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THE PRESENT STATUS OF THE BIRDS OF HAWAII[1]

By Andrew J. Berger[2]

First of Two Installments

The great expanses of open ocean that separate the Hawaiian Islands from the major continental land masses of North America and Asia resulted in the evolution of a number of unique landbirds. Unfortunately, a higher percentage of species of birds have become extinct in Hawaii than in any other region of the world. Approximately 40 percent of the endemic Hawaiian birds are believed to be extinct, and 25 of the 60 birds in the 1968 list of "Rare and Endangered Birds of the United States" are Hawaiian ("Rare and Endangered Fish and Wildlife of the United States, 1968 edition," Bureau of Sport Fisheries and Wildlife, Washington, D.C.). Most of the native birds of Oahu have long been extinct, and few native landbirds are to be found on any of the main islands below 3,000 feet elevation.

ENDEMIC HAWAIIAN BIRDS

Ten families of birds are recognized as having endemic genera, species, or subspecies in Hawaii (although taxonomic dispute still exists regarding the relationship of some Hawaiian forms to closely related North American forms); in addition, one entire family of birds (Drepanididae) is endemic to the Hawaiian chain of islands (Amadon, 1942; Mayr, 1943). An "endemic" form is one that occurs in one region only and is not found in any other part of the world. Ornithologists believe that the ancestors of these birds reached Hawaii from the areas indicated in Figure 1. The endemic Hawaiian birds, listed according to these 11 families, are discussed briefly.

1. Anatidae (ducks, geese, and swans)

The NENE or HAWAIIAN GOOSE (Branta sandvicensis) is endemic to the island of Hawaii, and in 1962 birds were first released in the Paliku Cabin area of Haleakala Crater on Maui. There is still debate as to whether or not the Nene originally inhabited Maui.

The Nene was on the verge of extinction in the 1940s, and the species is still included in the list of endangered species. In 1949 a Nene Restoration Program was begun by using a pair of captive birds obtained from Herbert Shipman of Hawaii. This has been a very successful program, and Nene have been raised in captivity both at the Severn Wildfowl Trust at Slimbridge, England, and at the State of Hawaii Fish and Game rearing station at Pohakuloa on the Saddle Road of Hawaii (Elder, 1958).

The program at Pohakuloa has been increasingly effective throughout the years, primarily through the dedicated efforts of Mr. Ah Fat Lee. Over 500 Nene have been raised at Pohakuloa during the period of 1949 through 1968. Most of these pen-reared birds have been released at several known habitats of wild Nene on the slopes of

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1 By special permission, reprinted from PACIFIC SCIENCE, Volume XXIV, No.1, Jan. 1970.

