



History and Population Status of Guam Swiftlets on O'ahu, Hawai'i

by Gary J. Wiles¹ and David H. Woodside²

Introduction

The Guam Swiftlet (*Aerodramus bartschi*) is endemic to the southern Mariana Islands of Guam, Rota, Aguiguan, Tinian, and Saipan. The species is endangered for a variety of reasons, including predation by Brown Tree Snakes (*Boiga irregularis*), high numbers of nest-eating cockroaches in some caves, and possibly cave disturbance by humans and feral mammals and the former use of pesticides (U.S. Fish and Wildlife Service 1991; Rice 1993; G.J. Wiles, unpubl. data). Recent population estimates are: Guam, 500 birds; Aguiguan, 400-475 birds; and Saipan, 1,100-1,300 birds (Stinson et al. 1993; G.J. Wiles, unpubl. data). Populations disappeared from Rota and Tinian in the 1970s (Engbring et al. 1986).

Swiftlets from Guam were introduced to O'ahu in the Hawaiian Islands in the early 1960s. A small population was successfully established and is now restricted to a single known breeding colony in the Ko'olau Mountains. Little biological information is available on the population and a census has never been conducted. In this paper, we document more fully the circumstances surrounding the original introductions, describe the results of the first swiftlet count on O'ahu, and briefly summarize nesting observations.

The Guam Swiftlet was formerly classified as a subspecies of the Uniform Swiftlet (*A. vanikorensis*; also commonly known as the Island or Vanikoro Swiftlet), but recent taxonomic investigations have separated populations in Micronesia into three allopatric species, with *A. bartschi* in the Marianas, *A. inexpecta* in the Carolines, and *A. pelewensis* in Palau (Browning 1993, Chantler and Driessens 1995, Lee et al. 1996). However, there remains a degree of uncertainty about the taxonomy of this species group and additional studies may well result in further

revisions.

Methods

We obtained information on the two translocations of swiftlets from Guam to Hawai'i by reviewing 19 letters and other documents written primarily by agency staff in the early 1960s. These are permanently filed at the Guam Division of Aquatic and Wildlife Resources. Our summaries of distribution and breeding information for swiftlets on O'ahu comes largely from a review of records held in the Sightings database at the B.P. Bishop Museum, Honolulu.

GJW visited the North Halawa Valley (NHV) cave on 29 November 1993 and 21 November 1997. General observations of nesting activity and cave conditions were made on both trips. A census of birds flying into the cave at dusk was conducted during the 1997 visit, employing the same technique used by researchers in the Marianas (G. Wiles, unpubl. data). Immediately prior to the count, an observer entered the cave to determine the number of roosting adults present, which inadvertently caused all volant individuals to flush from the cave. The observer returned to the entrance and began recording the numbers of swiftlets flying in and out of the cave at 10-minute intervals. Counting lasted from 1640-1830 hr, by which time all activity had ceased. Several counting sites were initially tried where the observer sat on the ground next to or just inside the entrance, but his presence frightened some birds flying past, causing them to turn around and exit the cave. After 20 minutes, a dimly lit location was selected 10 m inside the entrance, where he could press himself tightly against a small indentation in the left wall of the cave. The observer remained motionless until the end of the census and did not disturb any further birds. During the latter part of the count, darkness prevented birds from

being seen as they flew by, however, they remained easily detectable because of their distinctive click-like echolocation calls.

Results

Efforts to introduce Guam Swiftlets to O'ahu were sponsored and funded by the Hui Manu Society, a local organization of bird fanciers devoted to the establishment of exotic bird species in the Hawaiian Islands. DHW of the Hawai'i Division of Fish and Game (now the Division of Forestry and Wildlife) coordinated much of the project in Hawai'i, which was made for esthetic purposes and ostensibly to enhance insect control (Woodside 1970).

Planning for the first introduction began in 1960, when the Hawai'i Division of Fish and Game contacted U.S. Naval officials on Guam about procuring a large number of swiftlets. The Navy in turn sought the help of the Guam Division of Fish and Wildlife (GDFW; now the Division of Aquatic and Wildlife Resources) in the spring of 1961. Capture of birds on Guam through 1965 was coordinated by Terry A. McGowan, a biologist with the GDFW. In preparation for shipments to Hawai'i, McGowan caught and tested six birds under simulated shipping conditions in June 1961 and recommended that birds not be held longer than 24 hours after capture. On 7 July 1961, an additional 20 swiftlets were caught at Firebreak 3 Cave on U.S. Naval Magazine and sent to Hawai'i for necropsy, where they were found to be free of parasites and were judged to be safe as indicators for subsequent releases.

This was followed by the netting of about 175 swiftlets on the afternoon of 22 May 1962. The birds were placed in three crates and transported to Hawai'i on a commercial airliner later that evening. They arrived in Honolulu at noon on the

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same date and were driven to Niu Valley in southeastern O'ahu (Figure 1), where they were freed in a single group at 1445 hr. All but one (BPBM 152398) of the swiftlets survived the trip in good condition, and upon release, the remaining birds flew strongly from their crates, circled high over the area, and dispersed up the valley. Contrary to reports of an absence of sightings after the release (Bowles 1962, Donaghho 1970, Berger 1972), Hui Manu members observed birds in the vicinity of the valley for several months (A.S. Bowen, in litt.). An additional sighting was made along Round Top Drive in Honolulu during the summer of 1962 (T.K. Pratt, pers. comm.). Swiftlets were also reported near Niu Beach in May 1963 and a flock was seen along the Kuli'ou'ou shore in 1964 (L.S. Dillingham, in litt.).

To ensure the population's establishment, Hui Manu expressed interest in making a second introduction of swiftlets and an official request was submitted to McGowan in December 1964. On 29

January 1965, a second group of about 210 swiftlets was trapped and shipped to Hawai'i. The birds arrived in Honolulu at 0810 hr the same day, with no mortality registered. They were taken to Waimea Falls in the Waimea Valley on northwestern O'ahu and released at noon.

