

Fiscal Year 2009
October 1, 2008 – September 30, 2009
Annual Report



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

Executive Summary

Popular beaches, extensive ocean recreation, coral reefs, aquatic habitats, fishing resources, and agricultural irrigation resources are all a part of our state. But how is the State addressing polluted runoff issues that affect water quality and impact related health, environmental, economic, and social concerns in Hawaii? The State Department of Health (DOH), Clean Water Branch (CWB), Polluted Runoff Control Program (PRCP) was awarded a grant from the U.S. Environmental Protection Agency (EPA), under the Clean Water Act (CWA), Section 319(h), in the amount of \$2,141,866 on October 1, 2008. Funding supports staff, watershed planning efforts, implementation and restoration projects, education and outreach activities. This report highlights the PRCP accomplishments and challenges in 2009 and provides descriptions of existing projects funded by the CWA Section 319(h) grant.

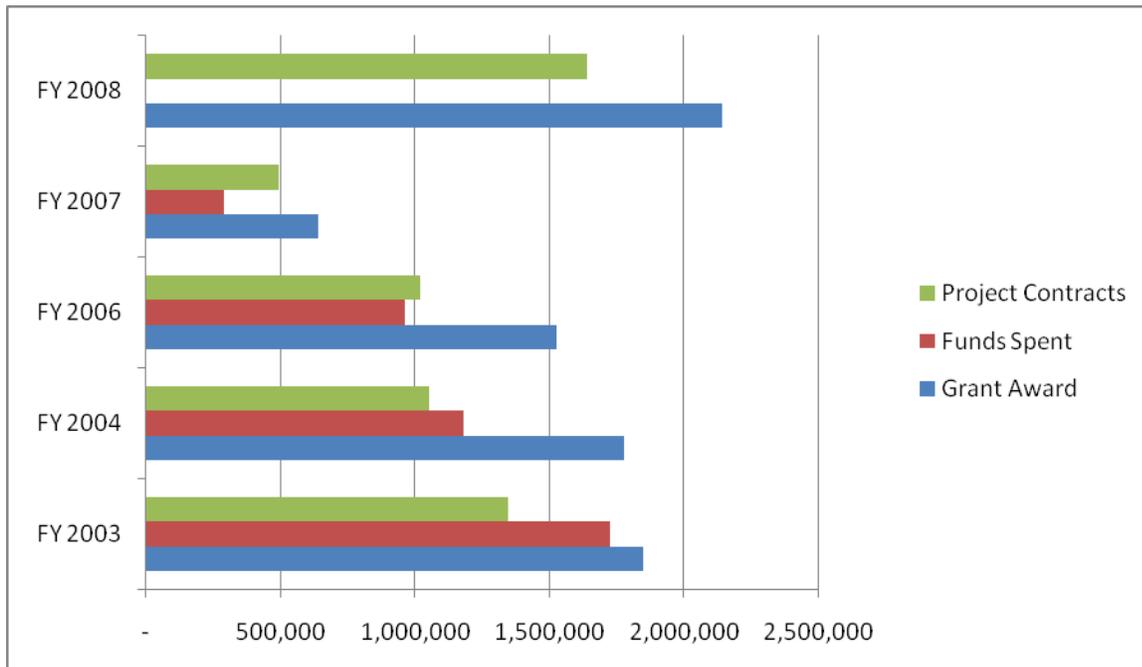


Figure 1: Grant funds awarded to the State and the amount spent to date for each Fiscal Year Grant. The State did not receive a grant award in FY 2005. A portion of the FY 2007 grant allocation was awarded to the State with the FY 2008 grant to allow the State more time to execute project contracts. Project contracts are funds allocated to State or Local agencies, and non profit or community organizations to conduct watershed planning and implementation to address polluted runoff. The majority of grant funds remaining in prior fiscal year grants are allocated to project contracts. For FY 2009 the State has received \$1,503,626 in CWA Section 319(h) funding.

Meeting the State Goal of Safe and Clean Water

In order to assist the State in meeting this goal the PRCP met the following objectives:

- PRCP effectively administered and implemented the CWA Section 319(h) program;
- PRCP developed contracts for projects focusing on Watershed Based Planning and Implementation;
- PRCP planned, participated and supported activities to control polluted runoff through private/public partnerships and various public events to address NPS pollution; and
- PRCP facilitated the development of Watershed Based Plans (WBPs) to meet FY08 Grant Guidelines and supported their implementation.

The PRCP has continued to make progress but was not able to completely meet the following objectives;

- Full approval of Hawaii's Coastal Nonpoint Pollution Control Program (CNPCP); and
- Monitor the effectiveness of 319(h) projects, implementation of BMPs, and overall program effectiveness.

Administering and Implementing the Program

In general, the State applies for and is awarded a CWA Section 319(h) grant annually. Each fiscal year grant funds five (5) State positions in the CWB, PRCP, and portions of other positions in the Environmental Management Division (EMD), Environmental Planning Office (EPO) and the Environmental Resources Office (ERO). During this fiscal year the PRCP has been fully staffed; Lawana Collier, Public Participation Coordinator; Brian Hunter, Planner; Greg Takeshima, Environmental Health Specialist; Michael Burke, Grants Management Specialist; and Madeleen Ledda, Clerk Typist. PRCP accounts for \$520,717 in State match from positions in CWB Monitoring Section and Wastewater Branch (WWB) Individual Wastewater System Engineers. The activities of these individuals assist PRCP in meeting our objectives of monitoring project effectiveness and obtaining full approval of Hawaii's CNPCP.

In addition to PRCP staff, two Intergovernmental Personnel Agreement (IPA) positions from EPA have been on detail to DOH under existing CWA Section 319(h) grants. Hudson Slay completed a four year detail in the PRCP in August 2009. During his detail he has facilitated the progress of Watershed Based Planning efforts in Hanalei, West Maui, Central Maui, Koolaupoko, Wailupe, and Waiulaula. He worked closely with the State Coastal Zone Management (CZM) Program and independent contractors to update the Coastal Zone Act Reauthorization Amendment (CZARA) Management Measures (MMs), develop a Watershed

Prioritization Process for the State, and develop a Watershed Guidance to assist groups in developing useful WBPs that can be implemented. He has also initiated a partnership between PRCP and the Safe Drinking Water Branch (SDWB), WWB, and University of Hawaii (UH) to map On-Site Disposal Systems (OSDS) and develop an inspection proposal to meet the CZARA MM. Also funded under the CWA Section 319(h) grants is an IPA position in EPO to assist with Total Maximum Daily Load (TMDL) development.

The State's FY 2001 grant expired on 12/31/08 and the Final FSR was submitted to EPA on April 8, 2009. The FY 2001 grant funded many restoration efforts, mainly on the island of Oahu. PRCP has learned since then that without an agreement with landowners to maintain the Best Management Practices (BMPs) and restoration areas of the project sites beyond the PRCP contract, it is most likely the restoration will be lost due to a lack of maintenance.

