'ELEPAIO

Journal of the
Hawaii Audubon Society

For the Protection of
Hawaii's Native Wildlife

VOLUME 49 NUMBER 4

APRIL 1989

KANEPU`U: A REMNANT DRY FOREST ON LANA`I, HAWAI`I

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INTRODUCTION

On the island of Lana`i, there are few remaining relatively undisturbed natural areas. Most of the original vegetation is gone and has been replaced with introduced plants including pineapple (*Ananas comosus*). However, a number of native plant taxa are still found on the island, and predominantly native forests of significant size occur at the summit, Lana`ihale, and on the northwest end of Lana`i's central plateau in the Kanepu`u area. Lana`ihale supports the only mixed mesophytic and rain forest on the island (Wagner et al. 1985). The vegetation in this area is relatively well protected owing to its elevation and value as watershed, although there is ample evidence of disturbance caused by introduced plants and axis deer (*Axis axis*) . The vegetation in the Kanepu`u area is generally classified as dry lowland forest (Rock 1913; Fosberg 1936, 1972) and comprises stands of a native forest that previously occupied a greater extent on the island. The purpose of this paper is to present the cultural and natural history of the Kanepu`u area.

BACKGROUND

The lowland forest region in Hawai`i generally occurs between 305 and 610 m and in most cases, differs floristically between the windward and leeward sides of the islands (Rock 1913). Forests in well-protected areas on the leeward (drier) sides are noted for their diversity of trees (Rock 1913, Mueller-Dombois 1981). The fossil bird record in Hawai`i (Olson and James 1982) indicates that the rich avifauna originally occurring in the dry lowlands was paralleled by the diversity of trees found there. However, approximately 1,400 years of human occupation in the Hawaiian Islands have modified this region significantly (Kirch 1982a). Many of the native plants originally occurring in the lowlands have either become extinct or are rare and endangered at the present.

Approximately half of the area on Lana`i lies between 305 and 610 m and could have supported a dry forest or open woodland at one time. In the historic period (i.e., after 1778), land use has generally been on a large scale because virtually the entire island has been owned as a single entity for about 125 years. During this period, ranch stock, subsequent feral herds, and game mammals destroyed much of the remaining native vegetation in the lowlands and on the central plateau. Today, the largest remaining stands of native dry forest on Lana`i are in the Kanepu`u area. Patches of native dry forest are also found in some of the lower gulches between Maunalei and `Awehi (Steven Perlman pers comm).

On most maps, "Kanepu`u" refers to a small hill, elevation 548 m, located on the northwest end of Lana`i's central plateau. Approximately 0.8 km north of this hill are stands of native dry forest within an area of roughly 111 ha immediately surrounded by a planted windbreak of swamp mahogany (*Eucalyptus robusta*). This forest is located within the ahupua`a (traditional Hawaiian land division) of Ka`a and lies at approximately 520 m elevation. Scattered peripheral stands of similar native vegetation lie mainly above 457 m to the east of the windbreak for approximately 4 km and to the north and south of the windbreak within the ahupua`a of Ka`a, Paoma`i, and Mahana. In this paper, the term "Kanepu`u" refers to the forested stands within the windbreak. The term "Kanepu`u area" refers to the general area including the windbreak, forest within the windbreak, and scattered peripheral stands of similar vegetation to the north, south, and east (Fig. 1).

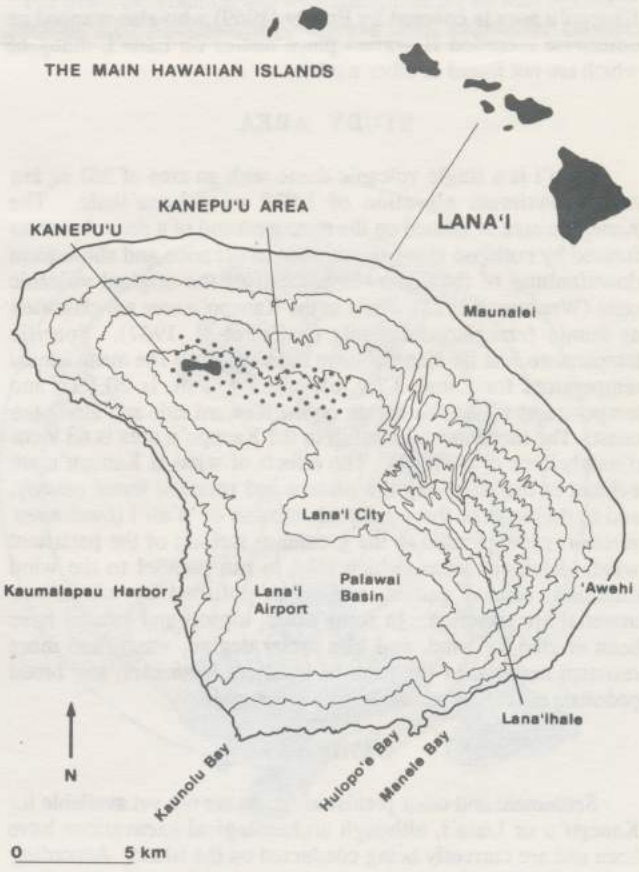

Figure 1. Location of the Kanepu`u study area and selected place names on Lana`i.

