

'ELEPAIO

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SEABIRDS IN THE CITY: BREEDING OF THE WHITE TERN IN LOWER MAKIKI

by Linda D. Murakami

Although the White Tern (*Gygis alba rothschildi*) breeds on most islands in the tropical Pacific, including the Leeward Chain (Berger, 1972), breeding records on Oahu are few. Ord (1961) first reported nesting on Oahu at Koko Head. Berger (1972) and Shallenberger (1975) reported low breeding numbers at Kahala, Kapiolani Park, and Fort DeRussy. Very little is known about the bird's breeding cycle. Ely and Clapp (1973) reported peak breeding during spring and summer on Laysan Island. Richardson (1957), studying the breeding cycles of birds of the Northwestern Hawaiian Islands, classified the White Tern as a year-round breeder. He reported, "Eggs are known from all months except January and September, with perhaps the greatest numbers laid from March into July."

The White Tern does not build a nest, but lays its egg on a horizontal branch or in a crotch of a tree. On Midway, adults were seen brooding chicks on the edge of flat roofs of the Bachelor Officers' Quarters (Berger, 1972).

Since February, 1977, I have been watching a small group of White Terns in downtown Honolulu, near the police station, Kalakaua and Young Streets. There is an asphalt parking lot at this intersection, and the area is heavily trafficked. The lot is lined on the Kalakaua side by four Philippine Mahogany trees. These trees have open but shady interiors. I observed the birds daily at 7:30 A.M. and 4:30 P.M. through September, and twice a week through November.

I first saw a pair of White Terns settle in one mahogany tree on February 22. The winds were gusty that day, and I thought perhaps the pair had come inland due to the



Fig. 1. White Tern chick, about 39 days old.

--Photo by the author



Fig. 2. Note the development of the wing and tail feathers.

--Photo by the author

storm. The pair seemed oblivious to the heavy traffic. I did not see any terns in this area again until late April, when groups of two to four flew in tight circles over the intersection.

In mid-May I saw one White Tern roosting on the crook of a branch about one foot thick, approximately 20 feet above the ground. The bird was in this spot for ten days, after which I did not see it.

On August 15, another roosting tern was observed apparently incubating an egg (R. Palomo and G. Oshiro, pers. comm.) I was quite certain the bird was incubating, as it made several "tucking" motions with its bill. The bird sat on an 8 in. thick, horizontal branch, approximately 25 feet from the ground.

On the evening of September 8, the discarded egg shell was discovered underneath the tree (G. Oshiro, pers. comm.) and on the morning of September 9 I first observed a downy chick peeping from underneath its parent's wing. By the following day, the chick was frequently alone.

By September 14, at about five days old, the chick was already about one-third the size of the adult. A parent returned with small fish carried in its beak about every half hour. The chick did not display any apparent begging behavior. After about five minutes of feeding, the parent would fly away again. The chick was able to turn around shakily on the branch and did so three times in one five-minute observation. The chick was downy, light beige to off-white, with dark grey streaking on its wings and head. I observed it lift its head and clean under and around its wing.

By October 18, at about 39 days old, the chick had most of its tail feathers, but still lacked the characteristic forked tail of the adult (Figures 1 and 2). The chick had replaced much of the down on its face and breast and spent most of its time preening its breast and wing areas. During this observation a parent returned with two fish, one fish almost as long as the chick, which it consumed with just a few swallows. At this time the chick was about two-thirds the size of its parent.

During my observation on October 27, the chick was vigorously flapping its wings while walking sideways along the branch. The chick did this several times, flying two inches off the branch on its third attempt. At about 50 days old, the chick had fledged, and made several circular flight patterns within and around the tree.



Fig. 3. White Tern fledgling, about 53 days old.

--Photo by M. Stemmermann



Fig. 4. A little down is still visible on the neck and wing coverts.

--Photo by M. Stemmermann

After each flight, it performed much preening. The chick's growth had slowed; it still had some down on its upper wing coverts and brown edging on its secondaries (Figures 3 and 4).

