

THE ELEPAIO

Journal of the
Hawaii Audubon Society



For the Better Protection
of Wildlife in Hawaii

VOLUME 27, NUMBER 2

AUGUST 1966

PEST CONTROL IN HAWAII AS PRACTICED BY THE STATE DEPARTMENT OF AGRICULTURE

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Although immigrant insects have been reaching our shores since the early history of Hawaii (1778) and many of us are familiar with such notorious pests as the Chinese rose beetle, sugarcane leafhopper, taro leafhopper, fruitfly (melon, Mediterranean and Oriental), termite, snail, mosquito, cockroach and armyworm, beginning in 1960 and continuing up to the present time we have been invaded by a steady influx of pests, some of which are potentially destructive, and others which have caused economic losses. For the record, and in order of occurrence these are the (1) notorious beet leafhopper, Circulifer tenellus (Baker), (2) hunting billbug, Sphenophorus venatus vestita Chittenden, (3) litchi fruit moth, Cryptophlebia ombrodelta (Lower), (4) Cribrate weevil, Otiorhynchus cribricollis (Gyllenhal), (5) Southern green stink bug, Nezara viridula var. smaragdula (Fabricius), (6) black twig borer, Xylosandrus compactus (Eichhoff), (7) Vexans mosquito, Aedes vexans nocturnus (Theobald), (8) Cuban laurel thrips, Gynaikothrips ficorum Marchal, (9) Caledoniae seed bug, Nysius caledoniae Distant, (10) hibiscus caterpillar, Anomis flava Fabricius, (11) vagrant grasshopper, Schistocerca vaga Scudder, (12) red-shouldered stink bug, Thyanta accerra McAtee, (13) black stink bug, Coptosoma xanthogramma (White) and (14) Acacia psyllid, Psylla uncatoides Ferrisklyver.

Most of these were first recorded on Oahu (Table I), and this suggests that the jet age which started in late 1958 and was in full operation by 1959-60 may have been a contributing factor.

TABLE I
INFLUX OF NEW PESTS AND THEIR SPREAD TO NEIGHBOR ISLANDS
1960-1965

Immigrant Pest	First Record	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii
1. <u>Circulifer tenellus</u> (Baker) (beet leafhopper)	1960 Oahu	1960	1960	1960		1964	1964
2. <u>Sphenophorus venatus vestita</u> Chittenden (hunting billbug)	1960 Oahu	1962	1960	1962		1962	1964
3. <u>Cryptophlebia ombrodelta</u> (Lower) (litchi fruit moth)	1960 Oahu	1962	1960				1962
4. <u>Otiorhynchus cribricollis</u> (Gyllenhal) (Cribrate weevil)	1960 Hawaii					1965	1960

Immigrant Pest	First Record	Kauai	Oahu	Molokai	Lanai	Maui	Hawaii
5. <u>Nezara viridula</u> var. <u>smaragdula</u> (Fabricius) (Southern green stink bug)	1961 Oahu	1962	1961	1963	1963	1963	1963
6. <u>Xylosandrus compactus</u> (Eichoff) (black twig borer)	1961 Oahu	1964	1961				
7. <u>Aedes vexans nocturnus</u> (Theobald) (Vexans mosquito)	1962 Oahu	1962	1962	1963			
8. <u>Gynaikothrips ficorum</u> Marchal (Cuban laurel thrips)	1964 Oahu	1964	1964	1964	1965	1964	1964
9. <u>Nysius caledoniae</u> Distant (Caledoniae seed bug)	1964 Oahu		1964				1964
10. <u>Anomis flava</u> Fabricius (hibiscus caterpillar)	1964 Oahu		1964				
11. <u>Schistocerca vaga</u> Scudder (vagrant grasshopper)	1964 Oahu		1964				
12. <u>Thyanta accerra</u> McAtee (red-shouldered stink bug)	1965 Oahu		1965				
13. <u>Coptosoma xanthogramma</u> (White) (black stink bug)	1965 Oahu		1965				
14. <u>Psylla uncatoides</u> Ferrisklyver (Acacia psyllid)	1966 Oahu		1966				

As will be noted, these are all insect pests. To be consistent with the title of this article we should also include weeds (Table II), and snails, in which much has been accomplished through their control by introduced enemies.

