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AN UNUSUALLY MASSIVE NEST OF THE HOUSE FINCH (Linnet) on Mauna Kea, Hawaii

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Bent (1968, U.S. Nat'l. Mus. Bull., 237) notes that the House Finch (Carpodacus mexicanus frontalis) nests in many diverse situations, from trees to tin cans hanging on fences. They have also been frequently found occupying nests of other bird species. In trees, the usual location of the nest is often the fork of an upright limb in the open interior part of the tree. He further notes that the usual height of the nest is from 1.5 to 2.1 meters above the ground.

On 8 July 1973 I found a House Finch nest in a mamane (Sophora chrysophylla) tree (Fig. 1). The area was 7,450± feet elevation on the northwestern slope of Mauna Kea in the Puu Laau region. The tree was completely dead with the bark peeling off; it stood 5.8 m high and had a circumference at chest-height of 233.7 cm. The nest was wedged between the dead peeling bark and the inner trunk, 1.7 m from the ground (Fig. 2).

I have worked in this area over the past five years and have recorded the characteristics of 60 House Finch nests. The average distance of these nests from the ground was 4.7± 1.7 (S.D.) meters. Although the House Finch nest found 8 July fits within Bent's usual limits of nest height, it is outside the standard deviation of the height of other nests observed in the Puu Laau region.

The birds started the nest at the bottom of the bark peel and built until an accumulated height from base to rim of 25.9 cm had been reached. The mean height of 21 other nests in the same region was only 7.1± 1.9 (S.D.) cm. Assuming a normal distribution of nest sizes, the probability of getting a value which deviated from the mean by 14.2 cm or greater is about 0.04, showing the height of this nest to be significantly different from others in the population. The remaining measurements of the nest fit closely with what I have found in others. The total width of the nest was 6.4 cm, bowl width 3.8 cm, and rim thickness varied from 0.5 to 3.8 cm.

The nest weighed 93.5 grams; mean weight of 12 House Finch nests I weighed was only 19.5± 3.3 (S.D.) grams. The total weight of materials used in construction was significantly greater ($P < .001$)*than those used in other nests of the same species, pointing toward an extremely prolonged nest construction period. *(P is less than .001)

After completion of the nest four eggs were laid (Fig. 3). The birds deserted the nest after a short period of incubation as the embryos were not well developed. Berger (Hawaiian Birdlife, University Press of Hawaii, 1972), while working in the same area, reported five of the eight House Finch nests he found to have had a clutch size of four eggs. Clutch size of 14 nests I observed at Puu Laau averaged 3.7. Apparently an extended nest-building period has little effect upon clutch size.

The choice of nest site by this pair of birds appears to be outside the behavioral norm for the species, that is they may have chosen an inappropriate or "wrong" nest site. The tendency of the House Finch at Puu Laau to use variant nest sites is small as this is the only case I have observed in five years of field work. The nest site was so aberrant that it required a distinct change in nest structure. Perhaps the capabilities of the House Finch were stretched too far and as a result the nest was not successful.

FIG. 1. The nest tree.

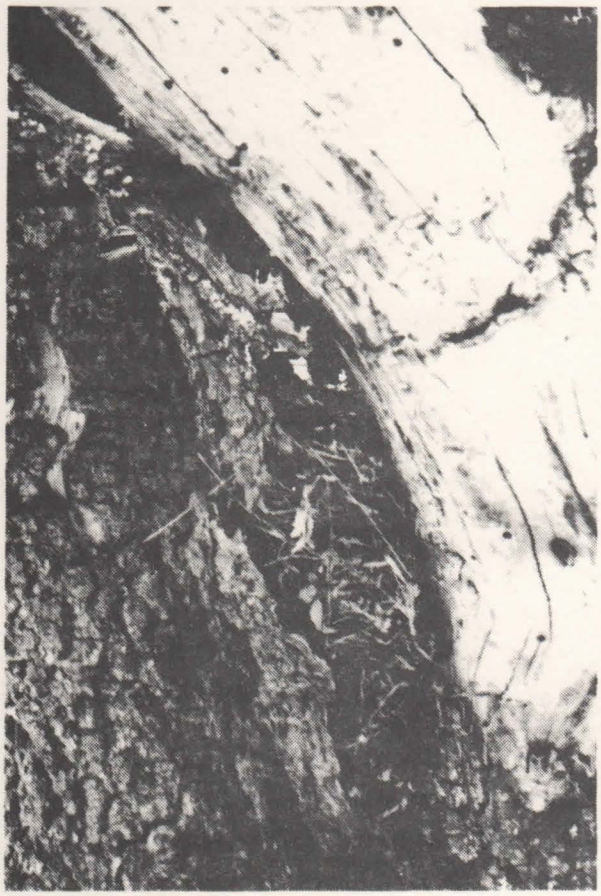

FIG. 2. Nest between bark and trunk.

FIG. 3. Nest with the bark pulled away.

It could be that the pair might have been unsettled by the inadequacy of the non-conforming nest site, and consequent nervousness might have led to abandonment.

I am most grateful to the Hawaii Audubon Society, the International Council for Bird Preservation, and the McInerny Foundation for their support of my field work, during which these observations were made.

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ECOPUSH Conference -- "Fresh Air, Pure Water -- What's the Cost? Who Should Pay?"
Presentation by President William P. Mull, 17 May 1973 at Princess Kaiulani Hotel, Honolulu

When I was three, I picked up a honeybee -- and got stung. That gave me an early respect for nature. Since then, I've spent fifty years looking at nature more closely than most people do -- and trying to figure out how to treat it. Pretty soon I learned that nature could get along without me, but that I couldn't get along without it. So I decided to treat nature gently -- and hope for the best.

Some folks don't agree with me on that. Maybe they didn't get stung by a bee -- or maybe they just didn't try to figure out why. Anyway, they call me an "instant ecologist" now. Which is kind of funny -- and kind of sad.

That's a small story about me -- and a big story about this conference. The main fact is that fresh air and pure water come from nature. And the main question is "How do we get enough of these things we need out of nature -- without getting stung in the end?" The agenda doesn't exactly say it, but that's what this conference is all about -- the way I see it.

