Hawaii Wetland Monitor

The newsletter of the Hawaii Wetland Joint Venture

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In this Issue

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Hawaiian Birds: Crisis or Opportunity?

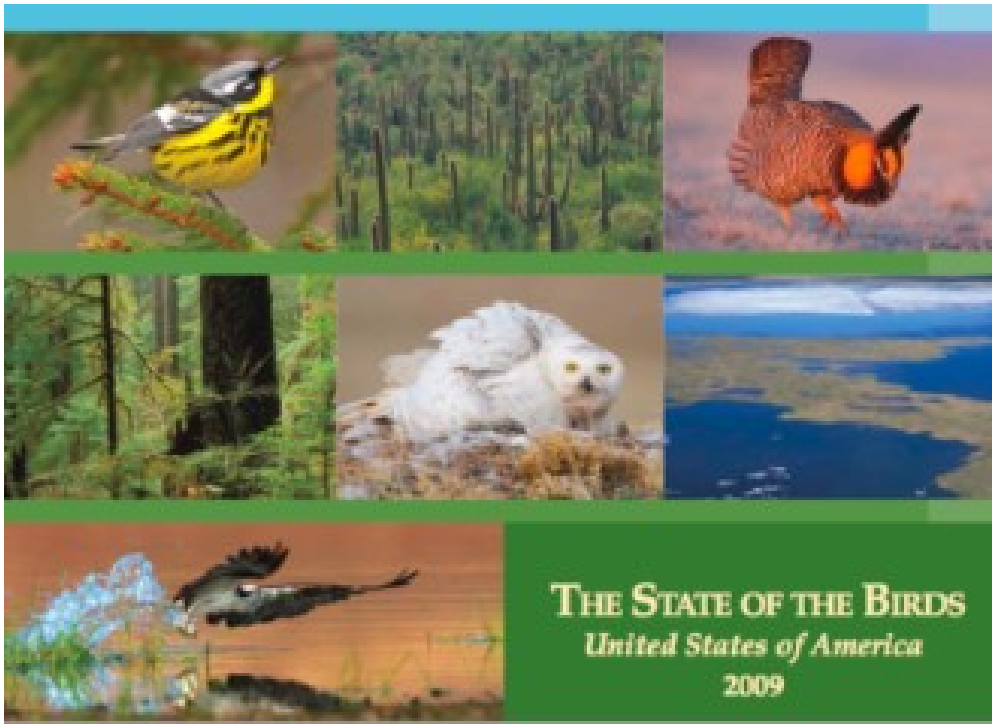
(Credits: This article references the U.S. Fish and Wildlife Service's report "The State of the Birds, United States of America, 2009.")

On March 19th, the U.S. Fish and Wildlife Service released the first comprehensive analysis of the state of our nation's birds. First it acknowledges that the health of bird populations is a refection of the health of our environment. It shows that along with the sobering declines of many bird species across the nation, there is also the heartening recognition that birds can respond positively to conservation actions, and do so quickly.

There are more than 800 species of native birds across the United States, diversified into terrestrial, coastal, and ocean habitats, including Hawaii. Of these 67 are listed federally as endangered or threatened and 184 more are species of conservation concern.

The report indicates that "more bird species are vulnerable to extinction in Hawaii than anywhere else in the United States" and defines Hawaiian bird status as a crisis situation. The Hawaiian Islands once supported 113 bird species unique in the world, but now 71 have become extinct and 31 more are federally listed. Ten of these listed species have gone unseen for 40 years.

The report goes on to state that "Most of Hawaii's conservation crises result from the introduction of nonnative plants and animals, but climate change is a growing concern. The leading threats to Hawaiian birds include habitat *(cont.)*



degradation from trampling and grazing by introduced ungulates; nonnative predators (e.g., feral cats, mongooses, and rats); nonnative plants and diseases; and bird diseases."