TABLE II

PRESENT BIOLOGICAL CONTROL STATUS OF NOXIOUS WEED PESTS IN HAWAII
April 18, 1966

	<u>Hawaii</u>	<u>Maui</u>	<u>Molokai</u>	<u>Oahu</u>	<u>Kauai</u>
1. <u>Lantana camara</u> var. <u>aculeata</u> (lantana)	P. to S.	P. to S.	P. to S.	P.	P.
2. <u>Eupatorium adenophorum</u> (Maui pamakani)		S. to C.			
3. <u>Opuntia</u> sp. (cactus)	S. to C.	P.	P.	P.	P.
4. <u>Clidemia hirta</u> (Kosters curse)				P.	
5. <u>Ulex europaeus</u> (gorse)	I.	I.			
6. <u>Myrica faya</u> (firebush)	I.				
7. <u>Pluchea odorata</u> (sour bush)	I.	I.		I.	I.
8. <u>Schinus terebinthifolius</u> (Christmas berry)	P.				
9. <u>Emex</u> spp. (emex)	P. to C.	P. to S.			
10. <u>Tribulus terrestris</u> <u>T. cistoides</u> (puncture vine)		P.		S.	C.
11. <u>Rubus</u> spp. (blackberry)		P.			P.

	<u>Hawaii</u>	<u>Maui</u>	<u>Molokai</u>	<u>Oahu</u>	<u>Kauai</u>
12. <u>Elephantopus mollis</u> (elephant's foot)					I.
13. <u>Melastoma malabathricum</u> (Indian rhododendron)				Introduced insects established but too early to assess effectiveness.	
14. <u>Hypericum perforatum</u> L. (Klamath weed)					
15. <u>Eupatorium riparium</u> (Hamakua pamakani)				Prospects for bio control of this pest not very promising. At least 3 candidates may warrant reintroduction.	

Explanation: table

P = partial, S = substantial, C = complete, I = incomplete.

Lantana camara var. aculeata

Between 1957 and 1961 the first important break-through in improved biological control of lantana occurred between sea level and 2000' elevation on Hawaii and Maui and up to 800' on the neighboring Island of Molokai. The responsible agents, with the exception of the tingid, Teleonemia scrupulosa Stal, were all new introductions, and in order of importance:

(1) Hypena strigata F. (1957, Kenya, East Africa), (2) Teleonemia scrupulosa Stal (1902, Mexico), (3) Syngamia haemorrhoidalis Guenee (1956, Cuba and Florida), and (4) Catabena esula Druce (1955, California).

There was, however, much to be desired in control of lantana in the wetter areas of the State, and this led to the reintroduction and establishment (1961) of the destructive stem and root boring cerambycid from Mexico, Plagiohammus spinipennis Thomson in the Kona and Kau Districts, Island of Hawaii, and the introduction of the leaf mining hispid, Uroplata girardi Pic from Vitoria, Espirito Santo, Brazil, in 1961 and its subsequent release in Lawai Valley, Kauai, (80" rainfall).

Beginning in 1963, significant developments occurred, first of which was the recovery of the leaf mining chrysomelid, Octotoma scabripennis Guerin, at White Sands, Kailua, Kona, on July 13th. This was the first recovery of this beetle since its reintroduction in 1953-55. Between 1963-65 it spread extensively in the Kona District, occurring in both dry and wet habitats, causing considerable foliar damage on the McCandless Ranch.

In June, 1965, Uroplata exploded in Lawai Valley, Kauai, 4 years after its liberation and it is estimated that it spread 15 square miles. On Oahu, it has spread extensively on Mt. Tantalus.

