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STAFF REPORT BY STATE DIVISION OF FISH AND GAME ON QUESTION SHOULD AXIS DEER BE INTRODUCED TO THE ISLAND OF HAWAII*

The proposal to introduce the axis deer to the island of Hawaii has been under consideration for a number of years. The Board of Commissioners of Agriculture and Forestry deliberated at great length on this question in 1949 and 1950, but finally at its meeting on June 29, 1950 it deferred action on the matter. The reason for this deferral as reflected in the minutes of the meeting was that there was a need for further study of the axis deer.

For several years no such study was undertaken, but finally in September, 1957 an intensive $3\frac{1}{2}$ year study of the history, biology and ecology of the axis deer on Molokai, Lanai and Oahu was initiated. This study was made by Dr. William Graf, Professor of Wildlife Management, San Jose College and Lyman Nichols, Jr., Wildlife Biologist, Division of Fish and Game, Department of Land and Natural Resources. A monograph covering this study is now being prepared for publication and is nearing completion.

Renewed public interest in recent years for and against the release of axis deer on the island of Hawaii has again brought the issue to the fore. Perhaps action on this matter has been deferred long enough and settlement of the issue is in order.

A discussion of the most common arguments expressed and questions asked concerning this subject is presented below together with comments based on the findings of the above mentioned deer study and consultation with persons having knowledge or interest in the subject.

I. Why should deer be introduced to Hawaii Island? What would be the advantages?

A. Deer would increase the recreation potential of the island in both quantity and quality.

Hunters on Hawaii are now limited to only feral animals for big game hunting: pigs, sheep, goats. An additional high-quality wild species would offer a much more challenging and satisfying quarry than a gone-wild domestic animal. This is demonstrated by the great demand for deer during the necessarily limited hunting seasons on Lanai and Molokai.

B. Deer would add to the general economy of Hawaii Island and to that of the State.

Deer hunters go to great lengths in time and expense to obtain their game—it is conservatively estimated that resident hunters spent approximately \$40,000 during the past deer season to hunt deer on Lanai and Molokai (transportation, lodging, car rental, supplies, etc.) or some \$66 plus

* Prepared 17 January 1964. Ronald L. Walker's contribution.

for each deer brought to bag. Increasing the availability of deer, and at the same time making them available on Hawaii would likely result in similar expenditures on that island. There is sufficient habitat available on Hawaii to support deer herds of large enough size so that deer hunting could be made available to non-resident (tourist) hunters as well, which would result in considerably greater expenditures within the State and on Hawaii.

C. Deer would increase potential income to private landowners by making possible commercial shooting preserve operations.

Although Hawaii's ranchers might not have come to realize the possibilities, the operation of private deer-hunting preserves (leased hunting rights; "Head" fees, etc.) can add considerable income with little or no additional overhead or effort on the landowner's part. This is particularly true in an area such as Hawaii where public lands are limited, where game is abundant on private lands, where hunting demand is high, and where the game involved is especially desirable. Once the opportunities are realized and acted upon, hunting leases could help many of Hawaii's cattle ranchers to increase the income derived from their lands. For example, landowners in Texas received approximately 12 million dollars in 1962 from the sale or lease of hunting privileges.

D. To take advantage of unused habitat.

Many thousands of acres of potential deer habitat on Hawaii are now unoccupied by big game, or are occupied only by feral species. Much of this area is classed as wasteland or is only marginal cattle range. This habitat is - for all practical purposes - being wasted and could well be used to support a high-quality game animal.

E. To eventually replace feral species.

Feral goats and sheep are not only less attractive to hunters than deer, but are much more destructive to the range and soil due to their feeding and herding habits. The substitution of more attractive, less destructive wild game species would eventually eliminate the need to preserve feral animals for sport hunting purposes, and would allow the elimination or reduction of at least some of these destructive feral herds.

F. To add a beautiful, wild big game species to the natural scene for the general enjoyment of the public.

Most people who are at all interested in nature receive enjoyment from merely seeing wild game. The sight of a wild buck adds something to the trip of even those who are merely driving through game habitat on a highway on a business trip.