McGowan's correspondence does not identify the caves on Guam where swiftlets were obtained for the translocations made in 1962 and 1965. However, Drahos (1977; pers. comm.) reported that both groups of birds were captured at the Firebreak 3 Cave (Figure 2), based on his later discussions with other GDFW personnel who assisted in the project. This cave held one of the largest swiftlet colonies on the island until the late 1960s (G. Wiles, unpubl. data).

No further observations of swiftlets on O'ahu are known

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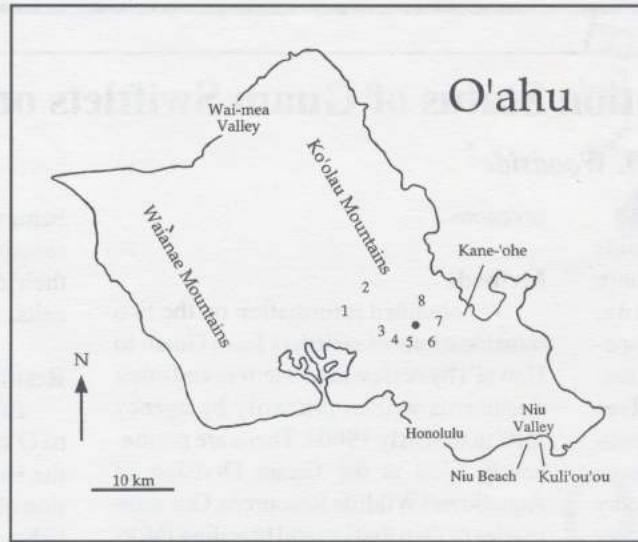


Figure 1. Map of O'ahu, showing the distribution of Guam Swiftlet sightings since 1969: (1) Pacific Palisades, (2) Manana Trail, (3) Aiea Loop Trail, (4) North Halawa Valley, (5) South Halawa Valley, (6) Moanalua Valley, (7) Ha'iku Plantation and (8) Kahalu'u Valley. The North Halawa Valley Cave is marked by the dot.

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until November and December 1969, when Donaghho (1970) discovered an estimated 25 birds foraging in the NHV. Since then, all sightings have come from this valley and surrounding areas (Figure 1). Most (14 of 21) records of foraging birds in the Sightings database are concentrated in the NHV, with scattered additional reports from the 'Aiea Loop and Manana Trails and Pacific Palisades to the west and the South Halawa and Moanalua Valleys to the south (Shallenberger and Vaughn 1978, Sightings database). There are also single sightings from windward locations in the upper Kahalu'u Valley and the Ha'iku Plantation in Kane'ohe (Sightings database). Swiftlets forage primarily over the native and introduced forests occupying the valleys and ridges of this area. Elevational records extend from 115 m in the lower reaches of the NHV to at least 550 m (Shallenberger 1976, Shallenberger and Vaughn 1978), but the presence of a few records in the windward valleys of the Ko'olau Mountains suggests that birds reach heights of up to 680-800 m when crossing the main ridge.

Discovery of the population's breeding cave in the upper NHV occurred in January 1978 during avian surveys for the proposed H-3 freeway (Shallenberger and Vaughn 1978). The site is located at about 425 m elevation and is approximately 17 km from Niu Valley and 32 km from Waimea Falls. The cave is a small human-made tunnel that was probably excavated before World War II as a potential source of irrigation water. It features a single almost straight passage measuring 59 m long, 1.0-1.3 m wide, and 1.5-1.8 m tall. Entrance dimensions are 1.8 m tall by 1.3 m wide. The cave is wet throughout the year, with water dripping from the ceiling and pools of water 5-12 cm deep covering most of the floor.

Sixty swiftlets entered the cave during the 1997 count (Table 1). Most (65%) arrivals occurred before sunset at 1749, with the last at 1815. No birds exited the cave during the count. At 1830, six additional swiftlets continued to linger in the

ravine outside the cave and were counted by a second observer with night-vision binoculars. None attempted to fly into the cave before our departure at 1855, and the echolocation calls of several were still audible as they flew about the ravine. We therefore considered the colony to hold a total of 66 birds.

Nesting occurs during most of the year at the NHV cave, with peak activity lasting from at least April to August, as evidenced by the larger numbers of eggs and nestlings during these months (Table 2). Activity was significantly reduced or absent from October to January. One egg is laid per clutch. Two or three clutches are probably produced per year, thereby accounting for the extended nesting season.

Swiftlets build their nests on the upper walls of the cave at heights ranging from 1.1-1.4 m. None were attached to the ceiling. All nests were located in the rear 11 m of the cave in complete darkness in an area where the walls remain

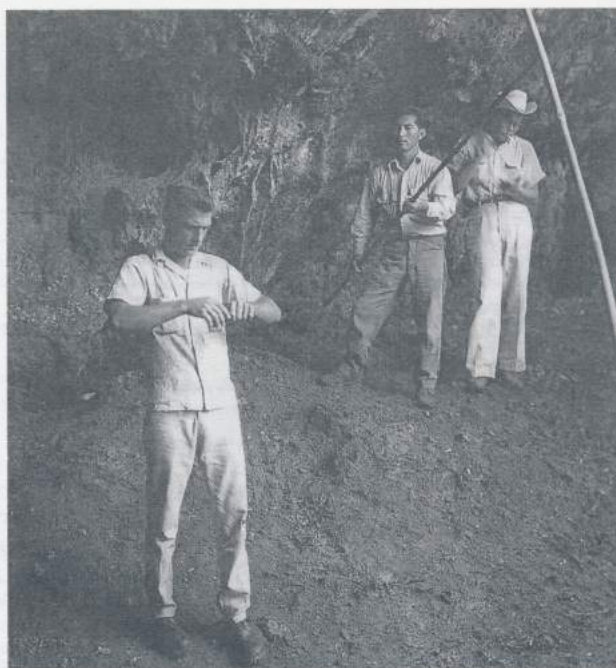


Figure 2. T. McGowan (left), I. Ikehara (middle), and F. Deleon (right) of the Guam Division of Fish and Wildlife mist netting Guam Swiftlets at Firebreak 3 Cave on U.S. Naval Magazine, Guam, for shipment to Hawai'i in the early 1960s.