METHODS

My initial review of the literature on Lana`i and the Kanepu`u area included general publications, biological reports, unpublished documents, and field notes. Maps, aerial photographs, and correspondence with a number of individuals yielded additional information. I made two field trips to Lana`i: from 17-20 January 1986 and from 25 to 26 April 1986. This paper is an updated summary of an undergraduate honors thesis for the Department of Geography, University of Hawai`i at Manoa (Ziegler 1986). Classification and species names follow Pyle (1988) for birds and Tomich (1986) for mammals. Plant names reported from earlier surveys have been updated and follow Wagner et al. (in press).

PREVIOUS WORK

Rock (1913) and Fosberg (1936) provide early descriptions of the vegetation in the Kanepu`u area and for other locations on Lana`i. In 1956, a survey of Kanepu`u was conducted by the Conservation Council for Hawai`i (Hosaka and Britten 1956). In 1971, students from the University of Hawai`i at Manoa conducted a detailed study of the vegetation at Kanepu`u (Spence and Montgomery 1976). Native plant occurrences at Kanepu`u were mapped by Spence and Montgomery (1976), Warshauer (1976), and The Nature Conservancy of Hawai`i Heritage Program. George C. Munro was employed on Lana`i from 1911 to 1935, and his unpublished work entitled "The Story of Lanai" (Munro unpubl ms) discusses land use and management from the late 1800s to around 1950. The cultural prehistory of the Kanepu`u area is covered by Emory (1969) who also mapped or otherwise recorded Hawaiian place names on Lana`i, many of which are not found in other works.

STUDY AREA

Lana`i is a single volcanic dome with an area of 361 sq km and a maximum elevation of 1,027 m at Lana`ihale. The Kanepu`u area is located on the northwest end of a central plateau formed by collapse along the northwest rift zone and subsequent downfaulting of the southwestern half of the original volcanic cone (Wentworth 1925). Soils in the Kanepu`u area are classified as humic ferruginous latosols (Baker et al. 1967). Specific temperature data for Kanepu`u are not available. The mean annual temperature for Lana`i City, elevation 495 m, is 20.1°C, and temperatures tend to be higher on the leeward side and along the coast. The mean annual rainfall in the Kanepu`u area is 63.9 cm (Giambelluca et al. 1986). The effects of wind at Kanepu`u are evident in the relatively low stature and rounded forest canopy, and to the north of the windbreak, crowns of `a`ali`i (*Dodonaea viscosa*) grow parallel to the ground as a result of the persistent wind. Blowout areas, which tend to run parallel to the wind direction, eroded gullies, and rocks polished by windblown material are common. In some areas, topsoil and subsoil have been eroded by wind, and to a lesser degree, water, and more resistant material in the form of boulders, pinnacles, and broad pedestals of rock or semi-compact soil remain.

LAND USE

Settlement and other prehistoric dates are not yet available for Kanepu`u or Lana`i, although archaeological excavations have been and are currently being conducted on the island. According to legend, Hawaiians did not colonize Lana`i until evil spirits inhabiting the island were destroyed by Kaulula`au, son of Maui chief, Kaka`alaneo (Emory 1969). Based on a chronological list of Maui chiefs, Emory (1969) places the Kaulula`au event at approximately A.D. 1400. Interestingly, this date coincides with the beginning of an apparent expansion period in the colonization of the Hawaiian Islands. According to Kirch (1982b), large tracts of leeward parkland and forest were being cleared for cultivation by A.D. 1400 to sustain the increasing Hawaiian population.

Hawaiians undoubtedly brought pigs (*Sus scrofa*), dogs (*Canis familiaris*), rats (*Rattus exulans*), Red Junglefowl (*Gallus gallus*), and a number of cultivated plants to Lana`i. Munro (unpubl ms) suggests that the plateau lands west of Kanepu`u (Hill) were the first uplands on Lana`i to be cultivated, and this area was heavily populated. Munro found a number of artifacts in the Kanepu`u area including adzes, rock pestles, abraders, `ulu maika stones (used in a traditional Hawaiian game), remains of fireplaces, cooking "ovens," and vast accumulations of what he suggests to be broken and rejected cooking stones. Emory (1969) did not find any rock platforms or enclosures (indications of traditional Hawaiian structures) on the flats around Kanepu`u (Hill) during his survey of the island from 1921 to 1922. However, house sites were well represented along the coast to the north and west of Kanepu`u and elsewhere on the central plateau. This suggests temporary occupation of Kanepu`u by Hawaiians who may have stayed in the forest for days at a time gathering plants, feathers, and wood, but preferring to live in more hospitable locations on the plateau and closer to the sea. Keahikawelo, to the northwest of Kanepu`u, is the possible setting of a Hawaiian legend and is marked with small stone cairns on large boulders. A possible heiau (traditional Hawaiian religious site) is located to the southeast of Kanepu`u near Keonehe`ehe`e (Emory 1969).