The most encouraging development, however, is the spread and damage caused by the lantana borer, P. spinipennis at Kukui Paddock, Kau District, where field adults were recovered for the first time. According to Dr. Harley, Australian Research Scientist, "A partial survey of the incidence of this insect has revealed that several acres of lantana are under heavy attack. It may be anticipated that within two or three years effective control of the weed may be effected. The position is excellent and should be viewed with optimism." Under Hawaiian conditions, adults appear to be emerging between June and August, and possibly later.

Opuntia spp. (panini or cactus)

Eradication of cactus between sea level and 500' elevation near Kawaihae, Hawaii, by Dactylopius confusus (Cockerell) and Cactoblastis cactorum (Berg) is a well established fact and has taken 3-4 years, with Dactylopius primarily responsible. However, at the higher elevations (2000-3000') control by the same insects has progressed very slowly. A photographic station at 2000' elevation has shown that after 15 years, a former dense stand has now been reduced to a few sporadic plants, primarily by Cactoblastis.

The introduced cerambycid, Archlagocheirus funestus Thomson, introduced from Australia in 1951 reached destructive population levels between 1963-65 and is responsible for the elimination of many cactus plants in some localities (2600-

3200'). As many as 30 emergence holes were counted on some plants.

Emex australis

E. spinosa (emex)

Complete control by Apion antiquum has resulted in the higher ranch land areas (4000') but only partial at 2000' elevation, and no control from sea level to approximately 500' elevation.

Tribulus terrestris

T. cistoides (puncture vine)

99% of puncture vine plants have been destroyed on Kauai by Microlarinus lypriformis (Wollaston), the stem weevil, and a substantial number of seeds were destroyed by the seed weevil, M. lareynii (Duval). There was sporadic reproduction in some localities in 1965, but the weevils were closing in rapidly.

Substantial control has resulted on Oahu, and on Maui. It is anticipated that the present partial control will be completed in another year.

It is interesting to note that the stem weevil M. lypriformis was found on Molokai in October, 1965, ex T. cistoides. It was never released on this Island and presumably flew inter island or hitch hiked via air or surface craft. Three other beneficial insects, Catabena esula (lantana), the predaceous anthocorid, Montandoniola moraguesi Puton and Cactoblastis cactorum also reached Molokai on their own!

Elephantopus mollis (elephant's foot)

The introduced tephritid, Tetraeuaesta obscuriventris (Loew) imported from Fiji in 1962 is well established on Kauai, but its effect on E. mollis has not been determined up to the present time.

Ulex europaeus (gorse)

Only three introduced insects were liberated; Apion ulicis from New Zealand, a French strain, and Apion scutellare Kirby from Portugal (1961).

Some progress in seed destruction was noted after the French Apion strain was liberated. The stem gall weevil, A. scutellare has not been recovered.

Rubus sp. (blackberry)

Two lepidopterous insects were introduced for the control of blackberry; a heliodinid, Schreckensteinia festaliella Hubner from Santa Barbara, California, and a tortricid, Aptoforma sp. from Jalapa, Vera Cruz, Mexico. After host specificity tests, S. festaliella was released October 30, 1963, at Olinda, Maui, followed by releases at Kokee, Kauai, in November and December. It was found established at Kokee on February 19, 1964, and at Olinda, on July 17, 1964. By mid year of 1965, Schreckensteinia built up to an extremely high population density, infesting 100% of the leaves at the release point and vicinity and spreading several miles by the end of the year. This bio control agent was of no consequence in California, but under Hawaiian conditions, it shows much promise of being an important contributor to bio control of blackberry. The tortricid, Aptoforma has been recovered on Maui and Kauai but cannot be assessed at this time.