relatively dry. Nests were made of moss-like material and measured about 7 cm in length, 5 cm in width, and 2-4.5 cm in height (n=3). All were single structures, with no clustering of nests as commonly seen on Guam (G. Wiles, pers. obs.). Counts of intact nests in the cave remained relatively stable from the mid-

1980s to 1997, with 10-20 nests noted on nine of 11 visits by a variety of visitors (Table 2). Lower nest counts in months with reduced breeding (i.e., January 1978, October 1986, December 1989, and November 1993) may be due to low persistence of nests beyond the end of the main nesting season in some years. GJW found the remnants of four to five older nests on the cave's walls and floor on each of the 1993 and 1997 visits. In June 1998, 33 nests were tallied, which is the highest recorded count and nearly twice the number found in November 1997.

Discussion

Our population estimate of Guam Swiftlets in the NHV is the first to be derived from an actual census of birds at their only known roosting and breeding cave. This result is higher than previous rough estimates, which generally placed the colony at only 25-35 birds (D. Woodside and G. Wiles, pers. obs.; J. Jeffrey, pers. comm.), based largely on a simple doubling of nest numbers (i.e., two adults per nest). Our observations in November 1997 suggest that a minimum of 17 breeding pairs occurred in the colony and that a large number of non-breeding individuals were present, many of which were presumably young of the year. Most of these birds must have gone on to nest in 1998, as evidenced by the large increase in nests over 1997. Greater than normal nestling survival in 1997 is perhaps responsible for the significant population growth during this period. Based on the general consistency in the rate and geographic range of reported sightings of foraging birds since the 1970s and the stability of nest counts from the mid-1980s to 1997, it seems likely that the population's size was relatively stable prior to 1997. We suggest that future counts be conducted from October to December after the completion of most nesting.

Nearly all sightings of Guam Swiftlets on O'ahu have been made within 5 km of the NHV cave since 1969. This supports a belief that the birds are probably restricted to a single breeding cave and that

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an absence of other suitable nesting sites, especially natural caves, limits further significant population growth. *A. bartschi* is not known to nest in cliffside overhangs or crevices in its native range, and this also appears to be true on O'ahu. However, irrigation tunnels similar to the one in the NHV are common on the island (J. Jeffrey, pers. comm.), thus, other small colonies may exist. DHW has heard of rare swiftlet sightings in other remote sections of the Ko'olau Mountains, but these remain unverified. We encourage birders to watch for this species else-

where on O'ahu and to report all sightings to the Sightings database at the Bishop Museum.

The NHV cave is probably a marginal breeding and roosting site because of its small size and damp conditions. Tunnels of similar dimensions dug by Japanese troops as fortifications during World War II are used by *A. inexpecta* in Chuuk in the Caroline Islands, but none hold sizable numbers of birds (Engbring et al. 1990). In contrast, the largest colonies of *A. bartschi* in the Marianas occur in much larger natural caves, with 200-500 birds typically present (Rice 1993;

G. Wiles; unpubl. data). Nighttime temperatures at the NHV cave fall to about 16 degrees Centigrade during the winter months, which is 6-8 degrees Centigrade cooler than in the Marianas, and may also reduce survival. During our visits, we did not observe other threats to the population, such as excessive human visitation, vandalism, or the presence of cockroaches, which can damage or destroy nests by consuming nest material and the swiftlet saliva gluing them to cave walls (Rice 1993).

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Table 1. Results of an evening arrival count of Guam Swiftlets at the North Halawa Valley Cave, O'ahu on 21 November 1997.

Time	No. of birds entering	No. of birds exiting
1640-1650	1 ¹	0
1650-1700	0 ¹	0
1700-1710	4	0
1710-1720	12	0
1720-1730	7	0
1730-1740	7	0
1740-1750	9	0
1750-1800	9	0
1800-1810	6	0
1810-1820	5	0
1820-1830	0	0
Totals	60	0

¹Five additional birds attempted to enter the cave from 1640-1700, but the counter's presence caused them to quickly turn around and exit the entrance chamber. These birds presumably entered the cave later in the count.

Table 2. Records of nesting activity by Guam Swiftlets at the North Halawa Valley Cave, O'ahu.

Date	No. of intact nests	Reproductive activity	Source
16 Jan 1978	"several"	nests empty	Shallenberger and Vaughn (1978), Pyle (1978) ¹
8 Mar 1978	-	nests with eggs	R. Shallenberger ¹
2 Jun 1984	20+	not noted	DHW and R. Shallenberger ¹
31 Oct 1986	0	no activity	DHW and R. Saito ¹
30 Aug 1987	17	3 nests with eggs, 3 with small chicks, 3 with feathered chicks	DHW and T. Pratt ¹
23 Oct 1988	17	4 nests with chicks almost fledged	T. Pratt and J. Engbring ¹
30 Jun 1989	18	8 nests with eggs, 2 with chicks, 3 with adults possibly incubating ²	DHW and R. Saito ¹
17 Dec 1989	"several"	nests empty	DHW and S. Fefer ¹
26 Apr 1991	14	all nests with eggs	J. Jeffrey, pers. comm. ¹
29 Nov 1993	10	nests empty	GJW, pers. obs. ¹
25 Aug 1995	16	5 nests with eggs, 5 with small or medium-sized chicks, 1 with an adult, 5 empty ²	T. Casey ¹
9 Jul 1996	15	some nests with eggs or small chicks	E. VanderWert ¹
21 Nov 1997	17	1 nest with a small chick, 2 with large chicks	GJW and DHW, pers. obs. ¹
20 Dec 1997	-	nests empty	DHW, pers. obs.
25 Jun 1998	33	18 nests with eggs, 9 with chicks, 3 with adults, 3 empty ²	DHW, K. Islam, and D. Smith ¹

¹Recorded in the Sightings database at the B.P. Bishop Museum.

