

## Hawai'i's Extinction Crisis: A Call to Action

The local news media recently reported on something we have long been aware of—Hawai'i's natural environment is under siege. Their stories were based on a "Report on the Status of Hawai'i's Natural Heritage," issued by the Hawai'i State Department of Land and Natural Resources, the U.S. Fish and Wildlife Service, and the Nature Conservancy of Hawai'i. Highlights of that distressing report follow:

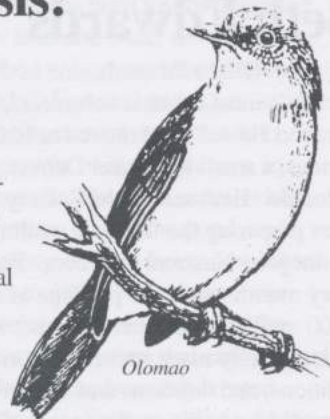
The natural environment of Hawai'i is one of our planet's most magnificent treasures. The islands are home to more unique species than any place of similar size on Earth. The only tropical rain forests in the 50 United States are found in Hawai'i. But Hawai'i's rain forests and the plants and animals they shelter are in serious trouble. Only by acting quickly and decisively, can we save many of Hawai'i's native species and their unique and fragile island environment.

The challenge we face is how to balance the needs of a growing population and island economy with the preservation of Hawai'i's limited natural resources. People are already working energetically together, in private groups and government agencies, to save Hawai'i's rain forests and other native ecosystems and the thousands of plants and animals that survive only there. But current efforts are not enough to stem the tide of extinction, and time is running out. We must act now.

Hawai'i has the most active volcano in the world, the wettest and the tallest sea cliffs. All major ecological zones of Earth



are represented in Hawai'i, from coral reef systems through rain forests to high alpine deserts—in less than 6,500 square miles of land. Hawai'i is home to over 10,000 life forms found nowhere else on the globe.



Extinction is a natural process. But in Hawai'i it began accelerating 1,500 years ago with the arrival of the Polynesians, and then accelerated even more in the late 1700s with the arrival of the Europeans. Today, extinction rates are thousands of times greater than the natural rate. If we are to save what is left, today's unnatural rates of extinction cannot continue.

Of all the places on Earth, Hawai'i has the most alarming concentration of species teetering on the brink of extinction. Hawai'i amounts to only 0.2% of the land area of the United States. Yet nearly 75% of the nation's historically documented plant and bird extinctions are from Hawai'i. Of all the currently endangered North American bird species, 41% are from Hawai'i. Hawai'i is home to more endangered birds and plants than any other state in the nation.

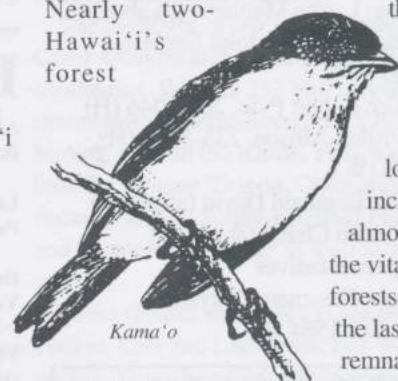
Hawai'i used to sustain at least 140 species of native birds. Now 70 of those species are extinct. Of the 70 surviving, 30 are endangered. Twelve of those species are down to such low numbers that they are at or close to the brink of extinction and may be beyond recovery.

As of 1 September, 1991, 37 Hawaiian plant species were federally listed as endangered. The entire U.S. endangered species list includes 209 plants—18% of

which are Hawaiian species. Within the next two years, the U.S. Fish and Wildlife Service expects to add 152 more Hawaiian plants to the list. Among the ranks of Hawai'i's rarest plants are at least 93 species with no more than 100 known individual plants—including trees, shrubs, herbs, vines, and ferns. At least five of these have been reduced to a single plant.

Many species described in the late 1800s can no longer be found, among them two dozen species of O'ahu tree snails whose beauty inspired both native folklore and early publications on evolution. Scientists estimate that there are well over 5,000 species of insects and other invertebrates yet to be discovered and described. Without decisive action, many of them may not survive long enough to be discovered. For many of Hawai'i's rarest plants and animals, loss of habitat is a primary cause for decline. Ecosystems in Hawai'i—from sun-baked coastal shrublands, through eternally wet rain forests, to snow-bound alpine deserts—are as unique and varied as the plants and animals they support.

Nearly two-thirds of Hawai'i's original forest cover has been lost, including almost 50% of the vital rain forests. Today, the last remnants of coastal plant communities are on our most remote and arid shores. Ninety percent of the lowland plains once forested by sandalwood and other unique dry forests have been destroyed. Of the 150 natural communities remaining today, 85 are considered critically endangered. While the loss of a single species is of serious concern, the loss of entire natural communities represents a crisis for Hawai'i's plants and animals, and ultimately for us.



(Continued on page 4)

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## Aloha to Beth Edwards

Elizabeth (Beth) Edwards, one of the Society's most devoted volunteers, has departed Hawai'i and moved to Idaho Springs, a small town near Denver, Colorado. Beth served the Society for years preparing the 'Elepaio mailing labels for our joint National members. Faithfully, every month, when the package of around 2,000 mailing labels arrived at her home, Beth carefully made numerous corrections, additions, and deletions and delivered the corrected set to the mailing team. Occasionally she helped with the actual mailing preparations.

A few days before leaving in mid-October, she took time out to be married to Jon Snyder in a beautiful outdoor ceremony in Pu'u 'Ualaka'a Park overlooking Honolulu. Her considerable help and friendly concern for the tasks are much appreciated and will be missed. The Society bids her fond aloha and best wishes for her new opportunities with Jon in Colorado. 

## HAS Dues for 1992

All amounts are in U.S. dollars.  
Includes delivery of 'Elepaio.

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## Mahalo Donors!

We wish to thank the following members and friends for their generous support. This list reflects contributions received through 6 December, 1991.

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## Mahalo Volunteers!

Mahalo to the following people who volunteered their time to help with the November mailing of dues notices, ballots, and fund-raising letters: Dorothy Cornell, Reggie David, Rebecca Lacno, Lynne Matusow, Christi Moore, Scott Nichols, Elly Roberts, and Brett Strong.

