THE ELEPAIO

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For the Better Protection of Wildlife in Hawaii

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LETTER TO THE EDITOR: COMMENTS ON CARLQUIST BOOK 11 February 1972

The review of Sherwin Carlquist's book, Hawaii, A Natural History, in the January 1972 issue of The Elepaio /pp. 66-67/ prompts me to send these comments, because I feel that the members of the Hawaii Audubon Society should have a more precise appraisal of chapter 11 on the endemic Hawaiian birds. The Natural History Press did a fine job of designing and producing Carlquist's book, but unfortunately, it contains perhaps the poorest discussion of the endemic birds that has ever been published. I hope, therefore, that the following comments will aid in reducing the number of times that unfounded and inaccurate statements in this 1970 book will be quoted as fact by future writers on Hawaiian birds. For the convenience of your readers, I refer to page and paragraph numbers.

Page 190:

par. 1. "Although many birds have been reported as stragglers or chance visitors to the Hawaiian Islands..., none of these are true land birds." In fact, at least six species of land birds have been recorded on the Hawaiian Islands.

par. 2. "During occasional strong Hawaiian storms, honeycreeper individuals are blown to lowlands. They are unable to find their way back to forests and soon die, in fact, in the unaccustomed lowland environment." This statement is based on speculations by early writers.

par. 4. I don't know of anyone who has proposed that the creepers (Certhiidae) were ancestral, or even closely related to any ancestor, to the honeycreepers.

par. 5. "two subfamilies (Psittacirostrinae and Drepanididae)...." Should be Psittirostrinae and Drepanidinae. His Drepanididae is the family name for the honeycreepers.

par. 6. and continued at the top of page 191. There is no factual basis for his statements about differences in diets of 'akepa, creepers, and 'amakihi. Of these three species, only the food habits of the 'amakihi on Hawaii have been studied thoroughly.

Page 191:

par. 2. The only factual basis for feeding habits of 'akialoa and nuku-pu'u is that given by Perkins in 1903.

Page 193. Drepanidis should be Drepanis. I have been unable to discover where Carlquist found the name Drepanidis; this incorrect name also is used on pages 198, 211, and 212.

Pages 194-197. The information on diet is so general and incomplete that its significance is doubtful.

Page 198:

par. 1. "The other subfamily of the Hawaiian honeycreepers, Drepanidae." The idae ending can only be used for a family name. The subfamily is the Drepanidinae. Nothing is known about the feeding habits of Palmeria except what Perkins wrote in 1903.

par. 3. Nowhere in Herman Spieth's article does he say that the 'I'iwi feeds on the Drosophila that are attracted to the lobeliad Clermontia arborescens. The 'I'iwi does feed on insects, but Carlquist should have referred to the paper by Paul Baldwin (1953. Univ. Calif. Publ. Zoology no. 52).

Figure at bottom of page: Loxops coccinea rufa is the Oahu 'Akepa, not the Kauai bird. The Kauai subspecies is yellow, not reddish. The bill of the 'Akepa also is "suited" for obtaining nectar.

Page 201. The 'Akiapola'au is not a "drab greenish Hawaiian honeycreeper." The males, at least, are bright yellow on the breast.

Page 203. Pseudonestor is not extinct.

Page 205. The Palila does not have a parrotlike bill, but the Maui Parrotbill does.

Page 207. The 'Apapane eats nectar, spiders, insects, and their larvae.

Page 208. The Crested Honeycreeper was not thought to be extinct. The Maui Nuku-pu'u was rediscovered during the Kipahulu Valley expedition in 1967.

Page 211. The bird illustrated is the Black Mamo, not the Mamo.

Page 212:

par. 1. Honeycreeper nests are not "shallow ." 'Apapane nests are not made of "grass or sedge leaves." The 'I'iwi nest is not made of leaves. "Some of the names given by the Hawaiians were attempts to record the calls: 'apapane,' for example." The 'Apapane is noted for its wide variety of calls and songs, but I know of none that can be likened to the name "apapane." The 'Apapane does not have "short, plaintive calls."

par. 2. Palmeria was not rediscovered on Maui; it was not said to be extinct. Pseudonestor is not extinct. Drepanidis should read Drepanis; Psittacirostra should read Psittirostra. "Most of the honeycreepers which are now extinct...occupied limited areas." According to available information, this is not true; many of the extinct forms were widespread, even though they were confined to one island.

