



THE WILDLIFE SOCIETY
HAWAII CHAPTER

Thursday	October 6, 2005-09-30	
8:30 - 9:00	Registration	The Wildlife Society - Hawaii Chapter
9:00 - 9:30	Introduction	The Wildlife Society - Hawaii Chapter
9:30 - 10:30	A Delicate Balance: Wetland Restoration	Nicole Athearn, USGS
10:30 - 11:00	Volunteer Management: What's in Your Toolbox?	Pauline Kawamata- Hawaii Nature Center
11:00 - 11:30	Kawainui Marsh Restoration Project	Travis Hylton, Oceanit
11:30 - 12:30	LUNCH	Ko'olau Catering
12:30 - 1:00	Waterbird Monitoring in Hawaii	Eric VanderWerf, USFWS
1:00 - 1:30	Hawaii Wetland Plant Field Guide	Terrell Erickson, NRCS
1:30 - 2:00	Wetland Monitoring - Hamakua Marsh Results	Christina McGuire & Rich MacKenize
2:00 - 2:30	BREAK	Ko'olau Catering
2:30 - 3:30	Regulatory Permitting - Panel Discussion	USACOE, CZM, DOH, DPP
3:30 - 4:30	Future Research Needs - Panel Discussion	Oceanit, AECOS, USFWS, DOFAW, UH
Friday	October 7, 2005	
8:30 - 9:00	Coffee/Pastries	Ko'olau Catering
9:00 - 9:30	Botanical and Bathymetric Survey of Kawainui Marsh	Eric Guinther, AECOS, Tobias Koehler, Oceanit
9:30 - 10:00	Coastal Wetlands Restoration: Waihe'e Dunes	Scott Fisher, Maui Coastal Land Trust
10:00 - 10:30	BREAK	Ko'olau Catering
10:30 - 11:00	A Year at Kaelepulu Wetland	Hugo Devires, Ron Walker & Larry Abbott
11:00 - 11:30	Ohiapilo: Successes & Lessons Learned	Arleone Dibbon-Young, Ahupua'a Natives
11:30 - 12:30	LUNCH	Ko'olau Catering
12:30 - 1:15	Genetics & Morphometrics of Koloa	Andrew Engilis & Kim Uyehara
1:15 - 2:20	Identification of Koloas & Hybrids	Andrew Engilis & Kim Uyehara
2:00 - 2:30	Feral Mallards- A Threat to Florida's Mottled Duck	Joe Benedict, Florida Fish & Game Commission
2:30 - 3:00	Nesting Structures for Koloa Management and Culling of Feral Mallards	Fern Duvall, DOFAW
3:00-4:00	Panel Discussion on Koloa Duck	Andrew Engilis, Kim Uyehara, Joe Benedict, Fern Duvall

The 2005 TWS Wetland Workshop was brought to you in part by the Natural Resources Conservation Service, Pacific Coast Joint Venture, Ducks Unlimited and the Hawaii Department of Land and Natural Resources.

Thursday, October 6, 2005

Nicole Athearn

A DELICATE BALANCE: SALT PONDS, WETLAND RESTORATION, AND WILDLIFE IN SAN FRANCISCO BAY

During the past 200 years, the San Francisco Bay Estuary has undergone topographical and ecological changes resulting from human growth and development. Over 78% of historic salt marshes have been lost, resulting in diminished habitat for native marsh species and fragmentation of remaining marshlands. Commercial salt ponds were constructed around the fringes of the bay and have been a part of San Francisco Bay's landscape since 1856. Today, these salt ponds represent not a chance to make commercial use of unusable land, but an unprecedented opportunity to reclaim and restore vital habitat for native wildlife. The U.S. Fish and Wildlife Service and the California Department of Fish and Game have acquired over 10,700 ha of commercial salt ponds in San Francisco Bay for the purpose of restoring tidal wetlands. Because salt ponds are also important for migratory birds, managers plan to retain some managed ponds as refuge and foraging habitat for hundreds of thousands of wintering shorebirds and waterfowl as well as unique assemblages of invertebrates and native fishes. However, no guidelines, model, or management strategies exist for converting ponds to tidal wetlands, nor for maintaining salt ponds at desired depths and salinities when ponds are no longer part of a salt-making system. Restoration activities may carry ecological risks such as erosion of Bay mudflats, local water quality effects, release of sequestered mercury from ponds, and spread of invasive cord-grass into restoration sites. Additional concerns associated with restoration actions in this highly urbanized region include flood control, public health, and public access. To meet these challenges, consistent project monitoring and integrated research will provide the necessary guidance and decision support that management needs to fulfill project objectives.

