

Annual Report

Fiscal Year 2008

October 1, 2007– September 30, 2008

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

Executive Summary

Heavy rains abruptly cause flashy streams to flush sediment and debris into the ocean, so polluted runoff continues to affect the waters of Hawaii. The State of Hawaii (State) Department of Health (DOH) Clean Water Branch (CWB) Polluted Runoff Control Program (PRCP) works with local watershed groups and various government agencies in efforts to help prevent runoff and improve water quality. This year the PRC Program has provided funding for projects that have resulted in an estimated load reduction of 4 tons of sediment from Kaho'olawe, an increase in knowledge among elementary school students of nonpoint source pollution issues through creative outreach, and the removal of over 500 pounds of trash, 260 pounds of green waste, and 350 pounds of metal fence posts and plumbing from the Kalihi stream. These activities throughout the year help us meet the DOH goals for coastal waters that are safe and healthy for people, plants and animals. This report will provide DOH partners with an overview of what has been planned and accomplished this year.

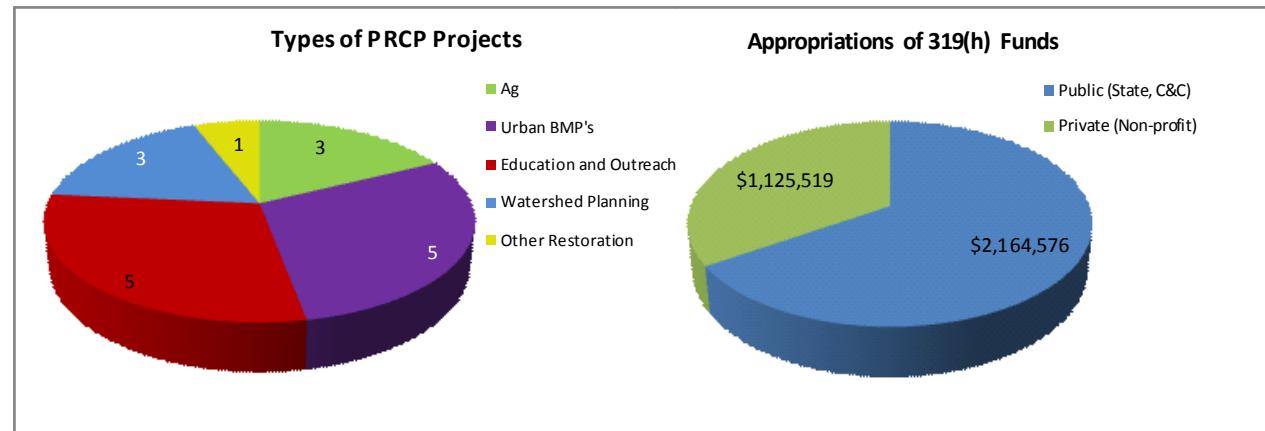


Figure 1: Different types of PRCP Projects and total appropriations of 319(h) funds to different municipalities; currently we have no contracts with Counties of the State.

A Request for Proposals was released on May 12, 2008, and eleven proposals were received on June 20, 2008. Six proposals were selected for Clean Water Act (CWA) Section 319(h) funding totaling \$622,605.00. Project contracts have been drafted and submitted to the Administrative Services Office and Attorney General's Office for review. The PRCP anticipates the projects will begin work in the spring of 2009.

Three new projects were initiated in FY2008. All three projects are joint efforts with other State programs.

- One project with the West Maui Soil and Water Conservation District to update the State DOH's Guidelines for Livestock Waste Management is being jointly supported by the PRC Program and the DOH Wastewater Branch. The Guidelines developed in 1996 will be updated to reflect new information and technologies available on waste management and in compliance with the EPA agreement for Animal Feeding Operations and Confined Animal Feeding Operations rules.
- A second project initiated this year with the University of Hawaii to assist DOH in mapping Onsite Disposal Systems throughout the state is jointly supported by the PRC Program and the DOH Safe Drinking Water Branch. Information obtained through this project will assist the State in addressing the OSDS Management Measure required under the Coastal Nonpoint Pollution Control Program.
- The third project with MCS International is to develop a document for the general public that provides all the approved Coastal Nonpoint Pollution Control Program Management Measures and the status of those still in process for approval.

Two additional project contracts were intended to begin in FY2008, the PRC Program initiated the contracting process in April 2008. The State Administrative Services Office (ASO) had staff retire and transfer to other offices, and new staff not familiar with the program placed these two contracts on hold and did not begin working on them until FY2009. This is detrimental to the Program as we continue to work toward increasing the amount of funding we put into projects on the ground to address polluted runoff. Delays in contract and contract modification review and execution, and approval of contract reimbursements at the ASO have seriously hindered the success of the Program. These issues have been brought to the attention of the DOH Deputy Director and the EPA Project Officer. The Program will continue to look for ways to improve our part in the contracting process.

The PRC Program continues to strive to address polluted runoff issues through a watershed approach. Starting with locally driven and scientifically based Watershed Based Plans, PRC anticipates the watershed wide implementation of these plans will yield the environmental results DOH is after. DOH and the United States Environmental Protection Agency (EPA) identified West Maui, Waimanalo and Hanalei on Kauai as our three priority watersheds. With the resources available we hope to move forward in these watersheds toward watershed based implementation and monitoring to show the effectiveness of our efforts. In addition to these three watersheds, the PRC Program also strives to encourage implementation in watersheds where planning efforts or Total

Maximum Daily Loads (TMDLs) exist, such as Ala Wai, Ko'olaupoko, Nawiliwili, Pelekane, Kapakahi Stream, South Molokai and Hilo Bay.

The CWB Monitoring Section has agreed to assist the PRC Program in evaluating the effectiveness of previously funded projects by measuring current water quality conditions in the water bodies affected by the project's implementation. EPA and DOH have been discussing the method to best monitor the water quality in West Maui, and will be looking at other priority watersheds in the future.

Hawaii's Coastal Nonpoint Pollution Control Program has not been fully approved by EPA and the National Oceanic and Atmospheric Agency (NOAA) however the State has made significant strides in meeting the conditions posed by EPA and NOAA. The State has contracted the development of a Watershed Guidance Package to include management measures and associated practices, and is working towards the implementation of the State's Ocean Resource Management Plan (ORMP) which will provide direction to State, local, and non government entities with watershed based planning. Additionally PRC Program personnel continue to work individually on the Onsite Sewage Disposal System and Roads, Highways, and Bridges management measures, which do not easily fit into the Watershed Guidance format.

The program has worked with Tetra Tech this year to determine ways to improve the State's Nonpoint Source education and outreach. Under a contract through EPA, Tetra Tech has developed an Action Plan for DOH. The next step will be to work with Tetra Tech to develop a strategy to address the lack of an overall coordinated outreach framework. DOH has continued participating in community events and conducting presentations for schools to increase the general public's awareness of polluted runoff. DOH anticipates future outreach efforts to be targeted to specific groups in specific watersheds in hopes of capturing measurable behavior change.

In addition to the activities conducted by the PRC Program and projects supported with Clean Water Act (CWA) Section 319(h) funding, there are other efforts throughout the state that also work toward addressing polluted runoff control issues. The PRC Program attempts to support these efforts by increasing awareness of these efforts among our partners.

Milestones in the State's NPS Management Program

In 2000 the PRC Program established three long term goals to drive not only program efforts but broader efforts of the State in addressing polluted runoff. These goals relate to the protection and restoration of water quality to insure beneficial use of all waters, the use of statewide approaches to watershed management to identify impaired waters and restore their the designated uses, and the development and implementation of management measures associated with Section 6217 of the Coastal Zone Act Reauthorization Amendments. These explicit long-term goals are a critical element of the State's nonpoint source program and are also required of all state nonpoint source programs by EPA. The long term goals as well as shorter term goals and action items were identified in Hawaii's Implementation Plan for Polluted Runoff Control (July 2000) (Implementation Plan). While many of the efforts associated with attaining these goals are under some authority of the PRC Program and the Department of Health many others depend upon the Program's ability to influence the efforts of our partners and may be limited by differing program priorities and resource constraints.

Progress has been made toward each of the long term goals and the associated measures of success during FY2008. It seems clear that the progress anticipated when these goals and accompanying measures where developed has not occurred as quickly as expected. Unfortunately, the five year update cycle for the implementation plan was not completed in 2003 nor in 2008 which leaves us with action items and measures of success that may have lost some of their relevance and require updating. Limited resources and staff turnover have limited the ability of the state to revise the implementation plan with much of the PRC Program activities being focused on shorter-term efforts to improve water quality. The State will consider reviewing and refining this information with our partners in FY2009 and beyond to insure that the long-term goals are still relevant and that we are focused on the appropriate action items and measures of success to meet these goals.