²Some birds classified as adults may in fact represent nearly fledged nestlings.

Our count at the NHV cave differed in several ways from typical counts made at the main colony on Guam. At NHV, most swiftlets arrived early in the count and made only a single entry prior to roosting. On Guam, swiftlets repeatedly enter and exit the cave before dusk, with most birds making their final entry during a 20-minute period beginning 4-12 minutes after sunset (G. Wiles, unpubl. data). The individuals that failed to enter the NHV cave before nightfall may have remained outside overnight, something that is rarely noted on Guam. These may represent recently fledged juveniles that are not yet skilled at finding their way into the cave in poor light, perhaps because of poor echolocating abilities.

Breeding seasonality in the NHV resembles that recorded on Guam, where reproduction is highest from January to September and much reduced from October to December (G. Wiles, unpubl. data).

Even though the Guam Swiftlet is introduced to Hawai'i, the NHV colony has great conservation value and should be safeguarded because of the species' endangered status in its native range. The total of 66 birds represents 3% of the entire population estimate of the species. The cave's small size makes the colony highly vulnerable to disturbance by humans, including well-intentioned researchers. We advocate that visits by professional biologists be made sparingly and that recreational birdwatchers and hikers be discouraged entirely from going to the site. During our 1997 visit,

several swiftlets attempting to flee the cave collided with observers, and our presence caused a nearly fledged nestling to flutter off its nest and fall into the water on the tunnel floor. Human disturbance may cause incubating adults to inadvertently kick eggs out of nests, when the birds hurriedly take flight to escape the cave. Visitors can also easily bump into nests and accidentally knock them to the floor. Even people standing outside the cave entrance can disrupt birds attempting to enter the cave.

Our count was made just a few weeks before the opening of the H-3 freeway, but based on the large number of nests observed in June 1998, public use of the highway does not appear to be harming the colony. The cave's location is remote enough to be protected from traffic noise.

Acknowledgments

Paul Conry and Dave Worthington helped greatly by making arrangements to visit the cave and accompanying GJW to the site. Bob Pyle and the Bishop Museum kindly shared records in the Sightings database. Paul Conry, Jack Jeffrey, and Nick Drahos provided other useful information. Mike Ritter, Reggie David, Bob Pyle, Thane Pratt, and Phil Bruner reviewed the manuscript.

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Hawaiian Waterbirds Draft Recovery Plan Available for Public Review

The Second Revision of the draft revised recovery plan for Hawaiian waterbirds has been released for public review and comment (editor's note: the comment deadline was September 7, and so has passed) by the U.S. Fish and Wildlife Service. Four endangered waterbirds are covered in this plan: the Hawaiian duck or *koloa maoli*, Hawaiian coot or *'alae ke'oke'o*, Hawaiian moorhen or *'alae 'ula*, and the Hawaiian stilt, or *ae'o*. All rely on Hawai'i's limited wetland areas for their survival.

The four waterbirds addressed in this plan are found in a variety of wetland habitats including freshwater marshes, coastal ponds, taro patches, irrigation ditches, and in the case of the Hawaiian duck, montane streams and swamplands. Accurate population estimates of Hawaiian waterbirds are not available; however, none of these species are thought to number more than 2,500 individuals, with the exception of the coot population, which is estimated to fluctuate between 200 and 4,000 birds statewide.

The primary cause for the historical decline of these ducks are loss of wetland habitat and hunting. Factors that continue to be detrimental include predation by introduced animals such as mongooses, rats, feral cats and dogs; hybridization; invasion of wetlands by alien plants and fish; disease; and possible environmental contamination.

The Hawaiian duck (*Anas wyvilliana*) was listed as an endangered species in 1967 under the Federal Endangered Species Act and is found only on the islands of Kaua'i, Ni'ihau, O'ahu, Maui, and Hawai'i. State and Federal agencies' efforts in captive propagation and release

programs, enforcing strict hunting laws, and working with private landowners have helped maintain steady population levels but the species is still vulnerable due to hybridization. The largest number of Hawaiian ducks can be found at Hanalei National Wildlife Refuge on Kaua'i, and Alakoko Pond on Maui. They can also be seen in the Kahuku, Pearl Harbor, and Waiialua areas of O'ahu, and at the Mana Road pond near Waimea on the Big Island.

A large population of Hawaiian coots (*Fulica alai*) probably never existed, but they are found today on all main Hawaiian islands except Kaho'olawe. Studies in the 1950s and 1960s indicated only about 1,000 coots remained, leading to the species' endangered status in 1970. The population appears to fluctuate according to climate and hydrologic conditions. Ni'ihau has the most coots during the winter because the lakes are usually flooded. O'ahu has the largest population in the state in its coastal wetlands. Maui Nui has the second largest population in the state, found mostly at Kealia Pond National Wildlife Refuge and Kanaha Pond State Bird Sanctuary. The Big Island populations are found at Aimakapa and Opa'e'ula Ponds on the Kona coast, and at Waiakea and Loko Waka Ponds in Hilo.

