

# End of Year Report

## Fiscal Year 2007

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### State of Hawaii / Department of Health / Clean Water Branch Polluted Runoff Control Program

October 1, 2006 – September 30, 2007

#### Executive Summary

The State of Hawaii's Department of Health (DOH) Polluted Runoff Control Program has completed another year's worth of activities directed at addressing polluted runoff issues affecting the streams and coastal waters of Hawaii. The purpose of this report is to provide an overview of the efforts of the Polluted Runoff Control Program and its partners. It is hoped that this information will solicit interest and ideas that will result in additional activities to address polluted runoff issues in order to protect and restore recreational as well as aquatic life uses and meet appropriate state water quality standards.

The Polluted Runoff Control Program continues to focus much of its efforts to improve water quality through the development and implementation of watershed based plans. This fiscal year a watershed based plan for the Ko'olaupoko region of Windward Oahu was completed and one other plan is currently under development (Waikoloa-Waiulaula watershed on Hawaii Island). In addition to these efforts, DOH and U.S. Environmental Protection Agency jointly identified three watersheds where water quality improvements may be possible and multiple clean water program tools may be applied to help recognize these improvements. The Polluted Runoff Control Program continues its efforts coordinate watershed planning and implementation activities with partner organizations such as the Land Based Pollution Local Action Strategy (LAS) to Protect Coral Reefs, the State Ocean Resources Management Plan (ORMP) implementation work group, and the State Nonpoint Source technical committee.

For portions of Fiscal Year 2007 two Polluted Runoff Control Program staff positions (Grants Management Specialist and Environmental Health Specialist which provides project management) were vacant. The Environmental Health Specialist position was filled in March 2007 and it is anticipated that the Grants Management Specialist will be filled in November 2007. The lack of staff limited the Polluted Runoff Control Program's ability to actually provide requested support and/or technical assistance.

In FY2007, the Polluted Runoff Control Program and the Hawaii Coastal Zone Management Program recognized that timely progress toward full approval of the Coastal Nonpoint Pollution Control Program was not occurring and that the approach being used was having questionable success and requiring too many resources. The State, with direction from EPA and NOAA, has developed a new, comprehensive approach to move toward full program approval. This approach calls for the development of watershed guidance to assist in addressing all of the management measures. It is anticipated that development of the

guidance will be initiated in FY2008. In addition to these activities, the Polluted Runoff Control Program has initiated implementation of the Onsite Wastewater Disposal System (OSDS) strategy primarily to address water quality impacts associated with these systems and the fact there is currently no requirement for the inspection of existing OSDS.

Only one new project was initiated in FY2007 due to staff constraints and other program difficulties. In FY2007, four projects (totaling more than \$500,000) were completed and the Polluted Runoff Control Program largest project (Kaho'olawe Island Restoration) completed Phase II. Four projects (totaling over \$600,000) were ongoing in FY2007 and most will be completed in FY2008. The Polluted Runoff Control Program released a Request for Proposals in late August 2007 and hopes to use this to support additional projects in FY2008.

In FY2007, the Clean Water Branch, Monitoring Section agreed to expand monitoring efforts at several BEACH (Beaches Environmental Assessment and Coastal Health) monitoring sites in watersheds to support Polluted Runoff Control Program interest (either priority watershed or project(s) in watershed) to include laboratory analysis for nutrients and turbidity. Section 319 funds were used to purchase additional laboratory equipment to support the nutrient analysis. The Monitoring Section conducted water quality monitoring at 10 different sites where watershed plans or TMDLs either have been developed or are being considered.

Education and outreach activities were constrained by lack of staff resources but several activities were undertaken nonetheless. These include school presentations approximately once a month, assisting with community stream clean ups, and participating in large community events four or five times a year. In addition, the Polluted Runoff Control Program contracted the Honolulu Theatre for Youth (HTY) to develop and produce a playlet to educate elementary school students and their families on polluted runoff control and the importance of keeping our beaches and oceans clean. The Program, through EPA, has initiated a contract with Tetra Tech to provide an "Analysis to Improve Effectiveness of Nonpoint Source Program Outreach and Education Activities by the Hawaii Department of Health (HDOH)" in hopes of identifying potentially new and more effective methods of not only teaching people about polluted runoff but to also advocate behavior changes that will help reduce nonpoint source pollution.

Staff took advantage of several training opportunities offered throughout the year. This training was intended to improve our efforts related to watershed planning, the use of Geographic Information Systems (GIS), the development of appropriate water quality sampling plans through systematic planning and sampling design.

In addition to the activities conducted by the Polluted Runoff Control Program and supported with Section 319(h) funding from the U.S. EPA, there are also numerous and very substantial efforts underway throughout Hawaii that play a big role in addressing the polluted runoff control issue. The Polluted Runoff Control Program attempts to support these efforts in any way possible even if it is simply raising awareness of these efforts by inclusion in this report.

## The Watershed Approach

The Polluted Runoff Control Program continues to focus on the development and implementation of watershed based plans as the key to addressing nonpoint source pollution and improving water quality. In addition to previously completed watershed plans for the Nawiliwili Bay watersheds, Kapakahi Stream and Kahoolawe, a watershed plan for the Koolaupoko district (20 watersheds) of windward Oahu was completed in June 2007. These watersheds are eligible for Clean Water Act, Section 319(h) funding to support projects identified in these plans that address nonpoint source pollution problems.