Christian missionaries were on Lana`i by 1823 (Ellis 1917). Ellis (1917) noted Maui inhabitants visiting Lana`i in 1823 to cut wood for house timber, and according to native informants (Munro unpubl ms), `ohi`a (*Metrosideros collina*), one of the trees used as house timber, was common to the north of Kanepu`u in the 1800s, although it is uncommon in the area today. A majority of the native trees used in traditional Hawaiian house construction are dryland species (Apple 1971, Fosberg 1972).

Large scale ranching on the island began in 1865 when Walter Murray Gibson formed the Lana`i Ranch. According to Munro (unpubl ms), as many as 18,000 goats (*Capra hircus*) and 50,000 sheep (*Ovis aries*) were raised for skins and wool. Eventually, the domestic herds became feral and roamed virtually the entire island. Goats apparently destroyed the `akoko (probably *Chamaesyce celastroides*) shrubs, which occurred on much of the central plateau (Munro unpubl ms). Ranching continued on Lana`i under the ownership of the Hayselden Family from 1888 to 1902 and Charles Gay from 1902 to 1910. The remaining sheep were probably sold, and the number of goats was reduced to a feral herd of around 10,000 between 1910 and 1917 when cattle (*Bos taurus*) ranching began under the ownership of the Lana`i Company. (Feral goats occurred on Lana`i until the 1980s.) Munro was hired as general ranch manager in 1911. Significant numbers of pigs were introduced in 1911 when a piggery was established in the Palawai Basin. (Feral pigs occurred on Lana`i until the 1930s.) Cattle ranching continued from 1917 to 1922 under the ownership of Harry and Frank Baldwin.

The Hawaiian Pineapple Company (later Dole) owned most of Lana`i in 1922, and large-scale pineapple cultivation began on the central plateau a year later. Lana`i City was built in 1924 to accommodate incoming plantation workers. Cattle ranching

continued until around 1950, and native forest in the Kanepu`u area was still being cleared for pineapple cultivation in the 1960s. In 1966, Castle and Cooke purchased Dole Pineapple Company and currently owns 98 percent of the island.

From 1951 to 1972, 29,267 ha (roughly 80 percent of Lana`i) were managed as a game area. Subsequently, the area was reduced to 14,430 ha on the northwest end of the island, including Kanepu`u, and is currently managed as the Lana`i Public Game Area by the Hawai`i Division of Forestry and Wildlife under an informal agreement with the landowner. Mammals introduced to Lana`i for the purpose of hunting include axis deer in 1920, pronghorn (*Antilocapra americana*) in 1938, and mouflon (*Ovis musimon*) in the late 1950s. Survival of the pronghorn was poor, and any remaining individuals are now protected from hunting. Mouflon are concentrated on the west end of the island, and in 1988, 829 mouflon and 1,235 axis deer were counted within the Lana`i Public Game Area (Tod Lum pers comm). Currently, an estimated 6,000 axis deer occur on the entire island (Meyer Ueoka pers comm). They are present in the Kanepu`u area, apparently increasing in the watershed areas at Lana`ihale, and occasionally seen in pineapple fields during periods of drought. Mouflon, axis deer, and ten species of introduced birds are open to hunting on Lana`i during designated seasons. Private hunting arrangements can also be made with the landowner. Kanepu`u is within a State Conservation District and is further subzoned "Protective." Aside from hunting, there is no active use of the land in the Kanepu`u area.

VEGETATION

In the Kanepu`u area, approximately 53 ha of predominantly native dry forest lie within a total area of roughly 111 ha immediately surrounded by a planted windbreak of swamp mahogany. Scattered peripheral stands of native dry forest ranging in size from 0.4 to 4.0 ha extend to the north, south, and east of the windbreak.

A detailed study of the vegetation in the Kanepu`u area was conducted in 1971 (Spence and Montgomery 1976). The plant specimens collected are deposited in the herbarium of the Department of Botany at the University of Hawai`i at Manoa.

According to the 1971 survey and subsequent data analyses (Spence and Montgomery 1976), the closed scrub-grass community at Kanepu`u consisted of woody plants less than 2 m tall, occasionally growing close together over a dense ground cover of herbs and grasses. The shrub layer was dominated by the introduced plants scarlet sage (*Salvia coccinea*) or lantana (*Lantana camara*). The native lama (*Diospyros sandwicensis*) and lantana seedlings were dominant in the herb layer. The woodland community was composed of woody plants 2 to 8 m tall with interlocking crowns and sparse ground cover. The canopy provided 70 to 90 percent cover, and the native olopua (*Nestegis sandwicensis*) and lama were the dominant trees. In some areas, olopua made up 85 to 90 percent of the canopy, with lama less than 15 percent (Warshauer 1976).

Most, if not all, of the stands of dry forest in the Kanepu`u area were dominated by native vegetation, although introduced taxa made up a larger percentage of the total number present. During the 1971 survey, 25 endemic (to the Hawaiian Islands), 8 indigenous, and 51 introduced plant taxa were reported (Spence and Montgomery 1976). An additional 13 endemic taxa were reported at Kanepu`u by Munro before 1934 (Spence and Montgomery 1976, Munro unpubl ms) but those were not seen in 1971 or in 1986.

