little-disturbed upper elevation forests of Haleakala's northeast slopes.

Another endangered species, the Crested Honeycreeper (*Palmeria dolei*), and the rare Maui Creeper (*Loxops maculata newtoni*) were found in Kipahulu Valley by other members of the expedition as well as myself. Information concerning these two birds will be given later in a general account of the avifauna.

The occurrence of four rare birds in Kipahulu Valley, one previously considered extinct, points up the importance of retaining this area in a natural condition if populations of these birds are to be preserved. In Hawaii, many unique birds found nowhere else in the world have become extinct because of land use practices and environmental changes brought about by civilization.

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BIRDS OBSERVED ON SAN NICOLAS ISLAND, CALIFORNIA

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During the period between 2 May 1962 and 1 January 1964 I was able to make a survey of the birds of San Nicolas Island, Ventura County, California.

San Nicolas Island is in the Pacific Ocean at 33° 15' N and 119° 24' W, or about 60 miles SW of Los Angeles, California. San Nicolas has an area of 20,000 acres and a maximum elevation of 917 feet. It is extremely eroded and quite arid, the annual rainfall being 6.08 inches. There are continuous northwest winds, and the air temperature ranges from 57.2 to 64.4° F. Vegetation is sparse, with coarse grasses and cactus being dominant. There is one ravine with a fresh-water spring and some scrub alders. The only data on the birds of this island appear to be those reported by Howell (Pacific Coast Avifauna no. 12, 1917).

I made observations daily in some areas and weekly in others. The entire island was surveyed at least once monthly. I was the only observer at the time, although the island has several hundred people occupying it. I was frequently in contact with Richard Banks, then of the San Diego Museum of Natural History, and his advice and criticism were invaluable.

Howell (*op. cit.*) records 52 species for San Nicolas Island. The following list includes 27 of these and 41

additional species. The latter are indicated by an asterisk.

*Gavia immer**. Common Loon. Occasional during the winter of 1962–63 and winter of 1963–64.

*Aechmophorus occidentalis**. Western Grebe. Three birds were observed within 200 feet of eastern side of island on 11 November 1963.

*Fulmarus glacialis**. Fulmar. Several were seen offshore during August 1962 and June 1963.

Loomelania melania. Black Petrel. A single bird was observed at close range about one-half mile offshore on 28 September 1962.

Pelecanus occidentalis. Brown Pelican. Common throughout the observation period.

Phalacrocorax auritus. Double-crested Cormorant. Breeding resident in small numbers.

Phalacrocorax penicillatus. Brandt's Cormorant. Breeding resident. Five rookeries were present in 1963.

*Phalacrocorax pelagicus**. Pelagic Cormorant. Resident. Observed in breeding plumage, May 1962 and April–May 1963. None observed nesting.

Ardea herodias. Great Blue Heron. Nonbreeding resident, observed during entire period. Observed flying between San Nicolas and Santa Barbara Island, 25 miles eastward.

*Branta canadensis**. Canada Goose. Many flocks were observed passing northward between San Nicolas and Santa Barbara Island in March and April 1963. A single bird was seen in a field on San Nicolas on 1 April 1963.

*Chen hyperborea**. Snow Goose. Several flocks were observed 1–9 April 1963 passing offshore. On

10 April 1963 a single bird was observed from aircraft over island, at an altitude of 2000 feet.

Anas acuta.* Pintail. Several rafts were observed off the north shore, 17 December 1963.

Buteo jamaicensis.* Red-tailed Hawk. A single bird was observed 8 May–22 May 1963.

Falco sparverius. Sparrow Hawk. Winter resident. First winter observations were on 6 November 1962 and 10 September 1963. The winter population of the island was about five birds.

Lophortyx californicus.* California Quail. Sixty-four birds of this species were introduced in June 1962. Twenty were observed on 21 December 1962. Several were reported but not observed on 3 October 1963. Four were seen on 2 February 1964.

Phasianus colchicus.* Ring-necked Pheasant. Introduced prior to 1962. There were about 25 birds on the island, and they were successfully breeding. Six immatures were observed in 1962 and eight in 1963.

Charadrius alexandrinus. Snowy Plover. Common resident.

Squatarola squatarola. Black-bellied Plover. Common in all months. Minimum numbers were observed from May through September.

Arenaria interpres. Ruddy Turnstone. Winter resident. The first winter observation in 1963 was on 25 October.

Arenaria melanocephala. Black Turnstone. Common; observed every month.

Numenius americanus.* Long-billed Curlew. Occasional in winter. Seen continuously, December 1962–March 1963. Observed 18 October 1963, 20 October 1963, and 11 November 1963 but on no other occasions in winter of 1963–64.