The effort to develop a watershed based plan for Waikoloa-Waiulaula (Hawaii Island) has been extended and will be completed in December 2008. Current activities with this project include: collection of water quality data through the use of automatic samplers to capture storm runoff events, watershed modeling using the Nonpoint Source Pollution and Erosion Comparison Tool (N-SPECT model), and efforts related to sediment source tracking. In the Hilo Bay watershed, the Watershed Advisory Group has partnered with Hawaii County and has received funding from the Hawaii Coastal Zone Management Program to assist with water quality data collection as well as the development of a web site. Hopefully, these efforts in the Hilo Bay watershed will identify opportunities to utilize Section 319(h) funding to support projects that will improve water quality. DOH and its partners continue efforts to finalize the South Molokai watershed plan.

The PRC Program continues to focus efforts in a limited number of watersheds where measurable water quality improvements have an opportunity of being attained. The list of priority watersheds include those with a watershed-based plan and/or Total Maximum Daily Load (TMDL), those with previous planning and/or implementation activities intended to address water quality problems, those watersheds identified as a priority by other, complementary efforts and those with a watershed organization or some other entity capable of undertaking or leading implementation efforts in the watershed. The watersheds include: Hanalei Bay, Nawiliwili, Kapakahi, Waimanalo, Koolaupoko, South Molokai, West Maui (Honolua Bay), Waiulaula-Waikoloa, Maunaloa Bay and Hilo Bay.

The Hanalei, Waimanalo, and West Maui watersheds were also selected by DOH and EPA as places where water quality improvements may be possible and multiple clean water program tools may be applied to help recognize these improvements. Given this focus, the PRC Program contacted local organizations in both the Hanalei and West Maui watersheds to initiate discussions concerning the development of a watershed plan with the intent of being able to support future on-the-ground activities to address polluted runoff as identified in these plans. The responses were positive and it is anticipated that these watershed plans will be completed for both watersheds in FY2008. Efforts in the Waimanalo watershed focused on the use of the newly developed Koolaupoko watershed plan and the previously developed TMDL and TMDL implementation plan to identify project implementation opportunities. PRC Program met with the Windward Oahu SWCD and the Kailua Bay Advisory Council to discuss opportunities to support focused implementation of conservation plans in the watershed in order to improve water quality. It is anticipated that such an effort will be initiated in FY2008.

In FY2007, there was one TMDL finalized by DOH (Kapaa Stream) and another drafted (Hanalei Bay streams/estuaries). The Kapaa Stream TMDL for total suspended solids, nitrogen and phosphorus was reviewed for opportunities to address polluted runoff. While there is a load allocation component to the TMDL, opportunities for the use of Section 319 funding is complicated due to the presence of multiple National Pollutant Discharge Elimination System (NPDES) permits in this small watershed. The Hanalei Bay watershed TMDL was drafted in early FY2007 and the PRC Program reviewed the draft and provided feedback on the implementation framework provided in the TMDL. The PRC Program also participated in the TMDL public meeting and has approached the Hanalei community about developing a watershed plan to detail the next steps of implementation to address water quality issues in this area.

In addition to these watershed efforts, the PRC Program has also worked to coordinate watershed based plans and TMDL implementation activities with other watershed management efforts. The PRC Program participates with other local, state, federal and nongovernmental agencies on a variety of committees (Land Based Pollution Local Action Strategy (LAS) to Protect Coral Reefs, the State Ocean Resources Management Plan (ORMP) implementation work group, State Nonpoint Source technical committee). The PRC Program utilizes these opportunities to coordinate potential watershed planning and implementation activities, maximize the use of limited resources to support watershed projects and avoid duplication of effort. Here are a few highlights that have resulted from these partnerships:

- The Land-Based Pollution Local Action Strategy continues its efforts in Hanalei, West Maui and South Molokai. The PRC Program efforts in West Maui and Hanalei mentioned previously have and continue to be coordinated with the LAS.
- PRC Program staff is participating in the Ocean Resources Management Plan implementation work group. The ORMP (<http://www.hawaii.gov/dbedt/czm/orm/orm.shtml>) implementation effort is organized by the Office of Planning and offers an opportunity to engage other state agencies as well as the counties in watershed efforts to protect water quality. ORMP implementation activities will also include an effort to address the remaining Coastal Nonpoint Pollution Control Program efforts through the development of watershed guidance.
- Participated in the Hawaii Department of Land and Natural Resources Watershed Partnership Symposium in October 2007 and participated in the evaluation of funding proposals for Watershed Partnership funding. The PRC Program continues to discuss potential opportunities for collaboration with the Watershed Partnerships but also other appropriate Department of Land and Natural Resources programs.
- The State Nonpoint Source technical committee initiated an effort to revise the Memorandum of Understanding (MOU) between agencies to improve coordination and program effectiveness in addressing nonpoint source pollution on a watershed basis. Ultimately, the effort to identify and include priority watersheds in the MOU overwhelmed the process and a new MOU was not signed.

To enhance opportunities to support the development and implementation of watershed based plans, the PRC Program initiated discussions with the University of Hawaii about the

possibility of supporting a watershed resource position to provide a broad range of assistance to organizations involved in watershed management activities.

## **Hawaii's Polluted Runoff Control Program**

Current staff includes Lawana Collier, Public Participation Coordinator, Brian Hunter, Planner, Greg Takeshima, Environmental Health Specialist, and Hudson Slay, on detail from EPA Region 4. The program is currently in the process of filling the Grants Management Specialist position. The position has been vacant for 1 ½ years and we expect to have the position filled on November 15, 2007.

