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NOTES ON NESTS AND BEHAVIOR OF THE HAWAIIAN CROW *

By P. Wuentin Tomich

Second of Three Installments

Eggs and Incubation

On April 12, 8 days after the crows had been observed completing the nest, I visited the site with two observers. A brooding bird was flushed from the nest as we arrived at 11:18 A.M. The task on this trip was to describe and photograph the nest and its contents. Four eggs present in the nest were smeared with dried yolk from a broken egg. One egg was lightly smeared with blood when laid. It is assumed that the clutch size was originally five. No two eggs were exactly the same color; however, three had a pale greenish-blue ground color and were heavily splotched with brown. The fourth had a paler ground color of grayish blue, but generally heavier blotching than the others. In addition to the blotching, which was concentrated near the larger ends of the eggs, there were relatively dense flecks and a few spots, generally in black. The eggs were, therefore, in color and in pattern, much like those of other genera and species of corvids. Numerical data are given in Table 1.

Table 1: Numerical Data of Eggs Found in Nest No. 2

	Egg Number				Mean
	1	2	3	4	
Length (mm)	42.7	44.9	46.2	46.4	45.1
Width (mm)	29.0	30.5	30.2	29.1	29.7
Ratio (%)	67.9	67.9	65.4	62.7	65.9

It was impossible to know when incubation began, but if an egg had been laid daily from April 5 through April 9, it could have been as early as April 9.

On April 18, approximately on the 8th day of incubation, accompanied by one companion I made 5 hours of observations, beginning after daylight. An attempt was made to reach the nest and settle down near it before daylight, but the exact location could not be found by flashlight. We began watching from the partial blind consisting of jumbled 'a'a, tussocks of fountain grass, and a fallen limb at the base of an 'ohi'a 18 m from the nest tree. Both birds were vocal and active in the vicinity as we arrived and settled, but only one was seen in the dim light at the nest when the watch began at 6:45 A.M.

This bird soon left the nest, hopped up into the foliage about a meter above, rocked and fluttered, and then returned to brooding. The tail of the bird projected above the nest rim and usually indicated its location and position. The second bird was then seen at rest on the far rim of the nest. After incubating for 12 minutes, the nest bird shifted about 90 degrees. Four minutes later the resting rim-bird flew off 15 m to another 'ohi'a, returned below the adjacent old nest, preened briefly, and then flew 15 m in another direction to a lama, where it appeared to be foraging. Soon it returned and was identified again at rest on the nest rim. It soon became obvious that

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both birds shared the incubation, that the bird not sitting on the eggs at a particular time was highly solicitous of its mate, and that the birds sometimes preened one another. At other times the off bird sat quietly on the nest rim or rocked from side to side, dozing. It may be postulated that the nonbrooding bird spends the night on the nest rim because of the usual use of this resting platform during the day and the lack of any specific resting perches away from the nest. Changeover is frequent and the eggs are almost always attended by one or the other of the pair. Frequent trips are made away from the nest by one bird, and, for short intervals, both birds are absent.

At 8:00 A.M. the off bird was on the nest rim, vigorously preening, with one wing raised. Preening continued for about 2 minutes. At 8:05, after resting, this bird stood, shook and fluttered slightly, and flew off. The sitting bird arose and followed, but only to the adjacent lama tree; it then returned in slow stages from 4 m below the nest, to resume incubation. It was absent only 40 seconds. Its mate returned 10 minutes later, having called several times from some distance away. There had been no alarm. At 8:16 there was a definite changeover when the brooding bird arose slowly and flew off, and its mate slipped from the nest rim into position over the eggs.

Because of the similar appearance of the birds and because of our lack of knowledge of which bird was which after both were out of sight, we found it to be impossible to distinguish between the sexes. Some details of the nest activity were obscured by foliage and branches. Conditions improved when, at 8:23, I climbed from the makeshift blind to a vantage point near the level of the nest, causing minimal disturbance to the crows. ...

Self-preening by the bird at the nest rim was often continuous for several minutes, especially about the neck and breast, with wings somewhat raised and feathers loosely fluffed. Mutual preening also occurred frequently. At 9:17 the brooding bird held its head high as its mate sat on the nest rim. There was occasional bill preening between them; then the nest bird settled again. Five minutes later the birds were again billing. Then the nest bird twice probed gently, with bill open, at the head of the rim bird. It then rose from the nest cup, briefly ruffled its feathers, and flew off silently. The rim bird reached into the nest as if turning or arranging the eggs, leaned into the nest with wings and tail slightly ruffled, and then settled onto the eggs. This behavior required about 20 seconds, and was in contrast with the usual immediate settling of the relief bird.

Nest attention was somewhat casual with one bird leaving or returning at will and the other usually at hand to take over, even if just for a few minutes. At 11:16 the off bird returned to the nest rim, stood for nearly a minute over its brooding mate, then settled down with a rocking motion. When settling on the nest rim or into the nest, the birds often made this side-to-side motion as if placing the feet comfortably. After 3 minutes the off bird preened intermittently for 12 minutes, standing several times and then settling each time. Then it stood attentively with its head down as if urging its mate from the eggs. At this, the brooding bird flew off and the relief bird immediately settled on the nest.