- *Long Term Goal #1: “Ensure that Hawaii’s coastal waters are safe and healthy for people, plants, and animals and protect and restore the quality of Hawaii’s streams, wetlands, estuaries, and other inland waters for fish and wildlife, recreation, aesthetic enjoyment and other beneficial uses by 2013.”*
- *Long Term Goal #2: “Identify impaired water bodies and restore their designated uses through a Statewide approach to watershed management within 15 years.”*
- *Long Term Goal #3: “Develop and implement economically achievable management measures, as identified in Section 6217 of the Coastal Zone Act Reauthorization Amendments, which are appropriate to Hawaii’s physical, economical, cultural, and social environment by 2013.”*

The information below summarizes progress the State and the Polluted Runoff Control Program has made toward reaching these goals.

The Integrated Water Quality Report which has combined the Clean Water Act (CWA), Section 305(b) water quality report and the CWA, Section 303(d) list of impaired waters is submitted to EPA every two years for review and approval. The process of developing the Integrated Report continues to be refined to improve the utility of the water quality assessment decisions included in the report which should aid in the development of both TMDLs as well as watershed plans. DOH is in the process of revising a comprehensive monitoring strategy which should allow more effective use of limited monitoring resources to insure that there is adequate information to support program efforts to protect and restore water quality. (Goal 1)

The PRC Program continues to provide funding to the Hawaii Association of Conservation Districts to support 4 conservation specialists with local soil and water conservation districts. These conservation specialists assist with the development and implementation of conservation plans with agricultural producers. Implementation of the best management practices (BMPs) identified in the conservation plans should minimize agricultural impacts to polluted runoff. During FY2009, some of the conservation specialists’ efforts will focus on activities in specific watersheds to determine the status of BMP implementation and the effect on water quality. (Goals 1 and 3)

The PRC Program continues to participate with state and federal agency partners in the Land-Based Pollution Local Action Strategy to Protect Hawaii’s Coral Reef established under auspices of the U.S. Coral Reef Task Force. Efforts of the LBP LAS are focused in four priority

watersheds and the PRC Program has selected proposals to develop watershed plans for two of these priority watersheds in FY2008. These watershed plans will build off of efforts undertaken by local, state and federal partners in these watersheds and identify implementation activities needed to improve water quality. (Goal 1 and 2)

Through a contract with EPA, Tetra Tech has worked with the State to evaluate the current situation of our nonpoint source education and outreach efforts, looking at the effectiveness of the current program and developing a strategy to improve our PRC Program's efforts. We hope to continue to work with Tetra Tech over the next year to develop a more specific Outreach Strategy including improvements to our website and outreach materials. (Goal 1 and 2)

In general, the watershed plan development and implementation process has continued to rely upon priorities identified through efforts of the Unified Watershed Assessment and the Clean Water Action Plan. Focusing on areas where there are interested stakeholders and perhaps previous planning efforts seems to be the most effective approach to watershed plan development and implementation. The PRC Program continues to work with a variety of stakeholders to develop and implement watershed plans as well as TMDLs. As of FY2008, watershed plans have been developed for the Nawiliwili watershed (Kauai), the 20 watersheds of the Ko'olaupoko district (Oahu), Kapakahi Stream (Oahu), Pelekane Bay (Hawaii) and Hilo Bay (Hawaii). Substantial efforts have been made to engage local stakeholders in priority watersheds concerning watershed plan development and implementation which has resulted in the PRC Program receiving proposals for watershed plan development. While the EPA requirements for watershed plan content is still a concern with many groups, it has been acknowledged that having the required level of detail is essential to developing a watershed plan that can be implemented. In addition, TMDLs have been developed for Waimanalo Stream watershed, Ala Wai Canal, Kawa Stream, Kapa'a Stream, Hanalei Bay watershed streams and estuaries, and Nawiliwili watershed streams. (Goals 1 and 2)

In addition to the watersheds with TMDLs and/or watershed plans, DOH and EPA have focused efforts of the clean water programs on three priority watershed areas-Hanalei, Waimanalo and West Maui. Efforts have been initiated in each watershed to either; a) develop a watershed plan to identify implementation opportunities to improve water quality (Hanalei), b) implement a TMDL/watershed plan (Waimanalo) and c) determine if on-the-ground activities have resulted in water quality improvements (West Maui). (Goals 1 and 2)

DOH and CZM have been working to integrate the activities of the Coastal Nonpoint Pollution Control Program and watershed planning and implementation by developing watershed guidance. The intent of the watershed guidance is to guide the preparation and implementation of watershed plans in Hawaii. The guidance will be designed to help organizations and agencies navigate the process of developing watershed management plans, provide some continuity throughout the state with regards to watershed planning, and provide a stronger linkage to the Coastal Nonpoint Pollution Control Program (CNPCP) management measures as a means to implement watershed plans and improve water quality. (Goals 1, 2, and 3)

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. There were no additional watershed plans completed in FY2008. Those watersheds with completed plans include: the Nawiliwili Bay watersheds, Kapakahi Stream, Kahoolawe, and the Ko'olaupoko district (20 watersheds) of windward Oahu. 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. In FY2008, the Nawiliwili Bay watershed stream TMDLs as well as the Hanalei Bay watershed stream TMDLs were completed.

The effort underway by the Mauna Kea Soil and Water Conservation District (SWCD) to develop a watershed based plan for Waikoloa-Waiulaula (Hawaii Island) has been extended and will be completed in March 2009. 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. These efforts were used as the foundation of a watershed planning workshop offered as part of the U.S. Coral Reef Task Force meeting held in Kona in August 2008. In the Hilo Bay watershed, the Watershed Advisory Group partnered with Hawaii County and received funding from the Hawaii Coastal Zone Management Program to support water quality data collection and the development of a web site. It is hoped that these efforts will allow the Watershed Advisory Group to gain some momentum and identify opportunities to utilize Section 319(h) funding to support projects that will improve water quality.

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, Maunalua Bay, Waimanalo, Ko'olaupoko region, South Molokai, West Maui (Honolua Bay), Waiulaula-Waikoloa, 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 supporting future on-the-ground activities to address polluted runoff as identified in these plans. A proposal to develop a watershed plan for the Hanalei Bay watersheds was submitted by the Hanalei Watershed Hui in response to the May 2008 PRC Program Request for Proposals (RFP). This proposal was selected for funding and contract for this project should be in place by early 2009. The West Maui Soil and Water Conservation District continues to contemplate revising a watershed plan for the West Maui watersheds. A draft proposal was submitted in 2008 and the PRC Program provided substantial feedback but a final proposal has not been submitted to date. The U.S. Army Corps of Engineers

will initiate the West Maui Watershed Reconnaissance Study in late 2008 and the PRC Program and its partners intend to participate in this effort to emphasize activities to improve water quality. Efforts in the Waimanalo watershed have focused on the use of the Ko'olaupoko watershed plan and the previously developed TMDL and TMDL implementation plan to identify project implementation opportunities. The Oahu Resource Conservation and Development Council submitted a proposal in response to the September 2007 RFP to implement soil and water conservation practices in the agricultural portion of the watershed intended to improve water quality. Contract processing has taken longer than anticipated but the project should be underway by late 2008 and completed in 2011.

In FY2008, there were two TMDLs finalized by DOH, the Hanalei Bay watershed streams/estuary and the Nawiliwili Bay watershed streams. The Hanalei Bay watershed stream/estuary TMDL for nutrients, sediment and indicator bacteria was reviewed for opportunities to address polluted runoff. The watershed plan to be developed under contract by the Hanalei Watershed Hui is intended to provide a framework for addressing the nonpoint source component of the TMDL. The PRC Program reviewed the draft Hanalei Bay watersheds TMDL as well as the Nawiliwili Bay watersheds TMDL and provided feedback on the implementation framework. The PRC Program also participated in the TMDL public meeting and hopes to utilize the Nawiliwili Watershed Plan as part of the foundation to implement this TMDL although no local efforts have been initiated to undertake implementation of this watershed plan which was developed in 2003.

The PRC Program has tried to augment its ability to develop and implement watershed plans by including these activities in the contract with the Hawaii Association of Conservation Districts (HACD) to support four conservation specialists with various soil and water conservation districts throughout the state. The focus of these conservation specialists is on the development and implementation of conservation plans but they will be focusing these efforts in PRC Program priority watersheds.

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 and has added the Maunalua Bay watersheds as another priority area. The PRC Program efforts in West Maui and Hanalei mentioned previously have and continue to be coordinated with the LAS.
- The PRC Program collaborated with other Land-Based Pollution Local Action Strategy steering committee members to develop a watershed planning workshop agenda and conduct the workshop. This workshop was offered as part of the U.S. Coral Reef Task Force meeting held in Kona, Hawaii, August 2008. The training highlighted technical issues

associated with watershed characterization in Hawaii, different watershed planning tools such as the EPA watershed handbook and watershed plan builder.

- 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 have focused on the development of watershed guidance with the Coastal Zone Management Program. The watershed guidance is a major component of the PRC/CZM strategy to address the remaining management measures that was submitted to EPA and NOAA in late 2007 and is described further in Coastal Nonpoint Pollution Control Program section.
- At the request of the Hawaii Department of Land and Natural Resources the PRC Program participated in the evaluation of funding proposals for Watershed Partnership Program. The PRC Program continues to discuss potential opportunities for collaboration with the Watershed Partnerships as well as other appropriate Department of Land and Natural Resources programs.