The Polluted Runoff Control (PRC) Program utilizes Clean Water Act Section 319(h) funding to address the State's nonpoint source pollution issues. In fiscal year 2007 the State of Hawaii received \$500,780 from EPA. The program will apply for the remaining \$1,024,320 after identifying projects to be funded with this year's grant.

The Request for Proposals issued in August 2007 will not have new projects contracted until Fiscal Year 2008. Throughout the year the program has been in discussions with various agencies regarding potential nonpoint source projects, but has not yet executed a contract for any of the proposed projects. Only one new project contract was executed this year and added to the thirteen (13) ongoing projects under the program's management. One (1) project was completed and a final report is available at the PRC Program office.

## **State approaches full approval of CNPCP**

A total of 70 Coastal Nonpoint Pollution Control Program (CNPCP) elements were presented in June 1996 for approval by NOAA and EPA in the Hawaii Coastal Nonpoint Pollution Control Program: Management Plan, including 57 management measures and 13 administrative elements. Initial approvals were given in the Findings for Hawaii's Coastal Nonpoint Pollution Control Program document (June 1998), which also contained conditions for the non-approvable elements. "Interim decision documents" are the tools used by the federal agencies when specific conditions are met.

In FY2007, the State recognized that timely progress toward management measure and full program approval was not occurring and that the approach being used was having questionable success and requiring too many resources. The State, with direction from EPA and NOAA, has developed a new, comprehensive approach to move toward full program approval. This approach calls for the development of watershed guidance to assist in addressing all of the management measures. The watershed guidance will outline varying approaches to watershed planning and management (including those used in the state), emphasize plan content needed to facilitate plan implementation, and include all of the management measures as a menu of implementation options. DOH and CZM will make a more formal commitment of resources toward implementation of the watershed guidance through the use of Section 319 funds to support the development and implementation of watershed plans and TMDLs. Many of the activities focused on the development and implementation of the watershed guidance will be initiated through the State Ocean Resources Management Plan (ORMP). The ORMP will allow DOH and CZM to gain

interagency (state and county) attention to polluted runoff, access to interagency assistance in developing watershed guidance to insure that it meets appropriate needs (e.g., agencies, counties, watershed organizations), and also allow information about the development and implementation of watershed plans and the coastal nonpoint pollution control program to be shared with state agencies and the counties.

At this time, there are several efforts underway to address the water quality impacts of onsite wastewater systems. A description of activities related to this management measure during FY2007 is provided below.

#### Onsite Disposal System (OSDS) Management Measure

In FY2007, the PRC Program continued work to address the OSDS management measures through implementation of the OSDS strategy. In FY2006, an OSDS strategy was developed to highlight the direction of State efforts and activities to address the OSDS management measures but also assist with broader onsite wastewater issues. The strategy outlines a mechanism to require upgrade to denitrifying OSDS (when necessary), information to document the restriction and elimination of new cesspools, and a coordinated approach to address the inspection of operating OSDS. Several activities were initiated in FY2006 to assist with the management of onsite wastewater systems and address the management measure conditions. The information below summarizes further progress made during FY2007:

- The 'inventory' of wastewater disposal/treatment method by parcel utilizing GIS data layers was in draft form for both Oahu and Maui
- All DOH Waste Water Branch cesspool cards were scanned into an electronic format and are available through a searchable (by address or TMK) database within DOH
- Scanned cesspool cards with TMK number have been mapped using GIS
- The DOH Monitoring Section contract with the USGS to refine the ability to detect wastewater and nutrient problems has been completed. A unique monitoring approach (wading with monitoring probe and sampling of beach pore water) as well as sampling for multiple tracers helped determine if bacteria problems were related to human/animal waste or wastewater. These techniques continue to be improved are currently available to DOH Monitoring Section staff to refine the source of bacteria problems at monitoring sites.
- DOH (PRC and Waste Water Branch) provided technical assistance to the Hawaii Coastal Zone Management (CZM) Program on a \$75,000 project funded by CZM to provide information to promote the effective use of onsite wastewater treatment systems in rural and urban settings. The purpose of the effort included: identifying the range of wastewater treatment and disposal systems suitable for use on individual lots as well as for multiple dwellings; describing the systems in terms of design and installation, O&M, cost, and field constraints; evaluating the systems with respect to water quality requirements under Hawaii field conditions; identifying technical issues relative to implementation of these systems; and developing a methodology for assisting engineers and homeowners in selecting an appropriate onsite

wastewater system for their application. The project is being conducted by the University of Hawaii-Water Resources Research Institute and the project is slated for completion in late 2007 or early 2008.

- DOH participated in the onsite wastewater system track at the Hawaii Water Environment Association (HWEA) conference in February 2007. As a result of these discussions, DOH (Wastewater Branch, Safe Drinking Water Branch and Polluted Runoff Control Program) initiated discussions with the University of Hawaii concerning a potential project to provide additional information required in order to consider making any changes to existing onsite wastewater regulations with respect to inspections.
- The project with UH was not initiated by the end of FY2007 but a contract is pending. The contract includes two major components: an assessment of the risk posed by OSDS to drinking water resources, and shoreline and stream environments, based on identifying those areas where on-site disposal of sewage poses the greatest risk and the development and testing of inspection protocols for each major category of OSDS. Depending upon the findings of the project, the results may be used to refine or revise the State's rules pertaining to Individual Wastewater Systems.

Once the elements outlined in the strategy (including those listed above) have been either initiated or completed and will assist in demonstrating that these elements will address the management measure conditions the State will submit a revised management measure to EPA and NOAA.