On the morning of November 5, I saw for the first time both parents with the fledgling. The fledgling was fed twice in a half hour period, greeting both parents with a high pitched "kee kee" call. This was the first time I heard the fledgling vocalize.

Howell in Berger (1972) reports the young tern to stay near the nesting site for several weeks after its first flight. It will be interesting to see if this one stays until it is full grown. It would also be worthwhile to check for future tern nestings in this downtown area.

ACKNOWLEDGEMENTS

I would like to thank Ricky Palomo and Glenn Oshiro for giving me information on the activities of the White Terns, and C. J. and Carol Ralph for their suggestions on the manuscript.

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HAWAII AUDUBON SOCIETY BOARD MEETING, OCTOBER 10, 1977

The Board discussed editorial policy for the 'Elepaio. The journal is presently under a five-person Editorial Committee, with C. J. Ralph as Acting Editor. Questions had arisen as to the selection of the Editor and to the powers of the Editor in rewording submitted articles. Frank Howarth agreed to develop draft wording expressing the Board's resolve

that the 'Elepaio Editor be appointed by the President with the advice and consent of the Board, and to draft statements of policy guidance for the Editor, as may be appropriate. A motion was passed approving of the continuation of the Editorial Committee of five members with C. J. Ralph as Acting Editor.

As a result of a letter inquiring about the availability of a Society grant for a study in marine biology, the Scholarship Committee was asked to formulate a policy for accepting candidates for scholarships and report back at the January Board Meeting.

The inventory of *Hawaii's Birds* has dropped below 7,000, and there is a need for reprinting. Rob Shallenberger, who edited the book, cited three areas for changes in the new printing: minor changes and corrections, changes resulting from new research, and better pictures. A large order of the Preliminary List was made by the DOE, and we should think about a reprinting of it also.

It was decided to dispense with the reading of the Minutes at the General Meeting, but for the Recording Secretary to prepare summaries of the Board and General Meetings for inclusion in the 'Elepaio.

L. Pyle proposed that the Society make a donation to the Friends of the Aquarium. A table top speaker's podium was suggested as an appropriate gift. The donation will be discussed with Aquarium officers, and Rob Shallenberger will investigate costs of a suitable podium. If no gift can be agreed upon, a cash donation will be made before the end of 1977.

HAWAII AUDUBON SOCIETY OFFICERS FOR 1978

The Nominating Committee proposes the following names for Hawaii Audubon Society Officers for 1978:

President	Dr. Robert L. Pyle
Vice-president (Program)	To be Nominated
Vice-president (Conservation)	Dr. Robert J. Shallenberger
Treasurer	Lawrence T. Hirai
Recording Secretary	Maile Stemmermann
Corresponding Secretary	Dr. John F. Walters
Director (Legislative)	George Campbell
Director (Field Activities)	Timothy A. Burr

Additional nominations are welcomed and may be made at the General Meeting of the Society on December 12, at which time Officers will be elected.

GLEANINGS FROM THE TECHNICAL LITERATURE

EVEN DODOS WERE GOOD FOR SOMETHING

Plant-animal mutualism: coevolution with dodo leads to near extinction of plant

by Stanley A. Temple
Science 197: 885-6, 1977

Dr. Temple has deduced a fascinating case of a plant depending on an animal for survival. On the island of Mauritius in the western Indian Ocean an endemic, large-fruited tree, *Calvaria major* (family Sapotaceae, which also includes the star apple), has declined in numbers to only 13 individuals, all at least 300 years old. These trees regularly produce abundant seed, but the seeds have never germinated, in natural or nursery conditions. The seed is encased in a large, very hard pit about 30 mm across with walls 15 mm thick. Dr. Temple noticed that the age of the last *Calvaria* reproduction apparently coincided roughly with the time the dodo was exterminated by man. The dodo was a large (about 12 kilograms), flightless bird that ate fruits and seeds, especially of large-fruited forest trees. It had a strong gizzard with stones in it for crushing these foods. From measurements of the forces in the gizzards of existing birds, Dr. Temple calculated that a *Calvaria* seed probably would have survived a trip through a dodo, although it would have been severely abraded. When Dr. Temple force-fed 17 *Calvaria* fruits to turkeys, he recovered 10 of them, and most importantly, three of these subsequently germinated, the first *Calvaria* saplings in three centuries. The author proposes that the extremely thick and hard seed coat evolved to protect the seed from being digested in the dodo's gut. However, in the process the seed coat became so tough that the seedling could not force its way out unless this capsule had been weakened by digestion. The tree then depended on the dodo for germination.