The State's FY2003 grant expired on 07/01/09 and the State has submitted the Final FSR to EPA. Thirteen (13) different projects were funded under this grant. Projects ranged from the successful start of restoration on the island of Kaho'olawe where there is so little vegetation that soil runs off mountain cliffs into the ocean with heavy rainfall. PRCP envisions strategic plantings will help increase vegetative cover over the years and reduce the amount of soil loss. On



There were some definite lessons learned with projects like the South Molokai Watershed Based Plan and the Demonstrating Watershed Participatory Assessment and Action, where PRCP and the contractor did not share a clear

*Figure 3: Photo at left of pili (*Heteropogo contours*) bales surrounding plant on Kaho'olawe taken on a site visit by Environmental Health Specialist, Greg Takeshima.*

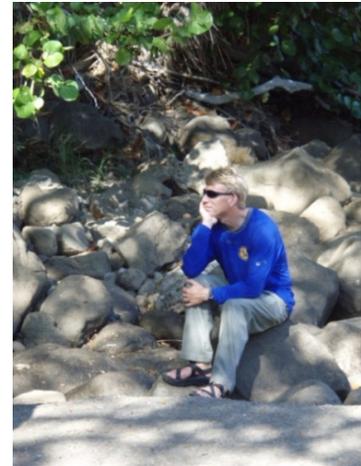


Figure 2: Photo at right of IPA Hudson Slay at the bottom of the Waiulaula Watershed listening to representatives from the Mauna Kea Soil and Water Conservation District (SWCD) and the State Department of Land and Natural Resources (DLNR) discuss polluted runoff concerns. The ability to listen to the watershed community is vital in watershed planning and implementation.

understanding of the expectations of the project. As a result PRCP incorporates more specific details as to what will be funded and what results are expected in future Request for Proposals (RFP).

The FY 2004 grant will expire September 30, 2010. Approximately \$1,000,000 from this grant was allocated to the Kahoolawe Restoration Project. \$250,000 from the grant paid for the NPS IPA position, and \$45,000 was used to extend a contract with the Hawaii Association of Conservation Districts (HACD) to plan and put on the 2006 Water Quality Conference.

The FY 2006 grant has nine (9) open project contracts and one (1) completed contract with the Ka'u SWCD to plan and conduct the 2008 Water Quality Conference. This grant will expire December 31, 2011, and all existing contracts will expire no later than March 2011. There is approximately \$23,000 in base contract funds still available to support a project that can be completed before the grant expires.

The FY 2007 grant partially funded NPS IPA position and also the TMDL IPA position. The grant supported an in-kind contract between EPA and Tetra Tech to develop and begin implementing an Action Strategy for Improving Nonpoint Source Pollution Control Outreach Efforts in Hawaii. This grant will expire December 31, 2011. Due to delays in contract execution and the lack of qualified proposals received for project funding \$676,947 from this grant was awarded under the FY 2008 grant. This will allow the State two more years, until December 31, 2013, to award and spend these funds.

The FY2008 grant was awarded on August 1, 2008 and will expire December 31, 2013. This grant also supports the IPA positions and the Tetra Tech contract. \$361,433 was contracted to HACD for the support of the Conservation Specialist (CS) Program from April 2009 – April 2011. An additional \$150,000 from the State Oil Tax fund may be added to this contract to extend the four existing CS positions beyond 2011. Due to the State Budget crisis the PRCP was not certain the Oil Tax funds would be available for these positions as they had been in the past. Seven (7) project contracts are close to being executed and

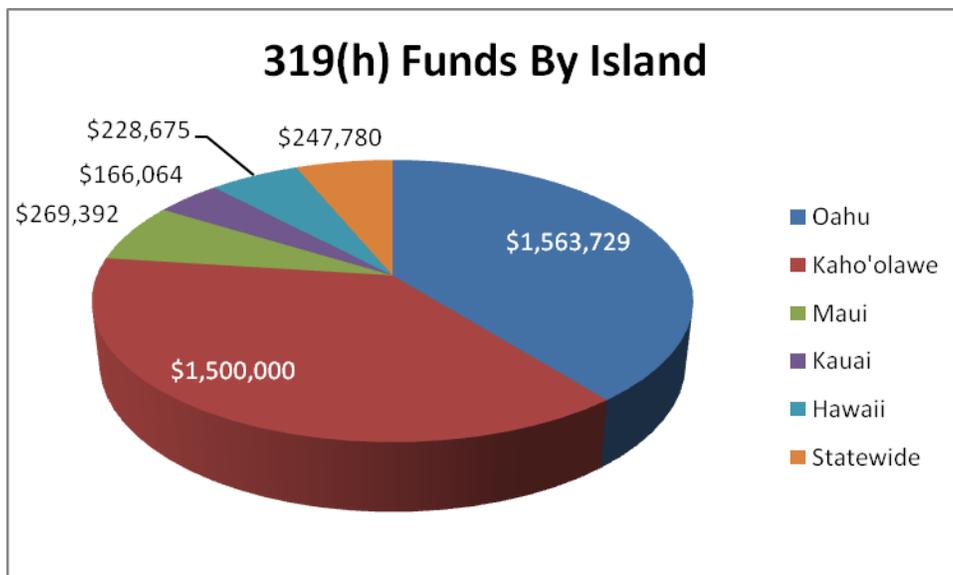
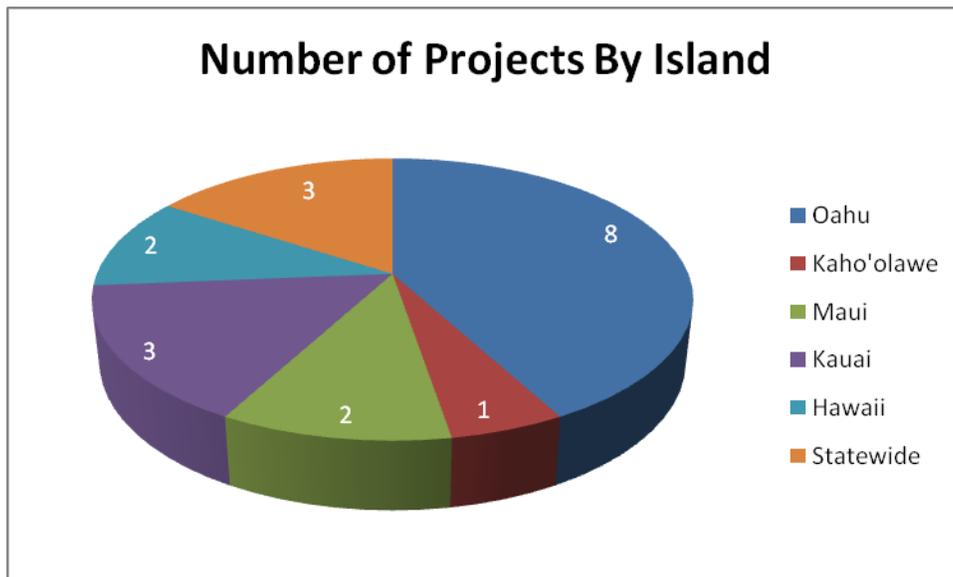


Figure 4: Waipio Valley on the Big Island of Hawaii is home to Taro farmers and pristine natural ecosystems.

will begin work within the next few months.

The State applied for a FY 2009 grant in July 2009 and has received the award in October 2009. Under the PRCP's last RFP, one (1) proposal was selected for funding. PRCP anticipates another RFP before the end of 2009.

Polluted Runoff Control Projects Supported with CWA Section 319(h) Funding Provided By the U.S. Environmental Protection Agency



The PRCP manages 19 projects funded through a series of EPA grants. The following sections will describe these projects, the contractors contact information, the projects

purpose, their expected outcomes as well as their load reductions (where reported by contractor).