## **Polluted Runoff Control Projects supported with Section 319(h) funding provided by the U.S. Environmental Protection Agency**

### ***Projects Initiated in FY2007***

One new project was contracted this fiscal year:

#### **Water Quality Grant**

Contractor: Ka'u Soil & Water Conservation District

Contract Amount: \$45,028 (from State's Fiscal Year 2006 Grant)

Start Date: May 3, 2007

End Date: November 3, 2008

Expected Outcome: Currently in the state of Hawaii, the coordination of local, and state decision making entities is rather difficult because of scheduling and lack of communication between respective programs statewide. This project aims to encourage and create local and state partnerships for the prevention of NPS pollution. The contractor also plans and coordinates an interagency water quality training conference for the next fiscal year (FY08). To increase awareness of non-point source pollution the project contractors must also attend at least four outreach and education events such as school fairs, community events, and school presentations. The project also aims at increasing public awareness of soil and conservation districts by creating a website for the general public.

## ***Project Site Visits***

In order to monitor progress and develop a better understanding of PRC Program supported projects, staff attempts to visit projects on an annual basis. At a minimum, staff members make site visits at the beginning and end of the project. The following is a brief description of site visits made during FY2007.

### **Innovations in Stream Phytoremediation and Erosion Control of Degraded Stream Banks**

On May 18, 2007 the PRC staff visited Kahawai and Waimanalo streams, the sites of the riparian and stream bank restoration project. Waimanalo stream has been listed on the 303(d) list due to nutrients, turbidity, and TSS and is also considered a priority watershed. The TMDL for Waimanalo stream states that there is a priority to “establish vegetative buffers adjacent to the stream” (DOH, 2001). The purpose of this project is to stabilize stream banks and decrease soil erosion with pre-planted coir logs. As seen in the photos below, both sites are rather bare in the riparian areas and are in need of bank stabilization and revegetation. The contractors are selecting the proper plants based upon native status, wetland indicator status (preferably obligate species due to planting at the toe of the stream bank slope), the ability to establish roots in the coconut fiber coir logs, pollutant uptake, stream hydraulic properties, ease of maintenance, remedial quality, and local availability. The project did experience early delays due to conflicts between the restoration of riparian buffers with native vegetation and the fact that the Hawaii Department of Land and Natural Resources (DLNR) maintain easements along the stream in this area. DLNR maintenance of these areas consists of clearing the area to the ground which is not necessarily compatible with stream bank restoration. The project contractor has worked with DLNR and established an agreement that will allow the project to move forward but DLNR restrictions on vegetation height may severely impact the ultimate success of the project. Laboratory testing will be completed by March 2007 and stream bank restoration will be started by the end of January 2008.



*Kahawai Stream before stream bank restoration.*



*Waimanalo Stream before stream bank restoration*



*Left: 'Abu'awa (*Cyperus javanicus*) freshly planted on the experimental coir logs, Center: Arrays of coir logs in differing nutrient concentrations, Right: One array of four Coir Logs, note that there are different plants at different areas for randomization and standardization.*

### **KAUPA – Kalihi Ahupua'a Community Service Project**

On November 15, 2007 the PRC Staff went to Kalihi Stream to see the project site and the progress that has been made thus far. Kalihi Stream is listed on Hawaii's 303(d) list for TSS, trash, Total Phosphorous, and Turbidity. The project's goals are to utilize public outreach, education, and participation activities to prevent and reduce pollutant loads to improve the water quality and biological integrity of Kalihi Stream. Community volunteers assisted in stream clean-ups resulting in large and small trash items being removed from the stream. Approximately forty, 45 gallon trash bags of litter and refuse as well as bed mattresses have been removed by approximately 10 volunteers on four different occasions. Monitoring will consist of five sampling locations, and samples will be taken and analyzed using a Lamotte Low Cost Water Monitoring Kit for chemical and physical parameters. KAUPA will also use the Hawaii Division of Aquatic Resources, 'Hawaii Stream Bio-assessment Protocol' to survey the stream for O'opu (native fish) as an indicator species. Shade trees were planted on the stream bank during a recent volunteer event. A new permeable stream walkway is going to be constructed by volunteers beginning in December 2007.



*Left: Kalibi Stream project site (~160 ft of stream bank), Center: Area for permeable steps for public access and monitoring area, Right: White Hibiscus (*Hibiscus arnottianus*) and Kukui (*Aleurites moluccana*) have been planted near the bridge and walkway that the project will restore.*



*Left: Refuse bin in which volunteers painted and placed at the project site, Center: Cleared “scientific experiment” area for Farrington High School, Right: Area where the walkway will be cleared and planted with native vegetation.*

### **Hawaii Watershed Experience: A Hands-On Elementary Education Program**

On November 30, 2007, the PRC staff attended a presentation by the Healthy Hawaii Coalition at Parker Elementary School in Kaneohe. The Healthy Hawaii Coalition received \$29,288 to present an educational program for elementary school children to encourage behavior changes that will result in healthier watersheds through pollutant load reductions, overall water quality and habitat improvements. The program deals with the adventures of ‘Waterwoman’ and her arch nemesis ‘Oily Al’ over a three day presentation concerning Hawaii and its watersheds. Each school receives a watershed specific booklet with key words and quick quizzes about their respective watersheds to take home as homework and share with their parents.



*Left: Hawaii watershed participants at Parker Elementary School, Right: Waterwoman at a performance for the Parker Elementary School children.*

## **Continuing Projects**

### **HACD Conservation Specialists**

The Hawaii Association of Conservation Districts receives \$150,000 of state oil tax money and \$50,000 from the 319 grant to employ four conservation specialists on four different islands; Kauai, Maui, Hawai'i and Oahu. The conservation specialists provide assistance in reducing non-point source pollution by aiding in outreach and education, assisting local farmers in creating conservation plans for individual farms, assisting with watershed planning and implementation efforts, monitoring exercises as well as other duties. The conservation specialists also presented their respective workings to conference attendees during the 2007 Water Quality Conference.