## Join Our Phone Tree

The Hawaii Audubon Society is growing a phone tree—a chain of people who can make calls to decision-makers on environmental issues. This allows the environmental community to respond very quickly with public pressure on important issues. To join our phone tree, call David Hill at 943-2784.

# GREENPRINT

VOLUME 4, NUMBER 1

AUDUBON HAWAII CONSERVATION NEWS

JANUARY/FEBRUARY, 1992

## THE ENDANGERED SPECIES ACT

**Reauthorization provides an opportunity to strengthen the law**

In the mountains of southern California, a great bird spreads its enormous wings and soars effortlessly through the sky. It peers down on a landscape it has never seen before, though its ancestors have flown here for thousands of years. The California condor, North America's largest bird, once stood perilously close to extinction. For several years, none of these birds has known freedom; all were in captivity, part of a last-ditch effort to rescue this majestic species from extinction. This winter, that rescue effort reaches a dramatic milestone with the release of captive condors back into the wild. Two condor chicks, offspring of the last birds brought in from the wild, will soar over the mountains northwest of Los Angeles. Against almost insuperable odds, the endangered Species Act (ESA) is succeeding in turning the condor's road to extinction into a road to recovery.

The success of the condor does not stand in isolation. This fall, 50 young black-footed ferrets were released on a high, windswept plain in southcentral Wyoming. Only a decade ago the species was thought to be extinct. Thanks to the success of a breeding program funded under ESA, there are more than 300 of these masked weasels in captivity, and biologists hope next year to double the number of ferrets placed in the wild.

Red wolves, bald eagles, whooping cranes, brown pelicans, peregrine falcons, alligators, gray whales, and many other plants and animals, both in the U.S. and abroad, also have benefited from recovery programs under this landmark 1973 law. However, every four or five years, including next year, Congress must reauthorize the funding authority in the Act and, as always, this subjects the law to close scrutiny and opens the door for amendments.

### THE OPPOSITION

In past ESA reauthorizations, this process has resulted in a net benefit for endangered wildlife because many of the amendments adopted in 1978, 1982, and 1988, fine-tuned and strengthened the legislation. But 1992 may be different unless the environmental community bands



Endangered Nene at Kapapala Ranch, Big Island.  
Photo by D. Kokubun.

enforcement provisions and insure adequate funding for conservation activities.

Frantic last-ditch efforts to save a species like the California condor or the black-footed ferret from extinction are expensive and labor intensive, but unfortunately, often necessary. Many more species could be saved, but the agencies with principal jurisdiction over the endangered species program, the U.S. Fish & Wildlife Service and National Marine Fisheries Service, are woefully understaffed and underfunded. As a result, there are hundreds of species on the endangered species list that do not receive the attention they deserve, dozens receive no funding at all, and more than 250 do not have recovery plans. Currently,

together to defend the Act from the onslaught of amendments expected from a powerful, well-funded coalition of miners, loggers, shrimpers, ranchers, inholders, real estate developers, Western water barons, and others, joined by their ideological allies in Congress and the Bush administration.

In addition to spawning a national anti-ESA coalition, powerful Pacific Northwest politicians, including House Speaker Tom Foley (D-WA), may align themselves with other regional delegations to support weakening amendments to the Act.

For example, in August, Congressman Jim Hansen (R-UT) and thirteen western Republicans introduced legislation that may well be the most dangerous assault on the Endangered Species Act. Hansen's bill (H.R. 3092), cited as the Human Protection Act, would require "that potential economic benefits under ESA outweigh potential economic costs." In ten words, this amendment would completely gut the Endangered Species Act. Under current law, economic considerations are taken into account in recovery efforts, but a determination of whether to list a species as threatened or endangered is based "solely" on biological factors. Hansen's amendment would strike the word "solely" from this provision and require federal agencies to consider the economic impacts of listing a species. This would not only bring the listing process to a virtual halt, but would fundamentally abandon the reasons Congress enacted legislation to protect endangered species — to prevent species from becoming "extinct as a consequence of economic growth and development" and to preserve their "esthetic, ecological, educational, historical, recreational, and scientific value to the National and its people."

More than 300 anti-ESA lobbyists, under the banner, "Fly In For Freedom", stormed Capitol Hill in September. The group reportedly is preparing a comprehensive bill to weaken the Act. In addition to Hansen's bill, opponents are expected to champion an amendment that would eliminate protection below the species level, such as for subspecies like the northern spotted owl and for vertebrate populations like the Mojave desert tortoise.

#### THE CONSERVATIONIST'S AGENDA

The conservation community, collectively known as the Endangered Species Coalition, have a list of amendments of our own that we recently presented to leaders of the Senate Environmental Protection Subcommittee and House Fish & Wildlife Subcommittee. Our amendments are designed to streamline the process of listing species, improve critical habitat designation, enhance recovery planning, strengthen

there are more than 3800 candidate species that federal agencies believe warrant listing. Obviously, this is not what Congress intended for the Endangered Species Act.

When Congress reauthorizes the law next year, these problems must be addressed. But lawmakers should go a step further. The Endangered Species Act would be strengthened substantially if Congress would adopt a provision that requires federal agencies to take a more proactive, multi-species, ecosystem approach aimed at preventing species from becoming threatened or endangered. This is easier and makes far more economic sense than forever racing to save individual species from the brink of extinction. The conservation community is preparing to offer such an amendment.

#### TIMING

The funding authority in the ESA expires on September 30, 1992, but otherwise provisions in the Act remain in force. Congress has been known to delay reauthorization for several years because of controversy surrounding substantive changes in the law. Congressional leaders may opt to defer floor consideration until after the '92 elections. However, we can expect the heat to be turned up considerably on this issue as both sides posture and the media fans the flames. Over the course of the next year, we can expect several committee hearings and perhaps even votes on the various legislative proposals. But it is simply too early to predict whether ESA will be reauthorized this Congress.