2 Dept. of Zoology, University of Hawaii, Honolulu. Supported by NSF Grant GB-5612.

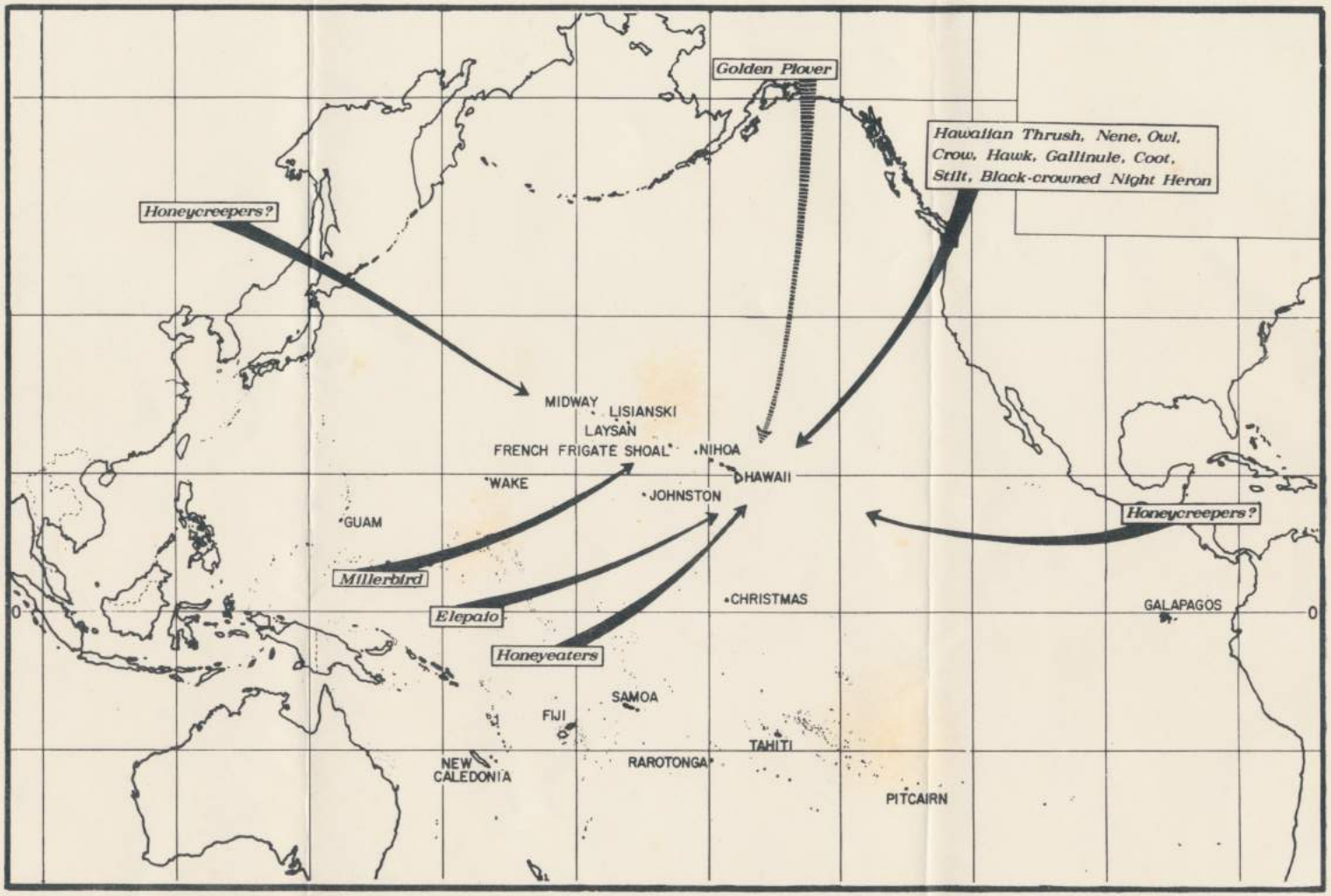

FIG. 1. Map of the Pacific Basin to show regions from which the ancestors of endemic Hawaiian birds are presumed to have originated. The broken arrow indicates the annual migratory flights of the Pacific Golden Plover between Alaska and the Hawaiian Islands.

Mauna Loa; a smaller number have been released in Haleakala Crater.

The Nene is a highly specialized goose, adapted for living in a rugged habitat of lava flows far from any standing or running water (Miller, 1937). Among the more noticeable anatomical specializations for this terrestrial life is a reduction in the webbing between the toes. The birds spend much of the time on sparsely vegetated lava flows on Mauna Loa and Hualalai, at elevations between approximately 5,000 and 8,000 feet. Here the birds often build their nests on the lava although typically well concealed in clumps of vegetation. The nests are lined with the birds' own down feathers; the clutch consists of from 2 to 5 eggs.

The KOLOA or HAWAIIAN DUCK (Anas wyvilliana) originally was found on all of the main Hawaiian Islands except Lanai and Kahoolawe. A decline in numbers of Koloa on most of the islands was noted by several writers after the turn of the present century, and in recent years this duck has been found only on Kauai. A propagation program is now underway at Pohakuloa, Hawaii.

Man probably was the most serious predator on the Koloa, and the birds could be hunted legally during the early 1920s, when the bag limit was 25 ducks per day. Duck hunting was prohibited for a period of two years beginning in 1939, and hunting was further closed during World War II. Fortunately, duck hunting (both for the Koloa and the wintering migratory ducks) has been prohibited since that time. The decline in taro and rice acreages, however, has reduced suitable habitat for the birds.

Wild dogs are known to be serious predators on both ducklings and the adults in their flightless stage during the annual postnuptial molt. A number of other animals (e.g., large-mouth bass, bullfrog) have been known to kill small ducklings on Kauai. The role of the mongoose in the great reduction or extinction of the Koloa throughout most of its former range is unknown, but it may be significant that Kauai, the last stronghold of the Koloa, is the only main island on which the mongoose has not been introduced. Wild cats, rats, and pigs also destroy nests.

