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THE ATTAINMENT OF SEXUAL MATURITY IN THE HAWAIIAN JUNGLE FOWL (Gallus gallus gallus)

By C. Robert Eddinger, Department of Zoology, University of Hawaii

The Hawaiian Jungle Fowl (Hawaiian name: Moa) is a descendent of the Red Jungle Fowl that is widespread in the Oriental Region. The Red Jungle Fowl is the ancestor of all domestic poultry. An excellent discussion of the Red Jungle Fowl in its native habitat is provided in Smythies (1953).

I taught for three years on the Shan Plateau of central Burma. It was there that I first became familiar with the Red Jungle Fowl. Our Hawaiian Jungle Fowl is very much like its Asian ancestor both in physical appearance and in the general type of habitat in which it lives (teak forests in Burma, 'ohi'a forests in Hawaii).

The Jungle Fowl reached the Hawaiian Islands long before the arrival of Captain James Cook in 1778. Munro (1960) suggests: "We can only conjure the course of their changes, as migratory peoples carried the birds with them from place to place: from the Asiatic mainland through the Malays to Polynesia, then with these hardy voyagers to Hawaii."

The Hawaiian Jungle Fowl, once common throughout the populated Hawaiian Islands, has been virtually eliminated from all the islands except Kauai, because of the introduction of the mongoose. Visitors to Kauai, and especially to Koke'e State Park, can easily observe the birds at close range. Within the park itself, small flocks come to the cabins to feed.

On the evening of 14 April 1968 Dr. Andrew J. Berger and I returned to our cabin at Koke'e State Park after a day of field study. Under our cabin were two Jungle Fowl hens and a brood of six chicks. I collected four of the chicks to bring back to Honolulu. One quarter of a mile up the hill from the cabin I found two more hens with a single cock and six downy young, smaller or younger than the group at the cabin (no suggestion of primary wing feathers in the second group). I collected three young from the second brood.

The Jungle Fowl chicks were transported to Honolulu and caged in an indoor aviary in the Department of Zoology, University of Hawaii. I fed the chicks the standard chick-starter and changed to coarser grain as the birds matured. Live insects, live geckos, papaya, and Deca Vi Sol babies' vitamin drops mixed with boiled Quarker oats were also provided.

Of the seven Jungle Fowl collected, four were cocks and three were hens. Because of limited space in the aviary, on 1 August 1968, three cocks and one hen were given to Paradise Park. The one cock and two hens remaining were kept together in

the aviary at the University.

On 21 August 1968 hen no. 1 (the smaller of the two) laid her first egg. On 23 August hen no. 2 laid her first egg. The eggs laid by the two hens differed in color. The eggs of hen no. 1 were light tan, while those of hen no. 2 were brown.

On 23 August I left on an expedition to the islands of Nihoa, Necker, French Frigate Shoal, and Laysan. My friends who cared for the Jungle Fowl removed eggs from the aviary daily. When I returned to Honolulu 17 September both hens were still laying daily.

On 20 September I put two nesting boxes with sawdust into the aviary. The two hens did not use one nesting box and exclude the other. Both hens laid eggs in both nesting boxes. Nine eggs were laid in the first nesting box and six eggs were laid in the second box.

On 25 September hen no. 1 began to incubate the clutch of nine eggs in the first nesting box. The results are summarized below:

1 egg opened for examination	10 October
4 eggs hatched successfully	16 October
1 young died getting out of the shell	17 October
2 eggs rolled from the nest	18 October
1 egg removed and placed under hen no. 2 ...	18 October

The egg opened for examination on 10 October showed advanced development. I opened the two eggs that rolled from the nest on 18 October. One egg showed no trace of an embryo and the second contained an embryo in the early stage of development. I removed the last egg, because the chicks would not stay in the nest and the hen alternated between brooding her chicks and incubating the remaining egg.