Hawaii's Polluted Runoff Control Program

| All PRC Program positions are filled at this time;

Public Participation Coordinator -	Lawana Collier
Planner -	Brian Hunter
Environmental Health Specialist -	Greg Takeshima
Grants Management Specialist -	Mike Burke

Temporary NPS IPA from EPA -	Hudson Slay
Temporary TMDL IPA from EPA -	Alexi Remnek

The PRC Program utilizes Clean Water Act Section 319(h) funding to address the State's nonpoint source pollution issues. In fiscal year 2008 the State of Hawaii received \$141,181 from EPA, the balance of our Fiscal Year 2007 grant. The program also applied for and will receive on October 1, 2008, a Fiscal Year 2008 grant in the amount of \$2,141,866 to fund salary, equipment, travel, training and projects listed in our Fiscal Year 2008 workplan.

Six projects were selected from the Request for Proposals issued in May 2008 and will be funded with the Fiscal Year 2008 grant. The PRC Program is hopeful all contracts will be executed early 2009. There are currently 8 projects in the contracting process, 9 ongoing projects, and one that has been completed this fiscal year.

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 FY 2008, the State has placed a considerable amount of effort to assist with the implementation of activities outlined in the DOH/CZM strategy to address the remaining management measures that was submitted to EPA and NOAA in late 2007. In order to implement this strategy, the State will be developing a watershed guidance package that will provide direction for watershed planning efforts to state, local and nongovernmental entities and will include the CNPCP management measures and associated management practices as an implementation menu for watershed plans. It is hoped that the watershed guidance will improve watershed planning, management, and implementation in the state and also assist in addressing approval requirements for the remaining management measures. 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. The efforts of the DOH/CZM to develop the watershed guidance are also occurring in the context of implementation of the State's Ocean Resources Management Plan (ORMP). The use of the ORMP as a forum for the watershed guidance 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 FY2008 is provided below.

Onsite Disposal System (OSDS) Management Measure

In FY2008, 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 and FY2007 to assist with the management of onsite wastewater systems and address the management measure conditions. The information below summarizes further progress made during FY2008:

- Updated the OSDS strategy to reflect progress in implementation and include activities developed and initiated to implement the strategy (CZM funded study, USGS monitoring work for Clean Water Branch-Monitoring Section, coordinated effort with Source Water Protection and the University of Hawaii)
- Mapped wastewater disposal method by parcel using GIS for the islands of Oahu, Maui, Kauai and Hawaii. This includes seweried parcels, those utilizing DOH-permitted Individual Wastewater Systems, and cesspools. Relative breakdown of disposal method by watershed was also completed for Maui.
- Shared wastewater mapping information with the TMDL program for integration into two TMDLs (Nawiliwili and Kaneohe).
- 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.
- The *Onsite Wastewater Treatment Survey and Assessment* document developed by the University of Hawaii with CZM funding was delivered as a final draft in May 2008. After review by CZM and DOH this document was finalized and has been posted on both the CZM and DOH Wastewater Branch websites for public use. The document includes: identification of the range of wastewater treatment and disposal systems suitable for use on individual lots and multiple dwellings; description of the systems in terms of design and installation, O&M, cost, and field constraints; evaluation the systems with respect to water quality requirements under Hawaii field conditions; identification of technical issues relative to implementation of these systems; and development of a methodology for assisting engineers and homeowners in selecting an appropriate onsite wastewater system for their application.
- The contract with the University of Hawaii, Water Resources Research Center has been executed and work has been initiated. The first steps of this effort include the use and refinement of the GIS wastewater inventory information mentioned above. DOH is hopeful that specific discussion of this information will lead to overall improvement in the quality of these data and their utility for other uses. The basics of the contract include developing risk-based analysis of OSDS (Oahu only) and inspection protocols. Expected outcomes of this contract include: 1) Identify geographic areas where OSDS have higher likelihood of impacting coastal water quality; 2) Identify inspection protocols for different OSDS used in Hawaii. 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. This project should be completed in March 2009.

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.

Roads, Highways, and Bridges (RHB) Management Measure

The PRC Program is also tasked with shepherding the State's efforts to attain certification of the RHB Management Measure. Efforts during FY2008 included continuing to work with Hawaii County Department of Public Works (DPW) on its comprehensive contract format as PRC staff met with them and their consultant December 2007 to discuss the necessary specificity of practices and effectiveness that would meet the management measure. We then met with the County of Hawaii Planning Department in January 2008, as part of the Hilo Bay Watershed Based Plan effort, and informed them of the efforts regarding the RHB process within the County's DPW in an attempt to insure internal coordination.

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Given that EPA/NOAA had determined that language within State of Hawaii Department of Transportation (DOT) documents satisfy the conditions for planning, siting, and developing roads and for siting, designing, and maintaining bridges in February 2008 PRC staff met with DOT consultant to request standard DOT contract language and information on how DOT was meeting the requirements of the RHB management measure outside of the MS4 areas under their jurisdiction.

To herald this potential holistic approach (Hawaii County contract and DOT language) statewide, as well as to gauge ability and temperament to adopt such practices, PRC Program staff visited with the County of Kauai (March 2008) and County of Maui (April 2008). In May 2008 PRC staff met once again with the County of Hawaii DPW and their consultant to further clarify potentials within their tentative comprehensive contract format. In May 2008, having heard nothing from DOT from our February meeting, we requested an update on their progress in providing the necessary information.

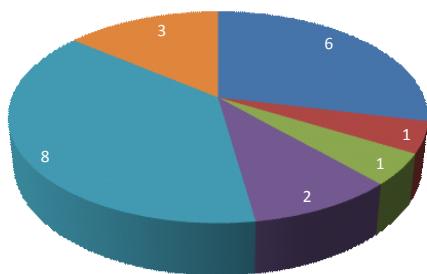
In June 2008 PRC staff met with DOT and City and County of Honolulu (CCH) in a joint meeting to include the same RHB management measure information that had been brought forward to the other counties, as well as to reiterate to DOT the necessity of them providing the requested information. In September 2008, we met with EPA San Francisco staff and provided them with progress to date, as well as an ongoing strategy to revisit all necessary parties with a more direct, yet still collaborative, approach identifying the necessity of cooperation toward the management measures certification.

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

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Number of Projects By Island



319(h) Funds By Island

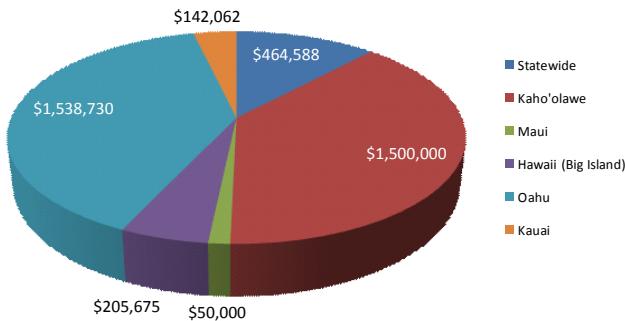


Figure 2: The total number of projects by island is shown to the left and a breakdown of the total amount of 319(h) dollars spent by island is displayed to the right.

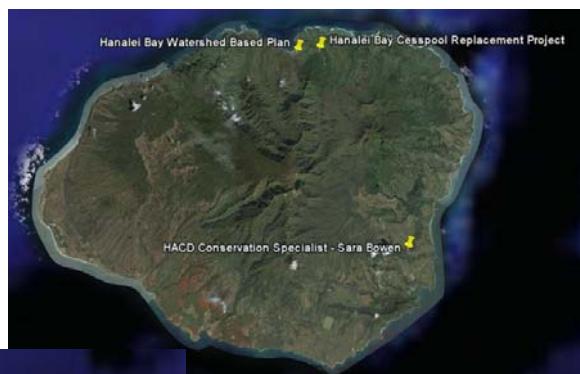


Figure 3: Aerial views of the Big Island of Hawaii, Maui, and Kauai with their respective PRCP Projects.

