



Field Notes on Native Forest Birds in the Hanawi Natural Area Reserve, Maui

Andrew Engilis, Jr.

Established in 1986, the 3,000-hectare Hanawi Natural Area Reserve (NAR) is part of the State of Hawaii's Natural Area Reserve System (NARS). Situated on the northeastern flank of Haleakala Volcano, Maui, it contains one of the most remote forested areas in the state. Its boundaries extend from 610 to 2,285 m in elevation and encompass ten native communities, including grasslands, shrublands, riparian forests, and native rain forests. The dominant forest type is the montane wet 'ohi'a (*Metrosideros polymorpha* [NARS unpubl. rept.]) forest.

The native forest bird community in Hanawi NAR is one of the richest in the state. Nine species of endemic Hawaiian honeycreepers (subfamily: Drepanidinae) are presently known to inhabit the reserve. Listed in order of decreasing abundance, these are 'Apapane (*Himatione sanguinea*), Maui Creeper (*Paroreomyza montana newtoni*), 'Tiwi (*Vestiaria coccinea*), Maui 'Amakihi (*Hemignathus virens wilsoni*), 'Akohekohe (*Palmeria dolei*), Maui Parrotbill (*Pseudonestor xanthophrys*), Po'ouli (*Melamprosops phaeosoma*), Maui Nukupu'u (*Hemignathus lucidus affinis*), and Maui 'Akepa (*Loxops coccineus ochraceus*). Several observations of an 'O'o-like bird have also been reported in the Hanawi watershed (Sabo 1982, USFWS unpubl. data). The Hawaiian Short-eared Owl (*Asio flammeus sandwichensis*) and Hawaiian Goose (*Nesochen sandvicensis*) inhabit the grassland area above the reserve, although the Hawaiian Goose is infrequently seen. There are few introduced species in the Hanawi forests above 1,500 m. The Japanese White-eye (*Zosterops japonicus*) and Red-billed Leiothrix (*Leiothrix lutea*) are relatively common, while the Hwamei, or Melodious Laughing-thrush (*Garrulax canorus*), Northern Cardinal (*Cardinalis cardinalis*), and House Finch (*Carpodacus mexicanus*) are rare. The upper grasslands provide habitat for gamebirds; the most common are the Ring-necked Pheasant (*Phasianus colchicus*) and Chukar (*Alectoris chukar*). The Common Barn-Owl (*Tyto alba*) has been heard in the upper forests (pers. obs.).

Historically this region of Maui has been ornithologically neglected due to its remoteness, steep topography, and inclement weather. Members of the Hana Rainforest Project were the first to extensively explore the Hanawi area (Casey and Jacobi 1974). It was during that project in 1973 that the Po'ouli, a new species of Hawaiian honeycreeper, was discovered (Casey and Jacobi 1974). From 1976 to 1983 the Hawaiian forest bird surveys were conducted in many remote areas throughout the state, including the Hanawi watershed (Scott et al. 1986). Detailed life history information concern-

ing the Maui Parrotbill (Mountainspring 1987) and Po'ouli (Mountainspring, Casey, Kepler, and Scott 1990; and Kepler, Engilis, and Ecton in prep.) are the result of research begun in 1980 by the U.S. Fish and Wildlife Service. Few ornithologists have summarized their field observations of birds in Hanawi. Scott and Sincok (1977) report their observations of birds from the western edge of the reserve. Conant (1981) includes bird observations from Hanawi in her summary of observations of endangered species in Hawaii's national parks. Conant and Kjargaard (1984) provided an annotated list of birds of Haleakala National Park that also included observations from Hanawi.

In March 1988, Michael Buck and I (Hawaii Division of Forestry and Wildlife) and Samuel Gon and Steve Perlman (The Nature Conservancy) conducted an ecological survey of the reserve for use in preparation of a management plan for Hanawi Natural Area Reserve. The goal of this survey was to evaluate ecosystems within the reserve and assess the status of native forest birds. This paper presents my ornithological findings during the 1988 survey as well as rare bird observations from earlier trips to the reserve in 1985 and 1986.

METHODS

The survey was conducted from 8 to 11 March 1988 (western boundaries of the reserve and aerial reconnaissance of lower reserve) and 19 to 22 March 1988 (eastern boundary of the reserve).