*Left: Conservation Specialist John Astilla using ranging equipment out in Maui Land and Pineapple Co. lands, Center: John Astilla Dressed up as the rain-drop in an outreach effort for soil and water conservation, Right: Conservation Specialist Megan O'brian learning to use ranging and leveling equipment.*

### **Watershed Based Plan for Waikoloa-Waiulaula**

The Mauna Kea Soil and Water Conservation District received \$150,000 to create a Watershed Based Plan for the Waikoloa-Waiulaula Watershed located on the west side of the

Island of Hawaii. Waikoloa Stream is on Hawaii's 303(d) list for TSS. Waikoloa and Waiulaula streams both lead to Pelekane Bay; according to preliminary data from the CWB Monitoring Section Pelekane Bay is a severely degraded system due to high residence time and large inputs from the perennial streams. Three auto-samplers are being used to retrieve base flow and storm flow data from the Waiulaula stream. The auto-samplers have not taken samples due to a relatively dry summer and fall seasons but with winter approaching there should be a few good storm events to take samples from. The data will then be taken to establish load reduction estimates. This project was initiated in June 2005 and is expected to be complete in December of 2008.



*Left: Conservation Specialist John Pipian working on the intake tube for the autosampler, Center: John getting the samples from the autosampler at the upper Waiulaula monitoring site, Right: Waikoloa Stream near the monitoring station*

### **Demonstrating Watershed Participatory Assessment and Action**

The University of Hawaii's College of Tropical Agriculture and Human Resources received \$223,873 to demonstrate a new and innovative best management practice in urban, forested, agricultural, recreational boating and hydro-modified areas of the Kaiaka Bay Watershed. Kaiaka Bay is currently listed on Hawaii's 303(d) list for Enterococci, turbidity, nutrients, total suspended solids, chlorophyll-a, and ammonia. The University has been conducting local meetings to try to get an idea of what the community defines as the largest problems in the area. The project is also educating the local residents on BMP practices, and simple monitoring techniques. Recently there have been problems with contracts and payment schedules with the University of Hawaii's Office of Research and Services. The project was initiated in June 2006, and should be completed in June of 2008.

### **HACD Water Quality Grant**

The Hawaii Association of Conservation Districts received \$45,000 to participate in the Non-point Source Pollution Rules Advisory Committee, encourage local and state partnerships for the prevention of NPS pollution, plan and coordinate an interagency water quality training conference. The 2007 Water Quality Conference was held at the Maui Beach Hotel in June and featured several excellent presenters representing PRC Program contractors as well as many other organizations that have taken initiative to address polluted runoff issues. The 2008 Water Quality Conference is currently being put together and announcements of where and when will be made early next year.

## *Summaries of Project Completed This Fiscal Year*

### **Kaha Gardens Best Management Practices Park**

The Center for a Sustainable Future, and the Kailua Bay Advisory Council received \$200,000 to construct a best management practices (BMP) demonstration park and install educational signage to showcase measures that can be taken to reduce non-point source pollution. The project site (Kaha Park) is located on the island of Oahu near Oneawa Canal. According to the Kailua Bay Advisory Council's 2003 Recommendations for Water Quality Improvement Projects, Oneawa Canal was evaluated as having the highest potential to impact water quality in Kailua Bay. The project highlights the use of best management practices that utilize native vegetation to address erosion control and excessive nutrients that impact water quality. The location of this project at a county park adjacent to Kawainui Marsh provides excellent opportunities to educate the public about the use of these BMPs to improve water quality. The project was initiated in April 2005 and finished in October 2007.



*Left: Native vegetation for erosion control, Center: Stream bank stabilization using fiber matting and native trees, Right: Permeable walkways and native vegetation (Pictures take in August 2007).*



*Left: Signs for education on Best Management Practices, Center: Native shrubs and other native grasses, Right: A Milo tree (*Thespesia populnea*) has been planted on the stream bank to increase bank stabilization (Pictures taken in November).*

### **Watershed Based Plan for Ko'olaupoko**

The Center for a Sustainable Future along with the Kailua Bay Advisory Committee received \$120,860 to create a watershed based plan for the Ko'olaupoko region of the island of Oahu. The watershed plan covers 20 watersheds of Windward Oahu from Kualoa to Makapuu.

The plan identifies major pollutants to water quality, priority problems and recommended implementation activities within each watershed, implementation options as well as a monitoring component. There are several streams and coastal waters within the Ko'olaupoko region on the State's Section 303(d) list of impaired waters where implementation activities have been recommended to address these water quality impairments. The development of the Watershed Based Plan allows interested stakeholders potential access to 319(h) funding to implement recommendations found in the plan. The project was initiated in May 2005, and was completed in June 2007.

