

## The Importance of Stream Beings

by William S. Devick  
Division of Aquatic Resources

Hawaii is the water state, renowned for its spectacular waterfalls and surrounding blue sea. Our hundreds of freshwater streams by contrast barely register on the public consciousness. To the callously uninformed, streams are at best environmental annoyances that catch waste from the land, pollute the ocean, kill reefs, and at times inconveniently inundate structures built on flood plains. Unless these waters are captured or diverted for beneficial uses such as irrigation, the water flowing out to the sea is considered wasted. Streams flowing through urbanized areas of course must be bulldozed, reconfigured, and filled with concrete to move water through more rapidly and contain even storm flows within artificial banks.

In biological reality, Hawaii's streams are an extension of the sea, or more properly, perhaps the sea should be viewed as an extension of streams, which we have identified as mauka-makai lifelines. The five species of native stream fishes (known collectively as 'o'opu) and four migratory invertebrates ('opae kala'ole or shrimp; 'opae 'oeha'a or prawns; and hihiwai and hapawai or limpets) are descendants of ocean colonizers and are still by definition actually marine species. They all exhibit an amphidromous life cycle in which larval development takes place at sea but the remainder of their lives is spent in fresh water. Three of the 'o'opu ('o'opu nakea, 'o'opu nopili, and 'o'opu hi'ukole or alamo'o), opae kala'ole, and hihiwai are excellent climbers capable of ascending vertical waterfalls and may be found many miles inland. The 'o'opu hi'ukole and opae kala'ole have been found at elevations as high as 3,000 feet.

Properly managed streams literally feed the sea, not just with water. They provide the basic nutrients that sustain nearshore fisheries. They replenish groundwaters and wetlands. They form estuaries, green-blue bridges,



Male 'o'opu hi'ukole (*Lentipes concolor*). Photo © Mike Yamamoto, Division of Aquatic Resources.

where fresh and salt waters mix. These transition zones serve as nurseries for a wide variety of marine organisms and are especially susceptible to upset from human interference with naturally functioning ecosystems.

The original Polynesian immigrants to Hawaii developed a complex society inseparably linked with stream resources and formed a deep emotional attachment to stream biota. Postlarval 'o'opu, known collectively as hinana, were harvested en masse and regarded as a delicacy. Certain of the inland 'o'opu were reserved as food for the ali'i. Streams, their watersheds, their biota, diversions for taro with return of water to the stream, fishponds, and fronting waters of the ocean were intelligently managed within a unit known as an ahupua'a. Some present day local communities have retained an intense appreciation of these resources and understand their part in the cultural heritage of native Hawaiians. Modern ecologists who are espousing an ecosystem approach to resource management have begun to recognize the equivalence of ecosystem and ahupua'a boundaries and in that sense may just be catching up with the management practices of the old Hawaiians.

The ascendance of westernized customs in Hawaii highlighted exploitation of resources and transformed local practices definable as sustainable management into maximization of economic gain. Natural resources began to be mined, which is to say not replaced. The ahupua'a ideal, or ecosystem-based manage-



'O'opu nopili (*Sicyopterus stimpsoni*). Photo © Mike Yamamoto, Division of Aquatic Resources.

ment, was subverted by many actions, but most dramatically by diversion of water from streams for industrial scale agriculture, especially sugar cane. With the loss of stream water the native stream biota were devastated, taro culture declined, fish ponds deteriorated, and productivity of nearshore marine waters declined. By the 1980s it became blatantly apparent that unless preventive action was taken, the native stream biota would inevitably slip to threatened or endangered status.

Creation of a State Water Code in 1987 and formation of the State Commission of Water Resource Management (CWRM), reinforced by growing appreciation of streams in the conservation community, provided a vehicle for halting that slide. For the first time there was an assertion of state authority over surface waters, which previously had been viewed as privately owned and therefore beyond the scope of state regulation. With the new assertion of authority came an unavoidable responsibility to protect the surviving biological resources despite the increasing demands of the ever-growing human population. Although far from perfect, the resultant process has effectively met an implicit objective of "no net loss of habitat" occupied by native biotic populations recognized as significant and has encouraged rapid improvement in understanding fundamental elements of the distribution, behavior, habitat requirements, and biology of the prominent native aquatic species and of non-human threats that persist, such as invasions by alien species.



The process was sorely tested this year by a water development project proposed jointly by the State of Hawaii and County of Kaua'i at Makaleha Springs and Stream on northeast Kaua'i. The development would tap the natural springs in the Makaleha Mountains through construction of an underground cut-off trench, and in the process would substantially alter the surrounding area and reduce stream flows. Planning was completed by the mid-1980s, but the project was slowed by persistent questions about its environmental impacts. Nevertheless, by 1995 most per-

mits had been acquired and the final decision rested with CWRM; needless to say, the pressure for approval was extremely intense.

Makaleha Stream is an upper tributary of Kapa'a Stream, a large stream system that through most of its extent is an environmental disaster area due primarily to agricultural development. The Makaleha Stream and Springs area is presently unspoiled by diversion or other development and, under the criteria of the 1990 Hawaii Stream Assessment, would receive an "outstanding" rating for its biological resource value. It would also

qualify for Heritage Stream designation, under rigorous criteria developed by the Stream Protection and Management Task Force in 1994. (Heritage Streams, under the proposed plan, would be off limits to any development; unfortunately, the program has yet to be implemented.) Viable populations of 'o'opunakea, 'o'opu nopili, 'o'opu hi'ukole, and opae kala'ole populations are present, and only one alien fish species, *Poecilia reticulata*, has been found in the most recent surveys. The degraded habitat in most of the remainder of the Kapa'a Stream system is incapable of sustaining these natives, although a wide variety of aquatic alien species thrive there. Despite downstream diversions in the Kapa'a system and a gauntlet of aliens, periodic flows are sufficient to permit the obligatory life cycle migrations between Makaleha and the sea.