A number of plant taxa at Kanepu`u significant by virtue of their rarity or their status as endangered include the native Hawaiian gardenia or na`u (*Gardenia brighamii*, Fig. 2), sandalwood or `iliahi (*Santalum freycinetianum* var. *lanaiense*), ko`oloa`ula (*Abutilon menziesii)*, and a koki`o (*Kokia drynarioides)*, which are listed by the U.S. Fish and Wildlife Service as endangered (U.S. Fish and Wildlife Service 1987). Lana`i endemics in the Kanepu`u area include a native mint (*Haplostachys munroi*) and the hidden-petaled abutilon (*Abutilon eremitopetalum*), which were reported by Munro but not seen recently, and *Santalum freycinetianum* var. *lanaiense*. *Achyranthes splendens* var. undetermined, *Chamaesyce celastroides* var. undetermined, *Kokia drynarioides*, and other species were planted in the Kanepu`u area by Munro during his employment on the island.

The major structural features of the vegetation at Kanepu`u have not changed since 1971. In 1986, olopua and lama were still dominant in the woodland community (Fig. 3), and lama seedlings and saplings were numerous in areas where axis deer were not present. The introduced Christmas berry (*Schinus terebinthifolius)*, lantana, and introduced grasses were also present in significant numbers. Fewer endemic taxa were seen in 1986 than recorded in 1971. Site surveys in 1986 involved reconnaissance but not quantitative sampling of vegetation and were restricted to fenced areas within the windbreak (see below) and selected stands to the east. The endangered na`u and `iliahi were observed in 1986, as was the rare native morning glory, *Bonamia menziesii*. Uncommon dry forest trees, including `ohe kukuluae`o (*Reynoldsia sandwicensis*), kolea (*Myrsine lanaiensis*), `ahakea (*Bobea sandwicensis*), `ala`a (*Pouteria sandwicensis*), and `aiea (*Nothocestrum latifolium*), were observed in 1986. Relatively common indigenous taxa, including naio (*Myoporum sandwicense*), alahe`e (*Canthium odoratum*), huehue (*Cocculus trilobus*), and `ilima (*Sida fallax*), were also observed.

Figure 2. Dr. Steven Montgomery examining the na`u (*Gardenia brighamii*) at Kanepu`u, Lana`i.

Photo by Marjorie F.Y. Ziegler

BIRDS

Approximately 42 taxa of birds have been reported on Lana`i (Hirai 1978, Walker et al. 1985, Scott et al. 1986). Pratt et al. (1987) list a few additional possible migrant and vagrant species, as well as introduced birds that may or may not be established on the island. Currently, most of the land birds on Lana`i are introduced species. However, early accounts indicate that native species were still common in the late 1800s and early 1900s (Wilson and Evans 1890-1899, Rothschild 1893-1900, Perkins 1903, Munro 1960). Since then, the Lana`i Oloma`o (*Myadestes lanaiensis lanaiensis*), `O`u (*Psittirostra psittacea*), Lana`i `Akialoa (*Hemignathus obscurus lanaiensis*), Lana`i Creeper (*Paroreomyza montana montana*), and `I`iwi (*Vestiaria coccinea*) have become extinct on Lana`i (Pratt et al. 1987, Pyle 1988).

Among the extant native land birds on Lana`i, the Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) is most frequently seen in the Kanepu`u area and was the only native bird observed on the 1986 field trips. The `Apapane (*Himatione sanguinea sanguinea*) may be found at Kanepu`u but is more likely restricted to the Lana`ihale summit area (Scott et al. 1986). The Dark-rumped Petrel or `Ua`u (*Pterodroma phaeopygia sandwichensis*), an endangered sub-species (U.S. Fish and Wildlife Service 1987), was rediscovered on Lana`i in 1976 (Hirai 1978) and may also be restricted to the summit area. The Maui `Amakihi (*Hemignathus virens wilsoni*) may be extinct on Lana`i because the number of individuals was low in the 1970s (Hirai 1978), and it was not observed during the Hawai`i Forest Bird Survey between 1976 and 1983 (Scott et al. 1986).

In 1986, a goose bone that may represent the Hawaiian Goose or Nene (*Nesochen sandvicensis*) was found on Lana`i (Bernice Pauahi Bishop Museum Accession No. 1986.146). It is expected that the fossil bird record for Lana`i, once it has been thoroughly documented, will reveal that the prehistoric avifauna was more diverse than the historic records indicate.