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Pauline Kawamata

VOLUNTEER MANAGEMENT: WHAT'S IN YOUR TOOLBOX?

In the Spring of 2002, the Hawaii Nature Center field tested a new third grade wetland program at Pouhala Marsh. Since then, third grade students and volunteers alike have been a part of this new and exciting venture. Pouhala Marsh is located in Waipahu across the street from the Transfer Station on Waipahu Depot Road. It is comprised of a remnant fishpond and coastal marsh in the western loch of Pearl Harbor and is considered part of the Waikele watershed. Pouhala is owned by the City and County of Honolulu and the State of Hawaii. At 70 acres, Pouhala is the largest of the remaining wetland habitats in Pearl Harbor. Pouhala Marsh is of vital importance for the endangered Hawaiian stilt.

Using the Pouhala Marsh restoration project as an example, a few basic "nuts and bolts" of volunteer management will be presented as well as suggestions for recruitment, retention and recognition of volunteers. All of these tools can be incorporated into your volunteer toolbox and will help you build a successful volunteer project.

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Travis Hylton

KAWANUI MARSH RESTORATION PROJECT: ESTABLISHING WETLAND VIABILITY THROUGH FIELD-SCALE HYDROGEOLOGIC TESTING

The Kawainui Marsh Restoration Project is intended to provide habitat for endangered Hawaiian waterfowl in the Koolaupoko region of the island of Oahu. With this end goal in mind, a design has been developed that employs a terraced wetland pond system to support the species of concern while considering the hydrology and geology of the project site. The designed wetland habitat will be a series of 11 terraced pond cells arranged in an irregular mosaic pattern and separated by low earthen berms. As part of the project source water investigation report, initial hydro-geologic testing was conducted through well development and percolation tests. These tests challenged a number of assumptions about the availability of groundwater in the area and localized infiltration rates. In order to evaluate the viability of establishing a constructed wetland with stable water levels needed to provide waterfowl habitat, a test pond program was developed to evaluate hydro-geologic parameters on a field scale. This four month research project yielded valuable water balance information that provides a high level of confidence that the project will be viable as designed, and also provides insight into how the wetland system may be best managed.

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Eric VanderWerf

WATERBIRD MONITORING IN HAWAII: RECENT EFFORTS AND IMPROVEMENTS AND FUTURE NEEDS

Monitoring of a species' distribution and abundance is crucial to understanding its conservation needs and the efficacy of management actions. The primary tool used for monitoring of waterbirds in Hawaii is the biannual waterbird survey coordinated by the Hawaii State Division of Forestry and Wildlife, though Christmas Bird Count data provide valuable information from some areas. Waterbird survey data from 1970-present were recently compiled by the Hawaii Natural Heritage Program and the U.S. Fish and Wildlife Survey. Review and preliminary analysis of this data allowed us to devise improvements to the count methodology, including a revised field data form, standardization of methodology and wetland names, more detailed instructions, and a photographic field guide. Data were used to create maps and graphs depicting the distribution and population trend of the Koloa, Hawaiian Coot, Hawaiian Moorhen, and Hawaiian Stilt, which were included in the 2005 Draft Revised Recovery Plan for Hawaiian Waterbirds. Further analysis of this large data set is needed, and likely will reveal additional modifications that can help refine the survey methods, but current analyses of the data are already valuable and will help us determine the status of our wetland birds and whether managements actions aimed at their protection are effective.

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Terrell Erickson, Christopher Puttock, Clyde Imada, Laura Crago, Derral Herbst, Kimberly Uyehara, and Christina McGuire

HAWAI‘I WETLAND PLANT FIELD GUIDE: AN ECOLOGICAL AND IDENTIFICATION GUIDE TO WETLANDS AND WETLAND PLANTS OF THE HAWAIIAN ISLANDS

Since the 1980s there has been only one field guide to Hawai‘i’s wetland hydrophytes, Lani Stemmermann’s “*A Guide to Pacific Wetland Plants*”. This field guide covered one-eighth of the wetland plant species known in Hawaii. It included Stemmermann’s recommendations for wetland indicator status; the National List of Plant Species That Occur in Wetlands: Hawaii (Region H) (Reed 1988), affectionately called the “Green Book”, had not yet been published.