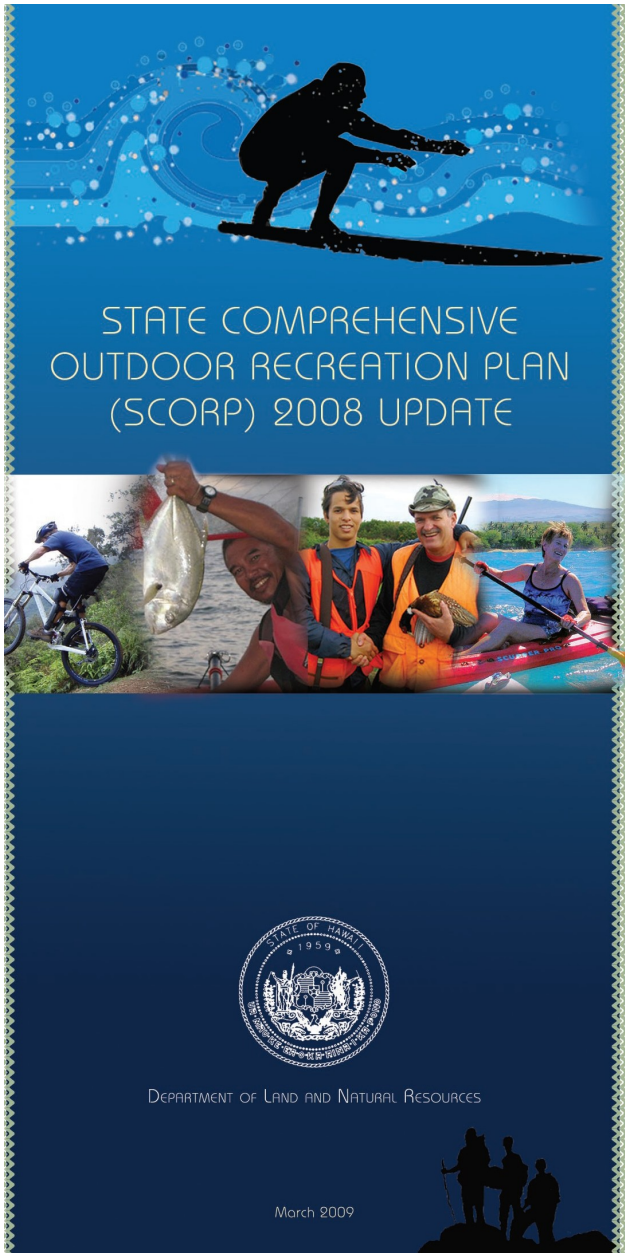
In the face of this sad news the release of this report presents a great opportunity and a call to action. It is envisioned that the Joint Ventures across the nation will play a vital role in the follow up to the State of the Birds Report. The Joint Ventures are posed to be the vehicle for increased conservation measures on-the-ground.

Now is the time to highlight the important habitat conservation work that the Hawaii Wetland Joint Venture has been doing and to gain more funding support for continued and expanded efforts here in Hawaii. This report provides us with the foundation to request greater assistance in our on-the-ground efforts and expand our partnerships in the service of protecting and restoring wetland habitat for waterbird conservation in Hawaii.

At the press release of this document speaker John Fitzpatrick, Director of the Cornell Lab of Ornithology, brought this point home when he stated that "Hawaii is a borderline ecological disaster spectacularly underinvested in…. an epicenter of extinction and near extinction…a source of huge pride…that's desperately in need of U.S. attention."

The full report, along with an overview, press release and other material, can be found at: http://www.stateofthebirds.org/

Updated 2008 Hawaii State Comprehensive Outdoor Recreation Plan (SCORP)



The State Comprehensive Outdoor Recreation Plan (SCORP) is a little known planning effort that guides the use of the Land and Water Conservation Fund. This fund is made available through the National Land and Water Conservation Act (NLWCA), passed in 1965 to assist with the development of outdoor recreation opportunities for U.S. citizens. Federal requirements for the SCORP include identifying wetland acquisition needs in the context of recreation opportunities for citizens.

The Land and Water Conservation Fund (LWCF) Program[1] receives its main funding from the Outer Continental Shelf Revenues, with additional support from recreation fees, motorboat fuel taxes, and federal surplus property sales. Apportionment of these funds to each state is based on the state's population size. After the National Park Service receives its allocation of the fund, the remaining portion is distributed to qualifying state governments.

To qualify for the grant funds, states must prepare a SCORP and update it every 5 years. The SCORP document contains the following components: 1) an updated inventory of outdoor recreation resources, 2) identification of public demand for recreation resources, 3) identification of issues affecting outdoor recreation, 4) strategic plan to address these issues and demands, and 5) a wetlands resource plan. With each update the public is asked to participate and provide input on their recreational needs and issues.

The updated SCORP, submitted to the National Park Service for acceptance, identifies current recreation trends and issues of statewide importance. These include issues such

[1] To view a LWCF Report highlighting projects go to www.tpl.org/lwcfreport

as resource protection and sustainability, the need for well-maintained and safe parks, funding and staffing for recreation areas, and user conflicts, with a plan of action to address these issues. Recent response to the user survey and public meetings in Hawaii identified a high demand for recreation in natural areas and walking paths.