— Randall Snodgrass

#### WHAT YOU CAN DO

- Please write to Representative Pasty Mink and Representative Neil Abercrombie and urge them to oppose H.R. 3092, Congressman Hansen's Human Protection Act.
- Ask the members of the Hawai'i delegation — Mink, Abercrombie, Senator Daniel Akaka and Senator Daniel Inouye — to take a leading role in reauthorizing ESA by championing amendments supported by the Endangered Species Coalition.
- Join the Hawai'i Audubon Society activist phone tree and make phone calls or write letters on local, state and national conservation issues. Contact Dave Hill at 943-2784, eves.
- Become part of the Audubon ESA grassroots network. Call the Hawai'i State Office at 522-5566 to receive information and action alerts specifically on the ESA reauthorization campaign.

## A Message from the Editor:

For the next two years, the Hawai'i State Office of National Audubon will be at the forefront of one of the most important campaigns in the history of United States wildlife protection. Our lead story spotlights the federal Endangered Species Act and describes why protection of rare plants and animals under this law may be at risk. Randall Snodgrass, director of wildlife policy for the National Audubon Society in Washington D.C. describes recent threats to the Act and forecasts its future.

In future issues of *Greenprint*, we'll provide updates on the debate over the ESA and suggest ways you can participate. Although the first committee hearing in the nation's capital may be nearly a year away, Audubon will be taking full advantage of the coming months to set the tone of the debate and to inform our members.

Over 70% of the U.S. species already extinct came from the Hawaiian islands. Arguably, the ESA is more important in Hawai'i than in any other state. Without a strong Act, we could see the extinction rate rise to unbelievable proportions.

The reauthorization of the ESA will be a battle fought and won at the grassroots level. Without the help of concerned citizens in Hawai'i and across the country we cannot expect to win. I hope that you will consider becoming personally involved.

— Dana Kokubun



SCA intern Melodie Isgro searches for a rare Hawaiian beetle at Haleakala National Park. Photo courtesy of Hawaiian Electric Industries.

## Conservation Internships Offered to Young Adults in Hawai'i

## BIOCONTROL: CURSE OR CURE?

The unofficial motto of Audubon's Alien Species Alert Program (ASAP) is "prevention is the best cure", but many pest plants and animals continue to become naturalized to Hawai'i. In fact, certain species of pest plants — like banana poka — are spreading like wildfire. What can be done to control alien pests in Hawai'i once they're already established?

Hand clearing, pesticides, or herbicides may be options in some cases, while impractical or environmentally unwise in others. For example, the pest plant *Clidemia*, or Koster's curse covers so many acres that attempting to clear the plants by hand is simply not feasible. Instead, the Department of Land and Natural Resources has tested and released a fungus which attacks *Clidemia* plants.

DLNR's fungus scheme is an example of classical biological control, or biocontrol: the suppression of pests by the deliberate introduction of its natural enemies. Biocontrol has been practiced by the state of Hawai'i for about a hundred years.

An early example of a misguided biocontrol attempt is the common myna, brought to feed on the armyworms infesting pastures in the late 1800s. Unfortunately, the myna has also been accused of disseminating the seeds of the plant pest *Lantana*. And since 1902, no less than 26 insect species have been deliberately introduced as biocontrol agents for *Lantana*. They have been largely successful, however; today the several hundreds of thousands of acres once ravaged by *Lantana* at the turn of the century have been reduced to about 5,000 acres statewide.

A few years ago the National Park Service warned that half of Hawai'i's native ecosystem was susceptible to invasion by *Myrica faya* or firetree and took the lead in publicizing the problem. The State legislature provided funding to test biocontrol agents on nearly 100 plants over three years in order to ensure that non-target plants would not be affected. The testing revealed that despite the fact that ironwood, alder, and oak are related to *Myrica faya*, the larvae of the biocontrol agent placed on the leaves of those trees would starve to death. Four insects are currently in quarantine awaiting release to control firetree infestations and another fifteen hold promise.

More biocontrol projects aimed at insect pests have been conducted in Hawai'i than anywhere else. According to Po-Yung Lai, former head of the Plant Industry Division in the Hawai'i Department of Agriculture, biocontrol has been effective in controlling 38 species of insect pests and 7 species of weeds in Hawai'i. Biocontrol is now often com-

Wanted: Hawai'i high school graduates, age 18 or older, to work with government conservation agencies. Interns will work on projects to protect the state's forests, wildlife and other natural resources.

The Student Conservation Association, with a grant from Hawaiian Electric Industries Charitable Foundation, is recruiting local volunteers to work with the U.S. Fish & Wildlife Service and the National Park Service in Hawai'i.

Volunteers work as Resource Assistants for 12 weeks, usually in summer. They receive travel grants to cover transportation costs, free housing at the project site and a stipend for food and basic living expenses. Some of the participants are in college, but a person does not need to be a student to apply.

The Student Conservation Association is a private, non-profit education organization which recruits volunteers to assist with conservation projects that would not be feasible otherwise due to budget and staffing limitations.

Hawaiian Electric Industries Charitable Foundation provided funding for the intern program last year, but all the volunteers were from the mainland. This year, the Foundation would like to strongly encourage local participation in the program.

Resource Assistants will be working at Hakalau Forest National Wildlife Refuge on the windward slopes of Mauna Kea or at Hawai'i Volcanoes National Park on Mauna Loa, both on the Big Island.

Resource Assistants work a 40-hour week. Projects include protecting the habitat of endangered birds, alien plant control, botanical surveys, and reforestation. They also will help with trail and cabin maintenance, assessment of visitor impact, resource management, fire prevention programs and wild animal control.

The Hawai'i Forest Birds Research Project at Volcanoes National Park also will use Resource Assistants. Volunteers will assist with nesting behavior surveillance, mist-netting and banding of native and introduced birds.

This conservation intern program has a lot to offer to young adults in Hawai'i. Interns will have the opportunity to improve their general job skills and knowledge of resource conservation as they will be working closely with resource professionals. For college students, the program can be used to satisfy internship requirements or to earn off-campus elective credits.

Most of the internships are available in summer, but some positions are open throughout the rest of the year. For more information, contact SCA-RESOURCE ASSISTANT PROGRAMS, P.O. BOX 550 Charlestown, NH 03603, (603) 826-4301.

— Rae Alice Hall

management system.