There are additional unique non-migratory natives dependent upon Makaleha. Up to five species of the endemic, biologically important damselfly (*Megalagrion*), which have been described as the insect equivalents of Hawaiian honeycreepers, inhabit the area. One species of native lymnaid snail (*Erinna newcombi*) previously unknown to science was recently found in Makaleha and is the subject of a Federal petition for listing as an endangered species. The Makaleha Springs area also is a prime candidate for the existence of hyporheic ecosystems, which Dr. Frank Howarth of the Bishop Museum has hypothesized may exist in Hawaii. This possibility has been ridiculed by non-biologists but needs to be taken seriously.

Biologists who reviewed the Environmental Impact Statement recognized that the development would permanently alter a unique, biologically important habitat, could upset the associated ecosystem to the point that it would no longer support the highly diverse native aquatic invertebrate fauna, would degrade the last remaining vestige of natural habitat suitable for native stream fishes in the Kapa'a system, could lead to the extermination of organisms warranting endangered species categorization and would irretrievably damage Makaleha Springs and Stream. As surrounding communities began to realize the harm that would ensue to an area that they already believed should remain in a natural condition, opposition to the project increased, intensified by their knowledge that less destructive water development options existed. Given this background, and a failure to demonstrate a need for new domestic water sources in the area, the CWRM in August denied the

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permit application without prejudice, meaning that the proposal could be revived at some future time. Without the Water Code and CWRM, however, the project would already have been completed.

The seed of this confrontation actually was planted by the emphasis on threatened and endangered species in environmental planning, assessment, and decision-making, whereas protection of natural communities and ecosystems should be the essence of an enlightened conservation policy. The former is anchored legally in the Endangered Species Act and the latter in the State Water Code. Because there were no listed species present in Makaleha, the developers felt that they had a green light for the project. Biological opinion nevertheless was solidly on the side of the value of the Makaleha Springs area as habitat. The outcome suggests that the State Water Code can in fact provide protection for unique

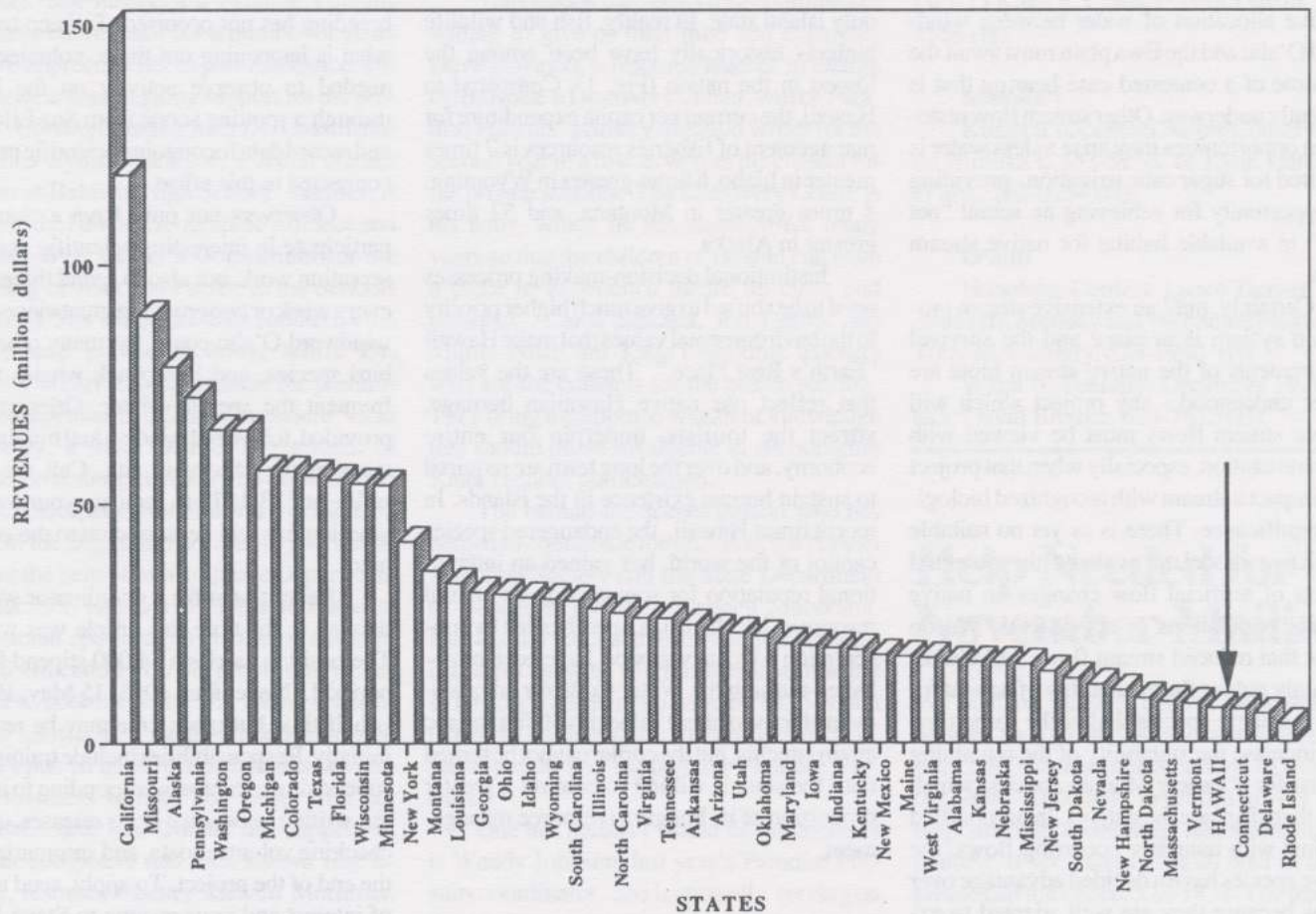
habitat that is targeted for development by politically powerful interests, if the scientific, conservation, and local communities become involved.

