'ELEPAIO

Journal of the Hawaii Audubon Society

For the Protection of Hawaii's Native Wildlife

VOLUME 47 (11)

November 1987

Laysan Finches Drown as a Result of Marine Debris

Marie P. Morin[1]

Within the last two decades, there has been an increase in awareness about the problem of interactions between marine debris and wildlife, especially with respect to oceanic plastics (Kenyon and Kridler 1969; Wehle and Coleman 1983; Conant 1984; Shomura and Yoshina 1985). This note reports on an interaction involving marine debris and the endangered, endemic land passerine, the Laysan Finch (*Telespyza cantans,* Fig. 1), which I studied on Laysan Island from February to July, 1986 and from April to July, 1987.

Laysan is an isolated, uninhabited, low, coral island that is part of the Hawaiian Islands National Wildlife Refuge; it is approximately 700 nautical miles northwest of the main Hawaiian island of Oahu (Ely and Clapp 1973). The shoreline and the interior of this remote island are littered with plastics and other marine debris that have floated there or arrived via seabirds which have mistaken the plastics for food during their pelagic foraging (Kenyon and Kridler 1969; Pettit *et al.* 1981; Day *et al.* 1985). This debris includes such items as lost fishing gear (especially plastic line, nets, and floats), glass bottles and floats, plastic cigarette lighters, plastic tampon inserters, plastic toys, styrofoam fragments, plastic sandals, and many other identifiable and nonidentifiable objects. When possible, National Marine Fisheries Services (NMFS) field personnel remove or destroy plastic lines and nets that have washed ashore on these remote islands, because the endangered Hawaiian Monk Seal (*Monachus schauinslandi*) has been known to become entangled in them (Balazs 1979; Andre and Ittner 1980; Henderson 1984).

On 16 June 1986, the bottom half of a red and white plastic cooler (Fig. 2) containing two dried Laysan Finch carcasses was found high on the beach near our west shore campsite on Laysan. The cooler's insulation appeared to be wood, which suggests that it was an older style of cooler. NMFS and U.S. Fish and Wildlife Service (FWS) personnel brought the cooler to me, mentioning that it was found at or near the west shore vegetation line, which is approximately the highest waterline for winter storms. Both of the dead finches had been previously banded by me in March 1986 (FWS band numbers 791-04457 and 791-04470) in the general vicinity where their bodies were found. The waterline marks within the cooler suggested that one or more rainstorms had filled the upright cooler with water, which had subsequently evaporated, although not before the two finches had drowned in it. Based on the condition of the carcasses, I estimate that the finches had been dead 1-4 weeks. After removing the aluminum bands from the finches, I buried the cooler above high watermark to prevent another drowning incident.

There is no standing fresh water on Laysan. Other than rainwater that collects on vegetation or rocks, or the moisture in the finches' foods, the only other natural sources of nearly fresh or brackish water are small springs which feed directly into the hypersaline lake in the island's interior. Laysan Finches do not naturally have experience with standing fresh water; however, they are extremely attracted to fresh water during hot or dry periods when there is little or no rain (pers. obs.) and probably especially during certain stages of the breeding season. Laysan Finches are also extremely curious birds and explore everywhere, including researchers' tents, seabird burrows, and other open holes such as the camp pit toilet (which is no longer left uncovered). This curious exploration probably derives from their omnivorous eating habits and is part of their foraging search for seeds, plant roots, carrion, eggs, and invertebrates. For these reasons, Laysan Finches easily drown when they encounter any sort of man-made containers with steep sides (e.g. metal drums, buckets, coolers, etc.) which hold more than a few inches of enticing fresh water. Rainstorms can occur suddenly on Laysan. During heavy storms, uncovered containers may rapidly collect water. Field personnel have observed that the finches will drown in uncovered containers of water (S. Conant pers. comm. and M. Morin pers. obs.). Amerson (1971) reported that when the closely related Nihoa Finch (*Telespyza ultima*) was introduced to French Frigate Shoals, some of them drowned in an uncovered bucket and also in a 55-gallon drum of fresh water.

Figure 1. Laysan Finch, adult male. North Is., Pearl and Hermes Reef.

Photo by Sheila Conant

During hot, dry weather on Laysan, I frequently baited shallow containers (less than 1½ inches deep) with fresh water; at these sites, the finches could be easily caught with an insect net for banding. Obviously, if a container has very low sides, the finches can climb out even if they become totally waterlogged.

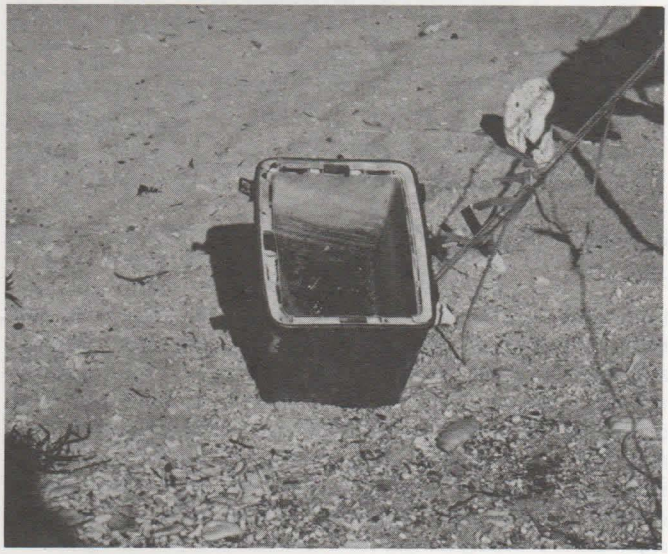


Figure 2. Dead Laysan Finches in a cooler, Laysan Is., 1986.
Photo by Marie Morin

Of course, it is possible that the presence of these man-made objects benefit the finches by supplying water, a potentially limiting resource. Presence of additional water sources may benefit finches by increased nestling survival due to reduction of parental and/or chick heat stress. Cost to the finches would be the risk of drowning.