PROTECTION

The first attempts at protecting Kanepu`u may have been initiated by the early Hawaiians. Munro (unpubl ms) believes that the forest was not cleared because Hawaiians recognized its value as a windbreak. In the surrounding area, Hawaiian occupation and land use modified the original (i.e., pre-human) vegetation to some undetermined degree; however, land uses within the last 125 years have had a more significant influence. Overbrowsing and overgrazing by free-ranging ranch stock in the 1800s resulted in extensive soil erosion in the Kanepu`u area. In 1875, Bermuda grass (*Cynodon dactylon*) was sown over several hundred hectares of eroded land on the northwest end of the central plateau. Between 1911 and 1935, rice grass (*Paspalum scrobiculatum*), molasses grass (*Melinis minutiflora*), Rhodes grass (*Chloris gayana*), and Guinea grass (*Panicum maximum*) were sown in the Kanepu`u area by Munro to control soil erosion and to provide food for cattle. Introduced trees were planted on Lana`i as windbreaks, watershed cover, and for soil reclamation beginning in the early 1900s. In 1922, Munro planted the Kanepu`u windbreak, which originally consisted of swamp mahogany and century plant (*Agave* sp.). A portion of the Kanepu`u area was fenced off from cattle in 1918, and forested stands within the present windbreak were similarly fenced a few years later. The fences were removed in 1935, and the entire area was opened to cattle grazing until 1950 when the cattle were rounded up and sold.

Figure 3. Olopua (*Nestegis sandwicensis*) woodland at Kanepu`u, Lana`i.

Photo by Marjorie F.Y. Ziegler

In 1976, three exclosures were constructed in the Kanepu`u area to protect the vegetation from axis deer, which degrade the forest by grazing and browsing, trampling, and rubbing their antlers on tree trunks. The landowner, Castle and Cooke, provided major funding for this fencing project and construction labor was donated by volunteers. The main criterion for the location of these exclosures was inclusion of individual na`u (native gardenia) trees. Kanepu`u is the main habitat for this species (Gagné 1982), although it is found elsewhere on Lana`i and on Maui, Moloka`i, and O`ahu (Gagné 1982). Two of the exclosures are located within the Kanepu`u windbreak and the third approximately 0.8 km to the east. The exclosures range in size from 0.2 to 0.4 ha (Warshauer 1976). As of early 1989, most of the fencing needed to be replaced. Axis deer are entering the exclosures by jumping over rusting and sagging sections of the fence and by pushing their way under it in places where fence posts are lacking. There is also evidence of deer trying to push their way through the large mesh.

Additional threats to the native vegetation in the Kanepu`u area include fire, rats (probably *Rattus exulans* and *R. rattus*), and introduced plants. Native forest in the Kanepu`u area was destroyed by fires in 1971 and 1973. Fire buffer zones should be established around the forested stands. Rodent and weed control would also greatly enhance protection of the forest. Rat predation on lama and na`u fruits is evident at Kanepu`u and is probably the main reason why na`u trees within the exclosures are not regenerating.

Residents on Lana`i, as well as elsewhere in Hawai`i, have expressed an interest in protecting and actively managing Kanepu`u as a nature preserve. In the past, volunteers made sporadic fence repairs but fencing materials were lacking. In 1987, the Lana`i-based Hui Malama Pono O Lana`i submitted a proposal to Castle and Cooke requesting funds to fence 12 ha of forest within the windbreak. Also in 1987, the Hawai`i Audubon Society donated funds to the Hui, which are currently being used to fence a stand of `ahakea (*Bobea sandwicensis*) and native morning glory (*Bonamia menziesii*) population located to the east of the windbreak.

In January, 1989, Castle and Cooke granted The Nature Conservancy of Hawai`i a conservation easement to manage 186 ha in the Kanepu`u area as a nature preserve. The Conservancy plans to fence the preserve, eradicate weeds, and investigate strategies to enhance natural regeneration of native plants in the area (Alan Holt pers comm).

CONCLUSIONS

The unusual diversity and composition of the native dry forest at Kanepu`u merit protection. When the current distribution of lowland native dry forests in the Hawaiian Islands is considered, the value of Kanepu`u becomes even more apparent. A significant amount of native vegetation in the lowlands of Hawai`i has been lost due to human and human-related activities. The Kanepu`u area provides habitat for several rare and endangered plants, an undetermined number of associated native invertebrates, and possibly some native birds.

Castle and Cooke has taken advantage of a unique opportunity to perpetuate a significant part of Lana`i's natural history by designating Kanepu`u as a nature preserve, and The Nature Conservancy of Hawai`i's stewardship of the area will ensure its long-term protection. In addition to maintaining biological diversity on Lana`i, the establishment of a nature preserve at Kanepu`u will enhance scientific research and educational opportunities and provide residents and visitors an opportunity to experience a portion of Lana`i's remaining natural beauty.

ACKNOWLEDGEMENTS

I wish to thank those who assisted me in this research, especially Castle and Cooke, the late Dr. John Street, Dr. Steven Montgomery, Dr. Alan Ziegler, Dr. Sheila Conant, two anonymous reviewers of this paper, and the Hawai`i Audubon Society for providing partial funding for the research.

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Author's note: Native dry forests all over Hawaii, like those of Kanepuu are in need of protection. Fencing projects to protect plants from grazing animals and programs to control introduced plants are only two of the more pressing needs. The Hawaii Audubon Society's George C. Munro Fund, orginally endowed by a bequest from Mr. Monro himself, is specifically established to support activities aimed at the protection of native dry forest. Your contribution to the Munro fund would support the protection of these forests. Send your contribution to the Munro fund care of the Hawaii Audubon Society, PO Box 22832, Honolulu Hawaii, 96822.