There's a lot of talk these days about "tunnel vision" -- which seems to mean that we're looking at things through a small hole when we should be looking at them through a big hole. I think that's the way a lot of us look at fresh air and pure water. We expect to get these things out of a hole in a wall or a hole in a pipe, and most of us don't think much about what's at the other end of these holes.

We've managed to isolate ourselves from nature and still get what we need out of it. The result is that most of us look at nature through a pretty small hole -- if at all.

Even in this so-called "age of environmental awareness," our first thought about how to solve any shortage of a natural product is to call on human technology to increase the supply -- and our very last thought is to cinch up our belts and decrease the demand. This puts quite a strain on nature in some areas, and we hear a lot about "ecology" and "pollution."

It seems like everybody is saying these words, but hardly anybody seems to understand their meaning. We're so preoccupied with man-made systems that we can't think clearly about the natural systems that make our man-made systems possible in the first place.

I marvel at the number of people I know who are able and willing to plunge into the intricacies of cost/benefit analysis when it comes to a public utility system -- and I despair at the number who are unable and unwilling to get into the complexities of a biological analysis of a native watershed ecosystem. It's as if wild nature is some kind of forbidden fruit that's ok to pick but not to look at or think about -- or we might learn something that we weren't meant to know or that's not worth knowing.

A few of us will remember with righteous satisfaction a high school lesson about how plants absorb carbon dioxide and give off oxygen and how animals do the opposite, as we meticulously manicure the exotic plants in our garden -- or help plant some foreign tree in a vacant lot in the city, in the interest of "ecology." But how many of us will apply that lesson with deep concern to a news article about man's destructive impact on thousands of acres of native forest in Hawaii or millions of acres of native forest in the Amazon Basin? Of the very few who do, how many will be moved to try to do anything about it?

Many of us understand the virtue of corporate diversity and the tragedy of business failure. But how many of us understand the virtue of natural biological diversity and the tragedy of species extinction? And how many of us see the catch in this apparent parallel? Man can rebuild businesses and corporations that go bust, but he can't recreate a species he extinguishes or reconstitute the changed ecosystems that result.

The fact is, we are extinguishing species faster than nature can evolve new ones to replace them. And we are reducing populations of many species faster than they can reproduce themselves. By so doing, we're reducing nature's means to preserve the environmental status quo that our species depends on.

Nature will adjust. Empty niches will be reoccupied by different species, and

unb alanced ecosystems will seek to regain equilibrium by rearranging interrelationships among their components. The result will be environmental changes that we have neither the knowledge fully to predict nor the creative power to control.

Our ignorance about many elements in our biotic environment can be costly. It makes possible the careless sacrifice of many species because most of us don't know enough about them to care, even though they may play important roles in the stability of our ecosystems and even though they may be of great potential value for scientific study.

Hawaii is especially rich in unique and relatively unstudied plants and animals. Let me illustrate some of the things I'm talking about with a few color slides:

(Slide #1) Here at Paliku, at the far east end of Haleakala, is a small scene of Hawaiian vegetation -- one of our native lobeliads (Lobelia grayana) and our only native hydrangea (Broussaisia arguta), surrounded by native ferns. This is the real Hawaii. Such plants evolved with the land and are the backbone of its ecosystems.

(Slides #2-10) This series of arboreal land snails from Oahu (Achatinella sowerbyana, from Poamoho; A. vulpina, from Tantalus), West Maui (Purdicella sp.), Lanai (Partulina sp., from Lanaihale) and Molokai (Partulina spp., from Kahanui and Keopukaloa; Laminella sp., from Ohia Gulch) represent an unprecedented example of extremes of speciation and adaptive radiation, with over a thousand forms of land molluscs evolving on these islands from only a handful of original colonizers over millions of years. These little "vacuum cleaners" sweep microscopic fungi and algae from the leaf surfaces of our endemic forest trees. Over half of the thousand-plus known native snails of Hawaii are now considered extinct, and other populations are now greatly reduced -- through the acts of man here over the past two centuries. The effects on our native trees from the loss of so many of these snails, with which the trees evolved in close association, is as yet unknown -- as is the potential effect of further losses. Our scientists are still working on the taxonomy and morphology of these unique creatures; their biology and ecology are largely unknown.

(Slides #11-12) Here are two nocturnal insects that live in the native forest areas of the Waianae Range on Oahu. This katydid (Banza sp.) preys on other insects, and this tree-dwelling cricket (Prognathogryllus sp.) is believed to be a vegetarian. Each is an evolutionary component of the Waianae forest ecosystem, and each in its own way helps keep that natural system healthy.

(Slides #13-14) This remarkable insect (Dictyophorodelphax mirabilis) is a tree hopper that has undergone extreme adaptive change that allows it to feed on the poisonous juices of the native 'akoko plant (here, Euphorbia celastroides). The outlandish horn protruding from its head contains a loop of its gut, which scientists speculate is equipped to render the 'akoko juices chemically harmless and digestible for the insect. This species is endemic to the Waianae Range. Here is its generic cousin (D. swezeyi) from the Koolau Range, Oahu, whose "horn" curves up, instead of down, whose compound eye is red, instead of black, and whose host plant (E. multiformis?) is an 'akoko species endemic to the Koolau. Other generic cousins of this endemic genus have evolved on Maui, Lanai and Kauai -- in accociation with 'akoko host species in those areas. No such adaptation within this family of insects (Delphacidae) is known from anywhere else in the world -- and it still has not been completely studied and understood.

(Slides #15-16) This virtually blind wolf spider (family Lycosidae) is one of a whole series of newly-discovered arthropods that inhabit the dark zone of Hawaii's lava tubes. These life forms are new to science and, collectively, have opened up an entirely new avenue of both entomological and vulcanological investigation. Contrast the tiny vestigial eyes of this spider (Lycosa howarthi) with the huge headlights on this recently-collected cousin (Lycosa sp.) of his from the alpine-scrub ecosystem at the 8,000-foot level on the slopes of Mauna Loa, Hawaii -- which may also be a new species. Both of these fellows are specialized insect-control elements that are organic to their respective native ecosystems.

