



# Hawai'i Wetland Monitor

The newsletter of the Hawaii Wetland Joint Venture

Volume 1, Number 1 November 2007

*Hui ola hou i nā 'olokele*

## In this issue

- 1 Building partnerships for Hawaii's wetlands
- 2 About the Pacific Coast Joint Venture
- 3 Nu'u Wetlands: Protecting One of Maui's Fragile Oases
- 4 EPA-Funded Project Samples Coastal Lowland Wetlands in Hawaii
- 6 Are you a Koloa?
- 7 Moorhen Research Sheds Light on Reclusive Bird
- 8 Testing for Avian Influenza
- 10 Resources and Training
- 11 Grants and Resources for Finding Funding

*Hawaii Wetland Monitor is compiled and edited by Christina Ryder and Shelley Kirk-Rudeen.*

## Building partnerships for Hawaii's wetlands

Wetlands are places of incredible biological productivity, species diversity and habitat transition. Hawaii's hydrological conditions – heavy rainfall, porous volcanic soil, and steep terrain – have created unique wetlands that are very different from those found in any other continental land masses.

These wetlands include coastal lagoons, mountainous bogs and anchialine ponds. Anchialine ponds are land-locked, brackish pools in porous lava, connected underground to both fresh and salt water. Hawaii is one of the few places world-wide where they are found.



At one time Hawaii contained an estimated 59,000 acres of wetlands. At present Hawaii has lost over 12 percent of its total wetland acreage and over 30 percent of its natural lowland wetlands.

Although the remaining wetlands cover less than three percent of Hawaii's surface area, they are extremely important because they support a suite of plant and animal species found only in the Hawaiian Islands.

Hawaii's wetlands are inhabited by five endangered endemic waterbird species, including the Hawaiian duck, Hawaiian stilt, Hawaiian moorhen, Hawaiian goose and the Hawaiian coot. A major contributing factor to declining populations of these species is the loss of wetland habitats. *(Continued on page 2)*

## Building partnerships for Hawaii's wetlands (from p. 1)

The Hawaii Wetland Joint Venture is part of the Pacific Coast Joint Venture and was created to help protect and reverse degradation to Hawaii's remaining wetlands and spearhead the recovery of endangered waterbird populations. Today the partnership consists of over 15 federal, state and local partners. who meet quarterly to review project successes, prioritize future efforts and provide funding and support for conservation action.

<p><b>Mission</b></p> <p>Protect, restore, increase and enhance all types of wetlands, riparian habitat and associated uplands throughout the Hawaiian Islands through partnerships for the benefit of birds, other wildlife and people.</p> <p><b>Motto</b></p> <p><i>Hui ola bou i nā 'olokele</i></p> <p>The People who care for wetlands</p>	<p><b>Goals</b></p> <ol style="list-style-type: none"> <li>1. Facilitate partnerships between conservation organizations, public agencies, private landowners and other partners interested in the conservation of wetland habitats.</li> <li>2. Provide assistance to partners by coordinating meetings and disseminating information.</li> <li>3. Identify funding sources for needed conservation and to prioritize projects to receive that funding.</li> </ol>
--	---

## About the Pacific Coast Joint Venture

The Pacific Coast Joint Venture is one of 18 habitat joint ventures in North America working to protect and restore ecosystems to benefit birds and other wildlife. The joint ventures facilitate partnerships within the public and private sector to fund and implement habitat projects. Partner projects help carry out the goals of four major bird conservation initiatives:

- North American Waterfowl Management Plan
- North American Waterbird Conservation Plan
- U.S. Shorebird Conservation Plan
- Partners in Flight (landbirds)

The Pacific Coast Joint Venture works in high-priority areas in coastal Alaska, British Columbia, Washington, Oregon, Northern California and Hawaii.

- PCJV U.S. Coordinator: Carey Smith, 360.604.2562, [Carey\\_Smith@pcjv.org](mailto:Carey_Smith@pcjv.org)
- Hawaii Wetland Joint Venture Coordinator: Christina Ryder, 808.542.1559, [m McGuirec@hawaii.edu](mailto:m McGuirec@hawaii.edu)



## Nu'u Wetlands: Protecting One of Maui's Fragile Oases

*Scott Fisher, Maui Coastal Land Trust*

The Nu'u wetlands are an oasis in Maui's dry, dusty southeastern plains and a haven for a number of endangered Hawaiian waterbirds. Recent counts have observed over 40 Hawaiian coots, 16 Hawaiian stilts and several Hawaiian ducks. Nu'u also provides critical habitat for other aquatic and terrestrial species. Perhaps due to its remoteness, the quality of the wetland habitat remains high, with native sedges (Kaluha and Makaloa) dominating the majority of the pond.