My comments on Carlquist's statements on extinction follow:

a. Destruction of forest areas was an important contributing factor, but I doubt that we can say that it was a "prime cause" in the past. It could be in the 1970s.

b. Rats undoubtedly kill honeycreepers, but the Polynesian rat has been here a long time, and there is no valid evidence that rats caused the extinction of any species on the main Hawaiian Islands.

c. Bird malaria does not cause "swelling of the claws," but bird pox may cause swellings on the toes.

The photograph (bottom left of page) simply cannot be an 'Apapane nest.

Page 213:

par. 1. The author has absolutely no basis for saying that the 'Elepaio competes with the honeycreepers. The 'Elepaio nest is not "fragile." It is not "formed largely of lichens."

par. 2. "Another member of the Old World flycatcher family is the ōmao thrush." The Hawaiian Thrush is a member of the thrush family, Turdidae.

Page 214:

par. 1. Phaeornis palmeri is not extinct; it is an endangered species. It is not entirely insectivorous; it eats berries as well as insects.

par. 2. "Miller birds, also members of the Old World flycatcher family...." Millerbirds are members of the Old World warbler family (Sylviidae).

par. 3. There is no evidence that thrushes or the 'Elepaio are competitors with honeycreepers in any way. Chaetoptila was much smaller than the Hawaiian Crow.

par. 4. The Kauai 'O'o is not extinct. Despite Carlquist's 1970 description

of the 'O'o nest, no nest of any species of 'O'o was discovered until May 31, 1971, when John L. Sincock found a nest of the Kauai 'O'o.

Page 215. The Puaiohi of Kauai is not extinct.

Page 217. The Hawaiian Crow had a wider distribution in the 1890s.

Page 218:

par. 2. Typical habitat of the Nene is not "high grasslands." Typical habitat is a sparsely vegetated lava flow.

par. 3. "All six main islands host the Hawaiian duck." This duck was not found on Lanai. Moreover, the Hawaiian Duck became extinct on all islands except Kauai during this century. Efforts recently have been made to re-introduce the species on Oahu and Hawaii by releasing pen-reared birds. There should not be a subspecies name for the Hawaiian Duck. The Laysan Duck is not "a distinct subspecies of the same species"; it is a distinct species. The same error is made on pages 401 and 403.

par. 4. The author undoubtedly is wrong when he says that there were two races of rails on the main islands. There is no evidence that there was ever an endemic rail on Oahu. "Among coots, two species are represented on the Hawaiian Islands by subspecies." This is misleading because there is one coot and one gallinule, not two subspecies of coots. There appears to be no reliable evidence that the Nene was ever a breeding species on Maui. The specific name is misspelled.

Page 219. In the caption for the photograph of the Koloa, there should be no subspecies name. The distribution statement is incorrect; see my comments for page 218.

Page 220. The author gives two scientific names for the Hawaiian Coot, both of which are incorrect. The subspecific name for the gallinule is incorrect. He gives two different names for the Hawaiian Stilt, one of which is correct. Neither the coot nor the stilt are found on Lanai. The last sentence on the page is misleading: "colonies of marine birds...may still be seen along some protected or remote shores of the main islands." Red-footed Booby colonies are found on the Mokapu Peninsula on Oahu and at the Kilauea Lighthouse on Kauai; neither area is remote nor "protected."

Page 221. I am not aware that anyone has referred to Pterodroma phaeopygia as the "sooty-rumped petrel." The common name is Dark-rumped Petrel. The subspecific name for the Hawaiian race is sandwichensis.

There are errors in other parts of the book, as well. Following are some of the more glaring mistakes:

"Only seven colonizations can account for all the land birds, in the strict sense, not native to the Hawaiian Islands." There had to be at least eight such colonizations (page 86).