The main breeding season on Kauai appears to be from December through May, although the species seems to breed throughout the year, inasmuch as nests or downy young have been found in all months except August (Swedberg, 1967). The well-concealed nests are built on the ground. Clutch size is reported to be from 2 to 10 eggs, with a mean of 8.3 eggs for wild birds. The Koloa is tolerant of varying climatic and ecological conditions. On Kauai the birds nest from sea level to 3,500 feet elevation, and in areas of annual rainfall varying from 35 to 125 inches.

The LAYSAN DUCK (Anas laysanensis) was in danger of extinction during the early part of this century (Rothschild, 1893-1900). Again man was the agent of destruction. The birds were hunted for sport and for food by the personnel of the guano mining company on Laysan, and, after these operations ceased, Japanese feather hunters also used large numbers of the ducks for food. Theodore Roosevelt established the Hawaiian Islands National Wildlife Refuge in 1909, but Alfred M. Bailey believed there were only seven ducks left by 1912. Alexander Wetmore (1925) counted 20 birds during the Tanager Expedition of 1923. Since that time, when the last of the rabbits were believed to have been killed, both the vegetation and the Laysan Duck have made a remarkable recovery. Because of the dense vegetation of the areas inhabited by the ducks, it is virtually impossible to make an accurate count of the birds, but the population is now thought to fluctuate between 100 and 600. The downward fluctuations in population that do occur are thought to result in part from severe winter storms, but there may be other, as yet unknown, reasons. The present habitat is thought to be adequate for about 600 ducks.

It is imperative for the future welfare of the Laysan Duck (as well as for the surviving honeycreeper and the tens of thousands of nesting seabirds) that predators (such as rats, cats, dogs) and pest insects and plants (which would alter the ecology of the island) be prevented from gaining access to Laysan Island.

Nests of the Laysan Duck are built on the ground and are well concealed among the vegetation. Little is known about the breeding biology in the wild, however. There are more than 150 birds in zoos and private aviaries; breeding pairs also are

held at Pohakuloa, Hawaii.

2. Accipitridae (hawks, kites, and eagles):

The HAWAIIAN HAWK or 'IO (Buteo solitarius), for entirely unknown reasons, has always inhabited Hawaii only. The bird is now uncommon and has been placed on the list of rare and endangered species. The chief reason for the decline in numbers of this interesting bird is believed to be shooting by uninformed people who consider all hawks to be "chicken hawks." All available evidence, however, suggests that rodents form the main food of the 'Io. Although much rarer than the Hawaiian Owl, the hawk sometimes can be seen soaring high in the air on the slopes of both Mauna Loa and Mauna Kea.

Few nests of this species have been found and very little is known of its breeding habits. The birds build nests of twigs and sticks in trees, and one author has described a lining made of the stems and fronds of ferns. Two or three eggs are thought to form a clutch.

3. Rallidae (rails, gallinules, and coots):

The LAYSAN RAIL (Porzanula palmeri) had a historical life of 116 years. The species was discovered on Laysan Island in 1828, and it probably became extinct in 1944.

The devastation wrought by the rabbits released on Laysan Island in 1903 is well depicted by Alexander Wetmore (1925) after he visited Laysan in 1923 as a member of the Tanager Expedition: "On every hand extended a barren waste of sand. Two coconut palms, a stunted hau tree and an ironwood or two, planted by former inhabitants, were the only bits of green that greeted the eye. Other vegetation had vanished. The desolateness of the scene was so depressing that unconsciously we talked in undertones. From all appearances, Laysan might have been some desert, with the gleaming lake below merely a mirage."

It was estimated that there were about 2,000 rails on Laysan as late as 1915, but Wetmore and his party found only two birds, and the species is thought to have been extirpated there before 1936.

A pair of Laysan Rails was introduced to Midway Island in 1891. A large population had built up by the turn of the century and still existed in 1939. The extermination of the Laysan Rail on Midway, however, was very rapid after the onset of World War II when the U.S. Navy took over, and rats gained access to both Sand and Eastern islands. The last rails were seen on Eastern Island in June of 1944.

The Laysan Rail could easily have been saved from extinction if Government officials had heeded the pleas of ornithologists, but they were unable to obtain the necessary transportation to restock Laysan Island (or other islands) from the Midway population after the vegetation began to recover on Laysan. Although small and flightless, the Laysan Rail was a hardy bird, easily reared in captivity. Several birds survived the long sea voyage to England in the 1890s.