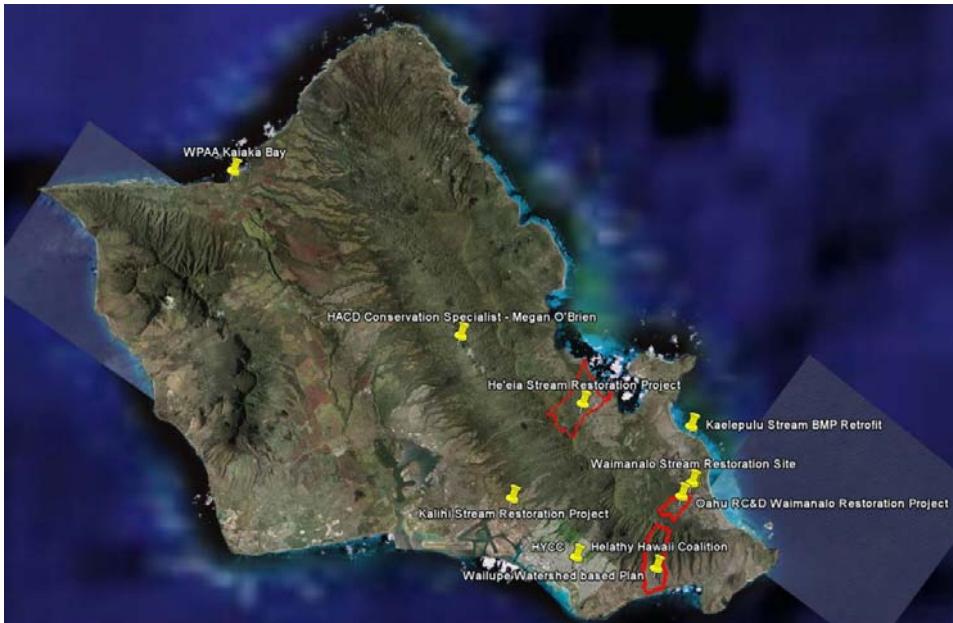


Figure 4: Aerial view of the PRCP Projects on the island of Oahu.

Summary of Completed Projects This Fiscal Year

Hawaii Youth Conservation Corps

Contractor: Department of Land and Natural Resources, Division of Forestry and Wildlife
1151 Punchbowl Street #325
Honolulu, HI 96813
(P): 808-587-4188 (F): 808-587-0160

319 Funds: \$150,000

Time Period: May 2006 – October 2008

Location: Statewide

Partners: DOH CWB, Pono Pacific, University of Hawaii, National Oceanic and Atmospheric Administration, Kamehameha Schools (Aina Ulu Program)

The Youth Conservation Corps is an education and outreach program which targets interested high school and undergraduate students. The project's main goal is to get students interested in conservation and science. The conservation corps offers a strong hands-on curriculum to give its participants knowledge in conservation. All of the participants were surveyed with a conservation quiz before and after they had participated in the program to determine project effectiveness and awareness of watershed-wide activities, problems and potential solutions.

Environmental Results: Results have been difficult to assess due to a “weak” monitoring plan. No data was reported to the DOH CWB in any of the projects in which the participants volunteered. On a positive note, the pre- and post- tests of the students showed a marked improvement over the course of the project. 18,430 service hours were reported to DOH by the HYCC in 2007-08; of the 18,430, approximately 2401 hours were spent on trail restorations, 5436 hours were spent on invasive species removal, 700 hours spent on watershed restoration, and native plant restoration totaled approximately 4387 hours.

Major Projects (Deliverables): Develop pre- and post- conservation test, analyze pre- and post- tests for participants.

Milestones: Contractor selected volunteer sites at 6 of the 8 major islands, advertise for potential interested students, selected students for participation



Figure 5: Maui HYCC volunteers putting together exclusion fencing to keep invasive fauna from entering waterways and assisting the US Fish and Wildlife Sanctuary on the North Shore of Oahu with non-native invasive species removal; photos courtesy of HYCC

Projects Initiated in FY2008

Updating the State of Hawaii Department of Health's Guidelines for Livestock Waste Management

Contractor: West Maui Soil & Water Conservation District
PO Box 2993
Wailuku , Maui 96793
(P): 808-244-7951 (F): 808-244-4108
319 funds: \$ 25,000 (FY06 grant)
Time Period: May 1, 2008 – May 1, 2010
Location: Statewide
Partners: DOH CWB, DOH WWB, USDA NRCS, UH CTAHR

The State DOH Guidelines for Livestock Waste Management was developed in 1996 to assist farmers and ranchers to identify solutions and practices related to their animals waste. The project’s goal is to update the Guidelines to reflect new information and technologies available on waste management and in compliance with the US EPA agreement for Animal Feeding Operations (AFOs) and Confined Animal Feeding Operations (CAFOs) rules.

Expected Environmental Results: The updated Guidelines will be available to the public and distributed to interested farmers and ranchers to encourage practices to decrease polluted runoff associated with their livestock.

Major Products: Technical Advisory Group (TAG), 1,500 brochures and handouts distributed and posted on DOH WWB website, 500 copies of updated Guidelines printed and available for distribution

Milestones: Coordination and creation of TAG, development and distribution of education/outreach materials, update and finalize “DOH’s Guidelines for Livestock Waste Management”

Continuing Projects

HACD Conservation Specialists

Contractor: Hawaii Association of Conservation Districts (HACD)
99-193 Aiea Heights Drive, Suite 110
Aiea, Hawai'i 96701
(P): 808-483-8600 (F): 808-483-8619

319 Funds: \$50,000 (\$959,460 from Oil Tax Monies)

Time Period: July 2002 – present

Location: Hawai'i (Big Island), O'ahu, Maui, Kauai

Partners: DOH CWB, USDA NRCS

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’ grant has been extended and work plans for the individual islands have been updated to reflect the different duties at each island.

Expected Environmental Results: The Conservation Specialists are expected to assist in developing and implementing conservation plans which should increase water quality due to BMP implementation. Conservation specialists are also directed to assist in the development and implementation of watershed based plans where applicable, also aiding in water quality improvements.

Major Products (Deliverables): Presentations of workplan and accomplishments at annual HACD Conference, and annual reports to DOH

Milestones: Completion of a set number of conservation plans during a quarter.



Figure 6: John Astilla using survey equipment to create conservation plans for farmers on Maui. Ruby Raindrop and Sammy Soil help to educate Hawaii's Youth.

Kaho'olawe Restoration Project

Contractor: Kaho'olawe Island Reserve Commission (KIRC)
811 Kolu Street, Suite 201
Wailuku, Hawaii 96793
(P): 808-243-5023 (F): 808-243-5885

319 Funds: \$1,500,000

Time Period: August 2005 – August 2010

Location: Hakioawa, and Kaulana Watersheds (Kaho'olawe)

Partners: DOH CWB, DLNR, U.S. Geological Survey, USDA NRCS

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. 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 contortus*) bales which lower wind speed to the freshly rooted plants and also acts as sediment catchment areas. This year many of the plantings were surveyed and determined to have increased in size and maturity.

Expected Environmental Results: Thus far the project has decreased potential runoff into streams and the ocean by approximately 4 tons (KIRC, 2008). The growth of plantings on the island have shown an increase in size and increased soil stability due to the plants taking root. Decreased soil erosion and nutrient input are expected due to plantings near the headwaters of Hakioawa and Kaulana.

Major Products (Deliverables): USGS Stream gage data, plant growth data, erosion pins data.

Milestones: The project is nearing the completion of Phase II, and will be entering phase three in the upcoming winter months.



Figure 7: Lyman Abbott pointing out native plant restoration in Pili Grass hay bales. Plantings on irrigation with Maui in the background.

Watershed Based Plan for Waikoloa-Waiulaula

Contractor:	Mauna Kea Soil and Water Conservation District PO Box 750 Kamuela, HI 96744 (P): 808-885-6460 (F): 808-877-1247
319 Funds:	\$155,675
Time Period:	June 2005 – March 2009
Location:	Waikoloa-Waiulaula Watershed (Hawai'i)
Partners:	DOH CWB, USDA NRCS, Marine and Coastal Solutions International

The contractor is in the process of creating 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 taken several samples during three storm flows in the 07 winter season. The data has then been analyzed and the project has been extended for one more winter season to catch potential winter season storm flows.

Expected Environmental Results: Implementation of the watershed based plan will increase water quality by allowing interested groups, community groups, etc. to access 319 base funds for BMP implementation in priority areas.

Major Products (Deliverables): Storm flow and nutrient analysis is expected before the end of the project, watershed based plan meeting EPA's 9 key elements.

Milestones: Conduct public meetings for public input on WBP, NPS source list, monitoring plan, and a sampling and analysis plan.



Figure 8: The Waianae-Waikoloa Watershed looking towards the Kohala Mountain. The headwaters of Waianae Stream during average flow.

Hawaii Watershed Experience: A Hands-on Elementary Education Program

Contractor: Healthy Hawaii Coalition
PO Box 75505
Kapolei, HI 96707
(P): 808-778-4243
(F): 682-2591

319 Funds: \$21,780

Time Period: June 2006 – December 2008

Location: Statewide

Partners: DOH CWB, Department of Education

RFP: 08-01



Figure 9: Playlet of Oily Al and Waterwoman.

The Healthy Hawaii Coalition brings elementary school children a look at a watershed/ahupua'a from top to bottom. They deal with non-point source issues such as storm drain education, erosion control and nutrient management. The program consists of 3 days; the first day consists of a playlet entitled "The Adventures of Waterwoman and Oily Al", the second day consists of the students taking a field trip to a local, easily accessible area where they are introduced to concepts like erosion, nutrient/fertilizer control, etc. and the third day consists of reviewing materials from the first two days. The goal of the new contract is to bring the program to all 9 of the priority watersheds. The Contractor aims to increase general and base knowledge of watersheds and general non-point source pollution issues. The program is specifically targeted towards children in grades 4-5.