II. What species of deer should be introduced, and why?

A. The axis deer (Cervus axis) is the most logical choice because:

1. They are already established on Lanai and Molokai and are therefore available locally.
2. They are obviously well adapted to Hawaiian conditions, and are known to be generally compatible with ranching.
3. Their ecological relationships under Hawaiian conditions have already been intensively studied and so are well understood.
4. They are well liked by Hawaii's hunting public, and would be particularly attractive to tourists due to their lack of availability on the mainland.
5. They have been found to be relatively free of diseases or parasites dangerous to humans or livestock, and they can be thoroughly tested and quarantined before shipment to Hawaii.
6. They are not damaging to the range, forests or soil on Lanai or Molokai, and so are not expected to do such damage on Hawaii if properly controlled.
7. Their reproductive rate is slow, they do not inhabit very dense forests or rugged terrain, and they are highly attractive to the hunting public.

They are, therefore, easily controlled by hunting, thus should never get out of hand on Hawaii.

III. Comments on arguments against the introduction of axis deer to Hawaii.

A. Deer will hurt the cattle industry.

1. They will compete for food with cattle. Because axis deer are primarily browsers and cattle are primarily grazers, competition for food has been and will be low. Deer do compete to a very limited degree with cattle for green grass in the spring on Molokai, and compete directly for kiawe beans when these are in season. In general, their food habits are different enough so that competition is negligible. On Hawaii, the major cattle range are open grasslands - habitat entirely unsuitable to axis deer, and into which deer are not expected to range.

2. Deer will bring in and spread cattle diseases. Deer on west Molokai and Lanai have been found free of disease or parasites except for a tiny round worm commonly found in cattle. Any deer captured for shipment to Hawaii will be quarantined before shipment and thoroughly tested by State veterinarians for disease and parasites such as Brucellosis, Anaplasmosis, Tuberculosis, Leptospirosis, etc.; thus all but eliminating the possibility of introducing livestock diseases with deer. Deer may pick up and transmit livestock diseases already present in cattle on Hawaii, but so will the pigs, goats and sheep already present throughout most cattle range there. This problem has been discussed with veterinarians of the Department of Agriculture, and they can foresee no significant additional threat to livestock on Hawaii by the introduction of axis deer from Lanai or Molokai following complete testing, especially in view of the wide distribution of wild pigs, goats and sheep which are already present.

3. Deer cannot be fenced out. Axis deer are not generally fence jumpers like other deer species, but prefer to crawl through or under fences. Normally, a four-foot woven wire fence will keep them out of an area unless they are forced to jump, and a six-foot fence is almost certain protection. A four or even six-foot fence will not necessarily keep them in a pen or corral, but this is a different situation. A six-foot fence has been serving to keep deer out of a very attractive alfalfa field in the heart of deer habitat on Molokai. Therefore, deer can be fenced out.

4. Deer would be an attraction for poachers. The presence of deer on ranches or other private areas would probably attract a few more poachers than normally enter these lands for the pigs, goats or sheep already there. The number of poachers would likely depend on the availability of deer for public hunting. If deer were legally available in ample quantity on public lands, the incentive to poach on private lands would be low. Landowners could turn the attractiveness of deer into an asset by leasing or selling hunting rights, in which case the income would more than repay any losses due to poaching while at the same time the leasees would be aiding the landowner in preventing poaching by jealously guarding their hunting investment.

B. Deer will seriously damage farms and plantations.

1. The sugar cane fields will be damaged by deer. No damage of importance has been reported in the past where deer range adjoined cane fields on Oahu and an experimental cane planting on Molokai. Slight and occasional feeding on young cane at the edges of the fields was noted, and bucks occasionally rubbed their antlers on adult cane stalks but these damages were negligible. No serious damage problems are predicted on Hawaii. Should damage occur, however, the offending deer can easily be removed by shooting or by some other means.

2. Truck farms will be jeopardized by deer. Past damage to garden crops on Molokai has been sporadic and localized, and occurred only where such crops were planted within the heart of the deer range. Such occasional damage can be expected on Hawaii under certain situations, such as extreme drought conditions. Fencing or the shooting of offending animals can be used to protect crops. No such problem is anticipated for the major truck farm area of Kamuela due to the large surrounding

area of open grassland which is expected to act as an efficient barrier to axis deer.