With one observer, I visited the nest again on April 26, on about the 16th day of incubation. At 10:00 A.M., while we were still 100 m off, we heard excited calls of crows from near the nest. These calls were repeated in series several times during the next 9 minutes. When we circled and approached the nest from the forest above it, a crow that was apparently on a foraging trip 60 m from the nest and 30 m from us, ignored us. When we were in the close vicinity of the nest tree at 10:29, a crow flew from a perch in an 'ohi'a 12 m away to the nest, also seeming to ignore us. Several low calls came from the nest. We settled down under our observation tree at 10:36. One crow on the nest rim seemed to watch us idly, while the other remained in the nest, but neither expressed alarm.

After 6 minutes of quiet the rim bird stood up and soon flew off to an 'ohi'a 10 m away, perched 3 m above ground on a horizontal limb, pecked at the back, ran 3 m along the limb, and then flew back underneath the nest as low calls were made by the brooding bird. It idled in the tree for nearly 4 minutes, then rose in a hopping flight on a usual route to the nest rim. There it settled, preening. The disturbance in progress 45 minutes earlier seemed to have subsided completely. A gentle wind swayed the nest as the birds idled. The brooding bird turned about in the nest at

10:56 but appeared to be completely at ease. At 11:05 the brooding bird dipped off the nest and lit in a rangy, dying 'ohi'a about 30 m from the nest. This snag had been used occasionally when one or another of the birds approached the nest or at times of alarm. The crow began to preen, then after about a minute it began to make the ringing, fluty, two-note calls we had heard earlier in the day. These were loud, expressing a quality of alarm. Usually two calls were given in succession, but sometimes these were single or in threes. These vocalizations appeared to have a special significance, so are reported in some detail. In the next 7 minutes the bird gave 20, 23, 29, 24, 26, 24, and 21 calls. In the first minute the bird gradually ceased preening as its excitement rose, and this excited state was maintained. During the 4th minute, having continuously faced the nest, the bird then turned about and faced away from it. The nest bird seemed to ignore its calling mate until the 5th minute when it then showed alertness toward the bird on the snag. At the beginning of the 8th minute the perched bird gave one call, and flew about 60 m to the edge of a large kipuka where the birds frequently foraged. After two additional calls from the kipuka, the brooding bird left the nest, perched about 20 m away, and answered with a pair and a single one of the same kind of calls that its mate had been making. In the 9th minute the more distant bird sounded five more calls and these were answered with three calls by the bird that had just left the nest. This crow then flew off to join the other at the kipuka and all was quiet.

When the birds did not return after 9 minutes I quickly climbed to the nest. A single egg remained which was heavily stained with yolk from other eggs broken and which was infertile or had otherwise failed in development. It was then obvious that the nest was a failure and that the alarmed behavior observed that morning was part of the process of voluntary abandonment of the nest. The fate of the missing three eggs, which had not been seen since the nest was examined closely 14 days earlier, was a matter of conjecture. Apparently they had been broken, possibly in the normal nest care by the crows. The surviving egg weighed 15.6 g.

At 11:26 A.M. one crow returned to the nest in great alarm as I remained in the tree about 3 m away, at the level of the nest.

The bird brooded the empty nest only briefly and then left. First one crow and then the other (the bird which had called from about 300 m away) returned after 20 minutes. Both birds were in the tree, somewhat disturbed by my presence, and, when I took several photographs, they called almost continuously. Later, one bird again returned and settled on the nest, but both birds left as we retreated from the nest area at noon.

The unfortunate loss of the nest may be attributed to the softness of egg shells which could not withstand the usual pressures during the turning of the eggs and during incubation. A second possibility is that the roof rat (Rattus rattus) may have been a predator on the eggs. This rat is a common resident of the forest, but since no observations of its behavior are available, no conclusion can be drawn.

To be continued

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On 1 March 1973 the State Department of Land and Natural Resources Division of Fish and Game has issued for the general public an illustrated single page information on the Hawaiian crow under the heading PROTECTED SPECIES! Hawaiian Crow or 'Alala

The public is reminded that the Hawaiian Crow is protected by both State and Federal law and should never be disturbed.

This large black native forest bird is found on the slopes of Hualalai and Mauna Loa in the Kona and Kau Districts of the Island of Hawaii.

It is very rare with perhaps less than 100 remaining today. In the latter part of the 1800's the 'Alala was reported to be very numerous in the forests of Kona. However, after 1890 the population began to decline drastically probably due to the effects of introduced bird diseases and changes in the forest habitat brought by cattle grazing.

The 'Alala builds a bulky nest of sticks and twigs in larger trees and raises two or three young during the summer. In recent years very few young birds have been produced and studies are underway to determine the causes of the low production and to learn what may be done to save this interesting native bird.

Unlike crows in the mainland United States the 'Alala is not a pest and causes no damage to agriculture. It feeds mostly on fruits and berries of native and introduced forest plants.

All persons are urged to help protect the 'Alala and to report sightings of this rare and endangered species to the Division of Fish and Game office in Hilo. Phone number 961-7291.

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DISCOVERY OF THE NEST OF THE KAUAI 'AKEPA *

By C. Robert Eddinger

...The 'Akepa (Loxops coccinea) has distinct subspecies on four of Hawaii's main islands: Loxops coccinea caeruleirostris on Kauai; L.c. rufa on Oahu; L.c. ochracea on Maui; and L.c. coccinea on Hawaii. The species is fairly common only in the Alaka'i Swamp region of Kauai, less common at Koke'e State Park on Kauai; it is extinct on Oahu, and rare on both Maui and Hawaii.