An immediate and more difficult problem involves the transfer of windward O'ahu stream water to the Ewa plain for agricultural irrigation. In this case the need for and benefits of restoration of stream flows, specifically at present to the Waiahole-Waianu-Uwau Stream System, are key issues. There is no question that native Hawaiian stream biota have declined markedly during the past century as habitat has been lost to diversions, impoundments, channelization, and other alterations associated with urbanization and intensive agricultural development. The situation is especially serious on O'ahu, where some native aquatic species populations will not be sustainable over the long term unless there is active human intervention to improve

environmental quality and increase the availability of suitable habitat for native stream organisms. In other words, we need to take advantage of any opportunity for stream restoration.

The situation is less severe on the neighbor islands, where the critical management goal is to prevent further habitat loss in order to assure survival of the remaining native aquatic species populations before they decline to O'ahu levels, creating a Statewide crisis that would mandate draconian cuts in surface water use. Even on the neighbor islands, however, we need to consider the stream restoration option in recognition of the fact that both migratory and non-migratory aquatic species have declined. And because at least the amphidromous 'o'opu seem to represent a genetically uniform population throughout the islands, habitat improvements that lead to 'o'opu population increases anywhere would

### FISH AND WILDLIFE COMBINED BUDGETS COMPARED BY STATE FOR 1991



Source: Wildlife Conservation Fund of America 1991 Survey

Fig. 1.



be a Statewide benefit.

Restoration has many facets and could be defined as correction of any anthropic perturbation that upsets stream ecosystems. In the Waiahole context, the questions pertain to the effects of increasing stream flows. Increased flows, and particularly increased base flows, will expand the available habitat for aquatic stream organisms and for that reason should lead to an increase in the occurrence and density of native stream species because shortage of habitat, combined with competition for space with exotic species, is limiting the abundance of natives. As expected, restoration of flows in Waiahole did result in a reduction of the abundance of alien species, and significant postlarval recruitment of all five of the native 'o'opu has been observed, including two species that haven't yet been found as adults in the stream. Increased flows should also enlarge the estuary fronting Waiahole Stream in Kane'ohe Bay, contributing to the potential for increased production of economically valuable commercial and recreational fisheries.

A decision by the CWRM about the relative allocation of water between windward O'ahu and the Ewa plain must await the outcome of a contested case hearing that is presently underway. Other stream flow restoration opportunities may arise as less water is required for sugar cane irrigation, providing an opportunity for achieving an actual "net gain" in available habitat for native stream biota.

Certainly, until an extensive stream protection system is in place and the survival requirements of the native stream biota are better understood, any project which will reduce stream flows must be viewed with extreme caution, especially when that project will impact a stream with recognized biological significance. There is as yet no suitable predictive model to evaluate the potential effects of artificial flow changes on native species populations or ecosystems. We do know that reduced stream flows will almost certainly reduce the availability of habitat for native aquatic species and at the same time will increase the suitability of the remaining habitat for a variety of alien species, which may then displace the natives. In unmodified streams with naturally occurring flows, the native species have a decided advantage over aliens because they are well adapted to extreme conditions.

The Makaleha and Waiahole controversies have a common bond: the prevailing public view of natural resources as being free

for the taking. Be it fish or water, there is an unwillingness to pay for their exploitation. The Makaleha proposal was rationalized as tapping a water source that could be distributed without a pumping cost. In the case of Ewa, there is an abundance of water available from pumps, which are no longer required to supply sugar cane, and in the future from reclaimed water. But water transferred in a man-made ditch from windward O'ahu to Ewa is almost free. In neither case has there been a serious willingness to admit that the real but hard to quantify costs of the impact on natural resources should be factored into the equation.

The view is especially evident in examination of funding allotted to fisheries (referring to all aquatic biological resources) management in Hawaii. Protection and management, including improving the knowledge base, of stream and estuarine biota is one of the smaller activities of the State Division of Aquatic Resources, which is also responsible for marine waters and the fourth longest coastline in the United States. Related programs would be expected to be well funded in the only island state. In reality, fish and wildlife budgets historically have been among the lowest in the nation (Fig. 1). Compared to Hawaii, the current per capita expenditure for management of fisheries resources is 7 times greater in Idaho, 6 times greater in Wyoming, 4 times greater in Montana, and 52 times greater in Alaska.

Institutional decision-making processes need to be shifted to give much higher priority to the environmental values that make Hawaii "Earth's Best Place." These are the values that reflect our native Hawaiian heritage, attract the tourists, underpin our entire economy, and over the long term are required to sustain human existence in the islands. In recent times Hawaii, the endangered species capitol of the world, has gained an international reputation for squandering its natural resources. Mechanisms, spearheaded by conservation advocacy groups, have been established through the Water Code for advancement of some of these values involving aquatic environments, but the corner cannot be turned until the state is willing to commit a greater proportion of its budget to resource management.

## Laysan Albatross Project in Third Season—Volunteers Needed

by Susan Elliott Miller

For the past two years, Society members have volunteered their time as observers for a project to encourage Laysan Albatross to breed on Kaohikaipu Island, near Manana Island and Sea Life Park. Decoys and a sound system will once again be set up on the Island to simulate an albatross colony, in hopes of attracting the colonial-nesting birds to begin using the Island to breed. The intent is to draw the birds away from areas such as Dillingham Field, Kahuku, and Marine Corps Base Hawaii at Kane'ohe, where there are a number of potential conflicts with human uses, as well as danger to the albatross.

In the two previous seasons, albatross have been attracted to the Island, although breeding has not occurred. To keep track of what is happening out there, volunteers are needed to observe activity on the Island through a spotting scope from Sea Life Park and record data for ongoing scientific projects connected to this effort.

Observers not only have a chance to participate in interesting scientific and conservation work, but also to spend three hours every week or two enjoying great views of the windward O'ahu coast, the many other seabird species, and humpback whales which frequent the area in winter. Orientation is provided, followed by individual training sessions at the observing site. Call the HAS office at 528-1432 to indicate your interest; your inquiry will be passed on to the coordinator.

Recruitment for a coordinator was underway at the time this article was written. The position carries a \$4,000 stipend for the period 15 November, 1995- 15 May, 1996. It is half-time but more time may be required initially. Responsibilities include training and supervising volunteers, responding to inquiries, writing occasional news releases, quality checking volunteer data, and summarizing at the end of the project. To apply, send a letter of interest and your resume to Steve Kress, National Audubon Society, 159 Sapsucker Woods Road, Ithaca, NY 14850.