The *Hawai‘i Wetland Plant Field Guide* project is funded by Environmental Protection Agency to Erickson and Puttock (editors) through McGuire (Project Manager) Hawai‘i Department of Land and Natural Resources. The field guide will provide an overview of wetland ecology, functions and values, restoration and mitigation, and descriptions and photographs of more than 200 of the most common plants found in coastal wetlands in the Hawaiian Islands. This field guide is critically needed for ongoing and expanding wetlands conservation in the state. It is intended to be a primary resource for wetland inventories, biological assessments, monitoring projects, watershed planning, and wetland restoration efforts on every level (from federal, state, and local governments to efforts on private lands). The field guide will build capacity and improve effectiveness of these projects by providing practical and useful information about wetland ecology and the dominant plant species found in wetland ecosystems in Hawai‘i.

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Christina McGuire and Richard Mackenzie

THE EFFECTS OF INTRODUCED TILAPIA AND POECILIID FISH ON INSECT EMERGENCE RATES: A CASE STUDY OF HAMAKUA MARSH, OAHU, HAWAII

The African blackchin tilapia (*Sarotherodon melanotheron*) was introduced to Hawaii in 1951 for use as a baitfish and to control aquatic weeds; poeciliid mosquitofish (*Gambusia affinis*, *Poecilia latipinna*) were introduced in 1905 for biocontrol. Since their introductions, these fish have rapidly colonized the Hawaiian Islands, maintaining abundant populations in low-energy coastlines as well as in streams and drainage channels. Few studies have documented the ecological impacts of these invasive fish on the aquatic invertebrate assemblages within Hawai'i's aquatic ecosystems. To examine the effects of fish predation on aquatic insect populations, insect emergence was measured within Hamakua Marsh, a brackish wetland on the island of Oahu, Hawai'i. Fish access to invertebrate communities was manipulated through the use of exclosures, creating areas of fish free habitat. Emergence was sampled every week over a six month period, encompassing both wet and dry seasons. Preliminary results at Hamakua Marsh revealed that abundance and biomass of emergent insects were highest in emergence traps where fish were excluded compared to traps from areas where fish were present. Our results suggest that the presence of invasive fish decrease populations of aquatic invertebrates, in turn decreasing forage for endangered waterbirds who inhabit wetland areas throughout the Hawaiian Islands.

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Friday, October 7, 2005

Robert Bourke, **Eric Guinther** and **Tobias Koehler**

BOTANICAL AND BATHYMETRIC SURVEY OF KAWAI NUI MARSH

Kawai Nui Marsh, located on the windward side of Oahu, is Hawaii's largest wetland. Today, native and non-native vegetation, growing on top of a layer of peat, covers 90% of the surface of the marsh. In many areas the peat forms a floating mat. The present study, funded by the Corps of Engineers and DLNR was designed to ascertain the nature of the substratum and composition of the flora. This included determining the thickness of the peat, depth of water, and thickness of the mud under the peat. With this information, the Corps and DLNR hope to undertake restoration of significant areas of open water, enhancing waterfowl habitat. This study determined that the peat thickness ranged from zero to over 8 feet thick, averaging 4.1 feet. The depth to the mud layer ranged from zero to over 16 feet thick, while depth to a hard bottom measurement fell between 0.5 feet and over 16 feet (most over 16 feet). Based on a recent satellite image, past reports, and present field surveys, the plant cover of the entire marsh was classified into vegetation assemblages and their coverage estimated. The three most commonly found assemblages were saw-grass at 21% (148 acres); neke fern-bulrush mix 20% (140 acres), and California grass at 33% (225 acres).

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Scott Fisher, and Penny Levin

COASTAL WETLANDS RESTORATION: PRINCIPLES, PRIORITIES AND
DIRECTIONS FOR APPLIED RESEARCH

In July 2004, the Maui Coastal Land Trust purchased the 277-acre Waihe`e Coastal Dunes and Wetlands Refuge. The central portion of the refuge consists of an approximately 26-acre palustrine wetland, the third largest on Maui, and is surrounded by a high dune along the upper boundary. Although this area once held large numbers of indigenous and endemic wetland bird and plant species, significant changes in local water hydrology and land use resulted in recruitment of invasive species, profoundly altering the quality of the wetland.

This presentation will look at the application of principles and priorities suggested in the Bradley method of bush regeneration as it applies to the habitat restoration work in the Waihe`e Wetlands. Additionally, we will explore how applied research can assist land managers improve the efficiency and efficacy of ecosystem/habitat restoration, in spite of budgetary and personnel limitations.

