'ELEPAIO

Journal of the Hawaii Audubon Society

For the Protection of Hawaii's Native Wildlife

VOLUME 47, NUMBER 8 August 1987

Nest-Site Variability in the 'Ākepa and Other Cavity-nesting Forest Birds on the Island of Hawaii

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Introduction

The Ākepa (*Loxops coccineus*) is unusual among the Hawaiian Drepanidinae, as well as birds in general, in that subspecies on different islands vary considerably in nesting habits. All 4 reported nests of the Kauai subspecies (*L. c. caeruleirostris*; Eddinger 1972a) and the one possible nest of the Maui subspecies (*L. c. ochraceous*; Perkins 1903) have been open statant cups (Pettingill 1985) attached to small branches in the terminal crown of ohia trees (*Metrosideros collina*). In contrast to these subspecies, all 6 reported nests of the Hawaii Island subspecies (*L. c. coccineus*) have been statant cups in cavities in trunks and limbs of ohia and koa (*Acacia koa*) trees (Sincock and Scott 1980, Collins 1984).

Here we document a nest-site of the Hawaii 'Ākepa that differs from the few previously described. Although this is the first case of within-island variation in this endangered subspecies, the variation is consistent with that of some other cavity-nesting species on Hawaii (reviewed below). We also document the details of mate-feeding through which the nest was revealed.

Discovery and Description of the Nest

The nest was discovered on 24 May 1984 in an ohia tree near the Kahuku Ranch cabin, just above the upper edge of the Kau Forest Reserve on Mauna Loa (1884 m elevation). The height of the tree was estimated to be 18 m; the diameter at breast height was 38 cm. The tree was located approximately 90 m from the tree in which Sincock and Scott (1980) found an 'Ākepa nest. Our nest was a circular statant cup, approximately 4 cm in diameter at the inner edge and 3 cm deep, and was wedged in a crevice between loose bark and the trunk (7 cm maximum separation of bark from trunk; height 5.3 m). There were 2 warm eggs in the nest on both 24 and 25 May, the day that we left. Considerable light entered the nest through a major horizontal break and minor vertical splits in the bark.

The nest was revealed by the behavior of a male and female and was discovered after 4 hours (0800-1200) of continuous observation of an unbanded female 'Ākepa calling from an ohia tree. One observer, not knowing that there was an active nest in the tree,was located within 5 m of the tree, while a second observer was located approximately 20 m away. A male was heard singing at distances ranging from 10 to 40 m from the tree. Singing occurred at intervals ranging from 5 sec to 30 min throughout the observation period. At intervals ranging from 34 to 68 min, the female call rate increased dramatically from one call every 2-15 sec to almost 2 calls per sec. A male, not apparent to either observer in the area when the female increased her call rate, appeared within 10 sec after each initiation of accelerated calls. The female begged with quivering wings and the male regurgitated food to the female, sang, and then departed, whereupon the female resumed calling at a slow rate. The female had crept toward the male for these feedings, but little movement was necessary due to the close approach of the male. The nest was finally discovered at 1200 hours when a male perched on some loose bark, disappeared in a crevice (the nest-site), and then flew out a short distance to a branch. The female joined the male and received a feeding. The female resumed incubating during the afternoon of 24 May once observers stationed themselves away from the immediate vicinity of the nest tree. An adult 'Āpapane (*Himatione sanquinea*) perched on the bark and extended its head and neck into the crevice later that afternoon. Neither parent was in or near the crevice at the time.

There were many family groups of 'Ākepa on the study site on the day of discovery. Because there was no evidence of family groups during a previous trip on 22 April, or during trips in February and March, this nest probably represented a late initial breeding attempt or a re-nesting following failure. The nest was abandoned when re-inspected 2 weeks later (7 June). There was a single cold egg with embryo, now deposited in the Bishop Museum (BPBM 160877). There were still some family groups evident during this last visit. The breeding status of 'Ākepa after 7 June was not determined.

Adult male (left) and adult female (right) Hawaii 'Ākepa being held for banding.