Marine debris has the potential to drown Laysan Finches because containers capable of holding several inches of rainwater periodically wash ashore. Intermittent inspections of the shoreline should be made by field personnel already present on the island in order to find and destroy or bury these objects. Although death by drowning in marine debris is certainly not a major source of Laysan Finch mortality (their total population numbers between 10,000 and 15,000, FWS unpubl. data), mortality that is human-caused should be prevented. Ideally, the solution to this problem is the removal of man-made marine debris from the world's oceans; unfortunately, this solution lies somewhere in the future. Biologists are aware of the problem, however, and hopefully solutions, such as the widespread use of highly biodegradable plastics and the cessation of oceanic dumping of nonbiodegradable plastics, will be found and implemented. In addition, education of the general public encouraging the proper disposal of garbage is vitally needed.

LITERATURE CITED

Amerson, Jr., A.B. 1971. The natural history of French Frigate Shoals, Northwestern Hawaiian Islands. Atoll Res. Bull., No. 150. Smithsonian Institution, Washington, D.C. 383 pp.

Andre, J.B. and R. Ittner. 1980. Hawaiian Monk Seal entangled in fishing net. 'Elepaio 41:51.

Balazs, G.H. 1979. Synthetic debris observed on a Hawaiian Monk Seal. 'Elepaio 40:43-44.

Conant, S. 1984. Man-made debris and marine wildlife in the Northwestern Hawaiian Islands. 'Elepaio 44:87-88.

Day, R.H., D.H.S. Wehle, and R.C. Coleman. 1985. Ingestion of plastic pollutants by marine birds. *In:* Proceedings of the workshop on the fate and impact of marine debris, 27-29, November 1984, Honolulu, Hawaii. NOAA Tech. Memo. NMFS, NOAA-TM-NMFS-SWFC-54, Honolulu, Hawaii 96812. 344-386 pp.

Ely, C.A. and R.C. Clapp. 1973. The natural history of Laysan Island, Northwestern Hawaiian Islands. Atoll Res. Bull., No. 171. Smithsonian Institution, Washington, D.C. 361 pp.

Henderson, J.R. 1984. Encounters of Hawaiian Monk Seals with fishing gear at Lisianski Island, 1982. Mar. Fish. Rev. 46:59-61.

Kenyon, K.W. and E. Kridler. 1969. Laysan Albatross swallow indigestible matter. Auk 86:339-343.

Pettit, T.N., G.S. Grant, and G.C. Whittow. 1981. Ingestion of plastics by Laysan Albatross. Auk 98:839-841.

Shomura, R.S. and H.O. Yoshida (eds.). 1985. *In:* Proceedings of the workshop on the fate and impact of marine debris, 27-29, November 1984, Honolulu, Hawaii. NOAA Technical Memorandum NMFS, NOAA-TM-NMFS-SWFC-54, Honolulu, Hawaii 96812. 580 pp.

Wehle, D.H.S. and R.C. Coleman. 1983. Plastics at sea. Nat. Hist. 92:20-26.

[1] *Department of Zoology*
Edmondson Hall
University of Hawaii, Manoa
Honolulu, Hawaii 96822

CONSERVATION NEWS

SETTING THE RECORD STRAIGHT ON KOA

Acacia koa is the largest and most valuable of native Hawaiian forest trees. Koa hardwood was favored by early Hawaiians for canoes, surfboards, calabashes, and other uses where beauty and strength were required. The word *koa* also means brave, bold and fearless in the Hawaiian language. An old proverb conveying good will, *"e ola koa,"* says "live like a koa tree"--live a long time, like a koa tree in the forest.

But too few long-lived koa remain today to meet the needs of both preserving native koa forest habitats and supplying commercial koa lumber. Ways and means of curbing the decline of koa forests was the theme of Hawaii's first Koa Conference, held in Hilo in December 1986. A report on the conference appeared in the *'Elepaio*, March 1987 (vol. 47[3]), "Koa for wildlife; koa for wood."

At the Hilo conference, a spectrum of diverse interests--from wildlife conservationists to commercial koa entrepreneurs--came to agreement on two goals: first, conservation of existing koa forests for native wildlife habitat, and second, promoting industrial koa plantations on former koa lands in both public and private ownership. The second goal involves converting ranchland pastures in the former upland koa belt into koa tree farms.

Sponsored by the Resource Conservation and Development Council of the U.S. Department of Agriculture, the revitalized Forestry Committee on the Big Island gained an infusion of enthusiastic new members from the conference. They started to work in January 1987 on actions needed to maintain koa forests and to encourage planning for commercial koa tree farms.

Some myths and biases about koa that have persisted for years on the Big Island found their way into three newspaper articles about koa published in the Hawaii *Tribune-Herald* (Hilo) on June 25 ("Group would preserve endangered koa reserves"), June 28 ("Koa group is taking firm steps to halt trees' decline"), and July 26, 1987 ("Focus on agriculture"). The articles gave the appearance of representing the views of committee members named in the text, even though the substance of what was published had not been aired at the Koa Conference or at any Forestry Committee meeting in 1987. In this way, the reporter unwittingly used sources that misrepresent the koa situation.

To correct these misconceptions about koa, each has been refuted by citing contrary data from the works of research biologists that appear in the scientific literature. Following are the results of that effort, in the form of a critique, which has been endorsed by the Forestry Committee as accurate and documented information about koa and koa forests that should be presented to the public.

1. **Newspaper:** "Young koa seedlings are not replacing the trees that succumb to . . . the encroachment of the aggressive 'ohi'a, hapu'u and other tree ferns," (all 3 articles).
   Reply: In the natural Hawaiian forest, seedlings of many species do compete for space and light. Koa is as healthy and vigorous a competitor as 'ohi'a or any tree fern. Koa and 'ohi'a evolved and adapted together as the two dominant trees in the forest ecosystems of Hawaii. In biology, native species associations and interactions are not described in terms of "encroachment" or "aggression." Such terms are used to describe the invasion of native forest systems by introduced alien plants and animals, such as cattle, feral pigs and banana poka *(Passiflora mollissima)* in 'ohi'a-koa forests.

   See Mueller-Dombois *et al.* (1) and (3) for an ecological approach to 'ohi'a-koa forests: "Instead, koa can be considered an opportunist that is well adapted to maintaining itself in the Kilauea forest within the existing species composition and under existing environmental conditions" (p. 275).

2. **Newspaper:** None of the articles mention the destructive impact of feral pigs in koa forests.
   Reply: The damage to koa seedlings in forests by feral pigs is well documented by several biologists. Through digging, trampling, eating, and rubbing activities, pigs are a major factor in the low replacement rate of koa in native forests.