Dr. George Markin, a researcher at Volcanoes National Park, is responsible for testing potential biocontrol agents to ensure that they attack only targeted species. He would like to see quarantine facilities expanded and a long term multi-agency commitment to biocontrol. Dr. Frank Howarth, entomologist at the Bishop Museum, concurs with Dr. Markin that the dangers of extensive plant damage may sometimes outweigh some of the potential risks of bio-control.

Dr. Howarth warns that biocontrol "is an extremely risky activity" and that some species brought in for control switch to non-target hosts. Dr. Howarth notes, "As we bring in more alien species, even for good intentions, the risk of wrecking havoc on native systems becomes greater."

Both Dr. Howarth and conservationist Betsy Gagné have called attention to the possible extinction of at least 15 species of the larger native moths, which they believe to be largely caused by biocontrol agents. Thus far, no plant species appear to have been driven to extinction through such introductions, though Dr. Howarth is quick to point out that "absence of evidence of negative environmental impacts is not evidence of absence of these impacts."

Dr. Markin himself admits that of the 50 plant species in Hawai'i targeted for biocontrol about 40 had been deliberately introduced. He feels strongly that all plants in the melastome group, like *Clidemia* and *Miconia*, and all members of the broom family should not be allowed into Hawai'i in the first place.

Attempts to control alien species often involve expensive and Herculean efforts. The amount spent to control the lesser corn stalk borer since 1986, for example, has reached nearly \$8 million. A cautious approach to biological control would appear most prudent. The seeds arriving today could be the weeds of tomorrow.

— Sheila Laffey  
Dana Kokubun

#### WHAT YOU CAN DO

- Testify at the upcoming Noxious Weed Hearings. Call the Department of Agriculture on your island for dates and locations.
- Join the Noxious Weed Task Force which is developing a consensus position for the Noxious Weed Hearings, and investigating broader issues involving noxious weeds in Hawai'i. For more information, call the Hawai'i State Office at 522-5566.

# Turtle Tumors

by Niki Lauren

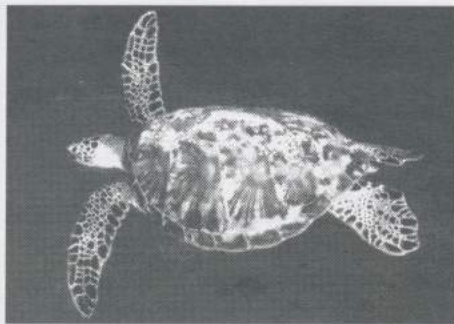
The idyllic scene of Hawaiian green sea turtles effortlessly gliding through the sea as the sun reflects off their glistening, smooth skin is becoming rarer and rarer. Turtles with tumors are appearing everywhere, some heavily infested.

In the last few years, green sea turtles around Hawai'i and Florida have developed tumors, called fibropapilloma, in epidemic proportions. The cause is yet unknown, but it is the unanimous belief among scientists that this disease represents a significant threat to the green turtle's survival and will continue to affect turtle populations, both local and worldwide, according to the report, "Research Plan for Marine Turtle Papilloma—Results of a 1990 Workshop," edited by George H. Balazs and Samuel G. Pooley. Much of the report was based on papers submitted by workshop participants.

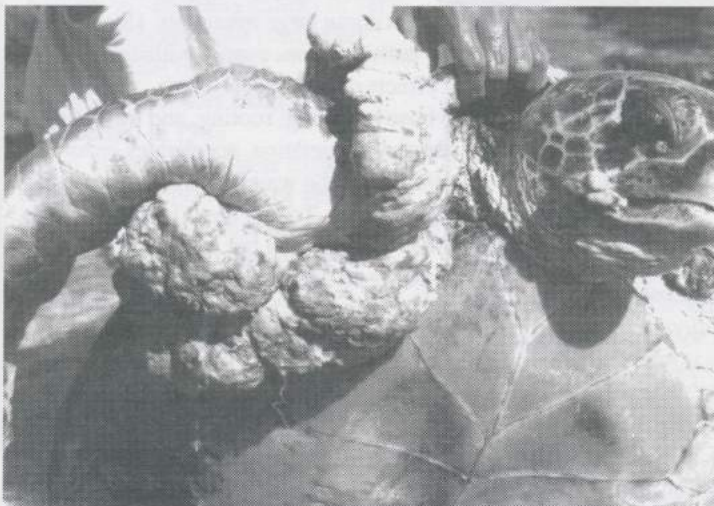
Green turtle fibropapilloma (GTFP) can develop on the skin (neck, flippers, or tail), eyes, mouth, and internal organs of turtles. Tumors range from a few millimeters to 30 cm in diameter. If lesions are near the mouth or eyes, turtles may have trouble eating, breathing, or seeing. Some turtles are blinded. GTFP can also affect swimming ability.

GTFP appears to increase turtles' susceptibility to parasitism by marine leeches. Observations in Hawai'i suggest that GTFP can cause emaciation, increased predation by tiger sharks and humans, reduced ability to migrate and breed, and increased entanglement in fishing gear. GTFP, then, is not simply a cosmetic problem but one which interferes with the species' survival. So far GTFP has been documented almost exclusively in green sea turtles, although there have been a few sightings of afflicted olive ridleys in the eastern Pacific and loggerheads in Florida.

Green sea turtles, *Chelonia mydas*, are listed as a threatened species in Hawai'i and are protected under the U.S. Endangered Species Act. Historically their populations have suffered serious decline due to over harvesting, habitat destruction, and incidental capture and mortality due to fisheries. The Hawaiian green sea turtle population is geographically isolated, and the number of reproductive females has been reduced to only 100-500 annually, according to George Balazs. Up to 12% of



Left: Healthy green sea turtle. Photo by David Schrichte.



Below: Turtle suffering from GTFP. Photo by George Balazs.


the nesting females tagged yearly at the breeding colony of the French Frigate Shoals have lesions, he continued. At Kane'ohe Bay the live capture by hand of 121 turtles since 1989 has shown GTFP rates ranging from 50-90%, according to the report.