..."On one occasion I saw a pair of the Maui species building their nest high up in a tall 'ohi'a, near the extremity of a horizontal branch. Both sexes kept coming to the ground for material and were carrying off the woody down or 'pulu' of some stunted tree ferns, probably as a lining for the nest. This was so well concealed that even with glasses I was unable to make out the details of structure with any certainty, and the eggs and unfledged young I have not seen." ...

I discovered the first Kauai 'Akepa nest in Koke'e State Park on 9 March 1969. ... The 'Akepa is not common in the Koke'e area, but I have seen as many as five in one day of field work there. The nest was in the terminal crown of a non-blooming 'ohi'a tree 30.5 feet above the ground. The top of the tree was too thin to support my weight, but I was able to see into the nest by using a mirror attached to the end of a six-foot pole. The nest was empty and appeared incomplete in that one side was still thin. After checking the nest I concealed myself in the underbrush beneath the tree. Ithen saw one bird fly to the nest, hop in and remain for two or three seconds, after which it flew down to within 15 feet of me. I could plainly see that it was an 'Akepa. It gave repeated call notes and then flew back to the nest.

I watched both the male and female 'Akepa adding material to the nest. Between 8:30 and 10:30 on 11 March, each added material eight times. The male often sang from a tall neighboring 'ohi'a tree as the female was adding to the nest. His song was a high trill, higher in pitch and shorter in duration than the song of the 'Anianiau. The male also uttered a variety of whisper songs, similar to those of the 'Amakihi.

I observed courtship feeding on several occasions, usually on a branch a short distance from the nest but once on a branch only three feet from the ground. The female soliciting feeding by crouching slightly, depressing and quivering her wings, and giving a vocalization similar to that of a fledgling begging for food.

A pair of 'Apapane were building in a neighboring 'ohi'a tree 40 feet from the 'Akepa nest. On several occasions the 'Apapane flew to the 'Akepa nest, pulled loose nesting material, and added it to their own nest. This stealing was usually done during the absence of the 'Akepa but on 14 March an 'Apapane flew to the nest while the 'Akepa were present. The male 'Akepa gave the alarm call and chased the 'Apapane from the nest and through several nearby trees, but in less than 15 minutes the 'Apapane returned and, in the absence of the 'Akepa, again took material from the nest. The 'Akepa were still adding material on 18 March. On 27 March I found half of an egg shell on a branch about a foot below the nest. The shell fragment looked very much like the eggs of the other drepanidids--white with irregularly shaped brown markings. The lining had been torn out of the nest and neither adult was near. I continued to observe the nest until 4 April but never saw the 'Akepa near it again.

The construction of the 'Akepa nest differs from that of the 'Akepa in that fewer twigs and coarse materials are employed, the 'Akepa nest being composed largely of mosses. Construction is less compact so that from the ground the nest appears quite large. Measurements were as follows: rim thickness, $\frac{3}{4}$ to $1\frac{1}{2}$ inches; outside diameter, $3\frac{1}{4}$ to $4\frac{1}{2}$inches; measurement from the top rim to the bottom of the nest, $4\frac{1}{2}$ inches;

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inside diameter of the nest cup, 1¾ to 2½ inches; depth of the nest cup, 1¾ inches.

In 1970 I found two inaccessible 'Akepa nests, the first on 26 March and the second on 11 April. I estimated their heights to be approximately 40 feet above the ground. Both were in the terminal crowns of non-blooming 'ohi'a trees. The first nest was under construction when I found it and I observed courtship feeding in this pair. The second probably contained eggs, because the female spent periods of 15 to 20 minutes in the nest.

On 29 March 1970 I found an accessible 'Akepa nest 37.5 feet above the ground in the terminal crown of a non-blooming 'ohi'a tree. The nest appeared to be complete when I found it. The first egg was laid in this nest on 2 April, the second on 3 April. The eggs measured 16.6 x 13.3 mm and 16.6 x 13.1 mm. They had a whitish background with irregularly shaped dark brown markings scattered over the entire surface, but more concentrated at the large end of the egg. On 4 March the nest lining had been pulled up, burying the two eggs. I observed the nest until 6 April when it was apparent that it had been deserted. I broke one of the eggs to see the yolk. It was yellow, as in the eggs of the 'Amakihi and 'Anianiau, as opposed to orange as in 'Apapane and 'I'iwi eggs.

Travel funds for this study were provided in part by grants from the Chapman Memorial Fund, the Eastern Bird-Banding Association, and by National Science Foundation Grant GB-5612, awarded to Andrew J. Berger, Department of Zoology, University of Hawaii.

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BIRD OBSERVATIONS AT OPAEULA AND AIMAKAPA PONDS, HAWAII

By Eugene Kridler

On February 27, 1973 a through water-bird census was conducted on Opaeula and Aimakapa (Honokohau) Ponds located in North Kona, Hawaii, by the writer and Messrs. Norman Carlson and William Lindsey. Following is a tabulation of the results:

	Opaeula	Aimakapa	Total
Cinnamon Teal	-	2	2
Pintail	-	32	32
Shoveler	18	82	100
Scaup	-	1	1
Cattle Egret	-	1	1
Black-crowned Night Heron .	-	1	1
Semipalmated Plover	1	-	1
Wandering Tattler	2	2	4
Hawaiian Stilt	14	6	20
Golden Plover	4	6	10
Hawaiian Coot	10	48	58

The remains of a cattle egret were found at Opaeula Pond. The scaup was a female. The cinnamon teal pair consisted of a drake in full spring plumage and a female with which it kept company. One coot was noted on what appeared to be a floating nest in the middle of Aimakapa, but we were unable to determine if it contained eggs. No definite pairing of stilt could be determined.