The Hawaiian stilt (*Himantopus mexicanus knudseni*) was historically known on all major islands except Lana'i and Kaho'olawe. Historical population counts are unknown for this species but were believed to be about 1,000 in the late 1940s. The Hawaiian stilt was once a popular game bird, but waterbird hunting was banned in 1939. The Hawaiian stilt was listed as an endangered species in

1970. These stilts can still be found on all islands except Kaho'olawe today, but their numbers have not increased by much. The stilts can be seen at Hanalei National Wildlife Refuge on Kaua'i, Kakahaia National Wildlife Refuge on Moloka'i, and Kealia Pond National Wildlife Refuge on Maui, as well as in other wetland areas around the state.

As with the other three species covered in this plan, historical data on the Hawaiian moorhen (*Gallinula chloropus sandvicensis*) are unknown. They apparently were common on the main Hawaiian islands in the 1800s but radically declined by the mid 1900s. The Hawaiian moorhen was listed as an endangered species in 1967. Today, the moorhen is found only on the islands of Kaua'i and O'ahu and is the rarest among the four waterbirds covered in this plan. Because they are such secretive birds, it is very difficult to conduct surveys on this species. The Kaua'i population is found in lowland wetlands and valleys. The O'ahu population is widely spread but is mostly found between Hale'iwa and Waimanalo.

The objective of the draft revised recovery plan is to provide a framework for the recovery of these four endangered Hawaiian waterbirds. The availability of this plan was announced in the *Federal Register* on July 9, 1999. Copies of the draft plan are available from the U.S. Fish and Wildlife Service's Pacific Island Office at 300 Ala Moana Blvd., Suite 3-122, Box 50088, Honolulu, HI 96850, or by calling (808) 541-3441.

Source: U.S. Fish and Wildlife Service News release dated July 20, 1999.
Contact: Amy Tse - (808) 541-2749

Po'ouli Recovery Update

In an effort to prevent the extinction of this severely endangered Hawaiian forest bird, the Fish and Wildlife Service and the State of Hawai'i are proposing intensive habitat management and the translocation of one or more individuals.

Endemic to the island of Maui, the Po'ouli currently is found only in a restricted area of the island's remain-

ing rainforest. This species has been declining since its discovery in 1973, and the total population may number no more than three individuals.

From the six management proposals considered, we selected a combined alternative: continue and intensify habitat management to reduce or eliminate threats to the birds in the action area and, if necessary and feasible, conduct

translocation(s) in an attempt to bring isolated birds together to form a breeding pair.

source: U.S. Fish and Wildlife Service's Endangered Species Bulletin, Vol. XXIV, No. 3, May/June 1999, p. 25. Reported by LaRee Brosseau of the FWS Portland Regional Office.

Hawaii Audubon Society's 60th Anniversary Awards Banquet and Art Unveiling

WHAT: *A sumptuous three course dinner, 60th Anniversary art unveiling, and Annual Awards presentation*

WHEN: *Thursday, November 18, 1999, from 6:00pm to 9:00pm*

WHERE: *Sarento's Top of the I at the Ilikai Hotel*

Please join us as we hold our Annual Awards banquet and 60th Anniversary celebration! Internationally renowned artist Richard Pettit will be on hand to unveil his original painting featured on our commemorative poster, as well as other original works featuring the birds of Hawai'i.

The cost for HAS members and their spouses/significant others is \$30.00 per person, and includes dinner (see menu choices below), dessert, and a deluxe quality open edition HAS 60th Anniversary commemorative print (1 print per couple) by Richard Pettit.

The first course of the dinner features your choice of Minestrone soup or Caesar salad. This is followed by your choice of entree: Salmon Alla Boscaiola (sauteed with Portobellos, tomatoes and capers in a garlic white wine sauce), Chicken Marsala (sauteed in Marsala wine with Shiitake mushrooms), Fusilli Alla Venezia (sauteed beef tenderloin, Cremini mushrooms, sundried tomatoes in a Barolo wine sauce), or Pasta Primavera (fresh vegetables served on a bed of linguine in Marinara sauce). Dessert will be Raspberry Sorbet, and coffee or tea is included with your meal.

We look forward to seeing many of you on this wonderful occasion! Please make your reservations by calling the HAS office (528-1432) before Friday, November 5th, or mail your checks to the office (P.O. Box 4714, Honolulu, HI 96813

Celebrate Wild Things at Hakalau Forest National Wildlife Refuge

More than 500 wildlife refuges managed by the U.S. Fish and Wildlife Service will observe National Wildlife Refuge Week October 10-16, 1999. The Big Island's Hakalau Forest National Wildlife Refuge will celebrate this "wild" occasion by opening its gates to the public on Saturday, October 16.

"Visitors will be given a rare opportunity to view colorful and endangered Hawaiian birds such as the 'Akiapola'au and the 'Akepa," said Refuge Manager Dick Wass. "Two species of endangered plants called 'Oha wai may also be observed and photographed during the rainforest hikes."

Residents and visitors are invited to participate in this seventh open house at Hakalau Forest and to hike through the Pu'a Akala Tract, which harbors a high-elevation rainforest and lots of native birds. A historic 100-year-old koa cabin will also be open for viewing.

Visitors will be met by refuge staff and tour leaders at the Pua Akala Barn

anytime between 9:00am and 1:00pm. They will receive a briefing on refuge management objectives and strategies and a description of the plants and animals the refuge protects. Based on the particular interests and abilities of the visiting party, a customized hiking or driving tour will be offered.

Hikes can be as short as 15 minutes or as long as three hours and will be led by biologists and staff familiar with native Hawaiian flora and fauna. Depending on visitor interest, the refuge's cultural resources, gorse control effort, and tree propagation and outplanting program may also be highlighted on the tours.

Participants must arrange their own transportation to the Refuge. A four-wheel-drive vehicle is required for the two-hour drive from Hilo, Waimea, or Kona. "We don't recommend this trip for young children or those who lack an adventurous spirit due to the long rough ride, rugged terrain, and primitive facili-

ties," said Wass.