3. Deer will damage macadamia, coffee and other orchard crops.

There has been no past contact of axis deer in Hawaii with macadamia or coffee groves, so possible damage cannot be accurately evaluated. It is not expected to be serious, however, except possibly to young trees in certain areas where conditions favor deer invasion. Damage to young papaya trees has been demonstrated on Molokai where these were planted in deer habitat. In any case, damage can be rapidly and efficiently controlled by shooting the offending deer where necessary, or by fencing for long term protection.

C. Axis deer will destroy Hawaii's forests and watersheds as they have done on Molokai and Lanai.

1. Molokai -- Molokai's native forests were well on their way to destruction by excessive timbercutting and livestock grazing before deer were even introduced. It is possible that deer did contribute to this destruction since they populated wet forest areas that had already been opened by cattle, and, under undue protection, became overabundant by about 1898. However, once these deer, and especially the cattle were removed from the forest areas, the forests grew back more or less to their original dense form. There are no barriers to prevent deer from re-populating these same areas today, and deer are common below the forest's limits. However, these thick, wet, "native" forests are just not suitable for axis deer unless opened by other uses, and deer are not prone to enter them in their normal dense condition.

2. Lanai -- Lanai's native forest was almost completely destroyed by cattle, sheep and goats before 1900. Deer were not introduced until about 1920. Cattle and sheep were removed from Lanai by 1952, while deer have been allowed to increase. Despite the increasing presence of axis deer, Lanai's forest and range have grown back remarkably since reduction and removal of livestock. Deer do not enter the regrown rain forest on Lanai, though they have always had free access to do so; the forest is just too dense for this species of deer. Primary axis deer range on both Molokai and Lanai is in the kiawe forests of the coasts, the brushland-scrub forests of the upper elevations, and the relatively open lower fringes of the high-elevation rain forests. Nowhere is there any evidence that these deer are causing or have caused any significant damage to Hawaii's forests, soil, range or watersheds.

3. Hawaii -- The experience on Lanai and Molokai indicates that axis deer will not cause any significant damage to the forests, watersheds, ranges or soil on Hawaii Island. This does not mean that deer cannot cause such damage if protected and allowed to increase to such numbers that they overstock an area, but it is not likely that they will ever be so protected on Hawaii. Axis deer will probably not inhabit the dense rain-forests of Hawaii Island which are so important as watersheds. The division of Forestry does not oppose the introduction of axis deer to Hawaii, nor do they anticipate any serious problems between deer and existing forests or deer and newly planted exotic forests as long as the deer are properly managed, which, of course, is the key to damage prevention. Forestry officials agree that the "multiple use" concept of forest lands includes hunting recreation, and so believe that deer or other game have a definite place in Hawaii's forests as long as they are kept under control.

D. The introduction of deer will add another undesirable exotic to Hawaii Volcanoes National Park, which is designed to preserve its lands in a native state and free of exotic plants and animals.

1. This argument is true. Any but native animals and plants are basically incompatible with the purpose and policy of the National Park Service.

2. However, the Park is already altered by the presence of numerous exotic plants, birds and animals, so further alteration of the native state by deer would not be significant.

3. Presence of deer would probably add somewhat to the Park's problem

of controlling exotics (especially goats) but the lower reproductive rate and more specific habitat requirements of the axis deer would probably prevent the problem from growing to serious proportions. In addition, the park is planning to fence its entire accessible boundary, which would reduce the possibilities of deer entering the Park, and make control easier should they enter.

4. Axis deer in the Park would add to its attractiveness for tourists, since most people would prefer to see wild game even though it is not native, than no game at all.

E. Axis deer cannot be controlled if they are released on Hawaii.

1. There have been absolutely no problem regarding the ability to control the size of herds through hunting on Lanai or Molokai. The problem presently is how to raise enough deer, not how to control them. The only reason deer are present in numbers on these islands is that they are protected by game and trespass laws. Remove this protection and the deer would soon be drastically reduced. There is no reason to expect that the situation would be any different on Hawaii Island.

2. Axis deer are especially susceptible to control by public hunting in Hawaii because there is a great demand - they do not inhabit extremely dense forests or rugged terrain, and their reproductive capacity is comparatively low (less than one fawn per doe per year on the average). They are also susceptible to individual control in specific areas of damage because of the ease with which the actual culprits may be shot at night with a spot light. Their "home range" is also relatively small, which means that deer may be cleaned out of an area and outside deer will then be slow in re-populating the area. This has been demonstrated on Lanai and Molokai in the past.