### **Kaho'olawe Island Reserve Commission Restoration Project Phase II**

Vegetation is largely absent from Kaho'olawe due to its location in the rain shadow of Maui but more importantly due to years of the island's use as U.S. Navy bombing range as well as the presence of large numbers of feral ungulates. The Kaho'olawe Island Reserve Commission received a portion of a \$1,500,000 grant to restore 2 major drainage areas on the island of Kaho'olawe in order to reduce sediment loss and its impacts on coastal waters and coral reefs. Hakioawa and Kaulana both received approximately 12,000 native plants from the Natural Resources Conservation Service (NRCS) Ho'olehua Plant Materials Center (PMC). Many plantings of the native vegetation are conducted by placing the plants within 'boxes' constructed of pili grass (*Heteropogon contours*) bales which lower wind speed to the freshly rooted plants and also acts as sediment catchment areas. USGS stream gages have been installed in both Hakioawa and Kaulana Streams to capture both stream and sediment discharge (see

[http://waterdata.usgs.gov/hi/nwis/uv/?site\\_no=16682000&PARAMeter\\_cd=00065,00060](http://waterdata.usgs.gov/hi/nwis/uv/?site_no=16682000&PARAMeter_cd=00065,00060).

Turbidity loggers were installed in Hakioawa and Kaulana bays to correlate the stream and sediment discharge with changes in coastal water turbidity. Thus far there have been few storm events on Kaho'olawe. During the two storm events that have occurred during the past year it was estimated through the use of erosion pins and hay bale measurements, that there has been a 2 ton load reduction due to the implementation of best management practices (primarily revegetation and associated activities). Phase II of the three phase project began in December of 2006 and ended in November 2007. In August 2007, PRC staff visited the NRCS Ho'olehua Plant Materials Center (PMC) on the island of Moloka'i for a site visit and meeting to aid in determining the future focus of the PMC. It was decided that conservation crops as well as native plant rearing would be PMC priorities. This is very important for the restoration of Kaho'olawe since the PMC supplies the Pili grass bales and other native plants for the Kaho'olawe Restoration Project.



*Left: Aerial View of the Ho'olehua Plant Materials Center, Center: Series of native plants for Kaho'olawe's restoration project, Right: Fields of Pili Grass nearly ready to be bundled into the Pili Grass Bales.*



*Left: Native Kawelu (Eragrostis variabilis) on irrigation, Center: Pili Grass bales used as wind breaks for newly planted shrub, Left: Kului (Chenopodium oahuense) behind the Pili Grass bales.*

### **Hawaii Youth Conservation Corps**

The State of Hawaii Division of Forestry and Wildlife received \$150,000 to provide supplemental funding to the Hawaii Youth Conservation Corps (HYCC). The HYCC which is funded primarily by the Hawaii Division of Forestry and Wildlife is a summer youth program which provides an educational experience in non-point source pollution and its impact on wetlands, streams and coastal areas throughout the Hawaiian Islands. The funding supported 24 HYCC positions over two years. Many of the participants in the HYCC are now much more aware of conservation problems and that has been shown by pre- and post-testing of the participants. Several participants have also been swayed into conservation sciences due to the program. The project was initiated in April 2006, and completed in October 2007.

### **Erosion and Sedimentation Control Standards and Guidelines Update**

The County of Hawaii received \$44,000 to update their Erosion and Sedimentation Control Standards and Guidelines and also to hold meetings for county employees to educate them on the updated erosion control practices. The overall effort included a review of the existing County of Hawaii Standards and Guidelines (adopted in December 1975), comparison and evaluation of standards and guidelines from other counties in the State of Hawaii as well as examples from the Mainland, an update of the erosion and sedimentation control standards. The update includes the application of best management practices to construction projects, detailed guidance for the preparation of erosion control plans, evaluation of alternative methods to calculate erosion rates and an update of soil, rainfall, water quality and other information pertinent to the assessment of erosion potential. This updated information establishes much higher standards for erosion control and provides a great deal of recommendations to developers and consultants regarding practices to reduce polluted runoff associated with land disturbance activities. The updated standards will be distributed to many of the engineering companies in the County of Hawaii and all of the construction firms which receive contracts from the County of Hawaii. The project began in June 2006 and was completed in December 2007.

## Summary of Activities Related to Polluted Runoff Control around the State

This section highlights efforts and activities related to polluted runoff control undertaken by other local, state, and federal agencies in Hawaii. The purpose of this section is to share information about efforts in some cases where the Polluted Runoff Control Program has partnered with these organizations but also the information is provided to share some ideas about how polluted runoff and related issues are being addressed in Hawaii.

### Kauai County

#### **Cleaning Waikoko stream discharge to Hanalei coral reefs**

The University of Hawaii, Department of Natural Resources and Environmental Management in cooperation with the Land-Based Pollution Local Action Strategy to Protect Coral Reefs was awarded a grant from the National Fish and Wildlife Foundation. The project will work with a local farmer to apply best management practices to taro farming in order to reduce pollution in Waikoko Stream. Waikoko ahupua'a totals 300 acres with 35 acres of taro pondfields that drain to Waikoko stream and then onto coral reefs of Hanalei Bay. Hanalei is part (one of three areas) of the State of Hawaii's Coral Reef Local Action Strategy (LAS) to address land-based pollution threats to coral reefs (Hawaii LAS, 2004), which includes addressing pollution from taro farming. It is anticipated that sediment and nutrient reduction will improve coral health and larval recruitment on adjacent reefs. The DOH Polluted Runoff Control Program participates on the Land-Based Pollution LAS steering committee.



## **Hanalei Watershed Workshop, February 21-22, 2007, Princeville, HI**

A workshop was organized to bring together local, state, federal and nongovernmental organizations to discuss research and implementation activities geared toward addressing coral reef and water quality issues in Hanalei Bay and its watersheds. This workshop was initiated to document the collective understanding, better integrate the results of efforts that have been undertaken, and identify the salient issues that remain to be studied. The workshop focused on a number of questions:

- How sediment is generated in the watershed
- How sediment is transported in the watershed
- Deposition of sediment in the lower watershed
- Flow of nutrients and pathogens via groundwater and surface flow
- How terrestrial and aquatic ecosystems have been affected
- What management actions are needed to improve water quality and reduce pollution threats to corals?