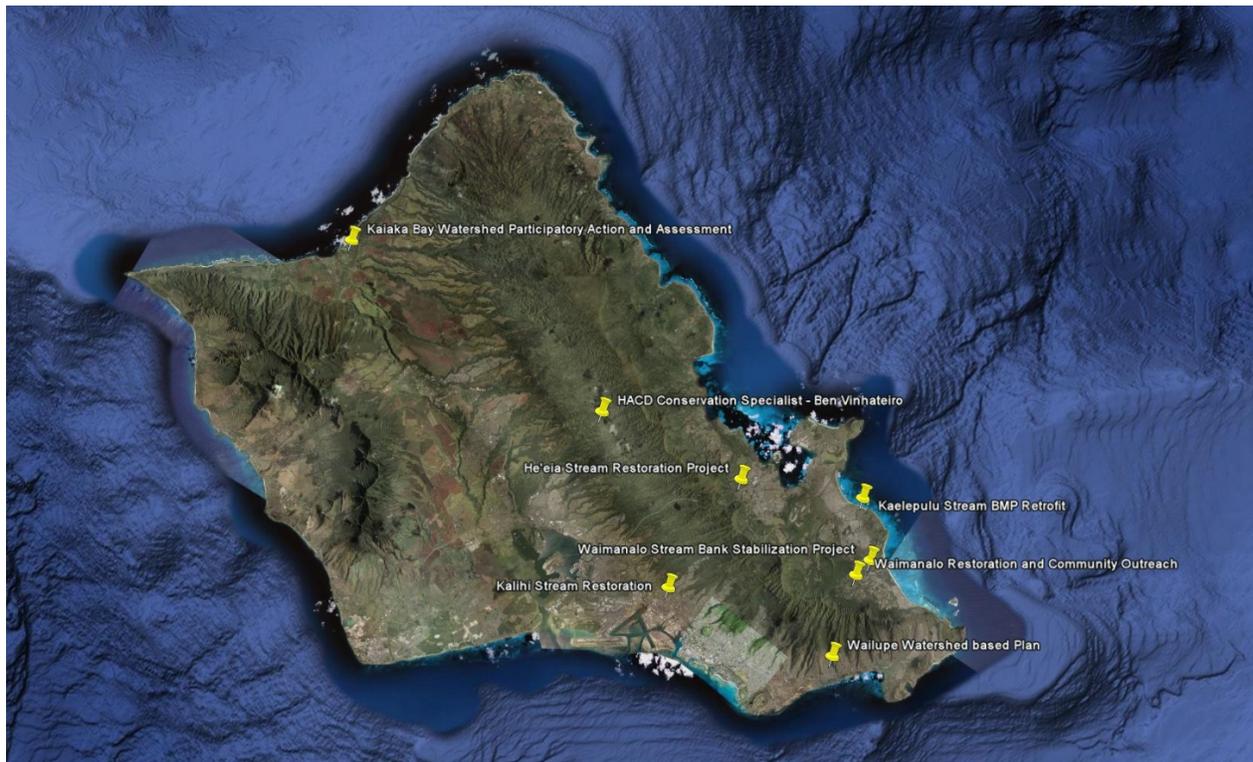


Figure 5: Aerial view of Oahu and site locations around the island.

Completed Projects on the Island of Oahu in FY09

Demonstrating Watershed Participatory Assessment and Action

Contractor: University of Hawaii at Manoa – College of Tropical Agriculture and Human Resources

Dr. Russ Yost, Lead Investigator

3190 Maile Way, Honolulu, HI 96822

(P) 808-956-7066

Website: <http://www.ctahr.hawaii.edu/ctahr2001/>

319 Funds: \$223,873

Match: \$227,530

Start/End: 12/31/2007 – 06/30/2009

Location: Waialua Watershed, O'ahu

Partners: DOH CWB, North Shore Neighborhood Board

Kaiaka Bay was listed on Hawaii's 303(d) list in 2006 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.

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 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. A draft final report has been submitted to DOH but no final report has been accepted and approved.

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. The project has been successful in creating a watershed advisory group; an offshoot of the North Shore neighborhood board.

Innovations in Stream Phytoremediation and Erosion Control of Degraded Stream Banks

Contractor: Sustainable Resources Group International Inc.

Andy Hood, Lead Investigator

111 Hekili St., Suite A373, Kailua, HI 96734

(P) 808-356-0552

Website: <http://www.srgii.com>

319 Funds: \$299,781

Match: \$300,007

Start/End: 6/27/2006 – 6/27/2009

Location: Waimanalo Watershed, O'ahu

Partners: DOH CWB, C&C of Honolulu, Department of Land and Natural Resources (DLNR)
Land Board, UH – CTAHR, Hui Ku Maoli Ola

Waimanalo stream was placed on the 303(d) list in 2004 for nutrients, turbidity, and TSS. It is also considered a priority watershed for the DOH and the EPA. The TMDL for Waimanalo Stream states 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 and streamside plantings. 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 2007 the contractors had selected Makaloa (*Cyperus laevigatus*), Ahu’awa (*Cyperus javanicus*), Kiolohia (*Cyperus polystachyos*) and Uki (*Cladium jamaicense*).

During the project period SRGII found out that their restoration site had been sprayed with herbicides by DLNR maintenance crews. SRGII decided to continue the project by re-planting the coir logs with plants which were steeply discounted in price by Hui Ku Maoli Ola, a local nursery. The PRCP met with SRGII to discuss potential steps to take in response to DLNR’s actions. After much discussion, limited recourse and conflicts of interest, SRGII chose not to pursue the issue with DLNR. At a professional site visit, ideas were discussed to bring out maintenance crews and educate them to better identify native plants and restoration sites.

Currently DOH is awaiting the draft Final report from SRGII to determine load reductions from plantings and erosion control measures.

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 6: Kahawai stream, on the left, before restoration began. Note the herbicided grass along the bank of the stream, due to the Department of Land and Natural Resources stream maintenance crew. Waimanalo stream, on the right, before restoration began. Note the deep cuts in the stream bank. Photo taken May 14, 2007.



Figure 7: Kahawai Stream approximately two weeks after plantings occurred. The day and evening before we visited the site there was a small rainfall event showing the resiliency of the plants to survive a medium flow conditions. Note the coir logs planted with the grasses as well as some of the grasses planted in the toe of the stream to stabilize the toe of the bank. Photo taken June 12, 2008.