Nu'u is also a *Wahi Pana*, a land of legends and stories. Numerous archaeological sites dot the landscape, including pictographs and petroglyphs, *heiau* (temples), a canoe landing and house sites.



For over two years the Maui Coastal Land Trust has been working to purchase the 6-acre Nu'u pond and the surrounding 72 acres from Kaupo Ranch. To date we have identified nearly three million dollars in grants, well over half the anticipated purchase price.

In spite of the relative health of the wetlands, ecological restoration work is badly needed. Recent visits have revealed evidence of growing populations of

mongoose, cattle egret and feral pigs. Additionally, invasive plant species have become established in some of the shallow areas of the Nu'u pond.

The Maui Coastal Land Trust anticipates beginning the planning stages for restoration work sometime in early 2008. Our experience on our Waihe'e Refuge has suggested that working with the neighboring community remains one of the most important elements in any ecological restoration project, and we have already begun to work with a number of local stakeholders. A Hawaiian *'olelo no'eau* sums up the urgency of the work needed to prevent further degradation of the Nu'u wetlands: *Wela ka hao*, [strike while] the iron is hot.

## EPA-Funded Project Samples Coastal Lowland Wetlands in Hawaii

Greg Bruland, Christina Ryder, Adonia Henry, Rich MacKenzie, and Meris Bantilan-Smith

While endangered waterbirds and waterbird habitat in Hawaii have been well-studied, less work has been done on water quality, soil properties and processes, and fish community dynamics in coastal lowland wetlands. In response to the need for greater quantitative data and assessment of these issues, a cross-disciplinary and multi-institutional team submitted a proposal to EPA Region 9 in March 2006. The project was accepted for funding and began in September 2006.

The goal of the 3-year project is to conduct a comprehensive ecological assessment of coastal lowland wetlands in Hawaii and specifically to assess the water quality and habitat functions of semi-natural, restored, and created wetlands across the state. The project team consists of individuals working for the federal government (U.S. Fish & Wildlife Service, U.S.D.A. Forest Service, and Army Corps of Engineers), the state of Hawaii (University of Hawaii Manoa), and non-governmental organizations (Pacific Coast Joint Venture and Ducks Unlimited, Inc.).

### Testing reveals variable water quality

The first phase of the project involved sampling 40 coastal lowland wetland sites across the five major islands in March and April 2007. Both freshwater and estuarine coastal wetlands were sampled and included sites managed by the federal government, the state of Hawaii, and private landowners. We sampled water quality with a YSI probe (temperature, dissolved oxygen, pH, conductivity, and salinity) and collected grab samples for analysis of nitrogen and phosphorus concentrations at the Marine Science Analytical Laboratory at University of Hawaii Hilo. This water quality data indicated tremendous variability in physical and chemical parameters and we will continue to assess this variability with quarterly samplings at a subset of 20 sites over the next two years.

### Non-native and invasive species impact wetlands

Fish community composition was sampled with modified lift nets. Initial results of the fish community sampling indicate that on average, greater than 80% of the fish biomass was comprised of invasive species across each of the five islands. For some islands, no native fish species were observed in any of the coastal lowland wetlands sampled. The two dominant invasive fish species occurring across all sites were *Gambusia affinis* and *Poecilia spp.*

A total of 102 plant species were identified at the 40 coastal lowland wetland sites. Of those species, only 18 were native, indicating that most coastal lowland wetland sites in Hawaii are highly impacted by invasive vegetation. The three most common species observed across the 240 sample quadrats were *Urochloa mutica* (California grass), *Batis maritima* (pickleweed), and *Paspalum vaginatum* (seashore paspalum), which occurred in 23%, 22%, and 17% of the sample quadrats respectively. These three species are exotic and highly-invasive. The number of species observed within a given site ranged from 1 to 17. The Klipper Pond site, located at Marine Corps Base Hawaii on the island of Oahu, had the greatest number of native species present with a total of six. Interestingly, this is a created wetland site that was recently planted with native species.



### **Soil properties have implications for wetland health**

We are still in the process of analyzing the soils data, but preliminary results indicate that restored and created wetlands had significant higher bulk densities, pH values, and extractable phosphorus concentrations, and significantly lower organic matter concentrations than natural wetlands. Higher bulk densities in restored and created wetlands may be due to compaction caused by prior land-uses or by the use of heavy machinery during wetland restoration and creation. Higher pH may be due to liming, and higher extractable phosphorus may be a result of fertilization. Lower organic matter may be a result of enhanced decomposition during prior land-uses or excavation into low organic matter subsurface horizons or the use of low organic matter fill material that occurs in wetland creation. These differences in soil properties have important implications for root penetration, soil fertility, and subsequent plant growth and survival as well as cycling and retention of nutrients at restored and created wetland sites.