Multiple DOH programs (Clean Water Branch Polluted Runoff Control Program and Monitoring Section as well as the Environmental Planning Office) participated in the workshop. Proceedings from the workshop have been published as a United States Geological Survey (USGS) Open-File Report and can be viewed at:

<http://pubs.usgs.gov/of/2007/1219/>

City and County of Honolulu

### **Malama Maunalua**



Mālama Maunalua is a new community-based alliance dedicated to creating a more culturally and ecologically healthy Maunalua region in Southeast O'ahu. The area includes Maunalua Bay as well as the watersheds between Diamond Head and Koko Head. In 2006 the group hired a coordinator, raised funds to support first year activities, established a steering committee, identified resources, threats, and actions, developed a Conservation Action Plan, and developed links

with the community. The group shares a vision where the fish are once again plentiful, pollution and sedimentation are mitigated, and where people, community groups, businesses and agencies take kuleana in caring for and managing the bay in a sustainable manner. Malama Maunalua has requested information and some assistance from different members of the Land-Based Pollution Local Action Strategy to Protect Hawaii's Coral Reefs steering committee, including DOH. Both DOH and the LAS continue to pursue opportunities to assist this new group with their efforts to address coral reef and watershed restoration and protection activities.

### **Oahu Soil and Water Conservation Districts (SWCDs)**

Oahu SWCDs have gone through difficult times in the past few years due to scarce funding and urbanization, which has taken a large amount of Oahu's prime agricultural lands. In 2006, a mutual effort between Oahu SWCDs and Oahu Resource Conservation and Development was made through the Mayor's Office of Economic Development to fund two full-time Conservation Planner positions for the SWCDs. This funding was made available to address the backlog of Conservation Plans accumulated in the last couple of years. The SWCDs on Oahu are now actively working on a variety of local conservation needs and have significantly renewed their presence in the local agricultural community. These Conservation Planner positions complement another position funded by DOH through the Hawaii Association of Conservation Districts and should aid in efforts to address water quality problems associated with agricultural activities on Oahu.

### Maui County

#### **Honolua Bay Stewardship/Development of Volunteer Water Quality Manual**

With the support of funding from the Hawaii Tourism Authority, Project S.E.A.-Link initiated an effort with the Malama Kai Foundation, other local partners, and community volunteers to expand stewardship efforts at Honolua Bay. The projects includes the development of a Volunteer Water Quality Manual and water quality monitoring, engaging local teachers and students in community-based projects, developing interpretive signage, and the continuation of current efforts such as biological monitoring and educational outreach. Development of the manual has included consultation with the Department of Health, EPA and other water quality sampling experts around the state. After the volunteer water quality manual is developed, training of volunteers utilizing these protocols will be conducted by Project S.E.A.-Link partners. The manual will then be revised based on field testing and comments by volunteers. In addition to developing consolidated volunteer water quality manual, this effort may also serve as a model for other areas across the state frequented and impacted by visitors. The project will be completed in June 2008.

### Hawaii County

#### **Hilo Bay**

The Hilo Bay watershed advisory group has continued their efforts to make progress on addressing water quality problems within the Hilo Bay watershed. The Hilo Bay watershed based plan which was completed in FY2006 identified opportunities to improve water quality but there was either not adequate data or data analysis conducted to provide a strong enough foundation for a watershed-based plan that addresses all of the EPA requirements. The watershed advisory group has partnered with Hawaii County and has received funding from the Hawaii Coastal Zone Management Program to support water quality monitoring and the development of a web site. It is hoped that these efforts will lead to implementation opportunities to improve water quality in the Hilo Bay watersheds.

#### **Mauna Kea Soil and Water Conservation District and Kohala Mountain Partnership**

The Mauna Kea Soil and Water Conservation District (SWCD) and the Kohala Watershed Partnership (part of the Hawaii Department of Land and Natural Resources Watershed

Partnership Program) have partnered to collect water quality data in the Waikoloa-Waiulaula watershed. The Watershed Partnership has provided the Mauna Kea SWCD with funds to purchase water quality monitoring equipment and support sample collection to aid in the development of the Waikoloa-Waiulaula watershed plan. It is hoped that the two groups can also partner in implementing recommendations provided in the watershed plan. Development of the watershed plan is slated for completion in December 2008 and is supported primarily with Section 319 funding from the DOH-Polluted Runoff Control Program.

#### Statewide

#### **Hawaii Department of Land and Natural Resources-Division of Forestry and Wildlife-Watershed Partnerships**

The Division of Forestry and Wildlife recently awarded a total of just over \$2.5 million in funding to the watershed partnerships to support the development and implementation of Watershed Management Plans. These plans have been developed by the Watershed Partnerships and Negotiated with Private Landowners. There are currently 9 watershed partnerships around the state. These include: West Maui Mountains, East Maui, Ko'olau Mountains, Kauai, Lanai, East Molokai, Ola'a-Kilauea, Leeward Haleakala, and Kohala Forest. On the ground projects have focused on alien species control and fencing projects to exclude feral ungulates. For additional information about the watershed partnerships visit: <http://www.state.hi.us/dlnr/dofaw/wpp/index.html>

A special thanks for providing this information goes to: Hawaii County, Kathy Chaston, the Hawaii Association of Conservation Districts and all 16 Soil and Water Conservation Districts, Natural Resources Conservation Service, the Hawaii Department of Land and Natural Resources, Hanalei Watershed Hui, Malama Maunaloa, and the United States Geological Survey.