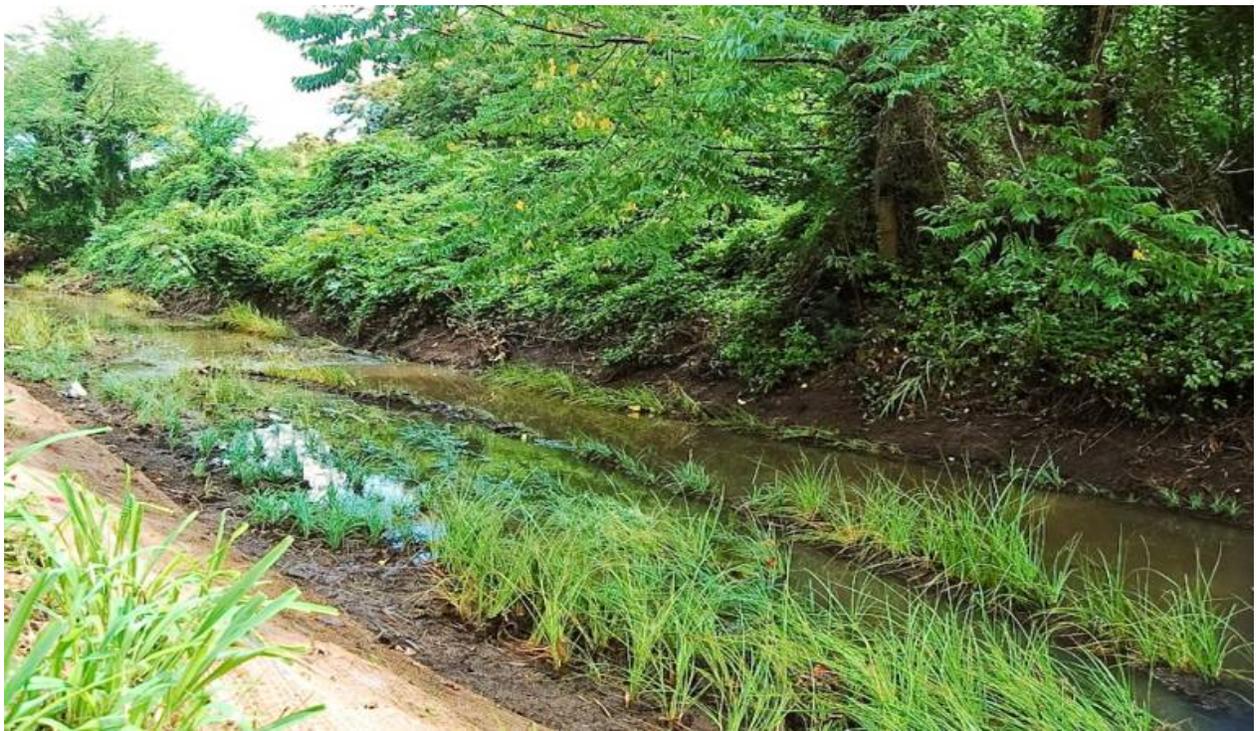


Figure 8: Kahawai Stream above and Waimanalo Stream below two weeks after planting and initial installation of coir logs. Photos taken approximately two weeks after installation. Photo taken June 12, 2008.



Figure 9: Pictures of Kahawai Stream on September 18, 2008 showing damage to the native plants from the Department of Land and Natural Resources streamside maintenance.



Figure 10: Kahawai Stream as of August 13, 2009. Note that many of the original shrubs survived after the second planting and the placement of signs marking the restoration area.



Figure 11: Farther upstream of the Kahawai Stream restoration. None of the Waimanalo Stream coir logs or native shrubs survived the herbicide. Photo taken on August 13, 2009.

Ongoing Projects on the Island of Oahu in FY09

Waimanalo Stream Restoration and Community Outreach Project

Contractor: Oahu Resource Conservation and Development Council

Jean Brokish, Watershed Coordinator

99-193 Aiea Heights Drive, Suite 111, Aiea, HI 96701

(P) 808-483-8600 ext. 112

<http://www.oahurcd.org>

319 Funds: \$400,000

Match: \$416,298

Start/End: 1/15/2009 – 3/15/2011

Location: Waimanalo Watershed, O’ahu

Partners: DOH-CWB, Hui O Ko’olaupoko, US Dept. of Agriculture – Natural Resources Conservation Service, AECOM, Hawaii Association of Conservation Districts, Windward O’ahu Soil and Water Conservation District

Waimanalo is listed as a priority watershed for the Department of Health. Implementation of a watershed based plan (Ko’olaupoko Watershed Restoration and Action Strategy) will begin with this project. Agricultural BMPs will be installed for several farmers within the riparian areas of the stream interested in addressing polluted runoff issues. 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.

Currently the project is in the beginning phases of characterizing the Waimanalo agricultural project area with chemical and physical monitoring. There are several parties in the watershed who have expressed interest in the project and program. The project has also received media coverage for an agricultural/professionals field day at Frankie’s Nursery.

Expected Environmental Results: The BMPs at the 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



Figure 12: Waimanalo sub-watershed as seen from the Ko'olau Mountain Range



Figure 13: A section of Waimanalo Stream showing stream bank erosion, and stream bed hardening.



Figure 14: Chad Kacir describes cover cropping and engineered swales that have been incorporated at Frankie's Nursurey at left. Frank Sekiya (center) describes his farm and the assistance provided by the NRCS throughout his farm. Photos taken on September 17, 2009.



Figure 15: Cover crops (perennial peanut) keeps soil on the property and also stabilizes the hillside of Frankie's Nursery.

[Ka'elepulu Stream On-site Stormwater Retrofit](#)

Contractor: Hui O Ko'olaupoko

Todd Cullison, Director

629-A Kailua Rd., Suite 3, Kailua, HI 96734

(P) 808-277-5611

www.huihawaii.org

319 Funds: \$83,040

Match: \$84,775

Start/End: 6/9/2009 - 6/9/2011

Location: Ka'elepulu Watershed, O'ahu

Partners: DOH-CWB, Hui Ku Maoli Ola, City and County of Honolulu Hughes and Hughes Landscaping Co., Mid Pacific Country Club

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 city and county of Honolulu owned parking lot.

The Contractor will develop and implement a landscaping plan with Hughes and Hughes, and Hui Ku Maoli Ola. 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, potentially harmful liquids and metals from leaking vehicles may be absorbed and diluted by the implemented BMPs. The buffer will also increase filtration 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,



Figure 16: A silt plume is clearly visible during a rain-storm at the storm water retro-fit site. Photo taken on November 22, 2008



Figure 17: More silt and sediment coming off of a small crack in the barrier in the parking lot for Buzz's Steak house and Kailua Beach Park. Photo taken on November 22, 2008

and an operations and maintenance plan.

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

Wailupe Watershed Based Plan

Contractor: Community Links/Malama Maunalua

Tia Blankenfeld / Alyssa Miller

1003 Bishop St. #2605, Honolulu, HI 96813

(P) 808-777-1481

www.communitylinkshawaii.org, www.malamamaunalua.org

319 Funds: \$60,000

Match: \$61,840

Start/End: 5/15/2009 – 11/15/2010

Location: Wailupe Watershed, O'ahu

Partners: DOH-CWB, City and County of Honolulu, Sustainable Resources Group International Inc. (SRGII), United States Geological Survey, United States Army Corps of Engineers, Department of Land and Natural Resources

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, a watershed based plan that includes EPA's 9 Key elements must be developed and implemented. The watershed based plan will include BMP implementation in priority areas to decrease potential loading into Maunalua Bay.

The contractor received their Notice to Proceed (NTP) on May 15, 2009. Community Links and Malama Maunalua have decided to sub-contract the development of the plan to SRGII. Currently SRGII is compiling data on the Wailupe area for use as background information on Wailupe.

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.



Figure 18: Wailupe stream during Tropical Depression Felicia. Photo taken on August 12, 2009.

He'eia Stream Riparian and Water Quality Improvements

Contractor: Hui O Ko'olaupoko

Todd Cullison, Director

629 A Kailua Rd. Suite #3, Kailua, HI 96734

(P) 808-277-5611

www.huihawaii.org

319 Funds: \$193,180

Match: \$221,964

Start/End: 6/29/2009 – 6/29/2012

Location: He'eia Watershed, O'ahu

Partners: DOH-CWB, Hui Ku Maoli Ola, Hawaii Pacific University

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.

The project has received their NTP on June 29, 2009. There has been little work done thus far due to the recent NTP.

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.



Figure 19: Greg Takeshima at left taking pictures of He'eia Stream during a site visit. Michael Burke, Brian Hunter and Lawana Collier of the PRCP at right, Todd Cullison, director of Hui O Ko'olaupoko, center left, and Audrey Shileikis, at left of US EPA Region 9 during a site visit at He'eia Stream.