Expected Environmental Results: With an education and outreach project such as this environmental impact will be difficult, at best, to characterize and quantify. The contractor is, however, trying to change perspectives and outlooks and they are monitoring those processes via surveys 4-6 weeks after the program is completed.

Major Products (Deliverables): Pre- and post- surveys of participants general knowledge of watersheds, educational information brochure,

Milestones: Completing 30 educational presentations in priority watersheds.

Kalihi Ahupua'a Community Service Project

Contractor: Kalihi Ahupua'a Ulu Pono Ahahui (KAUPA)
1579 Kalaepa'a Dr.
Honolulu, HI 96818
(P): 808-848-7998 (F): 538-7819

319 Funds: \$228,856

Time Period: December 2006 – December 2009

Location: Kalihi Stream, Oahu

Partners: DOH CWB, Kalihi Waena Elementary School, Farrington High School,
DLNR Division of Aquatic Resources (DAR), Hui Ku Maoli Ola, C&CH
Division of Environmental Services, Protect the Plant

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.

Environmental Results: Community volunteers have assisted in stream clean-ups every month resulting in large and small trash items being removed from the stream. Approximate weight and numbers of units volunteers have removed during stream clean-ups :

Litter removed: 497 lbs

Plants planted: Cassava (tapioca) planting area, plus 50 edible and medicinal plants

Green waste removed: 264 lbs and 16 bundles

Metal removed: 350 lbs, including plumbing, fence posts, rebar

Miscellaneous items removed: bike, live cockatoo, 2 mattresses, kid's plastic chair, chicken wire, and scraps of wood

Sighted 2 native O'opu (Naniha and Akupa) indicator species

Major Products (Deliverables): Kalihi Stream NPS Pollution Brochure in 6 languages, KAUPA Informational Stream Signs, Monitoring Plan and QAPP, Operations and Maintenance Plan, Public Outreach Campaign articles
Milestones: Conducting water quality monitoring and bio-assessment monitoring, distribution of brochures to community members, installation of restoration site signage, and completion of BMPs in and around Kalihi Stream.



Figure 10: Kalihi restoration site with permeable pathway and taped off areas for native floral plantings.

Demonstrating Watershed Participatory Assessment and Action

Contractor: University of Hawaii at Manoa – College of Tropical Agriculture and Human Resources
3190 Maile Way
Honolulu, HI 96822
(P): 808-956-7066 (F): 808-956-3894

319 Funds: \$223,873

Time Period: June 2006 – March 2009

Location: Kaiaka Bay Watershed, O’ahu

Partners: DOH CWB, North Shore Neighborhood Board

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.

Expected Environmental Results: Initially this project was designed to develop a watershed based plan to assist the North Shore community in accessing more 319 funds for implementation. Thus far the project has stalled several times and it seems as though a watershed based plan incorporating EPAs 9 key elements will not be created. Water quality testing has been conducted (although without an approved Monitoring plan) and data has been analyzed.

Major Products (Deliverables): Community surveys, lists of comments and concerns about Kaiaka Bay, and raw data from water quality and soil sampling

Milestones: Collect WQ and Soil data, present data to the North Shore Neighborhood Board, request and analyze community concerns and suggestions for remediation, compilation of information gathered into a final report.

Innovations in Stream Phytoremediation and Erosion Control of Degraded Stream Banks

Contractor: Sustainable Resources Group International Inc. (SRGII)
111 Hekili St., Suite A373
Kailua, HI 96734
(P): 808-356-0552 (F): 808-356-0552

319 Funds: \$299,780.88

Time Period: June 2006 – June 2009

Location: Kahawai Stream and Waimanalo Stream (Ko'olaupoko Watershed), O'ahu

Partners: DOH CWB, C&C of Honolulu, DLNR Land Board, UH – CTAHR, Hui Ku Maoli Ola

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. 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 a coconut fiber coir log, pollutant uptake, stream hydraulic properties, ease of maintenance, remedial quality, and local availability. Using plant tissue analysis from the grow boxes established at the end of last year the contractors have selected Makaloa (*Cyperus laevigatus*), Ahu'awa (*Cyperus javanicus*), Kiolohia (*Cyperus polystachyos*) and Uki (*Cladium jamaicense*). Recently SRGII found out that their restoration site had been sprayed with herbicides by DLNR maintenance crews. SRGII has decided to continue the project by re-planting the coir logs. DOH CWB will be meeting with SRGII to discuss potential outcomes and action in response to DLNRs actions.

Expected Environmental Results: The plants were selected based upon professional opinion (Hui Ku Maoli Ola), and lab analysis of nutrient uptake by plant tissue sampling. The coir logs were also placed into the stream bank to decrease stream flows (without hindering storm flow) into the already severely eroded banks. Within the coir logs, the contractors planted a “riparian area” with other sedges to help trap suspended sediments during medium flows.

Major Products (Deliverables): Monitoring plan, Potential Plant Species List, Nutrient up-take data from grow boxes, Operations and Maintenance Plan, and Lab Analysis data.
Milestones: Receive Right of entry from DLNR Land Board, begin grow box testing, grow selected species in coir logs, install coir logs into stream banks, and begin monitoring up and down stream of project sites



Figure 11: Pre- and post-installation pictures of the plantings, coir logs, and erosion control matting placed at Kahawai stream and Waimanalo Stream.



Figure 12: Kahawai Stream restoration site after DLNR Maintenance Division had sprayed the area with herbicides.

Hawaii Water Quality Conference

Contractor: Hawaii Association of Conservation Districts (HACD)
 99-193 Aiea Heights Drive, Suite 110
 Aiea, Hawai'i 96701
 (P): 808-483-8600 (F): 808-483-8619
 319 Funds: \$45,028
 Time Period: May 2007 – Nov 2008
 Location: O'ahu
 Partners: DOH CWB, DOH Environmental Planning Office, USDA NRCS, UH
 CTAHR, O'ahu RC&D, County of Hawaii, US Geological Survey, Kailua
 Bay Advisor Council (Hui O Ko'olaupoko)

The Hawaii Water Quality Conference brings local, state, and federal agencies, community members and private professionals who are interested in water quality together to discuss new topics in water quality relating to Hawaii. The conference was held on March 24-25, 2008 at the Honolulu Country Club. Topics which were discussed ranged from Hawaii watershed projects to Hawaii TMDLs to effectiveness of restoration efforts. Due to a lack of participation from a diverse professional audience, the project will not be renewed unless there is a major overhaul of the conference/program.

Expected Environmental Outcomes: The conference was developed to showcase recent

information on water quality gathering techniques, updates on water quality projects and issues pertaining to water quality throughout the state. The environmental outcomes will be difficult to assess due to the fact that only a conference was held and no actual work was done to prevent NPS pollution.

Major Products (Deliverables): Create a website for the water quality conference and for general NPS info for the public to visit, and host the 2007 and 2008 water quality conferences.

Milestones: Create the NPS technical committee and hold committee meetings, host 2007 and 2008 water quality conferences.

Projects Selected under the RFP CWB-PRC 07-01 or 08-01

Waimanalo Stream Restoration and Community Outreach

Contractor: O'ahu Resource Conservation and Development Council, INC.
19-193 Aiea Heights Drive, Suite 111
Aiea, HI 96701
(P): 808-483-8600 ext. 112

319 Funds: \$400,000

Time Period: 24 months (in four phases)

Location: Waimanalo (Ko'olaupoko Watershed), O'ahu

Partners: DOH CWB, Windward O'ahu Soil and Water Conservation District, USDA NRCS, Hui O Ko'olaupoko

RFP: 07-01

Waimanalo Stream has been listed as a priority water body for the Department of Health and implementation of a watershed based plan (Ko'olaupoko Watershed Restoration and Action Strategy) will begin with this project. Agricultural Best Management Practices will be applied for several interested farmers within the riparian areas of the stream. The Waimanalo Stream Restoration and Community Outreach Project will focus on 826 acres designated for agricultural use. The O'ahu RC&D will initially characterize the watershed and try to define problem areas within the watershed. After characterization of problems is completed, the contractor will aim to partner with landowners in target areas.

Expected Environmental Results:
The BMPs at selected farms should decrease nutrient loading into Waimanalo Stream. The BMPs will also increase awareness by demonstrating the potential positive impacts of those BMPs to other farmers in the area during the Public site visits.

Major Products (Deliverables): A Watershed Assessment and Water Quality Sampling Plan will be developed, 5-15 landowners will implement conservation plans created during the project's earlier phase, increasing awareness of BMPs by holding 5 field days at cooperating landowner's properties to show potential impacts the BMPs will address.