The Nihoa Finch is a finch-billed, not a parrot-billed, honeycreeper (pages 378, 400, and 403).

The extinct Himatione sanguinea freethii was the Laysan Honeycreeper, not the "Laysan Honeyeater" (pages 400 and 404).

The Laysan Rail "had fewer primary feathers than any other bird in the world" (page 404). This is not true, because at least three other species have fewer primary flight feathers.

The unfortunate fact is that Dr. Carlquist's book is totally unreliable as a source for accurate information on Hawaiian birds.

Andrew J. Berger
Department of Zoology
University of Hawaii

AGAIN? AXIS DEER? YES!

Following article is from 12 February 1972 HONOLULU STAR-BULLETIN, page A-11: Lot Kamehameha's Axis Deer by Russ and Peg Apple:

Those dear little deer are back in Hawaii's news again.

Those damn little deer are back in Hawaii's news again.

Choose an opening sentence to suit your point of view. If undecided, or not yet aware of Hawaii's great deer controversy, reserve selection.

The deer in question are called by scientists Axis axis, but even scientists, after getting them taxonomically identified, join the rest of us and call them Axis deer.

Axis deer make headlines every time there is a chance a colony of them may be planted on the Big Island of Hawaii. They already roam the Islands of Molokai and Lanai. There may even be a few scampering around Oahu, if the stray dogs and developments encroaching up the hills haven't finished off the remnants of the Oahu herd.

A 300 acre pen on the Big Island's Mauna Kea mountain stands empty while 17 deer--at last known count--await authorization and an airlift from Lanai. They have been waiting since October 1969. That was when the Governor held up the first scheduled shipment for a study of what Axis deer would do to the Big Island's ecology.

Chances have been on-again, off-again for decades. Now the State Animal Species Advisory Commission is reviewing the matter, and opponents to the introduction of Axis deer to Hawaii Island are mobilized again.

Without dipping into this honey of a controversy, some description and history of deer in the Islands offered.

No, the Axis deer were not here before the Hawaiians, and no, they were not aboard the canoes, with the Polynesian dogs, pigs, fowls and rats that came with the first Hawaiians.

Ancestors of Hawaii's herds were seven in number, and were on the deck of the trader, "Loch Na Garr," which arrived in Honolulu harbor in December 1867.

Seven were on deck when the ship arrived, and soon there were eight. How many deer started with the ship from Hong Kong is not known. But three bucks and four does made it, and one of the does gave birth to a male fawn while the herd's fate was debated ashore. Perhaps there were pro-and anti-Axis deer introduction arguments then in royal circles. They came as a gift to the king. The deer stayed on board to be finally transferred in January 1868 to the royal yacht and transshipped to the royal lands on Molokai.

Some of the deer, or their descendents, were brought to Oahu sometime later. By 1898 there was a herd on Diamond Head. Some got away to Moanalua Valley about 1910, and by 1938 the Moanalua Valley herd was estimated to be about 1,000 animals. Most were gone by 1950, and in that year a few were seen behind Tripler Hospital. About 25 were said to be in the kiawe thickets above Salt Lake in 1962. Poachers and stray dogs were after them.

Lanai got its deer, a group of 12, about 1920. Maui got some in 1960. Deer hunting is now a licensed State activity on Molokai and Lanai.

His Hawaiian Majesty Lot Kamehameha, who reigned as Kamehameha V, got the deer as a gift. They came from Hong Kong. But who sent them?

India is the home of the Axis deer. They also are on Ceylon, and some are in Nepal. Because they are cute little animals -- they are small deer, 80 to 100 pounds usually -- with white spots on brown fur all year round, they make great gifts to monarchs. The Emperor of Japan has an Imperial Deer Park full of them. One story is that the deer which came to Hawaii in 1867 were a gift from Hawaii's consul to Japan. Perhaps they came from the Emperor himself.