# Rare Hawaiian Plants Proposed for Listing

## 32 Plants Proposed for Addition to Endangered Species List

Thirty-two rare native plant species that exist only on the islands of Hawai'i and Kaua'i are being proposed for addition to the federal threatened and endangered species list by the U.S. Fish and Wildlife Service (USFWS). Two species, known in Hawai'i as *haukuahiwi*, have completely disappeared in the wild and exist only in private gardens and as cultivated individuals planted back into their original habitat. Many other species have five or fewer populations, and several are represented by fewer than 10 remaining individual plants. Two plants are proposed as threatened species; the remaining are proposed for endangered status.

The plants proposed for listing are scattered across the two islands at varying elevations and in differing vegetation and climate zones, but they share in common many of the same threats to their existence. According to the USFWS, competition from introduced plant species; fire; hurricanes; landslides; habitat destruction by feral or domestic animals; agricultural, military, and residential development; and predation by cattle, goats, insects, and rats have all contributed to bringing these plants close to extinction.

"Of particular concern are those species with very few individuals remaining, because a single event such as a fire, a volcanic eruption, a hurricane, or rooting by feral pigs could quickly wipe out the species forever," said Robert P. Smith, Pacific Islands Ecoregion Manager for the USFWS in Honolulu. "By adding them to the threatened and endangered species list, they will not only receive the legal protection afforded by the Endangered Species Act, but also benefit from activities aimed at restoring the species to safe population levels."

The small numbers of populations and individuals of most of these taxa increase the potential for extinction. The limited gene pool may affect the plants' ability to make seeds, or a single human-caused or natural environmental disturbance could destroy a significant percentage of the individuals or the only known population.

Native plants are important for their ecological, economic, and aesthetic values, and Hawai'i's plant life is among the Nation's

most unique. Native plants play an important role in the development of new crops that resist disease, insects, and drought. For example, the Hawaiian cotton (*Gossypium tomentosum*) has been bred with the agricultural strain of cotton to produce a strain that does not attract ants. This saves the cotton industry millions of dollars in the cleaning of cotton fibers prior to use.

At least 25 percent of modern prescription drugs contain ingredients derived from plant compounds, including treatments for cancer, heart disease, and malaria, and medicines to assist in organ transplants. Plants also are being used to develop natural pesticides to replace chemicals more harmful to people and the environment.

Federal listing protects plants on Federal lands and requires agencies to consult with the USFWS when federally licensed or permitted projects may affect listed species. Because Hawai'i State law automatically includes federally listed species on the State threatened and endangered species list, and the State's endangered species law prohibits the destruction of imperiled plants on State and private lands, protection of listed plants also extends to nonfederal lands in Hawai'i.

The two trees that are extinct in the wild, *Hibiscadelphus giffardianus* and *Hibiscadelphus hualalaiensis*, survive only from cultivated material. *Hibiscadelphus giffardianus* is known only from the Bird Park area of Hawai'i Volcanoes National Park. National Park Service employees have successfully reintroduced 11 trees to their native habitat. The State Division of Forestry and Wildlife has planted 24 *Hibiscadelphus hualalaiensis* seedlings in the Pu'uwa'awa'a area of the Big Island.

Another *Hibiscadelphus* species, *Hibiscadelphus woodii*, was first discovered in 1991 and is known only from its original site in Kaua'i's Kalalau Valley on State land. The four remaining trees grow on cliff walls and are in danger from rock slides. Other threats to this species are habitat degradation by feral goats and pigs, competition with alien plant species, and nectar robbing by the Japanese White-eye, an alien species of bird.

Only a single population of *Labordia tinifolia* var. *wahiawaensis* survives today, located on private land in a drainage of the Wahiawa Mountains of Kaua'i. More than 100 plants were originally known, but Hurricane 'Iniki reduced the population to be-

tween 20 and 30 individuals. The primary threats to the species are habitat degradation by pigs, trampling by humans, and competition with the alien plant strawberry guava.

*Phyllostegia knudsenii*, a perennial mint, was historically known only from the original sample collected in the 1800s. In 1993, one individual was rediscovered at a single location in Koai'e Canyon on State-owned land. Because only a single individual is known, this species is particularly vulnerable to extinction. Other major threats to *Phyllostegia knudsenii* are habitat degradation by pigs and goats and competition with alien plants.

A single population of *Pritchardia viscosa*, a short palm with silvery-gray undersides of the leaves, remains on State land, and it contains just three individuals. This species is at severe risk of extinction from hurricanes; Hurricane 'Iniki destroyed half the population in 1992. Additional threats to *Pritchardia viscosa* are fruit predation by rats and competition with alien plants such as Hilo grass.

Of the more than 1,500 U.S. and foreign species that are listed as endangered or threatened, the largest category includes plants — 529 species are protected. Recovery strategies for listed plants often include habitat restoration and establishing new populations through propagation and transplantation.

These proposed additions to the threatened and endangered species list were published in two separate rules in the *Federal Register* on 25 September, 1995. Public comments will be accepted until 24 November, 1995, and should be sent to Brooks Harper, Field Supervisor, Pacific Islands Office, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3108, Box 50088, Honolulu, HI 96850.

Plants proposed for listing (all as endangered species) in the Big Island package are: 'oha wai (*Clermontia drepanomorpha*), haha (*Cyanea platyphylla*), hau kuahiwi (*Hibiscadelphus giffardianus*), hau kuahiwi (*Hibiscadelphus hualalaiensis*), alani (*Melicope zahlbruckneri*), (*Neraudia ovata*), kiponapona (*Phyllostegia racemosa*), (*Phyllostegia velutina*), (*Phyllostegia warshaueri*), hala pepe (*Pleomele hawaiiensis*), loulou (*Pritchardia schattaueri*), 'anunu (*Sicyos alba*), and a'e (*Zanthoxylum dipetalum* var. *tomentosum*).