3. There are ample hunters on Hawaii to effect any desired level of deer herd control merely by allowing them access to land and freedom from restriction, i.e. - increased bag limits, longer season, etc.

4. The State Fish and Game agency has demonstrated its ability in the past to control deer damage on Lanai and Molokai both by manipulation of hunting seasons and by more localized and specific methods. The same can be done on Hawaii, and there is no reason to expect that deer herds will get out of control or that specific damage to crops, etc., cannot be handled as needed.

For example, a local damage complaint can be handled by granting the complainant, once damage has been verified, a permit to kill the animals involved, or Fish and Game personnel can do this if necessary. The carcasses of animals so killed would revert to the State in order to prevent the abuse of such permits for meat hunting purposes.

IV. Location and method of release.

A. Axis deer would be captured on Lanai or Molokai, held in pens for veterinary testing and treatment, and then shipped to Hawaii. There they would be placed in a 300-acre deer-proof enclosure at Puu Laau (on the west slope of Mauna Kea at approximately 7,500 feet elevation in mamane-naio forest) and held until acclimatized. From the enclosure, they would be released into the Mauna Kea Game Management Area.

B. These deer, while within the enclosure and after release, would be kept under close observation so as to determine their adaptability and reactions to their new habitat. Future releases - if any - would be adjusted according to these observations. If deemed necessary, deer could be wiped out on Mauna Kea, just as the sheep almost was.

V. Expected future management

A. Initial protection would be necessary until the herd is well established. As soon as a huntable deer herd is established on State-controlled lands, normal management for hunting will begin on such lands.

B. On private lands, the deer herds will be managed as they are being managed

on Molokai where land owners control hunting of such herds.

VI. Axis deer range on Hawaii.

The probable range of axis deer on Hawaii Island after all suitable habitat is populated will include nearly all open forest and forest-brushlands except: dense forest, open grasslands, rough or extensive lava flows, excessively rugged terrain, sugar cane fields. Choice habitats will probably be mamane forests, relatively open 'ohi'a-koa forests (these with open understory), 'a'ali'i-'ulei-'ohelo brushlands (where large bushes or trees are available for cover), kiawe forests and guava thickets.

VII. Recommendation.

It is the recommendation of the Division of Fish and Game that the axis deer be introduced to the island of Hawaii. This recommendation is based on the findings of the intensive 3½ year study of the history, biology and ecology of the axis deer in Hawaii and in the belief that axis deer can be adequately controlled and will materially benefit the people of the Big Island and the State as a whole.

Editor's Note: Now that you have heard both sides of the question, what is your idea? Please send in your comments to Kojima, 725-A 8th Ave, Honolulu, Haw.96816.

Field Notes from Helen A. deS. Canavarro, 25 June 1969: White-capped Noddy

As a member of the Hawaii Audubon Society I wish to report my discovery May 18, 1969, of a nesting colony of seabirds near the outlet of the Seven Sacred Pools, Kipahulu, Maui....

While sitting on the rocky promontory on the right side of where the Seventh Sacred Pool flows into the ocean and gazing through my 7x35 binoculars along the cliffs of this isolated area, my attention was called to what looked like some "dark-gray bumps" on a ledge of lava rock. The ledge was about 50 feet from the breaking waves below and about 10 feet from the vegetation on top of the cliff.

Looking more closely I saw crevices and holes in the cliff with white streaks below them, indicative of nesting birds. Then I saw some of the "bumps" move and realized that what I was seeing was the backs and gray heads of 4 to 6 immature birds sunning themselves on the ledge. It was about noon time. The sun was shining brightly and quite a breeze was blowing, so I could not hear any sounds above the noise of the waves breaking against the cliffs.

I watched them for about 15 minutes, but always they sat still with their backs toward me--dingy black backs and round dark gray heads. One bird went into a hole, but so quickly, I didn't have a chance to see the color of its feet or bill. Another bird, I didn't see where it came from, spread its short wedge-shaped tail fanwise as it joined the others on the ledge. The tail feathers were dingy white. I could not see whether there was white any where else on the bird. I think the birds were 12 to 15 inches long....

Hoping that some one can identify the "gray bumps" I saw....

The birds were identified as white-capped noddy or noio at the Hawaii Audubon meeting, 18 August 1969.