Visitors should come prepared for wet chilly weather and bring their own lunch, water, binoculars and rain gear. Reservations are required and may be obtained by calling the Refuge office in Hilo at 808-933-6915 by October 12. Directions and additional information will be mailed to all participants.

Hakalau Forest National Wildlife Refuge consists of 32,733 acres of native forest and grassland on the windward slope of Mauna Kea between elevations of about 2,500 and 6,500 feet. The Refuge was established to protect and manage endangered forest birds and their habitat, and contains some of the finest stands of koa-ohi'a forest in the state.

*Source: U.S. Fish and Wildlife Service
News Release dated 09/15/99
Contact: Dick Wass, 808-933-6915*

Ten Plants From Maui Nui Added to Endangered Species List

The U.S. Fish and Wildlife Service has listed ten Hawaiian plants that exist only in the Maui Nui group of islands as endangered under the Endangered Species Act. A species is designated as endangered when it is in danger of extinction throughout all or a significant portion of its range.

Eight of the newly listed plants exist in only a few remaining populations, including one plant with just two remaining individuals. Primary threats to the ten newly listed plants include habitat destruction by feral animals, including goats, pigs, and deer; competition by invasive vegetation; and chance events such as hurricanes and fires.

The Maui Nui group of islands includes Maui, Moloka'i, Lana'i, and Kaho'olawe. At one time, when the islands were younger and larger and the sea level was lower, these islands and the Penguin Bank were a single island called Maui Nui. The islands have been separated for 100,000 to 200,000 years.

"By adding these plant species to the list, we are trying to protect more of Hawai'i's unique natural resources," said Anne Badgley, the Regional Director for the Service's Pacific region. "As in many places around the world, plants play an important role in the local culture, and they deserve protection for future generations."

"By protecting these species, other native plants and animals in the area will benefit too," Badgley continued. "Many of the threats causing the decline of these plant species also are affecting native wildlife such as forest birds, tree snails, and insects."

Perhaps the most famous of the ten plants is *Kanaloa kaho'olawensis*, discovered in 1992 by two botanists from the National Tropical Botanical Garden during a survey of the Island of Kaho'olawe, soon after the State of Hawai'i assumed ownership of the island from the military. This small shrub in the legume family survived many years of practice bombing by the military as well as destruction of the island's vegetation by an overpopulation of goats.

Only two living individual plants have been discovered, both on a rock stack on the southern coast of Kaho'olawe that is almost completely separated from the island. The location's inaccessibility to goats may have allowed the plant's survival. Although goats have been removed from the island, this new plant genus is threatened today by landslides and competition from invasive plants.

A recovery plan for all ten species will be developed, and other recovery actions are anticipated. Under State contract with the National Tropical Botanical Garden, seeds of one of the plant

species listed, the Kanaloa, have been harvested and plants are being propagated. Some of the plants, particularly those on Federal or State lands, also have been fenced to protect them from predation by feral pigs and goats.

The Service's decision to list the species was published in the *Federal Register* of September 3, 1999. The Endangered Species Act does not prohibit "take" of listed plants on private lands, but landowners must comply with State laws protecting imperiled plants. Federal agencies must consult with the U.S. Fish and Wildlife Service when funding or permitting activities that may affect listed species.

Native plants are important for their ecological, economic, and aesthetic values. Plants play an important role in the development of crops that resist disease, insects, and drought. At least 25 percent of prescription drugs contain ingredients derived from plant compounds, including medicine used to treat cancer, heart disease, juvenile leukemia, and malaria, as well as that used to assist organ transplants. Plants are also used to develop natural pesticides.

Source: U.S. Fish and Wildlife Service News Release dated 09/03/99

Contact: Barbara Maxfield, 808-541-2749 or 342-5600

It's Annual Mailing Time Again!!

We need many hands to make work light! Mark your calendar:

Saturday, November 20th, 10 a.m. to 4 p.m. at the HAS office

Can you spare a couple of hours to stuff and seal envelopes so that you and your fellow members can receive 1999 HAS ballots and the President's annual report/appeal??

YOU WILL BE REWARDED by Pizza, refreshments, good company, and endless gratitude!

Please call Linda Shapin at the HAS office - 528-1432 and let her know when you can come by. MAHALO!!!!!!!!!!!!!!

Christmas Bird Count Approaches!!

by Arlene Buchholz,
Christmas Bird Count Coordinator

This year's annual Christmas Bird Count will take place between December 16 and January 3rd. The tentative date for the Honolulu count is Sunday, December 19th. Eric VanderWerf will be the compiler for that count and Arlene Buchholz will be the coordinator. People interested in participating can contact Arlene at snovakz@juno.com or 988-9806.

Rick Potts will coordinate and compile the count for Moloka'i, to be held on December 21st. You can reach him at 808-567-6802, ext. 7, or write him at Kalaupapa National Park, P.O. Box 528, Kaunakakai, HI 96748.

There will be a new count circle added on Maui this year. Lance Tanino has been working with the Nature Center in Iao Valley on Maui and they have outlined a circle center in Iao Valley for West Maui. Lance can be contacted at ltanino@parsonsuxb.com or 808-280-4195. This circle will include wetlands that have not previously been included in the Pu'u O Kaka'e count.

Reggie David will lead the North Kona count on the Big Island and can be contacted at rdavid@kona.net or call him at (808) 329-9141.

On Kaua'i, Barbara Stuart will compile the Kapa'a count. The staff at Koke'e Natural History Museum will tentatively coordinate the Waimea count. Call (808) 335-9975 or write Koke'e Natural History Museum, P.O. Box 100, Kekaha, Kaua'i 96752.

See next month's 'Elepaio for more complete information.