Milestones: Assessment of watershed problem areas, definition of priority areas and contacting interested partners/landowners, outreach and education for fellow farmers and other interested community members

Reducing Non-point Source Pollution in the Hanalei River Watershed through Septic Upgrades at the Hanalei National Wildlife Refuge

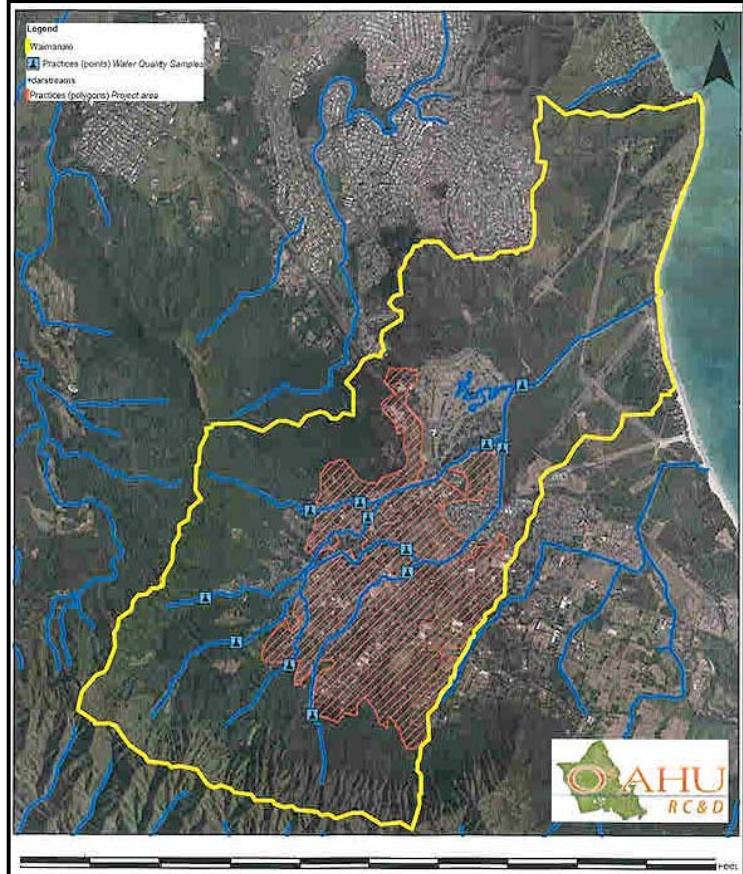


Figure 13: Waimanalo Watershed and potential project sites; map provided by O'ahu RC&D and NRCS.

Contractor: Hanalei Watershed Hui
PO Box 1285
Hanalei, HI 96714
(P): 808-826-1985 (F): 808-826-1985
319 Funds: \$25,453
Time Period: 15 months
Location: Hanalei Wildlife Refuge, Kauai
Partners: DOH CWB, U.S. Fish and Wildlife Service

Hanalei Bay has been listed as a priority water body by the Department of Health. The stream as well as the bay is listed on the DOH's 303(d) list of impaired waterbodies. Several cesspools in the area have been identified by the Hanalei Watershed Hui as being a direct threat to water quality and therefore are candidates for removal and replacement of proper updated septic systems. The contractor will replace 4 cesspools near the Hanalei River with newer technology septic systems. The

project may potentially decrease seepage of primary treated waste and associated nutrients and bacteria into priority areas around the Hanalei river watershed.

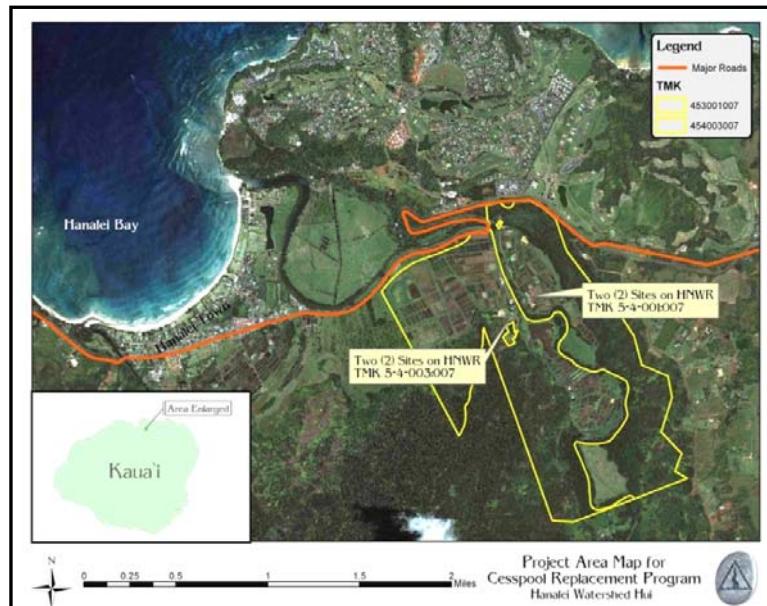


Figure 14: Four proposed cesspool to septic system upgrade sites; map provided by the Hanalei Watershed Hui

Expected Environmental Results: Replacing the four aged cesspools with new septic systems should decrease untreated waste entering the river. A decrease of nutrients should also be seen due to the decrease in untreated seepage.

Major Products (Deliverables): Pre- and post- installation monitoring data for interpretation and analysis, development of a Monitoring Plan, installation and removal of four septic systems in priority areas in the Hanalei Wildlife Refuge.

Milestones: Development of a Monitoring Plan, and installation and removal of four septic systems in priority areas in the Hanalei Wildlife Refuge.

Development of a Water Quality Action Plan for the Hanalei Bay Watersheds

Contractor:	Hanalei Watershed Hui PO Box 1285 Hanalei, HI 96714 (P): 808-826-1985 (F): 808-826-1985		
319 Funds:	\$66,609		
Time Period:	12 months		
Location:	Hanalei Wildlife Refuge, Kauai		
Partners:	DOH CWB, University of Hawaii SeaGrant Extension Service, UH Natural Resources and Environmental Management		

Hanalei Bay has been listed as a priority water body by the Department of Health and the EPA. The Hanalei Watershed Hui proposes to develop a watershed based plan by utilizing their Watershed Action Plan and incorporating the EPA's 9 key elements to include implementation of BMPs in priority areas in a comprehensive plan for the Hanalei Bay watershed.

Expected Environmental Results: The watershed based plan will include

potential implementation measures which a community, organization or agency may use to positively impact the water quality in the watershed. Priority areas will be defined and remediation suggestions will also be included into the plan.

Major Products (Deliverables): A watershed characterization report, a pollution control strategies plan, an implementation plan, an evaluation and monitoring plan, and watershed Based Plan (incorporating EPA's 9 Key Elements)

Milestones: Assessment of watershed problem areas, definition of priority areas and implementation measures, outreach and education to inform the Hanalei community about the watershed planning process and to solicit input

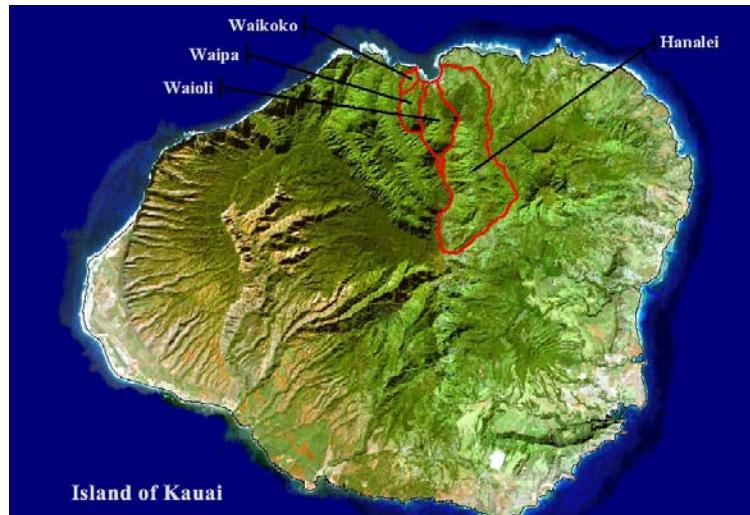


Figure 15: Sub-watersheds which drain into Hanalei Bay; map provided by Hanalei Watershed Hui

Ka`elepulu Stream On-site Stormwater Retrofit

Contractor: Hui O Ko'olaupoko
629 A Kailua Road Suite #3
Kailua, HI 96734
(P): 808-277-5611 (F): 808-262-6242

319 Funds: \$83,040
 Time Period: 24 months
 Location: Ka'elepulu Stream
 (Ko'olaupoko
 Watershed), O'ahu
 Partners: DOH CWB, City and
 County of Honolulu
 (C&C), Hughes and
 Hughes Landscaping
 Co., Mid Pacific
 Country Club, Hui
 Ku Maoli Ola
 RFP: 08-01

Ka'elepulu Stream is listed on the DOH's 303(d) list for nutrients and turbidity. Very few areas on the banks of Ka'elepulu stream are publicly accessible; therefore there are limited areas where restoration and BMPs will be able to make a difference. Hui O Ko'olaupoko proposes to retrofit one of these few areas to decrease sediment and nutrient loading from a parking lot. The Contractor will develop and implement a landscaping plan with Hughes and Hughes, and Hui Ku Maoli Loa. Parking stalls will be moved approximately three meters from the stream and BMPs (bio-swales and vegetated buffers) will be constructed.