Photo by Maile A. Kjargaard

Discussion

This nest-site differs from those previously documented in that all others have been located in internal cavities of trunks and limbs in live trees and of snags (reviewed by Collins 1984). However, the heights of the nest and tree are comparable to those of the 6 previous nests (5.3 m vs average 7.2 [range 1-11 m] for nest height; 18 m vs average 21 m [range 17-30 m] for tree height). The new nest-site thus reveals that large trees provide 2 different types of cavities and that Hawaii 'Ākepa will nest considerably below the canopy in both types.

With only 7 reported nests of the Hawaii 'Ākepa, it is difficult to estimate the extent to which crevices are used or to determine the criteria that the birds use to select cavities. Internal cavities would likely provide greater protection from wind and rain than would crevices. This nest-site thus indicates that Hawaii 'Ākepa may use broader criteria for selecting nest-sites or that internal cavities may be in short supply. We did find internal cavities that were empty in trees within 20-50 m of the nest-site tree, including some explored by a pair of 'Ākepa observed during April of 1985, but too little is known of the breeding biology of 'Ākepa to evaluate the suitability or quality of cavities.

We had positioned 54 nest-boxes throughout 20 ha of habitat in which 'Ākepa were present during the study to assess cavity use by these birds. During February, boxes were placed on ohia trees comparable in size to the nest-site tree and at heights ranging from 1-4 m, within the range of heights of nests discovered previously. These were unused, including one located 2 m from the nest. This experiment shows that cavity-nesting Hawai'i 'Ākepa may not recognize bluebird-style boxes constructed from unpainted plywood as potential cavities. Cavity-nesting birds in the Kilauea Forest reserve, including 'Ākepa, also did not use nest-boxes (Mike Scott, pers. comm.).

Nest-site variability (open nests versus cavities) is characteristic of several species or subspecies of birds on the island of Hawaii. Of the 9 reported nests of the Hawaii Creeper (*Oreomystis mana*), 2 have been in cavities (crevice in one case, other case not described) and 7 have been in the forks of horizontal or crotches of vertical branches (Sakai and Ralph 1980, Scott et al 1980, Sakai and Johanos 1983). Of the 10 reported nests of the 'Ōma'o (*Myadestes obscurus*), 6 have been in cavities (4 in crevices or protected platforms, 2 in internal cavities) and 4 have been on branches of trees or treeferns (Perkins 1903, Berger 1969, Berger 1981, van Riper and Scott 1979). The 'Ākepane, which typically nests in thin branches of ohia trees (Perkins 1903) and upper surfaces of treefern fronds (Berger 1981), has been known to nest in lava caves (van Riper 1973). Because all 7 nests of the Hawaii 'Ākepa have been in cavities (6 internal, 1 crevice), 'Ākepa show less within-population variation in nest-sites than do these other species. Although the sample sizes are small, the Hawaii 'Ākepa appears to be the only obligate cavity nester.

However, the 'Ākepa shows greater between-population (island) variation than these other species because of the extreme difference in nesting habits of the Kauai and Hawaii subspecies summarized above. The Kauai and Hawaii species of *Oreomystis* creepers show some between-island variation in nesting sites in that the 2 nests of the Kaua'i Creeper (*O. bairdi*) have been open statant cups in the terminal crowns of ohia trees (Eddinger 1972b) while some cavity nests have been found for the Hawaii Creeper. A similar pattern exists between the apparent open nesting habits of the Oloma'o (*Myadestes lanaiensis*) on Molokai (Perkins 1903) and the tendency toward cavity nesting in the 'Ōma'o on Hawaii. The discovery of cavity nesting among species or subspecies on Hawaii may reflect different ecological conditions on the island that favor or permit cavity nesting. Alternatively, cavity nesting may be discovered to be more frequent on other islands when comparable attention is focused on avian research that may lead to discoveries of nests.

Nest-site variability within and between populations of 'Ākepa and other Hawaiian birds has strong implications for the evolution of life history characteristics. In general, birds that breed in cavities tend to have larger clutch sizes, longer incubation periods, longer nesting periods, and greater nesting success than birds that breed in open-nests (von Haartman 1957; Lack 1968; Ricklefs 1968, 1969; but cf. Nilsson 1986). However, too few nests with eggs or nestlings have been discovered of 'Ākepa and other Hawaiian birds to begin comparing breeding characteristics of individuals within species that vary in nest-site. Further studies of the 'Ākepa and other Hawaiian birds will be valuable for identifying and interpreting within-population and between-population variability in breeding characteristics. Observations of multiple nesting attempts by banded birds will be especially useful for determining if individuals that nest in cavities or open cups do so repeatedly, possibly reflecting genetic variation in nest-site selection.