Six transects were established for botanical analysis of major vegetation communities (Table 1). Each transect consisted of stations placed 150 m apart with substations established at 50 m intervals. Methods for determining plant species diversity, physiognomy, climatic conditions, and degree of pig damage at each station follow those outlined in the Natural Area Reserves System Inventory Field Manual (Hawaii State Division of Forestry and Wildlife 1988).

Eight-minute circle plot counts were made at 52 stations along the transects to assess bird densities. Methods of establishing stations, counting, and recording data follow those used during the Hawaii forest bird survey (Scott et al. 1986). Densities were analyzed using the Variable Circle Plot Program, version 1.1, developed by Edward Garton. Densities are given for species of which 30 or more individuals were counted. Below this number the standard error and variance are too high for reliable density estimates (E. Garton and M. Scott pers. comm.) Percent occurrence was calculated by dividing the number of stations at which a species was seen by the total number of stations counted, multiplied by 100. Refer

Table 1 Status and percent occurrence of birds observed in Hanawi Natural Area Reserve, March 1988.

Density ^b	N on Transect	STATUS 1988	%OCC. 1988	%OCC. 1977 ^a	Density-1988 birds/km ²	Mapped birds/km ²
Ring-necked Pheasant	9	very rare	07.7	---	---	---
Short-eared Owl	1	very rare	01.9	---	---	---
Red-billed Leiothrix	35	common	51.9	05.6	127	101-200
Japanese White-eye	66	common	67.3	05.6	497	401-800
Northern Cardinal	0(2)*	very rare	00.0	---	---	---
Maui Parrotbill	9(29)	rare	15.3	---	---	---
Common 'Amakihi	82	abundant	90.4	77.8	710	401-800
Maui Creeper	126	abundant	71.2	91.4	2915	801-1600
Maui 'Akepa	1(2)	very rare	01.9	05.6	---	---
Tiwi	94	abundant	80.8	88.9	919	801-1600
'Akohekohe	60	uncommon	48.1	72.2	185	101-200
'Apapane	197	abundant	90.4	100.0	318	201-400
Po'ouli	2(5)	very rare	03.8	---	---	---

%Occurrence=the percentage of 8-min. count periods in which species was seen.

Status symbols: Abundant %OCC>70%
Common %OCC>50-69%
Uncommon %OCC=30-49%
Rare %OCC=10-29%
Very Rare %OCC<10%

to Table 1 for definitions of status terms used in the species accounts.

Data on behavior, social foraging, and vocalization were noted for all endangered species encountered. Incidental observations were also made when not counting birds. During non-count periods, birds were attracted by "pishing" and imitating their calls. A list comparing bird densities and percent occurrence in the upper reserve in 1988 with those found during the forest bird surveys of the 1970s and early 1980s is given in Table 1.

SPECIES ACCOUNTS

During our two-week survey we documented 14 species, 8 of which were native forest birds. Of the native species seen, four are listed by the state of Hawaii and U.S. government as endangered: the Maui Parrotbill, Maui 'Akepa, 'Akohekohe, and Po'ouli. A fifth endangered species in the reserve, the Maui Nukupu'u, was last observed in the Hanawi in 1986.

MAUI PARROTBILL (*Pseudonestor xanthophrys*). We recorded the Maui Parrotbill on all days except 19 March, with a total of 29 observed (9 on station) during the two-week survey. Excavations characteristic of those created by this species when foraging (Mountainspring 1987) and other feeding evidence (i.e., clipped *Broussaisia* fruits) were noted daily, indicating the presence of this species in all areas surveyed. Maui Parrotbills were rare between 1,800 and 2,000 m. Parrotbills readily associated with other species while foraging, joining mixed species flocks. Although parrotbill "chip" notes are similar to those of the Maui Creeper (Pratt et al. 1987), parrotbills generally call less frequently, averaging 3 to 5 seconds between chips, even when agitated. Creepers usually call with an interval of 1 to 3 seconds between chips. We were able to find many parrotbills, which would have otherwise been missed, by trying to locate each bird delivering less frequent chips.

Numbers in parentheses indicate total seen for entire 1988 survey.

^a from Scott and Sincok 1977.

^b adapted from Scott et al. 1986.

*=Not seen during count periods;

both birds were detected near Wai'e'ele.