Like many rails on oceanic islands, the Laysan Rail had evolved into a flightless condition. The birds ate many kinds of insects, the flesh from the carcasses of other birds, and the eggs of the smaller seabirds, such as terns and petrels. Although the rails apparently sometimes broke open the eggs, they are said usually to have waited until Laysan Finches (Psittirostra cantans) broke through the shells with their more powerful bills and then chased the finches away to eat the egg contents.

The breeding season apparently extended from late March through July on Laysan, but downy young were seen on Midway in March. The nests were built on the ground or in grass tussocks and were constructed of dried stems and leaves of juncus and other plants. Unlike Mainland rails, which lay large clutches of eggs, the Laysan Rail laid 2 to 4 eggs in a clutch (Baldwin, 1947).

The HAWAIIAN RAIL (Pennula sandwichensis) was last collected on the island of Hawaii (near Olaa) about 1864, and was last seen about 1884 (Greenway, 1958, p.235). Munro (1944, p.51) believed that this rail "frequented most of the larger islands"

and that "it certainly was on Molokai," although there is no good evidence for this belief. The nest, eggs, and newly hatched young were never described.

The causes of extinction of this small (about $5\frac{1}{2}$ inches in total length), flightless rail are unknown, but it seems certain that rats, dogs, and cats played a large role in the extermination of this unique species. Hawaiian chiefs are said to have hunted the rail with bows and arrows.

The GALLINULE (Gallinula chloropus sandvicensis) is considered conspecific with the Common Gallinule of North America and Eurasia, although the Hawaiian birds are nonmigratory and have been inhabitants for an unknown length of time. Their distinctness is indicated by their subspecific name. These are birds of fresh-water ponds and marshes, and, because of the continuing disappearance of such habitats in Hawaii, the birds are considered endangered on all islands they still inhabit. They formerly inhabited all of the main islands except Niihau and Lanai. Attempts to reestablish the birds on Hawaii and Maui appear to have been unsuccessful. Essential habitat is being destroyed to make way for housing developments, and mongooses, rats, dogs, and cats are serious predators on the birds. The prospects for survival of this species are considered by personnel of the Bureau of Sport Fisheries and Wildlife as "not good."

The gallinule builds its nest of reeds and other aquatic vegetation. Like its continental relative, the bird is thought to lay large clutches of eggs (6 to 13). The newly hatched young have red bills and are covered with black down feathers; they are precocial and are able to run about and swim within a few hours after hatching.

The HAWAIIAN COOT (Fulica americana alai) also is considered conspecific with the North American members of this widely distributed species. Like the gallinule, however, the Hawaiian birds are nonmigratory and have been inhabitants of the Hawaiian Islands for a long period of time. They are given subspecific designation.

Coots occupy the same general type of fresh-water ponds as gallinules, but they prefer more open water. The coot is found on all the main islands, and is especially common on Kauai and at Kanaha Pond on Maui. Munro (1944, p.54) reported seeing "from 500 to 600 on a lagoon near Lihue, Kauai," in 1891, but nowhere are they so abundant now. One or more birds sometimes can be observed on the reservoir along the Old Pali Road in Nuuanu Valley, Oahu. Coots were on the game bird list until 1939. They are now classified as an endangered species, with an estimated total population of 1,500 birds.

Coots typically build relatively large floating nests of aquatic vegetation. Little is known of the clutch size of the Hawaiian Coot, but it presumably lays fewer than the 8 to 12 eggs of the Mainland birds. The newly hatched chicks are covered with black down except on the head, neck, and throat where the down is reddish-orange. The down is short or absent on the forehead and crown of the head, giving the bird a bald-headed appearance. Like gallinule chicks, the young are able to move about shortly after hatching, when the down has dried.

4. Recurvirostridae (avocets and stilts)

The BLACK-NECKED or HAWAIIAN STILT (Himantopus himantopus knudseni) is a large (16 inches), striking, black-and-white bird with very long reddish legs. This species is endemic to the islands of Niihau, Kauai, Oahu, Molokai, Maui, and Hawaii, but is now greatly reduced in numbers in most of its former range.

The stilt was considered a game bird until 1941, and still is sometimes shot illegally. The birds also are subject to predation by the mongoose and by feral dogs and cats. A major reason for the decline of this species, however, has been the continual draining of marshes and other wetland areas.

It is estimated that the total population of the stilt now numbers about 1,500 birds, which are found chiefly on Oahu and Maui. One of the major nesting and feeding habitats is at Kanaha Pond on Maui. This marsh area is in constant danger of being filled in because of pressure to enlarge the runways at the Kahului Airport. Another important breeding area is found among the ponds on the Kaneohe Marine Air

Station on Oahu; efforts have been made with military personnel to have some of these ponds set aside as a sanctuary for the stilt.