Examples of such interdependence continually remind us of the value of preserving all of the many elements in an ecosystem, any one of which may be critical.

C. P. Ralph

THE BREEDING BIOLOGY
OF THE OAHU 'ELEPAIO

by Sheila Conant
Wilson Bulletin 89(a):193-210, 1977.

The author conducted a field study of the nesting biology of the 'Elepaio (*Chasiempis sandwichensis gayi*) in Manoa Valley, Oahu, from November 1965 to May 1968. The study site was 70 ha, mostly covered with introduced vegetation. Results were based on 32 nests and 53 eggs in 26 clutches. The breeding season of the 'Elepaio extended from December to mid-June, with males establishing 2 ha breeding territories in late December or January. Courtship activities began in mid-January, and nesting occurred from February until May. Dr. Conant observed the last young becoming independent in June. Nest construction took about two weeks, and at the one nest followed closely the incubation period lasted 14 to 16 days and the nestling period 16 days. Because the total time for this cycle was about 6 weeks, it is possible that a pair could raise two broods in one season. In closely-followed nests, the clutch sizes were two eggs in 15 nests and three eggs in one nest. Based on 27 nests with 53 eggs, total nesting success was only 13%, with hatching success 29% and nestling mortality 42%. Dr. Conant suggested that high winds and heavy rains were the primary causes of nest failure, although rat predation may also have contributed. Observations of the races on Kauai (*C. s. sclateri*) and Hawaii (*C. s. sandwichensis*) were also included in the discussions of such topics as foraging behavior, territory, clutch size, and incubation length.

Of course, a great deal more work remains to be done with the Oahu 'Elepaio. For instance, color banded birds could be followed more closely. However, the author has contributed one of the few detailed field studies on Hawaiian birds. A painting of the 'Elepaio by H. Douglas Pratt enhances the paper.

Lawrence T. Hirai

POSSIBLE SIGHTING OF AN 'IO
(HAWAIIAN HAWK) ON OAHU

by G. Vernon Byrd and Richard A. Coleman

A small buteo, which we identified as a dark phase 'Io or Hawaiian Hawk (*Buteo solitarius*), was seen soaring over Pearl City unit of Pearl Harbor National Wildlife Refuge, Oahu Island, at 1:00 p.m. on September 28, 1977, by the authors and Gordon Black. The buteo soared briefly over the northeast corner of the Refuge, as close as thirty feet above the observers, before disappearing over the trees to the north (mauka).

The bird initially was flying with four Rock Doves, and appeared slightly larger than the doves. In flight, its wing strokes were deep, like the doves' flight. It hovered two or three times. The wings were rounded and appeared narrow for a buteo, but not narrow and pointed like a falcon. The tail was relatively short, rounded like a buteo's tail, and showed light and dark bars of even width, about a third of an inch wide. The head was brown. Breast and underwings were medium brown, not as dark as the head. The bill was short, dark and hooked.

The wings seemed more narrow than the wings of a Broad-winged Hawk, and the dark underwing linings were not typical of a Broad-wing. The bird appeared to be too small for any North American buteo.

This observation was made using 10X binoculars with the bird in good light. The sky was partly cloudy, and winds were light southerly, 5-10 mph.

We are quite familiar with North American hawks, but neither of us has previously seen an 'Io.