Nest-site variability within and between populations is also interesting because obligate cavity-nesting is generally associated with intra- and interspecific competition for nest-sites (von Haartman 1957, van Balen et al. 1982, Collias and Collias 1984, Nilsson 1984). Perhaps it is significant that the 'Ākepa, as the most consistent and apparently obligate cavity-nester on Hawaii, is the only strongly sexually dichromatic species that breeds in cavities on Hawaii. The Hawai'i 'Ākepa, as the only subspecies of 'Ākepa known to breed in cavities, is also the most strongly sexually dichromatic subspecies. Further studies may elucidate the apparent covariation between nest-site and male coloration in this species.

Kahuku Ranch cabin in 'Ākepa habitat, about 20 m from the nest described in this paper.

Photo by L.A. Freed

ACKNOWLEDGEMENTS

We thank the Trustees of the Estate of Samuel M. Damon, Carl Bredhoff and other personnel of the Kahuku Ranch for cooperation, the Mauna Loa Field Station (especially Mike Scott and Jim Jacobi [USFWS] and Chuck Stone [NPS]) for logistic support, and the Hawaiian Evolutionary Biology Program of the University of Hawaii for financial support. Support during the writing stage was provided by the National Science Foundation (grant BSR-8516702). We appreciate critical readings of previous versions of the manuscript by Sheila Conant, Cam Kepler, Steve Palumbi, C.J. Ralph, Howard Sakai, Mike Scott, and Charlie van Riper III.

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A WHITE HOUSE SPARROW AT THE HONOLULU ZOO

Every year when on vacation in Honolulu I visit the park area of the Honolulu Zoo to observe wild birds. On 26 February 1986, while sitting on a bench underneath an Umbrella Tree (*Brassica actinophylla*), I was feeding a pair of Red-crested Cardinals (*Paroaria coronata*) and a Common Myna (*Acridotheres tristis*) when several other birds flew down to get crumbs. Among these was a white House Sparrow (*Passer domesticus*, Ploceidae). I inspected this bird through binoculars at a distance ofapproximately 8 feet. It was almost pure white, with a pale pink bill, pale pink legs and feet, and had a narrow line of black on the left lower wing which faced me. I was unable to see its right wing entirely. I observed it for only a few moments. Although I saw this bird only once, the sighting was corroborated by a member of the Honolulu Zoo staff.

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CONSERVATION NEWS

CRATER HILL UPDATE

The Kauai County Council and State Legislature have passed resolutions supporting federal acquisition. Congressman Daniel Akaka introduced a bill for a $1.5 million appropriation for the purchase of Mokolea Point. Congresswoman Patricia Saiki gave supporting testimony on this bill. Senators Spark Matsunaga and Daniel Inouye have recently introduced an authorization bill in the Senate. Unfortunately the House Bill did not get to the floor, but the Senate Bill is still alive and well.

A great many people are in favor of this project. What, then is holding us up? There are several unresolved questions in the mind of Senator Daniel Inouye regarding the purchase of Mokolea Point. According to his most recent correspondence, there remain 3 major questions: 1) U.S. Fish & Wildlife Service prioritization of Mokolea Point property; 2) Kauai County enforcement of conservation conditions on 101-acre Crater Hill parcel; and 3) the need for another appraisal of Mokolea Point.

The Crater Hill Coalition recently sponsored a well-attended public meeting with Allan Marmelstein, Pacific Islands Administrator for the U.S. Fish & Wildlife Service. While Mr. Marmelstein would not alter his position on this issue (i.e., endangered species habitat is the only top priority), public sentiment in favor of the acquisition of these lands and their addition to Kilauea Point National Wildlife Refuge was very thoroughly articulated, particularly the point of view of the Kilauea Point volunteers. This airing of unified public opinion has reached officials beyond Honolulu and should influence high-ranking decision makers in the Fish & Wildlife Service.