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Field Notes on Plover:

From Helen A. deS. Canavarro, 22 August 1969: A golden plover that left Kaneohe April 30 was back at its same location August 17.

From Unoyo Kojima, 19 September 1969: On 15 August a plover called and landed on

the grassy knoll near Buckner Gate (H-1 Hwy entrance) at Fort Shafter, but before I could say "welcome back", it took off leaving behind only the plaintive call for me to treasure until 20 August, when I saw two of them flying overhead. By 1700 hours of the same day their feeding areas were determined, and they were busily feeding. I hope they will continue to come back year after year, so others will have the opportunity to enjoy this wonderful world of nature we live in.

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Field Notes from Walter R. Donaghho, Maui Observations:

There is a Western Sandpiper at Kanaha Pond. (25 August 1969)

Hoku Mana Islet, off the cliffs between Keanae and Wailua on the windward coast, is at least a roosting place for Frigatebirds. I noted 12 birds fly up from this island on 26 August to escape a rain squall. I would estimate at least 20 birds on the island. You can see guano streaks on the rocks, indicating long usage. The Crowder tour noted this in December 1967, but no birds were seen, and we wondered what birds were there.

Frigatebirds were seen frequently off the coast at Wailua (near Kipahulu) Kipahulu and Kaupo. Others were off the north coast of Maui, at Kahakuloa and Honokahau.

Oahu Observations: One Semipalmated Plover at Waipio Settlement Basin in July! In company with four Sanderlings, eight Turnstone and two Golden Plover. Dit it, like the other shore birds, decide not to return to the North?

Noted a Black-headed Mannikin on the Poamoho Road, in the pineapple fields. (Same month)

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Field Notes from Henry Yuen, 5 September 1969: Frigatebird

It is 5:25 p.m. and I have just witnessed a struggle between two female frigatebirds over what appeared to be a fish, and a large one too. I am at home near the fire station in Kaimuki, where these birds often fly overhead towards Hikapuu at this time of the evening.

What I saw at first was two adults flapping hard on their wings, changing flight directions suddenly, one after another, then it dawned upon me that this pair was actually struggling for the possession of an object. Less than a minute after I first noticed the activity, one of them dropped the object which the other failed to recover. Both then continued on toward Koko Head-Hikapuu direction. I couldn't recover the object, which didn't appear to be heavy as it fell. It was light in color.

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Field Notes from Mr. & Mrs. William P. Hull, 15 September 1969, Sightings at Walker's Bay (West Loch), Waipio Peninsula, opposite the old airstrip:

	30 Aug	31 Aug	1 Sep	3 Sep	6 Sep
	AM	PM	PM	PM	PM
Black-crowned Night Heron ...	5+	14	5+	7	12
Black-necked Stilt	11	5+	5+	7	5
American Golden Plover	25+	5+	25+	26	11
Ruddy Turnstone.....	5+	30+	5+	6	9
Wandering Tattler	1	1	1	2	3
American Coot	5+	5+	8	8	6
Sanderling	-	4	6	1	2
Mallard *	-	-	1	1	-
Least Tern **	1	1	1	1	-
Cattle Egret	1	1	-	-	1

* Female

** Behavior, markings, size and repeated observations were conclusive. Observed repeatedly fishing, also sitting on mud flat in close company with sanderling and plover. Observed through 7-power, 10-power and 20-power binoculars from distances of 50 to 300 feet.

Markings:

Underparts: Appeared totally white from bill to tail and from wingtip to wingtip.
 Upperparts: Head - Black with white eye-stripe from eye to eye across forehead.
 Wings - Light gray leading edge shading to very light gray or white trailing edge, with wingtips darker gray.
 Back and tail: Appeared very light gray.
 Bill and feet: Appeared dark.

Size: About 9" long (distinctly smaller than American Golden Plover and slightly larger than Sanderling, as observed very clearly when the Tern was sitting on a mudflat within 2 feet of Plover and Sanderling).

Tail Shape: Forked but not deeply so (appeared straight across when spread during hovering).

Behavior: Mostly observed fishing, which was performed by flying upwind about 10-20 feet above the water with head pointed downward looking for fish. The flight consisted of much hovering, broken by frequent and repeated swoops close to the surface of the water and occasional plunges into the water--usually coming up with a small, shiny fish in its bill, with which the fish was quickly maneuvered into position and swallowed. The process was repeated several times over the same stretch of water, working gradually up-wind, then retracing the course quickly down-wind to begin again at the starting point.