Kaua'i plants proposed for listing as threatened (T) or endangered (E) species are: kawawae-nohu (*Alsinidendron lynchnoides*) (E), (*Alsinidendron viscosum*) (E), haha (*Cyanea recta*) (T), haha (*Cyanea remyi*) (E), mapele (*Cyrtandra cyaneoides*) (E), 'oha (*Delissea rivularis*) (E), hau kuahiwi (*Hibiscadelphus woodii*) (E), koki'oke'oke'o (*Hibiscus waimeae* ssp. *hanneriae*) (E), koki'o (*Kokia kauaiensis*) (E), kamakahala (*Labordia tinifolia* var. *wahiawaensis*) (E), kolea (*Myrsine linearifolia*) (T), (*Phyllostegia knudsenii*) (E), (*Phyllostegia wawrana*) (E), loulou (*Pritchardia napaliensis*) (E), loulou (*Pritchardia viscosa*) (E), (*Schiedea helleri*) (E), (*Schiedea membranacea*) (E), laulihilihi (*Schiedea stellarioides*) (E), and nani wai'ale'ale (*Viola kauaensis* var. *wahiawaensis*) (E).

## 42 Proposed for Listing as Threatened/Endangered

With only a few of their kind known to exist in the wild, 42 additional native plant species scattered throughout the Hawaiian Islands would be added to the threatened and endangered species list under three proposals published by the USFWS on 2 October. Only one of the species would be listed as threatened; the remaining 41 species are proposed for endangered status, with many known from only five or fewer populations.

The plants are found on one or more islands throughout the Hawaiian archipelago, specifically Kure, Midway, Laysan, Ni'ihau, Kaua'i, O'ahu, Moloka'i, Lana'i, Maui, and Hawai'i. They face a multitude of threats including habitat degradation; predation by pigs, goats, deer, and rats; fires; landslides; and competition from alien plants such as Koster's curse, blackberry, strawberry guava, Christmas berry, and Maui pamakani.

If these plants are listed as threatened and endangered species, recovery plans identifying steps to be taken to overcome these threats will be developed and implemented. Recovery strategies for listed plants include fencing populations at risk from predation or trampling, various means of habitat restoration, and establishing new populations through propagation and transplantation.

A variety of public and private partners are aiding in recovering Hawaii's listed plants, including many of the botanical gardens found in the State. The U.S. Army is working with The Nature Conservancy of Hawaii to develop management plans for the populations

of eight proposed species that occur on lands owned or leased by the Army. The U.S. Navy is developing a management plan that will include several of the proposed species.

Some of the most unusual plants included in the listing proposals are three species that until recently were considered to be extinct. *Eragrostis fosbergii* is a perennial member of the grass family rediscovered in 1991 by botanist Joel Lau of The Nature Conservancy of Hawaii. It is known from only six plants in four populations on City and County of Honolulu and State lands in O'ahu's Waianae Mountains. Threats to this species are habitat degradation by feral pigs and goats, competition with alien plant species, and trampling by hikers.

*Lobelia monostachya*, a prostrate shrub in the bellflower family, was rediscovered by Lau in the Wailupe Valley area of O'ahu in 1994. Only eight plants are known from one population on State land. The primary threats to this species are predation by rats and competition with several alien plant species.

*Achyranthes mutica* is a shrub in the amaranth family. Once known from both the islands of Kaua'i and Hawai'i, it was rediscovered in 1992 by biologist Thane Pratt of the National Biological Service on private land in the Kohala Mountains on the Big Island. The National Tropical Botanical Garden raised additional plants from seeds, which have been planted back in the same area through the cooperation of the private landowners.

Another of the plants included in the multi-island package is *Plantanthera holochila*, a member of the orchid family with small greenish-yellow flowers. Only 35 individual plants in five populations currently remain in the wild: one plant in Kaua'i's Alakai Swamp, fewer than 10 plants on Moloka'i in The Nature Conservancy's Kamakou Preserve, and between 15 and 20 on Maui in the West Maui Mountains and The Nature Conservancy's Waikamoi and Kapunakea Preserves. The State's Division of Forestry and Wildlife, The Nature Conservancy of Hawaii, the National Park Service, and the Fish and Wildlife Service are cooperating in a program to fence these few remaining populations to prevent further impacts by cattle and feral pigs.

Public comments will be accepted until 1 December, 1995, and should be sent to Brooks Harper, Field Supervisor, Pacific Islands Office, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3108, Box 50088, Honolulu, HI 96850.

The 14 plants proposed for listing as threatened (T) or endangered (E) species in the "multi-island" package are: (*Achyranthes mutica*) (E), Hawai'i, Kaua'i\*; kamano-mano (*Cenchrus agrimonioides*) (E) O'ahu, Lana'i\*; Maui, Hawai'i\*, Kure\*, Midway\*, Laysan\*; haha (*Cyanea grimesiana* ssp. *grimesiana*) (E), O'ahu, Moloka'i, Lana'i, Maui; pu'uka'a (*Cyperus trachysanthos*) (E), Ni'ihau, Kaua'i, O'ahu, Moloka'i\*, Lana'i\*; akoko (*Euphorbia haeleleana*) (E), Kaua'i, O'ahu; aupaka (*Isodendron laurifolium*) (E), Kaua'i, O'ahu; aupaka (*Isodendron longifolium*) (T) Kaua'i, O'ahu; lau 'ehu (*Panicum niuhauense*) (E), Kaua'i, Ni'ihau\*; (*Phyllostegia parviflora*) (E), Hawai'i\*, O'ahu, Maui\*; (*Platanthera holochila*) (E), Kaua'i, O'ahu\*, Moloka'i, Maui; (*Sanicula purpurea*) (E), O'ahu, Maui; (*Schiedea hookeri*) (E), O'ahu, Maui\*; (*Schiedea kauaiensis*) (E), Kaua'i; and (*Schiedea nuttallii*) (E), Kaua'i, O'ahu.

\* Islands of former distribution, where species has since been extirpated.