Hen no. 2 began incubating the clutch of six eggs on 30 September (plus the seventh egg on 18 October). The results are summarized below:

1 egg hatched successfully	20 October
6 eggs deserted	21 October

After the first egg hatched the hen left her nest to brood the chick. She returned to the eggs several times but would not stay in the box to incubate the eggs. On 21 October the eggs were cold so I opened them. Four of the eggs showed no development and two of the eggs had chicks that died very near hatching age.

The original chicks were collected on 14 April 1968. These birds matured and were laying eggs by August 1968 (21 August for hen no. 1, 23 August for hen no. 2). From this we can conclude that the Hawaiian Jungle Fowl reaches sexual maturity within four to five months after hatching.

I am indebted to Dr. Andrew J. Berger for his constant encouragement and to my friends Virginia Cone, Paula Waterman, Edward Brecknock, and Suraphol Sudara who patiently cared for the birds in my absence.

Literature Cited

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ANNUAL WATERFOWL AND ASSOCIATED WATERBIRD CENSUS CONDUCTED ON OAHU

By Ronald L. Walker, Wildlife Biologist, Hawaii Division of Fish and Game

The State Division of Fish and Game in cooperation with the U.S. Bureau of Sport Fisheries and Wildlife conducted its annual waterfowl and associated waterbird census on Oahu on January 14, 1969. As this survey was made 16 days after

the Audubon's Christmas bird count, and as it covered the entire island rather than the limited "circle" of the Christmas count, a comparison of the species seen should be of interest to Audubon Society members.

Thirty areas known to support birds associated with water were covered during the census by staff members of the Division and the Bureau. These included all areas along the shoreline on the lowland, as well as upland lakes, reservoirs and ditch complexes. Relatively fewer birds were seen this year than in previous years, but this is due in large measure to the high tide which occurred durihg the morning hours, causing birds using mudflats to go inland and disperse. Several other factors, however, have affected waterbird distribution. At Kawainui, Eugene Kridler reported that water hyacinth has completely covered two small ponds which were open last year and supported migratory waterfowl. At Waikele, this writer noted that the City and County sanitary fill has virtually prohibited Stilt use of this once busy mudflat due to fill and smoke pollution. David Woodside reported that Kuapa Pond is almost useless as habitat any longer due to filling and construction activity. Only four plover and two heron were seen here. The reservoirs in Makaha Valley, where in 1967, 100 pintails and ten teal were seen, have been completely renovated and there are no longer any shallow water areas or emergent plants which are favored by migratory ducks. None were seen this year.

The inventory of waterfowl and associated waterbirds seen on Oahu during this census is as follows:

Pintail	25	Stilt	162	Gallinule	5
Shoveller	35	Plover	524	Egret	749
Scaup	7	Turnstone	160	Glaucous winged gull	1
Bufflehead	1	Sanderling	82	Unidentified gull ...	1
Mallard	4	Tattler	19	Unidentified godwit .	1
Coot	15	Heron	48		

The 749 cattle egret seen represent a 386% increase over the number seen last year, and undoubtedly this species is a roaring success on Oahu. The actual total population on the island must be much larger than this, as much of the island particularly in the upland areas was not covered during this count.

The godwit was seen feeding with plover and sanderlings on the mudflat-mangrove area off Fort Kamehameha near the entrance to Pearl Harbor. I was unable to classify it as to species, but my field notes read as follows:

> "Large shorebird, slightly smaller than a bristled-thighed curlew, with a long bill slightly turned up at the end. Grey above with barring, light greyish or white below and under neck. Greyish-black legs, black or darker tail or wingtips as folded. No obvious white rump patch or barring on tail."

Except for the grey coloration rather than a tawny brown as described by Peterson, it appeared to be a bar-tailed godwit. Perhaps the non-breeding plumage lacks the barring on the tail or the brown coloration.

Details of the census relative to species seen by area are available at the Division of Fish and Game office.