Slides #17-18) This little brown caterpillar, happily munching a live fly it just caught, is one of a group of recently-discovered native Hawaiian predacious caterpillars. They belong to a widespread genus (Eupithecia) of vegetarians, and nothing like them is known from elsewhere in the world. Although some caterpillar species are known to eat s edentary insects, like aphids and scales, most are vegetarians and no others are known to be able to catch and eat active prey, like flies. Apparently, this Hawaiian group

evolved to occupy an empty niche in Hawaii's insect fauna that resulted from the absence of functional analogues like the mantids and mantispids found elsewhere in the world. The brown one pictured here was found a couple months ago on a windswept, rainswept ridge in the Kahanui district of Molokai -- and is the only one of its kind found so far. This brown species may be a primitive form -- sort of a "missing link" -- in the evolutionary chain from vegetarian progenitors to the apparently more advanced and widespread green species, like this one from Tantalus (Oahu) and the green one first discovered eating a fly on the Big Island a little over a year ago by an entomologist doing field work at Hualalai on native vinegar flies (Drosophila). They are all obligate predators -- they eat no vegetable matter at all. They are another unique insect-control element in our unique forest ecosystems.

(Slide #19) Finally, here's a glimpse of the edge of a native rain forest near Kulani (Hawaii), showing a couple of native Trematalobelia plants -- a species on which three of the predacious caterpillars were found nearby last August.

These somewhat bizarre examples are, nevertheless, representative of the uniqueness, fragility and functionality of our singular island ecosystems. They are part of the overall natural biotic community that has evolved on this land in keeping with its peculiar character. It is this living community that helps moderate and stabilize the climate on these islands and that is instrumental in providing fresh air and pure water for the people who enjoy life here. But our man-made systems -- and the human values and priorities that go with them -- are placing a great strain on nature, both quantitatively and qualitatively.

Our perspective on our needs for fresh air, pure water and other natural resources from these islands must take in all the elements that go into the natural system, if our view is to be realistic and long range. We must set our parameters for yield according to what the natural system can produce on the long haul while still maintaining itself -- not according to what the man-made system can extract on the short run with its technology. For example, gradual depletion of groundwater reserves should not be acceptable -- and certainly facilities and methods that damage or disrupt natural ecosystems should be avoided.

If the natural system cannot produce what our human population construes as its needs, then our human population should reduce its consumption -- or its pollution -- by whatever means are necessary and at whatever cost is necessary to the man-made system. Nature has the controlling hand in the end -- and it is man, not nature, who will pay the bill in the end. Needless to say, realistic State and Federal standards for air and water quality must be met whatever the cost to our man-made system -- for the good of the environment, which is to say for the good of the people.

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HONOLULU STAR-BULLETIN, 31 May 1973, page B-2: It Acts Like a Praying Mantis, Isles' Latest Sensation: Mr. Caterpillar by Helen Altonn (Illustrated with photographs of the caterpillar consuming a large native fly by John Kjargaard, Jr. and the TRANSFORMATION-- a beautiful green moth by William P. Mull)

Steve Montgomery couldn't believe his eyes when he stooped over to look at some plants and "there was a caterpillar chewing on a large fly." The caterpillar belongs to a family of plant-eaters. So, what was it doing dining on an insect?

A University of Hawaii graduate student, Montgomery ran across the strange creature while collecting native flies on the Big Isla nd last year for an entomology project. He scooped it up and took it back to the University for experiments to determine if it was a predator or just a freak.

"I gave it a fly and it ate the whole thing except the wings," he said.

His chance observation turned out to be a spectacular discovery. He sent the caterpillar to the British Museum in London which reported that it had not been identified and appeared to be unknown anywhere else.

"Nowhere else is there a caterpillar that acts like a praying mantis," said Montgomery. "When they walk, they loop or form a hump in back. I figure it could only happen in Hawaii because we have very few praying mantis or other predators." (There are only five species of praying mantis and none occurs at higher elevations where the carnivorous caterpillar is found.)

"The caterpillar must have moved in to fill the niche and evolved this kind of

behavior," Montgomery said. "And now we have a caterpillar closely related to those on Mainland that eat leaves, but in Hawaii they eat flies."

Montgomery asked William P. Mull...to photograph the caterpillar. And Mull became absorbed with "the beast," as the research group calls it. ...He helped Montgomery collect specimens of the caterpillar, found so far on all major Islands. He also has studied its growth and eating habits and has kept painstaking records.

The men haven't succeeded in catching any adult moths in the field because they're green--like the larva--and difficult to detect on leaves. But they have reared more than 50 moths in the laboratory -- successfully breeding some through an entire life cycle.

Mull found the eggs of the moth for the first time on Easter Sunday in the northern Koolau Mountains.

"Within 24 hours, one had hatched and that's the first we knew of the size of a hatching -- $2\frac{1}{2}$ millimeters long," he said.

He also learned in the hatching process that the eggs start out creamy yellow, then become bright red and later olive brown when the embryo is formed.

"This is a real breakthrough for us," he said, adding: "Every little stage is exciting because we're looking at unknown things."

He said when the caterpillar emerged from the egg, "It had all the gear of the big one. It was skinny with a big rear end and all ready for action. It struck postures within a few hours of its existence like a full-fledged larva."

Mull said, "No other caterpillar has legs so long and powerful in proportion to the body. Its legs whip out lightning fast to grab the fly."

He found through his research that a caterpillar can eat five flies in one day.

Montgomery said caterpillars usually are very sluggish, but this one is so fast it defends itself by eating its enemies. He saw an ant crawl up on a caterpillar. "It actually ate it before it could harm him." And it's cannibalistic. If another caterpillar is walking by of the same species, it will catch it and eat it, he said.

Montgomery and Mull believe they have at least two distinct species of fly-eating caterpillars.

Besides the green one which they have been raising, they picked up an oddball on Molokai which they call "Brownie." It catches flies like its green relative, but it hugs twigs instead of leaves and is brown.

"Its color would have no survival value on leaves," Mull noted. He said the adult moth also was brown, with different characteristics than the green adult moth.