### **Volunteers needed for next steps**

We are excited to continue to analyze the data generated from the first phase of the project and continue sampling a subset of 20 sites for water quality and fish community composition in the second phase of the project. We are grateful for the cooperation of all the managers and landowners that allowed us to sample these 40 sites, for without their support, this project would not have been possible. Finally, we are always looking for volunteers to assist with the field sampling on Kauai, Oahu, Molokai, Maui, and Hawaii. If you would like to assist in these efforts please contact Dr. Greg Bruland, [bruland@hawaii.edu](mailto:bruland@hawaii.edu), 808.956.8901.

## Are you a Koloa?

The greatest current threat to the endangered Koloa maoli, the native Hawaiian duck, is hybridization with the introduced mallard. On October 4, Andy Engilis and Dr. John Eadie from the University of California, Davis presented their latest findings on how to distinguish Koloa from mallards and mallard/Koloa hybrids. The research is an attempt to develop a morphological key to identify Koloa in the field and in the hand. These identification criteria are mandated as part of the recovery actions for the Koloa.

### Research results

- Asymmetric hybridization: hybrids are primarily the result of a female mallard mating with a male Koloa.
- There are significant morphological differences between mallards and Koloa when examined by age and sex.
- A high percentage of determinations can be made visually, but some will require birds in hand.

Thanks to genetic and morphometric analyses, the researchers have found morphological characteristics that appear to separate Koloa from mallards and hybrids. For example, Koloa weigh less and have a smaller wing measurement, and Koloa males have less green plumage on their heads.



Andy Engilis, Jeremy Kwolek (UC-Davis), Brenda Zaun, and Annie Marshall (USFWS) key out specimens at Hanalei NWR (Photo by J. Fisher).

Data collected to date suggest that Koloa and hybrids have high site fidelity, and feral mallards are limited to mainly urban communities. Andy and colleagues speculate that the Koloa could recover fairly quickly once hybrids and mallards are removed from the islands. For example, hybrid populations at Kahuku, Oahu are more Koloa-like due to control of mallards and hybrids thus forcing hybridization and introgression in one direction, towards Koloa. In addition, past experiments showed that the offspring of F1 hybrids appear more mallard-like. However, when these F1s were back-crossed with pure Koloa the result was more Koloa-like offspring.

Field tests were conducted in October 2007 at Hanalei and James Campbell National Wildlife Refuges to examine the usefulness of metric and plumage characteristics in determining taxa using live birds. The additional samples are being used to refine the criteria presented.

### Next steps and funders

The next step is to provide the identification criteria to wildlife managers in Hawaii. This project is co-funded by grants from the US Fish and Wildlife Service, USGS – Biological Resources Discipline, Pacific Coast Joint Venture, University of California, Davis, and the Selma Herr Fund for Ornithological Research.

## Moorhen Research Sheds Light on Reclusive Bird

*David DesRochers, Biology Department, Tufts University*

Since 2004 I have been investigating the distribution and abundance of the endangered Hawaiian moorhen. This species is one of the six waterbirds endemic to Hawaii and is considered to be the least well-studied. While general habitat needs for this species are known, there has not yet been a detailed study of their specific habitat requirements, and to date, there has been no investigation into how different types of land-use influence the abundance and occupancy of wetlands by moorhen.

After two years of habitat surveys, I am currently working on distributional analyses and will be publishing these findings within the next year. One of my first tasks in completing this research was to survey for moorhen to estimate the population size on Oahu. According to the recent draft of the Waterbird Recovery Plan by the U.S. Fish and Wildlife Service, the population estimate for the species is considered to be an underestimate due to their secretive behavior. The survey work included using playback recordings with calls of both Hawaiian moorhen and the North American subspecies combined with extended passive observation.

After two field seasons of playback surveys for moorhen across Oahu, I concluded that playing calls of the Hawaiian moorhen increased detection of birds by 30%, and at wetlands with larger populations of moorhen, I detected more individuals responding to the calls. This playback survey work is currently in review as



a joint manuscript with Hugo Gee and Michael Reed.

The work described above comprises the majority of my doctoral research and has been in collaboration with the James Campbell National Wildlife Refuge staff, State of Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife, Waimea Valley Audubon Center, Ducks Unlimited, Inc., and various property owners.