The nest of the stilt is a simple "scrape" made on the ground by the birds themselves; small stones, bits of wood, and other debris often are added to the scrape. The normal clutch is 4 eggs. The newly hatched, precocial young are covered with a coat of variegated brownish down, which makes them very difficult to find after they leave the nest. The young are brooded for some time after hatching, but they run from the nest and hide in the surrounding vegetation when disturbed.

5. Stridgidae (owls)

The PUEO or SHORT-EARED OWL (Asio flammeus sandwichensis) differs from most species of continental owls in that it is diurnal in habits. It is found in open grassland (such as along the western part of the Saddle Road of Hawaii), over lava flows, and in forested areas (both 'ohi'a and mamane-naio forests), and often it is seen near towns. This species appears to be tolerant of wide climatic extremes--from relatively dry areas (about 20 inches of annual rainfall) to the extremely wet Koke'e area of Kauai. The Pueo is resident on all of the main islands of the chain, and it was prominent in Hawaiian mythology.

The Pueo builds its nest on the ground. The females are said to lay from 3 to 6 eggs in a clutch.

6. Corvidae (crows, jays, and magpies)

The HAWAIIAN CROW (Corvus tropicus) is endemic to the island of Hawaii only, being found in the Kona and Kau districts. The bird is now rare, and it is estimated that the total population may be no more than 30 birds. In former times, they were much more common and were found at elevations from 1,000 to 8,000 feet. Shooting is probably responsible for the decline of this sole representative of the crow family to have reached the Hawaiian Islands. The effect of the great alteration of the environment on the decline of the species is unknown.

Very little is known about the feeding habits or breeding biology of the Hawaiian Crow. The birds build nests of twigs and sticks, lined with finer plant materials. The eggs have been described as having a greenish background with brown markings around the larger end of the egg. In April 1964, Dr. P. Quentin Tomich (1967) found a nest containing five eggs in an 'ohi'a tree.

7. Turdidae (thrush family)

The SMALL KAUAI THRUSH (Phaeornis palmeri) is now known to inhabit only the 'ohi'a forests in the Alaka'i Swamp region of Kauai. The size of the remaining population is unknown, but, because of its restricted distribution, this species is thought to be rare and it is included in the list of rare and endangered species, as are most of the endemic Hawaiian birds. Both this thrush and the Hawaiian Thrush (P. obscurus) appear to tolerate very little change in environment. Hence the further spread of exotic plants into the depths of the Alaka'i Swamp must be prevented if the native birds are to be expected to survive; population levels of goats and pigs also must be controlled.

Nothing is known about the breeding habits of this thrush.

The HAWAIIAN THRUSH (Phaeornis obscurus) developed races on all of the main islands except Maui. The races found on Oahu and Lanai are presumed to be extinct; reports of survival of the Molokai race need to be confirmed (Richardson, 1949).

The Kauai race, or the Large Kauai Thrush (P. o. myadestina) appears to be even rarer than the Small Kauai Thrush, whereas the Large Kauai Thrush was said by early writers to be the most common forest bird on Kauai in 1891.

The Hawaii race (P. o. obscurus) still is fairly common in suitable habitat (Berger, 1969a). The birds inhabit the 'ohi'a forests in regions of high annual rainfall, in general above 3,000 feet elevation. The best areas are on the Saddle

Road, Stainback Highway, and in the more undisturbed, wet forests of Hawaiian Volcanoes National Park, but this thrush also is found in 'ohi'a forests at higher elevations on the Kona coast.

A nest of this species and genus was first found near the Saddle Road on May 11, 1968, by Andrew J. Berger (1969). The nest, built on the trunk of a tree fern less than 5 feet above the ground, contained a single egg which was heavily covered by small, irregularly shaped, reddish-brown markings.

8. Sylviidae (Old World warbler family)

The LAYSAN MILLERBIRD (Acrocephalus familiaris familiaris) was one of three species of endemic birds to become extinct on Laysan prior to 1923 because of the destruction of the habitat by the rabbits. How the ancestors of this small bird (about 5½ inches in total length) managed to reach Laysan and Nihoa is, of course, unknown. Because of their Old World affinities, however, it is assumed that they came from Asia and "island-hopped" to reach Laysan and Nihoa islands.