   Stone and Scott (2): "Feral pigs are the major current modifiers of Hawaiian forests, probably even exceeding damage done by man. Pig damage has reached extreme levels in this century, perhaps as a result of increasing densities as well as expanding distributions" (p. 262).

   Stone and Scott (2): "Seedlings of dominant plants such as koa . . . may sometimes be taken [by pigs] in numbers great enough to affect forest composition, growth forms, and succession over large areas" (p. 264).

   Mueller-Dombois *et. al.* (1), (2), and (3): "Increased pig density also has the potential of disrupting the reproduction cycle of *Acacia koa* . . " (p. 317). "In the Kilauea forest, the effect of feral pigs is very noticeable" (p. 310). "Practically all koa seedlings that germinate on mineral soil are destroyed in the first year by pig activity . . " (p. 274).

   Scott *et al.*: "In many forests inhabited by endangered bird or plant species, pigs should be eliminated completely because they radically alter understory composition, hinder forest regeneration, and facilitate the invasion of introduced plants" (p. 360).

3. **Newspaper:** "The decline of koa forests has been well documented. As long ago as 1913, it was reported that large tracts of koa forests were perishing, with nothing left but dead trunks with huge branches dangling on strings of bark in South Kona's Kealakekua area" (June 28 and July 26 articles).
   Reply: This incomplete paraphrase is taken out of context from J.F. Rock, *Indigenous trees of the Hawaiian Islands*, privately printed, Honolulu, 1913. Reprinted 1974, p. 43. When you use a writer's account of an event he observed as crucial as this one, you should relate the whole story with the punch line. In the rest of the paragraph on page 43, Rock explains the cause of the decline of koa forests he saw in South Kona:

   "This condition is mainly due to the cattle, which have destroyed all the undershrubs and also injured the trees, which are then readily attacked by insects. It may be remarked that native insects, especially beetles, do not attack healthy trees, but only such as have been injured."

   Rock writes again of his 1912 observations of the "ravages of cattle" on "large tracts of koa forest which twenty years ago or so were in their prime [and] have now perished . . . . Cattle are the great enemy of the koa . . . There are still tracts of land where the koa forest is in its natural condition.

As already mentioned, the koa adapts itself to almost any environment. Ancient a'a (rough) lava flows have been covered by koa trees to the exclusion of everything else. It is on these lava fields that the tres are still in good condition, as cattle usually avoid crossing these sharp, rugged fields of lava" (pp. 176-177).

4. **Newspaper:** "A large percentage of the koa species on the Big Island has fallen" (June 28 and July 26 articles). Cattle are not mentioned as the prime factor in "fallen" koa.
Reply: The locations of where koa "has fallen" and the present land uses of those sites are not mentioned. The implication is some inherent "weakness" in koa. In all fairness, the sites of dead and rotting koa should be identified primarily as pastures and ranchlands. Cattle bulldoze the koa forest, trample the shallow root systems of standing trees and cause early death, and consume germinating seedlings. Present-day writers continue with Rock's "pitiable" story:

Scott and Stone: "Overall, cattle have been the single most destructive agent to native Hawaiian ecosystems, particularly to mesic forests. They usually prefer native plants to introduced species. Koa reproduction is completely suppressed by grazing . . . and cattle are responsible for converting large tracts of forest to open pasture through suppressing regeneration on . . . the dry side of Kohala Mountain . . . , the Waimea plains, the north and east side of Mauna Kea below 2200 m . . . , the mesic and wet slopes of Hualalai, most of South Kona, and the slopes between Mauna Loa and Kilauea" (p. 359).

Mueller-Dombois *et al.* (3): "There are a few remnant koa trees in this grassland on Mauna Kea, which are now dead or dying of old age. The reason that there is no replacement of young koa . . . trees is simply browsing and grazing by introduced mammalian herbivores . . . Grazing by cattle is the main reason for the dying koa forest in the lower portion of this zone . . . [in Volcanoes National Park] without cattle and goats, the koa is vigorously maintaining itself" (pp. 505-506).

Skolmen (1986): "We all have a pretty good idea of where extensive koa and 'ohi'a-koa forests were once located because in most places there is still evidence on the ground. We also know the principal cause of the loss of these forests--cattle, and the principal reason that they have not grown back again--cattle. I know from personal observations that cows will eat young koa in preference to grass . . ." (p. 1).

Whitesell: "Hawaiian forestry literature is full of references to the disasterous effects of cattle, sheep and goats on koa and other native species . . . Cattle, especially, are particularly fond of koa root sprouts, seedlings, pods and leaves. They straddle and trample large saplings to devour the foliage" (p. 6).

5. **Newspaper:** "Koa will become a scarce commodity within five years and can be saved only through long range environmental controls" (June 25 article).
Reply: The supply of koa as lumber in the market place may dwindle in the future. But koa as a dominant tree species in protected native forests is not threatened with extinction. The contrast between these separate uses of koa should be clarified.

Mueller-Dombois *et al.* (1): ". . . the species [*Acacia koa*] is not disappearing from the [Kilauea] forest since individuals are present in all size classes . . . This is a natural forest, in which the tallest tree species is represented with low density, a situation typical for emergent tree species in tropical rain forests elsewhere" (pp. 266-267).

Skolmen (1986): "Although there is certainly no serious threat to the continued presence of koa at the present time, there is a threat to the continued presence of the large diameter, long-stemmed koa trees that are preferred for timber" (p. 2).

6. **Newspaper:** "The tree is susceptible to root rot that gradually eliminates the root anchor-support function. Koa trees that have been able to build an immunity or were bypassed by the root rot fungi also lose a fair percentage of their crowns due to insect and pathogen attacks. A heart rot fungi is active in the koa stems and branches, especially in older trees. Young trees are apparently less susceptible" (June 28 and July 26 articles).
Reply: Once again, the significant part of the story is omitted. Heart and root rot fungi are commonly found on deteriorating mature koa that is remnant on heavily grazed ranch lands. Significant disease, rot fungi or insect damage is not reported in the literature from natural, mixed koa forests on the Buig Island. More than 40 species of native insects are associated with koa as a host plant. But the populations of native insects having the potential to seriously damage koa are kept under control by their natural predators--which are also supported by koa. It is all a part of nature's check and balance ecosystem.

Bega: The 5 species of heart and root rot fungi that Bega reported on old koa trees were all found in "heavily grazed rangeland" on the NE side of Mauna Kea in the Keanakolu area" (pp. 682-684).