Although GTFP has been reported in sea turtles since 1938 (Lucke 1938; Smith and Coates 1938), the earliest documented incidence of the disease in Hawai'i dates to 1958. The cause of the disease is still unknown. Participants (including scientists from across the country) at the 1990 workshop in Hawai'i on GTFP hypothesized the following causes: viruses, parasites, pollutants, environmental factors such as water temperature changes, food chain contaminants, transmissible tumors (nonviral) through sexual or other direct contacts, wound complications, weakened immune systems, genetics, or a combination of these factors.

According to the report, the most hopeful direction seems to point to identifying either a virus or a parasite in relation to the disease. Meanwhile, there are a number of immediate solutions which do not require the cause of the disease to be known first. Some of these include tumor removal (e.g. by surgery, cryogeny, or experimental dye infusion which is laser

activated to produce tissue necrosis), removal of diseased turtles from the population, drugs to reduce collagen levels in the reptiles (since the larger tumors consist mainly of collagen), immunization of turtles with tumor extract (similar to early attempts at immunizing humans against smallpox when the isolated virus was still unidentifiable), and improving the turtle's habitat.

Unfortunately, there are many constraints to finding the cause for GTFP. Inadequate funding and lack of time commitment due to other priorities of researchers are some problems. Also needed are a coordinated research plan to deal with this highly mobile population, research materials (green turtles and their tissues), data on the life cycle of green turtles, a controlled facility for experimental studies, and a public awareness of GTFP.

There are important reasons, however, for finding the cause of GTFP. First, there is the welfare and survival of this rare and threatened species. Second, diseased turtles, their stranded carcasses, or factors causing the disease may be possible threats to humans. And finally, there is the question of aesthetics and negative impacts to marine recreation and tourism. 

## Crisis: A Call to Action

(continued from page one)

Extinction is irreversible. There is no way to replace a species once all of its members are gone. For thousands of species, Hawai'i is their only home and their only hope. For humans, these species and the eco-

systems they form are of immense importance. Loss of species is only an *indicator* that something very serious is happening to our islands and our world environment. When species disappear, ecosystems deteriorate and human life suffers. With the loss of each individual species, the ecosystem deteriorates incrementally. We seldom know at which point this deterioration will mean the collapse of the entire ecosystem. We do know, however, that our day-to-day survival depends on the maintenance of a healthy, natural environment.

We rely on forest watershed areas for almost all of our fresh water. The forest intercepts rainfall, allowing water to slowly percolate into groundwater aquifers and streams. The constant recharge of our potable water supplies homes, businesses, and agriculture—services of the forest to Hawai'i's economy. Native forests protect fragile soils from erosion and, in turn, prevent siltation of reefs offshore. The health of our ocean fisheries is directly linked to the health of our forests.

We rely on native organisms for approximately 75% of all the modern medicines and pharmaceutical products we use. Valuable medical breakthroughs continue to be made. For example, scientists recently discovered a powerful anti-tumor compound in a soft coral, the *limu make o Hana*, found only in a few spots on Hawaiian reefs. The *limu make o Hana* has such promise that a research corporation was founded in Hawai'i to synthesize the new drug. Common plants and fungi contain thousands of chemical compounds which have the potential to become

effective in treating disease. Yet fewer than 10% of Hawai'i's plants have been surveyed for their possible medicinal value.

The main threat to Hawai'i's surviving native species and natural communities is the destructive effect of non-native species introduced to the islands by people. Hawai'i's native species evolved on islands without large mammals. Hence, many native species cannot withstand the effects of pigs, goats, cattle, and deer, whose browsing, rooting, and trampling destroys vegetation, accelerates erosion, and opens the way for other animal and plant pests. Today, these hoofed animals have invaded all but a few mountain peaks on Moloka'i, Maui, and Kaua'i.

Native birds have been hit hard by diseases carried to Hawai'i by non-native birds. Avian malaria and pox are transmitted to the native birds by mosquitoes, another introduced pest which has spread into the forest.

Some plants brought to Hawai'i by humans have exploded in an environment lacking the natural controls that kept them in check in their homeland. For example, banana poka, an attractive passion flower vine, is limited in its native South America by insects that feed on it. But in Hawai'i, banana poka has already smothered over 70,000 acres of native forest on two islands and threatens to destroy even larger areas unless effective controls are found.

Species that pose even greater threats are poised to invade Hawai'i. For example, on Guam the brown tree snake has wiped out 9 of the 11 species of native forest birds since 1975. This snake has stowed away on flights from Guam to Hawai'i. It has been found here by inspectors on six occasions. But how many times has it not been intercepted? If it establishes itself here, the outlook for protecting Hawai'i's native birds will worsen dramatically.

The brown tree snake is a frightening symbol of a disturbing trend: each year Hawai'i is invaded by at least 12 new, non-native species. As many as 35 new, non-native species have been known to invade Hawai'i in a single year. Among these are species destructive to forests, agriculture, and human health. Without strong, effective inspection and

enforcement programs, there will be more destructive and costly invasions.

The voyaging canoes of the Polynesians brought the first humans to Hawai'i 1,500 years ago. With humans came the need to clear land for food and housing, and the introduction of new plant and animal species. Unfortunately, some of these new species—such as pigs, dogs, and rats—preyed on native birds, plants, and insects. Others competed with native species for habitat. For cultural purposes, the feathers of thousands of forest birds were used to create ceremonial capes.

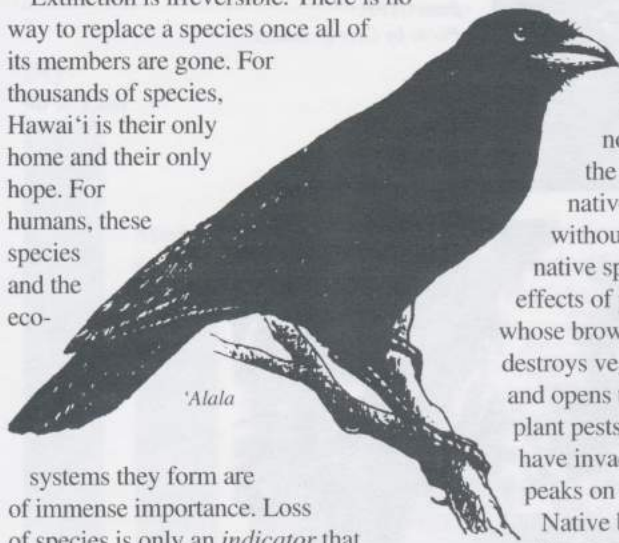
Damaging introductions accelerated greatly with the arrival of Europeans in the late 1700s. They introduced many more non-native species, including cattle, goats, European boars, and mosquitoes. They felled much of the forests for agriculture, grazing, and fuel for sugar mills. Just as European and Asian diseases decimated the native Hawaiian people, so did increased forest clearing. Introduced pest species continue to take a heavy toll on native Hawaiian plants and wildlife.