Information about the partnership work of the Hawaii Wetland Joint Venture is now included in the 2008 SCORP update. It also references wetland sites identified in the PCJV Hawaii's Strategic Plan for Wetland Conservation in Hawaii (2006.) Because wetlands are prime habitat areas for birds, offering excellent passive recreation opportunities for nature viewing along walking trails, the LWCF Program offers another wetland conservation funding tool for Hawaii Wetland Joint Venture partners

LWCF money can be used for both acquisition of public land and construction of outdoor recreation facilities such as walking and hiking trails, bike paths, boat ramps, and sports fields. Of course, recreational use must accompany any site acquisition funded by the LWCF. Therefore, funds are available to state and county agencies involved in outdoor recreation.

Since 1966, Hawaii has received $35 million dollars through the LWCF program, which has benefited over 400 acres through 141 projects. Decreased funding in the past 3 years has left Hawaii with $244,000 in 2008.

The Department of Land and Natural Resources, Division of State Parks administers the LWCF fund for Hawaii. They inform state and county recreation agencies when funds are available, usually around March, with project applications requested by August. Project selection is based on the recreational demands and priorities identified in the SCORP document. Selected projects are submitted to the National Park Service by the end of the year and grant funds are often obligated by March of the following year. All applications require a 50% non-federal match, which may be state and county funds, as well as in-kind services.

The official contact for details about SCORP funding is Martha Yent of DLNR State Parks at (808) 587-0287, e-mail: Martha.E.Yent@hawaii.gov.

The final SCORP update will be on line soon at http://www.hawaiistateparks.org

Fish Community Structure in Hawaii's Coastal Wetlands

Richard A. MacKenzie and Greg Bruland

Over the past two years, wetland scientists from the USDA Forest Service, University of Hawaii at Manoa, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and Ducks Unlimited have been collaborating on an EPA-funded project to assess the status of Hawaii's wetlands. Initially 40 sites were sampled across Kauai, Maui, Oahu, Molokai, and Hawaii in 2007, collecting information on water quality, plant community structure, sediment characteristics, and fish community structure. Since then, water quality and fish community structure are monitored quarterly on a subset of twenty sites.

Above, a male Mexican molly.
Below, a male mosquito fish.

Results reveal that 50-90% of the fish community is invasive species. Most of these invasive species were from the live-bearing Poeciliidae family and included mosquito fish (Gambusia affinus), Mexican mollies (Poecilia hybrid sp. complex), guppies (Poecilia reticulata), and swordtails (Xiphophorus helleri); poeciliid densities at some sites were more than 100/m2. Mosquito fish, guppies, and swordtails were first introduced to the Hawaiian Islands in the early 1900's for mosquito control (despite the fact the swordtails are herbivores), while Mexican mollies are believed to be an unintentional aquarium release. Based upon our research, these species are now well established in coastal wetlands throughout the state of Hawaii, especially on Oahu and Maui.

Poeciliids were introduced to feed on mosquito larvae. This method of mosquito control has been under debate for several years. For example, some studies have shown that poeciliids can actually increase the number of mosquito larvae by preying on predators of mosquito larvae such as beetles or dragonfly larvae. Once poeciliids have established themselves in a wetland, they can quickly spread to nearby aquatic ecosystems via overland flow during the frequent flooding events that occur in Hawaiian watersheds. It may even be possible for poeciliids to migrate from one coastal wetland to another. This is evident from the fact that mosquitofish and Mexican mollies were sampled from wetlands with salinities greater than 60 ‰, nearly twice that of the ocean salinity!

The specialized reproduction of poeciliids makes it possible for a single, fertilized female to successfully colonize a wetland. Female poeciliids can store sperm and fertilize

several broods throughout the year. Furthermore, poeciliids are live-bearers; fertilized eggs develop within the female and are born as fry. This increases the survival rate of young poeciliids by eliminating the possibility that eggs will be preyed upon. Thus, the colonization of a wetland by a single gravid female can result in a well-established population over a short period of time.