Kalihi Ahupua'a Community Service Project

Contractor: Kalihi Ahupua'a Ulu Pono Ahahui

Barbara Natale, Director

PO Box 17673, Honolulu, HI 96817

(P) 808-282-9449

www.kaupa4kalihi.org

319 Funds: \$228,856

Match: \$228,860

Start/End: 12/1/2006 - 12/31/2009

Location: Kalihi watershed, O'ahu

Partners: DOH-CWB, Kalihi Waena Elementary School, Farrington High School, City and County of Honolulu, Department of Land and Natural Resources - Division of Aquatic Resources (DAR)

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 and trash removed: >2 tons

Green waste removed: >500 lbs and >30 bundles

Metal removed: 800 lbs, including plumbing, fence posts, rebar and batteries

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

Sighted two native O'opu (Naniha and Akupa) indicator species during several biological stream assessments using the DAR Stream Bio-assessment protocol.

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 20: Kalihi Stream during a site visit, November 15, 2007, before most of the BMP's were installed



Figure 21: Kalihi Stream site after majority of BMP's have been installed, October 23, 2008. Note the pervious walkways and native vegetation.



Figure 22: BMP installation site in December 23, 2008



Figure 23: Finished porous walkway and native erosion control plantings are beginning to stabilize the stream bank, taken on May 5, 2009.



Figure 24: Aerial view of Kauai showing locations of PRCP projects.

Ongoing Projects on the Island of Kaua'i in FY09

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

Contractor: Hanalei Watershed Hui

Matt Rosener, Hydrologist

PO Box 1285, Hanalei, HI 96714

(P) 808-826-1985

www.hanaleiwatershedhui.org

319 Funds: \$24,455

Match: \$21,35

Start/End: 2/9/2009 – 5/9/2010

Location: Hanalei Watershed, Kaua'i

Partners: DOH – CWB, Hanalei Taro Farmers Association, Army Corps of Engineers, University of Hawaii at Hilo, Stanford University

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.

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.

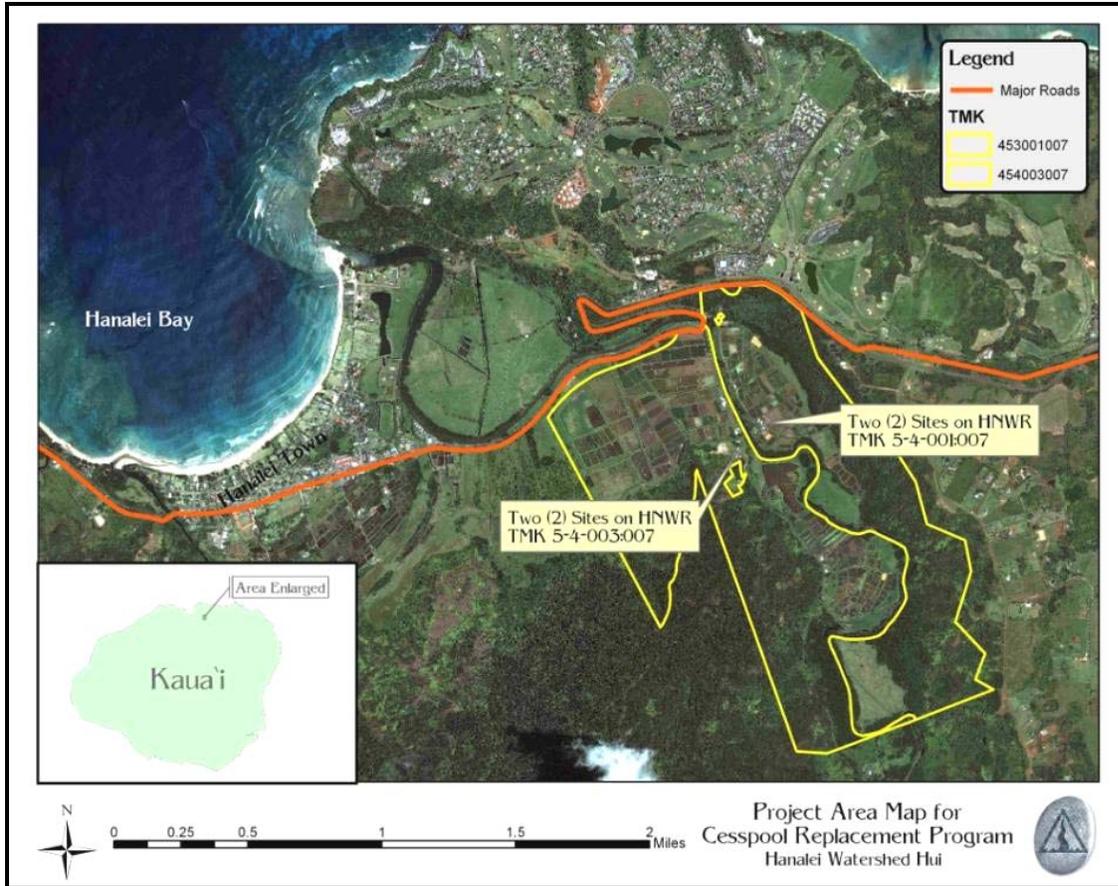


Figure 25: Aerial view of the cesspool to septic tank replacement locations near Hanalei Stream.