Expected Environmental Results:

Due to movement of the parking stalls away from the stream, potential harmful liquids and metals from leaky vehicles may be absorbed and diluted by the implemented BMPs. The buffer will also increase infiltration during storm events and decrease water movement from the parking lot into the adjacent stream.

Major Products (Deliverables): Project site monitoring plan, a restoration/landscape design, and an operations and maintenance plan.



Figure 16: Aerial view of the C&C owned parking area and potential monitoring sites; map provided by the Hui O Ko'olaupoko.

Milestones: Completion of a monitoring plan, select signage designs from local elementary school (Lanikai Elementary School) re: education and outreach for Polluted Runoff, restoration/landscape completion, and monthly monitoring.



Figure 17: Parking lot pre-restoration facing mauka and parking lot pre-restoration facing makai; picture provided by Hui O Ko'olaupoko.



Figure 18: Initial sketches of BMPs in parking lot; sketches and map provided by Hughes and Hughes Landscape and Hui O Ko'olaupoko.

The Hawaii Watershed Experience: A Hands-On Elementary Education Program

Contractor: Healthy Hawaii Coalition
PO Box 75505
Kapolei, HI 96707
(P): 808-778-4243 (F): 682-2591
319 Funds: \$21,780
Time Period: 24 months
Location: Statewide
Partners: DOH CWB, Department of Education
RFP: 08-01

The contractor was selected to continue their education in the Request for Proposals 08-01.
All of the descriptions, results, and milestones will be the same as the previous project.

Watershed Based Plan for Reduction of Nonpoint Source Pollution, Wailupe Stream, O'ahu

Contractor: Community Links
1003 Bishop Street, #2605
Honolulu, HI 97813
(P): 808-777-1481
(F): 808-535-6620
319 Funds: \$60,000
Time Period: 24 Months
Location: Wailupe Stream (Maunalua bay watershed), O'ahu
Partners: DOH CWB, Malama Maunalua, UH SeaGrant Extension Service
RFP: 08-01

Wailupe stream, on the southern shore of O'ahu, is the only unlined and least degraded stream within the Maunalua Bay watershed. Maunalua Bay is listed on the DOH's 303(d) list for total Nitrogen, Nitrates + Nitrites, Chlorophyll-A, and Ammonium. To begin recovery of the bay watershed based plans which include EPA's 9 Key elements must be developed and implemented. The contractor will develop a watershed based plan based on the EPA's 9 key elements. The watershed based plan will include BMP implementation in priority areas to decrease potential loading into Maunalua Bay.

Expected Environmental Results: The development of the watershed based plan should result in the implementation of BMPs by community groups and organizations. Priority areas and feasibility will be defined and taken into consideration during implementation.

Major Products (Deliverables): A Quality Assurance Project Plan will be required for proper sampling protocol, a watershed characterization report, an evaluation/monitoring plan, an implementation plan, and a watershed based plan.

Milestones: Submit planned outreach and education activities, interim reports on a quarterly status.

He'eia Stream Riparian and Water Quality Improvements

Contractor: Hui O Ko'olaupoko
629 A Kailua Road Suite #3
Kailua, HI 96734
(P): 808-277-5611 (F): 808-262-6242
319 Funds: \$193,180
Time Period: 36 Months
Location: He'eia Stream (Ko'olaupoko Watershed), O'ahu
Partners: DOH CWB, Hui Ku Maoli Ola, Hawaii Pacific University
RFP: 08-01

He'eia Stream is listed on the DOH's 303(d) list for Total Nitrogen, Nitrates + Nitrites, Total Phosphorous, Turbidity, and Total Suspended Solids. The Ko'olaupoko watershed has a current watershed based plan and implementation at He'eia is needed due to stream bank erosion and overgrowth of non-native invasive species. The contractor will stabilize stream banks and riparian areas along He'eia stream by removing harmful non-native invasive plant species and replacing them with native plants which have a greater potential to reduce erosion and increase nutrient uptake. The contractor will also inform the community around He'eia stream about non-point source pollution via pamphlets and brochures and public site visits.

Expected Environmental Results: Due to the new vegetation planned for the restoration site, ground cover will increase, and plants rooting into the substrate should increase overall water quality by decreasing sediment loads and water movement from the stream banks during rain. Re-vegetation with native plants should also increase diversity in the stream bank areas, increasing the possibility for native flora and fauna to return to the natural habitats.

Major Products (deliverables): A monitoring plan with QA/QC will be designed and submitted, hold a public lecture for education on nitrates/nitrites and residential BMPs, follow-up survey's on educational lecture

Milestones: Development of monitoring plan, begin propagation of plant materials, clear unwanted vegetation in stream/channel, complete planting in coir logs and alongside streams.

Hawaii Youth Conservation Corps (HYCC) Project

Contractor: KUPU
3569 Harding Ave. Unit A
Honolulu, HI 96816
(P): 808-735-1221 (F): 808-735-1223
319 Funds: \$201,000
Time Period: 24 Months
Location: Statewide
Partners: DOH CWB, Hawaii State Department of Land and Natural Resources (DLNR), DLNR Division of Forestry and Wildlife, University of Hawaii,

The Hawaii Youth Conservation Corps is a project in which the DOH CWB has been supporting with 319(h) funds since 2006. During the RFP 08-01 KUPU, the subcontractor for the DLNR HYCC project, proposed to the DOH CWB to again fund positions of the HYCC. The HYCC is an educational program aimed at high school and undergraduate college students who are interested in conservational practices and potentially careers in conservation. The program gives the participants a hands-on experience with conservation projects throughout the state. During a meeting with KUPU representatives, DOH CWB voiced its concerns over a lack of water quality monitoring, although a compromise was reached and written into the scope of services.

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 protect Hanalei coral reefs

The University of Hawaii 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. Dr.

Carl J. Berg is working 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 four priority areas) of the State of



Figure 19: Sediment discharge from Waikoko Stream, vegetation from stream after a rainfall event, and typical point source discharge from taro farms in the area.

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 agricultural activities.

Initial project activities during the past year included a watershed assessment, soil analysis to determine fertilizer needs, monitoring to guide and determine management practice effectiveness, and implementation of management practices. Management efforts focused on pollution prevention as well as remediation to address nutrients, turbidity and bacteria problems associated with taro farming in the Waikoko watershed. Pollution prevention efforts to address nutrients included: monitoring pondfield soil nutrient levels to determine nutrient needs prior to fertilizing, using controlled-release fertilizer and modifying fertilizer application methods (tilling) to reduce nutrients leaving the taro pondfields and entering the stream and bay. Pollution prevention efforts to address sediment included: managing water movement in and through the pondfields to allow fine sediment to settle and then dredging this material for pond and berm reuse, as well as fencing taro pondfields to exclude feral cattle and pigs, as well as horses, to reduce bacteria contributions to surface waters. Remediation activities have included: the use of floating trays of vegetation and weeds colonizing pondfield ditch banks for the uptake of nutrients, as well as capturing fine sediment, and reducing bacteria levels. Plant material was harvested from the trays and composted.

In addition to monitoring related to the management practices, this project also includes water quality, coral cover and coral disease monitoring to measure effectiveness of the management practices relative to the discharge of sediment and nutrients. Monitoring and adaptive management activities associated with this project will continue until Fall 2009.

City and County of Honolulu

Malama Maunalua



Figure 20: Aerial view of Maunalua Bay on the southern shore of O'ahu.

Mālama Maunalua is a 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. Assisted by a coordinator, the group has continued their efforts to involve the community in caring for and managing the bay in a sustainable

manner and to pursue solutions to resource problems in Maunalua Bay and its watersheds. During the past year, Maunalua Bay has been added as a priority area of Land-Based Pollution Local Action Strategy to Protect Hawaii's Coral Reefs which will provide access to resources from LBP steering committee partner agencies. Malama Maunalua continues to work with the Corps of Engineers on methods to minimize the impacts of flooding in portions of the watershed while protecting the water quality and biotic integrity of both the streams and coastal waters. DOH has selected a proposal to develop a watershed plan for the Wailupe watershed (which drains to Maunalua Bay) for funding and anticipates that this work will begin in early 2009. Malama Maunalua has also partnered with the University of Hawaii Sea Grant College Program to hire an extension agent to help with efforts to address land-based pollution.

Ecology, Restoration, and Management of Hawaiian Stream and Riparian Systems

The U.S. Army Engineers Research and Development Center sponsored a 3-day workshop in May 2008. The workshop addressed a wide variety of topics relevant to the ecology, restoration, and management of Hawaiian stream and riparian ecosystems. The workshop was very well attended and relied upon primarily upon local expertise to highlight the importance of riparian systems and the many tools used to restore and protect these systems. The intent of the workshop was to transfer information and technology from past, present, and future work to interested parties, and to provide a broad array of ideas, tools, and techniques that may be useful to individuals or organizations interested in improving the management of streams and riparian systems in Hawaii.