Should we be concerned about the prevalence of poeciliids in our wetlands? Definitely! Despite their small size, these fish can reach densities 10-30 times higher than some native fish such as gobies and flagtails. This suggests that they are worthy adversaries that compete with native fish (and birds) for valuable food sources, such as insect larvae or algae. Poeciliids have also been shown to be the source of exotic parasites that now negatively affect the health of native fish and possibly even native birds. Finally, we have evidence that poeciliids are increasing the nutrient concentrations in wetlands. This is of concern because these nutrients can stimulate algal or microbial growth that can adversely affect wetland health. Because many species of poeciliids are polyphagous, they eat anything including algae and plant material. As a result, these fish break down nutrients that are tied up in plant material (e.g, particulate organic nitrogen). It releases back to the environment in a readily available, dissolved form (e.g., ammonium) that can be utilized by microorganisms and may lead to nuisance algal blooms (or may facilitate the invasion of other exotic algae) such as in anchialine pools on the Kona coast.

Future wetland creation or restoration projects should not include the introduction of invasive poeciliids (or other invasive fish) as they can significantly impact the water quality and ecological value of systems that are beneficial to many native birds and fish. Preventing introductions of fish is the best management technique, as removal of poeciliids can be difficult, costly, and time-consuming. More research is needed to further understand the impacts of these invasive fish (e.g., do they play a role in the transmission of botulism?) Then we can prioritize which species need removal and determine the most effective method to use (e.g., rotenone, clove oil, biological controls).

Richard MacKenzie works with the USDA Forest Service Institute of Pacific Islands Forestry. Greg Bruland is a researcher at the University of Hawaii at Manoa, Natural Resources and Environmental Management Department.

References and Additional Reading:

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Van Dine, D. L. 1907. The introduction of top-minnows into the Hawaiian Islands. Press Bulletin 20:1-10.

Yamamoto, M. N., and A. W. Tagawa. 2000. Hawaii's Native and Exotic Freshwater Animals. Honolulu, HI: Mutual Publishing.

Considerations for Pacific Island Bats

Kimberly Uyehara and Gregory Koob

Do you have bats associated with your wetlands, riparian zones, or farmlands? The best time to observe ʻōpeʻapeʻa, Hawaii's only native terrestrial mammal, is at sunset when it comes out to forage. It is a major predator of night-flying insects such as moths, beetles, and termites. Insectivorous bats worldwide play an important role in regulating insect populations of natural and agricultural ecosystems.

Current research by Dr. Frank Bonaccorso (USGS) indicates that ʻōpeʻapaʻa is a generalist. It roosts in a wide variety of native and nonnative trees, and roost sites are densely vegetated with open access for launching into flight. The bat forages in open and wooded landscapes and linear habitats such as windbreaks and riparian corridors. Though not known to drink from water bodies, bats are regularly observed foraging over wetlands, reservoirs, stream mouths, and offshore. Because many flying insects have aquatic larval stages, bats may be attracted to insects of lush riparian vegetation or those emerging from the water. However, almost nothing is known about the use of wetlands by ʻōpeʻapaʻa.

ʻŌpeʻapeʻa is protected by federal and state endangered species laws, and many land managers have asked how they can help bats on their land. The USDA Natural Resources Conservation Service (NRCS) sponsored a Biology Technical Note on Bats of the U.S. Pacific Islands. It's an introduction to the habitat requirements of bats of Hawaiʻi, American Samoa, and the Mariana Islands and general guidance on conservation practices to enhance and manage bat habitats, to be used in conjunction with NRCS Farm Bill Conservation Programs and other habitat conservation initiatives. This project would not have been possible without the help of expert batologists Gary Wiles, Frank Bonaccorso, Anne Brooke, Sandra Banack, and many others. The Technical Note will be posted on the NRCS Pacific Islands website http://www.pia.nrcs.usda.gov/ in the near future. Remember to consider bats in your restoration and management planning.

Species Profile
Hawaiian hoary bat, ʻōpeʻapeʻa

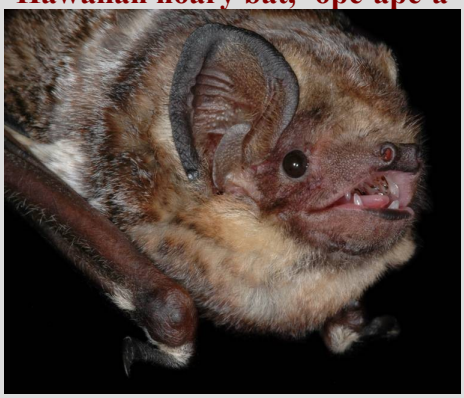

Photo Honolulu Zoo

Family: Vespertillionidae
Scientific name: *Lasiurus cinereus semotus*
Habit: Solitary, nocturnal
Wingspan: 26.9–34.6 cm
Average weight: ♂ 14.2 g; ♀ 17.9 g
Range: main Hawaiian Islands, all elevations
Approx. breeding period: April - December
No. of pups per year: 2 (twins)
Roosting habitat: Trees with dense foliage
Foraging habitat: Open and wooded landscapes and linear habitats
Food habits: Aerial insectivore - consumes night-flying insects primarily moths, beetles, and termites
Population estimate: unknown

The fanihi or Mariana fruit bat (*Pteropus mariannus mariannus*) is one of the 5 taxa featured in the NRCS Technical Note (Photo © Merlin D. Tuttle, Bat Conservation International).