The 25 plants proposed for listing as endangered species in the O'ahu package are: akoko (*Chamaesyce herbstii*), Waianae Mts.; akoko (*Chamaesyce rockii*), Ko'olau Mts.; haha (*Cyanea acuminata*), Ko'olau Mts.; haha (*Cyanea humboldtiana*), Ko'olau Mts.; haha (*Cyanea koolauensis*), Ko'olau Mts.; haha (*Cyanea longiflora*), Ko'olau and Waianae Mts.; haha (*Cyanea st.-johnii*), Ko'olau Mts.; ha'iwale (*Cyrtandra dentata*), Waianae Mts.\*; ha'iwale (*Cyrtandra subumbellata*), Ko'olau Mts.; ha'iwale (*Cyrtandra viridiflora*), Ko'olau Mts.; 'oha (*Delissea subcordata*), Waianae Mts.\*; (*Eragrostis fosbergii*), Waianae Mts.; nanu (*Gardenia mannii*), Ko'olau and Waianae Mts.; kamakahala (*Labordia cyrtandrae*), Waianae Mts.\*; anaunau (*Lepidium arbuscula*), Waianae Mts.; (*Lobelia gaudichaudii* ssp. *koolauensis*), Ko'olau Mts.; (*Lobelia monostachya*), Ko'olau Mts.; alani (*Melicope saint-johnii*), Waianae Mts.\*; kolea (*Myrsine juddii*), Ko'olau Mts.; (*Phyllostegia hirsuta*) Ko'olau and Waianae Mts.; (*Phyllostegia kaalaensis*), Waianae Mts.; loulou (*Pritchardia kaalae*), Waianae Mts.; (*Schiedea kealiae*), Waianae Mts.; (*Trematolobelia singularis*), Ko'olau Mts.; and (*Viola oahuensis*), Ko'olau Mts.

\*Historically known from other mountain range also.

The three plants proposed for listing as endangered species in the Moloka'i package are: haha (*Cyanea dunbarii*), Mokomoko Gulch; (*Lysimachia maxima*), Pelekunu Preserve; and (*Schiedea sarmentosa*), Kamakou Preserve. Source: U.S. Fish and Wildlife Service



# Kudos to Paradise Pursuits Volunteers

by Sylvianne Yee

Volunteers are often the behind-the-scenes movers who make things happen effectively and without much fanfare. The Paradise Pursuits program is fortunate to have just such a group of volunteers who are willing and able to coordinate the outer island competitions. They are spending many hours calling schools to encourage, cajole, and advise potential and present Paradise Pursuits teams to take the Paradise Pursuits challenge! Their reward is the gratitude of the students and coaches and knowing that they are doing much to further environmental education in Hawaii.

Dr. Renate Gassmann-Duvall, Hawaii Audubon Society's Maui representative, has once again consented to help out on the Valley Isle. She has been a Paradise Pursuits volunteer coordinator for a number of years and we appreciate her expert assistance, enthusiasm, and unflagging support for the program. Co-coordinating with Dr. Gassmann-Duvall is Sydney Jamison, a social studies teacher at Baldwin High School. Jamison is active in the Hawaii Geographic Alliance and the East-West Center's Consortium for the Teaching of Asia and Pacific in the Schools (CTAPS). She will be the main contact for the public and private schools while Dr. Gassmann-Duvall will organize the preliminary competitions. Moloka'i resident Vicki Newberry, a Maui District Department of Education resource teacher, has consented to be the contact person for Molokai High School.

On the Big Island we are very fortunate to have the help of two longtime Department of Education employees. Nanette Hiraoka, educational specialist in charge of environmental education, has very graciously consented to coordinate the Big Island schools. She is known as a hands-on educator who doesn't just sit in the office but gets out into the wilderness to hike and camp with her teachers. She has lent us the support of another competent and well known Big Islander, resource teacher Richard Mortimer. Some of you might be fortunate to have Dick's beautiful notecards featuring native and exotic birds. Dick has the big job of contacting all of the public and private schools on the Big Island to encourage them to come

# Christmas Bird Counts Need Your Help

Participants are needed to make the annual statewide Christmas counts a success. This is a sincere plea for help. You do not need to be an expert birdwatcher or ornithologist to participate.

Information collected during the counts will be compiled and submitted for publication in *Audubon Field Notes*, a magazine which includes the Christmas count volume and four other seasonal issues reporting bird observations throughout North America and Hawaii. Participants' fees (\$5 per person) go entirely to help offset the cost of publishing the Christmas count issue.

Christmas bird counts in Hawaii have been a longstanding tradition and one of the Hawaii Audubon Society's favorite annual field and social events. Bird counting will be done in towns, suburbs, wetlands, sea cliffs,

on board.

The Garden Isle boasts four coordinators willing to give of their time and expertise. Dave Boynton, a resource teacher in charge of the Koke'e Discovery Center, will be Paradise Pursuits' primary question writer for the second year in a row as well as the contact for the private schools. The Discovery Center is his baby, which he has nurtured for many years so that the children of Hawaii can have a place to experience nature up close and personal. Carol Shikada, Jon Derby, and Muriel Nishi are Kaua'i resource teachers who are the contacts for the public schools. They bring a combined wealth of knowledge that should prove invaluable in encouraging Kaua'i school participation.

The behind-the-scenes person who has helped to coordinate the efforts of the Hawaii Audubon Society and the State Department of Education (DOE) is Colleen Murakami, educational specialist for environmental education for the state. She has been instrumental in forging a partnership with the DOE which hopefully will translate into more public school participation and support for Paradise Pursuits.

One last person I would like to mention is Wendy Johnson, last year's Paradise Pursuits coordinator. She is currently serving on the education committee. She has been most generous with her advice and support and I am deeply grateful to her.

Hats off to all of these volunteers for their tireless efforts on behalf of Paradise Pursuits!

beaches, grasslands, mountains, and forest.

Following are a list of the counts and the person to contact for more information and to sign up. With the exception of Waipi'o, as of press time dates had not been set up.

## Hawai'i Island

North Kona. Contact: Reginald David, 329-9141 (W).

Volcano. Contact: Larry Katahira, 967-8226. Participants wishing to go with the party to Kulani Correctional Facility must get their social security number and birthdate to Larry Katahira no later than 20 November.