The men so far have found only one specimen like Brownie and they wonder if perhaps it is the primitive form of the green "beast." They're hoping now to find a caterpillar that eats both plants and insects -- "the missing link between the plant and meat eaters."

Montgomery, whose field is insect ecology, pointed out that the carnivorous caterpillar is not rare. It is widely distributed and apparently abundant in the Islands. But its taste for flies was never known before.

He said some specimens of the caterpillar were recorded in 1930. But they wouldn't eat when they were placed on leaves and they failed to mature into adult moths. They died, apparently of starvation.

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Testimony at hearing on Kaneohe-Kailua Flood Control Dam Project ("Keapuka Lake") to U.S. Army Corps of Engineers from Wayne C. Gagne, Acting President, 8 November 1973:

This project is an attempt at atonement for past errors in Land Use Planning in that it permits urbanization on flood plain. It is a plan to encourage, abet and allow more suburbanization to proceed in the Kaneohe Bay Watershed. But, as a plan to create wildlife habitat, it would not appear to be.

Any wetland habitat for waterbirds that might accrue, will not be because of the project, but in spite of it. There is no indication that the ecological factors which contribute to good shore- and waterbird habitat have been recognized. Certainly the planned human activities on and about the reservoir would seem to preclude it from becoming other than a periodic way-station for passing birds until they are driven out. So it is unlikely that the koloa (Hawaiian duck), 'alae Ke'oke'o (coot), and 'alae 'ula (gallinule) will establish or maintain reproducing populations in the reservoir.

Good shorebird habitat, for example, usually requires a stable shoreline environment with emergent vegetation. Typical shorelines of reservoirs usually are subject to such

excessive fluctuations and siltation that the development of vegetation there is prevented. For these reasons and the proximity of human activity it is also unlikely that the auku'u (black-crowned night heron) and ae'o (stilt) will establish. The reservoir will apparently be stocked with fish which are food competitors of waterbirds which will likely consume what little, if any, food sources that might develop in the new impoundment. In this respect, there should be documentation of which "food-producing organisms" which purportedly will develop there.

Unless these ecological factors are taken into consideration it is the opinion of the Hawaii Audubon Society that this project cannot and should not be advertised as one which will greatly benefit our now beleaguered shore- and waterbirds. With the projected visitation of over 300,000 people annually to the dam site, a lack of detailed ecological planning there, and the possible adverse impact to the Waikalua Fish Pond at the ocean end of the project, we wonder if the overall impact might not even detract from rather than enhance present wildlife values for the watershed as a whole.

Looking at this project critically it appears to be primarily a scheme for further urbanization, done up in fancy trappings of "recreation" and "wildlife enhancement" to sell to the gullible. We seriously doubt that much of the touted wildlife values will ever be realized if the present plan is implemented.

Thank you for the opportunity to present our viewpoint.

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Letter from Chairman Sunao Kido, Board of Land and Natural Resources to Acting President Wayne Gagne, 23 October 1973:

Thank you for your recent letter inquiring about the status of the axis deer environmental impact statement.. ...

With regard to the axis deer environmental impact statement, the Division of Fish and Game has completed preparation of a "Preliminary Draft Environmental Impact Statement for Establishment of Axis Deer (Axis axis) on the Island of Hawaii" on August 6, 1973 which has been undergoing in-house review by the resource divisions in this department and individual members of the Animal Species Advisory Commission. Following completion of this review a draft impact statement will be prepared that will be transmitted to the Office of Environmental Quality Control for distribution to individuals and agencies on its mailing list. It is estimated that the draft statement will be completed within two months. ...

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HONOLULU STAR-BULLETIN, 4 February 1974, page A-8: As Advisers Near End of Term Axis Deer Still in Limbo on Lanai by Helen Altonn

Some members of the Animal Species Advisory Commission may finish out their terms without acting on the major problem that prompted a law creating the organization four years ago. The problem was continuing fight between hunters and conservationists over a State proposal to introduce Axis deer for hunting on the Big Island.

Commission members represent both factions in the dispute, which goes back several decades. The Commission wasn't formally organized until late 1971 when it had full membership. Early in 1972 it held public hearings throughout the State on the Axis deer controversy. Then everything stopped, waiting for an environmental impact statement.

Ronald J. Endrizal, commission chairman, revived the Axis deer matter at a meeting Friday, calling for a "vote on members' feelings" on the deer introduction.

Michio Takata, head of the State Fish and Game Division and a commission member, said, "Mr. Chairman, we're not ready to take a vote."

Endrizal explained that he had in mind a poll, rather than a vote, to determine how the members feel and said he wanted to know how the commission stands on the impact statement.

Takata said his division has drawn up a preliminary draft statement and circulated it to the commission members and division chiefs in the Department of Land and Natural Resources for comments. But he said, "We simply haven't had time to prepare an impact statement." Nor could he say what the timetable will be. He said he hoped the statement would be ready last December but the division is understaffed with the State hiring freeze.

Endrizal commented that some of the members who heard the testimony won't be on the commission after next January if the issue is delayed that long.

The State Fish and Game Division planned in 1969 to move deer from a holding pen on

Lanai to a 300-acre release pen on the north slopes of Mauna Kea after the State Supreme Court ruled that the State could release the deer. But Governor John A. Burns intervened and halted the transfer.

The 1970 Legislature passed a law setting up the commission to deal with the problem, although the State Board of Land and Natural Resources will make the final decision.

Despite the Fish and Game Division's previous plans to introduce the deer, Takata and his staff were congratulated by commission members for their objectivity in the preliminary draft impact statement. ...

"I don't know if members on the commission who represent hunting elements are unhappy with me," said Takata, noting that the impact statement has no recommendation from the division. But he said, "An impact statement shouldn't be an instrument to justify action."

In other business Friday, some commission members protested bills under consideration in the Legislature to amend the law (Act 195) establishing the commission.