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Larry Abbott, Hugo deVries, and Ron Walker

A YEAR AT KA'ELEPULU WETLAND

Ka'elepulu wetland sits at the mauka end of Ka'elepulu Pond, Kailua, Oahu. The history of land use and ownership follows patterns seen elsewhere on the windward side of Oahu. See the handout available on the table. Currently, this privately owned four hectare wetland is comprised of a group of contoured islands surrounded by a moat and a residential area. It is managed under guidelines provided by the US Army Corps of Engineers. Quarterly report summaries and the text of this paper are available at our website: **kaelepuluwetland.com**

Working with hand held tools and herbicide a day or two a week we cleared much of the wetland to Corps standards within a six month period. Because there is far less alien growth at the start of the 2005 to 2006 management season, better progress is expected by May of 2006. Control of black rats by baiting, and frogs by trapping, seem effective. Predation by night herons is probably responsible for most chick mortality but these are not controlled. The principal measure of management effectiveness was the breeding success of the endangered waterbirds of Ka'elepulu Wetland. Because no records were available for comparison, a relative measure could not be made. Five or six broods of gallinules were observed and up to ten broods of coots were seen throughout the year. At least one pair of coots and one pair of gallinules reared two broods in the year. Chick survival seemed to be one or two per brood in most cases. Stilts were the most conspicuous of the endangered birds and two pairs nested successfully this season. Two of four chicks fledged. Two abandoned nest sites with eggs were discovered on island three and are presumed to have been flooded. On two occasions stilts with oysters clamped onto their toes were captured and freed. A third entrapped bird was reported from elsewhere in the lake but its fate is unknown. Research needs include nest flooding when the city opens the beach dike and stilt entrapment by oysters.

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Arleone Dibben-Young

OHIAPILO: SUCCESS AND LESSONS LEARNED

When Molokai's Kalamaula Landfill closed in 1993, it was discovered that the County of Maui had filled nearly 7 acres of wetlands. The EPA ordered the County to enhance a minimum of 19.67 acres of wetlands adjacent to the landfill as viable and permanent habitat for the endangered Hawaiian stilt and coot and for migratory waterbirds. The EPA Consent Order specified Success Criteria components that included bird use days, hydrology, and vegetative re-growth. The birds moved in immediately after the wetland's construction was completed, but no bird surveys were received by the County that would determine if this Success Criteria component has been met. The site's design was based on elevations to inhibit Batis re-growth, but within three years uncontrolled Batis was encroaching into the newly cleared mud flats. The site has long periods of inundation - much longer and deeper than anticipated by the original designers of the site - and unfortunately this allows an unforeseen fish population to grow. With each season's falling water levels botulism outbreaks caused by dead fish kill many stilts, coots, waterfowl and shorebirds, overshadowing any success the site may have as waterbird habitat.

The primary lesson learned is that no matter how admirable the planning, how comprehensive the specifications, how flawless the construction is or how well intentioned the managers are, there will always be a need for adjustments when creating a successful wetland enhancement site. For any wetland creation project, some portion of the funding needs to be held in abeyance to correct the unanticipated consequences that will inevitably occur. Funds will need to be allocated for future research and corrections at Ohiapilo, but with modifications will come bird use, nesting and chick survival, and preservation of what has turned out to be the most important wetland on Molokai.

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R. Joseph (Joe) Benedict, Jr.

FERAL MALLARDS – A THREAT TO FLORIDA’S MOTTLED DUCK

Florida is home to a relatively small (30-40,000) breeding population of mottled ducks (*Anas fulvigula fulvigula*). Historically, mallards only occurred in Florida as wild, migratory birds during the fall and winter months. These birds migrate out of Florida in the spring to northern areas and so are not present in Florida during the breeding season. However, captive-reared mallards are being illegally released by humans in large numbers in Florida, and these feral birds remain in Florida year-round. Released mallards pair with mottled ducks and the two species interbreed, resulting in hybrid offspring. When captive-reared mallards have been released in the breeding ranges of other closely related duck species (e.g. Grey duck, Meller’s duck, Hawaiian duck), mallards have devastated, through hybridization, the population of the native species. Biologists list hybridization with feral mallards as the biggest immediate threat to the conservation of Florida’s mottled duck. Because of the relatively small size of the Florida mottled duck population, complete hybridization of the population is a serious concern. We have developed a Mottled Duck Conservation Plan that identifies specific actions to maintain the mottled duck population over the long-term. Objectives are included for population and habitat management, and public information and education. Our public outreach efforts include an *Integrated Communications Plan for Reducing Mottled duck X Mallard Hybridization* and a *Mottled Duck Community Relations Action Plan*. This presentation will discuss those portions of the Conservation Plan that relate to reducing the feral mallard population, including extensive public education/outreach efforts and recent regulatory actions.