The County of Kauai Planning Department and County Councilmember JoAnn Yukimura have been working with the owner of the Crater Hill parcel in order to reach a mutually satisfactory agreement on management of this conservation parcel. Because the owner is asking for another extension by June 1987 for

development of the subdivision, it is the right time to ask for enforcement of the conservation management condition of the subdivision approval.

The final question is the value of Mokolea Point. An appraisal that is done according to federal standards for land acquisition will settle the question. Such an appraisal is required by the Fish & Wildlife service for any acquisition.

Kilauea Neighborhood Association needs to commission this second appraisal by the Hallstrom Appraisal Group, Inc. in Honolulu. The Fish & Wildlife Service has given approval of this appraisal firm. However, this appraisal is costly: $15,000. A pledge has already been made for $7,500, on the condition that matching funds are donated by the community. The HAS Board has approved a contribution of $500, and members may send their own contributions to the Crater Hill Coalition, Box 36, Kilauea, Hawaii 96754.

Members are also urged to call Congressional representatives, particularly Senators, to express their opinions on the Senate Bill.

Gary Smith
Crater Hill Coalition, 828-1502
JoAnn Yoshimoto
Kilauea Neighborhood Association, 828-1454

KAHAUALEA NOW A NATURE RESERVE

Governor John Waihee has signed the executive order setting aside the 16,726-acre parcel of state-owned rain forest at Kahaualea as the Kahaualea Natural Area Reserve. According to a letter received by the Hawaii Audubon Society from Robert Lee, administrator of the state's Natural Area Reserve System, the governor signed the executive order on April 13, 1987.

Kahaualea, on the east border of Hawaii Volcanoes National Park, was the center of a geothermal development controversy starting in 1981. At that time Campbell Estate announced plans to develop 250 megawatts of electrical power from geothermal resources on its land at Kahaualea.

Conservationists and residents carried on legal battles with Campbell Estate and the state for almost five years to keep geothermal development out of native wildlife habitats at Kahaualea and to hold down the size of development to meet the needs of the Big Island.

The controversy was settled by mid-1986--except for two Hawaiian plaintiffs appealing to the State Supreme Court--when the state-proposed land exchange was completed. The state took ownership of Kahaualea, and Puna Natural Area Reserve and forest reserve downslope were acquired by Campbell Estate. The state agreed that Kahaualea would replace the natural area reserve in Puna given to Campbell Estate.

Geothermal development on the new Campbell lands was reduced to an initial 25 megawatts. An additional 75 megawatts can be permitted later. No construction on the ground has taken place yet.

An additional 5,650 acres at Kahaualea, called Tract 22, is scheduled to be added to the national park when the state and federal government agree on a land exchange.

WEST HAWAII RESORT DEVELOPMENT

At the public hearing held in Hilo on June 23 by the Hawaii County Planning Commmission on the final draft of the revised General Plan, Island of Hawaii spokeswoman Mae E. Mull expressed the Society's concerns about the extensive, large-scale resort projects proposed for the Kona coast. Mull said the Society supported the environmental goals and policies of the General Plan, but "we see a great chasm between these admirable environmental goals on the one hand, and on the other, contrasting hand, the sweeping changes from Conservation or Open to Urban uses in the Land Use Pattern Allocation guide and map for West Hawaii."

"These land use changes from Conservation to Urban will have drastic impacts on the environmental quality, natural beauty, natural resources and shoreline. Yet, nowhere in these documents is any effort made to bridge the gulf between evnvironmental goals and the impacts of the totality of land use changes to Urban in West Hawaii," Mull said.

She said the Commission and the public need to know in advance what the long-term consequences are for the unspoiled beaches, inshore waters, shoreline wilderness, coastal ponds and wetlands, native wildlife habitats, native dryland plant communities and natural beauty when great land tracts are transferred to Urban use.

Mull asked for a detailed assessment that reveals the cumulative impacts of Urban land use on West Hawaii's natural resources, native wildlife habitats, shoreline, scenic qualities and public access. She said that sound decisions on land use changes cannot be made in the absence of knowledge of the consequences of such changes.