## Kaua'i

Kapa'a. Contact: Barbara Stuart, 826-9233 (H).

Waimea. Contact: Kate Reinard, 335-9975 (W).

## Maui

Pu'u O Kaka'e. Contact: Fern Duvall, 572-1584 (H).

## Moloka'i

Kualapu'u, Contact Nature Conservancy on Moloka'i, 553-5236, or Lynn Carey on O'ahu, 262-0254 (H).

## O'ahu

Honolulu. Contact: Lance Tanino, 247-5965 (H), Monday and Wednesday nights, or Tony McCafferty, 523-1940 (H).

Waipi'o, Tuesday, December 19. Contact: David Bremer, 623-7613 (H).

# Help Needed for November Mailing

We will be mailing ballots, dues renewal notices, and our annual fundraising appeal to over 2,500 members on Saturday, 18 November, from 10:00 a.m. to 2:00 p.m. We need help stuffing, addressing, and stamping the mailing. If you can give us an hour or more, please call the office, 528-1432. The mailing party will be at our office, 1088 Bishop Street, Suite 808.

This is a great way to meet new people and have fun while helping Audubon get the work done. Refreshments will be served.



# Your Talents and Caring Make Hawaii Audubon Society Live

by Susan Elliott Miller

Aloha kakou! My name is Susan Miller and I have the honor of being hired by the Hawaii Audubon Society Board of Directors to become its first Administrative Director. My basic responsibility is to make sure that all of the things that are needed to make the Society function get done. The Board and the membership remain responsible for the Society's policies with respect to issues of concern and for advocacy on those issues.

Any organization lives through the talents and caring of its members. The fact that the Society is more than 50 years old makes it obvious that many members have invested their time and talent in it over those years. I see part of my job as helping members continue to invest in and support the organization with their time and talent by connecting those resources and interests with the Society's needs.

I have outlined some of those needs below (also see articles in this issue about Christmas Bird Count on page 51, Legislative Representative on this page, and Laysan Albatross Project on page 48). If any of them interest you, please call me at the HAS office, 528-1432. Since my position is part-time, I am usually in the office during the afternoon but you can always leave a message.

**Office:** Several talents needed here: respondents to telephone calls (direct or message) and letters for information on membership, publications, birding spots, and "tell me everything about global change"! Organizers to tame the "paper monster" which has (and will) expand to fill the space available. (Mahalo to volunteer Lynnea Overholt who has made a real dent in this problem.)

**Education:** The Committee is focusing on helping this year's Paradise Pursuits, the unique environmental quiz competition for high school students sponsored by the Society. Later in the year, the focus will be the annual state science fair. The current Committee Chair, Emily Gardner, is looking for someone to train as her replacement.

**Conservation:** The Committee has a variety of changing issues on its plate. Chair Dave Hill welcomes your participation, both on the Committee and in the HAS phone tree.

## HAS Seeks Legislative Representative for 1996 Session

by Susan Elliott Miller

At its October meeting, the Board of Directors agreed that it had been valuable in the two previous years to have a representative advocate the Society's positions on bills affecting protection of native wildlife and its habitat and voted to seek a representative for the 1996 session.

It is hoped that the position will be occupied by a Society member with the appropriate qualifications, although Society membership is not required. Responsibilities for the five-month position (January through May 1996), carrying a stipend of \$4,000, are: from the 3,000+ legislative bills and resolutions, extract those affecting matters of concern to the Society; in consultation with appropriate Society officers, develop testimony and present the testimony at hearings; follow the bills and resolutions through the process; submit verbal reports at Society Board meetings and a written summary of activity within two weeks of the session's end.

If you are interested, please send a letter of interest, resume, and short writing sample to HAS President Linda Paul at the HAS office by the end of November, 1995.

Some past experience with Hawaii's legislative process will be a definite plus for applicants. The Administrative Director and knowledgeable Society members will provide a consultation pool for the chosen representative.

## Birders Network

HAS has a list of birders who are interested in informal trips with other members, allowing members to find others to go along with them on their outings—for the sake of safety, to share information on good spots, or simply to

# The Great Terrain Robbery

by Susan Elliott Miller

There are so many proposals before Congress this year to make it easier to extract natural resources from the nation's public lands for private gain that conservationists have labeled them collectively "the Great Terrain Robbery."

One of these proposals—to open the public land that is the Arctic National Wildlife Refuge (ANWR) to oil drilling—has been added as a revenue enhancement in the Budget Reconciliation bill. By the time you read this, the bill will likely be on its way to the White House. President Clinton has stated he will veto the bill if it retains many of its present provisions, objecting specifically to the ANWR drilling.

This issue is of concern to the Society because the Refuge coastal plain is the summer nesting ground of shorebirds which migrate to Hawaii such as the 'Ulili (Wandering Tattler), 'Akekeke (Ruddy Turnstone), and Kolea (Pacific Golden Plover). It is also the calving ground of the Porcupine River caribou herd and, as such, sacred to the Gwich'in native Alaskans.

At the time this article was written, Representative Neil Abercrombie had opposed the oil drilling provision, as had Representative Patsy Mink, a co-sponsor of H.R. 1000 to designate the area wilderness. Senator Daniel Inouye had not committed, while Senator Daniel Akaka, a co-sponsor of wilderness bill in 1993, voted for the oil drilling proposal in two committees this fall.

The most protective situation, espoused by HAS, Sierra Club, Life of the Land, Conservation Council for Hawaii (CCH), and the Ahupua'a Action Alliance, would be removal of the oil drilling provision from the Budget bill and designation of the area as wilderness. For current information, contact Steve Montgomery (CCH) at 676-4974.

increase the fun. If you are interested in putting your name on the list, which would be circulated to all those on the list, call or write HAS.



## New Study Validates Endangered Species Act

After over three years of study, the National Research Council (NRC) of the National Academy of Science (NAS) has issued its report on *Science and the Endangered Species Act*. Opponents of the Endangered Species Act (ESA) lose lots of ground with the release of this report. The NRC report totally debunks the arguments of ESA opponents by concluding that there is a "good match between science and the ESA" according to Michael Clegg, chair of the NRC Committee on Scientific Issues in the ESA).