The water level at Aimakapa appeared normal; however, Opaeula was very low, possibly as a result of draught conditions which this part of the island of Hawaii is experiencing this winter.

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Field Notes from Mabel R. Becker: Red-vented Bulbul

The red-vented bulbul first seen in March 1972 nested that year and is again nesting in the same yard across the street from 614 Kaha Street in Kailua, Oahu. As many as 6 have been reported at the same time.

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PLEASE IDENTIFY by Mary Roberts, 1 March 1973

An all black bird as large as a bulbul but with longer tail feathers and sporting a crest. Its call is a throaty "kerwit".

I checked in BIRDS OF THE WORLD by Oliver F. Austin, Jr. and found a bird resembling it; namely, the Phainopepla. It is 7" in measurement, the bulbul is 8". This bird, however, shows a bit of white.

I live on Makiki Street. My cousin in Manoa Valley reported seeing an identical

bird.

/Could it be red-vented bulbul?/ No. I have red-vented bulbuls and their babies as frequent visitors and also the African bulbul minus red whiskers. This bird is actually larger than the bulbuls and cardinals. My cousin has had as many as sic sit on his fence in Manoa, another cousin saw them on her feeder on Pensacola Street, and they revisited my garden yesterday calling a deep-throated "kerwit". They were too far away for me to get a good look, but when they flew, they looked every bit as large as the blackbirds in California. This definitely is a newcomer, but seems to be well-established already.

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Field Trip 14 January 1973 to Fort Kamehamaha, Salt Lake, Sand Island, and Walker's Bay by William Wingfield

The January field trip of the Hawaii Audubon Society was conducted to observe shorebirds. At Fort Kamehameha, on the mudflats, were observed good numbers of Hawaiian Stilt (32), Wandering Tattler (6), Ruddy Turnstone (50), Sanderling (12), and Golden Plover (20). Offshore were noted 6 Brown Boobies.

At Walker's Bay in West Loch we saw 8 Stilt, 3 Black-crowned Night Heron, 22 Shoveler, 6 Golden Plover, 5 Ruddy Turnstone, 2 Wandering Tattler, 4 Hawaiian Coot, and the lone resident Mallard drake. The settling basins were unsatisfactory for bird use, all but one being dry and that one being too full.

Salt Lake produced 35 Coot, 86 Pintail, 2 Shoveler, 12 Golden Plover, 4 Wandering Tattler, 17 Stilt, and 6 Scaup.

At Sand Island we observed 6 Brown Boobies and 2 Pomarine Jaegers circling over the sewer outlfow.

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Field Trip 11 February 1973 to Palehua-Palikea by William Wingfield

The February field trip, led by Mr. Alex MacGregor, was held in the Palehua-Palikea region of the Waianae range. It was a beautiful sunny day enjoyed by about 30 birders. The morning was spent hiking through a forest of mostly introduced species--Eucalyptus, Silky Oak, Paper Bark and others. Appropriately the birds observed here were mostly exotics including House Finches, Japanese White-eyes, American Cardinals, with a couple of Shama Thrushes and Japanese Bush Warblers being heard.

In the afternoon we hiked up the ridge trail (Palikea). Hiking through 'Ohi'a and Koa trees we saw numbers of 'Elepaio, 'Apapane, and 'Amakihi. The highlight of the trip was the observation of endemic plants, pointed out by Wayne Gagne.

By Julia Yoshida

On the Kupehau Trail, exotic flora such as eucalyptus, silky oak, ironwood, Christmas cosmos /Montanoa hibiscifolia/, pamakani (Eupatorium sp.) and kukui predominated. The following are some of the native plants seen: koa (Acacia koa), aulu (Sapindus oahuensis), 'ilima (Sida sp.), 'a'ali'i (Dodonaea sp.), a native mint--'ala'ala-wai-nui-pohina-wahine (Plectranthus australis), kupala (Sicyos sp.), and papala (Charpentiera sp.). Along with other arthropods, a number of native millipedes (Polyxenus sp.) were found beneath the outer bark of a fallen koa tree.

On the Palehua-Palikea Trail, the firebush tree, the ironwood, and the Australian black wattle were exotic species present in abundance, particularly at the beginning of the trail. Certain native plants were noteworthy. Numerous Lobelia yuccoides were seen adjacent to the trail and on nearby hillsides. Four L. yuccoides with unopened green inflorescences were seen. Rollandia sp. was also seen on an adjacent hillside, and Clermontia sp. with several green unopened inflorescences was seen directly over the trail. Two heau trees (Exocarpus sp.) were seen near the trail. Branches with and without leaves were observed on the same tree. Several woody violets (Viola sp.) were seen in bloom adjacent to the trail. Several violets, about a foot in height and bearing white blossoms, were observed in a shaded and protected portion of the trail. On exposed and rocky outcrops, the violets seen were 2-4 inches in height.