MAUI NUKUPU'U (*Hemignathus lucidus affinis*). Although Maui Nukupu'u were not observed during the 1988 survey, they have been observed several times in the Hanawi NAR; two such observations were my own (Fig. 1). The first individual I encountered was a drab-plumaged bird seen 13 November 1985 on the west Hanawi ridge trail at 1,950 m. It moved quickly through the 'ohi'a subcanopy, traveling with a mixed-species feeding flock consisting of Maui Creepers, Maui Parrotbills, and Maui 'Amakihi. The second sighting was of another drab bird, seen while I was monitoring a Po'ouli nest on 14 May 1986 in a small ravine east of east Hanawi Gulch at 1,800 m. This individual foraged in an understory pukiawe (*Styphelia tameiameia*), probing the minute flowers apparently for nectar. This bird probed the inflorescence with its tongue, often hanging and upside down while foraging. While moving through the foliage it frequently delivered a softly whistled "ke-whit," similar to the whistled note of parrotbills but not as forced and more distinctly double-noted.

Two other observations of Nukupu'u were made during the Po'ouli nest monitoring period (March through June 1986). The first, on 6 March, was of a single adult male moving quickly through the 'ohi'a subcanopy on a ridge east of East Hanawi Stream. It was observed trailing a mixed-species feeding flock at 2,040 m (B. Gagne unpublished field notes). The second observation was of another adult male seen on 1 June 1986 at 1,800 m near the Po'ouli nest area (USFWS unpubl. data for 1986). These few observations are consistent with the rarity of this species, documented during the Hawaii forest bird survey (Scott et al. 1986).

MAUI 'AMAKIHI (*Hemignathus virens wilsoni*). Maui 'Amakihi were encountered at all elevations and on all transects. This was the most frequently encountered native bird in the subalpine *Styphelia/Sadleria* shrubland. Densities were estimated at 710 ± 263 birds/km² (90% CI [confidence interval]), which was within the range of density mapped for our survey

area by Scott et al. (Table 1). Adults were inquisitive and responded to "pishing."

MAUI CREEPER (*Paroreomyza montana newtoni*). Maui Creepers were the most abundant understory species in the Hanawi NAR. They occurred in small family groups and small flocks and were the nucleus species in all of the mixed-species flocks encountered. I saw creepers foliage gleaning, bark picking, and feeding in 'ohi'a blossoms. Although observed creeping in a manner resembling the *Oreomyza* creepers, this was an infrequently encountered foraging behavior. Creeper density was estimated at $2,915 \pm 1,598$ birds/km² (90% CI), which was higher than the density mapped at our study area by Scott et al. (Table 1). However, Scott et al. (1986) did map densities as high as 3,200 birds/km² for forest due west of the reserve.

MAUI 'AKEPA (*Loxops coccineus ochraceus*). We detected only two Maui 'Akepa during our survey. The first, on 11 March, was a bird singing near the western gulch of Kuhiwa at 1,935 m (Fig. 1).

The second, on 19 March, was a male heard and then seen. Gon, Perlman, and I found the bird approximately 0.5 km east of Wai 'Ele'ele, on the flank of a small hill bordering New Bog at 1,970 m (Fig. 1). It was detected at 1500 hrs by its rapidly down-slurred song, the quality of which was remi-

niscient of that of the Maui Parrotbill, but faster and higher pitched. It more closely resembled the song of the Hawai'i 'Akepa (*L. c. coccineus*) (pers. obs.). After the bird sang three times it was located in the crown of a 12-m 'ohi'a and appeared to be leaf gleaning. It then worked its way down-slope to another patch of 'ohi'a, where it sang and called twice, a soft, thin "cher-weet." The bird continued to move down-slope where I was able to follow it to an elevation of 1,950 m, at which point the ridge became too steep and I lost sight of it. It was in view for 8 minutes.

The Maui 'Akepa is one of Maui's most critically endangered species. It survives in two known refuge, Kipahulu Valley to Wai 'Ele'ele (east of the main Hanawi Reserve), and the Waikamoi Reserve (Scott et al. 1986). The species has been recorded only 11 times since 1950, mostly from the Waikamoi Reserve. The most recent observation, prior to ours, of the Maui 'Akepa was in 1980 by S. Sabo (Hawaii forest bird survey data, M. Scott pers. comm.)