The Law gives the commission sweeping responsibility for protection of animals, fish, birds and "vegetable life." The commission is to advise the Fish and Game Division on every proposal for introduction of an animal species to or within the State on any matter affecting fishing, hunting, fish and wildlife conservation and proposed rules and regulations. Takata pointed out that the commission itself recommended the changes to the law two years ago after five months of study. He said the changes were intended to make the law more workable by improving the language. "If we followed it word for word, we (the division) would have to seek the advice of the commission for the purchase of a single pencil, which is ridiculous."

However, the commission has acquired some new members since its 1972 approval of the proposed legislation. Frank J. Radovsky, Bishop Museum entomology chairman, said, "Coming onto this as a new member it is extremely difficult to understand the intent and effects of the proposed changes. With the exception of providing reimbursement for secretarial services, the overall effect appears to attenuate the services of the commission and make it ineffectual in doing any good for the people of the State."

Alan Zeigler, also of the Bishop Museum, said some of the proposed amendments were his idea but his thinking has changed in two years. He said circumstances have changed, too.

Endrizal said, "it was a tedious task" to work out the changes and the commission doesn't have time to prepare a new bill for consideration. "If anyone has objections they can go before the legislative committee," he said. "I'd just as soon leave it the way it is."

HONOLULU STAR-BULLETIN, 7 February 1974, page A-12: Axis Deer Issue Pops Up by Helen Altonn

Not a single hunter testified at a legislative hearing yesterday on a bill introduced for hunting interests and unanimously opposed by scientists and conservationists.

The measure--House Bill 2150--proposes changes in the language of a law passed by the 1970 Legislature creating an Animal Species Advisory Commission in the State Department of Land and Natural Resources.

Rep. Richard A. Kawakami's House Committee on Water, Land Use and Development heard one speaker after another point out dangers in the bill. Kawakami finally asked when they "got together" but they assured him their testimony was prepared independently.

The only favorable view of the bill was presented by William Thompson for Land Board Chairman Sunao Kido. Thompson is Kido's deputy. In addition to written testimony, Thompson commented that the commission is supposed to serve the Division of Fish and Game in an advisory capacity. But he said the law gives the commission such broad powers it's questionable sometimes whether division director Michio Takata works for the commission or the Land Department.

The commission was set up primarily as a result of a longtime fight over the Fish and Game Division's plans to introduce axis deer for hunting on the Big Island--a hassle which hasn't been resolved yet. But scientists who sit on the commission with hunters said they have the start of a "foundation of communications" and they're working well together on special interest problems.

They said House Bill 2150 has some features which would strengthen the commission and which might be salvaged, but they oppose other changes which they said would make

the commission ineffectual.

For example, the bill would change the scope of commission responsibility over "introduction" of animals to "liberation from captivity." Scientists and conservationists contend this would allow axis deer to be introduced to the Big Island in holding pens from which they could be "liberated" accidentally. Kido noted in his summary of the legislation that the term "introduction" is changed to "liberation" because "the former is often used synonymously with importation."

Thompson said the commission under the present law has prevented the DLNR from settling the axis deer argument -- which he said could only be done by testing the animals in a holding pen on the Big Island. He also noted that the DLNR made a "commitment" to hunters to release the deer. (He was referring to the Land Board decision some years ago to take the deer to the Big Island from Lanai. However, Gov. John A. Burns intervened because of a furor from conservationists and asked for more information on the environmental impact.)

Frank J. Radovsky, chairman of the entomology department at the Bishop Museum and member of the Animal Species Advisory Commission, told the legislators yesterday: "I believe that a commission of this kind is most urgently needed to protect the present and future interests of Hawaii and that it is essential here to a degree unique among the 50 states..." He said he feels "the commission has demonstrated that steps can be taken to conserve indigenous life forms while satisfying the needs of hunters and fishermen and other recreational uses, and commercial uses, through wise management."

Frederick Erskine, State agriculture director, said amendments proposed by HB 2150 would duplicate laws and regulations under which the agriculture department operates. His department has an advisory committee with some of the same members of the Land Department's advisory commission. "We feel that a system of two advisory committees working in the same area is simply not warranted" he said. He suggested possibly a merging of committees to avoid overlapping functions.

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Plover Watching from David D. Dunatchik, Haleakala National Park, Maui, 26 July 1973:

Weather clear and warm. Time 2:30 p.m. While hiking up the Halemauu Trail I saw four golden plovers flying as a flock through Koolau Gap. They were headed into the crater in a southerly direction. They were in breeding plumage. I watched them until they were out of sight.

From files (This is the park's earliest recorded "fall" sighting of plovers. The latest recorded "spring" sighting before departure was May 5, 1959.)

From Erika Wilson, Honolulu, 20 January 1974, 8:15 a.m. Cool, clear, no wind.

While walking along Hibiscus Drive I heard the call of a Golden Plover; I quickly spotted the individual standing on a composition-shingle roof peak of a private residence. The bird was bobbing up and down and giving its short call note. It ran down the roof to a flat porch roof to look at me, then it returned to the peak of the roof. After a few moments it flew off toward Kapiolani Park and the ocean.

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Field note from Kauai by A.D. Hart

Late Thursday afternoon, December 27, 1973 during a brief visit to the Kauai Surf Hotel at Nawiliwili Harbor, Wayne Gagne and I were pleasantly surprised to find three Hawaiian Gallinules (Gallinula chloropus sandvicensis) on the hotel grounds. This species is considered to be rare and endangered by the Bureau of Sport Fisheries and Wildlife with a total population estimated to be in the low hundreds. Initially, one bird was observed in a small, shallow lily pond stocked with several varieties of exotic fish and plants and the other two on an adjacent lawn. They moved back and forth between the pond and the surrounding lawns. At the northeast end of the pond a semi-protected cove formed by naupaka provided a shelter for the birds which they were observed to use. Both the pond and surrounding lawn were completely open and there were no visible enclosures of any kind. At one point I managed to coax a bird to within a few feet of my outstretched hand only to have another bird come charging out of the pond and chase the curious one away. The birds did not seem to be bothered by their close contact with people or cars but simply went about their business unconcerned. We did not know if the birds were wild or even if the management of the hotel was aware of them. If they were

consciously and deliberately providing 'habitat' or attempting propagation their action is most commendable. In any case, we found the situation highly encouraging. Perhaps with a little encouragement they might establish a breeding population.