In addition to the prevalent 'ohi'a (Metrosideros collina), the following are some of the other native plants seen: 'ama'uma'u (Sadleria sp.), uluhe (Dicranopteris sp.), uluhe lau nui (Hicropterus sp.), moa (Psilotum sp.), 'uki'uki (Dianella sp.), 'ie'ie (Freycinetia arborea), maile laulii (Alyxia olivaeformis), 'olapa (Cheirodendron

trigynum), ma'oli'oli (Shiedea sp.), olomea (Perrottetia sandwicensis), ko'oko'olau (Bidens sp.), na'ena'e (Dubautia sp.), pukiawe (Styphelia sp.), 'ohelo (Vaccinium sp.), 'akoko (Euphorbia sp.), naupaka (Scaevola mollis, S. gaudichaudiana), kanawao (Broussaisia arguta), mistletoe (Korthalsella sp.), koki'oke'oke'o (Hibiscus arnottianus), kolea (Myrsine sp.), 'ala'ala-wai-nui (Peperomia sp.), ho'awa (Pittosporum sp.), pawale (Rumex sp.), pilo (Coprosma sp.), manono (Gouldia sp.), kopiko (Straussia sp.), 'alani (Pelea sp.), kawa'u (Ilex sp.).

A native wasp (Odynerus sp.) and a blue butterfly (Vaga blackburni) were seen. Several snails (Achatinella mollis and Succinea sp.) were found on native plants along the trail.

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Audubon's position on the Public Hearing on Application (A72-330) by International Development Corporation to Rezone 30 Acres of Conservation District Land to the Urban District at Salt Lake, Moanalua, Oahu, to Land Use Commission by Secretary Mae E. Mull, 20 October 1972:

For thirty-three years the Hawaii Audubon Society has worked for the protection and conservation of native wildlife and natural areas in Hawaii. The Society respectfully requests that the application to rezone 30 acres of Conservation land at Salt Lake to urban use be denied. These are reasons that water and adjoining land should remain in the Conservation District:

One provision of the Land Use Law under which this Commission functions is: "Conservation districts shall include areas necessary for conserving endemic plants, fish and wildlife" (Sec. 205-2). Some of the endemic wildlife that has been resident at Salt Lake consistently for a long period of time are the Hawaiian water birds. Two kinds of water birds that live at Salt Lake are the Hawaiian Stilt and Hawaiian Coot. The stilts and coots that live here are native Hawaiian and they never leave the State. These two bird species are described and listed as Endangered Species by the U.S. Department of the Interior because their population levels are so low and their living places are being destroyed so fast that these birds are in serious danger of extinction. The most recent official count found less than 1,000 stilts throughout the whole State and even fewer coots. Earlier this week Audubon members saw and counted 17 stilts and 24 coots at Salt Lake. Even with all the disturbance around the lake, these Hawaiian birds still live there because they find food and shelter and there is no place else for them to go. Other wetlands where Oahu's water birds used to live are now filled with houses--like Hawaii Kai and Enchanted Lake.

Although the Board of Land and Natural Resources made the unwise decision to permit Salt Lake to be filled in for a golf course in 1966, the lake still remains in 1972. It is not too late to reverse that permit and let Hawaii's largest natural lake live and support the endemic water birds and migratory shorebirds and ducks that depend on the lake. These are a part of the real Hawaii. Salt Lake and the wildlife it supports were here to greet the first Polynesians when they arrived. The lake and its native birds have enriched Hawaiian legends. To destroy the lake is to destroy more of Hawaii's unique natural heritage that belongs to all the people of Hawaii.

Of the approximately 30 acres in the subject application, more than half of the area (15.32 acres) is lake water. This "Parcel B", the rest of Salt Lake, its shores and mauka slopes should remain in the Conservation District as an area that is necessary for the conservation of endemic wildlife.

We contend that the developer does not meet the provisions of the Land Use Law (Sec. 205-4) that requires the submission of proof that the area is needed for a use other than Conservation District use. The developer has not submitted proof that these 30 acres are needed for urban use. The Land Use Law does not allow rezoning just so a developer can make a maximum amount of profit.

We would like to point out that the developer presents inadequate and misleading information in the brief paragraph on Flora and Fauna in his Lakeside Development proposal. In the only reference to native birds, the proposal says, "Some coots and herons may be found along the shoreline." That is all. The stilt is not even mentioned. The long-legged Hawaiian Stilt, with red legs and black and white body, is easily seen by anyone living, walking or working around the lake. Stilts fly low over the water, feed in the mud with their long bills, and "talk" a lot with loud calls to let you know

they are there. Hawaiian coots, with black bodies and a white plate at the front of the head, swim and paddle out in the water while others feed, preen and rest along the shore. These are endangered birds--part of Hawaii's special wildlife that occurs nowhere else in the world.

Salt Lake is attractive to native water birds now and has been since pre-Hawaiian times.

The 1966 decision of the Board of Land and Natural Resources to permit the lake to be filled in was based on insufficient and inaccurate data as far as the native birdlife at Salt Lake is concerned. Almost six years later the Director of the State Division of Fish and Game has rejected his own survey and conclusions made in a Memorandum to the Board of Land and Natural Resources, dated August 22, 1966, at the time the developer's application to fill in Salt Lake was pending. A press report on March 15, 1972 (Honolulu Star-Bulletin) quotes Mr. Michio Takata, Director of Fish and Game Division, as saying that his 1966 survey of the lake's birdlife was "totally inadequate." Mr. Takata told the reporters that no one "in his right mind would say that was an adequate (zoological) survey."