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Editor's Note: Please send in to Kojima, 725-A 3th Avenue, Honolulu, Hawaii 96816 your observations. The ecosystem is rapidly changing, and your observations are necessary to properly direct the changes toward the wise use of our natural resources.

Field Trip, 14 September 1969, to Waipio and Kahuku: Shore birds

A small but eager group of seven met at the Library at eight on a cloudy and threatening day and set out, determined not to let the weather sway them.

The first stop was at the Waipio Settlement Basins, where several surprises were awaiting them. First to be seen were the 150 or more Cattle Egrets that flocked about the mud flats, quite a few were of varying shades of brown, depending upon how seriously they fed in the mud. While scanning the many white birds sitting on the mud, a dark blue one was spotted. That was identified as a Little Blue Heron. A good look was obtained at this bird by everyone, and it was certified as a Blue Heron, with its light blue bill and maroon neck.

There were at least fifty Stilt, eighty Turnstone, at least 20 Sanderling and quite a few Plover. I spotted a Sandpiper with its clean white belly and the sharp division between the white belly and the striped front, and identified it as a Pectoral.

Strawberry Finches and Black-headed Mannikins flew about in the grass, and we examined a flock in some cane just makai of the basins, and noted at least two Tri-colored Mannikins, with their white sides and front, black bellies and black heads with dark bills. Later at least two more were seen in the west basin. Unless the flock in the cane flew over there, that makes at least four birds noted. I noted a family of three babies and their black-headed parents. The babies were duller in color than the females.

Pintail and Shoveler ducks were there in large numbers, especially Pintail, and they were not at all spooky, going on with their feeding while we stood on the road watching them. Their fall coloration was confusing to say the least, and I believe we saw quite a few males as well as females. I noted at least two with orange feet, which just had to be Mallards.

We noted many ducks and shore birds fly up just to the east of the east basin, and immediately wanted to go and investigate. We followed the roads around till we were on the mauka side of the new settlement basin, a moist mud flat on which were ducks, Stilts, Turnstones, Plover, and one small gray-backed plover with a white breast, and ONE BLACK BAND across the chest. "Either Snowy or Piping Plover"

I remarked, as I opened up Peterson. It was a Piping Plover, first record for Hawaii. Like the Baird Sandpiper, the Piping Plover does not regularly migrate down the Pacific Coast, generally coming no farther west than the Rocky Mountains. I don't believe that it could be one of the Asiatic Dotterals (Mongolian) for this bird has a narrow gray ring on its throat, whereas, the bird we saw had a black ring, very distinct and unbroken.

One more surprise was to await us as we went on to the airstrip and the adjacent bay on the mud flats of which were a large group of 'Auku'u and Coot, more than I have yet seen there. Suddenly a small light gray, white-breasted bird flew over the mud flats, which the lulls identified as the Least Tern. They had seen this bird here on September 3, and we all got a very good look at it as it dipped repeatedly to the water, fishing. Once it landed near a Turnstone, and we saw its small size, no larger than the Turnstone.

We also saw a female Mallard. This makes the fourth year in a row for this bird to visit this bay. There should be a male also. Has he been shot?

The next stop was Kahuku. We examined the small pond, with over 250 Pintail and Shoveler on it, then crossed the airstrip and walked out to the beach to look for Curlew. As we were walking back, two were scared up from the coral scrub mauka of the road and flew down the coast, calling. One more year in succession for the Bristle-thighed Curlew.

The mill settlement basin's ponds and mud flats didn't offer anything unusual; however, a large flock of shore birds were scared up from the mud flats before we had a chance to examine them.

Walter R. Donaghho

LETTERS from Mr. & Mrs. Joseph E. McNett, Webster, New York, 22 March 1969.

Spring is unfolding slowly in our western New York and with it comes the wild honking of the Canada Geese. These great fliers move by the thousands through our area stopping to feed along the way. Last Tuesday we saw our first flocks and it was indeed a thrill. Soon the beautiful white Whistling Swans will be seen, but all too briefly as they move northward rapidly. The Geese remain for several weeks and so we can observe them on the wildlife reserves more readily.