WATERBIRD HABITAT AT MAKALAWENA

The major concern of over 20 speakers at the public hearing held by the Hawaii county Planning Commission (described above) in Hilo on June 23 was Makalawena. Except for the Bishop Estate land owner, all who gave testimony at the Hilo hearing and at three other public hearings held earlier at other island towns, asked that Makalawena on the North Kona coast not be changed to Urban-Resort land use.

Speaking on behalf of the Society, Mae E. Mull made this statement: "On one specific land use designation before the Commission, the Society favors the retention of Conservation land use for the Makalawena parcel in North Kona. We are opposed to the proposed Urban-Resort designation of Makalawena. The Society's concerns focus on the Makalawena wetlands and Opaeula Pond as viable habitats for endangered waterbirds, migratory birds and other native wildlife and plants. The existing land use of Conservation for the whole makai parcel provides the best long-term protection to this extremely valuable habitat for the endangered Hawaiian Stilt (Ae'o), the endangered Hawaiian Coot ("Alae-ke'oke'o) and other native wildlife."

The headline of the Hawaii Tribune-Herald (Hilo) on June 24 read "Commission Urged to Save Makalawena," and three-fourths of the front page was devoted to a news story quoting testimony of speaker after speaker asking that the natural beauty of Makalawena be preserved, that Opaeula pond and waterbirds be protected, and that public access to the shore remain open. Some Commission members openly considered turning down Urban-Resort use at the close of the hearing.

An article in the July 12 Sunday Star-Bulletin &Advertiser carried the headline, "Bishop Estate temporarily drops resort

request," and gave this news "Bishop Estate has withdrawn its request to have its Makalawena land in North Kona changed to a resort status under a Hawaii County General Plan review soon to be completed."

"County officials said the move was a strategic one...The proposed resort has drawn increasing opposition from several conservation groups and government regulators concerned about the possible adverse impact on several ponds where native Hawaiian birds, including the stilt, live..."

"The proposal to withdraw from the current process was seen as an effort to buy time to answer questions and not be caught up in a late August deadline that the Planning Commission set to conclude the 10-year review...Groups such as the Hawaii Audubon Society, the Sierra Club and the U. S. Fish and Wildlife Service have expressed reservations about the development."

NATIONAL PARK THREATENED BY FLOOD CONTROL PROJECT

The Soil Conservation Service recently sent the Society a Notice of Findings of No Significant Impact (FONSI) for a proposed flood control project that could have harmful impacts on the Olaa Tract wilderness area of Hawaii Volcanoes National Park. The project site is the Wright Road farmlots in Volcano community where the average annual rainfall is 150 inches. What are now farmlots was native rain forest until the late 1950's. Flooding occurs during protracted heavy rains, washing away topsoils because the forest cover has been removed. The project would collect excess runoff into three channels which would empty into Olaa wilderness area. In reponse to the FONSI, Mae E. Mull sent this letter to the Soil Conservation Service on June 29:

"Over the years the Society has accumulated a lengthy written record of its concern about project affecting Hawaii Volcanoes National Park. The Society strongly supports the mission of the park to restore, protect and manage native Hawaiian ecosystems in a condition close to that existing before the arrival of continental man.

"We believe that the Wright Road Flood Prevention Measure has potential for detrimental environemental effects on Olaa Tract in the park. Olaa Tract has the status of wilderness area, designated by the US Congress. Also, Hawaii Volcanoes National Park is an official element of the International Biosphere for study of genetic diversity and other preservation purposes. The tract has the highest protection status available to any land parcel under National Park Service management.

"To flush large quantities of polluted flood waters from Wright Road farm lots onto Olaa Tract wilderness area is an unacceptable abuse of national park lands. Agricultural contaminants (fertilizer, herbicides and pesticides) would have harmful effects on soils and vegetation. Seeds of noxious alien plants would be deposited onto park lands. Large amounts of channeled flood waters dumped onto surface soils are likely to have serious erosion impacts. Alien feral pigs still resident in the tract presently bulldoze the soil and uproot the ground cover. Flood waters flushed onto the surface soil layer will exacerbate this problem and create sheet erosion.

"The project's disturbance of soils, ground cover, shrubs, ferns and trees could have deleterious impacts on the habitats of endangered and threatened wildlife. At least two endangered bird species are resident in the tract: 'Io, the Hawaiian Hawk, and 'O'u, an exceedingly rare Hawaiian honeycreeper. In addition, a number of threatened endemic Hawaiian plants inhabit Olaa Tract. Rare native Hawaiian invertebrates of great value to research in evolutionary genetics are resident in this rich rain forest habitat.