HELP WANTED

Office manager and staff - The Hawaii Audubon Society would like to establish regular daytime office hours, preferably for seveal hours a day, three or four days a week. We are looking for a volunteer office manager and others to staff the office. Office duty includes scheduling the use of the office for meetings, preparing and mailing meeting notices, updating memebership records, answering phone calls, etc. If you can help, please call Lynne Matusow at 528-1432.

Lynne Matusow

WISH LIST

Needed items for the HAS office are a desk, file cabinets and bookcases. If you can donate any of these items, please call the office, 528-1432. All donations are tax deductible to the extent allowed by law.

Lynne Matusow

U.S.F.W.S. WANTS YOU

U.S. Fish and Wildlife Service is looking for volunteers to monitor endangered waterbirds at the James Campbell Wildlife Refuge at Kahuku. Volunteers are needed to spend 11-12 hours per week at selected sites to record observations of broods of four species of endangered waterbirds. Starting from late March or early April, volunteers will also assist with general refuge management tasks such as water management and mongoose trapping. Volunteers must have their own transportation out to the site, safety gear, binoculars and spotting scopes will be provided. Interested persons should send a cover letter and resume to Jeff Holm, U.S. Fish and Wildlife Service, P.O.Box 50167, Honolulu, Hawaii 96850. For more information call Jeff Holm at 541-1201.

RESEARCH GRANT AWARDED

In February 1989, the Hawaii Audubon Society awarded a $500 research grant to Ms. Mari Smultea, a Master of Science candidate at San Jose State University, Moss Landing, California. This grant was made possible from members' contributions to the first fundraising drive. Ms. Smultea is studying the habitat use patterns of humpback whales off the west coast of the Big Island of Hawaii.. She will track humpback whales using a theodolite from the land station at Makalawena. The results should provide baseline data on natural distribution of humpback whales. The data will be useful in defining critical nearshore habitat and in assessing impacts of increasing nearshore development and aquatic recreational activities potentially threatening recovery of the North Pacific humpback whale. The HAS congratulates Ms. Smultea and hopes that her efforts will aid in the conservation of humpback whales.

The HAS annually awards several research grants and an undergraduate tuition scholarship. The $1000 Tuition Scholarship is provided to lend financial assistance to outstanding undergraduates majoring in natural science. Research grants are awarded to aid research projects on Hawaiian or Pacific natural history. Grants are aimed at small-scale projects and average about $500 each. The HAS Awards Committee is presently accepting applications for the 1989-1990 Tuition Scholarship and for research grants. The application deadline for the scholarship is June 1. The deadline for grants to be awarded in summer and fall 1989 is April 30. For information and application forms, write or call John Engbring, Awards Committee, P.O.Box 4443 Honolulu, Hawaii 96812: phone (business) 541-2749.

John Engbring

MAHALO FOR YOUR CONTINUED SUPPORT

The Hawaii Audubon Society thanks the following members who contributed to our recent fund drive: Herman and Joyce Adalist, Thomas Abel, Eve Anderson, Grace Atkins, Michael Bauerlein, John Beardsley, Jr., Keoni Bird, Irvine Brilliande, E.R. Champion, Thomas Copper, Marcel de Liso, John and Debra Gavelek, Janet Grosseto, Helen Hagemeyer, Netty Hansen, Patricia Hartwell, Thomas Harvey, Harry Hayashi, Robert Hite, Richard and Caroline Ingersoll, Eleanor Joplin, Dr. Janet Kalus, Fletcher Knebel, Doris Koller, Laura Krupp, and William Kruse.

Also, Arlynna Livingston, Karen Loomis, George-Ann Maxson, Carl McIntosh, Louise Meier, Marilyn Metz, Audrey Newman, Valerie Nishida, Tina Northern, Frank Padgett, Kathy Payne, Dr. Ted Pettit, Thane Pratt, Shaunagh Robbins, John Rogde, Craig Rowland, Winona Sears, George Stephanos, and Michael Street.

In addition, Joan Aidem and Warren King made donations to the Mae Mull Fund.

BIRDATHON SET FOR APRIL 29 SATURDAY

Mark your calendar and polish your binoculars for the first annual 1989 Audubon Birdathon to be held in Hawai'i! On April 29, Saturday teams of birders--novice and expert--will comb our fields, shores and forests in a marathon attempt to identify as many different types of birds as possible.

Team members will ask people to sponsor them for $.25 up to $5 per species seen. Funds raised will be used to support the local conservation efforts of the newly opened Hawaii State Office of the Audubon Society.

You can join in the fun in three ways:

1) Sign up as a team member. The itineraries of the existing teams are described below; several have available spaces. Call the coordinators at the end of each trip description for details.

2) For those who are already birders: Form a birdathon team in your neighborhood. Gather several friends and neighbors and challenge yourselves to spot as many different species of birds as possible on April 29. The more people you get to sponsor you, the more you help the conservation programs of the Audubon Society in Hawai'i.

3) Sponsor a team. Choose from those teams listed below and use the coupon to indicate your sponsorship, or call the team leaders directly. Most groups will not see more than 30-40 species of birds but you can put a "ceiling" on your contribution if you wish.