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RECENT BIRD STUDIES IN POLYNESIA

Review by E. H. Bryan, Jr.

David T. Holyoak, of the School of Biological Sciences, University of Sussex, Brighton, England, is carrying on a valuable series of studies of bird life in the Pacific area.

During the summer of 1972 he visited French Polynesia, principally islands in the Marquesas and Society groups, the expedition made possible by a Winston Churchill Memorial fellowship. Two comprehensive papers, "Oiseaux de Societe" and "Oiseaux des Iles Marquises" are in press. "Notes on the birds of Rangiroa, Tuamotu Archipelago, and the surrounding ocean," was published in the Bulletin of the British Ornithologists Club, 93:26-32,1973. Separates of three other papers have been received from the author. "Endangered land-birds in French Polynesia," which appeared in Biological Conservation, vol. 5(3), July 1973, notes the status of the Marquesan Pigeon (Ducula galeata) as fewer than 100 birds, restricted to the mountain ridges of western Nukuhiva; the Ultramarine Lorikeet (Vini ultramarina) of the Marquesas as reduced to a few hundreds; the Tahitian Flycatcher (Pomarea nigra) as very rare and localized; and the Tuamotu Sandpiper (Prosobonia parvirostris) as confined to a few small atolls in the Tuamotus. He lays the blame for these conditions on the uncontrolled increases in the number of feral cattle, sheep, goats, and pigs, which are destroying great areas of native forest; avian malaria; shooting by local inhabitants; and introduced cats and rats. These threats are also noted in a paper titled "Polynesian land birds face H-bombs and malaria," published in New Scientist, 8 February 1973, which also gives a map and small sketches of four of the species of birds. The third paper, from Ibis, 115: 419-420, 1973, discusses the significance of colour dimorphism in Polynesian populations of Egretta sacra, the "sacred" reef heron.

Dr. Holyoak spent June to September 1973 in the Cook Islands, visiting nearly all the main islands and the northern atolls, except Penrhyn (Tongareva). Making careful observations on the status of the birds, he was able to advise the Cook Island government regarding the status of the bird life and to make recommendations regarding the conservation of wildlife. This trip was made possible by the International Council for Bird Preservation and the Smithsonian Institution. Prior to the trip, a visit was made to the American Museum of Natural History to examine specimens collected by the Whithey South Sea Bird Expedition, which incidently did not collect in the Cook Islands.

Next year he plans to lead an expedition to selected islands in the Bismarck, Solomon and Santa Cruz groups, chartering a yacht to reach as many of the smaller, uninhabited islands in this region as possible.

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CONDOR, 75:4 p. 487: The International Council for Bird Preservation has funds for research and conservation of endangered or vulnerable species. Proposals may be submitted to the Office of the President, I.C.B.P., Room 336, National Museum of Natural History, Smithsonian Institution, Wash., D.C. 20560.

I.C.B.P. is currently revising the Red Data Book. Vol. II, Aves, on agreement with the International Union for Conservation of Nature and Natural Resources (I.U.C.N.). Published or unpublished reports on the status of endangered or vulnerable bird species are urgently requested at the above address.

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AUDUBON LEADER, Vol. 15, No. 1, 11 January 1974:

Endangered Species Bill Signed; It is a strong law--Congress completed action before the Christmas recess on the endangered species bill and it has been signed into law by the President. The new law for the first time provides federal protection for domestic endangered species and authorizes funds and procedures for states to develop their own protective programs. This long-due measure is generally a strong one and an important achievement for the 93rd Congress which conservation can applaud. A "backgrounder" sheet detailing the key points of the new law is being prepared and will be available in the next month or so from the LEADER.

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Interior Dept. Issues Strong Pet Trade Regs.--The Department of the Interior has

taken a bold step to cut off the importation of live wildlife by the pet trade. In proposed regulations, Interior has classified a few species including the canary, golden hamster and the bull frog, and a long list of fish as "low-risk wildlife." These species can still be imported. Other live wildlife can be imported only for scientific, educational, zoological or medial purposes under a permit from the Department of Interior. This means that once the regulations go into effect, the trade in exotic pets, which is taking a serious toll on wild animals, including rare species, would be effectively ended. Because the pet trade will undoubtedly launch a massive campaign to oppose these regulations, it is vital that Audubon members present their all-out support. Copies of the regulations are available from the LEADER; written comments should be sent, in triplicate, by March 1 to the Director (FSF/LE), Bureau of Sport Fisheries & Wildlife, Washington,D.C. 20240.

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Excerpts from minutes of Hawaii Audubon Society general meeting, 15 October 1973 by Sandra Guest, Acting Recording Secretary: ...Reef Runway Suit--Acting President Wayne Gagne reported that the executive board voted to support (not financially) Life of the Land in a petition for a rehearing to be held In Banc of the decision of the 9th Circuit Court in September to allow the reef runway to proceed. Kanaha Pond--Gagne reported that pressure...exerted appears successful in the withholding of federal money for the presently planned sewerage treatment plant involving injection of effluent under the pond. The State is now trying a new tack involving a treatment plant at the same site but no injection. We oppose this. There are better sites. Legislative Program for 1974 Session--The Democratic Majority of the House of Representatives have asked for the Society's participation and assistance in formulating a legislative program, and Gagne will meet with them. Green Sea Turtle--Gagne drafted a letter of support for the proposed regulation for protection of the Green Sea Turtles. There are only about 2000 turtles in the existing breeding population. Members were urged to write or voice their support of the regulation. Eel Introduction--Steve Montgomery presented a resolution against the introduction of eels to Hawaii, and the members accepted it. If the eels were to escape they would be capable of invading all the fresh water streams in the state, and they are voracious predators. Announcements--(1) Progress reports have been received from Paul Banko and Charles van Riper, III. Both are recipients of H.A.S. grants. (2) Gagne will participate in a panel discussion on "All you ever wanted to know about animals but were afraid to ask" at the annual Hawaii All-Breed Cat Club Show at the HIC, 10:30 a.m., Nov. 3, and will answer questions on birds. (3) Gagne and Montgomery will be giving a seminar on "Native Hawaiian ecosystems and what they mean to people" at the 3rd Annual Convention of the Hawaii Council of Teachers of English at 9:45 - 12:00p.m. on Oct. 20 at the Ilikai Hotel. ...(4) H.A.S. has reviewed a draft of proposed quarantine regulations provided by Act 69 of 1973, reviewed by the new Advisory Committee on Plant and Animals on Oct. 5. Speaker of the Evening--Alan Hart presented slides and a talk concerning a field trip he and Dr. Wingfield took into West Alaka'i Swamp. The trip lasted four days and four nights, and the results were compared to two previous trips made by Richardson and Bowles, and Sincock. White-eyes were the most common exotic bird seen, and the fourth most common species. In order of abundance, the following endemic birds were observed: 'Apapane, 'Elepaio, 'Anianiau, 'I'iwi, 'Amakihi, Creeper, 'Akepa, 'O'u, Large Kauai Thrush. The Nuku-pu'u, Small Kauai Thrush, 'Akialoa, and 'O'o'a'a were not seen.