Snail Pests

The giant African snail, Achatina fulica Bowdich was discovered on Maui and Oahu between 1936 and 1938 and for many years was limited to these Islands. Incipient infestations appeared on Kauai and Hawaii between 1958 and 1966, but the elimination of A. fulica from these Islands appears very promising.

The introduced carnivorous snails, Gonaxis kibweziensis, G. quadrilateralis, and Euglandina rosea have exerted considerable pressure on the giant African snail populations, so that it is no longer abundant in many former areas of high snail density. Many enemies of the giant African snail have been introduced but only five are established.

The Entomology program of this Department dates back to 1893 when Albert Koebele, fresh from the conquest of the cottony cushion scale in California by the introduction

of a ladybird beetle from Australia accepted employment under the direction of the Commissioner of Agriculture. Between 1893 and 1903 he introduced many beneficial insects into the Islands from several foreign countries and in some cases their effectiveness proved beyond any doubt that the biological method of insect control had great merit.

This and other service functions have continued up to the present time and are particularly important to the Agricultural interests of the State in controlling destructive insects, noxious weeds and snails.

Between 1890 and 1965 over 500 beneficial organisms were introduced into Hawaii for the control of harmful pests. Many of these were introduced by this Department, but other agencies such as the Hawaiian Sugar Planters' Association, Pineapple Research Institute and the State Board of Health contributed to their respective areas in the past. The complete control of the sugarcane leafhopper by introduced enemies is one of the classic examples of bio-control of a serious pest in Hawaii.

To attain the objectives in the State's bio-control program, the Department has a continuing program of exploration, importation (including host specificity tests), mass production and colonization or distribution of beneficial insects.

Although we have used biological control extensively in our Entomology program and have achieved good progress in this area, we cannot rely on this method completely. Some long established pests have not been effectively controlled and, in order to prevent economic losses, farmers and others have resorted to pesticide use to assure 100% protection of their crops. Some examples of pests which require frequent pesticide application are: the Chinese rose beetle, Fuller's rose beetle, vegetable and ornamental leaf miners, white flies, mosquitoes, pineapple mealybug, melon fly, giant African snail, and incipient infestations of new pests which have appeared in Hawaii for the first time and which may be feasible to eradicate by pesticides. This also includes incipient infestations of established pests which have spread to the Neighbor Islands, and we must depend on pesticides to do the job quickly in order to prevent their further spread.

Pesticides, if used judiciously, have a very important place in our way of life. Some very serious diseases of man have been eliminated in parts of the world by insecticidal destruction of their insect borne vectors and serious pests such as the Mediterranean fruitfly in Florida and others have been eradicated by effective insecticides.

Promising solutions for improved pest control, resistant strains of crops to disease and insects, more efficient and effective biological control agents, integrated control, the use of insect diseases, and the sterility approach, either by the rearing and release of sterile insects or by developing ways to sterilize insects in the natural population are being investigated, and some of these have been eminently successful.

Letter from Warren B. King, June 10, 1966:

In response to your field notes in the June, 1966, ELEPAIO concerning the bush warbler along the Koolau: On two occasion in 1965 I heard and got good look at bush warblers in Palolo Valley, especially in Kaau Crater, where there must be a population of 10 or more pairs, judging from the frequency of calls as we crossed the crater floor. They preferred the heavier cover of the northern? side where there is a remnant of an 'Ohi'a forest. One or two were heard along the crater rim and between the crater and the Koolau ridge above it.

I have heard one bird of this species call on several occasions (3 times) just below the Koolau ridge in 1964 and 1965 on Poamoho Trail, too.

In both valleys the birds seem to be very far up, close to the ridge, in somewhat stunted and open 'Ohi'a growth with brushy grasses and wet walking under-foot. It would be interesting to know if other observations confirm this. I haven't

heard it on Aiea Loop Trail on about four visits there over 1964-1965.

I too heard them calling from the Palolo Valley on June 5, 1966, when I was hiking along the Lanipo trail.