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SIGHTING OF WILD KOLOA ON THE ISLAND OF HAWAII AND HISTORY OF A PAST RELEASE

By Gerald Swedberg, Non-game Biologist, Hawaii Division of Fish and Game

On October 30, 1968, 2 Koloa (Anas wyvilliana) were observed in the Kohala watershed on the island of Hawaii. The birds were sighted in a small pool of Waikoloa stream approximately 400 yards above the Marine Dam, by Fisheries biologist Stanley Shima. Shima's identification of the Koloa is positive since he is well acquainted with the species from his stream survey work in Koloa habitat on the island of Kauai. This is the first positive sighting of wild Koloa on Hawaii in more than twenty years.

Prior to this sighting, several tentative identifications of Koloa were recently made by others. On May 3, 1968, I observed what apparently were two Koloa in the company of several shovellers (Spatula clypeata) at Opaeula or "Makalawena" Pond, North Kona. Winston Banko, in a letter dated May 28, 1968, mentions a tentative identification of two Koloa at Kahua Ranch. Other occasional reports of possible Koloa sightings have been received since 1963, primarily from the State Forestry staff on Hawaii, but since these sightings were all made during periods when migrant species of ducks visit Hawaii, and the observers were not positive of their identification, these sightings were not considered conclusive.

It is believed that the birds which Shima observed, and which others may have observed, probably resulted from releases totaling twenty-five Koloa made by the Division of Fish and Game at Kahua Ranch on December 12, 1958 and August 1, 1959. Most of the birds which were released had been propagated at Pohakuloa, Hawaii; the remainder were wild caught birds from Kauai.

Excerpts from field notes (D.H. Woodside) follow:

"11/30/58 - took 21 Koloa from Hilo to Pohakuloa, picked up duck trap and placed birds in trap at Kahua Ranch." (This was to be a gentle release. where the birds are kept in a pen at the release area for a period prior to release.)

"12/12/58 - released birds."

"7/12/59 - Walls (man's name) reports 2 Koloa broods at Kahua Ranch: one brood of 1 young, one brood of 2 young."

"8/1/59 - 2 pair Koloa to Kahua (Ranch) - violent release (released directly into the wild) 5 Koloa seen from previous release."

"7/6/60 - no Koloa seen or reported by residents."

Although no further follow-up of these releases was accomplished, it now appears that Koloa from these releases are surviving on Hawaii.

Regardless of whether the Koloa on Hawaii resulted from these releases or whether they belong to a residual population from former times, their occurrence on Hawaii is an encouraging sign.

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If you have any information on Koloa, please share your experiences with other members by writing to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

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Additional information on Koloa from HONOLULU STAR-BULLETIN, January 16, 1969, p. G-2:

Thirty-two Koloa were released January 17 in Kawainui Swamp, Kailua, Oahu. The release was part of the State's Koloa Restoration Project.

Kauai is the only island in the Hawaiian chain where the Koloa exist in great numbers...There are now about 3,000 of the rare birds on the Garden Island. The birds used to inhabit all the main Hawaiian Islands...None has been seen on any island except Kauai for years, but two were sighted in Kawainui Swamp about two weeks ago...This was the first such sighting on Oahu in about 15 years.

The birds being released...have been kept at the Honolulu Zoo for the past three months. They have been marked with U.S. Fish and Wildlife Service legbands, and the undersides of their wings have dyed blue...Fish and game officials would like people spotting the Koloa to report the sightings, by phoning 548-2811. After hours, the number to call is 262-7897, the residence of Gerald E. Swedberg, the man in charge of the Koloa release program.

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READERS' NOTES:

HONOLULU STAR-BULLETIN, March 8, 1969, page A-8: A Warning from the Seabirds by Bryant Evans, Copley News Service.

Coal miners used to take canaries into the mines to warn them when the air was

getting too foul for safety. The birds, more sensitive, would keel over before the men were affected, thus giving miners a chance to escape.

It may be that the seabirds in many parts of the world are giving the human race this sort of a warning today. It also may be that the human race is intelligent enough to understand the warning and escape in time but that is by no means certain.

