

Popoki and Hawai'i's Native Birds

By Linda Winter, Director *Cats Indoors! Campaign* American Bird Conservancy

Hawaii Audubon Society (HAS) members are well aware that Hawai'i is considered the endangered species capitol of the world, with more endangered plant and animal species per square mile than any other place on the planet. Beginning with Polynesian settlement over 1,600 years ago, Hawai'i's bird extinction crisis continued through the period of European settlement to today. By the late 18th century, at least 45 species of endemic birds had become extinct, including flightless geese and ibis, over a dozen honeycreepers, an eagle, a hawk and several species of owl and crow. Destruction of habitat for farming and human development, invasion of alien plant species, over-hunting, disease spread by introduced mosquitoes, predation by introduced rats, mongoose, and domestic cats (popoki), and habitat degradation by feral pigs, goats, sheep, and cattle have all played a role in bringing many of Hawai'i's unique native birds to the brink of extinction.

"Millions" of Cats

Obviously, domestic cats are not the only threat to endemic Hawaiian birds, but cats are an important factor, even in higher elevations far away from human development. Hawai'i's cat overpopulation problem is legendary. In Letters from Hawai'i (1861) Mark Twain wrote,

"The further I traveled through the town the better I liked it. Every step revealed a new contrast—disclosed something I was unaccustomed to. In place of those tiresome, everlasting goldfish, I saw cats—Tom cats, Mary Ann cats, Walleyed cats, cross-eyed cats, grey cats, black cats, white cats, yellow cats, striped cats, spotted cats, tame cats, wild cats, singed cats, individual cats, groups of cats, platoons of cats, companies of cats, regiments of cats, armies of cats, multitudes of cats, millions of cats, and all of them sleek, fat, lazy and sound asleep. There are just about cats enough for three apiece all around."

Given the mild climate, cats can breed year-round in Hawai'i, with 3 litters per year of 4–6 kittens per litter. Rabies does not occur on the islands, and there are no wild predators of cats, such as coyote, bobcat, or fox, to help keep the free-roaming cat population in check. Approximately 21 percent of O'ahu's households have cats, totaling about 150,000 pet felines. Despite O'ahu's Cat Protection Law of 1995, which mandates that all cats six months or older that spend time outside must be sterilized and wear identification, cat owners may not be aware of the law, or may not have the money to spay or neuter their cats. Since 1995, it has also been illegal to abandon any animal. Abandonment is punishable by up to one year in jail and a \$2,000

fine. Despite these laws and a low-cost spay/neuter program, the Hawaiian Humane Society (HHS) must euthanize over 11,000 cats per year on O'ahu alone.

Endangered Birds

So just how serious is domestic cat predation on Hawai'i's endemic birds? The federally endangered **Palila**, a Hawaiian honeycreeper, is threatened by feral cats in their protected, but limited habitat of mamane and mamane-naio forest on Mauna Kea from 6,000 to 9,000 feet in elevation. Biologists have been monitoring the Palila population for years and have found that since 1998, 8 to 11 percent of monitored Palila nests were depredated annually by cats. Cat predation inhibits efforts to restore the Palila population. To learn more about the movements, ranges, and habits of feral cats in high elevation dry forests, biologists from the U.S. Geological Survey captured and attached radio collars to five male and three female feral cats and tracked them for 18 months. Because of the cats' large home ranges, and immigration of new cats from lower elevations, the scientists concluded that controlling feral cats in Palila habitat will be very difficult. Although a cat removal program was conducted on the western slope in 2002, the nesting season was a poor one for Palila, and this season is even worse with no nests detected as of July 7.