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19 November 1973 by Sandra Guest, Acting Recording Secretary: ...Island of Hawaii Representative--Gagne announced that the Board had voted to establish a Society Representative on the Big Island. Mae Mull has volunteered to be the first representative. Bishop Museum Journals--A communication from the Bishop Museum regarding possible disposition of duplicate sets of journals donated by the Audubon Society, was received. The Museum is short of room and can not keep them. The members voted to tell the Museum to dispose of them in the easiest manner, which would involve giving them to a library which could then distribute them. Military Surplus Land at Pauwalu Point, Maui-- Rene Sylva has requested that the H.A.S. use its influence to establish a bird sanctuary at Pauwalu Point. Announcements--...(1) Mae Mull and W. Gagne responded against the Waiakea "Reforestation" Project by the State Division of Forestry. (2) The Society is requesting that the Axis Deer Issue be resolved once and for all. It is felt that this administration will provide the best chance for deciding against the introduction. ... Speaker of the Evening was

Sandra Guest, speaking on White-eyes in Oahu.

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Letter to Director Michio Takata, Division of Fish and Game from Margaret Titcomb, 14 December 1973: To read your Resolution 38, to make Paiko Lagoon a sanctuary is an immense satisfaction to the Hawaii Audubon Society. We are sure that a great many citizens not in the Society will share this pleasure.

We appreciate all you have done to conclude this effort, satisfying the lagoon-side residents as well as all others. We hope that the Resolution will be officially sanctioned very soon and that the birds will soon sense that security is theirs, just as the fauna of Hanauma Bay seems to have done.

At the projected meeting next Monday, we are sure that a few points will be reviewed, such as the nature of care as to maintenance and what guard can be provided so as to make it evident to vandals that it is off-grounds to them!

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HONOLULU STAR-BULLETIN, 15 December 1973, page A-14: Protecting Hawaii's Birds by Harry Whitten

Hawaii's native birds have had a rough time and have been diminishing in numbers for the past 150 years; in recent years new subdivisions have chased them out of areas where they used to thrive.

Two sanctuaries to protect them will be set up if regulations proposed by the State Division of Fish and Game are adopted. The division has scheduled two hearings on the regulations next week.

Regulation 38 would establish the Paiko Lagoon Wildlife Sanctuary at Kuliouou for protection and propagation of native shore and water birds. The hearing will be held at 7:30 p.m. Monday at Niu Valley Intermediate School Cafetorium, 310 Halemaumau St.

Regulation 37 would establish the Kipuka Ainahou Nene Sanctuary in North Hilo on the Big Island. It would set aside 38,400 acres of State-owned conservation district lands west of the Upper Waiakea Forest Reserve for portection and propagation of the nene, the native Hawaiian goose which is the State bird. The hearing will be held at 7:30 p.m. Wednesday at the Hawaii County Council room in Hilo.

The Paiko Lagoon Sanctuary, advocated by conservation groups for years, would be set up on State-owned lands surrounding the lagoon, which is at the ewa end of Maunalua Bay and is adjacent to Kuliouou Beach Park. It would include 40 acres of water and eight acres of land. In March the State finished building islets in the lagoon where such birds as the Hawaiian Stilt could nest in safety from such predators as rats, mongooses, or dogs.

On a recent trip to the lagoon, Wayne Gagne...observed such birds as stilt, sanderling, ruddy turnstone, night heron, and wandering tattler. Other birds are occasionally seen at the lagoon, including strays more often seen on the Mainland.

The proposed regulations would make it unlawful for any person, except agents of the Fish and Game Division on official business or other authorized persons, to operate boats or surfboards on the lagoon or to damage or remove vegetation from the sanctuary. Entry to the water area would be forbidden, but there are places where people can stand to study or observe birds.

There have been complaints of people fishing or crabbing in the lagoon and destroying food on which the birds depend.

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Report on the Hearing on Regulation 38 by Margaret Titcomb: ...A few people at the meeting favored vigorously permission for their children to play with boats or surf boards on the lagoon. Plenty was said against it, but no vote taken.

Discussion followed as to removal of debris and "bad" plants, such as mangrove, floating seeds, etc. Some were worried about trash being dumped. Low-flying helicopters were mentioned as frightening birds.

A foot bridge is to be installed across the entrance. Some think this will attract the wrong kind of observer. Actually, I think the best plan, and I think they are following it, is to make a few rules and try them out, allowing opportunity to change them if they are not wise. Some question about the 16 little islets. Are they large enough to succeed?

If this Resolution needs revision of slight change, it will be made by Fish and

Game at once. If judged to be of much change, another hearing will be held.

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HONOLULU ADVERTISER, 6 December 1973, Page E1: Nene Sanctuary Hearing Scheduled

The State Division of Fish and Game has scheduled a public hearing for a proposed 38,400-acre nene sanctuary on the Big Island.

The State Department of Land and Natural Resources wants to use 11,123 acres of Hawaiian Homes Commission lands and 27,277 acres of State forest reserve for the Hawaiian goose, which is staging a comeback from near extinction. The Kipuka Aina Hou nene sanctuary would be located on lands situated in the Mauna Loa Forest Reserve and the upper Waiakea Forest Reserve. ...