Skolmen (1986): "Cows . . . also scar up the shallow root systems [of koa] and cause the introduction of root diseases" (p. 9).

Whitesell: "The most destructive insects of koa are lepidopterous defoliators of the genus *Scotorythra*. Fortunately, they appear to be under good control biologically and seldom build up to damaging levels" (p. 8).

Hodges: "The potential problems of koa when used as a plantation tree may be somewhat greater. More than 40 species of insects and mites and several fungi attack this tree species. In native forests, where koa is often mixed with 'ohi'a and a few other species, these pests are currently causing little damage. Under plantation conditions, however, one or more of them could become a serious problem" (p. 23).

7. **Newspaper:** " 'The Kilauea forest tract is undergoing a similar threat,' Crabb pointed out. 'In spite of it being the best koa forest in the state, the pathogens and insects that ravaged other stands to their current low status are now active at Kilauea' " (June 28 and July 26 articles).
Reply: There is no documentation in the literature for these statements. In fact, the reports of the International Biological Program (IBP) research conducted in the Kilauea forest over

5-6 years in the 1970s are just the opposite.

Mueller-Dombois *et al.* (in charge of the Hawaii IBP) (3): "This [Kilauea] forest has been called decadent by some foresters because individual tall, old koa trees or sometimes groups of overstory koa trees are blown down during Kona storms. Moreover, the current density of koa is obviously far below what the site could carry if this forest was managed for koa."

"We studied the structure of this forest in detail through quantitative enumeration of koa and other tree individuals in all size classes. We found that there is replacement by koa regeneration from seedlings . . . Thus, koa is a fast-growing tree in this forest, and the species is certainly not decadent" (pp. 506-507).

No significant insect damage to koa was reported from IBP Kilauea forest research.

8. **Newspaper:** "This tract has been under total protective custodial management since before the turn of the century and has had ample opportunity to develop its maximum potential, but it has become apparent that the belief by some that the environment should pursue a course dictated by nature may not always be applicable to the delicate koa ecosystem" (June 28 and July 26 articles).
Reply: It is inaccurate to write that the Kilauea forest has been "under total protective custodial management." The ongoing, destructive impacts of introduced European pigs have increased in intensity in this century. No effort has been made to eliminate pigs there. Such inaction that changes the composition and diversity of the forest cannot be called "total protective management." The effects of pigs are noted under 2. above. Nevertheless, Mueller-Dombois *et al.* find that "the presence of scattered emergents of koa in the Kilauea forest appears to continue indefinitely in spite of the pig activity in the forest" (p. 275).

Other events point up the absence of "protective management." In the 1960s, foresters bulldozed a wide swath completely across the middle of the tract during the course of making a "timber cruise." In addition, since 1971, the land owner has permitted a profitable hapu'u logging operation that is highly disruptive in the lower forest. Notwithstanding vigorous public opposition to such questionable use of Conservation District land, the Board of Land and Natural Resources granted a permit for hapu'u logging on 150 acres in 1971 and another permit for an additonal 300 acres in 1979. The current logging will continue mauka to about 4500 feet elevation. Documentation of this operation is available for review.

Biologists do not consider the koa ecosystem "delicate." Rather, it has demonstrated its hardiness by surviving and maintaining itself at Kilauea in spite of the ravages of pigs and man's heavy hand. See Mueller-Dombois *et al.* points 1., 5., and 7. above.

Additional comment: Since consensus was reached on conservation goals at the Koa Conference, a newspaper article on the ecological values of koa forests would be most welcome. Scott *et al.* (1986) and Stone and Scott (1985) contain an abundance of substantive material on conservation strategies not previously published locally. For example, Scott *et al.* are in our league when they write that "reforestation of these [Mauna Kea] pasturelands to reconnect the mamane woodland and koa forests is a critical need on Hawaii for these [endangered] bird species" (p. 359).

Scott *et al.* come up with another winner: "Significant populations of endangered birds presently occur on only a handful of ranches . . . The salient point is that economic incentives are essential in persuading those ranchers who control prime forest bird habitat to manage their land for conservation objectives. Conservation easements, tax write-offs for inactive land, and improved watershed quality are potential benefits . . ." (p. 362).

The scientific findings of competent biologists that are discussed here should be taken into account in any future reporting on the koa situation.

Mae Mull
Island of Hawaii Representative

ANNOLATED BIBLIOGRAPHY

Bega R.V. 1979. Heart and root rot fungi associated with deterioration of *Acacia koa* on the island of Hawaii. Plant Disease Reporter 63:682-684. U.S. Forest Service, Berkeley. Diseases were found on deteriorating koa "on heavily grazed range land" on NE side of Mauna Kea--Keanakolu area--not in a natural koa forest.

Hodges, C.S. 1976. Protection problems related to intensively managed forest stands. In Industrial Forestry for Hawaii. Proc. 18th Annual Hawaii Forestry Conf., Nov. 18-19, 1976. Dept. Plan. & Econ. Dev., Honolulu, pp. 22-23. "In the native forests, where koa is often mixed with 'ohi'a and a few other species, these pests [insects, mites and fungi] are currently causing little damage."

Mueller-Dombois, D., K.W. Bridges, and H.L. Carson, eds. 1981. Island ecosystems: biological organization of selected Hawaiian communities. Stroudsburg, Penn.: Hutchinson Ross Pub. Co.
(1) Structure of 'ohi'a-koa forests, including Kilauea forest. pp. 264-275.
(2) Feral pig activity in Kilauea forest, pp. 308-317.
(3) Ecological importance and maintenance of 'ohi'a-koa forests, including Kilauea forest, pp. 502-509.

Scott, J.M., S. Mountainspring, F.L. Ramsey, and C.B. Kepler. 1986. Forest bird communities of the Hawaiian Islands: their dynamics, ecology, and conservation. Studies in Avian Biology 9.
Pp. 358-363, 372-383 outline destructive effects of cattle, pigs and koa logging on native forest habitats of endemic forest birds. Proposes conservation strategies.

Skolmen, R.G. 1974. Some woods of Hawaii . . . properties and uses of 16 commercial species. U.S. Forest Service, Berkeley.
Section on koa, p. 2. "The best koa forests have been cleared to develop pasture." Koa wood products are "highly susceptible to attack" by alien termites at low elevations.