The **'Alala** or Hawaiian Crow, is the world's most endangered corvid. Endemic to the island of Hawai'i, this crow was once abundant in lower and middle elevation mesic forests on the western and southern sides of the island. However, by the early 1990's, 'Alala could only be found in a small area of central Kona on the west slope of Mauna Loa Volcano. The 'Alala has suffered from loss and degradation of habitat,



'Alala photo by Jack Jeffrey

predation by cats, rats, and mongoose, and avian malaria and pox carried by introduced mosquitoes. In addition, captive released birds have contracted toxoplasmosis, a disease common to domestic cats and rats. Since 1993, 27 'Alala fledglings raised in captivity have been released to the wild on the McCandless Ranch. However, as of October 1999, 21 had died or disappeared, and the remaining six were taken back into captivity. As of 2003, there were 41 'Alala in captivity. Continued captive propagation of the 'Alala is required for its recovery. A draft environmental assessment has been prepared and

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Bulwer's Petrel

photo by Jack Jeffrey



Palila

photo by Jack Jeffrey



Wedge-tailed Shearwater

photo by Jack Jeffrey



Nene

photo by Jack Jeffrey

will be updated that will consider potential release-sites on Hawai'i and Maui. After the election of an appropriate release site, significant effort will be expended to improve habitat by removing feral ungulates and removal of rats and cats before re-introduction of 'Alala.

The Hawaiian Petrel ('Ua'u), which nests in burrows, was once abundant on all main Hawaiian islands except Ni'ihau. Today the world's largest known breeding colony is found at Haleakala Crater on Maui. The primary threat to this colony of 900 or more breeding pairs is predation by introduced roof rats, small Indian mongooses and feral cats, and habitat destruction by feral ungulates. Since 1981, an ongoing and aggressive predator control program has halted most losses, and this important colony appears secure. In a study comparing reproductive success before and after trapping, and in areas protected and unprotected from predators, protected sites showed significantly higher nesting activity and success in six of eight years. In a study of Hawaiian Petrels on Mauna Loa, Hawai'i, monitored burrows in the eastern group of nests suffered limited cat predation. A single cat was trapped, and the researchers did not find evidence of predation following the capture. Success for all nests that year (1995) was 61.5%. In 1996, trapping was not conducted, and nest success dropped to 41.7%, mainly due to cat predation in one of the central nest groups. A population viability analysis suggested that at this rate of predation, the southeast Mauna Loa population of approximately 50 nests may not persist.

Nene, or Hawaiian Goose, used to live on all the main Hawaiian Islands, but nearly became extinct in the 1950s due to over-hunting. Today, the Big Island is the only place where they are found naturally in the wild, and thanks to propagation efforts, they were re-introduced on Maui, Moloka'i and Kaua'i.] Nene are extremely vulnerable to predation by introduced predators such as rats, dogs, cats, mongooses, and pigs. Most nesting failures of wild Nene on Hawai'i and Maui are due to predation by mongooses, but goslings occasionally are taken by mongooses, cats and dogs. Dogs and mongooses account for most

known cases of predation on adult Nene, but cats and poachers also kill adults. Cats are also known to kill endangered **Hawaiian Coot, Hawaiian Duck, Hawaiian Moorhen, Newell's Shearwater, and Hawaiian Stilt.**

Even common native bird populations are impacted by cats in Hawai'i. A study investigated the effects of domestic cat predation on three small nesting colonies of **Wedge-tailed Shearwater** at Malaekahana State Recreation Area on O'ahu, where stray cats were fed by the public. These colonies were compared with a large Shearwater colony at nearby Moku'auia Island State Seabird Sanctuary, where cats were absent. During the study, feral cats were fed daily at Malaekahana at a site that was located only 30 meters from the closest Shearwater nesting colony. Many more burrows produced chicks at Moku'auia (62%) than at Malaekahana (20%). At Malaekahana, reproductive success was zero at the colony closest to the cat-feeding site, and almost all breeding adult Shearwaters in that colony were killed. Populations of long-lived seabirds such as Shearwaters, which produce only one egg per year and often do not breed until they are five or more years old, are sensitive to the loss of breeding adults.