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Fern P. Duvall II

NESTING STRUCTURES FOR KOLOA MANAGEMENT AND CULLING OF FERAL MALLARD HYBRIDS

Koloa-maoli (*Anas wyvilliana*), a federally-listed endangered Hawaiian duck species, were at one time extirpated from Maui-nui. Direct and soft-releases of both captive-bred and translocated Kauai koloa-maoli by the State of Hawaii Division of Forestry & Wildlife in 1989 and 1991 restored the duck to the East Maui mountain stream of Piinaau. Waterbird surveys performed bi-annually soon recorded koloa-maoli in varying slowly ascendant numbers on Maui. Recovery of the species would benefit from reduction of predation on these ground nesting birds and their eggs. Artificial nesting structures (tunnel baskets), were shown to be preferentially attractive as nest sites and to increase Mallard (*Anas platyrhynchos*) nesting success in North America, largely by reducing egg and nesting duck predation. This nest structure technology is now being experimentally implemented in the Kanaha Pond Wildlife Sanctuary on Maui to determine if koloa-maoli will utilize the tunnel structures for nesting, and will have enhanced hatching success. This presentation discusses the methods of site selection, construction, and deployment of such nesting tunnels at the sanctuary.

Hybridization of koloa-maoli occurs with feral-domestic mallards from domestic stock on Maui, as elsewhere in the State. Hybridization poses perhaps the single-most difficult to resolve recovery issue for wildlife managers, with respect to preserving the genetic purity of and recovering the koloa-maoli. While it remains unclear just how to define and identify such hybrids both in-hand and at a distance, varying numbers of koloa x domestic duck hybrids have been reported in survey data since 2000. Removal of hybrid ducks from the wild is a goal of koloa-maoli recovery management. This presentation will illustrate how this nesting structure is also being investigated as a tool to provide new management access to koloa x domestic duck hybrids. Hybrids using these structures could potentially be more easily accessed for study and testing, and/ or trapped and controlled, with less disturbance to the other wildlife at the sanctuary, than by other current methods.

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Andrew Engilis, Jr.

IDENTIFICATION OF HYBRID HAWAIIAN DUCK (KOLOA) X MALLARDS: AN AID TO THE RECOVERY OF KOLOA.

Review of museum specimens and their morphologic characteristics.

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REGULATORY PERMITTING

U.S. Army Corp of Engineer Regulatory Program Overview

Authorizing Statutes: 33 USC 403; 33 USC 1344

Regulations: Title 33, Code of Federal Regulations, Sections 320 through 331

Authority:

Section 10 of the Rivers and Harbors Act of 1899 authorizes the Corps to regulate structures or work in, over, or under navigable waters of the United States. Permits are required for projects such as marinas, bulkheads, bank stabilization, shoreline protection, piers, pipelines, dredging, or other work in navigable waters. Navigable waters are those waters which are presently used, have been used in the past, or may be susceptible for use, to conduct interstate or foreign commerce.

Section 404 of the Clean Water Act gives the Corps authority to regulate discharges of dredged or fill material in waters of the United States, including wetlands. Mechanized land clearing, grading, leveling, ditching, and redistribution of material within waters of the United States including wetlands, are examples of regulated activities. Waters of the United States is broadly defined and includes the navigable waters of the United States and most other lakes, rivers, streams, wetlands, bogs, sloughs, wet meadows, ponds, etc.

Section 103 of the Marine Protection, Research and Sanctuaries Act of 1972 authorizes the Corps to issue permits for the transportation of dredged material for the purposes of disposal in ocean waters.

Types of Permits:

Individual permits are usually required for projects considered large in scope and/or involving potentially conflicting issues in environmentally sensitive areas.

Letter of Permission is a type of individual permit that may be used to authorize activities in navigable waters where the proposed work would be minor in scope, would have negligible adverse impacts on the aquatic environment, and is not controversial. In these situations, an abbreviated individual permit review process, involving coordination with other Federal and state regulatory agencies and adjacent property owners, is used to expedite the authorization.