Another story is that they came from India via Hong Kong, with arrangements made by Dr. William Hillebrand himself when he visited Calcutta. Hillebrand was a physician and botanist in the service of Kamehamaha V.

Even the Duke of Edinburgh has been credited with the gift. He was supposed to have gotten them as a gift from the Mikado of Japan and got them off his hands by giving them to the King of Hawaii.

Another interesting article is from 5 February 1972, HONOLULU STAR-BULLETIN, page B-5: Answer on Axis Deer May Take a While. Following is an excerpt from the article:

The question was: Should axis deer be introduced on the Big Island?

It'll be quite a while, however, before there's an answer....

The State Animal Species Advisory Commission did a lot of talking about it yesterday....The commission includes hunters who would like to see the deer introduced for their own sport; scientists who are concerned with the Big Island's ecosystem and the welfare of existing plants and animals; and Fish and Game Division officials whose job it is to protect Hawaii's native plants and animals while providing Hawaii's sportsmen with recreation.

After the meeting, Chairman Ronald J. Endrizal told the Star-Bulletin that "we're not under any pressure" to reach a quick recommendation. The commission, he said, could take as much as a year to make investigation.

The tug and pull of loyalties and opinions were evident at the 11-member commission's third meeting yesterday. The meeting finally erupted in an emotional debate over the ethics of commission members who state their private opinions publicly....After an hour of discussion, the commission voted to impose a moratorium on public statements until the Ethics Commission can make a ruling on the point....

Despite a volume of letters -- most opposing the introduction of the deer -- the commission decided to go to Molokai and Lanai and see the effects of the deer first hand. Commissioners will visit Molokai March 3 and hold a public meeting that evening, flying to Lanai March 4.

The commission also heard some unnerving testimony.

Frank J. Radovsky, a Bishop Museum animal disease expert, said the axis deer could be a "significant threat" to the Big Island livestock industry because they could serve as a "disease reservoir" of animal pathogens and, if introduced and established, "could not be eradicated without great expense, if at all."

Jack Throp, director of the Honolulu Zoo, likened the axis deer question to Hawaii's past controversy over importing snakes. "I had to demonstrate that those two snakes were not going to be a threat to the community, and I would think that this commission would have to demonstrate that those deer would not be a threat to the Big Island," said Throp. "I'd like to ask this body if it has the right to introduce an exotic, permanent herbivore onto private land where it is unwanted."

Paul Breese, chief of the Wildlife Branch of Fish and Game, said that in the axis deer, "we're dealing with an opportunist. They'll eat what's there." Breese said the deer are chiefly browsers and grazers (eating kiawe, klu and ground cover) but have been known to eat sugar cane and young pineapple plants. This is what Big Island sugar producers fear.

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Following is the Hawaii Audubon Society letter to Honolulu Star-Bulletin and Honolulu Advertiser from Mae E. Mull, Secretary, 19 January 1972:

...The introduction of Axis Deer to the Big Island has again been proposed -- this time by Mr. Michio Takata, Director of the Division of Fish and Game, at the meeting of the Animal Species Advisory Commission on January 7, 1972.

Conservationists and others opposed to that introduction are again gathering forces -- this time as a "grass-roots" group, Citizens Against Axis Deer Introduction.

As a current "hot" issue, it should be newsworthy. We would certainly expect you to get the viewpoints of Mr. Takata and Mr. Ronald J. Endrizal, Chairman of the Animal Species Advisory Commission, as well as those of zoologists, botanists, ranchers, cattlemen, farmers and lay conservationists.

The enclosed Resolution, Petition and letters should be useful to an interested reporter.

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Following Hawaii Audubon Society position letter was sent to Governor Burns, Lt. Gov. Ariyoshi; Senators Altiery, Brown, McClung, Nishimura, Rohlfing, Yoshinaga; Representatives Beppu, Kawakami, Saiki; Director Souza, State Parks; Chairman

Gressitt, Natural Areas Reserves Commission; State Forester Tagawa; and Mayor Shunichi Kimura from Mae E. Mull, Secretary, 31 January 1972:

The question of the introduction of Axis Deer to the Big Island is presently before the Animal Species Advisory Commission.