## Testing for Avian Influenza

*Joshua Fisher, U.S. Fish and Wildlife Service*



Avian influenza, also known as bird flu, is a naturally occurring virus that infects wild birds (shore birds, waterfowl and migratory birds) and domestic poultry (chickens, turkeys, ducks and geese). Avian influenza normally takes on a low pathogenic form. However a new strain, HPAI H5N1, or highly pathogenic avian influenza, has emerged and has been responsible for deaths in over 80 bird species. So far, the virus has been reportedly contained to wild birds and poultry in Asia, Europe and Africa. However, such reports have been increasing in number. In rare cases, the virus has caused illness and death in some humans who had been in close contact with infected domestic poultry.

The HPAI H5N1 strain of avian influenza has not been detected in birds or humans in North America or the Pacific. It is possible that the virus could be introduced to North America via migratory birds traveling from places where the virus has been found, illegal imports of poultry or poultry products, and travel by people who are infected or traveling with contaminated articles

### **Partners in detection**

In 2006, as part of the U.S. Interagency Strategic Plan, a cooperative surveillance effort was initiated among state and federal agencies and the U.S.-affiliated Pacific islands for testing of live wild birds and domestic poultry to detect avian influenza. Agencies involved in a coordinated monitoring effort of Hawaii and the Pacific islands include the U.S. Fish and Wildlife Service, USGS National Wildlife Health Center, U.S Dept. of Agriculture-Wildlife Services, State of Hawaii Department of Land and Natural Resources-Division of Forestry and Wildlife, and Hawaii Department of Health, as well as agencies in Guam, the Commonwealth of Northern Mariana Islands, Palau and American Samoa.

### **Sampling methods and results**

A total of 4,077 samples were collected from the Pacific Region for the 2006 season (Sept. 2006-April 2007). Fecal samples comprised the majority (70%) of the samples with most samples collected from shorebirds. Capture methods used included mist nets, whoosh nets, cannon nets, walk-in traps (Guam/ Commonwealth of Northern Mariana Islands only) and swim-in duck traps. The latter proved an effective capture method for waterfowl. The most commonly sampled species were Pacific golden plovers, ruddy turnstones, Philippine turtle doves (Guam only) and mallards. Of the 4,077 samples collected for 2006 Pacific islands surveillance, no highly pathogenic avian influenza was detected and only a single low pathogenic form of the virus was detected from a Pacific golden plover caught in American Samoa.

### **Future testing and how to help**

Based on last year's national and regional results, surveillance efforts have been revised for this season. Given the extremely low detection rate of avian influenza in shorebirds, the Hawaiian Islands will focus primary efforts on duck traps and secondary efforts towards shorebirds. Shorebirds will continue to be a primary target species for the Mariana Islands and Palau due to their close proximity to Asia. Increases in mortality and morbidity surveillance will also be done for all the Pacific Islands involved. The public can help by reporting unusual sightings of dead birds to the Aloha United Way toll free hotline: 211, or by visiting [www.gotdeadbird.org](http://www.gotdeadbird.org).

## **Resources and Training**

### **Ecological Restoration; Principles, Values, and Structure of an Emerging Profession**

Andre F. Clewell and James Aronson  
Island Press, 2007

This volume offers for the first time a unified vision of ecological restoration as a field of study, one that clearly states the discipline's precepts and emphasizes issues of importance to those involved at all levels.

<http://www.islandpress.org/books/detail.html/SKU/1-59726-169-6>

### **Nēnē and `Io NRCS Tech Notes Now Available**

The first new technical note provides an introduction to the habitat requirements of Nēnē (Hawaiian goose) and guidance on conservation practices to enhance and manage Nēnē habitats. The second new technical note provides an introduction to the habitat requirements of Hawaiian hawk or `Io and guidance on conservation practices to enhance and manage `Io habitats. Technical Notes can be downloaded at:

<ftp://ftp-fc.sc.egov.usda.gov/HI/pub/technotes/> in the folder called "0 Tech Note Ann PI-6 Nene & Io."

### **Tropical Wetland Management Workshop**

The Hawaii Wetland Joint Venture is sponsoring a Tropical Wetland Management Workshop to be held on November 15 & 16, 2007. Dr. Leigh Fredrickson will lead the workshop, providing an overview of tropical wetland ecology (hydrology, insects, vegetation, etc) and relate how these components should be integrated into an on-the-ground wetland management program. Half of the workshop will consist of informative presentations while the second half will be field based, discussing how wetland sites are managed and what management strategies have been successful. The objective of this workshop is to provide a forum to wetland managers/professionals for discussion of wetland science and current management/restoration techniques and their effects. During the workshop participants will visit James Campbell National Wildlife Refuge, Kawainui and Hamakua Marshes on the island of Oahu.