Nationwide permits are a form of permit used to authorize specific activities determined to have no more than minimal impact on the aquatic environment. Nationwide permits are developed by Corps of Engineers Headquarters for the entire nation. The purpose of the nationwide permit program is to allow certain activities to be permitted in an expeditious manner with a limited review.

Steps in the Permit Process: Review of applications can be considered a three step process: pre-application consultation (for major projects), formal project review and decision making. Pre-application consultation usually involves one or several meetings between an applicant, the Regulatory staff, Federal, state or local resource agencies, and in some instances, the general public. The pre-application process is designed to provide the applicant with the Regulatory staff's assessment of potential alternatives available to accomplish the project purpose, to discuss

measures for reducing the adverse impacts of the project, and to advise him of the factors the Corps must consider in its decision making process.

Once an application is received, the formal review process begins. The project manager will review an application to determine if all required information has been received. If it is determined that work requires an individual permit, the project manager prepares a public notices, assesses the potential adverse impacts of the project, and evaluates the comments received in response to the public notice.

At the end of the formal review process, the project manager drafts the appropriate documentation to support a recommended permit decision. The permit decision includes a discussion of the environmental impacts of the project, the findings of the public interest review process, and any special conditions deemed appropriate for the authorized activity. Evaluation time will vary directly with the complexity of the proposed work, resources being impacted, and the type of authorization required.

Web Info: <http://www.usace.army.mil/inet/functions/cw/cecwo/reg/>

Regulatory Branch Address:

Honolulu

**Regulatory Branch, CEPOH-EC-R
U.S. Army Engineer District, Honolulu
Building 230
Fort Shafter, Hawaii 96858-5440**

Guam

**Regulatory Branch, CEPOH-EC-R
U.S. Army Engineer District, Honolulu
PSC 455, Box 188
FPO AP 96540-1088**

For any activities conducted in the State of Hawaii or American Samoa:

**(808) 438-9258 (Office)
(808) 438-4060 (Fax)**

For activities conducted in Guam or CNMI:

**(671) 339-2108 (Office)
(671) 339-2306 (Fax)**

**Permit applications and general inquiries can also be sent via email to
CEPOH-EC-R@usace.army.mil**

Section 401 Water Quality Certification

Issuing Agency: [Department of Health, Environmental Management Division, Clean Water Branch](#)

Permit Name: Section 401 Water Quality Certification

Triggering Activities: All construction activities requiring a permit from the U.S. Army Corps of Engineers need the certification before the permit is issued.

Process: Completed application is filed in conjunction with U.S. Army Corps permit. Public notice and opportunity to comment may be provided.

Fees: \$1000 for Individual WQC

Exemptions/ Other Information: Exemption from filing fees for Nationwide Permits that have conditional Certification from DOH.

Authorizing Statutes: HRS chapter 342D; USC 33.1251

Regulations: HAR 11.54.09.1

Web Page: www.hawaii.gov/health/eh/cwb/forms

**Department of Health Clean Water Branch:
Clean Water Branch
Environmental Management Division
State Department of Health
919 Ala Moana Blvd., Room 301
Honolulu, HI 96814-4920
(808) 586-4309
Email: CleanWaterBranch@eha.health.state.hi.us**

National Pollutant Discharge Elimination System (NPDES) Permit

Issuing Agency: Department of Health, Environmental Management Division, Clean Water Branch

Permit Name: National Pollutant Discharge Elimination System (NPDES) Permit

Triggering Activities: Permit required before any effluent discharge can be made from fixed point sources into surface waters. General Permit Coverage for storm water from Construction activities greater than one acre, and industrial facilities.

Process: Submit individual application or Notice of Intent for General Permits. No required public hearing but DOH must issue public notice of their intent to issue a permit. Applicant bears the costs of Public Notification.

Exemptions/ Other Information: Certain industrial facilities that claim No Exposure coverage.

Fees: \$1000 for Individual Permits; \$500 for General Permit Coverage

Authorizing Statutes: HRS chapter 342D part III; USC 33.1342

Regulations: HAR 11.54 – 55

Web Page: www.hawaii.gov/health/eh/cwb/forms

Department of Health Clean Water Branch:
Clean Water Branch
Environmental Management Division
State Department of Health
919 Ala Moana Blvd., Room 301
Honolulu, HI 96814-4920
(808) 586-4309
Email: CleanWaterBranch@eha.health.state.hi.us

Coastal Zone Management Federal Consistency

Issuing Agency: Hawaii Coastal Zone Management (CZM) Program, State of Hawaii Office of Planning

Permit Name: Coastal Zone Management Federal Consistency

Triggering Activities: (1) Federal agency activities; (2) activities requiring a Federal license or permit, e.g., Department of the Army Permit from the Corps of Engineers; and (3) Federal financial assistance to State and local governments.