There have been only four previous records of Maui 'Akepa from the Hanawi Reserve. The first was by D. Woodside in 1970 (Department of Land and Natural Resources Report to the Governor, 1970/71). T. Casey observed a preening male on 17 June 1972, "0.4 miles East of Wai 'Anapanapa at 6,700 feet" (2,040 m) (Casey 1973). J. Sincok

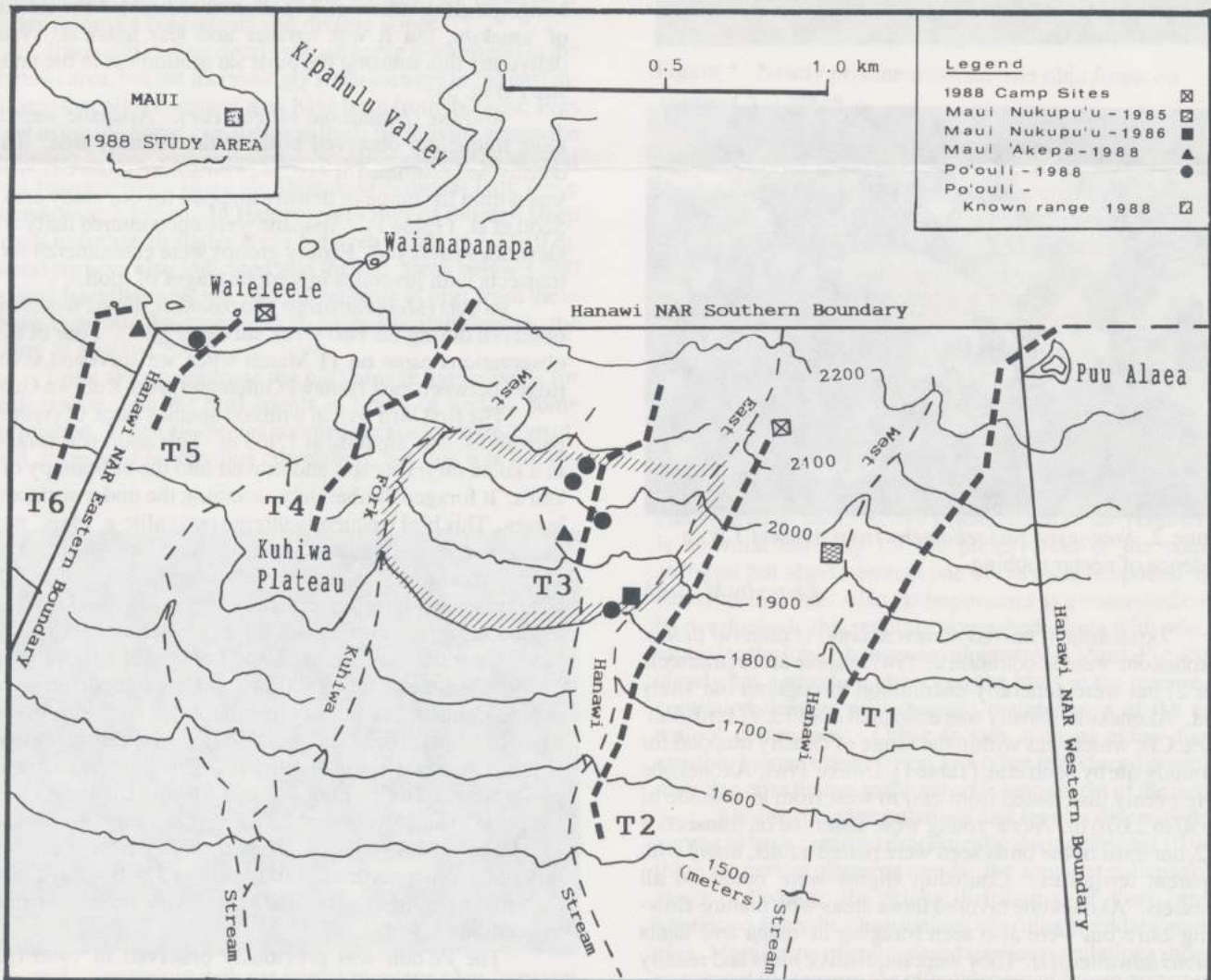


Figure 1. Map of the Upper Hanawi Natural Area Reserve showing locations of rare bird observations. Adapted from USGS 1:24,000 Naheku quad.

observed two birds in Hanawi, one on 30 April 1975 and another on 1 May 1975. Both observations were "ca. 1.0 mile NNW of Pu'u 'Alaea" (Scott and Sincock 1977). Conant (1981) sighted an 'Akepa in upper Kapahulu Valley in 1979.