Is there anyone interested in making a study of this bird? Within the last ten years it has spread all over the Koolau in the wet rain forest. According to Munro in BIRDS OF HAWAII, page 169, "This bird was released by the Board of Agriculture and Forestry in 1929, by the Hui Manu and others later. I heard it in 1935 on Puukana in the Waianae mountains, and on the Niu trail...It seemed to be at home in these drier forests." If you have any information on this bird, please write to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

BIRDS OBSERVED ON VARIOUS POLYNESIAN ISLANDS

ABOARD THE RESEARCH SHIP TE VEGA

By Fred X. Fry

Second and Final Installment

CANTON ISLAND, PHOENIX GROUP

Lying almost exactly on the equator, this atoll has scant rainfall so that it is the typical "desert island" of adventure story fame. There are no trees other than a few planted coconut palms about habitations. While some portions are covered with low shrubs, much of the island is quite bare. There is one entrance to the lagoon, in the middle of which is a small islet of approximately 5 acres. This is named Spam Island. The population is 100: 50 American technicians working for Bendix Radio Corporation and 50 Gilbertese maintained by the British. The Americans live on one side of the lagoon entrance, the Gilbertese on the other. The Americans track spaceships and the British do nothing (other than maintain a claim on the island). Relations between the two groups is very friendly and communication is via boats across the lagoon entrance rather than along the indifferently-maintained road which runs the full circle of the island. (Visited 9 to 13 July 65.)

Red-tailed Tropic Bird Phaeton rubricauda One bird observed 3 miles offshore. A visit to the site described by the residents as a nesting area, found it vacant.

Brown Booby Sula leucogaster A group of approximately 25 birds occupied a very small islet just off Spam Island. They appeared to be nesting, but I was not able to get to the islet to investigate. They were to be seen quite commonly anytime during the day. Their favorite perch seemed to be the rusting hulk of the President Taylor, which lies at the entrance to the lagoon.

Red-footed Booby Sula sula Occasionally seen flying in morning and afternoon.

Great Frigate Bird Fregata minor Seen occasionally patrolling the coastline and lagoon.

Sooty Tern Sterna fuscata Possibly 200 nesting birds mixed in with the Spectacled Tern colony on Spam Island. Nesting seemed to be at the egg stage, as no chicks were seen.

Spectacled Tern Sterna lunata A colony of 2000 birds occupied one corner of Spam Island. The nests contained either an egg or a chick, slightly more of the latter. The Spectacled Tern is the second commonest bird about the atoll. The colony on Spam Island equalled a Sooty Tern colony for noise and activity.

Common Noddy Anous stolidus The most common nesting bird on Spam Island. The colony, which occupied the greater part of the islet, numbered about 3000. Both eggs and young, slightly more of the former. These birds could be seen at any time over the surrounding seas. The nests of both these birds and the Spectacled Terns consisted of nothing more than a shallow depression of loosely arranged Acropora coral fragments.

White-capped Noddy Anous minutus Seen occasionally, flying over the far side

of the atoll where low shrubs grew. No nests seen.

White Tern Gygis alba Seen occasionally everywhere over the atoll, including being mixed in with the ornithological traffic jam over Spam Island.

Pacific Golden Plover Pluvialis dominica Seen frequently, singly and paired, scattered along the inner reef flats. All the birds were in non-breeding plumage. Often standing motionless in the shallows or on the flats. Easily the most common migrating bird at this time.

Ruddy Turnstone Arenaria interpres A band of 4 birds was seen flying over the inner reef flat on 11 July 65. All in non-breeding plumage.