Asst. Refuge Manager, USF&WS

Wildlife Biologist, USF&WS

COMMENT ON THE HAWK SIGHTING

by Robert L. Pyle

The native range of the 'Io is on Hawaii Island, and there are no confirmed records of it on any other island. The most recent unconfirmed sighting away from Hawaii Island of a reported Hawaiian Hawk was on the southeast coast of Maui Island, directly across Alenuihaha Channel from

Hawaii Island, in early 1977 ('Elepaio, May 1977:138). This bird was last seen flying out to sea toward Hawaii Island.

Prior to the sighting on Oahu, Kilauea Volcano on Hawaii Island had been erupting along its east rift zone sporadically since September 15. On September 25, it began a new phase of continuous strong activity. At this time, the normal easterly trade winds had been replaced by generally light winds from the south. By the 28th, on the date of the observation of the buteo, volcanic dust was already discernible in the air over Oahu. Two days later, on September 30th, a state-wide air stagnation alert was issued—a very rare event in Hawaii. Visibility in the Honolulu-Pearl Harbor area of Oahu was severely reduced, due primarily to the volcanic dust and haze drifting in on the southerly winds from the eruption site.

One might hypothesize that an 'Io could have been driven from its home range by the sudden burst of volcanic activity on September 25, and might have drifted with the volcanic dust on the abnormal southerly winds until it reached Oahu, some 380 kilometers (235 miles) to the northwest.

PUBLICATIONS OF THE SOCIETY

HAWAII'S BIRDS by the Society (1975). This is the best field guide to our birds, and includes colored illustrations of all native and well-established exotic species. (Postpaid, add 27¢ for airmail)..... \$3.30

FIELD CHECK-LIST OF BIRDS OF HAWAII by R. L. Pyle (1976). A pocket-size field card listing the species recorded in Hawaii with space for notes of field trips. (Postpaid)..... .25 (ten or more, 10¢ per copy)

GUIDE TO HAWAIIAN BIRDING by members of Society and edited by C. J. Ralph (1977). Where to go and some idea of what you are likely to see. For the islands of Hawaii, Maui, Molokai, Lanai, Oahu, and Kauai. (Postpaid)..... .50

PRELIMINARY LIST OF THE BIRDS OF HAWAII by R. L. Pyle (1977). An authoritative compilation of all species naturally occurring in Hawaii as well as those introduced by man currently established as viable populations. Gives an excellent summary of each species' status. (Postpaid)..... \$1.00

WAIPIO PENINSULA FIELD TRIP

September 11, 1977

Sixteen members and guests turned out on a sweltering morning to observe the early migrants in the Pearl Harbor area. Most of the morning was spent at the Waipio Peninsula settling ponds, and some of the group continued on to Honouliuli later in the day.

At Waipio, there was little out of the ordinary to reward our efforts. The first two ponds ("Fountain Pond" and the adjacent settling pond) were full of Cattle Egrets, but there were few migrant shorebirds and only a token number of stilt. As we walked towards "Big Pond", we noted the presence of a large flock of Black-headed Munia in the grassy area to the right of the dirt road. A few of us caught glimpses of a pair of Strawberry Finches flying with the group. We approached "Big Pond" with a good deal of anticipation, as this was the area which has been rich in accidental species. Unfortunately, there was nothing more than a large flock of stilt, several Northern Shovelers, some Ruddy Turnstones, and Golden Plover. Halfway between "Big Pond" and the access road to Walker Bay, there were some excellent sightings of coot, stilt, Sanderling, with the added bonus of a Semipalmated Plover and a Pectoral Sandpiper. The birds were attracted to water which had accumulated around some bagasse heaps. The final settling ponds which we visited were disappointing. There was a large flock of stilt here, as well as Cattle Egret, plover, Ruddy Turnstone, and Sanderling, but no sign of the Killdeer or Ruff, which had been seen here earlier in the month.