'Iwi (*Vestiaria coccinea*). The 'Iwi was documented throughout the Hanawi NAR from 1,500 to 2,070 m. It was most common between 1,800 and 2,000 m. 'Iwi density was estimated at 318 ± 135 birds/km² (90% CI), which is within the range of density mapped for our study area by Scott et al. (Table 1). Many juveniles were observed in various stages of molt. Aerial courtships were seen on transects 5 and 6. Although 'ohi'a flowering was uniform throughout our study area, 'Iwi distribution was patchy, creating an interesting distributional anomaly. 'Iwi appeared less numerous in areas of heavy pig damage (transects 3 & 4) and were most numerous where understory plants with tubular flowers such as *Clermontia* and *Stenogyne* were common (transects 5 & 6). These plants were completely absent in areas severely damaged by pigs. This patchy distribution indicates that 'Iwi may be susceptible to habitat damage by pigs, as such destruction limits the availability of tubular flowers in the understory.

'Iwi were seen on several occasions in 1986 tearing holes into the base of *Stenogyne* flowers to rob the plant of its nectar (A. Engilis and B. Gagne field notes). In 1988 several *Stenogyne* and *Clermontia* flowers were found pierced at their base in a similar fashion (Fig. 2).



Figure 2. *Stenogyne tamaehameha* from transect 1 with evidence of nectar robbing.

Photo by M. Buck

'AKOHEKOHE (CRESTED HONEYCREEPER) (*Palmeria dolei*). 'Akohekohe were as common as 'Iwi in some areas (transects 1 & 2) but were generally uncommon throughout our study area. 'Akohekohe density was estimated at 183 ± 97 birds/km² (90% CI), which was within the range of density mapped for our study site by Scott et al. (Table 1). Unlike 'Iwi, 'Akohekohe were evenly distributed from east to west from an altitude of 1,650 to 2,070 m. A few young were observed on transects 1 & 2, but most of the birds seen were paired adults, many with apparent territories. Courtship flights were noted on all transects. 'Akohekohe favored those areas with mature flowering 'ohi'a but were also seen foraging in 'olapa and 'akala (*Rubus hawaiiensis*). They were inquisitive birds and readily responded to "squeaking" sounds produced by kissing the back of one's hand. 'Akohekohe sang sporadically throughout the day and in definite bouts; such bouts lasted 20 to 30



Figure 3. Crested Honeycreeper delivering sub-song from the understory.

Photo by A. Engilis, Jr.

minutes and were noticed in early morning and late afternoon. We saw three different 'Akohekohe delivering a soft, warbling, gurgling subsong. In pattern it resembled the subsong of 'amakihi, but it was harsher and less musical. When delivering this subsong the birds sat motionless in the understory (Fig. 3).

'APAPANE (*Himatione sanguinea*). 'Apapane were the most frequently observed birds in the Hanawi area. Their density was estimated at 919 ± 423 birds/km² (90% CI), which was within the range of density mapped for our study area by Scott et al. (Table 1). 'Apapane were encountered daily at all elevations surveyed. Family groups were encountered on all transects with juveniles in various stages of molt.

PO'OU LI (*Melamprosops phaeosoma*). Five Po'ouli were observed during the two-week survey (Fig. 1). Four of these observations came on 11 March when we surveyed several ridges between east Hanawi Gulch and west Kuhiwa Gulch.

The first bird was in a mixed-species flock of creepers, parrotbills, and 'amakihi at 1,965 m. This adult was foraging in a kolea (*Myrsine* sp.) and moved into the subcanopy of an 'ohi'a. It foraged deliberately, scanning the under surfaces of leaves. This bird frequently uttered two calls: a "chip," much like a creeper but thinner, and a whistled "wh-whit." It also sang several times, especially while in the subcanopy. The song was a soft buzzing series of chips, rushed and upslurred toward the end: "chit-chit---chit-er, chit-er, chit-er, chit."