Numenius phaeopus.* Whimbrel. Winter resident. In 1962, last spring observation in early May, and first fall observation on 28 September. In 1963, last spring observation 11 May and first fall observation 30 August.

Heteroscelus incanum. Wandering Tattler. Common in small numbers on rocky areas during winter.

Catoptrophorus semipalmatus. Willet. Common in winter.

Erolia minutilla. Least Sandpiper. Three birds were observed in summer 1962, and 15 were observed in summer 1963. Numbers increased in September, and the species became common by January.

Erolia alpina.* Dunlin. Common in winter. Observed from mid-September to early May. No summer observations.

Dowitcher sp.* Single bird observed 30 November 1963.

Ereunetes mauri. Western Sandpiper. Common in all months, with minimum numbers between June and August.

Limosa fedoa.* Marbled Godwit. Records in 1962: 16 September, 28 birds; 21 October, 12 birds; 30 November, 2 birds. Records in 1963: 2 October, 12 birds; 30 November, more than 30 birds.

Crocethia alba. Sanderling. Winter resident. Observed from 28 September 1962 through 20 May 1963. Reappeared on 16 September 1963.

Stercorarius parasiticus.* Parasitic Jaeger. Seen occasionally throughout winter months, pursuing Royal Terns on each occasion. In 1963, first observation on 15 October.

Larus glaucescens.* Glaucous-winged Gull. Single bird observed at close range in dump, 10 April 1963.

Larus occidentalis. Western Gull. Breeding resident, with a single large rookery on north end of island. More than 600 downy young were present in 1963.

Larus argentatus.* Herring Gull. Occurred regu-

larly in small numbers from September through March.

Larus californicus.* California Gull. Common in winter, and occurring in small numbers throughout the summer.

Larus heermanni. Heerman's Gull. Small numbers of immatures were present regularly from September through June.

Rissa tridactyla.* Black-legged Kittiwake. A single bird in winter plumage was captured in exhausted condition 22 December 1963.

Sterna forsteri.* Forster's Tern. Observed occasionally from October through March, and most frequently in December.

Thalasseus maximus. Royal Tern. Winter resident. In 1962 the first autumn observation was on 8 September. Records in 1963: 1 January, 47 birds; 16 January, 16 birds; 28 January, 7 birds; 7 March, 11 birds; none seen in February. On 20 September 1963, more than 200 arrived on the island overnight.

Cerorhinca monocerata.* Rhinoceros Auklet. Twenty-five oil-covered birds washed ashore on the north side of island, 10–13 December 1962.

Columba livia.* Domestic Pigeon. Racing pigeons wearing aluminum bands appeared regularly every two weeks. They usually remained overnight before disappearing.

Zenaida asiatica.* White-winged Dove. A pair of birds were observed 11–12 November 1963.

Zenaidura macroura. Mourning Dove. Appeared in small numbers in summer. In 1962, observed May through August. In 1963, observed May through October. Maximum number observed at one time was 25.

Speotyto cunicularia. Burrowing Owl. Observed year-round. The population of the island appears to be less than 10 birds. Pellets from this species consist entirely of beetle remains.

Megaceryle alcyon.* Belted Kingfisher. Two birds were observed from September 1962 through January 1963, and 2 birds were seen on 18 October 1963.

Sayornis nigricans. Black Phoebe. A single bird was observed 8 December 1962.

Sayornis saya. Say's Phoebe. Single individuals were observed on 26 January 1963 and 28 November 1963.

Eremophila alpestris. Horned Lark. Abundant, breeding resident.

Riparia riparia.* Bank Swallow. Occurred regularly in small numbers from May through August 1963. Not observed in 1962.

Corvus corax. Common Raven. Abundant, breeding resident.

Sitta canadensis.* Red-breasted Nuthatch. Twenty birds appeared after strong north winds on the night of 19–20 September 1963. They remained near buildings, and dead individuals were found frequently (total of 11 dead). A single bird was observed on 25 November 1963.

Salpinctes obsoletus. Rock Wren. Common, breeding resident. Eighteen nests were observed, all located in rock crevices, during May–July 1963. Six nests contained 5 young each, 11 contained 4 young, and 1 contained 2 young.

Mimus polyglottos.* Mockingbird. Two birds were first observed on 20 September 1962. The species was observed daily thereafter, with 4 birds recorded on 1 June 1963 and 7 birds on 22 September 1963. No one that I contacted on the island had any knowledge of Mockingbirds occurring on the island before the summer of 1962.

Bombycilla cedrorum.* Cedar Waxwing. Four birds were observed on 18 October 1963. Eight birds were observed 10 December 1963.

Lanius ludovicianus.* Loggerhead Shrike. Observed infrequently but regularly during June–September 1963 (possibly a single bird). Last observed on 20 September 1963.