Process: An application is filed with the Hawaii CZM Program. The CZM Federal Consistency application includes: CZM application form, CZM consistency assessment form; detailed project description; site location map; project plans or drawings; a copy of the federal permit application; a copy of the application for Section 401 Water Quality Certification (if applicable). Supplemental information may also be required such as environmental reports, biological surveys, archaeological and historic surveys. A Public Notice will be published in the State Office of Environmental Quality Control semi-monthly bulletin *The Environmental Notice*. Pre-application consultation either by phone or meeting is highly encouraged. CZM forms are available from the Hawaii CZM Program or at the CZM website.

Fees: None

Exemptions / Other Information:

Federal agency activities occurring on federal land that will not affect any coastal use or resource may be excluded from State CZM review by the Federal agency.

Streamlining opportunities for CZM federal consistency reviews are available for activities qualifying for certain U.S. Army Corps of Engineers Nationwide Permits that have been conditionally “pre-approved” with a general CZM federal consistency concurrence. Examples of Nationwide Permits that have been conditionally “pre-approved” for CZM federal consistency and may be applicable to qualifying wetland activities include No. 3 Maintenance, No. 18 Minor Discharges, No. 19 Minor Dredging, No. 27 Stream and Wetland Restoration Activities, and No. 30 Moist Soil Management for Wildlife.

Authorizing Statutes: Federal Coastal Zone Management Act of 1972, Section 307(c) and Hawaii Coastal Zone Management Statute, Hawaii Revised Statutes Chapter 205A

Regulations: Code of Federal Regulations, Title 15, Part 930

Web Page: <http://www.hawaii.gov/dbedt/czm>

Hawaii Coastal Zone Management Program

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Applied Wetland Ecology Research Topics

Hydrology

- Quantifying the ecological importance/effects of hydro-period in Hawaiian wetlands (including different wetland types: bogs vs. low water areas; seasonal/annual variation in flooding).
- Quantifying nutrient inflow to lowland wetlands – how urban land use affects wetland processes/hydrology – flood pulse dynamics.
- How invasive species modify wetland ecology.
- Conductivity as a measure of productivity in tropical wetlands.
- Hydrology and bird habitat – managing for bugs/managing for birds.
- Ahupua'a Management - traditional Hawaiian watershed management – hydrology at the landscape level as a guide to restoration and management.
- Bird use of wetland areas correlated with water depth.
- Changing hydrology accommodating invasive vegetation - promoting negative-feedback loops.
- Update and maintain GIS database of wetlands statewide. Classify state (degradation). Last coverage 1978.
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Soils

- Soil organic-matter role in plant cover and distribution (native vs. non-native vegetative cover).
- “Bulk density” in wetlands: can roots penetrate highly compacted soils – changing plant communities?
- Soil texture as an indicator of plant species distribution?
- Mineral soils – will excavation down to mineral soils produce and maintain a higher percentage cover of native plants?
- Excavating - what is a good relative depth for creating and maintaining wetlands?
- Soil salinity effects on ecosystem function.
- Soil nutrient effects on hydrophytic plant species distribution.
- Soil temperature effects on plant germination rates.
- How do cattle affect wetland soils, plant distribution and abundance?

Fish

- Do native fish use lowland wetlands for spawning or feeding?
- Feasibility of various fish-control options in wetlands.
- Do fish compete with birds for food resources? Quantify.
- Do fish change trophic structures in aquatic insect communities?
- What types of fish do Hawaiian water birds eat?
- Do crayfish compete with invertebrates for food resources?
- Do crayfish alter trophic structures in aquatic plant and invertebrate communities?

Birds

- Quantifying native water bird diets.
- Phylogenetics of Hawaiian water birds.
- Does the pesticide Rotenone affect water birds?
- Food chain stable isotope analysis as a way to quantify water bird diets?
- Phylogenetics of all Hawaiian Waterbirds
- Emphasize different habitat requirement of the four endangered waterbirds.
- PVA for all species to identify management priorities (currently only a PVA for stilts: Reed et al.1995)
- Identify waterbird preferences for certain vegetation types.