If you choose not to select a particular team, your total donation will be calculated by multiplying your pledge per species by the total species count for April 29 -- estimated to be around 60 species.

Audubon Birdathon 1989
Island Teams

<u>Molokai</u>
Team leader: Dr. Thane Pratt, call 524-8464 on Oahu

Expect to see seabirds at the east end of Halawa Valley, migratory species at Kakahaia Pond, rainforest birds at Kamakou Preserve, and perhaps even an Albatross at Ilio Point at the northwest tip of Molokai.

<u>Lanai</u>

Due to the opening of a state hunt on Lanai, the birdathon team here has been cancelled this year.

<u>Oahu</u>
Team leader: Dr. Leonard Freed, call Dana Kokubun at 522-5566 on Oahu

Dr. Freed, professor of zoology at the University of Hawaii at Manoa, will take his team to the Aiea Ridge trail at Keaiwa Heiau State Recreation Area, where Apapane and Amakihi, two of the few native forest birds remaining on Oahu can be seen. This relatively easy hike will cross some native forest habitat as well.

In the afternoon, Dr. Freed's group will travel to James Campbell National Wildlife Refuge to search out native Hawaiian waterbirds.

Team leader: Thomas Harvey, call evenings 254-4258 on Oahu

The emphasis of this trip will be on waterbird species. Tom Harvey is assistant refuge manager of the Hawaiian Wetlands National Wildlife Refuge complex, which includes the James Campbell National Wildlife Refuge in Kahuku where Tom's group will spend the afternoon.

The morning will be spent at the Kaneohe Marine Corps Air Station and the Kawai Nui Marsh and quarry road area.

Team leader: Lynn Carey, call evenings 262-0254 on Oahu
Lynn will take her team to Hoomaluhia Park and perhaps even out onto the waters of Kaelepulu Pond (Enchanted Lake) in kayaks for a day of birding on the Windward side.

<u>Hawai'i (Big Island)</u>
Team leader: Reginald David, call 329-9141 on the Big Island

Travel from mountains to shore in one day. Team participants will spend the morning at the Hakalau Forest National Wildlife Refuge, home to many species of native rainforest birds (including rare and endangered Akiapolaau). Many introduced grasslands species such as Wild Turkeys and Ring-necked Pheasant will also be spotted in the surrounding rangelands. In the afternoon the team will visit Aimakapa Fishpond, north of Honokohau, to view waterbirds, possibly including some migratory species.

Only a few spots remain for this trip, so call today if you are interested in joining.

Team Leader: H.D. Pratt

H. Douglas Pratt, a professional ornithologist and illustrator, will lead a group of American Bird Association members on a search for the rare Ou and Akiapolaau, Creeper and Akepa along the Puu Oo trail off the Saddle Road. If time permits, they may also explore South Kohala and the Waimea plains area.

This is a private trip but you can sponsor Doug's team by calling the Hawaii State Office in Honolulu at 522-5566, or by filling out the coupon below.

<u>Kauai</u>
Team Leader: Winona Sears, call 822-3045 on Kauai

Science clubs at the Kapaa, Kauai, and Waimea High Schools are being asked to form birdathon teams. Another team which the public can participate in may form also. Contact Winona Sears for more information.

Maui
Team Leader: Dr. Fern Duvall, call evenings 572-1584 on Maui

Two wetlands and one forested area will be on the itinerary for this team. Both the Kanaha Pond State Wildlife Sanctuary, near Kahului Airport, and Kealia Pond, between Maalaea and Kihei, will be visited for waterbird species, including the endangered Hawaiian Stilt. Hosmer Grove, on the slopes of Haleakala within the National Park should provide an opportunity to see several native forest birds such as Iiwi, Maui creeper, Amakihi and Apapane.

TEAR HERE AND MAIL YOUR PLEDGE TODAY!

AUDUBON HAWAIIAN BIRDATHON PLEDGE CARD

I am happy to pledge $_____ per species in support of your birdathon.

My tax-deductable gift of $_____ is enclosed, payable to National Audubon or Hawaii Audubon Society.

Matching gift form enclosed from my employer.

FROM:_____
Name

_____
Address

_____
City, State, Zip

_____
Telephone

Team to sponsor:_____

Please mail your form and check to National Audubon Society, Hawaii State Office, 212 Merchant Street, Suite 320, Honolulu, Hawaii 96813.

HAWAII AUDUBON SOCIETY ANNUAL TREASURER'S REPORT 31 DECEMBER 1988

Prepared by Joel Simasko
Reviewed by Lynne Matusow
Unaudited

1988 REVENUE	
Hawaii's Birds (gross profit)	$14,787.67
Other Publications	400.58
Post cards	57.55
T-shirts	293.00
Dues - local regular	2,520.00
local life	1,100.00
joint	8,651.50
(dues forwarded)	(374.00)
Donations - annual fund appeal	1,302.00
other	10,877.03
Scholarships	2,130.00
Postage	151.30
Interest*	4,525.60
Micellaneous	364.39
Refunds	(139.00)
TOTAL REVENUES	$46,647.62

* Includes interest from Pratt, Bruner, and Berrett's Book The Birds of Hawaii and the Tropical Pacific.