Skolmen, R.G. In press. Where koa can be grown. Proc. of Koa Forestry Conf. held in Hilo, Dec. 17-19, 1986.
"Destruction of the koa forest is attributed primarily to cattle. Cattle are also the cause of koa not coming back naturally . . ." from abstract. "There is certainly no serious

threat to the continued existence of koa . . .," p. 2.

Stone, C.P. and J.M. Scott (eds.). 1985. Hawaii's terrestrial ecosystems: preservation and management. University of Hawaii, Honolulu.
(1) "It is essential that no more of the remaining 13.4% of the native-dominated mesic koa-'ohi'a forest be destroyed," pp. 6-19, by J. Jacobi and J.M. Scott.
(2) Alien animals in Hawaii's native ecosystems, by C.P. Stone, pp. 251-297. "Feral pigs are the major current modifiers of Hawaiian forests . . .," p. 262.

U.S. Fish and Wildlife Service. 1979. Preservation of the Keauhou-Kilauea forest: a unique Hawaiian wildlife ecosystem. Environmental assessment. 1979. Portland, Oregon.

U.S. Fish and Wildlife Service. 1979. Hawaii forest bird recovery Plan: Hawaii Creeper, Hawaii 'Akepa, 'Akiapola'au and 'O'u. 1982. Identifies the Keauhou-Kilauea forest as part of the "essential habitat" for these four endangered species (pp. 35, 60, 70).

Walker, R.L. In press. Koa and wildlife--an enduring relationship. Proc. of Koa Forestry Conf., Hilo, Dec. 1986. Native birds and 'ohi'a-koa forests are closely linked (pp. 1-6).

Whitesell, C.D. 1964. Silvical characteristics of koa (*Acacia koa* Gray). U.S. Forest Service, Berkeley. Identifies cattle as principal enemy of koa (pp. 6-8).

RECENT OBSERVATIONS JUNE THROUGH JULY 1987

(Editors' note: This article is excerpted from Bob Pyles' record of bird observations for the Hawaiian Islands. Refer to future issues of American Birds for a full acount.)

ABBREVIATIONS: FFS=French Frigate Shoals; H. = Hawaii Is.; K. = Kauai Is.; M. = Maui Is.; O. = Oahu Is.; JCNWR = James Campbell National Wildlife Refuge on Oahu; BPBM = prefix for specimen numbers of B. P. Bishop Museum; HRBF = Hawaii Rare Bird Documentary Photograph File.

CONTRIBUTORS: Kip Bottomley, Dave Boynton, Reggie David, Peter Donaldson, Paul Chang, Bruce Eilerts, Andy Engilis, Kimball Garrett, Darcy Hu, Allan Keith, Jaan Lepson, Ken McDermond, Patrice Moriyasu, Ken Niethammer, Mike Ord, Doug Pratt, Thane Pratt, Robert L. Pyle, Larry Richards, Ralph Schreiber, Catherine Summers, Tom Telfer, Kenneth Tomishima, Rick Vetter.

RAINFALL: Hot temperatures characterized this summer's weather, with many daily records set in the low 90's. Weak tradewinds led to patchy, generally low rainfall, except on windward Hawaii which received above average rainfall.

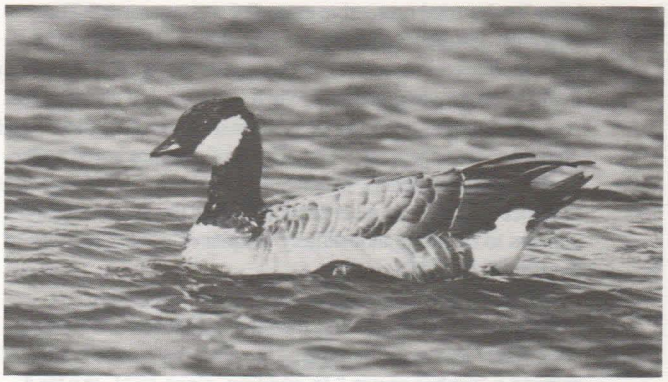
SEABIRDS -- Laysan Albatrosses nesting in the fenced-off colony at Kilauea Pt. NWR, K. successfully fledged three chicks, the same number as produced last year (KB). An adult Dark-rumped Petrel was found with a broken wing at Kapaa, K. on 14 July; it did not survive its injuries (TT). Newell's Shearwaters occasionally turn up on islands other than Kauai; this summer we had three such records. One was found dead on the beach near Laie Pt., O. on 8 June (LR, BPBM 175873), and another alive near Hilo, H. on 21 June, which died later (PM, BPBM 175874). Another was spotted by Bruce Eilerts as it flew about the lights of the Ala Moana Shopping Center in Honolulu on the night of 29 June.

Sightings of Red-tailed Tropicbirds from Oahu included: one at JCNWR (BE, 1 June), one at Makapuu Beach (PD, 21 June), and 5, some of which were courting, again from Makapuu (BE, 4 July), across from Manana Is., where the species has bred in recent years.

A White Tern was reported 1 June inland on Waialae-iki Ridge (BE), well back from the lowland sections of Honolulu which the terns frequent. That they would roost or nest successfully away from the city is doubtful, owing to their vulnerability to predation by Barn Owls.

WATERBIRDS -- As if to remind us of how little we understand the fate of vagrant birds reaching Hawaii, an adult Little Blue Heron appeared again this summer at Waipio and was discovered on 22 July (PD, RD) and 3 Aug. (AE *et al.*) in exactly the same spot where one was seen last year. For most of the past 20 or so years, this bird, or one or more just like it, has made a brief, summer appearance at Waipio, O.; whether this is the same visitor or a succession of herons, and whether this bird (if just one) migrates to or regularly resides elsewhere on Oahu, remains a mystery.

Fulvous Whistling-Ducks continue to breed on Oahu; a family of two juveniles with their parents was located at Amorient Aquafarm, O. on 3 Aug. (AE *et al.*). An *Aythya* duck -- probably a female Ring-necked Duck -- seen at Waipio on 19 June (PD) was late enough to be an oversummering bird.



Canada Goose (*Branta canadensis taverneri*). The Taverner's Canada Goose is a native breeder of northern interior Alaska and occasionally arrives in the Hawaiian Is., sometimes in small flocks with other races of Alaska-breeding Canada Geese. This one has taken up residence at Amorient Aquafarm, Kahuku, Oahu for nearly three years.

