



## Introduction

A watershed is a mauka to makai land division, similar to an ahupua'a, in which all surface and ground water in the region flows into a common body of water such as a stream or the ocean. Ko'olaupoko ("short Ko'olau") is bordered on the west by the entire ridge of the Ko'olau Mountain range and extends from Makapu'u to Kualoa. Ko'olaupoko covers 43,598 acres and includes 20 sub-watersheds that drain into Waimanalo, Kailua and Kāne'ohe Bay.

In 2007, Hui o Ko'olaupoko (HOK) was established as a permanent 501(c) 3 non-profit entity, serving as the successor organization of the Kailua Bay Advisory Council (KBAC) – the organization previously tasked with fulfilling a 1995 Consent Decree from the litigation over the Aikahi Waste Water Treatment Plant. KBAC was responsible for developing (1) a volunteer water quality monitoring program; (2) a technical/scientific program; and (3) an implementation plan for on the ground restoration. KBAC established HOK to carry out the responsibilities of the Consent Decree and HOK's first task was to research and develop the Ko'olaupoko Watershed Restoration Action Strategy (WRAS). The WRAS provides direction for watershed management in Ko'olaupoko – from Makau'u to Kualoa. The WRAS addresses all of the U.S. Environmental Protection Agency (EPA) nine elements of watershed plans and the plan was approved by the EPA in 2007.

Since these beginnings, HOK has been working to achieve the goals outlined in the WRAS by implementing restoration and low impact design projects that ultimately aim at protecting water quality. The projects that HOK pursues are first vetted and prioritized to ensure the greatest positive impact on water quality and ocean health. Many of HOK's project involved partnerships with local stakeholders including interested citizens, non-governmental organizations, government, educational institutions and businesses. Each of HOK's projects applies sound ecological principles, community input, and cultural heritage. HOK projects including ecosystem restoration, low-impact development and low-impact retrofits (LID/LIR), community outreach and education.

Through successful projects and community collaboration, HOK has become one of the leading community-based non-profit watershed management groups in Hawai'i and continues to be highly sought after for projects within Ko'olaupoko watersheds, as well as other watersheds across the State.

## Experience and Professional Qualifications

HOK's approach and experience in community-based watershed management extends from concept to completion. This includes project prioritization, stakeholder identification, community engagement, construction management and project effectiveness monitoring. Our watershed management services generally involved partnerships with various stakeholders including interested citizens, non-governmental organizations, government, educational institutions and businesses. Whether it is technical consultation, training and/or on-the-ground project implementation, each of our projects incorporates sound ecological principles, community input and cultural heritage. HOK watershed management services include:

- Watershed planning / watershed management plan development
- Project feasibility studies / implementation plans / project design
- Ecosystem restoration / riparian restoration
- Low impact development / low impact retrofit
- Storm water management / storm water BMPs
- Green infrastructure design and construction management



## **HOK Staff**

HOK has three full-time staff, one part-time staff and various interns working to support our projects. Staff is located in Hawai'i and work out of HOK's office in Enchanted Lakes. HOK's staff is varied in their backgrounds and experience and when combine together, are able to offer a complete array of watershed management services for our project partners and clients. Below are short descriptions for each of HOK's staff and more information on specific experience is provided in Attachment 1 - Resumes.

**Todd Cullison, Executive Director** – Mr. Cullison has been the Executive Director of HOK since August 2006. Prior to joining HOK, Mr. Cullison was the Director of Watershed Programs at the Columbia River Estuary Study Taskforce in Astoria, Oregon. In this position, Mr. Cullison designed and managed large-scale watershed restoration, monitoring and education projects. The primary focus was watershed function and restoration of habitat for threatened and endangered fish. Projects included tidal estuarine wetland restoration, riparian and stream habitat restoration, effectiveness monitoring of restoration projects and watershed education to K-12 and community audiences. Additionally, Mr. Cullison also facilitated over 300 community meetings dealing with natural resource issues.