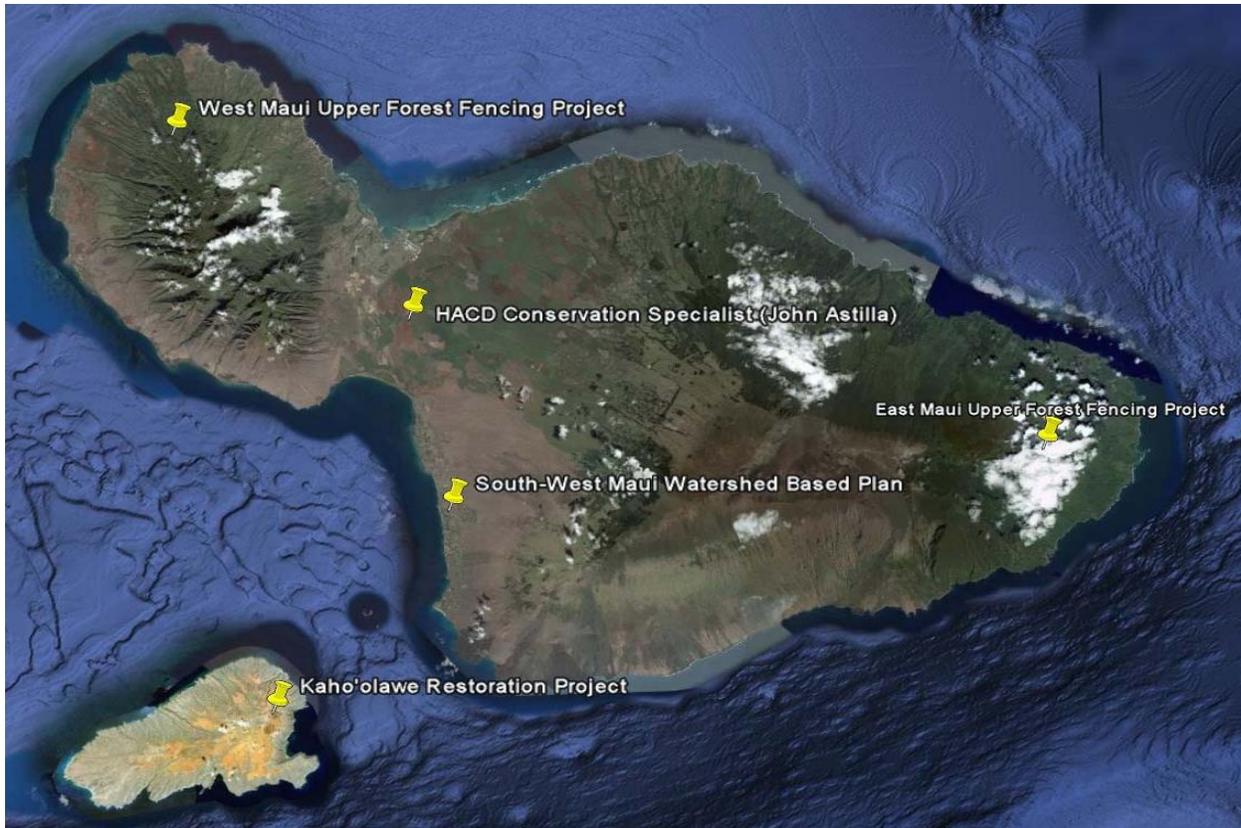


Figure 26: Aerial view of Maui showing location of PRCP projects. Also note the location of the Kaho'olawe Restoration project.

Pending Projects on the Islands of Maui and Kaho'olawe in FY09

Hawaii Association of Watershed Partnerships Watershed Monitoring Plan and Fence Installation

Contractor: Hawaii Association of Watershed Partnerships

Christine Ogura, Coordinator

1151 Punchbowl St. Room 325, Honolulu, HI 96813

(P) 808-388-9699

www.hawp.org

319 Funds: \$250,000

Match: \$255,452

Start/End: 40 Months

Location: Hana Forest Reserve and Honolua Watershed, Maui

Partners: DOH-CWB, East Maui and West Maui Mountains Watershed Partnerships, DLNR, Fish and Wildlife Service, National Park Service, US EPA, USGS.

The Hawaii Association of Watershed Partnerships is creating a comprehensive monitoring plan that will be available for other non-point source pollution control projects throughout the state. The contractors will put together chemical, physical and hypothetical (pollution load models) monitoring practices useful for the state of Hawaii to follow and characterize watershed work and NPS pollution implementation. As an implementation piece of the project the HAWP East Maui and West Maui Mountain Watershed Partnerships will install sections of fence and begin feral ungulate removal in those fenced off areas. Using specific methods from their monitoring plan the Watershed partnerships on Maui will begin to assess the efficiency of their fencing projects.

Expected Environmental Results: Reduction of feral ungulates (wild pigs, *Sus Scrofa*) leading to a reduction of erosion, Local monitoring guidelines suited for Hawaii climate and watersheds, two fences erected in Honolua and Hana upper forest areas.

Major Products: Watershed Monitoring Plan, construction of fence 1000 meters in East Maui and 1.2 miles in the upper Honolua Watershed to reduce destruction of pristine upland forest areas

Milestones: Completion of the Watershed Monitoring Plan, development of separate East and West Maui Monitoring Implementation Plan for evaluating fencing effectiveness, East and West Maui fencing installation

Southwest Maui Watershed Based Plan

Contractor: Central Maui Soil and Water Conservation District

Robin Knox, Lead Investigator

77 Hookele Street, Suite 202, Kahului, Maui, Hawaii 96732

(P) 808-244-3100 Ext. 101

www.hacdohawaii.org

319 Funds: \$194,392

Match: \$194,392

Start/End: 24 Months

Location: Mo'oloa, Hapapa, and Wailea watersheds, Maui

Partners: DOH – CWB, Hawaii Association of Conservation Districts, County of Maui, US Environmental Protection Agency, Natural Resource Conservation Service

The Central Maui Soil and Water Conservation District 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. The development of a watershed based plan will also allow for greater use of 319 funds in the area the plan encompasses.

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

Ongoing Projects on the Islands of Maui and Kaho'olawe in FY09

Kaho'olawe Restoration Project

Contractor: Kaho'olawe Island Reserve Commission (KIRC)

Lyman Abbott, Natural Reserve Specialist

811 Kolu Street, Suite 201, Wailuku, HI 96793

(P) 808-243-5023

www.kahoolawe.hawaii.gov

319 Funds: \$1,500,000

Match: \$1,500,000

Start/End: 8/29/2005 – 8/29/2010

Location: Hakioawa and Kaulana Watersheds,

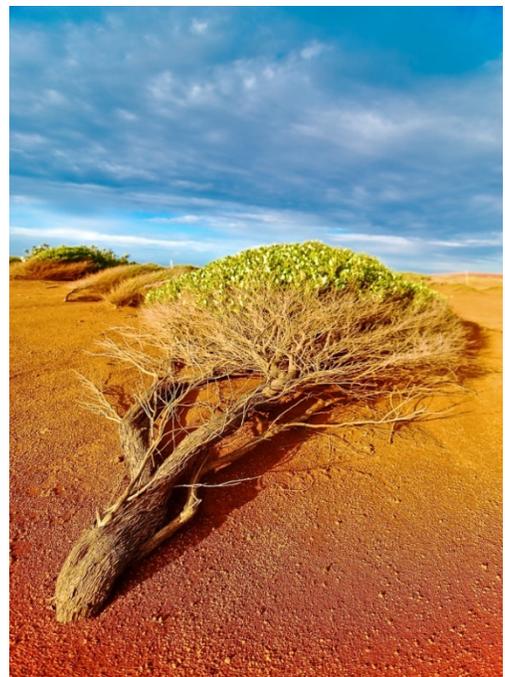


Figure 27: This photo shows several A'ali'i shrubs and the effects of the tradewinds. Much of the island is dry hardpan and makes it difficult for the shrubs to root.

Kaho'olawe

Partners: DOH-CWB, US Geological Survey, US Environmental Protection Agency, Department of Land and Natural Resources, County of Maui, Protect Kaho'olawe Ohana, Office of Hawaiian Affairs, University of Hawaii



Figure 28: Volunteers digging holes for plants along an irrigation line.

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 (goats). 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. This year, through monitoring, many of the plantings were surveyed and determined to have increased in size and maturity.

Environmental Results: Through erosion pin monitoring soil movement has been quantified. From initial plantings in 2006 until May, 2009 in Hakioawa an average of 1.12 mm of accretion occurred while 5.68 mm of soil was eroded in unplanted areas. In Kaulana an average of 0.21 mm of erosion occurred in planted areas while in unplanted areas an average of 4.5 mm of erosion occurred. The growth of plantings on the island have shown an increase in size and therefore have increased soil stability due to the plants taking root. Decreased soil erosion and nutrient input are expected due to plantings near the head-waters of Hakioawa and Kaulana.

Major Products (Deliverables): USGS Stream gage data, plant growth data, erosion pin data, EPA 319 Success Story

Milestones: The project is currently in phase III of the projects and monitoring and plantings will continue in areas of high mortality.



Figure 29: The general landscape of the island of Kaho'olawe is mostly bare soil. These patches of vegetation have been planted nearly 15 years ago and have survived the harsh climate of Kaho'olawe.



Figure 30: The contractor uses Pili grass (Heteropogo contours) hay bales for two reasons. In some areas the bales are used to decrease sediment transportation in gullies. In areas of high wind the bales are used to block the shrubs from windburn and assist the shrubs with growth.



Figure 31: Aerial view of the Big Island of Hawaii and locations of current projects.