Photo by Greg R. Homel

SHOREBIRDS -- The outstanding sighting of the season, an exceptionally early south-bound migrant and new State record, was a Hudsonian Godwit in nearly full summer plumage discovered by Peter Donaldson at Waipio Peninsula, O. on 21 July. Many subsequent observers (RD, AE, KG, MO, RLP *et al.*) took advantage of the opportunity to see and photograph this rare bird before it disappeared sometime after 29 July. This species breeds in arctic Canada, from which it normally migrates southeastward over the western Atlantic to South America. A few birds apparently head southwestward instead, finding their way as far as New Zealand. Though this bird represents the first definite record of the species from Hawaii, a previous sighting of a godwit in winter plumage near Kahuku in Nov. 1975 (*'Elepaio* 37:8) may have been either a Hudsonian or Black-tailed Godwit. The latter speices has never been

possitively identified in Hawaii. Bar-tailed and Marbled Godwits occasionally do show up here.

The USF&WS personnel (RV, KN) stationed on Tern Is., FFS were treated to another colorful, extra-early migrant, when a Ruff in nearly full breeding dress was sighted on 17 June. It gradually molted into one of the drab winter-plumaged Ruffs that we normally see.

PARROTS, OWLS, NIGHTJARS -- A Rose-ringed Parakeet seen flying over Aimakapa Pond, H. on 9 July (AK) was the first report of that species on Hawaii I. since a pair nested and produced one young near Hilo in 1981.

Six Pueo (Short-eared Owls) were seen along a 1.5 mile stretch of road s.w. of Mauna Loa, Molokai on 6 June, and 2 more were counted on the same day several miles west near Kaunala Gulch (CS). On Kauai, the owl die-off continued to take its toll as 8 more Common Barn-Owls and 6 Pueo were found dead during June and July (TT). The cause or causes for the die-off have not been determined.

Excellent photographs of the nightjar resident at Tern Is., FFS for a month last summer (*'Elepaio* 46:76) prove the bird to be a Common Nighthawk (AE, RV *et al.*, HRBF 575 *et seq.*). This is the first record of a Caprimulgid for Hawaii.

NATIVE FOREST BIRDS -- The critically endangered Kama'o was reported again from the Alakai, K., this time on the Koaie Cabin Trial at Kohua Ridge on June 27 (DB *et al.*).

Two young 'Akepa fledged successfully on 24 June from a nest first found on 24 May at the Hakalau NWR (JL). The young and parents were banded, bringing to 42 the number of 'Akepa marked for continuing study at this site. A Crested Honeycreeper was seen well on 4 July in Waikamoi Preserve, M. at roughly 5,500' elevation (AK), where two had been heard earlier in the day (PC *fide* AK).

ALIEN SONGBIRDS -- A pair of White-rumped Shamas nested (4 eggs) in a backyard in Ewa Beach, as reported by KT on 27 July. The hot, dry Ewa Plains bear little resemblance to the more heavily forested habitat usually prefered by shamas.

Several Orange-cheeked Waxbills were seen at Hoomaluhia Park in Kaneohe, O on 6 June (BE) and 3 were counted on the HAS trip to Sacred Falls near Punaluu (BE), both new localities for the species.

CHRISTMAS ISLAND, KIRIBATI -- El Nino conditions prevailed again at Christmas Is. this year, as they last did in 1982. Rainfall in 1987, normally 10-12 inches annually, had reached 100 inches by early July, and ocean temperatures climbed several degrees above normal. Abundance of rain brought about lush growth of vegetation over the usually sparse island. Thick carpets of grass over-ran the nesting ground of terns. Although all 18 species of breeding seabirds were present in mid-July (RLP, RD, RS), nesting was severely curtailed. The few tens of thousands of Sooty Terns could hardly compare with the millions expected from previous breeding seasons.

In contrast, the rains and lush vegetation favored the atoll's only land bird, the warbler Bokikokiko. Sightings of singing adults and begging juveniles indicated that breeding was taking place.

Migrants included 19 Wandering Tattlers and 40 Lesser Golden-Plovers seen 9 July, a few Bristle-thighed Curlews, and a completely unexpected Osprey which was watched perched and flying near Motu Upua on 11-12 July (RS, RLP, RD).

The small flock of about a dozen Rock Doves persists in the main village of London.

Thane K. Pratt

BOOK REVIEW

A Field Guide to the Birds of Hawaii and the Tropical Pacific. H. Douglas Pratt, Phillip L. Bruner, and Delwyn Berrett. Princeton University Press, Princeton, New Jersey. 1987. Cloth: $50.00; paper: $19.95.

Ten years ago I led an unbothered life in the beautiful archipelago of Palau, where I practiced my profession as an ornithologist for the U. S. Trust Territory Conservation Office. One day my supervisor, then the Chief Conservationist, asked a favor of me: "Show these two visitors a few of the better birding sites in Palau -- they're writing a field guide to the birds of the Pacific." The two birders were Doug Pratt and Phil Bruner. I showed them a few birds, and now their long-awaited book is done; not that the input I had was much of a contribution.

Palau represents a mere fraction of the many island groups covered by the field guide: all of Micronesia, most of Polynesia (New Zealand and Easter Island excluded), and part of Melanesia (Fiji). (The title is somewhat misleading, Hawaiian birds being afforded about the same coverage as the birds from other island groups. But the title is not nearly as nationalistically quaint as *A Field Guide to the Seabirds of Britain and the World.*)

About 500 species of birds have been recorded from this part of the Pacific and are included in the field guide. Four hundred of these, the resident species and those that are regular migrants, are illustrated in color and are fully discussed in the species accounts. The other 100 species are rare visitors or stragglers. These have abbreviated species accounts and are generally not illustrated, though they are amply covered by bird guides to surrounding regions.

The field guide is prefaced by 44 pages of introductory material, including a general map, a "how to use this book" section, a description of the islands and the major ecosystems, and a section on conservation. The Pacific is poorly known by much of the world, so the lengthy introduction is apt. The introduction is well-organized, clearly written, and easy to read. The well-developed section on conservation is especially appropriate for this part of the world, which has suffered more than its share of extinctions at the hand of man. A list of extinct, endangered, or threatened birds is included, with status as designated by the U. S. Fish and Wildlife Service and the International Council for Bird Preservation.