Professional bird-watchers have been noticing that the marine birds of prey are not hatching their quota of chicks. Now they have found out why. The chemical DDT has affected the hormone systems of the birds and as a result the eggshells have become too thin to protect the little birds.

This chemical used as an insecticide all over the world has spread over the ocean and has been intensified in its concentration as it moved up the food chain--from microscopic plants, through the ranks of fishes, and finally into the gullets of the seabirds.

Now the question arises as to whether the birds might not be the most sensitive of all species to a contamination of the world environment which is constantly increasing. The terrifying part of this story is that no one knows the extent of the damage that this chemical is doing to plants and to animals, including people.

...DDT, Dr. Charles F. Wurster, a biologist from the State University of New York, said, is similar to a hormone. It triggers enzymes in both simple and complex forms of life. It has been found to affect the female hormone, estrogen, which in turn regulates calcium metabolism.

If DDT were used locally and then disappeared, it would not be serious, but Wurster said it is an extremely stable chemical that remains active for years. He said a given quantity of DDT would have at least half its original activity after a decade.

As a gas it adheres to dust particles and travels in the atmosphere precisely as do radioactive elements from an atomic explosion. Like these particles, its fallout is worldwide. It has been found in the flesh of Antarctic penguins.

No one has identified its effect on human beings...Even if human beings should prove to have a magic imperviousness to the chemical, there are other reasons for concern. Marine ecologists are concerned because it cuts down photosynthesis, the process by which plants capture carbon, the basis of all life. Also, it could attack any or all links in the marine food chain to alter the productivity of the seas.

Some dairymen are becoming alarmed that their cows might transmit enough DDT to the milk to make it unacceptable.

Until recently the fuss over DDT was often dismissed by policy-makers as the overreaction of few nature-lovers. Now it appears that the birds may be doing the same service that the canaries did in the mine--acting as sensitive instruments of warning.

Dr. Edward D. Goldberg, the chemistry professor who organized the Scripps symposium, said at its conclusion: "Already, it may be too late."

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CORNELL UNIVERSITY NEWS, March 4, 1969:

Birds can be used as barometers to tell man how badly he is polluting the environment, according to a Cornell University ornithologist.

...Birds are adjusted closely to their natural environment and consequently are sensitive to any changes in the status quo. Like barometers...their numbers hold steady when there are no changes, rise when the changes are favorable and drop when unfavorable. Birds give us a very quick reading on environmental changes, because they are conspicuous and readily noticed.

When an excessive number of birds are killed in an area,...somebody had better find out why. Chances are that whatever is killing off the birds isn't doing humans any good.

To get barometric readings from various areas, the Cornell's Laboratory of Ornithology has instituted a North American Nest-Record Card Program. Through the program, hundreds of readings on bird populations are gathered and analyzed to try to note a significant trend.

"When a breeding population is declining somewhere,"Olin S. Pettingill, Jr.,

director of Cornell's Laboratory of Ornithology, said, "we want to know it and share the information with those persons who can determine the cause and take remedial action."

The laboratory has already received more than 75,000 cards from some 950 persons throughout North America.

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THE WASHINGTON POST, January 14, 1969: Six Trapped Peregrine Falcons at Patuxent for Pesticide Tests. (Ethel Matheson's contribution)

Six Peregrine Falcons were recently trapped at Chincoteague, Va., National Wildlife Refuge...and were taken to the Patuxent Wildlife Research Center at Laurel, Md., for experiments on the effects of pesticides on Peregrine reproduction.

Research on the effects of pesticides in fish and wildlife has been in progress since 1958. These studies have determined that certain pesticides remain in the atmosphere and build up, over a period of time, in the tissue of animals, affecting their reproductive capacity and even possibly causing their death.

Birds of prey are particularly susceptible to pesticide accumulation, because they feed upon smaller fish and wildlife that may already have a concentration of pesticide within their body tissues.

The occurrence of nearly three times as many young as adults among the Peregrine observed at Chincoteague this year indicates that Arctic populations are apparently still reproducing normally.