We are writing to you to let you know the position of the Hawaii Audubon Society concerning that proposed introduction.

At its January meeting the Society wholeheartedly approved the PETITION addressed to the Chairman of the Board of Land and Natural Resources, respectfully requesting that Axis Deer not be brought to the Island of Hawaii. A copy of the Society Resolution is enclosed.

While a sustained game population would benefit several hundred hunters, at the most, during several weekends of open-season hunting during the year, the cost in economic damage to the land and all that lives on it and the cost in ecological damage to native ecosystems must be measured also.

You may wish to inform the Commission of your views on this matter. We would ask that you give careful consideration to the intent of Act 195, Relating to the Protection of Indigenous Fish, Bird, Animal, and Vegetable Life, 1970, which established the Animal Species Advisory Commission. According to the Conference Committee Report 11-70, the purpose of the Act is to protect and conserve indigenous plant and animal life in Hawaii. What would be the consequences for native natural communities of letting loose to propagate freely another foreign herbivore? The cost from a surfeit of feral cattle, feral sheep and feral goats trampling and grazing on these islands has been enormous already in depleted soils, erosion, loss of watershed, lack of forest regeneration, extinction of native birds, insects and flora, and in the endangered status of additional native bird and plant species.

To introduce a new destructive hoofed mammal to the Big Island now is for the State of Hawaii to declare loudly and clearly that it still places a low value on the remaining unique plant and animal communities that evolved here over tens of thousands of years. We expect the State to protect the remnants of the Big Island's singular natural heritage for all the people -- not to speed their destruction for the benefit of a few.

We appreciate your thoughtful attention to this issue.

A RESOLUTION ON THE INTRODUCTION OF AXIS DEER TO THE BIG ISLAND

This Resolution was presented at the General Meeting of the Hawaii Audubon Society on January 17, 1972 and was approved by the members present without a dissenting vote:

that the Hawaii Audubon Society fully supports the following

"PETITION TO THE STATE OF HAWAII BOARD OF LAND AND NATURAL RESOURCES, MR. SUNAO KIDO, CHAIRMAN

It is understood that during its 1972 deliberations the Board of Land and Natural Resources may soon be considering the proposal to liberate Axis Deer on the Island of Hawaii.

We, the undersigned peoples of all Hawaii, are firmly convinced that for various reasons, both economic and ecologic, the liberation of Axis Deer on the Big Island would definitely not serve the best interests of our State.

We, therefore, urgently and respectfully request the Board of Land and Natural Resources to disapprove the impending proposal to liberate Axis Deer on the Island of Hawaii."

Copies of the PETITION, with a "fact sheet" on the reverse side, are available from the sponsoring group:

CITIZENS AGAINST AXIS DEER INTRODUCTION
P.O. Box 5032
Honolulu, Hawaii 96814
(telephone 988-6798)

or from W.C. Gagne

Wayne C. Gagne
Bernice P. Bishop Museum
P.O. Box 6037
Honolulu, Hawaii 96818
(telephone 847-3511)

On the reverse side of the petition were the following cogent arguments against introduction of the Axis Deer:

AXIS DEER TO THE BIG ISLAND??

A proposal has been made through the State Division of Fish and Game that Axis Deer be introduced to the Big Island as a game animal to be shot by hunters. Once introduced it will not be feasible to eliminate these deer, and disadvantages and damage would be overwhelming compared to potential benefit to a few individuals.

IRREPARABLE DAMAGE TO NATIVE PLANTS AND BIRDS

Axis Deer will destroy trees, shrubs, and herbs by browsing and trampling. We possess a unique natural heritage in the many plants found only here; it is scientifically documented that large animals like deer are devastating to vegetation of our islands. Native forests are the refuge of the wonderful native birds, and damage to forests by deer will destroy the birds' only habitat. Deer would invade Hawaii Volcanoes National Park as well as other natural areas.