The species accounts, succinct and well-written, make up the bulk of the text. Each account includes subheadings on appearance, habits, voice, identification, and occurrence. I appreciate the descriptions of voice. In the dense rain forests on many Pacific islands, aural cues are essential to efficient birding; birds are often heard but not seen or are heard well but seen poorly.

Taxonomy follows several standard references, but at the same time a number of revisions are introduced. I wish that local names could have been included, which would help to standardize bird names in local languages. Among the best conservation measures are those that originate within cultures and countries, and the inclusion of local names would encourage such ethics. Also, knowledge of local names would help visiting birders ask specific questions about birds. If one were to ask in Palau where to find a Micronesian Megapode, most Palauans would scratch their head and then go spearfishing. If asked where to find a *Bekai*, most could take you directly to a nest mound.

Several crisp and useful appendices follow the species accounts. These include a summary of hypothetical species, six regional checklists, 14 regional maps, a glossary, and a bibliography.

The color plates, placed at the back of the book, were painted by H. D. Pratt. They are excellent and far surpass anything previously available. Land birds are arranged by island group, while

seabirds and shorebirds are in phylogenetic order. Six of the plates are devoted to introduced species. Two of the plates are photographs of plants important to birds. In addition to the color plates, a number of pencil sketches are sprinkled throughout the text. All illustrations are remarkably well done. (Once, in a discussion with the artist, I cautiously broached the subject of a misplaced feather on one of the birds. After a cough and glance of unmitigated pity, Dr. Pratt replied that misplaced feathers were occasionally found in the earliest plates, those done 10 or so years ago. Since then, there have been no misplaced feathers.)

The classic epithets that stud many book reviews regarding the need for a particular work (long overdue, much needed, fills a gap, etc.) all apply. There just is not much information available for most of the islands, certainly nothing on a region-wide basis. Oftentimes, I have been approached by persons interested in a field guide to the insular Pacific, but I could offer them little except a blank stare, which after 10 years I have now perfected.

In part, the dearth of avifaunal information in the Pacific is due to the lack of a central reference. Publication of the field guide should greatly alleviate this problem. Aside from being a boon to the birder, the field guide will, hopefully, act a catalyst to conservation efforts thoughout the Pacific. I highly recommend this well-done, state-of-the-art guide for anyone interested in birds of the Pacific region.

John Engbring

NATURAL EVENTS CALENDAR

The Bishop Museum and Kamehameha Schools Presses have published *A Calendar of Natural Events*, by Nelson Foster, Barbara Pope, Wayne Gagne and Andrew Thomas. Gagne, Hawaii Audubon Society Conservation Committee Chair, points out that this is the first appointment calendar of its kind, featuring artwork ranging in vintage from 18th century naturalists' sketches to paintings, block prints and other artforms of 1980's artists. Each week of the calendar year features at least one such work depicting Hawaii's natural environment. The artwork is accompanied by sayings and proverbs, many from Mary Kawena Pukui's *Olelo No'eau: Hawaiian Proverbs and Poetical Sayings*. Each illustration and its accompanying text chronicle natural events. For example, flowering and fruiting times of native plants and breeding seasons of native animals are described so the reader is aware of these things as he consults his own appointment schedule. What an ideal way to be reminded of the nature in the midst of late 20th century day to day chaos! The calendar is ready for early Christmas shoppers now, and costs $12.50 ($13.50 if you choose to have it mailed). For information write to or visit the B. P. Bishop Museum, P. O. Box 19000 A, Honolulu, HI 96817.

PHOTOGRAPHING OUR SPECTACULAR HERITAGE OF ISLAND BIRDLIFE

Have you seen any rare birds lately? Found any nests of our endemic birds? You can help document the movements, nesting habits, and life histories of the many fascinating native birds of Hawaii by carefully recording your sightings in writing and reporting them to myself, Greg R. Homel.

I have begun a long-term photographic project to systematically document on film the numerous endemic, indigenous, and migratory birdlife of Hawaii. These photographs will be gathered for use in research projects, publications, public lectures, and promotion of conservation in Hawaii.

Very few professional quality photographs exist for most of our endemic birds. Many rare and endangered species have either never been photographed in their native environment or are represented by scarce or inadequate photographic documentation. In addition, migratory bird species often go unphotographed, leaving only written records of their passing.

For these reasons, I have decided to embark on this photographic project. If you would like to share the locations where any endemic or indigenous birds, no matter how common, can be photographed (particularly locations of nest sites), or where unusual migratory species are located, please phone me at (808) 947-3599 (eves.) or write to me at 2741 Varsity Ave. Apt 106, Honolulu, HI 96826. Future address changes will be noted in the *'Elepaio*.

Fulvous Whistling-Duck (*Dendrocygna bicolor*), a nearly cosmopolitan species that may have colonized Hawaii naturally, adding to our heritage of island birdlife.

Photo by Greg R. Homel

AN URGENT REQUEST FOR SICK OWLS

Since March 1987, Tom Telfer, State Wildlife Biologist, has been busy investigating reports of sick, dying, or dead owls on Kauai. Although owl mortalities have occurred before, the scope of this die-off is without parallel. The problem may also now include the islands of Molokai and Hawaii. Mainly Common Barn-Owls were affected at the beginning, but more recently Pueos are also being found sick or dead.

Until now no diagnosis has been made, either in Hawaii nor at the National Wildlife Health Center in Madison, Wisconsin.

The sick owls are found island-wide. Mostly they are seen standing along the roadsides; usually they are lethargic, cannot fly, and appear to have difficulties seeing and hearing. Simultaneously with this owl die-off, dead or sick rats have been found in remote upland areas of Kauai. Since symptoms in rats and owls appear to be similar, perhaps these die-offs are related.

In order to determine the cause of this die-off, we are very interested in recovering more infected owls, but also other birds or rats with similar symptoms, from any of the Hawaiian Islands. If you know of such birds or rats, please contact Tom Telfer (Kauai) 245-4433 or Renate Gassmann-Duvall (Maui) 572-0690 or 572-1584 (evenings) or the Department of Land and Natural Resources' Wildlife Biologist on your island.