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Have you read THE MAN WHO READS NATURE'S SECRET SIGNALS by Dick Kirkpatrick on pages 5 through 8 of February-March 1969 issue of the NATIONAL WILDLIFE?

The opening question asked is, "Cleve Backster's polygraph says plants feel apprehension, fear, pleasure and relief. Has he found an unknown kind of communication that links all living things?"

Cleve Backster's findings may completely change the current concept of ecosystem. What is your idea? Please write to Kojima, 725-A 8th Ave, Honolulu, Hawaii 96816.

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THE WILSON BULLETIN, Vol. 80, No. 4, December 1968, page 490: Bar-tailed Godwit from Alaska recovered in New Zealand.

Mr. Frank H. Rowson of Kati Kati, Bay of Plenty (North Island), New Zealand, found the skeleton of a banded Bar-tailed Godwit (Limosa lapponica)at the mouth of the Tawanga-Harkoin River on 28 October 1967. The bird had been banded by Delong on St. George Island, Pribilof Islands, Alaska, 31 May 1966. The distance between St. George and the Bay of Plenty, following the Great Circle Route, is 5,288 nautical miles. This is the first recovery of a Bar-tailed Godwit banded in North America and one of the longest over-water movements on record for any species of bird....

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THE EVENING STAR, 24 December 1968, page 12: Birdwatchers Invited, Chincoteague Attracts Snow Geese by George Huber. (Joseph E. King's contribution)

A "V" of snow geese illustrates the article. An inspiring wonderful photograph by the Bureau of Sports Fisheries & Wildlife.

...For the ordinary outdoors-lover who wants to see a lot of birds, and big ones, guaranteed, here's a suggestion: Go to the Chincoteague National Wildlife Refuge on the Atlantic side of Virginia's Eastern Shore.

It's fantastic, the number and kinds of birds wintering there. As at most refuges, it hasn't taken the birds long to know they're safe. People in automobiles can approach very close without disturbing the birds....As long as you remain in your auto you can see and photograph all sorts of waterfowl by the thousands and thousands.

Snow geese are there, 5,000 to 10,000 depending on conditions, probably the largest concentration on the East Coast....It's a tremendous thrill seeing them feeding in the fields as you drive slowly past, or stop and take pictures of them.

...The Canadas are at Chincoteague also. There are several thousands of them, although perhaps not as many as are wintering a bit to the north on the Chesapeake Bay side of the Delmarva Peninsula, principally in the Kent Island and Talbot County areas of Maryland.

...In addition to the birds, the famous Chincoteague ponies are there, grazing all over the place, and an occasional sika deer, a tiny animal, or smaller than the Virginia whitetail anyway, may be glimpsed.

Although the snow geese are the most numerous bird there, they might not be the star attraction. This role could go to the great blue heron, a majestic, long-legged beautiful creature. You are almost certain to see several. Swan are even more numerous.

Ducks are there by the thousands too. Black ducks, teal, mallards, gadwalls, especially, but almost all the others too. Pintails certainly can be seen, likely also ruddy ducks, mergansers, coots and loons among the waterfowl, and all the usual winter song and insectivorous birds.

That all these birds, especially the waterfowl, are there is no accident. Chincoteague is one of the coastal barrier islands and as such is a natural visiting place for the birds, but the area has been improved to hold them there. Ponds, both freshwater and saltwater, have been constructed to grow food waterfowl especially like, and on the land, more crops particularly attractive to birds have been raised.

Snow geese, for instance, like winter rye, as many an Eastern Shore farmer knows. When the tender shoots emerge in late October, geese will go right through a field and clean it out, roots and all. They love it. At Chincoteague they have their own fields of winter rye they can feed on to their fill, with no farmer to chase them away.

...Winter isn't the only time for birds at Chincoteague. Some of the ducks live there the year around, mallards and teals among them, and those beautiful wood ducks spend summers there after a winter in the south.