CHRISTMAS ISLAND, LINE ISLANDS

At the southern extremity of the Line Islands, Christmas is the largest atoll in the world in terms of dry land, being 220 square miles. Much of the central lagoon is filled in and is called The Isles Lagoon. This accounts for the island's remarkable acreage. There is a shallow entrance to the remaining lagoon. London, the village at one side of the entrance, contains the total island population of 300 Gilbertese. Paris, the village at the other side, is deserted. There is a small island between, named Cook Island, after the discoverer of Christmas, Captain James Cook. Christmas is administered by the United Kingdom and leased as a copra plantation. There is one white man on the island, Mr. Dudley Cook, who is the island manager and no relation to Captain Cook. It is claimed by the United States. There is a remarkably complete network of roads and the remains of an extensive military establishment. The island was the scene of British atomic bomb testing between 1958 and 1963. There are no obvious scars to be seen from the many explosions which must have occurred here. The vegetation is adequate but not lush, due to the limited rainfall. (Visited 21 to 23 July 65.)

Christmas Shearwater Puffinus nativitatus Fairly common over the waters surrounding Christmas Island. An all blackish-brown shearwater.

Crested Tern Sterna bergii Seen occasionally flying over The Isles Lagoon.

Sooty Tern Sterna fuscata Huge colonies of Sooty Terns, which must total in the millions, are scattered along the eastern shore of the atoll. These birds are reputed to breed every six months on Christmas. Te Vega visited this island because of this unique breeding cycle. Sir Alister Hardy, the great plankton specialist and a member of the Te Vega faculty, expected that such a remarkably short cycle must be supported by a particularly rich plankton growth in the surrounding seas. We failed to find such a rich growth.

Common Noddy Anous stolidus A common breeding bird on Cook Island. The total on the islet was about 2000.

White-capped Noddy Anous minutus A common nesting bird in the low shrubs on Cook Island. Some of the birds were sporting new tags, applied by an ornithological team from the Smithsonian Institute which had visited the island only 2 or 3 weeks previously.

Blue-gray Noddy Procelsterna cerulea A beautiful and frequently seen breeding bird on Cook Island. It closely resembles the White Tern except for its blue-gray coloration. It lacks the fearless curiosity of the White Tern and cannot be approached with any success.

Great Frigate Bird Fregata minor There are great numbers all about the island and surrounding seas. Not uncommonly seen in groups of a hundred birds. Nesting birds observed at close range near The Isles Lagoon in shrubs sometimes no more than a foot off the ground. The chicks are comically ugly, white little creatures who put up a show of fierce bravado when approached too closely.

In the late afternoon, it is the custom for several fishermen in small outriggers to put out just off the mouth of the lagoon entrance and catch the daily quota of one pound of fresh fish for each of the natives working the plantation. The Frigate

Birds wait for this daily occurrence and devote the remainder of the short, tropic twilight trying to steal the bait and or fish away from the fishermen. Their great size and wicked, hooked beaks do not impress the fishermen, who go about their business as if completely unaware that there are, within arms reach, anywhere from three to ten big rascals hovering with thievery in their hearts.

Blue-faced Booby *Sula dactylatra* Observed occasionally about the lagoon entrance. Not seen nesting.

Brown Booby *Sula leucogaster* Seen commonly, but no nesting birds discovered.

Red-footed Booby *Sula sula* Common. Observed nesting on Cook Island in the company of nesting White-capped Noddies and near The Isles Lagoon in the company of nesting Frigate Birds. The young birds were of good size and were about ready to lose their abundant down or had already done so and could fly -- if forced.

Red-tailed Tropic Bird *Phaeton rubricauda* Fairly common. Observed nesting on Cook Island. Eggs but no young seen.

Kokikokiko *Conopoderas aequinoctialis* I was particularly anxious to find this small, indigenous warbler but was unable to find one. Mr. Cook, the island manager, states that they could be found near a shallow, fresh water well with the exotic name of Banana Fresh Water.

FANNING ISLAND, LINE ISLANDS

A beautiful, small atoll in the Line Islands. There is one, narrow entrance to the lagoon. The population consists of 70 Gilbertese and one Australian manager, Mr. Phillip Palmer, who has been there for nearly 40 years. As on Christmas, the Gilbertese were brought there to operate the copra plantation. There are two very primitive roads dwindling away from either side of the lagoon entrance. The vegetation is lush. The island is administered by the United Kingdom and, of course, claimed by the United States. We found no nesting birds on Fanning.