Maui County

Honolua Bay Activities

Honolua Bay is priority area of the Land-Based Pollution (LBP) Local Action Strategy (LAS) to Protect Hawaii's Coral Reefs. In FY2008, the LBP LAS coordinator (Kathy Chaston) completed the Honolua Bay Review: A review and analysis of available marine, terrestrial and land-use information in the Honolua Ahupua'a Maui 1970-2007, which will serve as a valuable resource in and of itself but also for other efforts such as watershed planning. With much of the land surrounding Honolua Bay being privately owned, conflicts concerning future land use and their potential impacts came to a head in 2008. The landowner (Maui Land and Pineapple Company-MLP) proposed a project to develop Lipoa Point with a golf course and residential housing. Ultimately, community groups and MLP initiated meetings to discuss the future of the watershed. As a result of these meetings, MLP offered the Lipoa Point/Honolua Bay Conservation Compromise'. The compromise would protect Lipoa Point and the connecting shoreline areas in



Figure 21: Aerial view of Honolua Bay on the western shore of Maui.

perpetuity, conserve sensitive cultural, historical, and environmental areas, maximize open space, manage public access for sustainable ocean recreation uses, ensure adequate resources for permanent management, and create a win/win solution between the Community, Government, and ML&P.

Hawaii County

U.S. Coral Reef Task Force Meeting-Watershed Planning Workshop and Field Trip

The Mauna Kea Soil and Water Conservation District worked with the Land-Based Pollution Local Action Strategy steering committee members to develop a watershed planning workshop agenda. This workshop was offered as part of the U.S. Coral Reef Task Force meeting held in Kona, Hawaii, August 2008. The workshop agenda highlighted environmental conditions on the Big Island and focused specifically on the Waiulaula watershed where the SWCD currently is working on a watershed plan under contract with DOH. The intent was to expose workshop participants to Hawaii issues associated with watershed planning and management but also provide the SWCD with feedback to be used in the development of their watershed plan. The training highlighted technical issues associated with watershed characterization in Hawaii, different watershed planning tools such as the EPA watershed handbook and watershed plan builder. A group exercise allowed participants to work on problems and potential solutions for different regions of the watershed and was very well received. The SWCD also organized a field trip as part of the Coral Reef Task Force meeting which traveled from mauka to makai (mountains to sea) to expose participants to the unique environments and issues in each portion of the watershed.

Potential Effects of Roadside Dry Wells on Ground-Water Quality

The Hawaii County Department of Public Works (DPW) has initiated a project with the United States Geological Survey (USGS) to determine the effects of dry wells on ground water quality. Due to the geology Hawaii island, much of the stormwater generated here is directed into dry wells which are defined as an excavated hole in the ground that is deeper than it is wide. These dry wells have the appearance of a typical storm drain inlet but they are not connected to any surface water rather the water that is directed into these areas infiltrates through the substrate and moves through ground water to various receiving waters. These receiving waters may include drinking water sources or coastal waters with sensitive environments. Since dry wells are used to dispose of urban stormwater runoff there are concerns that they are a source of contaminants to sensitive receiving waters. The overall objective of this study is to assess the potential for DPW roadside dry wells to deliver contaminants to nearshore areas or drinking-water wells. The DPW wants to assess whether the dry wells actually pose a contamination threat before undertaking efforts to install and maintain filters in dry wells. This effort should be completed in FY2009.

Statewide

From Ridge to Reef: Forecasting the effects of changing Pacific islands on reef ecosystems

In response to concerns about the health of coral reefs and terrestrial communities, the United States Geological Survey (USGS) science is linking impacts on watersheds from invasive species, land use transformations, and climate change to declines in reef ecosystems using mapping, monitoring and models. This work requires an improved understanding of watershed processes, the

transport of sediment, and coral reef dynamics. When completed, this science will be applicable to other watersheds and could be used to couple onshore to nearshore management in the western U.S. and the developing Pacific Rim. Degraded watersheds and impaired coastal waters threaten both traditional and modern economies, and better tools are needed by stakeholders facing pressing management decisions. Mapping and other field measurements are being used to understand processes on the landscape, and models are being developed to show how changes in watersheds affect nearby coral reefs. The models will simulate erosion and route sediment from the ridge through the valley to nearshore waters, where ongoing work is measuring sedimentation rates and impacts on reef ecosystems. This will show how terrestrial sediment affects reef communities, and ultimately predict the effect of climate change and sea-level rise on watersheds and coastal ecosystems. Overall, the goal of Ridge to Reef is to provide new scientific information that watershed and coastal resource managers can use to prioritize decisions for maximum benefit.

Legacy Lands Conservation Program

The State Board of Land and Natural Resources (BLNR) has approved the award of \$4.7 million for county and nonprofit land acquisition projects to protect Hawaii's valuable resource lands through the Legacy Land Conservation Program (LLCP). The LLCP will convey funding from the State Land Conservation Fund to one county and four nonprofit organizations for acquisition and permanent protection of lands having cultural, archeological and natural resource values. The Legacy Land Conservation Commission is a nine-member commission composed of cultural, agricultural and natural resource experts and representatives from each county and advises the BLNR on this project selections. The following are summaries of the approved projects for 2008:

- Wai'anae Community Re-development Corporation (MA'O Organic Farms): \$737,300 for the acquisition of 11 acres, in Lualualei Valley, O'ahu, for the protection of its agricultural values.
- County of Hawai'i: \$1,500,000 for the acquisition of 550.871 acres in Kawa, District of Ka'u, Hawai'i Island, for the preservation of watershed, coastal, habitat, cultural, recreational, and open space values.
- Kauai Public Land Trust: \$700,000 for the acquisition of 20.532 acres fronting Kahili Beach, North Shore, Kauai, for the protection of its watershed, coastal, and habitat values.
- Maui Coastal Land Trust: \$994,724 for the acquisition of 128 acres in Nu'u Makai, southeast shore, Maui, for the protection of coastal, wetland, habitat, historical, and cultural values.
- Ke 'Aupuni Lokahi, Inc. (Moloka'i Enterprise Community): \$767,976 for the acquisition of 196.4 acres to be held by Moloka'i Land Trust, in Kawaikapu, Mana'e, Moloka'i, for the protection of watershed, cultural, and scenic values.

A special thanks for providing this information goes to: Hawaii County, Kathy Chaston, Carl Berg, 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 Maunalua, 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 addition 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, Wailoa 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 FY2008, 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 FY2009.

NPS Outreach and Education



Figure 22: NPS Outreach and Education during Earth Day at the Waikiki aquarium and Kalihia Keiki Water Festival at Kalihia Waena Elementary School.

The PRC Program conducts Nonpoint Source outreach and education throughout the year and throughout the state. Most Section 319 funded projects also conduct activities to increase awareness of the effects of polluted runoff and to teach individuals the activities they can do to help prevent nonpoint source pollution.

The PRC Program partnered with the City and County of Honolulu and the Department of Land and Natural Resources, Division of Aquatic Resources to develop an activity book for upper elementary school students to learn about polluted runoff and storm water issues. The book, Journey Home, has been distributed to over 10,000 students in six months and continues to be in demand. The Program also continues to distribute the Apoha coloring book, pencils, and Nonpoint Source brochures and posters.

In January 2008, Tetra Tech and EPA invited the PRC Program's partners in outreach and education to a meeting to assist in evaluating Hawaii's Nonpoint Source Outreach Program. Partners shared their programs goals and objectives, target audiences, messages, formats, distribution, evaluation, partners and resources. Tetra Tech used that information in addition to information gathered through their research and individual communications to develop a Summary of Nonpoint Source Outreach in Hawaii. This gave the PRC Program and our partners a picture of where we are today. The PRC Program then received an Action Plan for Improving Nonpoint Source Pollution Control Outreach Efforts in Hawaii from Tetra Tech in August 2008. This plan is intended to assist the Program in improving how we conduct outreach so that we can get to a point where our efforts entice behavior changes that positively affect water quality conditions. The Program's first step will be to develop an overall public outreach strategy to address the lack of an overall coordinated outreach framework.

Training

Grant Reporting and Tracking System Training

October 29, 2007 – November 2, 2007 in Philadelphia, attended by EHS.

Fundamentals of Management

January 31, 2008, February 19 and 21, 2008 attended by PPC.

Quality Assurance Statistics

February 11 – 14, 2008 attended by PL.

Marine Securities Training

April 15, 2008 attended by PPC and EHS.

California Nonpoint Source Conference

May 5 – 8, 2008 attended by EPA IPA.

CZM Project Design & Evaluation Workshop

May 12 – 13, 2008 attended by PPC and EPA IPA.

National Monitoring Conference

May 18 – 22, 2008 in Atlantic City, attended by EHS.

Restoration and Management of Streams Workshop

May 20 – 22, 2008 attended by EPA IPA.

How to Organize Files

August 1, 2008 attended by PL and EHS.

Sampling and Analysis Class

August 11 – 14, 2008 attended by EHS.