Hazards of Free-roaming Cats

Hawai'i's free-roaming cats are at risk of injury from cars, exposure to severe weather such as hurricanes, fatal feline diseases including Feline Leukemia (FeLV) and Feline Immunodeficiency Virus (FIV), and parasites including hookworm, roundworm, fleas, mites, and ticks. Domestic cats can transmit diseases, such as cat-scratch fever, to humans through scratch or bite wounds. People can also contract parasites such as toxoplasmosis, roundworm, or hookworm, through contact with contaminated soil or sand. Five or six feral cats attacked a woman who was walking her dog near a restaurant in Honolulu where a group of cats had been regularly fed. An outbreak of fleas from feral cats at the children's center on the University of Hawai'i-Manoa campus temporarily shut down the preschool.

Cat Colonies in Hawai'i

One of the most controversial methods of dealing with cat overpopulation in Hawai'i and elsewhere is trap/neuter/release (TNR) of stray and feral cats into "managed" cat colonies. Some cat advocates claim that TNR is a more humane and effective alternative than trap and removal of stray and feral cats if the cats will be euthanized. TNR varies, but in general, volunteers live-trap the cats and take them to a veterinarian to be spayed or neutered. Depending on available resources, the cats may also be vaccinated for fatal feline diseases. The tip of one ear is usually clipped to easily identify a cat that has been altered

'ELEPAIO

ISSN 0013-6069

Managing Editor: Linda Shapin

Scientific Editor:

Ronald Walker, 235-1681 (H)

The 'Elepaio is printed on recycled paper and published nine times per year: February, March, April, May, June/July, August/September, October, November, and December/January

(spayed or neutered). The volunteers then release the cats, usually at the trap site, and continue to feed them for as long as they stay in the colony. This could be a day, a month, or years.

TNR is strongly opposed by American Bird Conservancy (ABC) and many conservationists, wildlife biologists, veterinarians, and animal welfare groups. It is often difficult to trap all of the cats, the cat food attracts more cats, and the colonies become dumping grounds for unwanted pets. The cat food also attracts other introduced predators, such as rats and mongoose, which can spread disease and create a public health threat. Cats in colonies are not protected from cars, fights with other cats or dogs, diseases and parasites or exposure to severe weather. Well-fed colony cats still kill native birds, including endangered species.

The HHS and the Hawaii Cat Foundation (HCF) support the TNR program in Hawai'i begun in 1993. Every year, HHS receives funding from the City and County of Honolulu to spay or neuter cats for release. In 2002, HHS performed 2,609 free sterilization surgeries for cats in managed colonies. From 1993 to 2002, 19,786 cats were sterilized for release on O'ahu. There are over 2,000 cat caregivers registered with the HHS feral cat program on the island.

Managed cat colonies occur wherever stray and feral cats have congregated, including public parks, beaches, and sites adjacent to sensitive wildlife habitat, such as seabird nesting colonies. For example, in 1999, researchers found that a **Wedge-tailed Shearwater** colony at Waiehu on Maui near a managed cat colony lost 23 adult birds to cats in a 10-day period. A Shearwater colony at Ho'okipa lost 59 adults to cats and only 27 burrows fledged chicks. At a small Shearwater colony east of Kuau, six adult birds were killed by cats, causing the total loss of all chicks at five burrows. At Pauwalu, remains of **Bulwer's Petrel** chicks were found near a cat colony during each of three years, and there was no evidence that any chicks had successfully fledged from the colony during this time. According to researcher Dr. Fern Duvall, "Small colonies (of seabirds) were vulnerable to total failure and larger colonies to losses of returning adults and late-stage chicks and adults. Comparison of cat free Molokini islet illustrated cat predation has a sustained negative impact on established Maui native seabird colonies, expansion of colonies, and colonization of new areas by native seabirds."