Report of the Nominating Committee

by John T. Harrison, First Vice President and Chair, Nominating Committee

Pursuant to Article VII of the By-Laws of the Hawaii Audubon Society, a Nominating Committee consisting of John Harrison, Linda Paul, and Ellyn Tong was appointed in July to accept and evaluate nominations to the Board of Directors. Notice of the appointment of the Nominating Committee and of their availability to accept suggested nominations from the membership was published in the August issue of the 'Elepaio.

Currently, the Board consists of ten Officers and Directors, and the By-Laws stipulate a Board of from 3 to 15 members. One Officer (Harrison) will complete a 4th consecutive 2-year term this year, and thus is ineligible for re-election. Of the remaining current Directors, Tonnie Casey, Luisa Castro, Larry Kimmel and Kris Matsumoto are completing one-year appointments and are thus eligible and for re-election to two-year terms. Dan Sailor is completing a two-year term and is eligible for re-election. Mary Gaber, Wendy Johnson, Liz Kumabe and Sharon Reilly are completing the first year of their two-year terms, and therefore are not up for re-election. However, Liz Kumabe has agreed to fill the vacancy created by the retirement of the current 1st Vice President, and thus she is nominated to serve out the remaining year of her current term in that capacity.

The Nominating Committee has determined that all those Officers and Directors presently serving who are eligible for re-election have given their consent to run for re-election. Thus, we respectfully submit the following nominations for re-election:

Officers:

Elizabeth Kumabe	1st Vice President (1-yr term)
Dan Sailor	2nd Vice President (2-yr term)
Larry Kimmel	Treasurer (2-yr term)

Directors-at-Large (all for two-year terms):

Tonnie Casey
Luisa Castro
Kris Matsumoto

In addition, we have undertaken discussions with a wide range of candidate nominees, and as of this writing, two have agreed to run, and two others are weighing their outside commitments to determine whether or not service on the HAS Board is feasible. Accordingly, we submit the following nominations:

Directors-at-Large (all for one-year terms):

Marlee Breese
Trae Menard

Final decisions are expected shortly from the additional prospective candidates. The names of all candidates, along with short biographical summaries, will be provided in a supplemental report of the Nominating Committee to be presented to the membership at the October Program Meeting on October 18th.

The By-Laws also provide that an Elections Committee shall be appointed by the Board of Directors prior to November, and that additional nominations for directors of the Society may be made to this committee by the general membership, and should be mailed to the HAS office at 850 Richards St., #505, Honolulu, HI 96813. Nominations must be in writing and accompanied by written consent of the nominee, and the Elections Committee must receive them on or before November 10th.

James Campbell National Wildlife Refuge Re-opens to Public

James Campbell National Wildlife Refuge has reopened! This is the Refuge's second season of public tours. The Refuge is closed from February 15th to August 1st so that the endangered Hawaiian stilt can hatch its broods. From August to February the Refuge is visited by many migratory birds such as Northern Pintails, Northern Shovelers, Lesser Scaup, Wandering Tattlers, Ruddy Turnstones, Sanderlings, Bristle-thighed Curlews, and other unusual visitors. The Refuge is home to all four of Hawai'i's endangered native waterbirds—The Hawaiian stilt, the Hawaiian moorhen, the Hawaiian coot, and the Hawaiian duck - year-round.

The U.S. Fish and Wildlife Service invites Audubon members and others local birders to become volunteer guides during the public use season (August through February 15th). It is a nice opportunity to bird-watch with enthusiastic community visitors as well as with avid bird-watchers from around the world that are in Hawai'i on vacation. If you are

interested in devoting some time to this most worthwhile activity, please contact Margo Stahl, Assistant Refuge Manager for the O'ahu National Wildlife Refuge Complex (808-637-6330).

Bird-watching tours are offered to

the public on Thursday afternoons from 4 to 6 p. m. and on Saturday afternoons from 3 to 5 p. m. For information and reservations, call the Fish and Wildlife Service's Hale'iwa office at 808-637-6330.



Volunteer veteran birders Bob Pyle and Michael Ord set up spotting scopes for a group visiting the Refuge.

Field Trip Reports

by *Mary Gaber, Field Trip Coordinator*

Nine Windward area Girl Scouts, along with some moms and younger brothers, learned some facts about bird-watching at Ho'omaluhia Botanical Garden on the July 31st field trip. In addition to a slide presentation of some of Hawai'i's birds, the Scouts started their life list of birds. With Mary Gaber's help, the group saw and identified 10 species as they strolled through the Garden.



On our August service trip to Mt. Ka'ala, Audubon members wielded hammers and wire cutters laying down some non-skid mesh over a portion of the boardwalk in the marsh. Reuben Mateo led the group along the trail, identifying some of the rare endemic plants along the way, and supervised the work. Pictured here is hardworking HAS member Barbara Meyer.



George C. Munro Environmental Law Award Given

Hawaii Audubon Society President Wendy Johnson participated in the annual award ceremony of the William S. Richardson School of Law at the University of Hawai'i Manoa on August 30. The Society annually sponsors a monetary award, named in honor of past president George C. Munro, which is presented to the top student in the Environmental Law course. This year's winner of the George C. Munro Award is Paul Tanaka, an industrious young man with a bright future ahead of him.

Celebrate National Wildlife Refuge Week on O'ahu October 10-16, 1999

The O'ahu National Wildlife Refuge Complex will celebrate National Wildlife Refuge Week with a series of special guided tours on Thursday and Saturday afternoons that honor Fish and Wildlife Refuges in our state. Special magnets and posters designed for the week will be given to partici-

pants in the tours that correctly answer questions posed regarding refuge related issues!

Call the O'ahu Refuge Office at 808-637-6330 to reserve your space on a tour and also to ask about other volunteer work day events scheduled for that week.

My First Bird Walks in Hawaii

by George C. Munro

from 'Elepaio Volume 5, Number 2, August 1944

If you can visualize the ridge from Punchbowl to Tantalus as covered with grass, no trees and only scattered shrubs among the grass; the eastern part of Nu'uanu likewise, with only an occasional hau bush; the pali on either side, their pristine beauty in full view all the way, then you will see them as I saw them on that long ago December 53 years ago.