Wilsonia pusilla.* Wilson's Warbler. Two males and three females were observed on 4 May 1963. Four females (or immatures) were observed on 22 September 1963.

Passer domesticus.* House Sparrow. Breeding resident. Total population was approximately 200 birds.

Sturnella neglecta.* Western Meadowlark. Common, breeding resident.

Euphagus cyanocephalus. Brewer's Blackbird. Breeding, summer resident in small numbers. Observed in June, July, and August of 1962, and July through November 1963. Two nests were found in a wrecked ship on 10 July 1963. One nest contained 3 young on 28 July 1963. Ten birds including five immatures were observed from 28 October through 6 November 1963.

Molothrus ater.* Brown-headed Cowbird. Four birds were observed from 30 October through 3 November 1963.

Piranga ludoviciana.* Western Tanager. One male and 1 female were observed on 4 May 1963, and 1 male and 3 females (or immatures) on 22 September 1963 and a single female (or immature) on 18 October 1963.

Pheucticus melanocephalus.* Black-headed Grosbeak. Three males and 2 females were observed throughout September 1962, and 2 males were observed throughout September 1963.

Carpodacus mexicanus. House Finch. Common, breeding resident. In one instance a female was observed attempting to incubate 11 eggs.

Chlorura chlorura.* Green-tailed Towhee. A single bird was observed on 9 October 1963.

Junco oreganus.* Oregon Junco. A single bird was observed on 25 November 1963.

Zonotrichia leucophrys.* White-crowned Sparrow. Present in small numbers in all months. Immature birds were observed begging for food, but no nests were found.

Melospiza melodia.* Song Sparrow. Present in small numbers in all months.

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FEEDING-PERCHING BEHAVIOR IN THE MOCKINGBIRD

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Two Mockingbirds (*Mimus polyglottos*) wintering in a 20-acre orchard in Willow Glen, Santa Clara County, California, showed a consistent alternation between feeding and perching, a behavioral trait not previously reported.

Between the hours of 08:30 and 15:30 on 27 November 1966, a Mockingbird divided its time between feeding in a fig tree and perching in an almond tree about 15 yards away. The pattern of behavior was very consistent. Feeding on figs would occur for a few minutes, then the bird would fly to the almond tree, entering at a point about halfway up the tree, and quickly work its way up to a "favorite" perch near the top (usually facing the sun), where it performed various acts such as preening, scratching, stretching one wing back, or sitting quietly. This "feeding-perching" alternation occupied nearly all of the seven hours of observation with the exception of two short periods to the ground nearby, each lasting about five minutes.

On 10 and 11 December 1966 a Mockingbird was observed in another part of the orchard and found to have a similar "feeding-perching" alternation. This time the food was two ripe pears at the base of a small pear tree, and the perch tree was a cherry tree 15 yards away. Behavioral data collected at intervals throughout the two-day period totaled 90 minutes of activity representing 14 round trips between the perch tree and the food. Mean time spent in the perch tree during a full cycle of "feeding-perching" was 4.9 minutes (range 2.5–12.3 min), while the time spent on the ground by the food was 1.3 minutes (range 0.3–3.1 min). These data are representative of the time period 09:00–15:30 on the two days on

which data were gathered. Thus, in a single day the bird made approximately 65 round trips, spending about 5.5 hours perching and 1.5 hours feeding.

When the bird was on the ground near the two pears, it would take two to eight pecks at the food and spend the rest of the time standing near the food before flying back to the perch tree. In a single four-hour period, five intraspecific encounters occurred. In two encounters "hostile dancing" (Hailman, *Condor* 62:464–468, 1960) preceded fighting. In two others, fighting broke out immediately, and in one case the invading bird flew away at the approach of the resident.

By 28 December there were no Mockingbirds feeding in the 20-acre orchard. No pears or other fruit could be found. Night temperatures had been slightly below freezing for four days. Mockingbirds were seen feeding on *Pyracantha* berries in an adjacent suburban housing development.

These observations suggest that the "feeding-perching" alternation is a means for providing defense of a food source in an area where the food supply is low and decreasing. Possible reasons for a bird taking up a perch tree 15 yards away from the food rather than in the food tree itself or the tree above the food (perching closer to the food would seem more efficient defense) may be: (1) the food supply may not have reached the low level necessary to force the birds into more intense defense, and (or) (2) defense may be more effective when the bird flies between the perch tree and the food supply. The latter explanation seems more likely. Flight between perch and food gives maximum display of the bird's presence (including white wing patches). Also, the small fraction of time at the food source spent in eating (2–8 pecks per 1.3 minutes) seems to support the idea that frequent trips to the food were as important for defense of food as for securing nourishment.

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