Yet today, in October 1972, that totally inadequate survey that the Fish and Game Director rejects, is still being used, quoted and referred to by at least one government agency. In a Memorandum from the Planning Director of the City and County of Honolulu, dated September 19, 1972, dealing with the subject application for rezoning, Mr. Robert Way quotes Mr. Takata's misleading conclusions that were based on admittedly insufficient data. Mr. Takata's 1966 three-page report is even attached to Mr. Way's 1972 Memorandum. When does a rejected report ever get finally rejected?

The Land Use Commission needs an accurate and reliable 1972 report on the status of native wildlife at Salt Lake. Attached to this statement is such a report based on Hawaii Audubon Society data from 1954 to October 1972.

Besides the Hawaiian Stilt and the Hawaiian Coot, two other endangered water birds have been observed at Salt Lake on one or more occasions: the Hawaiian Duck or koloa and the Hawaiian Gallinule or 'alae 'ula. According to legend, the 'alae 'ula with its bright red bill and forehead brought Pele's gift of fire to the Hawaiians. A few black-crowned night herons, called 'auku'u, live year-round at Salt Lake.

Except for three months in the summer when they nest in Alaska, these shorebirds feed and rest along the lake shore: Pacific Golden Plover or kolea, Ruddy Turnstone or 'akekeke, and Wandering Tattler or 'ulili. Several kinds of migratory ducks feed and rest on the waters of the lake: Pintail, Shoveler, American Widgeon and Lesser Scaup ducks. Populations of all the native water birds mentioned here have been drastically reduced or eliminated on all the islands since continental man brought the rifle to Hawaii, drained ponds and marshes, and filled in the wetlands for commercial projects.

The State of Hawaii is beginning to recognize that its native wildlife and natural ecosystems must be better protected if the unique life forms that still exist are to survive at all. The Natural Area Reserves System Commission is studying several unique natural areas to recommend for long-term conservation.

The Governor signed a new law on May 16th this year, Act 49, designed to protect and conserve Hawaii's native birds and endangered species. Hawaii has more rare and endangered birds than all the rest of the United States put together--29 Hawaiian species out of 52 species for the whole country.

Act 49 calls upon the Department of Land and Natural Resources to carry out programs for the conservation, management and protection of indigenous birds and mammals, endangered species and their associated ecosystems. In addition, "The governor or his authorized representative shall also encourage other State and federal agencies to utilize their authorities in furtherance of the purposes of this section by carrying out programs for the protection of endangered species and by taking such action as may be necessary to insure that actions authorized, funded, or carried out by them do not jeopardize the continued existence of endangered species." (Act 49, 1972 State Legislature, Sec. 191-6(b)) (Underlining added)

The Hawaii Audubon Society respectfully requests that the Land Use Commission give full consideration to the impact of urban zoning on the endangered species resident at Salt Lake, as well as to the consequences for the human environment, and deny the

application. We also request that this Commission initiate appropriate action to keep the lake from being filled in. It would be contrary to recent policies and actions of the Governor and the State Legislature for the protection of environmental quality to permit Hawaii's only lowland natural lake to be filled in just to satisfy the narrow, short-range interests of the developer.

Salt Lake and the wildlife it supports are a precious natural heritage for all the people of Hawaii

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Hawaii Audubon Society: Native Hawaiian Birds Observed at Salt Lake, Oahu, 1954-1972

	Common and Scientific Names	Hawaiian Name	Minimum-Maximum Numbers 1969-72[1]	Maximum number in Latest Year Seen[2]
I.	Resident Native Birds:			
E 1.	Hawaiian Stilt ..... (Himantopus himantopus knudseni)	Ae'o	11 - 37	23 (1972)
E 2.	Hawaiian Coot[3] ..... (Fulica americana alai)	'Alae ke'oke'o	25 - 65	42 (1972)
E 3.	Hawaiian Gallinule ..... (Gallinula chloropus sandvicensis)	'Alae 'ula	0	1 (1958)
E 4.	Hawaiian Duck ..... (Anas wyvilliana)	Koloa maoli	0 - 3	2 (1970)
5.	Black-crowned Night Heron (Nycticorax nycticorax hoactli)	'Auku'u	0 - 11	9 (1971)
II.	Migratory Birds:			
6.	Pacific Golden Plover .. (Pluvialis dominica fulva)	Kolea	1 - 90	39 (1972)
7.	Ruddy Turnstone ..... (Arenaria interpres)	'Akekeke	2 - 35	9 (1972)
8.	Wandering Tattler ..... (Heteroscalus incanus)	'Ulili	2 - 8	5 (1972)
9.	Pintail[4] ..... (Anas acuta)	Koloa mapu	0 - 29	7 (1972)
10.	American Widgeon ..... (Mareca americana)	-	0	45 (1960)
11.	European Widgeon ..... (Mareca penelope)	-	0	4 (1957)
12.	Shoveler ..... (Spatula clypeata)	Koloa moha	0 - 7	7 (1970)
13.	Lesser Scaup ..... (Aythya affinis)	-	0 - 17	17 (1972)
14.	Bufflehead ..... (Bucephala albeola)	-	0 - 1	1 (1970)
15.	Glaucous Gull ..... (Larus hyperboreus)	-	0	1 (1962)
16.	Ring-billed Gull ..... (Larus delawarensis)	-	0	1 (1962)
17.	Bonaparte Gull ..... (Larus philadelphia)	-	0	3 (1960)

E = Endangered Species

1 Minimum and maximum numbers seen between December 1969 and October 1972 (14 trips).

2 Maximum number seen on a single trip in the latest year the species has been observed.

3 Hundreds of Hawaiian coots were seen consistently during 1954-1961 with high counts of 1,000 in January 1958 and May 1960, and 2,000 in November-December 1958. Only a few coots, stilts and other native birds were observed during the period 1963-1968 because of intensive construction activity around the lake.