DESTRUCTION OF AGRICULTURE

Axis Deer will not be practically excluded from large areas by fencing and will damage cane plantations, forage crops, orchards, nurseries, and truck crops. Besides causing immediate loss, they will seriously threaten the State's future economic growth by planned diversification of agriculture.

CARRYING TRANSMISSIBLE DISEASES

Axis Deer will forage among domestic herds, competing for food, and serve as potential reservoirs and disseminators of diseases they share with cattle and other livestock. Deer carry tuberculosis, undulant fever, leptospirosis, anaplasmosis, parasitic worms, and other diseases affecting cattle and some transmissible to man. Some of these diseases are now in Hawaii and could soon be spread by deer; others would be far more difficult to control and impossible to eradicate if introduced in the presence of deer.

WHO BENEFITS

Axis Deer will serve as targets for the small fraction of Hawaii's population that will hunt them--less than one per cent. This would be slight compensation for the great loss to our whole State! Furthermore, Axis Deer are present on the Islands of Molokai and Lanai and hunters can shoot them there; deer damage to the environment is significant on these islands, but fortunately less than it would be on the Big Island. Those against the proposed introduction include agriculturists, ranchers, conservationists, naturalists, scientific specialists, and many of the State's other citizens.

The introduction of Axis Deer to the Big Island would be a destructive action that is biologically wrong, unscientific, and economically wasteful.

BLOCK AXIS DEER INTRODUCTION

THE AXIS DEER PROBLEM

By F. R. Fosberg

Adviser for Tropical Biology, Smithsonian Institution

I have been asked for my considered scientific opinion of the advisability of the proposed introduction of axis deer on the Island of Hawaii.

Scientifically this introduction is indefensible. All previous experience shows that the inevitable result of the introduction of 4-footed animals on an oceanic island is degradation of the ecosystem, loss of vegetation and soil and of the animals which depend on these. The delicately balanced relationships between plants, animals, soil and water on an island evolved in the absence of terrestrial non-flying mammals.

It is common knowledge that as a natural ecosystem evolves, a complex system of compensations develops, and that any adverse influence induces a defense. In the absence of any particular such influence, no defense against it develops. The absence of mammals on oceanic islands has resulted in an ecosystem highly sensitive to trampling and browsing, with no capacity for recovery in the face of this treatment.

The Hawaiian Islands are famous, throughout the world, for their remarkable and varied biota. Because of ecological illiteracy and lack of appreciation by our forbears of this unique assemblage of plants and animals many of them have been lost already. With every major alteration in the ecosystem, more will go. Some of this is inevitable, because of increasing population and the demand for space. But generally there is developing a deeper understanding of ecological relationships and of consequences, and with this, an appreciation of the value of preserving as much of the diversity of the natural world as possible. This has passed the stage where it is only esoteric knowledge restricted to a few ecologists. I have even listened to U.S. congressmen discussing these very values.

There is no longer any excuse for losing these things through ignorance. If we deprive our descendents of some of what makes the world, and especially Hawaii, an interesting place to live, it is now only because we don't care, not because we don't know.

Scientifically, I have no hesitation in saying that introducing deer on the island of Hawaii will, in the long run, be a catastrophe with no compensating benefit. If we want to be responsible for depriving posterity of part of what makes Hawaii the fascinating and scientifically important place it is, we may go ahead with this introduction. We have the island of Molokai as an example of what will happen. It is an example that has not been adequately studied, but the general lines of what has happened in the way of forest degradation are clear enough. If we want a repetition of this on Hawaii we could do no better than to introduce deer. It is clear that already we have lost more than any thoughtful and appreciative person could countenance to the goats and sheep at high elevations. This is described in inimitable fashion by Richard Warner in his essay, "A forest dies on Mauna Kea" (Pacific Discovery 13(2): 6-14, 1960). Axis deer will take us much farther along the same path. Hawaii will lose just that much more of its uniqueness and fascination.

Of course, if immediate money returns are all that interest us, there may be room for argument. Certainly more ammunition and firearms will be sold if deer are introduced. Certainly a few guides will be employed and hotels will have something to advertise that the hunters can understand. More hunting licences will be sold. There will be short-term economic gain.