The report endorses protecting habitat where endangered species live. The report endorses the success of the law in saving animals like the sea otter and Peregrine Falcon. The report says that scientists regard the current rate of extinctions as a crisis.

The NAS endorses strengthening the ESA in several key areas, including providing additional protection for endangered plants, speeding up the recovery planning process, and emphasizing the protection of habitat as the primary way to bring species back from the brink of extinction.

*Source: Endangered Species Coalition,  
National Audubon Society.*

## September Field Trip

by DeLacy Ganley

On Saturday, 16 September, seven people joined the Hawaii Audubon Society to explore Wa'ahila State Park, located on the top of St. Louis Heights. The park's flora and fauna is a hodgepodge of plants, containing everything from "true" koa, strawberry guava, and lauhia ferns to huge "Mainland style" pine trees.

After introductions, we set off on the trail, which is initially steep but with secure footing. Within five minutes, we were hearing a plethora of birds. As we followed the ridge-trail up and down we occasionally saw 'Amakihi and bulbuls down on the ground eating the abundant strawberry guavas. Trip leader Lance Tanino said such a sight is rare.

All in all, we stayed on the trail for a little

## Federal Agencies to Consult Native Americans on Species

A new joint wildlife management policy designed to enhance the role of Native American Tribal governments in the endangered species program was announced by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service.

The policy seeks to involve Native American Tribal governments throughout the United States in every aspect of the endangered species program from providing information about which species should be protected to more active management of recovering species on or near Tribal lands.

The new joint policy calls for both agencies to consult with and use the expertise of Native American Tribal governments when determining which species should be listed, conducting surveys on species populations, and implementing conservation measures.

Provide notification to, use the expertise of, and solicit information from Tribal governments when preparing proposed and final rules to list species; consider impacts to reserved hunting and fishing rights and trust lands and exercise special regulatory authority for threatened species when reserved hunting and fishing rights are involved.

It also requires the Services to allow Tribal governments to participate in all phases of consultation about potential conflicts with endangered or threatened species, use the expertise of Tribal governments in habitat conservation planning, and include Tribal governments in all public aspects of recovery planning processes and implementation including design and implementation of monitoring programs for delisted species.

*Source: USFWS*

over an hour before turning back towards the parking lot. We probably walked a total of one-third of a mile. We spotted the following birds: House Finch (which flies in a scalloping motion), Red-vented Bulbul, Zebra Dove, Spotted Dove, 'Amakihi, Japanese White-eye, Red-billed Leiothrix, and a White-tailed Tropic Bird (which was soaring above Manoa Valley). The following birds were identified through their song: Nutmeg Mannikin, Northern Cardinal and White-rumped Shama Thrush.

## T-shirts for Sale

The Hawaii Audubon Society has a stock of T-shirts designed to spread the Audubon message. Not only are they attractive personal apparel, but they make excellent presents as well.

T-shirts bearing the Society's 'Elepaio logo are available in blue spruce and oatmeal with a black design and in forest green with an ecru design. In addition, the "hot" Kolea (Pacific Golden Plover) T-shirts are also available. This T-shirt is white with a three-color design of the Kolea and native hibiscus. Proceeds from the Kolea T-shirt go to help HAS fund research on shorebirds in Hawai'i and elsewhere in the Pacific region.

T-shirts are \$12 each, plus \$2.00 per shirt for postage. They are available in medium, large, and extra large adult sizes only. When ordering T-shirts, be sure to list size and first, second, and third choice of color. To order T-shirts send your check, payable to the Hawaii Audubon Society, to Yvonne Izu, 1957 Alai Place, Wahiawa, HI 96786. Don't forget to add \$2.00 per shirt for postage. Insufficient postage will delay your order until the proper amount is remitted. T-shirts are not available at the HAS office.

## Research Grants

The Hawaii Audubon Society makes grants for research in Hawaiian or Pacific natural history. Awards generally do not exceed \$500 and are oriented toward small-scale projects within Hawaii. Special consideration will be given to those applicants studying dryland forests and aeolian systems on Hawai'i.

The deadlines for receipt of grant applications are 1 April and 1 October. For an application form send a self-addressed stamped envelope to Grants, Hawaii Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813. For more information, call Phil Bruner, (808) 293-3820 (W).

### 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.



# Calendar of Events

## Monday, November 6

Monthly meeting of the Education Committee, 7:00 p.m., Burger King, University and Metcalf. To join or for more information call Emily Gardner, 734-3921 (H). The Committee is actively seeking new members to work on next season's Paradise Pursuits program.

## Wednesday, November 8

Monthly meeting of the Conservation Committee, 6:00 p.m., at Bale Sandwich Shop in Manoa Marketplace (near Safeway). To join or for more information call David Hill, 941-4854 (evenings).

## Sunday, November 12

Field trip of Manoa Cliffs Trail. John and Donna de Haan will lead this half-day hike on Tantalus. This trail features many native plants and native birds such as 'Amakihi and 'Apapane. Bring water, snacks, rain gear, and binoculars. Meet at the State Library on Punchbowl Street at 7:30 a.m. or at the hikers' parking area by the connector trail just before 4059 Round Top Drive at 8:15 a.m. For more information call John or Donna de Haan, 941-9817 (H). Suggested donation: \$2.00.

## Monday, November 13

HAS Board meeting, 6:00 p.m., at the office.

## Saturday, November 18

Mailing party. 10:00 a.m. to 2:00 p.m. at the office. For more information see story on page 51.

## Birding on O'ahu

A two-page guide listing areas on O'ahu where interesting birds may be found and where access is not a problem is now available. Written by Peter Donaldson, it offers important information for birders unfamiliar with Hawaii. The guide is not designed to give detailed directions or information on bird identification. For a free copy, send a self-addressed stamped envelope to O'ahu Birding Guide, Hawaii Audubon Society, 1088 Bishop Street, Suite 808, Honolulu, HI 96813.

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