Later that day, Perlman and I observed a Po'ouli at the 1986 Po'ouli nest site (1,800 m). It flew into an 'olapa, sat, preened, and then flew away from us. Buck and Gon observed a pair of adults at 2,035 m on an old USFWS transect between Kuhiwa and east Hanawi gulches. This pair was tame and easily attracted to "pishing." They followed Buck and Gon up the ridge to an elevation of 2,055 m (Gon unpubl. data). On 18 March, a fifth Po'ouli was heard singing from the subcanopy of an 'ohi'a north of Wai 'Ele'ele at 2,010 m. All of our Po'ouli observations were in or near small gulches with heavy vegetation.

The Po'ouli was previously observed in 1986 (pers. obs.) and is the only species whose current known range is inside the Hanawi NAR, where it appears to be almost entirely restricted to an area between east Hanawi and west Kuhiwa

gulches from 1,800 to 2,000 m (Fig. 1). Researchers have become concerned about the rapid decline of this species since its discovery in 1973 (Scott et al. 1986). Although density was not estimated, the number of birds seen per count period, 0.4, was the same as calculated by Mountainspring for observations in the early 1980's (Scott et al. 1986).

We failed to locate Po'ouli at the type locality and other sites on the east Hanawi trail. There were two known pairs in this area in 1986 (pers. obs.). Also, no Po'ouli were seen in the Kuhiwa drainage.

FERAL PIG PROBLEMS

Pigs are a major threat to the avifauna in the Hanawi NAR. Patterns of pig damage vary and can be used to infer pig movement in the reserve. The oldest damage was on the western two transects (1 & 2). These transects show some recovery in the understory, but the result is a simpler physiognomy and reduced plant species diversity. Transects 3 & 4 had areas with severe pig damage, mostly between 1,920 and 2,010 m. The Kuhiwa Plateau was devastated by pigs, and most of the activity was fresh. All that remained of the understory was a few uprooted ferns and some scattered 'akala (Fig. 4). Erosion had exposed the underground roots of many 'ohi'a. Transects 5 and 6 and areas between were nearly pristine (Fig. 5). In these areas the species-rich understory plants formed a continuous and diverse cover.

It was difficult to clearly visualize pig movements in the Hanawi area, but the increasingly fresh damage to the east indicated that pig movement may have been from the west. Pigs were using the upper grasslands as trails for moving across the mountain. This was supported by observations of several well-traveled trails along the Haleakala National Park fence boundary at 2,195 m. In Hanawi, pigs moved through steep ridges to forage in flatter areas between 1,800 and 2,010 m. Aerial surveys also indicated that the flat areas below 1,500 m were heavily impacted, and movements of pigs from these lower areas into the upper reserve poses a serious threat to the future of Hanawi NAR.

I was able to compare the pig damage assessments for each station with the bird counts in hopes of finding some correlation. When all species counted per station were considered, there was no obvious correlation, but this was not the



Figure 4. Severe pig damage in wet montane ohia forest on Transect 4, 1,920m.

Photo by M. Buck



Figure 5. Nearly pristine montane wet ohia forest on Transect 5, 1,800m.

Photo by M. Buck

case when considering only those species that forage primarily in the understory. The number of understory birds recorded per station in relatively intact forest (6.25) versus the number in severely pig-impacted forest (2.53) indicated that understory bird numbers were significantly affected by severe pig damage ($P=0.01$, Mann-Whitney U-test).

CONCLUSIONS

The Hanawi NAR on Maui contains one of the most diverse native avifaunas in the state of Hawaii. Five endangered species occur within the reserve, of which three are critically endangered: the Po'ouli, Maui 'Akepa, and Maui Nukupu'u. If an 'O'o is present on Maui, it is no doubt critically endangered as well. Active management of the Hanawi area is essential not only for the preservation of the complex avifauna but also to protect one of the most unspoiled native forests in the state. Also, its importance as a watershed cannot be overlooked; this montane watershed, along with others, is crucial to the future human development on Maui. Pig activity clearly has a negative impact on the birds in the reserve, and continued damage will threaten maintenance of the entire natural community. Other factors such as avian disease, erosion, human interference, and other introduced organisms may also pose threats to the natural components of the reserve.

Although bird populations and species diversity do not appear to have changed dramatically during the past 10 years, there are certain alarming trends: the apparent collapse of the range of Po'ouli; the patchy distribution of Tiwi; and the continued sporadic observations of critically endangered species. Monitoring of endangered species populations should be continued to measure the effectiveness of future management practices. Also, how native birds may adapt to changes in the reserve's avifaunal and botanical components will need to be

examined to provide planners with recommendations for ecosystem management of the reserve.