When Mr. Andrew Bloxam on May 13, 1825, went through the valley, its eastern end was evidently full of native forest, as was also the face of the cliff when Bloxam and the botanist, Macrae, started out for the east-end of the valley they left their pack donkey before they reached the Nu'uanu Stream. The trail was not even fit for a donkey. Bloxam in his diary said: "We climbed over several stone walls and crossed

some gullies and ravines and then passing over a steep hill came into the beautiful valley of Anu Anu, which for a space of four or five miles from Honolulu is everywhere cultivated and covered with taro patches." Further on he says: "After we had gone four or five miles the huts and cultivated plants became scarcer and we entered into a thick wood." It would seem by this that the last two miles before reaching the Pali was in dense native forest. The thought the Pali was about eight miles from Honolulu, instead of five. On his return early in the morning of the 14th, coming up the trail he heard the O'ahu thrushes singing "melodiously" and small birds chirping. In the valley he saw a male and female I'iwi. But there was no forest in the valley in 1890.

I had arrived from New Zealand on December 13, 1890. I was eager to make acquaintance with the Hawaiian forest in which I expected to spend a great deal of

time in the following year. Though I had grown up on a farm I was well acquainted with the New Zealand "bush," as the forest is called there. I had traversed its "tracks" and helped to clear roads through



photo by Norman Carlson

Pueo (The Hawaiian Owl)

its dense undergrowth, to fell and saw into lengths its magnificent kauri trees up to eight feet in diameter, with scarcely a taper in the trunk from the ground to the branches. I had read of the tropical "jungle" and wanted to know if that of Hawai'i was more dense than the undergrowth in the New Zealand brush.

On December 17, I started to follow a trail up the ridge from Punchbowl. At one place I passed through a large area of recently planted seedling trees, in holes at intervals in the grass. I remarked that the grass made a fine protection for the trees from the wind which swept unimpeded down the hillsides. From a distance the numerous holes made a curious pattern in the grass. Chinese laborers were at work clearing round the trees. This was the beginning of the fine forest covering those ridges today, and which strangers think is native Hawaiian forest, whereas the trees are nearly all exotics.

A large bird was flying slowly over the grass in the distance. It occasionally alighted and I could only guess what it was. I thought it was a hawk, something like the New Zealand swamp hawk. I was

not accustomed to seeing an owl flying round in the daytime. On the sides of Tantalus hill there were groves of trees, koa or ohia with grass and shrubs between.

The top of Tantalus and the crater bottom were beautiful. The top was covered with different species of creeping grasses, each occupying a patch of ground to itself. In the bottom of the crater was a small lake surrounded by beds of different shades and with a little fringe of reeds along its edges. The sides of the crater were pretty steep and covered with

shrubs but the bottom was like a carpet. A pair of ducks were swimming in the lake but they took wing and I could not tell for certain which species they were. I think, however, that they were the native duck, koloa. I did not go down into the crater but sat on the side enjoying the view. Another owl flew past and circled about the crater coming close enough for me to identify it as an owl. It alighted several times in the crater. The frequent alighting of the two birds I saw would indicate that they were probably young birds whose wings had not gained sufficient strength for sustained flight.

I did not visit the top of Tantalus again until 1935 when starting on the bird survey. All signs of the lake were gone. There was more scrubby vegetation and the rubbish left from picnickers' lunches disfigured the whole scene.

June 7, 1944. To be continued.



OCTOBER 1999

'ELEPAIO

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Calendar of Events

Thursdays, October 7 and November 4: Education Committee monthly meeting, 7 p.m. at BaLe Sandwich Shop in Manoa Marketplace (near Safeway). For more information, call chairperson Wendy Johnson, 261-5957.

Mondays, October 11 and November 9: Conservation Committee monthly meeting at the HAS office at 5:45 p.m. For more information, call chairperson Dan Sailer, 455-2311.

Mondays, October 11 and November 9: HAS Board meeting, always open to all members, 6:30 to 8:30 p.m. at the HAS office.

Saturday, October 2: Tour - an educational tour of the Kailua Ahupua'a and Kawai Nui Marsh sponsored by Kawai Nui Heritage Foundation. We will walk as well as carpool to Ulupo Heiau, Kukanono & Pohakupu Historical and Hawaiian sites, Mokulana Peninsula, Holomakani Heiau (maybe), Na Pohaku O Hauwahine Heiau, Pahukini Heiau, and Oneawa Estuary. Call Mary Gaber at 247-0104 for meeting time and place, and further details. A \$5.00 fee will be charged by Kawai Nui Heritage Foundation.

Monday, October 18: Program Meeting Wildlife Biologist Sharon Reilly will speak on "The Evolution of a Wildlife Biologist, 15 Years of Birds." Sharon has travelled halfway around the world working in many areas of bird (and mammal) conservation. In Hawai'i she has worked primarily in captive propagation and fieldwork. Come hear about her adventures! The meeting is from 7:30-9:30 p.m. at Bishop Museum, Paki Hall Conference Room. Refreshments provided. HAS publications, tapes, patches, T-shirts, and our new map will be available for purchase. Hope we see you there!

Saturday, October 23: Field trip to James Campbell National Wildlife Refuge in Kahuku. This is the refuge's second year of public tours (see article, page 65). We should see all four of Hawai'i's endangered waterbirds (Hawaiian Stilt, Moorhen, Coot, and Duck) plus migratory species such as Bristle-thighed Curlews, Sanderlings, Northern Pintails, Northern Shovelers, Lesser Scaup, Wandering Tattlers, and more. Trip limited to 20 people. Call Mary Gaber at 247-0104 to register and for meeting time and place. Suggested donation, \$2.00.

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