In 2000, the State Health Department, Vector Control Branch proposed a ban on feeding animals in public areas because of concern that the abundant cat food at colonies was also supporting large numbers of rats. Cat advocates were outraged and a bill was introduced in both the state House and Senate that would have created, "a temporary managed cat colony task force to address health concerns related to the feral cat population." The bills would have delayed the adoption of any rules relating to feral animals, and any rules already in effect could not be enforced until the managed cat colony task force had made its recommendations in two to five years. Hawai'i Audubon Society and ABC strongly opposed the bill which was not passed by the legislature, but little has been done to prohibit cat colonies on state-owned public lands.

During my trip to Hawai'i in April 2002, I saw and videotaped managed cat colonies on the campus of University of Hawai'i, on a path adjacent to the Pearl Harbor National Wildlife

Refuge where endangered Hawaiian Coot and Hawaiian Stilt were visible, and at the parking lot of 'Iao Valley State Park on Maui. Christin Matsushige, president of HCF, told me she had reduced the stray and feral cat population on the Chaminade University campus from 145 to 45 cats, but it had taken her 10 years to do so. While that is a significant effort, 45 cats is still a lot of cats, and many of Hawai'i's bird populations don't have 10 years to wait for a stray cat population to be significantly reduced. Besides, there are no studies that indicate whether 45 or even 5 cats exert less predation pressure on a sensitive wildlife population than 145 cats.

Is TNR Legal?

Apparently not. The U.S. Fish & Wildlife Service commissioned the University of Florida's Law School to review federal as well as state and local wildlife protection and animal cruelty laws in the state to determine if TNR may be in violation of those laws. In, "Feral Cat Colonies in Florida: The Fur and Feathers Are Flying," (<http://conservation.law.ufl.edu/spotlight.html>), author Pamela Jo Hatley determined that releasing cats into the wild and supporting feral cat colonies is a violation of the Migratory Bird Treaty Act and the Endangered Species Act, as well as laws prohibiting animal abandonment. "The domestic cat species is not indigenous to Florida or anywhere else in North America. They impact native wildlife in three primary ways: predation, competition, and disease. It is essential that our state and local governments take steps to educate the public about the destructive impact of free-roaming cats on native wildlife, and strictly enforce against the release of cats into the wild," Hatley said.

Stray Cat Sanctuaries: A Better Solution

Although ABC opposes TNR, we do support fully enclosed stray and feral cat sanctuaries on private property, such as those at Rikki's Refuge, VA, Habitat for Cats Sanctuary, MA, Humane Society of Ocean City, NJ, or the Wild Cats Village at Best Friends, UT. Stray and feral cat sanctuaries protect the cats from all the dangers that free-roaming cats face, and the cats can't kill native wildlife. The HCF has a new sanctuary for 100 - 150 cats on 1.4 acres of land in the Kahalu'u-Kane'ohe area and a smaller facility in Manoa-Kaimuki.

ABC's Cats Indoors! Campaign

In 1997, concern about cat predation of birds nationwide prompted ABC to launch the *Cats Indoors!* Campaign to educate cat owners and the general public that cats and wildlife benefit when cats are kept indoors, in an outdoor enclosure, or walked outside on a harness and leash. The campaign also stresses the importance of spaying or neutering cats *before* a litter is produced, and strongly opposes cat abandonment. ABC and its many partners, including The Humane Society of the United States and American Humane Association, developed educational materials, including the brochure and matching poster, "Keeping Cats Indoors Isn't Just For The Birds." Over the years, we've added fact sheets, print, radio, and TV Public Service Announcements, posters, an Educator's Guide for Grades K - 6, Power Point slide presentations, and more. Most materials are downloadable from: <http://www.abcbirds.org/cats>.