Chincoteague is especially famous for the shorebirds, sandpipers, plovers, yellowlegs and the like, during migration time in April and May, and again in late summer. Regular summer residents include the egrets, herons, gulls and ibises.

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News article from Dr. Frederick W. Landers, Upper Montclair, N.J., 1 January 1969:

"...The Montclair Bird Club has completed its 12th annual hawk watch at the Hawk Lookout Sanctuary in Upper Montclair....Members of the club counted 8,061 hawks between Sept. 7 and Sept. 30. It was the third highest total, topped only by the 8,849 in 1965 and 12,401 in 1962.

"Broad-winged hawks led the list with 6,917. This species migrates singly or in large groups....With no air pollution on Sept. 14, and with favorable northwest winds, 5,371 broad-wings were spotted, a single day record for the count. One group, or 'kettle,' of broad-wings numbered 830 birds....

"The flight on Sept. 14--the big day--was an unforgetable thrill for 32 observers. From mid-morning through 5:30 p.m. a steady stream of migrating hawks passed the lookout....The sighting of 2 bald eagles...added to the excitement....

"There were disappointments. Not a single peregrine was spotted at the Montclair lookout....Many naturalists consider the peregrine the most beautiful of our hawks. But unfortunately, it is wantonly shot by hunters and others even though it is protected in most states, and like many end-of-the-food-chain species the peregrine has suffered greatly from pesticide poisoning. Several conservation organizations are initiating programs that may help the peregrine survive.

"Ospreys, or fish hawks, showed another decline....Their problem is similar to the bald eagle's. Both are fisheaters. Their feeding grounds are contaminated with pesticides. Roland Clement, vice president of the National Audubon Society, has studied the effects of pesticides on wildlife. He says, 'The pesticides problem is one of the most difficult background issues ever faced by conservationists. The whole earthly environment has become seriously contaminated by long-lived, fat-soluble chlorinated hydrocarbon insecticides such as DDT, dieldrin, etc., and recently an industrial (non-insecticidal) hydrocarbon, BCP, has been found to behave in the same way. These materials have become part of the atmospheric fallout, wash from agricultural areas into streams, estuaries, and even contaminate the oceans of the world. These chemicals are now known to induce enzyme formation in the liver which interferes with calcium metabolism in egg formation, leading to thin-shelled eggs, poor reproduction in the birds....The damage these pesticides have done is thus both acute (acting quickly because of food chain poisoning) and

chronic (acting through delayed effects on reproduction)'...."

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THE NEW YORK TIMES, January 11, 1969, page C-35: The Everglades: Will Man Turn a Refuge into Wasteland? by Brooks Atkinson. (Ethel Matheson's contribution)

...The abundance of life is incomprehensible. After two or three hours of watching it, an intruder is not so much surfeited as dazed by the fecundity of the wildlife and its detachment from and indifference to civilized Florida. Primitive America, when the Indians pushed through the swamp in dugouts, must have looked like this--limitless in size, solitary, unhurried, inhuman, self-centered. In the warmth of the sun, under the white cloud pinnacles, this stupendous enclave of wildlife is a remnant of forgotten America.

As the human pressures outside the park increase, the pace with which the Everglades deteriorates increases also. Recent records tell somber facts. In the mid-thirties a million and one-half wading birds nested in the Everglades; there were fewer than 300,000 in the mid-forties, and about 50,000 breeding adults in the mid-fifties. In 1950 the park contained about 100,000 wood storks. Last year they numbered about 4,000. There has not been a successful nesting of wood storks in the park since 1962. The alligator count is down sharply--due to poaching as well as the scarcity of water.

Crocodiles, panthers, bald eagles, Everglades kites are species that may not survive. If the pressures continue, if the use and demand for water increase, it is possible that the Everglades National Park could deteriorate into a wasteland within a century, and become less a refuge than a dump.

...The fate of the park will be decided outside the park boundaries, for everything in the Everglades depends upon a continuous flow of water from the north, and that water belongs to the state of Florida. Good water in goodly amounts is the genius of the park, but the Federal Government does not own or control it.