Dr. Renate Gassmann-Duvall
Tom Telfer

SEPTEMBER FIELD TRIP MOANALUA VALLEY

The H.A.S. field trip to Moanalua Valley on 20 September was hosted by local artist and long time valley resident Patrick Ching. Seventeen people participated in the hike and were treated to a full tour of the historic and natural features of the area. Old housing sites were explored, and Hawaiian petroglyphs were encountered along the way. Native and introduced plants were observed, including a variety of fruit trees, koa, 'ohi'a, kukui, and royal palms. Birds sighted during the outing included the native 'Amakihi and White-tailed Tropicbird and several introduced species such as White-rumped Shamas, Japanese White-eyes, Spotted and Barred Doves, House Finches, Red-vented Bulbuls, Northern Cardinals, Japanese Bush-Warblers, Nutmeg Mannikins, and Common Mynas. The migratory Lesser Golden-Plover was often seen flying along the trail.

The valley was dry, and the streams were not flowing, but a few small pools were visited along the streambed. The weather was beautiful throughout the day.

Around 11:00 AM, the group ate lunch at a place named Pu'u Pueo, which overlooked much of the upper valley. During the return walk down the trail, everyone received lessons in the art of stalking and catching bullfrogs (courtesy of Patrick).

When the hike ended around 12:15 PM, all participants were invited to Patrick's house for refreshments and free wildlife posters autographed by the artist himself. H.A.S. would like to say "Mahalo!" to the Ching family. Their hospitality was much appreciated. See you all next time!

Bruce Eilerts

1987 CHRISTMAS COUNT

There will be seven H.A.S. Christmas Counts this year. These counts are always exciting, with records to be broken and new birds to be seen. We especially need people to attend the counts on the outer islands. The counts have been scheduled to facilitate a weekend visit to Kauai, Maui, or Hawaii. For information on the Kauai counts, contact Winona Sears at 822-3045 (res.), for Oahu count contact Bob Pyle at 262-4046 (res.), for the Maui count contact Fern Duvall at 571-0690 (wk.), and for the Volcano count contact Paul Higashino at 967-7262 (res.). Workshops on bird identification will be conducted on Oahu: lecture at 7:30 PM on 10 Dec. at Atherton Halau, B. P. Bishop Museum and field trip on 12 Dec., yet to be announced. A workshop for the Volcano count was announced in the last issue of *'Elepaio* (47:104); it will be held on 18 Dec. The counts, with dates and leader, are as follows.

OAHU:
- Honolulu -- Sunday, 27 December, Bob Pyle
- Waipio -- Saturday, 2 January, David Bremer

KAUAI:
- Lihue -- Saturday, 19 December, Winona Sears
- Waimea -- Sunday, 20 December, Marsha Erickson
- Kapaa -- undetermined

MAUI:
- Puu O Kali -- Sunday, 3 January, Fern Duvall

BIG ISLAND:
- Volcano -- Saturday, 19 December, Paul Higashino

NOVEMBER 21st FIELD TRIP REEF WALK AT KOKO HEAD

Please do not miss the next H.A.S. field trip on Saturday night, November 21st. This outing will be a night-time reef walk along a Koko Head lava bench filled with tidal pools. This walk will take place during one of the lowest tides of the year. Be prepared to encounter a wide variety of reef animals including banded coral-shrimp, nudibranchs, reef fishes, seaweeds, colorful shells, and various other fishes and invertebrates. This trip will be led by Bruce Eilerts. Participants are asked to wear tabbies or old tennis shoes, and everyone should bring a bright flashlight and a warm shirt or sweatshirt. Meet in front of the State Library on Punchbowl Street at 6:45 PM or in front of the Hawaii Kai Baskin & Robbins at 7:30 PM. This will be a fun and unusual one, folks! For more information call me at 941-5974.

Bruce Eilerts

NOVEMBER PROGRAM: A CASE OF CONTRAST IN CAPTIVE PROPAGATION OF ENDANGERED SPECIES -- POHAKULOA AND OLINDA

At the General Meeting of H.A.S. on Monday, 16 November, Dr. Fern Duvall II will present a slide program outlining the history of the State's (DLNR) involvement with the propagation of Hawaii's endangered species. Dr. Duvall will speak about past and current methods of managing Nene, Koloa, Laysan Duck, and 'Alala. He will explain why the Pohakuloa Endangered Species Breeding Facility on the Big Island, with its long history of successful breeding of Hawaii's endemic waterfowl, is now being phased out and a new, modern facility is being developed at Olinda, Maui.

FREE ICE CREAM!

Requests for flavors are now being received for the Saturday, 14 November paste up of the *'Elepaio* at Thane Pratt's house. **Note that this month's paste up will be a week earlier than usual.** Paste up will begin at 1:00 PM. We thank Sheila Conant, Greg Homel, Bob Pyle, Cappy Summers, and Leann Syrotuck for their help on the October paste up. For more information call Thane Pratt at 524-8464.

CALENDAR OF EVENTS

July 30 to November 10. Exhibit of original bird art by Douglas Pratt. Jabulka Pavillion, B. P. Bishop Museum.

Nov. 9 (Mon.) Board Meeting at Bishop Museum at 7:00 PM. Call Pete Luscomb, 923-4772 (wk.).

Nov. 14 (Sat.) *'Elepaio* paste up at Thane Pratt's house, 1:00 PM. Call 524-8464.

Nov. 16 (Mon.) General Meeting at Atherton Halau, Bishop Museum at 7:30 PM. Announcement on page 115.

Nov. 21 (Sun.) Field trip to Koko Head tide pools. Meet at the State Library on Punchbowl St. at 6:45 PM. Announcement on page 115.

TABLE OF CONTENTS

Laysan Finches drown as a result of marine debris. *Marie P. Morin.* 107

Conservation News. *Mae Mull*.....109

Recent Observations: June through July. *Thane Pratt*.....112

Book Review: A field guide to the birds of Hawaii and the tropical Pacific. *John Engbring* 113

September field trip report. *Bruce Eilerts*.....115

HAWAII AUDUBON SOCIETY
P.O. Box 22832
HONOLULU, HAWAII 96822

Non-Profit Organization
U.S. POSTAGE
PAID
Honolulu, Hawaii
Permit No. 1156

FORWARDING AND RETURN POSTAGE GUARANTEED
ADDRESS CORRECTION REQUESTED

Doug Pratt's Art

Birds of Hawaii and Tropical Pacific

at the Bishop Museum

Opening July 30 through November 10

HAWAII AUDUBON SOCIETY