News and Announcements

Obama Administration Lists Its First Endangered Species – Hawaiian Wetland Plant
(Environment News Service – March 17, 2009)
http://www.ens-newswire.com/ens/mar2009/2009-03-17-093.asp
A Hawaiian native plant is the first species to be protected by the Obama administration under the Endangered Species Act. The U.S. Fish and Wildlife Service announced that it is listing Phyllostegia hispida from the island of Molokai as an endangered species. Just 238 plants of the species exist today. Federal listing of Phyllostegia hispida automatically invokes state listing under Hawaii's endangered species law….Phyllostegia hispida is a diffuse perennial vine of the mint family with many-branched stems that form large tangled masses. Found only in the wet forests of eastern Molokai, one group of plants grows in The Nature Conservancy's Kamakou Preserve and more are growing in the state's Pu'u Ali'i Natural Area Reserve.

NEW Hawaii Fish Habitat Partnership Approved
http://fishhabitat.org/images/documents/FHP_Candidates/hawaii_fhp.pdf
As a newly approved partnership of the National Fish Habitat Action plan, the Hawaii Fish Habitat Partnership seeks to cooperatively develop and implement aquatic conservation projects in Hawaiian streams and estuaries through the support and participation of government agencies, non-governmental organizations, and the private sector. For more information contact: Gordon Smith U.S. Fish and Wildlife Service, 808.792.9400, gordon_smith@fws.gov or Robert Nishimoto, Hawaii DLNR - Division of Aquatic Resources, 808.974.6201, robert.t.nishimoto@hawaii.gov.

Hawaii Launches New CREP Program
http://hawaii.gov/dlnr/dofaw/forestry/crep
On January 22, 2009, the USDA Farm Service Agency and the Hawaii Department of Land and Natural Resources announced approval of the Hawaii Conservation Reserve Enhancement Program (CREP). Like all CREPs, it is a state-federal partnership program that provides resources for landowners who agree to improve water quality and restore wildlife habitat under long-term contracts. Farmers and ranchers on the six main islands —Hawaii, Maui, Molokai, Lanai, Kauai and Oahu—can enroll up to 15,000 acres in 15-year contracts. They get funding to restore native forests along mountain streams, wetlands and other rare native habitats, like dryland forests. A major focus of the new CREP is unique provisions to address invasive, non-native species that imperil Hawaii's native species.

Wetland Breaking News, Association of State Wetland Managers
http://www.aswm.org/wbn
The Association of State Wetland Managers provides a monthly briefing about the news and events concerning America's wetlands. Wetland Breaking News is an edited compilation of wetland-related information submitted by readers and gleaned from list-serves, press releases, and web sites from throughout the United States.

July 28-30, 2009. Hawaii Conservation Alliance (HCA): 2009 Annual Conference Hawaii in a Changing Climate: Ecological Cultural, Economic, and Policy Challenges and Solutions. (Honolulu Convention Center, HI)
http://hawaiiconservation.org/2009_hcc.asp
*Register by **Friday, May 29** to get the early bird discount rates.*

The following excerpt from the HCA web site describes the conference focus:
The annual Hawai'i Conservation Conference, presented by the Hawai'i Conservation Alliance, is the largest gathering of people actively involved in the protection and management of the natural environment in Hawai'i and the Pacific Region. The conference facilitates interaction among resource managers, the scientific community, and other stakeholders. This is an annual opportunity to share experiences and ideas on a wide range of conservation issues affecting Hawai'i and the Pacific.

Climate change is a profoundly important topic for Hawai'i. We are just beginning to understand the magnitude of changes that will impact our lands and seas, water resources, cultural heritage, residents, agricultural areas, and infrastructure. Many of our island neighbors in the Pacific already have been measurably affected by climate change and their experiences presage what's to come here in the Hawaiian archipelago. The conference will highlight the current state of knowledge on climate change impacts and foster a dialogue on adaptation and mitigation strategies for Hawaii's natural and human communities.