Few pristine areas remain within the Hanawi NAR and it is only a matter of time before they, too, lose their understory as a result of pig damage. Protection will be costly and time consuming. With several species apparently on the verge of extinction, natural area reserve management planners have drafted a plan to help preserve this unique area. Continued delays in funding and implementation, however, may well result in the tragic loss of these species.

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HAS GRANTS AWARDED

The Hawaii Audubon Society granted two awards this Spring. David Jacobs, a graduate student at the University of Hawaii at Manoa, received a \$500 research grant for his ongoing research on the endangered Hawaiian hoary bat. Very little is known about this rare and solitary species, and recovery efforts have been hampered by this lack of knowledge.

A second award of \$250, the George C. Munro Award for Environmental Law, was granted to second-year law student R. Nathan Gooding. This annual award was established by HAS to honor the top student in Environmental Law at the William S. Richardson School of Law.

HAS annually awards several small-scale grants for natural history research in Hawai'i and the Pacific, as well as a \$1,000 undergraduate tuition scholarship for a natural history student. For information about the awards program, write or call John Engbring, Awards Committee, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813, phone 541-2749 (wk).

BIRDATHON WRAP-UP

Over \$8,000 was raised in support of Audubon in Hawai'i during the 1990 Birdathon. We give special thanks to wildlife artist Patrick Ching, who designed the special T-shirt, honorary Chairman Don Chapman, Corporate Benefactor Chevron, and Corporate Sponsors Hawaiian Electric Company, Inc., Honolulu Cellular, and Pacific Resources, Inc.

We also offer a mahalo nui loa to the following prize donors: Atlantis Submarines, Cafe Che Pasta, Consolidated Theatres, Alicia Davies, GTE Hawaiian Telephone, Honolulu Book Shops, Liberty House, Paradise Cove Luau Park, Polynesian Cultural Center, Sea Life Park, Studebaker's, Timm Timoney, Valenti Brothers Graphics, and Alan C. Ziegler.

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OVERSEAS SUBSCRIBERS: POSTAGE IS GOING UP

The cost of mailing the *'Elepaio* to non-U.S. addresses has increased. Effective 1 January 1991, the subscription rate will be \$6 a year, plus the actual postage required. Exact figures will be included with the renewal notices scheduled to be mailed in November 1990.

CONSERVATION NEWS

Endangered Hawaiian Plants: On 9 May 1990, a lawsuit, filed last year by the Sierra Club Legal Defense Fund on behalf of the Conservation Council for Hawai'i, Sierra Club, and Hawaiian Botanical Society, was successfully settled out of court. The suit called for the USFWS to list 186 Category 1 candidate endangered Hawaiian plant species as required by the Endangered Species Act. The USFWS is now legally committed to commence the formal listing process within the next three years. Once listed these plants will automatically be included on Hawai'i's endangered species list.

Environmental organizations and key individuals aided in the successful outcome for Hawaiian plants: the Hawaii Audubon Society donated funds necessary for the legal research and initiative; Jay Hair, president of the National Wildlife Federation, corresponded with U.S. Fish and Wildlife Service director John Turner; and Rep. Pat Saiki met with Turner to discuss Hawai'i's endangered species situation, including candidate plants. Turner also discussed with Saiki the establishment of new environmental education and management enhancement programs to protect Hawai'i's wildlife.

Hawai'i's State Water Plan: The Commission on Water Resource Management approved most of the components of the Hawai'i Water Plan at its 27 June 1990 meeting. The Commission has made every indication that these plans are first cuts and require more work. The Commission has also sponsored a public workshop on sustainable yields. If you are interested in participating in further plan development or in attending future workshops, call the Division of Water Resource Management (previously Division of Land and Water Development) at 548-7539.

Hawai'i's Ocean Resources Management Plan: The Hawai'i Ocean and Marine Resources Council, under the administration of the Department of Business and Economic Development, is preparing Hawai'i's Ocean Resources Management Plan. The council was established by the State Legislature in 1989. Members were appointed by Governor Waihe'e and one council member specifically represents the environmental community. The plan will address issues such as fisheries, mariculture, ocean recreation, marine minerals, harbors, coastal erosion, waste management, and conservation, and the Council will be making recommendations on ocean policy to the State Legislature and Governor Waihe'e.