1988 OPERATING EXPENSES	
General Operations	
Office Expenses	$1,518.42
Travel	2,439.50
Equipment	584.77
Insurance	451.00
Taxes, licenses and fees	227.33
Annual Fund Appeal	568.26
'Elepaio	
Paper and printing	15,169.28
Labels and postage	2,339.28
Supplies	162.01
Special Projects	
Assistance grants	16,076.21
Other publications	432.09
T-shirts production	645.01
Committees	
Conservation - general expenses	537.07
Conservation - professional fees	200.00
Research grants	3075.00
Scholarships	250.00
Other Committees	366.63
Miscellaneous	155.00
Undepositable depositable checks	8.50
TOTAL OPERATING EXPENSES	$45,205.36
Net Income for 1988	$1,442.26

HAS APRIL FIELD TRIP

The April HAS field trip will be to the James Campbell Wildlife Refuge at Kahuku on Sunday, April 16. Participants can expect to encounter native and migratory waterbirds. Returning migrant birds from the South Pacific are also sure to be encountered as they migrate north to their summer breeding grounds. It is hoped that a few unusual vagrant species will also be sighted. Meet at the State library on Punchbowl Street at 7:30 a.m. or at the Kahuku Sugar Mill parking lot at 9:00 a.m. Call Bruce Eilerts at 599-4795 or Lyn Carey at 262-0254 for further information. Be sure to bring along binoculars!

Bruce Eilerts

HAS APRIL PROGRAM

Dr. Alan Ziegler will speak on marsupial evolution on Monday, April 17 at 7:30 p.m. at Atherton Halau on the grounds of the Bishop Museum.

IIWI ON MOLOKAI

Have you ever seen an Iiwi on Molokai? If so, The Nature Conservancy's Hawaii Heritage Program would like to talk to you. We are gathering information on sightngs of rare Molokai forest birds for a contract we are working on.

We are also seeking information on the Hawaiian bat. Sightngs on Waimanu Valley on the Big Island are of particular interest, but we are collecting reports on all sightings in Hawaii.

If you have any information , please fill out the following form and mail to Karen Lombard at The Nature Conservancy, 1116 Smith Street, Suite 201, Honolulu, Hawaii, 96817 or call 537-4508. If possible, please include a map of the sighting location.

_____
Name

_____
Species Date

_____

_____
Location name and directions (specify island)

_____
Elevation Dates observed

_____
# of birds observed (specify audio or visual)

_____
Other observers

Any other important or interesting information about your observations (i.e. type and condition of habitat, behavior, presence of other endangered forest birds, etc.):_____

_____

_____

_____

If you have included at map, how confident are you of your mapped location?

___Very certain (pinpoint) ___Certain (w/in 1/4-1/3 mi)

___Approximate (w/in 1/2 mi) ___Cannot recall

AWARD GRANTED

Linda Paul, a second-year law student at the William S. Richardson School of Law, has received the second George C. Munro Award for Environmental Law. The Hawaii Audubon Society established the $250 annual award to recognize the outstanding student in environmental law. George C. Munro's pioneering work to protect Hawaii's native wildlife serves as an example to all who wish to preserve its unique flora and fauna.

BEQUESTS

A bequest to Hawaii Audubon Society is an excellent way to help in our ocnservation efforts. George Munro, tireless and enthusiastic field ornithologist and naturalist provided for a fund to be used exclusively for the protection of native dry forests. Today, the George C. Munro fund provides monies for research projects on dry forests.

Although an attorney should be consulted in the drafting of your will, a model clause for bequests is set in below.

"I hereby, give, devide and bequeath to the Hawaiia Audubon Society, Honolulu, Hawaii, the sum of _____ dollars (or set forth a description of the property) to be used for the general purpose of said organization."

For more information and assistance, contact Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, Hawaii, 9681

CALENDAR OF EVENTS

Apr. 10 (Mon.)	Board Meeting at HAS office at 7:00 p.m Call Bruce Eilerts at 599-4795 for details.
Apr.16 (Sun.)	Field trip to James Campbell Wildlife Refuge. Meet in front of State Library at 7:30 a.m. See page 27 for details.
Apr.17 (Mon)	General Meeting at Atherton Halau, Bishop Museum at 7:30 p.m. Program: Marsupial Evolution by Dr. Alan Ziegler.
Apr. 29 (Sat.)	Birdathon. See details on page 25.

HAS office is located at 212 Merchant Street (Arcade Building), Room 320. The building doors are locked at 6:00 PM on weekdays and 4:30 PM on Saturdays. A person will be posted at the Merchant Street door to let you in for meetings. If you are late, please call 528-1432. Parking is available on the street free after 6:00 PM on weekdays and all day on Sundays (even in the red zones). Check the signs at other times.

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HAWAII AUDUBON SOCIETY/NATIONAL AUDUBON SOCIETY JOINT OFFICES
ADDRESS: 212 Merchant Street, Room 320, Honolulu, Hawaii
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HAS MAILING ADDRESS: PO BOX 22832, Honolulu, HI 96822

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