Today, land conversion to agriculture, ranching, and residential uses has permanently displaced native vegetation on over half of the Hawaiian landscape. Coastal and lowland areas have been particularly affected. Wildfires often destroy rare dryland native plants. Flammable non-native weeds take over these burned areas, creating a vicious cycle of destruction. Modern fishing techniques threaten marine and seabird life. Increased development, tourism, and a growing population continue to impact Hawai'i's natural resource base.

While Hawai'i's early inhabitants relied heavily on Hawai'i's natural resources for their survival, our survival today depends on saving what is left of our native ecosystems. We need to strike the proper balance between the needs of an island economy and growing population and the preservation of Hawai'i's limited natural resources.

The challenge of saving Hawai'i's remarkable natural heritage has spurred state and federal agencies, private organizations, and individuals to work together.

To protect essential habitat for native species, more than one million acres of land are now included in a network of state, federal, and private natural areas. Together, these areas include examples of nearly 75%



'Alala



Nukupu'u



of Hawai'i's 150 natural communities. Increased funding for fencing, animal and weed control, and other active management to save our remaining ecosystems from further invasion will be key to their continued survival.

In recent years, new initiatives have begun to address many of the most serious threats to Hawai'i's natural heritage. A consortium of public agencies and non-profit organizations has taken the lead in halting the threat of invasion by new and even more destructive alien species through stricter importation and quarantine procedures and widespread public education. Their work is just beginning.

Efforts to rescue Hawai'i's rarest plants and animals are underway through innovative propagation programs involving zoos and botanical gardens from Hawai'i and the mainland.



'Akialoo

Captive rearing has been successful for two of

Hawai'i's endangered birds, the Nene (Hawaiian Goose) and Koloa (Hawaiian Duck). Propagation techniques need to be developed or improved for many others.

Similarly, over 100 of Hawai'i's rarest plant species are now under cultivation and await reintroduction to protected areas. The goal of all these programs is to reestablish these plants and animals in their natural, wild habitat.

Conservation of Hawai'i's unique ecosystems requires an understanding of how they work and how they should be managed. The need to focus more research on urgent conservation questions is great. To meet this need, scientists from different research groups and universities are joining forces to build field stations, increase funding, coordinate research programs, and develop university programs in Hawaiian conservation biology and resource management. To bring conservation to the people, environmental education is essential. Another new local consortium has formed to promote and improve environmental education opportunities throughout the islands. For the first time, an elementary curriculum about Hawai'i's special island ecosystems is available. A modest high school conservation internship program is expanding, and more agencies are offering volunteer



Oahu Creeper

programs to involve local communities in the management of their protected areas.

While these efforts are yielding promising results, it is clear that current efforts are not enough. The tide of extinction continues to sweep the islands, and more must be done.

Here's what we can do to reverse the extinction trend in Hawai'i.

#### **Protect essential habitat for native species.**

National parks and wildlife refuges, state-owned reserves and sanctuaries, and private preserves now protect many important habitats throughout the state. But essential forests, wetlands, and other natural areas on several islands remain vulnerable. They must be protected—and soon. State and federal funds must be allocated to protect these areas through purchase or long-term conservation agreements. Only the lasting legal protection and management of large, intact natural areas can ensure the long-term survival of the majority of Hawai'i's plants and animals.

#### **Fund active, long-term stewardship of essential habitats on publicly-owned**

## Hawai'i's Birds "On the Brink"

'*Akialoo*—probably extinct; last observed in 1964

'*Alauahio*—probably extinct; last observed in 1985

*Kakawahie*—probably extinct; last observed in 1963

*Nukupu'u*—probably extinct or very near extinction; last confirmed observation in 1988

*Olomao*—probably extinct; last observed in 1988

*Maui 'Akepa*—very near extinction

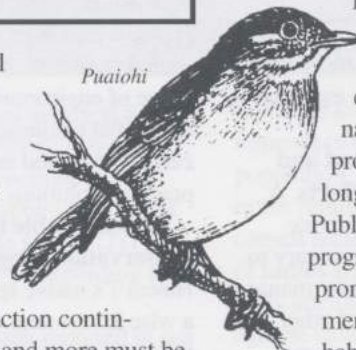
'*O'u*—probably extinct or very near extinction; last observed in 1989

*Po'ouli*—critically low numbers

*Kama'o*—probably extinct; last observed in 1989

*Puaiohi*—critically low numbers, as few as 20 remain

'*Alala*—critically low numbers



Puaiohi

**natural areas:** National Parks and Refuges, State Forest Reserves, Natural Area Reserves, and Sanctuaries. More than half of Hawai'i's wild lands (over 1 million acres) are owned by the state or federal government. Strong public agency programs to manage these habitats are vital in the battle against extinction. The chief challenge facing public land managers is the threat of pigs, goats, weeds, and other pests foreign to Hawai'i. National Parks and Refuges require increased federal funding for effective pest control. Recent support for management of the state's irreplaceable system of Natural Area Reserves, Forest Reserves, and Sanctuaries must continue to grow to address these threats on state lands.

**Provide strong incentives for private landowners to protect endangered species and native ecosystems on their property.** Nearly one million acres of Hawai'i's native forests and other important habitats are privately owned.