It will doubtless be some time before the general cultural level will be raised to the point where large numbers of people will want to come as tourists to see such things as tree lobelias, fern forests, and plant successions on lava flows. But it is most likely that, as leisure time becomes more plentiful, such interests will spread and become more general. Then it would be a great pity, even economically, if all the unique biological features had been sacrificed to the interests of a few hunters.

It has been claimed that the axis deer pose no threat to the wet forests of Hawaii. This claim does not seem valid to casual observation, but there has been no systematic and impartial investigation of such facts as are available. It would seem essential, before bringing deer to Hawaii, that such an investigation be carried out. The claim that placing the deer in an enclosure on Hawaii is for purpose of investigation is not even worthy of a respectful hearing. Anyone who has watched these animals in the field knows that a sheep fence will not contain them.

Conservationists will not be satisfied with any investigation carried out by the State Fish and Game Division, or any other government agency, as these are all subject to political pressure and most officials in such agencies consider that they are paid by the hunters and their objectivity is immediately suspect. It has been suggested that an independent scientific agency, such as the New York Zoological Society, or the Smithsonian Institution, perhaps backed by a foundation grant, or by State money with no strings attached, should be commissioned to carry out a thorough investigation of this question, to determine, once and for all, what the effects of axis deer at various population levels have on the native flora and vegetation, and indirectly on the animal life that is dependent on the plants.

What is really up for decision is the level of civilization that the people of

Hawaii have reached. If money and short-term advantages outweigh the long-term quality of the environment they bequeath to their descendents, their cultural level must be rated as low, indeed.

Letter from James K. Baker, Research Biologist, Hawaii Volcanoes National Park to Wayne Gagne, 9 February 1972:

As a biologist concerned about the continuing threat to native flora and fauna in Hawaii from non-native ungulates, I would like to comment upon the proposed introduction of Axis deer onto the Big Island. I speak somewhat from experience because of my work and observations on vegetative destruction by introduced herbivores in Hawaii, the Channel Islands National Monument, California, Padre Island National Seashore, Texas, and in New Zealand. Almost without exception, the introductions of non-native mammals to island ecosystems has been biologically disastrous to native biota. Several things happen in about three successive stages that are biologically contrary to a natural scheme of stable, balanced, pristine ecosystems.

First, herbivores are introduced into habitats that never before knew herbivore pressures. The vegetation had either lost or never evolved protective mechanisms such as spines, thorns, chemical repellents or irritants, and unpalatability. Neither did the vegetation adapt an ability to recover from excessive trampling. The newly introduced herbivores increase, at times rapidly, until an initial peak population density is attained. This could take one or several decades.

Second, there eventually comes a period of peak population growth when excessive numbers of animals force individuals to browse, graze, peel off bark, or devour parts of plants, or eat plants, that would normally have been ignored. This could go on for several years during which time the population suffers from malnutrition and other pressures such as non-productivity associated with overpopulation and limited food or space requirements.

In geologically young islands, as Hawaii, shallow soils cause animal-plant-erosion problems that are interrelated due to over-browsing, excessive trampling, and stripping away of ground cover species. Once soil is blown or washed away, exposing lava substrates, restoration of native flora becomes less and less probable.

Third, the population begins to decline to come into balances with the severely modified carrying capacity of the habitat, which is greatly less than before the initial peak population density was attained. It is in this period of several decades when the animal-plant-soil interrelationships are adjusting to a new degree of stability. The ecosystem may become healthy again, under new sets of influences, but it will, by that time, be greatly modified.

Plants that cannot withstand the selective browsing pressures are gradually replaced by herbaceous and woody species that are less palatable, more browse resistant, or both. Therefore, the carrying capacity for introduced herbivores is usually much less than before the initial peak population was reached. In the new adjustments to habitat stability, it is very likely that some native species will become rare and endangered, or extinct. This phenomenon has happened over and over again in Hawaii, New Zealand, the Galapagos Islands, the Channel Islands and numerous other island masses around the world. There is a rapid change from a natural flora and fauna to a new biota that is still composed of native species but minus some, mixed with fourishing exotics which permanently alter the original habitat.