4 A high count of 129 pintails observed in December 1959.

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HAWAII'S BIRDS, a field guide, is available for $2.00. Send in your orders to: Book Order Committee, Hawaii Audubon Society, PO Box 5032, Honolulu, Hawaii 96814.

Statement for the Public Hearing on the Wailuku-Kahului Wastewater Treatment and Disposal System Held by the US Environmental Protection Agency at Kahului, Maui, on February 23, 1973 by Corresponding Secretary Mae E. Mull

The Hawaii Audubon Society works toward the goal of better protection of native wildlife in Hawaii. We have few victories to point to with pride. The birds are losing out as their living places are bulldozed, polluted, degraded or filled-in. Is it a better world for people in Hawaii when Hawaii's native wildlife disappears? Some people think we shouldn't care about birds, as though caring about Hawaiian birds is some kind of a luxury that means you don't care about people. On the contrary, those of us in conservation work care a great deal about people. We want our children and grandchildren to have a good life in Hawaii. We want the human race to survive. We want people to have decent living places with clean air and pure water. But the quality of human life depends on how we use our natural environment. We cannot destroy the natural world and fool ourselves that this is progress for people. Human beings too are a part of nature and we cannot ignore the laws of nature without great harm to ourselves. The decline of Hawaii's birds and loss of native ecosystems is a barometer of what man is doing to the environment that we have to live in too.

We all agree that a solution must be found to the sewage problem. But is the ONLY solution putting the treatment plant between Kanaha Pond and the ocean? Is pumping the wastewater under Kanaha Pond the ONLY way to dispose of the effluent? A long time ago in 1952, before any environmentalists were around, Maui people and Territorial people recognized that Kanaha Pond was something special and should be saved as a refuge for Hawaiian water birds and the migratory birds that spend eight or nine months of the year at Kanaha. A long time ago, Maui people thought and planned for a public park across from the pond. It was such a beautiful beach and there was lots of room for recreation and picnicking. Those were good plans for people, for birds, and for people to enjoy birds. The State made plans for a public park and bird sanctuary. The Legislature appropriated $100,000 for that. Kahana Pond was promised as a bird refuge. A public park was promised. Shouldn't those promises be kept? Is it wrong to want what was promised? We urgently request the planners to find a better site for the sewage plant and a better way to reclaim the wastewater.

The Hawaii Audubon Society was started in 1939 by people who saw a crisis at hand. Native birds like the Hawaiian stilt, Hawaiian coot, Hawaiian duck, and migratory ducks and plovers were being overhunted and the numbers of birds were seriously declining. Audubon members worked hard to stop the shooting so these birds could continue to exist in Hawaii. Then in the 1950's and 1960's huge development projects began to take over wetland areas and water birds lost huge chunks of habitat on Oahu. Today there are hundreds of stilts, coots, herons and migrant birds living at Kanaha--one of the few places left where stilts and coots can nest and raise their young. It is essential to protect Kanaha Pond as a permanent sanctuary if Hawaii's endangered water birds are to survive as viable species.

Audubon's Statement Re: Public Hearing on Wailuku-Kahului Wastewater Treatment and Disposal System at Kahului, Maui, on February 23, 1973 by President William P. Mull to Mrs. Cassandra Dunn, Hearing Officer, US Environmental Protection Agency, Region IX, San Francisco, California:

...The Hawaii Audubon Society...has been working for thirty-four years to conserve Hawaii's waterbird populations and their habitat. We strongly support adequate sewage treatment and disposal for Wailuku and Kahului--and for all urban centers in the State--but not at the potential cost of such a unique and important ecological entity as Kanaha Pond, if such a loss can be avoided.

In cooperation with the Maui Chapter of the Conservation Council for Hawaii, I will outline briefly a few facts about the current status of Kanaha Pond in the overall context of waterbird habitat and endangered species in Hawaii.

Studies by federal, State and university biologists during the last decade have established that Kanaha Pond supports year-round populations of Hawaiian stilts of from 71 to 558 birds and Hawaiian coots from 22 to 166 birds--both of which are designated as endangered species by the US Bureau of Sport Fisheries and Wildlife and the Hawaii Division of Fish and Game. In addition, Kanaha Pond supports winter populations

of ducks and other migratory birds that number over one-thousand individuals.

These biologists regard Kanaha as the most important piece of waterbird habitat remaining in Hawaii. The most significant factor in their conclusion is the ability of Kanaha to fulfill the nesting requirements of the endangered Hawaiian stilt and coot. They state that Kanaha Pond is essential to the survival of the Hawaiian stilt and the Hawaiian coot.

In the larger context, Kanaha Pond is an essential part of the overall Hawaiian ecosystem--an ecosystem that is largely endangered. This is indicated by the fact that State and federal authorities regard 28 out of Hawaii's 45 surviving species and subspecies of unique land and waterbirds as threatened with extinction. In the national context, Hawaii's 28 endangered species represent well over half of the 52 "endangered species" of birds so designated by the US Department of the Interior for the entire nation. Native Hawaiian plants, insects and other forms of life that make up our Hawaiian ecosystems are in similar bad shape.