The intricate biotic systems that make the park unique--for the expansion of knowledge as well as public recreation--are the result of pure fresh water at a warm temperature that for thousands of years seeped into the Shark River Valley area from Lake Okeechobee to the north. After the rains, the Everglades has always passed through an annual cycle of flooding and drying--picking up nutrients and organisms and incubating them and producing an abundance of marine food that the birds, fish and animals live on. But the human population of Florida also has to be fed and watered. Although the state of Florida values the Everglades Park,... the human pressures are more articulate than the wild, and have better political support. For many years flood control has been serving the second purpose of land reclamation. Land for agriculture and building lots has been created by draining and filling marshes where water the park needs would normally be stored.

A greater crisis is in the making. Construction has already begun on a huge jetport on land that has to be drained and filled in the essential northern area where in the past water flowed into the Everglades by gravity. Eventually the jetport will be a solid block of construction 38 square miles in area.

It took hundreds of thousands of years to create the Everglades. Now men have the ability, facilities and the will to destroy it in less than a century....

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LETTERS from Mrs. Hans Hansen, Kalaheo, Kauai, 10 January 1969:

...I was drinking a cup of coffee in the living room. A cock pheasant arrived and was joined by two meadowlarks. They have a nest in the pasture close to our house.

It is such a joy seeing these birds, but I am worried over a cat situation which has developed here....If it weren't for the mynahs giving a warning cry, I don't believe the other birds would survive. The meadowlarks don't fly away when the cats come near them, but when they hear the mynahs they take off...

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From Frank Richardson, Winter Harbour, B.C., February 25, 1969:

I should add a note to the one in the January ELEPAIO telling of the year my

wife and I are spending on the wild NW end of Vancouver Island. I am studying birds much of the time and it is proving most interesting and exciting. We have seen about 125 species since last July. A number have been unusual or new to me: A Buff-breasted Sandpiper, a White-throated Sparrow, Snow Buntings, and Lapland Longspurs. A dozen or so great Trumpeter Swans are often on the inlet a mile from us. Bald Eagles are numerous and there are occasional Peregrines and Pigeon Hawks.

We are often reminded of Hawaii living by the beautiful wild sea here, but it hasn't been warm enough since September to strengthen the comparison--and the water never warms up!...

From Mr. & Mrs. Virgil L. Griner, Livonia, Michigan, January 26, 1969:

...It is mid winter here and not many birds are even brave enough to come out in the open. The temperature is 17°....Our winter feeder hasn't provided too many varieties, but we do have the old faithfuls: 41 cardinals, 10 mourning doves, 2 white-breasted nuthatches, 4 juncos, 1 downy woodpecker, 1 tree sparrow, and more house sparrows and starlings than I care to count!

Our Christmas bird count was not exactly an unusual one. It was a bright clear day but it was a cold 10°. The count on evening and pine grosbeak and redpoll was a little surprising. They do not usually appear in such numbers this far south. Evidently the cold and record snow fall in the north has driven them down....The deer are having a very bad time finding feed. The Conservation Department are trying to take feed in to them on snowmobile and helicopter.

It is distressing when you realize how few native birds there are left in Hawaii. It makes you anxious to want to do something. You might be interested in the enclosed article that our local newspaper ran on Virgil.* He is...trying to interest other people in a species that were here before at least white man. But if everyone took an interest in each vanishing species and influenced his friends to do the same perhaps the problem could at least be slowed down.

*THE LIVONIA OBSERVER, November 13, 1968, page 4A(L): Building Bird Houses Alters Engineer's Life by Martha Mahan

When Virgil Griner began building a bird house as a wintertime diversion five years ago, he unknowingly changed his whole way of life. He added a new circle of friends, created an absorbing set of interests and started out on a path which has carried him and his family to the West Coast and Hawaii and may reach as far as Scandinavia....