Completed Projects on the Island of Hawaii in FY09

Waikoloa-Waiulaula Watershed Based Plan

Contractor: Mauna Kea Soil and Water Conservation District

Carolyn Stewart, Lead Investigator

PO Box 750, Kamuela, HI, 96744

(P): 808-885-6460

www.maunakeaswcd.org

319 Funds: \$150,000

Start/End: 06/23/2005 – 06/22/2009

Location: Waiulaula Watershed, Hawaii

Partners: DOH-CWB, DLNR, USGS, Board of Water Supply, HACD, NRCS

The contractor completed 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 were 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.



Figure 32: Headwaters of the Waiulaula Stream on the Kohala Mountain.

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.



Figure 33: Looking towards the Kohala mountain from near the end of the Waikoloa-Waiulaula Watershed near sea-level. The watershed landscapes range from rain-forest to pasture land, suburban and desert.

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

Ongoing Projects throughout the state of Hawaii in FY09

HACD Conservation Specialists

Contractor: Hawaii Association of Conservation Districts

Michelle Watson, Executive Director

99-193 Aiea Heights Drive, Suite 110

Aiea, Hawaii 96701

www.hacdhawaii.org

319 Funds: \$416,554

Start/End: 4/17/2009 – 4/17/2011

Location: Maui, Kaua'i, Hawai'i and O'ahu

Partners: DOH-CWB, NRCS, University of Hawaii, Oahu Resource Conservation and Development Council, City and County of Honolulu, County of Maui, County of Kauai, County of Hawaii, Hanalei Watershed Hui

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 four conservation Specialists cover four of the major islands including: Maui (John Astilla), Oahu (Ben Vinhateiro), and Kauai (Sara Bowen). All positions are currently filled except for a recent opening in September 2009 for the Hawaii island Conservation Specialist. The conservation specialists' grant has been extended for two years 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 help improve 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 workload and accomplishments at annual HACD Conference, and quarterly as well as annual reports to DOH.



Figure 34: John Pipan at left at one of the auto-samplers during a site visit. John Astilla in the photo in the right, presenting at the Hawaii Association of Conservation Districts Annual Meeting.



Figure 35: Ben Vinhateiro in the photo on the left, introducing himself at the HACD annual conference in Ka'u on the island of Hawaii. Sara Bowen going over her year at the Kauai Soil and Water Conservation District, for the attendees at the HACD annual conference.

Hawaii Youth Conservation Corps

Contractor: Pono Pacific

John Leong, Coordinator

3569 Harding Avenue, Unit A, Honolulu, HI 96816

(P) 808-735-1221

www.hawaiiycc.com

319 Funds: \$201,000

Match: \$201,240

Start/End: 6/9/2009 – 6/9/2011

Locations: O'ahu, Maui, Kauai, Hawaii, Kaho'olawe, Molokai

Partners: DOH-CWB, NRCS, Kaho'olawe Island Reserve Commission, DLNR, Kamehameha Schools, US Fish and Wildlife Services, Americorps

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.

Expected Environmental Results: Results will be difficult to assess due to a "weak" monitoring plan and multiple project assistance for short periods of time. No data was reported to the DOH CWB in any of the projects that the participants volunteered at thus far. On a positive note, the pre- and post- tests of the students showed a marked improvement over the course of the project.

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

Hawaii Watershed Experience: A Hands-on Elementary Education Program

Contractor: Healthy Hawaii Coalition

Ali Riggs, Coordinator

PO Box 75505 Kapolei, HI, 96707

(P) 808-778-4243

www.healthyhawaiicoalition.com

319 Funds: \$21,780

Project Duration: 24 Months

Locations: Oahu, Maui, Kauai, Hawaii, Molokai

Partners: DOH-CWB, Department of Education, City and County of Honolulu, County of Maui, County of Kauai, County of Hawaii

The Hawaii Watershed Experience: A Hands-on Elementary Education Program brings the concepts of their watershed/ahupua'a to elementary schools around the state. The Healthy Hawaii Coalition deals 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 9 of the states priority watersheds. The Contractor aims to increase general and base knowledge of watersheds as well as 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.

Hawaii Livestock Guidelines Update

Contractor: West Maui Soil and Water Conservation District

Buddy Nobriga, Chairman

PO Box 2993, Wailuku, HI 96793

(P) 808-244-7951

www.hacdhawaii.org

319 Funds: \$25,000

Match: \$25,000

Start/End: 5/1/2008 – 5/1/2010

Locations: Statewide

Partners: DOH-CWB, DOH-WWB, City and County of Honolulu, NRCS, Department of Agriculture, HACD

In partnership with the Department of Health, Waste Water Branch, the West Maui SWCD is leading the update to local livestock maintenance and guidelines. The guidelines are being developed to address waste management, potential BMP's and targeted education and outreach to livestock operators.

Expected Environmental Results: Revisions to the Hawaii Livestock Guidelines will inform Hawaii's livestock producers to the most recent pollution control measures. The brochures will inform and educate these producers to become better equipped and educated regarding livestock waste and ways to properly deal with it.

Major Products: Leaflets will be produced and distributed to livestock owners; a revised Livestock Guideline will be produced for more detailed information regarding livestock waste management

Milestones: Final Livestock Waste Management Guidelines, Technical Advisory Group meetings

Hawaii's Coastal Nonpoint Pollution Control Program (CNPCP)

Seventy (70) Coastal Nonpoint Pollution Control Program (CNPCP) elements were submitted 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-approved elements. Hawaii has worked toward meeting those conditions and gaining full approval for the past eleven years. "Interim decision documents" used by the federal agencies when specific conditions are met, have been received for several elements. The management measures remaining include urban watershed protection, existing development, protection of wetlands and riparian areas, streambank and shoreline erosion, physical and chemical characteristics of surface waters, instream and riparian habitat restoration, critical coastal areas, monitoring, roads highways and bridges, and onsite disposal systems.

A "Strategy for Addressing Remaining Management measures for Hawaii's Coastal Nonpoint Pollution Control Program" was developed in 2007 by CZM and DOH. The Strategy was submitted to EPA and NOAA as the State's approach for gaining approval of most of the remaining CNPCP management measures as well as to overall CZARA Program approval. In FY2009 the State placed a considerable amount of effort toward the implementation of activities outlined in the strategy.

A major component of the Strategy is the development of a watershed guidance package. This will provide direction for watershed planning efforts to State, local, and nongovernmental entities that will include the CNPCP management measures and associated management practices as an implementation menu for watershed plans.

The efforts of the DOH and CZM to develop the watershed guidance are also occurring in the context of implementation of the State's Ocean Resources Management Plan (ORMP). The usage of the ORMP as a forum for watershed guidance will allow DOH and CZM to gain multiple agency (State and County) attention to polluted runoff issues. The ORMP provides access to interagency assistance in developing the watershed guidance to insure that it meets appropriate needs (e.g., agencies, counties, watershed organizations). This also allows for information about the development and implementation of watershed plans and the coastal nonpoint program to be shared with State agencies and the counties. As of September 2009, the ORMP watershed caucus has been discussing meeting with a range of watershed management agencies and organizations to improve coordination. There is ongoing discussion about how the meetings ought to be organized, who should be involved, and what the objectives should be, among others.

DOH has contracted and recently completed an update of the Management Measures. Included in this document is a statement of each management measure, its status with NOAA/EPA, applicability to include summary of any differences between the State of Hawaii Management Measure and the Federal guidance specifying management measures for sources of nonpoint pollution in Coastal Waters, responsible agencies, implementation tools, and a reporting tool. This document will be part of the Watershed Guidance Package.