On October 7, 1970, the US Congress enacted Public Law 91-438, which concludes that "one of the most crucial situations to face this or any other civilization" is "the immediate or near potential of mankind to damage, possibly beyond repair, the earth's ecological system on which all life depends." In January of the same year, the President signed into law the National Environmental Policy Act, which established the requirement and the machinery to assess the potential impact of federally funded projects that might have a significant effect on our human environment.

Also in 1970, the Hawaii State Legislature enacted two pieces of legislation (Acts 139 and 195) to preserve natural areas and to protect native biota. Since then, the Governor has issued an Executive Order requiring environmental impact statements on State projects. Last year, the State Legislature unanimously approved a bill to conserve and protect indigenous and endangered birds and mammals in Hawaii. Act 49, the Endangered Species Conservation Act, was signed into law by Governor Burns on May 16, 1973.

In this context of serious State and federal action to conserve and protect the species and ecosystems that make up our essential natural environment, Kanaha Pond takes on an importance for the State and for the nation that deserves the most careful and serious consideration. As it turns out, there was more involved than the whims of a few birdwatchers and scientists when the State first set aside Kanaha Pond as a refuge in 1952 and when the federal government declared it a significant Natural Landmark in 1968 deserving permanent preservation.

Clearly, the official machinery is available to weigh prudently where and what kind of treatment and disposal facilities might best be set up to serve the community's needs both for sewage treatment and for insured perpetuation of Kanaha Pond as a valuable element in Maui's natural environment. Thorough environmental impact statements, with objective assessment of alternative sites, at both the State and federal levels will provide the best-informed answer.

The Hawaii Audubon Society will do whatever it can to help find the best possible answer for all the people, now and in generations to come.

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RECOVERIES: Banded under G.C. Munro's Permit No. 5738

Band No. 42 330 840

Species: Noddy Tern (Juvenile)(Too young to fly when banded)

Banded Date: 12 June 1947 at Manana Island, Oahu by ~~G.C. Munro~~ Chester M. Fennell

Recaptured: 23 May 1972 at Manana by William Y. Brown, Dept. of Zoology, University of Hawaii. (Comments by Brown: The noddy was in good condition and had bare broodspots. The old band was very worn, so I removed it and put on a new one, 1023-27585.)

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ANNOUNCEMENTS

HAWAIIAN BIRDLIFE by Andrew J. Berger, The University Press of Hawaii, $15.00

From the jacket: ...HAWAIIAN BIRDLIFE is a comprehensive survey of the birds of all the Hawaiian Islands, including the Leeward Islands...This book encompasses all aspects of birdlife in Hawaii, with emphasis on habits, biological relationships with the environment, and the place of birds in the Hawaiian ecosystem, as well as their prospects for survival...HAWAIIAN BIRDLIFE is illustrated with 59 color plates and 126 black-and-

white figures, including both original photos and paintings...

Andrew J. Berger is professor of zoology at the University of Hawaii. He is the foremost authority on Hawaii's birds and is well known throughout the State as an active and effective proponent of conservation.

R. McKenzie, a long-time member of the Hawaii Audubon Society, is the author of an ornithological guide to New Zealand, IN SEARCH OF BIRDS IN NEW ZEALAND: HOW AND WHERE TO FIND THEM, 9x6in, 256 pages, 53 illustrations, casebound, US$9.75, published by A.H. & A.W. Reed, address: Reed Books Ltd, 38-40 Ghuznee Street, Wellington, New Zealand.

Following paragraph is from the Reeds announcement: ...This thorough ornithological guide to New Zealand is embellished with unusual Maori folktales about the native birds he describes throughout the text. Every place of interest to the birdwatcher is mentioned and described, from CapeRegina to Stewart Island. Easy-to-follow and practical advice on bird-watching makes the book an ideal introduction for beginners. Also of great importance are references to protected bird reserves and the handy guide to accommodation, equipment, maps and local information.

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ALOHA to new members:

Life from regular: Donn Carlsmith, PO Box 68, Pepeekeo, Hawaii 96783

Junior: Leslie Omura, Hawaii Preparatory Academy, Kamuela, Hawaii 96743
Burt T. Tanoue, 1661-A Mott-Smith Drive, Honolulu, Hawaii 96822

Regular: Kathryn A. Harrington, PO Box 939, Honolulu, Hawaii 96808
E.C. Jones, 44-749 Malulani St, Kaneohe, Oahu 96744
Louise Maisenhelder, 211 Cypress St, Leland, Mississippi 38756
Nelda Q. Metzner, 1120 Lake Ave, Wilmette, Illinois 60091
Betty S. Nagamine, 908 Alewa Place, Honolulu, Hawaii 96817
Dr. Daniel D. Palmer, 1481 S. King St, PH 503, Honolulu, Hawaii 96814
Ruth L. Rath, 21 3F Craigside Place, Honolulu, Hawaii 96817
Maria Stewart, PO Box 310, Lawai, Kauai 96765
Kaupena Wong, 2942-B Date St, Honolulu, Hawaii 96816
Seabury Hall, PO Box 497, Makawao, Maui 96768
Fauna Preservation Society, Regent's Park, London, NW, England 14RY

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APRIL ACTIVITIES:

8 April - Field trip to Ulupau Head to study the boobies. 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: Charles van Riper. For information call Tonnie Casey 988-4362.

9 April - Board meeting at McCully-Moiliili Library, 6:45 p.m. Members welcome.

16 April - General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m.
Speaker: Charles van Riper
Topic: Native Forest Birds of Big Island (color slides)

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