Red-winged Blackbirds and Grackles have arrived at our feeders and an early Song Sparrow was singing his song to us this week. We have had over 50 Evening Grosbeaks with us of late, but they will move along as the spring continues. Now our Chickadees and Nuthatches are busily feeding and singing their spring songs. We see them open a seed and attentively pass it to their mates during this season. Of course, the Cardinals are ever with us and they brighten the early morning hours with their songs of "Oheer" "What Cheer".

Today as we drove out along the Lake the color made us think of Hawaii. It had that deep blue and then a soft emerald hue. But it was cold and a biting north wind made us take to the car quickly after looking over some flocks of migrating ducks and geese.

I am looking forward to the arrival of our Purple Finches. They come early and nest with us. Their enthusiasm for sunflower seeds keeps them close to us and so we can readily watch their mating antics. Often we sit spellbound watching their quivering and fluttering mating dance and listening to their bright little lively warble....

From the McNetts, 25 August 1969.

A lovely summer is drawing to a close and as the Oriole sings his "farewell" to us while feeding in the tree-tops I think it will not be long and he will be winging his way southward for another year. We have enjoyed many beautiful summer birds. The Wood Thrush nests with us and often sings his evening song throughout the summer months. Robins are plentiful in our area and we enjoy them for they usually have three broods as do the Cardinals. Therefore, they are singing and chasing long after the other nesting birds have completed their cycle and are experiencing postnuptial molt. Some trim little Pewees are taking care of the flies

in our front woodlands, while the Vireos, both Warbling and Yellow-throated, ferret through the tree-tops for insects. Chickadees, Nuthatches, and Titmice are steady customers at our sunflower feeders and the Downy, and Hairy Woodpecker frequent the suet feeders. Flickers feed upon the ants where they find them. Catbirds, like your 'Elepaio, saucily squawk in the thickets. The Purple Finch has been active until recently, but now must be molting as we do not see him of late....

...Soon the fall migration will begin and there will be some excitement. A few shore birds have been migrating, but we are slowly losing our shallow waters and the feeding grounds for these shore birds is lessening....

I am curious to learn how long the resident birds nest in Hawaii. How much of a rest cycle do they need? Our Cardinals are chasing and singing even while going through their molt. We have many young Cardinals feeding together even now....

Editor's Note: If you have the information, please write to Kojima, 725-A 3th Ave, Honolulu, Hawaii 96816. Nesting information is very important in determining the condition of a ecosystem, so if you have the time, please report in your observations.

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From Dr. & Mrs. Hubert Frings, Norman, Oklahoma, 24 August 1969.

We have been extremely busy the last few months. Early in May, it was decided to publish formally the lab manual for my course in General Zoology. Our textbook in Zoology, titled, CONCEPTS OF ZOOLOGY, is in the last stages of publication and should be out by December....And we have been going on full time research this summer--studying hearing in beetles.

Carl and Sheila are living in the country....Sheila is studying the behavior of blue jays for her Ph.D. thesis--she changed from a study of wrens when the wrens proved to be too elusive and too few. We have plenty of blue jays. And they are really interesting. Carl is working on behavior of spiders for his thesis....We still have our Leiothrix, Brazilian Cardinals, and many other birds in a large flight cage (8 feet by 8 feet) in a room next to my study--actually our count shows 55 individual birds of about 16 species....

ALOHA to new members:

Mrs. Jesse E. Blackwell, 4450 Kolohala St, Honolulu, Hawaii 96816
 Mrs. William G. Gorst, 669 Ulumalu St, Kailua, Oahu 96734
 Lenora K.Y. Ho, 1054 Green St, Honolulu, Hawaii 96822
 Mr. & Mrs. Charlie Smith, 4026 Harding Ave, Honolulu, Hawaii 96816

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

OCTOBER ACTIVITIES:

October 12 - Field trip to study shore birds. Bring lunch, water, and if possible your car. Transportation cost (\$1.00) to be paid to the drivers. Meet at the Library of Hawaii at 8:00 a.m.
 October 13 - Board meeting at the Zoo entrance bldg at 7:30 p.m. Members welcome.
 October 20 - General meeting at the Waikiki Aquarium Auditorium at 7:30 p.m.
 Speaker: Richard H. Davis Topic: Molokai and Axis Deer

HAWAII AUDUBON SOCIETY EXECUTIVE BOARD:

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