"To our knowledge, there has been no local notice of public meetings or other information on this project. Community input must be solicited to meet NEPA requirements.

"Because the project may result in significant environmental damage to a wilderness area of Hawaii Volcanoes National Park, the Society requests that an environmental impact statement be prepared to fully disclose the potential impacts on all aspects of the natural environment of Olaa Tract. It is essential that all possible alternatives outside the park be considered. There must be full opportunity for public comment, public review and revision of the proposal. This project calls for a Section 7 consultation with the US Fish and Wildlife Service under provisions of the federal Endangered Species Act."

KILAUEA FOREST TO BECOME WILDLIFE REFUGE?

Local Hawaii Audubon members are elated with the good news that extremely valuable native forest habitats in private ownership at Kilauea forest and Keauhou Ranch on the Big Island are proposed for acquisition as wildlife refuges. Those land parcels with mixed koa and 'ohi'a forest are part of the essential habitats of three endangered Hawaiian honeycreepers: Hawaii 'Akepa, 'Akiapola'au and Hawaii Creeper. The news was carried in the Hawaii Tribune-Herald (Hilo), June 26, 1987, in a story by Steve Tetreault, T-H Washington Bureau, with the headline: "House bill contains isle bird money." The story reports:

"The House passed a bill yesterday that contains $4 million to add land to Big Island refuges for endangered forest birds and plants.

"The money would add to the Hakalau National Wildlife Refuge, located on the western slopes of Mauna Kea, and also purchase acreage at the Kilauea Forest Reserve and the Keauhou Ranch...

"Those areas are home to koa and ohia forests, 19 threatened plant species, five species of endangered birds and the endangered Hawaiian Hoary Bat, according to a request for the money made earlier this year by Rep. Daniel Akaka, D-Hawaii.

"Over the past three years, Congress has spend $13.5 million to add land to Big Island nature preserves...

"Money in previous years was spent to acquire land for the Hakalau National Wildlife Refuge. With that area close to completion, officials from the Fish and Wildlife Service and the private Nature Conservancy group are turning attention to the Kilauea Forest Reserve and Keauhou Ranch.

"'Due to present economic pressures, the Kilauea Forest Reserve and remaining Keauhou Ranch forests will be considered for logging or woodchipping unless the land is acquired as a refuge,' Akaka said.

"Three other areas of the Big Island have been identified as hosting endangered species. They are Kakuku, on the southern slope of Mauna Loa, and Honaunau and Hualalai on the western side of the island.

"Those areas are likely to be targeted for protection, either through federal, state or private efforts, officials have said."

Mae E. Mull
Island of Hawaii Representative

ERRATUM

The editors regret that the last sentence of Andrew Engilis' review of *Birds of New Guinea* was inadvertently omitted. It should have read "As a student of New Guinea's Avifauna, I highly recommend *Birds of New Guinea.*"

Our apologies to Mr. Engilis.

TWO EARLY CLASSICS AVAILABLE FOR PURCHASE

Rothschild, Walter 1893-1900. *The Avifauna of Laysan and Neighbouring Islands.* R.H. Porter, London.

Wilson, Scott B. and A.H. Evans 1890-1899. *Aves Hawaiienses: the Birds of the Sandwich Islands.* R.H. Porter, London.

These two great books published in the closing years of the 19th century, describe nearly everything that was then known about the birds of Hawaii. Each contains superb hand-colored plates of most of the native birds of the islands. The books have since become reference classics, commanding a high price, and are almost impossible to obtain now.

Thus, it is of great interest and significance that a copy of each classic is now being made available for sale by their long time owner, Mr. Spencer W. Tinker, 1121 Hunakai St., Honolulu, Hawaii 96816, telephone (808) 734-1646. Persons interested in acquiring either of these books are invited to contact the owner. The *'Elepaio* is publishing this notice with the hope that these classics may be acquired by a local resident or agency, thereby remaining closer to the Hawaiian public.