Incentives like the State Natural Area Partnerships will

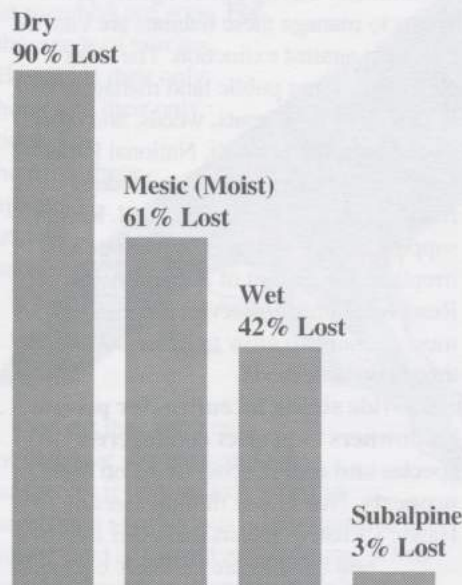
encourage landowners to commit their high-quality natural lands to conservation by providing 2:1 matching funds for long-term stewardship projects. Public/private matching fund programs must be bolstered to promote wise, long-term management, improve native species habitat, and ensure sustainable use

of forest resources. Additional incentives, such as favorable tax classifications for forested lands, are also urgently needed.

**Halt the flow of new foreign pest species into Hawai'i.** Congress and the state legislature must recognize Hawai'i's exceptional vulnerability to destructive foreign plant and animal pests and enact special measures to prevent the establishment of additional problem species. Hawai'i cannot keep pace with its extinction problems if new, destructive pest species continue arriving in commercial cargo, personal baggage, or packages mailed to the islands.

**Increase public awareness of the extinction problem and public participation in the solutions.** New programs to develop environmental education curricula for Hawai'i's schools must be expanded so young people can learn about the island's special ecosystems, their struggle for survival, and the opportunities for saving

## Estimated Losses of Hawaii's Native Ecosystems



them. University programs and more hands-on conservation experiences are essential to train conservation professionals.

**Further integrate government and private citizen conservation efforts.** A task force of federal, state, and private conservation organizations is necessary to coordinate land acquisition, habitat management, research, enforcement, and other conservation measures in the most cost effective manner possible. Shared databases on the status and biology of native species need reliable funding.

**Expand intensive efforts to rescue species "on the brink."** For dozens of species now nearing extinction, survival depends on human intervention to collect and raise Hawai'i's rarest plants and animals in botanical gardens and zoos. These intensive propagation projects have begun for native birds, rare plants, and even tree snails. But the program must be expanded to include the many species at greatest risk.

**Increase the effectiveness of conservation laws.** State and federal conservation laws and their companion regulations have been designed to prevent accidental destruction of important resources, as well

as to penalize intentional harmful acts. To effectively enforce these laws throughout the islands, there is an urgent need for additional state and federal enforcement, planning, and regulatory staff.



Maui 'Akepa

In some cases, conservation laws also need to be revised, and new laws may need to be enacted.

**Increase scientific research and training focused on Hawai'i's conservation challenges.** A key ingredient in the successful conservation programs currently underway has been strong scientific research to develop safe, effective control methods for alien pest species, to determine the habitat needs of native forest birds, and to solve other basic natural resource management problems. To meet the challenges ahead, more applied research is needed, and training programs must be strengthened to prepare more people for increasingly complex conservation work. Hawai'i also offers an ideal site for long-term research within an incredibly wide range of environmental conditions. Here the global challenge of extinction can be carefully studied and met head-on with practical solutions.

**Provide stable funding for essential conservation programs.** The protection of Hawai'i's native species and ecosystems is a wise investment in the long-term health of the state, the nation, and the world. To be successful, conservation programs generally require long-term commitments of both people and resources. Erratic funding can quickly reverse the progress gained through many years of management. By committing to maintain funding levels for key programs, government can secure these programs against hard economic times—times when people are even more dependent on the "free services" of a healthy environment. Uninterrupted annual funding for the management of state and federal natural areas is imperative. Secure, long-term funding for public/private partnerships and other incentive programs is also essential.

**Lastly, you can become an active member of the Hawai'i Audubon Society.** Participate in our conservation and educational programs. Help us prepare public testimony. Hawai'i's extinction problem can be reversed, but it will take the hard work of all of us.

## Grants and Scholarships

The Hawaii Audubon Society makes grants annually for research in Hawaiian or Pacific natural history. Awards generally do not exceed \$500 and are oriented toward small-scale projects within this state. HAS also awards a \$1,000 tuition scholarship to an undergraduate in an accredited university majoring in a field related to Hawaiian or Pacific Basin natural history.

The deadlines for receipt of grant applications are 1 April and 1 October; for scholarships, 1 May. For information and application forms, contact John Enbring, HAS Grants and Scholarships Chairman, P.O. Box 4443, Honolulu, HI 96812, Tel: (808) 541-2749 (days)

## Hawaiian Wildlife Information

Do you need information regarding recent rare or unusual wildlife observations within the main Hawaiian Islands? Call Bruce Eilerts at 487-1806. He will advise you on rare bird sightings and offer tips on where to best observe native flora and fauna. Please leave your questions and messages on his answering machine.

## Notice to Authors

*'Elepaio* invites submission of scientific articles on the natural history of Hawai'i and the Pacific. Such articles are subject to peer review.

Scientific articles should be typewritten and double-spaced. Four copies must be submitted. In addition, authors are asked to submit the article on a computer diskette, with clear indication of the word processing program used.

Photographs may be either color or black-and-white prints, 3.5 by 5 inches or larger. Cropping lines (if needed) should be indicated. The originals of figures, maps, graphs, etc. should be clean and clear, with lettering large enough to remain legible after reduction to fit journal format. Submit two good-quality xerographic copies along with each original illustration.

Manuscripts should be sent to *'Elepaio*, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813.

# HAS Concerned About Population Growth


by Marjorie Ziegler

At the urging of the Hawaii Audubon Society (HAS), Sierra Club Hawai'i Chapter, Conservation Council for Hawai'i, Hawai'i Planned Parenthood, and Zero Population Growth, Governor Waihee proclaimed 20-26 October, 1991 as World Population Awareness Week. The organizations also committed to help raise public awareness regarding the consequences of unmanaged growth. At the last legislative session, HAS supported House Concurrent Resolution 307 and House Resolution 328 which called for the revival/re-establishment of a state commission on population growth and the implementation of recommendations made by the commission a few years ago. Our testimony follows:

The Hawaii Audubon Society strongly supports the intent of these resolutions, which would contribute toward sound population growth policies in this state. The Society has noted, with great concern, increasing pressures on land, water, and other natural resources, which are essential to maintaining Hawai'i's native ecosystems.