As throughout the cruise, Dr. Eugene Haderlie, Professor of Oceanography at the Naval Postgraduate School in Monterey, was of great assistance with bird identification on Fanning. (Visited 24 to 26 July 65.)

Red-footed Booby *Sula sula* Fairly common.

Blue-faced Booby *Sula dactylatra* Occasionally seen.

Brown Booby *Sula leucogaster* Occasionally seen.

Great Frigate Bird *Fregata minor* Common. This bird is kept as a household pet on Fanning. The natives capture the young birds just as they have learned to fly and are ready to fend for themselves. They are not restrained in any way, but perch free on long 2 by 4's placed horizontally about 6 feet off the ground near the native dwellings. They are identified by long, cloth streamers which are tied to the mid portion of one of the wings. Each family has a distinctive color and the birds can be identified at great distances by this means. This unusual method of tagging does not seem to hinder the effortless flight of these remarkable birds. Mr. Palmer complained humorously that he often can't get a decent day's work out of his natives because they have always to be sure that they have enough time to catch a daily fresh fish for each of their birds. The history of Polynesia records that these birds were once used as we used homing pigeons. We observed mostly immatures as pets, which leads me to believe that, once adulthood is gained, the birds forsake the easy life.

Frigate Birds made a nuisance of themselves at a poison station established on the edge of a small, fresh water pond to obtain specimens of *Tilapia*, a small, introduced fresh water fish. The dead fish often floated to the surface and, before they could be collected, many were brazenly stolen by these birds. This they would do by gliding low over the surface, momentarily dropping their heads and hooking-up the fish with their long beaks. Fortunately, the poison was not injurious to them.

White-tailed Tropic Bird *Phaeton lepturus* Seen occasionally flying to and from

the sea.

White-capped Noddy Anous minitus Seen commonly, flying in and about the tops of coconut trees.

White Tern Gygis alba Observed frequently, singly and paired.

Kokikokiko Conopoderas aequinoctialis or C. pistor Despite a careful search, I could not find this bird. Mr. Palmer stated that he had not seen one for years. Professor Kirby reported it in 1925.

Lorikeet Psittacula kuhli or Vinis kublii This bird was reported as an introduced resident by Professor Kirby in 1925. I could not find it, but Mr. Palmer stated that he sees it frequently about the atoll.

On 25 July 65, in good, mid-day light, I observed a single gull on the edge of a small, shallow, brackish pond not far from the main village on Fanning. It was a large gull, everywhere white except for a dark, sooty mantle. On the wings there was a trailing edge of white, contrasting sharply with the remaining mantle. The feet were flesh colored and the bill was lightly colored and strong. The bill marking could not be made out. The head was not completely white as there were some dull, gray patches behind and above the eye and on the side of the chin. The bird appeared ragged, with several of the primaries and secondaries missing. As best I could identify it, it was a Western Gull, Larus occidentalis.

INCIDENTAL NOTES

The birds observed on the open sea, between islands, are not included here. Many and various terns, shearwaters, tropic birds and others were sighted but often specific identification was not made. The following are a few positive sightings:

Black-footed Albatross Diomedea nigripes Seen daily on the leg of our cruise between Honolulu and Monterey, California, from a point about 600 miles north of Honolulu to within 50 miles of the California coast. From one to six birds could be seen at any time.

Western Mourning Dove Zenaidura macroura marginella Observed flying about the ship for most of 30 minutes on 4 Sept 65, approximately 220 miles off Monterey. It landed for a short time in the rigging but fear shortly overcame fatigue and it was last seen flying low and aimlessly the wrong way, due west.