The NIHOA MILLERBIRD (Acrocephalus familiaris kingi) has one of the most limited distributions of any bird species: Nihoa contains 156 acres. Personnel of the Bureau of Sport Fisheries and Wildlife estimated a total population between 500 and 600 in 1967. The species is endangered because of its limited distribution, and it is imperative that rats, cats, and dogs be prevented from gaining access to Nihoa and the other islands in the Hawaiian Islands National Wildlife Refuge.

The birds are secretive in habits, usually staying in the dense cover afforded by Chenopodium sandwicheum (goosefoot) and Sida fallax (ilima). Several nests have been found in this vegetation, but little else is known about either the breeding biology or the feeding habits of the Nihoa Millerbird.

9. Muscicapidae (Old World flycatcher family)

The 'ELEPAIO (Chasiempis sandwichensis), important in Hawaiian folklore, has a puzzling distribution in that races have developed on Kauai, Oahu, and Hawaii, but there is no evidence that the species was ever found on the other main islands in the chain (Wilson and Evans, 1890 - 1899).

Although not as common as reported during the early 1900s, the 'Elepaio has been able to adapt to man-made changes in the environment as no other endemic landbird has been able to do. The Oahu race (C. s. gayi) is still fairly common in the mixed forests of the island, and a small population is resident in the lowland introduced forest near the head of Manoa Valley.

The Kauai race (C. s. sclateri) is common in the Koke'e State Park area as well as in the Alaka'i Swamp. The Hawaii race (C. s. sandwichensis) is found both in the wet 'ohi'a forests and in the dry mamane-naio forest on Mauna Kea.

Frings (1968) found that the Oahu 'Elepaio defended a territory of 4.9 acres. The nest site is selected by the female, but both sexes take part in nest-building activities. The average height above ground of 32 nests was 25 feet. The small cup-shaped nests are very neat and compact, and contain large quantities of spider web, which aids in holding the plant materials together. The eggs have a white background covered with reddish-brown spots, which are concentrated at the larger end of the egg. The clutch size was 2 eggs in 15 nests and 3 eggs in one nest. The incubation period is 14 days, and the nestling period, 16 days. Frings found the breeding season in Manoa Valley to extend from mid-January to mid-June. The season differs on the other islands for as yet unanalyzed reasons.

To be continued

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Field Notes from Charles G. Kaigler, 6 & 7 July 1970: Kapaa district, Kauai

Both Hilde and I found two Collared or White-throated Laughing Thrush (Garrulax albogularis) feeding in and under a plumeria, shortly after dawn in company with a pair of Chinese Thrush (Garrulax canorus). We are quite familiar with the Chinese Thrush, but this was our first sighting of the Collared Thrush. The size (10-11")

and general brown coloration was almost the same, but the white cheeks, instead of spectacles and the white throat, light brown to yellowish breast with a dark V-shaped collar or necklace crossing it were distinctive. We saw our bird on later dates, and the bird has been seen since by Dr. David Sears who lives in the house where we were staying.

Field Notes from Charles G. Kaigler, 20 September 1970: Kahuku

Our first journey to Kahuku this fall proved both disappointing and rewarding. We could find no trace of the Bristle-thighed Curlew, and the ponds near the airstrip were almost devoid of birds; 2 wandering tattler, a dozen or so each of golden plover and ruddy turnstone. However, the enlarged pond near the sugar mill held some 200 pintail, one shoveler, over 100 coot, over 50 stilt, hundreds of plover and turnstone, a few sanderling, and one semipalmated plover. We found three gallinule; also a number of cattle egret, three black-crowned night heron, 2 tattler and of course, ricebirds, doves and mynahs. Offshore a flock of about 8 red-footed boobies dived for fish.

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FAIRY TERN NESTS IN WAIKIKI

By Charles G. Kaigler

Hilde Kaigler has already reported on the number of Fairy Terns that she has observed in the Ft. DeRussy area this summer. Now we can report the successful nesting of at least one pair in the area of the center of Waikiki. One parent was observed by Hilde on 11 September 1970 setting as if on an egg on a high branch of a monkeypod tree adjacent to the MP booth in DeRussy. The limb was too high, about 30 feet, for actual observation of an egg, but one bird was always there in the same spot each time we looked, which was almost every day thereafter. We were not able to stay long enough to observe possible changeovers on the egg by the parents. The bird was in the same spot on 29 September. We did not observe on 30 September or 1 October, but on 2 October, a chick was sitting on the branch next to the parent, a small ball of light grey-brown down with a well-developed bill and the dark eye-circle markings already in evidence. The chick moved about on the branch without hesitation but spent most of its time nestled in the breast feathers of the parent, one of which seemed to be present at all times.