At Honouliuli we were fortunate to have the opportunity to enter the replacement habitat area under the guidance of Demi Black of the Fish and Wildlife Service. The first and most exciting sighting here was that of the Bristle-thighed Curlew, which was standing on a dike less than 20 feet from our cars. We were also able to observe it as it foraged along the shoreline of one of the nesting islands. The long-awaited ibis was also seen as it fed among the shallows. Hovering over the water, and occasionally seen diving to the water level were a pair of Least Terns, at least one of which was immature. Golden Plover and stilt were extremely abundant here, and the Wandering Tattler was seen in fair numbers. No gallinules or herons were seen.

Total counts for Waipio: Spotted Dove, 15; Barred Dove, 2; Common Myna, 15; Japanese White-eye, 5; Northern Cardinal, 9; Red-

crested Cardinal, 10; Spotted Munia, 24; Black-headed Munia, 75; Red Munia (Strawberry Finch), 7; Golden Plover, 18; Semipalmated Plover, 1; Hawaiian Stilt, 176; Ruddy Turnstone, 11; Sanderling, 4; Pectoral Sandpiper, 1; Cattle Egret, 27; Black-crowned Night Heron, 1; Northern Shoveler, 6; Hawaiian Coot, 2.

Maile Stemmerman

FIELD TRIP TO MANOA CLIFFS TRAIL, OAHU

October 9, 1977

Twelve members and guests met at the State Library, and quickly moved up to the head of the trail. At 7:45 a.m., after directions by Dick Davis, we began a pleasant three mile hike under sunny as well as cloudy, but never rainy, skies. As we hiked through the forest, Betty Namakura and Maile Stemmerman pointed out various native and exotic plants, as the rest of us helped out on identification as best we could. A variety of native birds were seen on the trail, with the highlight being an 'Elepaio, showing its friendly nature by bouncing along branches less than three feet from all of us enchanted observers. As the group rounded the trail overlooking Manoa Valley, a White-tailed Tropicbird sailed below, lending an aquatic highlight to the otherwise terrestrial avifauna. Despite many keen ears, no Bush Warblers or the elusive India Hill Mynah were noted. In the tall grove of trees just before we met Round Top Drive, we encountered a very large concentration of birds including 2 'Elepaio, more than 50 Japanese White-eyes, several Amakihi, and 2 Red-whiskered Bulbuls. At 11:30 at Round Top Drive, we stopped for lunch as Dave Smith manfully jogged back to the cars to retrieve his car and ferry drivers back up to theirs.

The total number of birds seen or heard was: White-tailed Tropicbird, 1; Spotted Dove, 6; Barred Dove, 7; Melodious Laughing-thrush, 1; Red-whiskered Bulbul, 5; 'Elepaio, 9; Japanese White-eye, 360; 'Amakihi, 29; 'Apapane, 7; Northern Cardinal, 16; Spotted Munia, 142; and House Finch, 20.

In addition to these hikers mentioned above, our group included Jon and Tim Burr, Sarah Freeman, Holger Gossmann, John Mitchell and Janet Smith.

— C. J. and Carol Ralph

OCTOBER MEETING REPORT . . . "DON'T SHINE THE LIGHT ON THE FOOD"

At the October 17 general membership meeting, Dr. Sheila Conant presented a talk on a 1975 trip into the Alakai Swamp, Kauai, with Rob Shallenberger and Doug Pratt. For those of you who were unable to attend and who are dying to know what the title meant, apparently Doug Pratt preferred not to see his food while eating. We were never told why.

Dr. Conant showed a delightful series of slides taken by all of the expedition members. They were airlifted by helicopter on a day that must have had much magic, as it hardly rained for the next week! This was probably one of the longest dry spells the Alakai has ever had. The net result was a series of spectacular pictures of one of the most pristine treasures in the islands. Dr. Conant related that on the first morning they were awakened by an insistent Kauai 'O'o singing right overhead. It is sad to relate now, two years later, that the species has been seen only once since. Some feel that the bird may well be extinct. At any rate, the 'O'o they saw was full of vigor, and it and its mate were seen often feeding in the flowers of 'ohi'a trees around and near the camp.