In the spring, he placed that first bird house in the backyard of his home. Purple martins soared in on April 10, as they have regularly every year since. They depart just as regularly in mid-August for Brazil and the Amazon valley.

Arrival of the graceful, swooping birds with their rich, throaty cries led Mr. & Mrs. Griner and their 11-year-old daughter, Tracey, to begin studying up on them. They now are walking encyclopedias of purple martin lore....Griner has beautiful color movies of the birds which inhabit his yard each year and sound tracks of their husky cries. When Griner saw that the branches of the tree under the first house interfered with the martins' gliding flight, he set to work on another. He has built four so far....Each bird house had been more elaborate, or "functional" as Griner describes it, than the one before. The latest model measures about three and a half feet high topped by old TV antennas which serve as perches. The octagonal house has separate sections for 20 pairs of birds, each with its own "porch" and rail to keep the young from toppling out. Griner, who designed the plywood structure, has even contrived "sparrow traps" to protect his martins from their foes....

"Sometimes I think people believe we're crazy when we say it, but the birds do have personalities of their own," Mrs. Griner smiled. Griner briskly nodded his head in full agreement.

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Excerpts from the minutes of the general meeting of the Hawaii Audubon Society, January 20, 1969: ...The speaker for the evening was Gary Parker, Assistant Professor of Linguistics at the Universityof Hawaii, who gave us a very interesting

talk on the birds of New Hebrides. He was in Vila, capital of the New Hebrides during the summers of 1967 and 1978 investigating one of many Melanesian languages of the southwest Pacific island groups. He gave out lists of the birds of New Hebrides.

Bob Pyle gave a report on the highlights of the 1968 Christmas count. There was a total of 49 species sighted and the total number of individual birds was 11,024. Major highlights were the sightings of two native species not seen on the count for a number of years, the Hawaiian creeper and the Koloa. Two species of bulbuls were also recorded--the red-vented bulbul and the red-whiskered bulbul....

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YOUR PUBLICATION

THE ELEPAIO needs your help to improve its quality and become an influential publication on conservation for Hawaii.

The following is the financial report from 1 January through 31 December 1968:

Envelopes and stamps..	$247.40		
Paper.....	115.44	Mimeographing	- Gratis (Bishop Museum)
Stencil.....	19.45	Typing	- Gratis (members)
Miscellaneous.....	5.04	Mailing	- Gratis (members)
	$387.33		

The mailing list for December 1968 issue was as follows:

Honolulu	101 copies	APO & FPO	2
Rural Oahu	22	Mainland	85 (27 States)
Hawaii	11	Canada	3
Kauai	10	New Zealand	4
Maui	4	Guam	1
Molokai	2		245 copies

Please write to Kojima, 725-A 8th Ave, Honolulu, Hawaii 96816 for any suggestions.

MAHALO NUI LOA

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ALOHA to new members:

Junior member: Tracey Griner, 35533 Minton Court, Livonia, Michigan 48150.

Regular member: Marvin K. Devereux, 47-684 Hui Alala St, Kaneohe, Oahu 96744.
Mary Orr Russell, Box 183, Reserve, New Mexico 87830.
Hiroshi Tagami, 47-754 Lamaula Road, Kaneohe, Oahu 96744.

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

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APRIL ACTIVITIES:

April 13 - Field trip to Ulupau Head to study the boobies. Bring lunch, water, and if possible, your car. Transportation cost (75¢) to be paid to the drivers. Meet at the Library of Hawaii at 8:00 a.m. Leader: Charles G. Kaigler, telephone 988-3195.

April 14 - Board meeting at the Zoo entrance bldg. at 7:30 p.m. Members welcome.

April 21 - General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m. Chapman Lam of KGMB News is tentatively scheduled to give an illustrated talk on Hanauma Bay, a wildlife preserve.

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DUES: Regular-$3.00 per annum, Regular out of State-$2.00 per annum, Junior (18 years and under)-$1.00 per annum, Organization-$2.00 per annum, Life-$50.00