## Grants

### **RAMSAR**

**Deadline: November 30, 2007**

Environmental Concern Inc. has one-time, limited funds to distribute through a grants program to support the designation of US Ramsar Sites and promote Wetlands Communication, Education, and Public Awareness programs/initiatives associated with current U.S. Ramsar sites. Non-profits, institutes of higher education, schools, local governments, and state governments are eligible to apply for one-year awards up to \$10,000. More information available at:

[http://www.sws.org/documents/Ramsar\\_grant\\_guidance\\_app.pdf](http://www.sws.org/documents/Ramsar_grant_guidance_app.pdf)

### **Small NAWCA grants:**

**Deadline: November 30, 2007**

The Small Grants Program is a competitive, matching grants program that supports public-private partnerships carrying out projects in the United States. Projects must involve long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats for the benefit of all wetlands-associated migratory birds. Grant requests may not exceed \$75,000, and a 1:1 match component is required. Please contact Christina Ryder (808.542.1559) Hawaii Coordinator for the Pacific Coast Joint Venture for guidance on developing your project proposal. More information available at:

<http://www.fws.gov/birdhabitat/Grants/NAWCA/Small/index.shtm>

### **USDA/NRCS Wildlife Habitat Incentives Program (WHIP)**

**Deadline: January 16, 2007**

The Wildlife Habitat Incentives Program (WHIP) is a U.S. Department of Agriculture (USDA) voluntary conservation program that encourages creation of high quality wildlife habitats that support wildlife populations of National, State, and local significance. It provides financial and technical assistance to landowners and others to develop upland, wetland, riparian, and aquatic habitat areas on their property. The primary purpose of WHIP is to help participants “develop upland wildlife, wetland wildlife, threatened and endangered species, fish and other types of wildlife habitat.” Private lands owners and state agencies can apply for funding. Awards amount range Please contact Gwen Gilbert ([gwen.gilbert@hi.usda.gov](mailto:gwen.gilbert@hi.usda.gov)) with any questions regarding the program

More information available at: <http://www.hi.nrcs.usda.gov/programs/whip/whip.html>

### **Large NAWCA Grants**

**Deadline: March 7, 2008**

Projects must involve long-term protection, restoration, and/or enhancement of wetlands and associated uplands habitats. Proposals can request 1 million dollars in funding but must have a 1:1 match component (1:1.5 is recommended to be competitive) Please contact

Christina Ryder (808.542.1559) Hawaii Coordinator for the Pacific Coast Joint Venture for guidance on developing your project proposal. More information available at: <http://www.fws.gov/birdhabitat/Grants/NAWCA/Standard/index.shtm>

### **Atherton Family Foundation Grants**

#### **Deadlines: Rolling Deadline**

The Foundation makes grants for programs and projects that benefit the people of Hawai'i. The fields of greatest interest are arts, culture and humanities; community development; education; environment; health; human services; spiritual development; and youth development. Applicants must have 501(c)(3) status or must apply through a fiscal sponsor with 501(c)(3) status. Grants have a one year time frame. No match is required and first time applicants are encouraged to submit grants under \$50,000.00.

More information available at: <http://www.hawaiicommunityfoundation.org/atherton/>

### **Pikake Fund**

#### **Deadlines: Rolling Deadline**

The Pikake Fund provides support for film or video projects on environmental protection efforts. Grant-making only occurs in even numbered years. Funds have been granted for 2006. Proposals for the next grant round will be accepted after January 30, 2008.

More information available at: <http://www.hawaiicommunityfoundation.org>

### **Wildlife Habitat Policy Research Program**

#### **Deadline: Letters of Intent due to NCSE by December 3, 2007**

This research grant program aims to strengthen wildlife habitat protection by improving general implementation of the statutory State Wildlife Action Plans. Reflecting the multidisciplinary nature of this conservation challenge, the program will support research in law, economics, social sciences, natural sciences, and public policy. Grant awards will range from \$100,000 to \$150,000. More information available at: <http://ncseonline.org/WHPRP/>

### **2008 PCJV Discretionary Funds: Look for RFP in January 2008**

## Resources for finding funding

Hawaii Forestry Extension Incentive Programs

<http://www.ctahr.hawaii.edu/forestry/Data/incentives.html>

Federal and State of Hawai'i Incentive Programs:

Matrix of funding available for land management on private lands

[http://www.ctahr.hawaii.edu/forestry/Data/Forestry\\_Matrix\\_table\\_10\\_16\\_07.pdf](http://www.ctahr.hawaii.edu/forestry/Data/Forestry_Matrix_table_10_16_07.pdf)