Michio Takata, State fish and game director, said the proposed area is "the most important single tract of State-owned nene habitat being occupied during the summer period as well as during the winter breeding season."

The Hawaiian Home lands have been set aside for public hunting by gubernatorial executive order. The order would have to be canceled, to include the lands in the sanctuary.

Takata said 55 nene raised at the State's main breeding grounds at Pohakuloa on the slopes of Mauna Kea have been released at Kipuka Aina to augment the small breeding population already there.

HONOLULU STAR-BULLETIN, 27 December 1973, page A-21: 3 Nene Born This Christmas

...Russ Cahill, superintendent of Haleakala National Park, said yesterday three goslings were hatched in an enclosure at the park headquarters, 7,000 feet up the slopes of the dormant volcano. The newly hatched goslings come from a clutch of four eggs laid in the fall. Propagation of the nene at the park headquarters is part of a "natural sciences resources study" aimed at removing the species from the endangered list through natural reproduction. Authorities sxpect the park-bred nene to pioneer a new population and re-establish a community at Haleakala, once the birds' natural habitat.

Last Christmas, five goslings were hatched to one of two pairs of nene kept at the enclosure for breeding purposes. These goslings were given their freedom when they reached maturity in the fall.

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The following Hawaii Audubon Society items formerly on loan to Bishop Museum were converted to gift status (Accession No. 4667) on 14 December 1973: (1) Vertebrate Zoology: 11 birds, 5 partial specimens--1 mounted pheasant, 2 young and 1 adult barred doves, 1 'apapane, 1 Pacific golden plover, 1 white-eye, 1 linnet (?), 1 frigatebird(female), 1 Hawaiian gallinule, 1 red-footed booby, 1 pair legs of wild rooster, 3 pairs wings Bulwer petrel, 1 skull Bulwer petrel. (2) Geology: 1 box chalk like substance from Pali, east side below Hoolehua, 1 box glossy pebbles from Lanai. (3) Botany: Christmas berry branch eaten by caterpiller.

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Because of critical paper shortage the annual index for Volume 34 will be mailed to members only upon request, so if you are interested in receiving a copy, please send in your reservation before July to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

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ALOHA to new members:

Junior: Fredora Kay Powell, 51 Kaikea Place, Kailua, Oahu 96734

Regular: Dr. David H. Brown, 1351 Lower Main St, Wailuku, Maui 96793
Sayo A. Nakagawa, 2029 Wilhelmina Rise, Honolulu, Hawaii 96816
Carroll E. Pinckard, Jr., 6601 Walther Ave, Baltimore, Maryland 21206
Frederic Shaffer, 2957 Kalakaua Ave, Apt 515, Honolulu, Hawaii 96815
Richard C. Smith, 1011-114 Beyer Way, San Diego, California 92154
Alvin Y. Yoshinaga, Dept of Botany, University of Wisconsin, Madison, Wisconsin 53706
Lanai Community School Library, PO Box 358, Lanai City, Lanai 96763

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HAWAII'S BIRDS, a field guide, is available for $2.50 postpaid, Airmail 50¢ extra. Send in orders to: Book Order Committee, Hawaii Audubon Society, PO Box 5032, Honolulu, Hawaii 96814.

THE ELEPAIO

Expenses from 1 January through 31 December 1973:

Envelopes and stamps	$ 206.17
Paper	249.39
Stencil	22.00
Miscellaneous	38.91
Total	516.47

Miscellaneous

Addressograph plates	24.84
Correction fluid ...	.92
Twine	3.49
Mimeograph ink	9.66

Mimeographing Gratis (Bishop Museum)
Typing ..... Gratis (members)
Mailing ..... Gratis (members)

Mailing list as of 31 December 1973:

Honolulu	152	Mainland (28 states & DC)	104
Rural Oahu	31		
Hawaii	25	Canads	5
Kauai	13	England	2
Maui	10	Fiji	2
Molokai	4	Malaya	1
Guam	2	New Zealand	3
APO	4		
FPO	1	Copies	359

Please send in suggestions to improve the quality of the publication despite paper shortages and cost increases to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

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MARCH ACTIVITIES:

10 March - 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. In order to spend more time at the booby colony the group will leave promptly at 8:00 a.m. from the State Library on Punchbowl Street. Leaders: George-Ann Davis and Erika Wilson, telephone 523-1843.

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

18 March - General meeting at Waikiki Aquarium Auditorium at 7:30 p.m.

Program: The Kawaikoi Stream, Wailau Valley, and Kahikinui Subalpine Scrubland Trail-Building Service Trips by Dana Peterson, Roy Ihara and Lorin Gill (color slides)

For the past four years, the Sierra Club in cooperation with the State Division of Forestry has sponsored a program in which young people (ages 16-22) volunteer their time and pay their way to labor in the mud and bring remote trails into repair, or construct needed new ones. The speakers will describe their experiences and new plans to relieve hiking pressure on the Alaka'i Wilderness Preserve. On Maui, they will provide greater access to the remote, goat-infested koa forest and uplands on the leeward side of Haleakala, which have been a State-owned reservoir for the "hoofed locusts" that plague the National Park. The Board will be considering partial financial support of this program.

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HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

Pres ident: Wayne G. Gagne
Vice Presidents: H. Eddie Smith (program)
George-Ann Davis (education)
Secretaries: Patricia Bloedon (recording)
Erika Wilson (corresponding)
Treasurer: C. Florence Hendrycy
Board Members: Steven L. Montgomery (conservation)
Mae E. Mull (Big Island representative)

THE ELEPAIO: Editors--Charlotta Hoskins & Unoyo Kojima
MAILING ADDRESS: P.O. Box 5032, Honolulu, Hawaii 96814

DUES for 1974 are now payable: Regular - $3.00 per annum
Junior (18 years and under) - $1.00 per annum
Life - $100.00

Members whose dues have not been paid by March 31st will be dropped from the membership roll and THE ELEPAIO mailing list.