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photo by Linda Winter



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Hawai'i Cats Indoors! Campaign

ABC has always been concerned about cat predation on Hawai'i's native birds, which prompted my trip to O'ahu, Maui, and the Big Island to meet with potential partners in a Hawai'i Cats Indoors! Campaign, to get a feel for the extent of the cat overpopulation problem, and to see some of Hawai'i's unique birds. I met with many biologists from the U.S. Fish & Wildlife Service, Hawai'i Division of Forestry and Wildlife, Haleakala and Volcanoes National Parks, U.S. Geological Survey and University of Hawai'i who generously gave of their time. I also met with staff from HHS, The Bishop Museum, Hawai'i Department of Health, and environmental committees in the state legislature. After giving a slide presentation at a meeting of HAS, Wendy Johnson, president, agreed that HAS would be a lead partner in a Hawai'i Cats Indoors! Campaign if funding were secured.

I am very pleased to announce that the Hawai'i Division of Forestry and Wildlife has given a start-up grant to ABC to help educate cat owners and the public about cat predation impacts on Hawai'i's native wildlife, and the dangers to cats themselves from roaming free. ABC will produce a state-specific fact sheet, Power Point slide presentation, Web page with downloadable materials, and a press release. The materials will be available by the end of 2003. We encourage HAS members to help distribute and advertise the availability of these materials and the importance of this issue to Hawai'i's endangered native species. Only through educating the public can we tackle Hawai'i's cat overpopulation problem at its source—cat owners.

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Check out HAS'
wonderful website:
www.hawaiiaudubon.com

Announcing the Website for the Hawai'i Forest Bird Interagency Database Project <http://biology.usgs.gov/pierc/HFBIDPSite/HFBIDPHome.htm>

The website for the Hawai'i Forest Bird Interagency Database Project (HFBIDP) represents a major step forward in distributing information from forest bird surveys in the islands. The ability to deliver information over the Internet increases data-sharing and provides an efficient means for disseminating HFBIDP products.

Since the Hawai'i Forest Bird Surveys (1976-1983), over 400 surveys of forest birds have been conducted throughout the state, but the data are scattered among agencies and in many cases have never been analyzed. The purpose of HFBIDP is three fold. First, we are producing a centralized, standardized, relational database of all forest bird census data collected since the 1970s. Second, from these data we are calculating population estimates for forest birds, producing distribution maps that depict species' ranges, and are calculating abundance estimates to detect and describe trends in bird populations. Third, these results on the status of Hawaiian forest birds will be published as printed reports and made available on an easy-to-use website.

Some Specifics about the Web Site

The website contains information for four aspects of the project's activities: databases, bird distribution and density, surveys, and documents.

The Database menu provides links to metadata files and the database dictionary. Each survey set processed by HFBIDP has two associated metadata files. The Data Proofing Summary files document the error rate in data entry, while the Data Set Summary files provide information summarizing when, where, and how each survey was conducted, as well as a record of HFBIDP's processing procedures for that survey. The Database Dictionary presents a dictionary of the database design as well as describing HFBIDP's acquisition, processing, analyses and

documentation procedures. In addition, this menu will link to a Data Entry Form and eventually to the Database (see below).

The Distribution and Density menu contains links to species maps for Hawai'i Volcanoes National Park (HAVO) and Hakalau Forest National Wildlife Refuge (HFNR). Observed Maps show distributional records for four species over the past three decades of surveys conducted in HAVO. Modeled Maps show predicted range and density for 13 forest bird species in HFNR based on modeling of data from variable circular plots and habitat associations.

The Survey menu provides links to three sets of information: region maps, transect maps and summary tables, currently only available for Hawai'i Island. As HFBIDP processes data from other islands, the region and survey maps and associated summary tables will be made available.

The Documents page lists documents HFBIDP produced or participated on and contains links to the documents when available (e.g., Hawai'i Conservation Conference poster presented in 2000).