## **Monitoring**

Monitoring is a critical component of the PRC Program since it is the foundation for determining the results of Program investments. All projects funded by the PRC Program are required to have a monitoring/evaluation component to determine project success and the impact on water quality. The approaches vary depending upon the nature of the project but specific water quality monitoring for appropriate pollutants of concern is preferred and will be required of all projects in the future. During FY2006, the PRC Program initiated discussions with the Clean Water Branch-Monitoring Section concerning additional water quality monitoring in several watersheds. The intent of the monitoring is to assist with determining load reductions and water quality improvement as a result of Section 319 funded projects. In FY2007, the Monitoring Section agreed to expand monitoring efforts at several BEACH (Beaches Environmental Assessment and Coastal Health) monitoring sites in watersheds with PRC Program interest (either priority watershed or project(s) in watershed) to include laboratory analysis for nutrients and turbidity. Section 319 funds were used to purchase additional laboratory equipment to support the nutrient analysis. The Monitoring Section conducted water quality monitoring at 10 different sites where watershed plans or TMDLs either have been developed or are being considered. A total of 243 samples were taken at these sites during the fiscal year and analysis was conducted for 7 parameters (TSS, Ammonia, nitrate+nitrite, TN, TP, Filtered Silica, and chlorophyll a). The monitoring sites include:

- Hilo Bay (exit of Ice Pond, Lighthouse, Wailua River mouth) (Hawaii)
- Honolua Bay (Maui)
- Kalapaki Beach (Kauai)
- Kihei South (Maui)
- Kualoa Beach (Oahu)
- Pelekane Bay (Hawaii)
- Waimanalo Beach (Oahu)
- Waiulaula (Hawaii)

The data which has been gathered by the Monitoring Section will be analyzed and shared among interested parties (such as those working on Watershed Based Plans) to give them a larger base of data to work with and interpret. Presently the sampling by the Monitoring Section is set up rather haphazardly, with no direct correlation to rain events or any type of structured sampling with no continuity in dates. In FY2007, discussions were initiated with the Monitoring Section regarding the possibility of undertaking a more intensive water quality monitoring effort to determine water quality status and links to implementation efforts in priority watersheds. It is anticipated that this type of effort will be explored and possibly initiated beginning with West Maui in FY2008.

## NPS Outreach and Education



NPS outreach and education is conducted year round although minimal staff time is dedicated to these activities. Through some of the 319 funded projects the general public is educated on the effects of polluted runoff and on some of the activities individuals can do to help prevent nonpoint source pollution. The Program does school presentations approximately once a month, assists with community stream clean ups, and participates in large community events four or five times a year.

This fiscal year, the Program contracted the Honolulu Theatre for Youth (HTY) to develop and produce a playlet to educate elementary school students and their families on polluted runoff control and the importance of keeping our beaches and oceans clean. The playlet was seen at 209 performances with an estimated audience total of 15,000. Teachers attending the play receive a study guide with additional information and activities they can do in the classroom to further the students' understanding of polluted runoff issues. By reaching a

broad audience of young impressionable students, one can surmise that the students and participants of the plays will take home some of what they learn and apply it or at least tell their parents about the issues of non-point source pollution.

The Program, through EPA, has initiated a contract with Tetra Tech to provide an “Analysis to Improve Effectiveness of Nonpoint Source Program Outreach and Education Activities by the Hawaii Department of Health (HDOH).” The Program looks forward to potentially new and more effective methods of not only teaching people about polluted runoff but to also advocate behavior changes that will help reduce nonpoint source pollution.

## **Training**

### **ESRI GIS Training**

### **CPR First Aid Training**

### **EPA-sponsored Watershed Planning workshop**

This EPA-sponsored training was held in Berkeley, California on January 24-25, 2007. The workshop covered the watershed planning process as well as some of the details of developing and implementing watershed based plans consistent with EPA requirements. The focus of the workshop was on how to achieve more significant water quality improvements by quantifying pollutant loads and through sustained implementation activities. The workshop also addressed how watershed planning can integrate with source water protection, TMDLs, and other natural resource management efforts. Several case studies were presented to emphasize certain points. Hudson Slay attended along with two other participants from the State of Hawaii.

### **Managing Uncertainty with Systematic Planning**

PRC Program staff participated in this weeklong training course. The course covered all aspects of the systematic planning process to aid in developing appropriate approaches toward solving a problem. The process includes: stating the problem, identifying the appropriate decision that needs to be made, identify the inputs to the decision, a definition of the study boundaries, development of a decision rule, determining tolerance on decision errors, and optimizing the design for obtaining data. The course provided staff with a much broader and more detailed understanding what needs to be considered prior to initiating water quality or other types of environmental sampling.

### **Sampling for Defensible Environmental Decisions**

PRC Program staff participated in this weeklong training course. The course covered a very wide range of topics, including: sampling theory, sampling errors, statistics for sampling, data quality objectives, and sampling plan design. The training provided staff with more information to aid in the development of appropriate sampling plans and assist in the review of sampling and analysis plans.

**15<sup>th</sup> National Nonpoint Source Monitoring Workshop**

Dave Penn (DOH TMDL coordinator) represented DOH at the 15<sup>th</sup> National Nonpoint Source Monitoring Workshop, which was held in Austin, Texas from August 26-30, 2007. Themes of the conference included: Effectiveness monitoring to achieve water quality goals, Assessment and application of best management practices, watershed programs and linkages with TMDLs.