Invertebrates

- Are there seasonal aquatic-insect emergence patterns in tropical wetlands?
- Top-down vs. bottom-up factors – which has a larger affect on insect communities in wetlands.
- How to restore and manage invertebrate communities in created/restored wetlands?

Vegetation

- The ecology of California grass (*Brachiaria mutica*).
- The ecology of *Batis maritimus*.
- Breaking the invasion cycle – do specific plant invasions facilitate further habitat modification?
- Effective planting strategies for native plant re-introduction.
- How to use non-natives to help in ecosystem restoration.
- Using non-natives as phyto-remediation in degraded wetlands.
- Germination requirements of various native and non-native wetland plants.
- Large-scale mapping/trend analysis of non-native vegetation.

Current & Ongoing Research:

Jamie Rader, MS South Dakota State University, August 2005. Thesis: Response of Vegetation and Endangered Waterbirds to Habitat Management Techniques at Kealia Pond National Wildlife Refuge. Cell 731 695-1764. pintail_2001@yahoo.com.

Hugo Gee, MS South Dakota State University, December 2005. Project: Habitat characteristics of taro loi and refuge wetlands used by endangered waterbirds at Hanalei National Wildlife Refuge. Wildlife and Fisheries Sciences, South Dakota State University, Box 2140B, Biostress Bldg, Room 138, Brookings SD 57007-1696: Phone 605 688-4787. hugogee@hotmail.com.

Jennifer Gutscher, MS South Dakota State University, August 2006. Project: Macroinvertebrate communities in tropical wetlands and taro lo'i. Wildlife and Fisheries Sciences, South Dakota State University, Box 2140B, Bio-stress Bldg, Room 138, Brookings SD 57007-1696. Cell 810 845-4153. Jennifer.Gutscher@sdstate.edu.

Nick Wirwa, MS South Dakota State University, May 2007. Project: The effects of vegetation manipulation and fish predation on macroinvertebrate communities at Kealia Pond National Wildlife Refuge. Cell 731 695-7794. South Dakota Address: Wildlife and Fisheries Sciences, South Dakota State University, Box 2140B, Bio-stress Bldg, Room 138, Brookings SD 57007-1696. Maui Address (Jan-Aug): Kealia Pond NWR, Mile post 6 Mokelele Hwy, Kihei HI 96753. nwirwa@yahoo.com.

Christina McGuire. MS University of Hawaii at Manoa. May 2006. The effects of introduced fish on aquatic insect emergence at Hamakua Marsh Wildlife Sanctuary.

Jaap Eijzenga. MS University of Hawaii at Manoa. May 2006. Factors influencing breeding success of the endangered Hawaiian Stilt (*Himantopus mexicanus knudseni*). jaap.eijzenga@hawaii.edu.

David DesRochers. PhD Tufts University. May 2008. Life history investigation of the Hawaiian Moorhen: Applications for management. Phone: 617-306-5367. Maine Address: Tufts University, Biology Department, Medford, MA 02155. e-mail: David.DesRochers@tufts.edu

India Dawn Clark. MS University of Hawaii at Manoa, Department of Urban and Regional Planning. May 2008. Using taro Lo'i to provide habitat for endangered wetland birds: Working with a community in Waipi'o Valley on the Big Island. indiadawn@gmail.com.

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Aquatic habitat and aquatic food sources for endangered waterbirds at Hanalei National Wildlife Refuge: final report, September 1980. Call #:SZ 860430.03

Bachman, R. E., M. L. Ueoka, and R. S. Saito. 1981. Surveys and inventories of waterbirds and their habitats in the state of Hawaii. Progress Report, Job No. R-III-A, Project No. W-18-R-5. Division of Forestry and Wildlife, Honolulu.

Bachman, R. E., M. L. Ueoka, R. S. Saito, and T. C. Telfer. 1982. Surveys and inventories of waterbirds and their habitats in the state of Hawaii. Progress Report, Job No. R-III-A, Project No. W-18-R-6. Division of Forestry and Wildlife, Honolulu.

Bachman, R. E., M. L. Ueoka, R. S. Saito, T. C. Telfer, and M. P. Morin. 1983. Surveys and inventories of waterbirds in the state of Hawaii. Progress Report, Job No. R-III-A, Project No. W-18-R-7. Division of Forestry and Wildlife, Honolulu.

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