ALOHA AND MAHALO TO PETE STINE

Has members regretted to hear that Pete Stine of the U. S. Fish and Willdlife Service (FWS) Endangered Species Office in Honolulu has accepted a new FWS position in southern California. Pete has been one of our most important allies in conservation efforts for Hawaiian forests. He was instrumental in negotiations among FWS, The Nature Conservancy and private landowncers for land acquisitions that comprise the new Hakalau National Wildlife Refuge on Mauna Kea on the Big Island. He has also played a role in encouraging legislation that would appropriate funds to acquire lands for the establishment of nature reserves at Kilauea Forest and Keauhou Ranch (see article in Conservation News). Pete also gave generously of his time by serving on the Board of Directors of HAS and as President of the Hawaii Chapter of the Wildlife Society. The HAS sincerely appreciates his efforts in conservation and wishes Pete success in his new position in California.

KALUANUI STREAM (SACRED FALLS) FIELD TRIP REPORT

The June 21st outing was a visit to Kaluanui Stream (Sacred Falls) with U.S. Fish and Wildlife Service Biologist Andy Yuen. Twelve people participated in the walk which started at the stream mouth near the ocean and continued about a mile up-stream. Andy planned to use a "fish shocker" device (a pole net with with wires hooked up to a 12 volt battery backpack) to flush o'opu and other streamlife from their hiding places into nets held by members of the group.

Either the streamlife knew we were coming, or the device malfunctioned, because our nets came up empty. To everyones' delight, Andy gave a thorough presentation on the natural history of Hawaii's stream ecosystems. An ominous black cloud over the Koolau Mountains and persistent rain made most of the group turn back about two-thirds of the way to the falls. A few people decided to continue up the trail on their own.

Birds encountered during the trip were Common Mynas, Cattle Egrets, Japanese White-eyes, Red-vented Bulbuls, House Sparrows, Red-crested Cardinals, White-rumped Shamas, Japanese Bush Warblers and four Orange-cheeked Waxbills.

The trip was enjoyable and HAS would like to express its appreciation to Andy for taking the time out on his first "Fathers' Day" to lead the trip.

HAS offers monthly trips for members and their families and friends. Trip locations are chosen in an attempt to expose participants to a wide variety of natural communities and plant and animal types.

Hopefully, more and more members will participate in these field activities to learn about Hawaii's unique flora and fauna and meet many of the professionals working with our environment. These individuals give their time freely to teach, share and answer any questions that outing participants may have.

Come one, come all. See you next month!

Bruce Eilerts

Biologist Andy Yuen using "fish shocker" while HAS hikers stand ready with nets.

Photo by Bruce Eilerts

AUGUST PROGRAM: KOSAKA ON BROWN TREE SNAKE AND PACIFIC AVIFAUNA

At the August 17 General Meeting of HAS, Mr. Ernie Kosaka from the U.S. Fish & Wildlife Service will present a 30 minute slide presentation showing the role the Brown Tree Snake *(Bioga irregularis)* has played in the decline of Guam's avifauna (see February 1987 *'Elepaio* for more on this problem).

The Brown Tree Snake was introduced into Guam shortly after World War II. This species is arboreal and has been shown to be a very effecient predator of birds and their eggs. As the Brown Tree Snake spread through out Guam there was a related decline in endemic bird populations. It is now felt that over 90% of Guam's endemic bird life has been lost. The causes of this decline are not completely understood, but it is felt that the Brown Tree Snake has played an important role.

Members should note that the Society has a **new meeting place**: the Atherton Halau at the B.P. Bishop Museum.

FREE ICE CREAM AND COOKIES!!

To continue to entice our capable and enthusiastic volunteers to come to paste-up, we are adding cookies as a late summer special. August paste-up will be at Thane Pratt's house on Saturday, August 22, beginning at 1 PM. We thank Rob Fleischer, David McCauley, Bob Pyle, Susan Schenk and, especially, Lee Ann Syrotuck for their help on the July paste-up. Call Thane Pratt for more information at 524-846.

VOLUNTEER HELP NEEDED

Filling orders for back issues of the *'Elepaio* is a chore needing the services of an interested volunteer. Orders received by the Society are passed to the volunteer, who would then:

- retrieve the requested issues from the file;
- package and mail them (expenses reimbursed);
- forward payments to Treasurer;
- copy an occasional issue that's in short supply;
- add copies of current new issues to the file.