Song Sparrow Melopiza melodia After a very short preliminary appraisal of the ship, it landed aboard on the morning of 5 Sept 65, approximately 80 miles from Monterey. It stayed aboard, usually on deck, for about two hours before flying away.

Black Phoebe Sayornis nigricans Also seen about the ship approximately 80 miles west of Monterey. Alighted only briefly and was away.

Audubon's Warbler Dendroica auduboni This bird was seen almost in the company of the Black Phoebe. It was too wary to do more than circle the ship a few times, and then was off.

Wandering Tattler Heteroscelus incanum This traveller flew aboard very early the morning of 5 Sept 65, when Te Vega was about 100 miles west of Monterey. It stayed on deck much of the day and dined on a handful of fresh plankton stolen for the purpose from the last plankton tow.

The first gull was seen 440 miles from Monterey. It was an immature and not interested in Te Vega, so I could not identify the species.

Almost within sight of land, we passed through thousands of migrating Sooty Shearwater, Puffinus griseus.

It was surprising to me to find so many land birds so far at sea. Te Vega approached Monterey sailing due east so that no sailing parallel with the coast was involved in obtaining this "yield". Weather conditions ashore had been ideal for several days when we landed.

FOR JUNIOR MEMBERS:

Have you seen the July 2, 1966, Honolulu Star-Bulletin's article by Toni Withington, "Many besides the Nene are in Peril. The Battle to Save Our Native Birds." on page B-1? Isn't it wonderful? PICTURES!

Last year when we studied the rare and endangered birds on the calendar, there were only two Hawaiian birds--Nene and Laysan teal. This article illustrates and describes twenty-one of the twenty-two native Hawaiian birds that are in direct or indirect danger of extinction. It said, "It is believed to be the first time that sketches of Hawaii's endangered birds have appeared together in one publication. Only one rare bird is missing. It is the Nihoa Finchbill. So rare and inaccessible is the Finchbill that no drawings or photographs were available to Ray Higuchi, the Star-Bulletin's staff artist, as the basis for a sketch. He worked many hours over a one-month period in preparing the pen-and-ink illustrations. In some instances he was forced to work from three separate pictures in order to produce one suitable drawing."

According to the Managing Editor they are checking now on the possibility of reprints of the page and will let us know. If reprints are available, we'll send you one, and if not, we'll tell you more about the article in the subsequent issues of THE ELEPAIO.

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Winifred Cahill cared enough to write to the editor about this article. (See Honolulu Star-Bulletin, July 9, 1966, page A-4)

Jerriane Sakoda, who just returned from attending the National Youth Conference on Natural Beauty and Conservation in Washington, D.C., stressed the importance of education in the letter to the editor. (See Honolulu Star-Bulletin, July 11, 1966, page A-8)

Let's all help make Hawaii become conscious of the unique flora and fauna we possess and care enough to take action to keep them forever. If there's any information or any suggestion you want to share with the other members, please write to Kojima, 725-A 8th Avenue, Honolulu, Hawaii 96816.

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FIELD NOTES:

While cruising past the Ala Wai Golf course on Wednesday, June 17, 1966, Mrs. Irene Casey sighted two fairy terns. They were flying away from Koko Head Crater. As they passed the Waikiki end of the golf course, they circled seaward and disappeared.

Erin Casey

Wonderful to have Erin share her mother's observations with other members. You also may have interesting experiences, please share them by writing to Kojima.

AUGUST ACTIVITIES:

- August 8 - Board meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Members are always welcome.
- August 14 - Field trip to Rabbit Island to study sea birds. Trip will be limited to Society members. Boat fare is estimated at \$3.00. Meet at the Library of Hawaii at 8:00 a.m. Leader: Mike Ord, telephone 915-704 for reservations.
- August 15 - General meeting at the Honolulu Aquarium Auditorium at 7:30 p.m. Program for the night: Winston E. Banko will talk on "Accession and Organization of Literature on Hawaii's Birds."

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