Other species of rare and seldom-seen birds, such as the Small Kauai Thrush and 'O'u, were seen and heard in fair numbers. The Pueo, or Short-eared Owl, was not an uncommon visitor, cruising the treetops, looking perhaps for an unwary 'I'iwi. No pigs were found, but some sign was seen. This lack of pigs possibly explains the abundance of 'Ie 'Ie, the Climbing Screw-pine. This is supposedly one of the favorite foods of the 'O'u, and has been decimated in many areas of the islands by pigs. Even the endangered Koloa, or Hawaiian Duck, was recorded. A pair sprang up in front of Dr. Shallenberger from one of the streams near the camp. The streams themselves, full of "Alakai tea", were probably a bit acid, but quite palatable.

Dr. Conant talked about the differences between the Kauai birds and those of the Big Island. She mentioned that the 'Amakihi had a much bigger bill on Kauai, perhaps because of the presence of the 'Anianiau, a possible

competitor for the same resources. The Kauai Creeper has habits much like the Big Island bird, but its appearance is quite different. On a final note, left to intrigue the audience, Dr. Conant proposed the question "How did four *Loxops* ['Amakihi, 'Anianiau, Creeper, and 'Akepa] all manage to evolve, feeding on much the same substrate, 'ohi'a flowers and insects?" The answer, and how these species manage to survive despite the apparent competition with each other, is a study awaiting initiation.

On a poignant final note, Dr. Conant showed a silhouetted Kauai 'O'o and wished, with all of us, that somehow this and other species facing the bleak eternity of extinction could be brought back.

— C. J. Ralph

FUNDS FOR GRADUATE RESEARCH

Graduate students planning environmental research are encouraged to consider the National Wildlife Federation Conservation Fellowship program. Grants of up to \$4,000 will be awarded next May for a broad variety of topics, including resource management, environmental education, and wildlife ecology. The 4-page applications are due by Dec. 31 and can be obtained from the National Wildlife Federation (1412 16th St. NW, Wash. D.C. 20036) or Steve Montgomery (Dept. of Entomology, University of Hawaii, Honolulu, HI 96822).

CHRISTMAS COUNTS ON KAUAI

Kauai birders are rarer than the Oahu subspecies, but around Christmas their activity level is higher, with three bird counts to Oahu's two.

The Lihue and Kapaa counts will take place Saturday, December 17. For information on the Lihue count, contact Winona Sears, 190 Lalo Road, Kapaa, Kauai 96746, or call 822-3045. For information on the Kapaa count, contact Delano Kawahara, RR 1, Box 261 A21, Kapaa, Kauai 96746, or call 822-3271.

The Waimea count will take place Sunday, December 18. For information, contact David Boynton, P.O. Box 651, Waimea, Kauai 96796, or call 335-3393.

HAWAII AUDUBON SCHEDULE OF EVENTS

Dec. 12. Membership meeting, 7:30 p.m., Waikiki Aquarium auditorium. Officers for 1978 will be elected. Following the formal business, we will have a social hour, with refreshments. Come, vote, and talk story with fellow birders. (No Board Meeting this month.)

Dec. 17. Christmas Bird Counts: Ewa, Oahu; and Lihue and Kapaa, Kauai.

Dec. 18. Christmas Bird Counts: Honolulu, Oahu; and Waimea, Kauai.

Jan. 2. Christmas Bird Count: Volcano, Hawaii.

Jan. 9. Field Trip to Mokauea Island. See shore birds and a Hawaiian fishing community. More details in next month's 'Elepaio.

March 18-21. Not strictly a HAS event, but one of the most significant events of the decade for Hawaiian conservation: the biennial conference of the National Audubon Society's Western Region, at the Asilomar Conference Grounds in Monterey, California. The meeting will focus on the wildlife resources of Hawaii and Alaska, and the unique issues besetting them. More details as they become available.

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