Based upon the updated Management Measures document the State believes that the Management Measure for Planning, Siting, and Developing Roads and Highways, and the Management Measure for Bridges may be approved. DOH continues to work on Roads, Highways, and Bridges maintenance and operation as well as Management measures for Roads, Highways, and Bridges Runoff systems. The expansion of the approved Hawaii Department of Transportation (DOT) Oahu programs to all islands is the preferred approach, as we continue our ongoing strategy, to revisit all necessary partners with a more direct, yet still collaborative, process identifying the necessity of cooperation toward the management measures certification. To date, convincing the Counties to initiate new programs to address Operation and Maintenance has proven challenging and time consuming with little reportable results. The Watershed Guidance may be the appropriate implementation tool, along with the use of DOT Oahu programs, for considering operation, maintenance, and runoff systems.

As part of the State's Strategy, a Watershed Summit was held on June 8, 2009. The purpose of the Watershed Summit was to gather State and federal agencies currently engaged in some form of watershed planning, management, restoration, and/or protection efforts and gather feedback as the development of the Watershed Guidance is initiated. We sought input on the watershed planning guidance, determine areas of common or overlapping interest and needs with regard to watershed planning, determine how to better coordinate efforts, identify how the CNPCP can complement and benefit existing watershed efforts, and brainstorm incentives for collaboration. The majority sentiment indicated that an all agency review and comment on the watershed prioritization process, which is intended for use in targeting Section 319 funding for development of new watershed plans, is required. The Hawaii Watershed Prioritization Process Report identifies priority targeted watersheds for new plans and implementation and describes the process and criteria used to identify priority watersheds. The State of Hawaii Office of Planning continues to refine and update the process as new information and data become available. The Coastal Zone Management Program has posted the watershed prioritization process report on its website and invited comments and suggestions for refinement. Significant progress will require meaningful engagement of all potential partners in setting priorities, developing plans, and implementation.

DOH suggested to CZM that the final Hawaii Watershed Prioritization Process report delivered by their consultant be distributed for review and comment by, at a minimum, the

agencies represented at the watershed summit. Based upon this review, DOH and CZM would make a determination if the prioritization process is generally acceptable as a starting point for prioritizing watersheds for plan development. In August 2009, CZM placed on their website a summary report of the proceedings of the watershed summit and the watershed prioritization process report and appendix requesting comment.

As of September 2009, work in this area from the Office of Planning has not advanced given the absence of the CNPCP coordinator for medical reasons. To further complicate CZM's ability to continue timely process of the program in the future, due to the Governor's response to the State's fiscal situation, the CZM program manager position has been eliminated effective end of October 2009. In addition to continued or future ORMP efforts, DOH is continuing to work towards the previous stated paradigm suggested by the ORMP watershed caucus, without benefit of CZM input, as part of a potential joint sponsorship focused West Maui Watershed Reconnaissance Study with Army Corps of Engineers, NOAA, EPA, and the Department of Land and Natural Resources (including DOFAW, DAR, and CWRM), as well as the West Maui Mountains Watershed Partnership.

In FY 2006, an OSDS strategy was developed to highlight the direction of State efforts and activities to address the OSDS management measures and 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.

A contract with the University of Hawaii (UH), Water Resources Research Center included the use and refinement of the GIS wastewater inventory information mapped in FY2008 for Oahu. This includes sewer parcels, those utilizing DOH-permitted Individual Wastewater Systems, and cesspools. UH is developing risk-based analysis of OSDS (Oahu only) and inspection protocols. Expected outcomes include draft reports by end of October 2009 on: 1) Identification of geographic areas where OSDS have higher likelihood of impacting coastal water quality; and 2) Identify inspection protocols for different OSDS used in Hawaii. Depending on 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 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.

Hawaii's Monitoring Strategy

What's in that water?

“Good water quality monitoring informs and supports good water quality management.

The Water Quality Monitoring Strategy is designed to facilitate the identification and implementation of projects that provide representative data used for the evaluation, restoration and protection of the quality of Hawaii's waters and their designated uses under the law.

The primary purpose of the “Water Quality Monitoring Strategy” developed and maintained by the Hawaii Department of Health, Environmental Health Administration (EHA) is to provide the answers to five basic questions concerning the water resources of the State:

1. What is the overall quality of waters in the State?
2. To what extent is water quality changing over time?
3. What are the problem areas and the areas needing protection?
4. What level of protection is needed?
5. How effective are the established clean water programs?”

(A Comprehensive Water Quality Monitoring Strategy for the State of Hawaii, Version 1.1.1, 7-24-2009)

The PRCP's role in the Hawaii Water Quality Monitoring Strategy is ensuring some form of monitoring is being done to determine the effects and outcomes of the practices funded under the 319 grant. State-wide the PRCP has 8 projects which are specifically monitoring water quality on 4 islands (Maui, Oahu, Kauai, and Hawaii). The projects monitor for specific pollutants in regards to their own particular projects and are not necessarily the same throughout. All projects are required in the contracts to provide the state with Monitoring plans as well as Quality Assurance/Quality Control Plans to ensure the data the projects are getting is “good, usable” data.

Data and other project information are updated regularly by the PRCP to the EPA's Grant Reporting and Tracking System (GRTS). This system is a data warehouse for the EPA's 319(h) grant where each individual state inputs data (water quality, project location, contact information, etc.) obtained by contractors. GRTS is able to provide users with a quick way to create reports from the data which has been inputted into the system. GRTS is a public system and any user may sign on as a guest, although only authorized users may input data into the database.

<http://iaspub.epa.gov/pls/grts/f?p=110:1>

Hawaii's Outreach and Education

Getting information on nonpoint source pollution into the hands of the general public is easy. Getting people to change their behaviors after learning about their role in polluted runoff is not as easy. PRCP distributes books, brochures, posters, pictures, pencils and other educational materials to schools, residents, partners and the general public. It's easy to track how many children were at our presentations, how many students picked up a brochure or book to take home and how many families visited our booth to take a picture with Apoha the O'opu. But PRCP has struggled to measure the effectiveness of our outreach. Are more people picking up their trash at the beach so it doesn't end up in the ocean? Are farmers using more cover crops to prevent soil from being displaced during heavy rains? Are residents picking up after their pets? Are we changing people's behaviors to prevent polluted runoff and improve water quality?



Figure 37: Education and outreach has been socially rewarding for the PRCP but it is difficult at best to describe the effect of the outreach on water quality.

Under a contract with EPA, Tetra Tech helped PRCP develop an Outreach Strategy. The Strategy will guide PRCP's education and outreach efforts to hopefully become more effective in both changing people's behaviors and measuring that change. One of the



Figure 38: Apoha the O'opu is the PRCP's mascot and attends all of the PRCP's education and outreach events.

activities in the Strategy was to host a Getting in Step Workshop for our partners. The workshop was well attended and feedback from participants was positive. Many found the "Getting in Step: A Guide for Conducting Watershed Outreach Campaigns" to be very useful. More of our partners are looking at how we can evaluate our collaborative efforts before and after so we make the best use of our resources.

Another activity in the Strategy was to update the Polluted Runoff Webpage. Adding both general information and information specific to funding, agriculture and on site disposal systems gives the public access to a lot more information. Another activity Tetra Tech assisted the State with was the development of new posters and placing the posters on the City buses. The posters provide a quick action item for the general public. Additional posters were printed and will be distributed to schools and public buildings for additional visibility.



Figure 39: TheBus advertisement produced by Tetra Tech, EPA and the PRCP.