Looking Ahead

HFBIDP is in the process of testing a Data Entry Form for keying in survey data, and we are also writing a User's Guide for this form. The form, created in Microsoft Access 2000, will allow periodic updates of tables via the Internet and easy transfer of survey data to HFBIDP. A report-generating feature of the Form summarizes survey effort (e.g., start and end dates; observers; transects and stations sampled), generates a species list, and calculates birds per station. In addition, the User's Guide details how to enter, proof and transfer the keyed data to HFBIDP. Proofed data will then be included into the database.

HFBIDP is currently adding proofed data from Hawai'i Island surveys and is normalizing the database. Survey data from the other Hawaiian islands have been entered into the database. The normalization process will make data access and retrieval more efficient. Once analysis of the data is completed, the database will be made available. As HFBIDP continues to analyze the monitoring data, results and reports will be made available to all parties via the website.

We are pleased to present the website and hope you find the information useful. We would appreciate hearing from you, and your comments and suggestions are welcome. We will announce new information as it becomes available on the HFBIDP Home Page. For more information contact Rick Camp, information below.

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Field Trips for 2003

All trips with an * are still in the process of being planned. Details will be provided as the scheduled dates get closer. A donation of \$2 per participant on all field trips is appreciated.

Shorebird Homecoming at Paiko Lagoon

September 6, Saturday 6-8:00 am

September 27, Saturday 9-11:00 am

Welcome our shorebirds home! Another great trip to Paiko Lagoon to welcome our Kolea home and see if other shorebirds have also returned. This is a keiki-friendly trip – the kids will love it! Wear old tennis shoes or reefwalkers, and bring sunscreen, water and lunch. We will meet at Paiko Lagoon at 8:30am. Call Alice to register, 538-3255.

* James Campbell National Wildlife Refuge

October—details soon!

* 'Ewa Plains Sinkholes with Dr. Alan Ziegler

November

* Christmas Bird Count

December

Nominating Committee Seeks Candidates for Board of Directors

At the Board Meeting of July 14, 2003, a Nominating Committee of Arlene Buchholz and Linda Paul was formed (one more committee member is to be selected). The committee is looking for Society members who are willing to serve on the Board of Directors. The bylaws call for fifteen directors to serve two-year terms; five of the fifteen directors are elected by the membership to officer positions. Normally eight directors are elected in even years and seven elected in odd years. This varies, however, as a result of resignations and Board members being appointed to fill unexpired officer terms.

Positions open for nomination are President, Second Vice President, Treasurer, Recording Secretary, and 5 Directors. Recording Secretary Tonnie Casey will be running for reelection, as will Directors Chad Castle and Alice Roberts. Director Arlene Buchholz and First Vice President Liz Kumabe's terms will expire in 2004.

The HAS Board is a dynamic group of committed individuals whose energy and expertise involve many aspects of environmental protection in Hawai'i from fund raising to education, and from birding to habitat cleanup. All members of the Board are expected to attend two-hour Board meetings every other month and a Leaders' Retreat in January. Directors are also expected to be active on one of the Society's two standing committees: Conservation and Education. Persons interested in serving on the Board are encouraged to attend a Board meeting; the next one is listed in the Calendar section on the back page.

If you are a Society member and want to be a candidate, please submit a letter of interest and brief resume of your background and activities (in and/or outside of HAS) to the attention of the Nominating Committee at the Society's address by November 10, 2003. For an information sheet giving more specific information regarding responsibilities of officers and directors, please call the office at 528-1432. Nominating Committee members may be contacted by emailing the HAS office at hiaudsoc@pixi.com, or calling 528-1432 for their individual phone numbers.

Our next Program Meeting will be on August 18th

The speaker for the August meeting will be Diana King, Project Manager for the National Audubon Society's nature center in Waimea Valley. She will discuss the cultural and natural resources of Waimea Valley and National's plans for preservation and education there.

Program meetings are held at Henry Hall Room 109 on the Chaminade University campus, 3140 Wai'ala'e Avenue, Kaimuki. Meetings are from 7:30 to 9:30pm. Refreshments are served, and HAS publications, T-shirts, and maps are available for purchase.