On both 3 and 4 October we were able to observe feeding procedures. One parent would fly in from the ocean with three small translucent fish crossways in its bill, would replace the accompanying parent, and would face the chick with its head lowered and bill extended. The chick faced the parent and took the fish from its bill and swallowed them, one at a time. After feeding was completed the other parent, which had been perched nearby would return to the ocean, while the feeder took over brooding the chick.

Also, on 4 October, in one instance, while both parents were sitting by the chick, three other terns flew over to the tree and fluttered about the chick, softly yapping (the only way I can describe the sound) as if they were inspecting and presumably approving the new arrival. They were joined briefly by the parents who then returned to the limb as the others flew off again.

On both 5 and 6 October we witnessed parents returning without fish. Both the parent and the chick went through the same procedure as if the parent brought fish, but briefly, and if there was any exchange of food I couldn't see it. The chick, however, did not seem perturbed that nothing was forthcoming. On 6 October the parent that had returned without fish almost immediately flew out to sea and returned within 20 minutes with the usual three (one of the parents is banded, which raises the interesting question of where the terns came from). This was the first day that we have observed both parents being gone at the same time and for appreciable periods of time.

The chick, which seems to grow as one watches it, spends its time preening, stretching its wings, moving back and forth on the branch and sleeping. Three dark stripes on the crown became apparent on 5 October.

At least one more tern, first observed by Bill Prange on 21 September in Kapiolani Park setting on the limb of an ironwood tree near the band shell, should be hatching soon. On 7 October no bird was sitting on the nest when we arrived and we could see the egg, heavily blotched with brown. The tern returned within minutes and took up its position over the egg, it was still setting there on the 8th.

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MALLARDS ON OAHU

By David L. Olsen, Bureau of Sport Fisheries and Wildlife and
Gerald E. Swedberg, Natural Resource Staff, U.S. Navy

On 8 October 1970 Messrs Gerry Swedberg and David L. Olsen observed 5 mallards adjacent to a waterhole on the Waipio golf course, Waipio Peninsula. The caretaker there had reported the presence of these unusual ducks to the Hawaii Division of Fish and Game.

The birds were first noticed on the grass adjacent to one of the water hazards. Their orange legs and feet were obvious. They were approached within 50 feet before they flushed. As they jumped, the blue speculum bordered by thin white bars was easily noted. Four of the birds had the appearance of typical female mallards, while the fifth duck had the appearance of a typical male in eclipse plumage.

The birds flew around the golf course several times and then landed on the pond again. They immediately swam to the edge of the pond and walked up on the adjacent grass. They were again flushed at approximately 70 feet and the first observations were verified. A shoveler joined the flying flock, and the difference in size between the two species was clearly evident.

These ducks were a part of a flock of 19 ducks noted on the area. The other ducks were not identified.

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Excerpts from the minutes of the Hawaii Audubon Society general meeting, 20 July 1970:

...Mr. William Mull described the field trip of 12 July 1970 to Manoa and the Woodlawn Trail. He characterized this hike as "a good trip for plant-watchers." Among birds seen, however, were the Indian Hill Mynah, the Common Mynah, and the Shama Thrush....

The society voted unanimously to adopt Mr. Charles Kaigler's nomination to grant Honorary Life Membership to Miss Margaret Titcomb, Mr. W. Michael Ord, Mr. E.H. Bryan, Jr., and Mr. Charles Dunn. These four individuals have donated an enormous amount of their time and energy to the Hawaii Audubon Society.

Mrs. John Knight spoke...about...Flora Pacifica, slated to be held in the Honolulu International Center from 11 through 20 September. This is to be an ethnobotanical exhibition, emphasizing man's dependence and use of plant life in the Pacific environment. This community-sponsored exposition will cost $250,000.

Rob Shallenberger reported his finding of the first nest of the Great Frigatebird ...on Moku Manu...on 17 July 1970....

Mr. George DuBois, Executive Director of the Hawaii Wildlife Federation,... stressed that, as of July, 8,000 signatures have been collected on a petition asking that the Axis Deer be released on the Big Island. He suggested that we write to the president of the National Wildlife Federation to express our opinions. The address is: Dr. James H. Schaeffer, Parker, South Dakota.