Initial public workshops were held throughout the islands (except Lana'i and Moloka'i) in June to identify issues important to the public and to comment on issues already identified by the Council. The public is invited to join specific focus groups working on the individual issues. There will also be opportunity to comment on the draft plan, which should be available by mid or late summer/early fall. For more information on the plan, call DBED's Ocean Resources Branch, 548-6262 or the Sea Grant Extension Service, 956-8191.

ENVIRONMENTAL DIRECTORY

The Hawaii Audubon Society recently published the *Hawai'i Green Pages*, a directory compiled in celebration of Earth Day 1990. The directory lists over 150 environmental efforts in Hawai'i. For a free copy, send a self-addressed stamped #10 envelope to Directory, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813.

BIRD WITH US IN MICRONESIA

The Hawaii Audubon Society is sponsoring a visit to Micronesia from 15 February to 3 March 1991. The focus is on birds.

Koror, Yap, Truk, Saipan, and Pohnpei are among the thousands of coral atolls and volcanic islands scattered across nearly 12,000 square miles of the Pacific Ocean and known as Micronesia.

The Pohnpei Flycatcher, Fantail, Lory, Cicadabird, Long-billed White-eye, Oceanic Flycatcher, Blue-faced Parrotfinch, Great Truk White-eye, Palau Fruit-Dove, Micronesian Pigeon, Palau Ground-Dove, Nicobar Pigeon, Nightingale Reed-Warbler, Golden White-eye, Rufous Fantail, Mariana Fruit-Dove, Mariana Crow, and Black Drongo are among the birds the group can hope to see.

Dr. H. Douglas Pratt, an authority on the natural history and bird life of Hawaii and the Pacific, will lead the HAS group. Pratt, a talented artist as well as a zoologist, illustrated the *Field Guide to the Birds of Hawaii and the Tropical Pacific*. His work is on display at the Bishop Museum.

The tour will cost \$3,895 a person, including round-trip air fare from Honolulu. If there are fewer than 13 participants, the cost will be \$3,995 each. Hawaii Audubon will receive \$150 per participant.

For more information and a detailed itinerary, contact Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813.

NOMINATING COMMITTEE

William Gilmartin has been named Chairman of the HAS Nominating Committee. Other members are Carl Christensen and Synthia Tang. HAS members are invited to submit nominations for 1991 HAS directors and officers to the Nominating Committee by 31 August 1990. Nominations must be accompanied by the written consent of the nominee. Send to Nominating Committee, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu HI 96813.

HAWAII AUDUBON SOCIETY

212 Merchant Street, Suite 320
Honolulu, Hawai'i 96813
(808) 528-1432

BOARD OF DIRECTORS

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	Synthia Tang	544-3116 (wk)

CALENDAR OF EVENTS

- Aug. 13 (Mon.) HAS Conservation Committee Meeting: HAS office at 6:00 P.M. Call Marjorie Ziegler for details, 528-1432.
- Aug. 13 (Mon.) HAS Board Meeting: HAS office at 7:00 P.M. Call M. Casey Jarman for details, 263-6396 (hm), 956-7489 (wk).
- Aug. 19 (Sun.) HAS August Field Trip: Honouliuli Unit of the Pearl Harbor National Wildlife Refuge (replacing the originally scheduled Bishop Museum outing). Bring water and binoculars or spotting scope to view waterbirds. Meet on Punchbowl Street by the Hawai'i State Library at 7:00 A.M. Call Bruce Eilerts, 599-4795 (hm), or Robert Pyle, 262-4046 (hm), for details.
- Aug. 20 (Mon.) HAS General Meeting: Bishop Museum's Atherton Halau at 7:30 P.M. Program: "Hawai'i's Birds--Birdwatching in Hawai'i: Why, What, When and Where" by Bruce Eilerts, HAS Vice President. All are welcome and refreshments will be served.

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'ELEPAIO STAFF

Editor	Sheila Conant	956-8241 (wk)
Managing Editor	Stuart Lillico	734-3703 (hm)
Production	Lynne Matusow	531-4260 (hm)
	Marjorie Ziegler	247-5318 (hm)
Mailing	George Campbell	941-1356 (hm)
	Elizabeth Edwards	-
	Susan Schenck	-
	Alan Ziegler	247-5318

HAWAII AUDUBON SOCIETY
 212 MERCHANT STREET, ROOM 320
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