Mark Your Calendar – HAS' 10th Annual Awards Dinner is October 20th

This marks the tenth year that the Society has recognized outstanding volunteers, corporate leaders, and public servants for their contributions in protecting Hawai'i's native wildlife and habitats. The dinner will once again be held at Hawai'i Imin Conference Center at UH Manoa from 6:00 to 9:30pm, with dinner catered by Kaka'ako Kitchen. Look for details in the October 'Elepaio, or coming soon on our website, www.hawaii.audubon.com. Please make your reservations no later than October 15th by calling the HAS office at 528-1432 or emailing us at hiaudsoc@pixi.com.

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- 3) Purchase participating *Give Aloha* products to help increase the \$200,000 gift!

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The Wings Over Alaska Birding Program Takes Flight This Spring

Now birders throughout Alaska and North America will have even more incentive to identify as many birds in the state as possible. "Wings Over Alaska" is a new Alaska Department of Fish and Game program that encourages more people to enjoy Alaska's birds and to take their birding skills to a higher level. Alaska is home to a huge variety of birds—468 species have been positively identified to date—and makes the 49th state a paradise for birders and a destination for many who hope to see Auklet and Bristle-Thighed Curlew.

Wings Over Alaska participants are awarded certificates for bird species they have seen in Alaska. There are four levels of certification for birders based on identifying 50, 125, 200 and 275 species in the state. The highest level of certificate will be signed by the Governor.

You can start birding anytime. Birds already on your Alaska life list count towards your Wings Over Alaska certificates. Birders are encouraged to record their observations at www.eBird.org <<http://www.ebird.org/>>, a free program to track your birding efforts and make a contribution to science.

Wings Over Alaska Rules

- * All birds listed must be within the state of Alaska when identified. For purposes of this program, birds identified when traveling between Alaska ports by boat, whether or not within territorial waters, will be accepted.
- * All birds listed must be alive, wild, and unrestrained when identified. Birds at the zoo or a raptor center or mist-netted don't count, birds at your feeder do.
- * Birds must be naturally occurring in Alaska. Accidentals that got here on their own count. The neighbor's loose parrot doesn't, even if it survives the winter.

- * All birds listed must be identified by sight or sound by the person submitting the application.
- * Applicants may be asked to provide details or verify listings at the discretion of the department. All awards will be made at the discretion of the department.
- * A complete application is required for each person.
- * Only one person may be listed on each certificate awarded.
- * Just one of each certificate per person please.

For more information or to be included on a list for program announcements e-mail: wingsoveralaska@fishgame.state.ak.us or call the program coordinator, Karla Hart, at 465-5157.

The Wings Over Alaska program is sponsored by Alaska Airlines.

HAS Awards Two Research Grants

by Phil Bruner
Chair, HAS Grants and Scholarships Committee

HAS is pleased to announce the awarding of \$500.00 research grants to Stephanie Dunbar and Charles Chimera. Stephanie's project involves the systematics and biogeography of three endemic *Plantago* species. Charles' work is focused on seed dispersal and seed predation in Hawaiian dry forests. This ecosystem has declined dramatically since human contact. Not only are many of the plants associated with this habitat rare, but many birds once found in these forests are now extinct. Charles and Stephanie will provide a summary of their findings for inclusion in the 'Elepaio.

2003 Membership in Hawaii Audubon Society

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Calendar of Events

September 15, Monday

HAS Board meeting

Open to all members, 6:30 to 8:30 p.m. at the HAS office. Education and Conservation Committees meet at 5:45 p.m. before Board meetings. Please note: Board Meetings have been changed from the second Monday of every other month to the third Monday, alternating months with Program Meetings.

August 18, Monday

Program Meeting

See page 48.

September 6 (6-8:00 am), and 27

(9-11:00 am) Saturdays,

Field Trips

Shorebird Homecoming at Paiko Lagoon.

See page 47.

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