For example, increasing amounts of land and water are being developed for residential, resort, recreational, and other purposes. Along with population growth and its associated land and water development, is the need for more landfills, roads, energy, and the like, which place additional pressure on native ecosystems. Much of the development has occurred to the detriment of native species and their habitats and is especially noticed on the outer islands at present. (This is in addition

to socio-economic and environmental impacts of unlimited and poorly planned growth on the human species.) Habitat for native species has been lost or degraded because of land and water development; can we afford to lose any more than we have already? Forested and other natural areas are being carved up by roads to facilitate growth, or in many cases, to promote growth. Precious water, which supports stream, anchialine pond, and estuarine ecosystems, is being committed on almost a monthly basis to meet the needs of increasing land-use activities. Nearshore coastal waters and ecosystems are degraded by inadequately treated sewage, which is discharged from facilities that are unable to handle existing loads.

Unlike parts of the mainland, Hawai'i is, or should be by now, painfully aware of the finite amount of land and other natural resources in Hawai'i. The Society urges you to take legislative action and encourage the implementation of sound growth policies in this state. Recommendations previously have been made by a special commission, which was given such a mandate. Possibly, the Office of State Planning could coordinate implementing these recommendations and identify legislative, administrative, and other means by which to do so. We hope that this Legislature has the foresight to consider this action now when there is still time to plan ahead. Mahalo nui loa for the opportunity to comment. If the Society can be of any assistance, then please let us know. 

## Moving?

Please allow four weeks for processing address changes. Because our records are kept in order by zip code, we need both old and new addresses.




## Come Bird With Us in Arizona

Former Hawaii Audubon Society President and award-winning wildlife photographer Bruce D. Eilerts will lead a spring birding tour from 2 May to 9 May, 1992. This tour is timed to see the southeastern Arizona specialty birds, resident desert birds, and Mexican species. We will visit both the low and high desert for incomparable birding. Tucson is our starting point for an introduction to desert birds, including Roadrunner, Costa's Hummingbird, Cactus Wren, and Gambel's Quail. We will then spend the next three days stopping in Madera Canyon, Patagonia, Huachuca Mountains, and Ramsey Canyon Preserve. The terrain will change from dry scrub and mesquite of the low desert to lush, high desert canyons lined with sycamore.

The highlight of our trip is a stay at Cave Creek Canyon at the base of the Chiricahua Mountains. With its 337 bird species, the mountains are considered one of the hottest birding spots in the nation. Here we will look for Elegant Trogon, Olive and Red-Faced Warbler, Sulphur Bellied Flycatcher, and Montezuma Quail, as well as Mexican species.

Other species we expect to see are Gilded Flicker, Gila and Ladder-backed Woodpecker, Vermilion Flycatcher, Great-tailed Grackle, Inca and White-winged Dove, Harris' Hawk, Gnatcatcher, Rufous, Black-chinned and Broad-billed Hummingbird, Cassin's and Botteri's sparrow, and Abert's Towhee.

The cost of this trip, which is limited to 13 participants, is \$1,290 per person, double occupancy, round-trip from Tucson.

For a complete itinerary write to Trips, Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813. The cost includes a \$100 donation to the Hawaii Audubon Society. 

## Your Bequest Can Help

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

Although an attorney should be consulted in the drafting of your will, a model clause

for bequests is set forth below.

"I hereby give, devise, and bequeath to the Hawaii Audubon Society, Honolulu, Hawai'i, the sum of \_\_\_\_\_ dollars (or set forth a description of property), to be used for the general purpose of said organization."

For more information and assistance, contact the Hawaii Audubon Society, 212 Merchant Street, Suite 320, Honolulu, HI 96813, (808) 528-1432.

# Calendar of Events

## January 11, Saturday

Board meeting, 7:00 p.m. Call Reggie David on Hawai'i, 329-9141 (W), for details.

## January 18, Saturday

Field trip to James Campbell National Wildlife Refuge. Meet at the State Library on Punchbowl Street at 7:45 a.m. or the Kahuku Sugar Mill Parking Lot at 9:00 a.m. Bring binoculars, hat, sunscreen, water, and lunch. We will see the endangered Hawaiian Stilt, Coot, Gallinule, and Duck as well as other waterbirds and migratory ducks. Suggested donation: \$2.00. For more information call Casey Jarman, 956-7489 (W).

## January 21 and 22, Tuesday and Wednesday

Annual fund-raising phonathon. Help is needed for this event. See details on page x.

## February Field Trip, Weekday Date to Be Announced

We will tour the Red-footed Booby colony at the Kane'ohe Marine Corps Air Station on Mokapu Peninsula. The party will be limited to 25 persons. For more details and

to register in advance, call Casey Jarman, 956-7489 (W). Suggested donation: \$2.00.

## February 17, Monday

General Meeting, 7:30 p.m., Atherton Halau, B.P. Bishop Museum, four part program on Alien Species. Showing of "The Threat From Beyond," a five minute video produced by the State Department of Agriculture, which warns incoming airline passengers about the dangers of bringing alien species into Hawai'i. Sheila A. Laffey, from the Alien Species Alert Program (ASAP) of the Hawai'i State Office of the National Audubon Society will give an overview and look at the pathways aliens take into Hawai'i. Scot Medbury, horticulturist, Honolulu Botanical Gardens, will discuss the role of botanical gardens and limited plant introductions. And, Betsy Harrison Gagné, former research assistant, Haleakala National Park, will discuss what belongs, what doesn't, how they spread, and what to do about it. Refreshments will be served.

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# Help Needed for 21 and 22 January Phonathon

As part of our annual fund-raising campaign, we will be calling O'ahu members on Tuesday, 21 January and Wednesday, 22 January. This is the fourth year HMSA is assisting us by kindly making its phones available. Calls will be made from 6:00 p.m. to 9:00 p.m. both evenings. Dinner will be served prior to the event. We need your help in seeking pledges from members. Call Lynne Matusow, 531-4260, if you can make telephone calls.

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