The Society receives about 12 to 12 orders per year. Back issues currently are stored at Bishop Museum. Persons interested in helping the Society with this task are invited to contact Bob Pyle at Bishop Museum, 848-4155, or at home 262-4046.

ART EXHIBIT REMINDER

Members will not want to miss the exhibit of original artwork by Doug Pratt (*Birds of Hawaii and the Tropical Pacific)* that will be on display at the B. P. Bishop Museum from the time of its opening on July 30 (at 7 PM at the Museum's Atherton Halau) to the November 10 closing date. Many of the paintings on display will feature endangered and rare species from Hawaii and other Pacific Island Groups.

AUGUST 16TH FIELD TRIP TO TANTALUS

The next HAS field trip will be a hike along Tantalus on August 16th. The trip leader will be Steve Perlman and participants are urged to bring rain gear, lunch and binoculars. The hike will meander through exotic forest with some mixed native vegetation and we will visit lookouts with great views. Both native and introduced birds may be encountered during this outing. Meet in front of the State Library on Punchbowl Street at 7:30 A.M. This will be one of the easier hikes that HAS will be offering this year. For more information call Steve Perlman at 734-0519.

HAWAII AUDUBON SOCIETY

BOARD OF DIRECTORS

President	Phillip Bruner	293-3820 (wk)
1st V.P.	Peter Luscomb	923-4772 (wk)
2nd V.P.	Allen Allison	848-4145 (wk)
Treasurer	Joel Simasko	529-2364 (wk)
Rec. Sec.	Tim Ohashi	734-4006 (hm)
Cor. Sec.	Michael Hall	293-3805 (wk)
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	John Engbring	541-2749 (wk)
	Robert Fleischer	948-8884 (wk)
	Wayne Gagne	848-4166 (wk)
	Mae Mull	967-7352 (hm)
	Timothy Sutterfield	737-5874 (hm)

COMMITTEES

Adopt-a-Refuge	Timothy Sutterfield	737-5874 (hm)
Conservation	Wayne Gagne	848-4166 (wk)
	Allen Allison, Brian McKnight, Mae Mull	
Education	*vacant*	
Field Activities	Bruce and Robin Eilerts	941-5974 (hm)
	Patrick Ching, Steven Perlman	
Finance	Audrey Newman	537-4508 (wk)
	Mary Engilis, Norris Henthorne, Marie Morin, Thane Pratt, Joel Simasko	
Grants and Scholarships	John Engbring	541-2749 (wk)
	Allen Allison, Phillip Bruner, Robert Fleischer, Robert Kinzie	
Mail Distrib.	Leilani and Bob Pyle	262-4046 (hm)
Membership	Bob Pyle	262-4046 (hm)
	George Campbell, Beth Edwards, Susan Schenck	
Programs	Allen Allison	848-4145 (wk)
	Peter Luscomb	
Publicity	Darwin Bohnet	293-1410 (hm)
Publications	Andrew Engilis	
	Phillip Bruner, Sheila Conant, Peter Donaldson, Robert Fleischer, Bob Pyle	
Sales	Martha McDaniel	235-6636 (wk)

ISLAND REPRESENTATIVES

Hawaii	Mae E. Mull	967-7352 (hm)
Kauai	Dr. David and Winona Sears	822-3045 (hm)
Maui	Fern Duvall II	572-1584 (hm)

CALENDAR OF EVENTS

July 30 to November 10 - Exhibit of original bird art by Douglas Pratt . Jabulka Pavillion, B. P. Bishop Museum. Opens July 30, 7 PM.

Note: There will be no HAS Board of Directors meeting for the month of August.

August 16 (Sun.) Field trip to Tantalus. Meet at 7:30 AM at State Library on Punchbowl St. See page 85 for announcement .

August 17 (Mon.) General Meeting at **Atherton Halau, B. P. Bishop Museum** at 7:30 . Program: The potential effect of the Brown Tree Snake on Pacific Avifauna. By Ernest Kosaka. See page 85 for announcement.

August 22 *'Elepaio* paste-up at Thane Pratt's House at 1:00 PM. Call Thane Pratt (524-8464) .

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

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