It is to prevent these animal-plant-soil erosion problems and to keep the subsequent permanent alteration of native ecosystems from happening that I argue against the introductions of non-native herbivores into <u>any</u> island ecosystem. We are witnessing all of the above three stages of adverse influences with our feral sheep and goats on the Big Island. As a result, the native biota has already been severely altered.

It would be ecological catastrophe and sheer stupidity, in the light of what is already known about island introductions, to introduce still another herbivorous ungulate -- the Axis deer -- onto the Big Island. Such an introduction could result in nothing more than further destruction of what little is left of native Hawaii.

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Field Notes from Anne Powlison, Kailua, Oahu, 31 December 1971:

...The bulbuls are very plentiful around Hilltop House. They are a top-of-tree bird only lured down by a sprinkler or the bird bath. Their song is more hoarse than melodic. For a long time, the Brazilians were not about, but now they have returned....

Field Notes from Ross McKenzie, Auckland, New Zealand, 29 December 1971:

...We are quite busy with our birding, censuses, routine exercises, rare birds etc. I see that you are still extending your Hawaiian list. We got Ringed Plover last season and second records for Baird Sandpiper and Great Knot. What about chasing a Bristle-thighed Curlew over to us. The one record we have is from the Kermadec Group, a long way from here but in our formal area....

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THE GREAT HAWAIIAN JUBILEE

Your help is needed at the spring arts festival sponsored by the Honolulu City and County Department of Parks and Recreation in Kapiolani Park on 25-26 March 1972. Please call William P. Mull, 988-6798 for your offer.

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ALOHA to new members:

Junior: Damien Horigan, 2563 Date St, Apt 303, Honolulu, Hawaii 96814
Anita Maria Kristan, 230 Kelly Road, Vernon, Conn. 06086

Regular: Donald Brock, 5840 Seminary Court, Oakland, Calif. 94605
Russell W. Cahill, Supt., Haleakala Nat Park,PO Box 456, Kahului,Maui 96732
Mr. & Mrs. Charles Cline, 6334 Ben Ave, North Hollywood, Calif. 91606
Dr. C. Robert Eddinger, Honolulu Community Coll, 874 Dillingham Blvd,Hon. 96817
Margaret M. Kocsis, 70 Howe St, Apt 404, New Haven, Conn. 06511
Clarence A. Pretzer, 45-090 Namoku St, C2, Kaneohe, Oahu 96744
Mr. & Mrs. Frederic S. Shaffer, 3420 Vista Ave, Cincinnati, Ohio 45208
Wilbur Stuhlman, 1110 University Ave, Honolulu, Hawaii 96814
Steve West, 2501 Cole Village, Las Cruces, New Mexico 88001
Mrs. Esther H. Wright, 933 Kaheka St, Apt 409, Honolulu, Hawaii 96814
Mrs. Russell Wright, 46-094 Ipuka St, Kaneohe, Oahu 96744
Denver Museum of Nat Hist, City Park, Denver, Colorado 80205

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

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MARCH ACTIVITIES:

12 March - Field trip to Aiea Loop trail to study forest birds. Bring lunch, water, and if possible your car. Transportation cost ($1.00) to the drivers. Meet at the State Library on Punchbowl Street at 8:00 a.m. Leader: William P. Mull, telephone 988-6798.

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

20 March - General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m. Speaker: Steven Montgomery
Topic: Native Dry Land Forest of Hawaii

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HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:
President-LtCol Charles G.Kaigler, Vice-Pres.-William P.Mull & David Woodside
Secretary-Mrs. Mae E. Mull, Treasurer-Miss Christine Jones
Board Members-Wayne Gagne & Robert Shallenberger
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MAILING ADDRESS: P.O. Box 5032, Honolulu, Hawaii 96814
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
DUES FOR 1972 ARE NOW PAYABLE
Members whose dues have not been paid by 31 March will be dropped from membership roll.