Mr. David Woodside showed a most interesting movie dealing with the Nene Restoration Project. This project was begun in 1949, at a time when only 12-50 Nene remained in the wild.

It was suggested that the Hawaiian Crow may be the next bird to be artifically reestablished. Mr. Winston Banko, Wildlife Biologist with the Rare and Endangered Species Program of the U.S. Bureau of Sport Fisheries and Wildlife, has estimated that only about 24 of these endemic birds are left....

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HAWAII'S BIRDS, a field guide for $2.00, is an excellent gift for mailing to friends. Send in your orders to: Book Order Committee, Hawaii Audubon Society, P.O. Box 5032, Honolulu, Hawaii 96814.

Our new honorary life members:

E. H. Bryan, Jr.

His close association with the Bishop Museum was of the greatest help. He wrote many articles for THE ELEPAIO, was always ready to do any research into a scientific problem that arose. Made skins and mounts available to us for study. Encouraged us particularly in regard to THE ELEPAIO, which he has always felt is an important contribution to scientific knowledge of the Pacific.

Charles M. Dunn

In 1939 he put a notice in the Star-Bulletin, for which he worked for many years, calling on people interested in birds to meet at the Library to form a bird-study club. He was elected secretary at that first meeting, an office which he held for a year or two. In the early days of the Hawaii Audubon Society he never missed a meeting, led many of the trips (he was well acquainted with the trails) saw that our publicity got into the paper, and was indeed, a staunch member and a great help.

W. M. Ord

He has a true passion for birds. So much so that he was willing to help us out, because he wanted to help those who were interested. His photography, I think, was largely undertaken with the purpose of learning more about birds, so that he could study every aspect of the bird. He was largely responsible for the new edition of our field guide, HAWAII'S BIRDS, and for its illustrations.

Grenville Hatch

Margaret Titcomb

She is a conservationist in the word's truest sense. To her, all natural resources are worthy of protection and preservation. Besides her great professional contribution as Librarian of the Bishop Museum, her gift of her services to the entire community through her activities in the Hawaii Audubon Society (she has served in practically every office and on countless committees, assisted in research, written and edited material for ELEPAIO), on the Conservation Council for Hawaii, in the Hawaiian Botanical Society, in hearings before the Territorial, then the State Legislatures, in ways too numerous to mention in this brief note, has given impetus and encouragement to all of her associates.

Charlotta Hoskins

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ALOHA to new members:

Regular to Life: Mr. & Mrs. William P. Mull, 3202 Woodlawn Drive, Hon. 96822.
Reinstated: Dr. & Mrs. John W. Cooper, 3551 Nuuanu Ave, Hon. 96817.
Regular: John J. Allen, 99-448 Fernridge Place, Aiea, Oahu 96701
Frank Bragg, 1810 University Ave, Honolulu, Hawaii 96822
Mrs. O.J. Burnett, Colony Surf #1501, 2895 Kalakaua Ave, Hon. 96815.
Mrs. Phyllis M. Gummerson, 14 Makalapa Drive, Honolulu, Hawaii 96818.
Dr. David R. Sears, RR1, Box 214D, Kapaa, Kauai 96746

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IN MEMORIAM

Two long-time life members, Mrs. Alfred L. Castle and Mr. M.B. Henshaw, died in September. We'll miss their generous support, and we extend our deepest sympathy to their families.

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NOVEMBER ACTIVITIES:

8 November - Field trip to study shorebirds. Bring lunch, water, and if possible your car. Transportation cost ($1.00) to be paid to the drivers. Meet at the State Library on Punchbowl Street at 8:00 a.m. Leader: William P. Mull, telephone: 988-6798.

9 November - Board meeting at the Zoo entrance bldg at 7:30 p.m. Members welcome.

16 November - General meeting at the Waikik Aquarium Auditorium at 7:30 p.m. Speaker: Jerome Pratt, Haleakala National Park Administrator Topic: North American Endangered Wildlife

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HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:
President-LtCol Charles G.Kaigler, Vice Pres.-Miss Margaret Titcomb & Jack L.Throp
Secretary-Mrs. William P.Mull Treasurer-William W. Prange, Jr.
Board Members: William P.Mull & David H. Woodside
THE ELEPAIO: Editors-Miss Charlotta Hoskins & Miss Unoyo Kojima
MAILING ADDRESS: P.O. Box 5032, Honolulu, Hawaii 96814
DUES: Regular-$3.00,Regular out of State-$2.00,Junior-$1.00,Organization-$2.00,$50.00 Life-