In his current position as Executive Director, Mr. Cullison is responsible for managing all HOK projects. He also oversees donor relations, fundraising, staffing, grants/contract administration, business development and project design. Additionally, he is responsible for the technical and fiscal management of each project; works to secure necessary subcontractors and teaming partners; ensures successful project outcomes; and works to achieve consistent monitoring and maintenance for each project. Mr. Cullison is also experienced with the state and federal regulatory process for restoration and water quality projects and is able to effectively navigate through the regulatory process to accomplish intended project goals.

**Kristen Mailheau, Community Coordinator** – Mr. Mailheau was been working with HOK since October 2008 and engages the community and stakeholders in volunteer activities and educational events, as well as manage HOK's restoration activities. Prior to this position, Ms. Mailheau worked for three years with the U.S. Army Garrison, Environmental Office, Natural Resource Section as a field technician and horticultural assistant. She also worked on natural resource management and conservation projects with environmental organizations on Kaua'i and Maui prior to her full time employment with HOK. Ms. Mailheau holds a B.A. in Environmental Studies from the University of Hawai'i and has taken Hawaiian language classes at Windward Community College.

Ms. Mailheau actively engages the community in watershed work by incorporating educational and hands-on volunteer experiences into each of HOK's projects. Ms. Mailheau manages HOK's on-line presence, including the website, social media sites, third party volunteer databases and conservation oriented websites. She coordinates with interested volunteers to set up group and individual volunteer work days at each of HOK's project sites and leads the volunteers during the work days. Ms. Mailheau is a Hawaiian native plant expert and highly experience with ecosystem restoration and storm water management. Her on-the-ground restoration field work as well as her wealth of knowledge has been critical to the success of HOK's projects and the educational opportunities she has provided to our thousands of volunteers has been invaluable to the community.

**Annie Lovell, Project Coordinator** – Ms. Lovell began working with HOK is October 2013 as a project coordinator focusing on education and outreach for storm water best management practices. Ms. Lovell has a B.A in Environmental Studies and Psychology and prior to joining HOK, Ms. Lovell worked for



five years as an environmental scientist with an engineering/consulting firm, focusing on water and natural resources projects in the Pacific.

Currently, Mr. Lovell works on HOK's Rain Garden Co-op Program, which involves recruiting interested homeowners to join the program; coordinating the design/build process; and follow up monitoring/maintenance for each rain garden project. Additionally, Ms. Lovell is developing a community-based social marketing campaign to address residential storm water runoff, specifically targeting residential fertilizer use. In addition to these education and outreach programs, Ms. Lovell also assists with HOK's watershed projects as well as website and social media management, marketing, grant writing and fundraising.

**Lehua Slater, Grants Administrator/Accountant** – Ms. Slater has been working with HOK since March 2013, managing HOK's grants and finances. Ms. Slater received a B.A. in Botany in 2008, with a focus on environmental conservation and ethnobotany studies with a second B.A. in Accounting. She has over 10 years of experience working with non-profits and small business operations and enjoys professionally and personally supporting the work of community, grassroots environmental organizations.

Each year, HOK also has the help of various interns working on existing or new project initiatives. In the past, HOK has benefited from internship assistance from University of Hawai'i, Hawai'i Pacific University, Windward Community College and University of Hawai'i students as well as interns from various mainland universities. HOK works with students and advising university faculty members to develop a worthwhile experience in which the student supports HOK's initiatives while also connecting their work to their undergraduate/graduate studies and career goals.

## Project Management

### Project Management Structure

HOK is governed by the Board of Directors, composed of the following members:

Name	Position	Professional Affiliation
Jeffery Harris	President	Hawai'i Pacific University
Mark Heckman	VP	Education Coordinator, Hawai'i Institute of Marine Biology
Dr. Andrew Brittain PhD	Secretary/Treasurer	Faculty Teaching Fellow, Associate Professor of Microbiology, Hawai'i Pacific University
Jillian Yasutake	Board member	State of Hawai'i, Workforce Development Council

In addition to the direction provided by the Board of Directors, HOK's Executive Director, Todd Cullison oversees all HOK projects as well as grant and contract administration.

### Project Assignment

HOK's Executive Director provides overall management for HOK programs and projects, with significant support from HOK staff to carry out project tasks. Once a project is identified and the contract is secured, project responsibilities and tasks are outlined and assigned to specific team members (both HOK staff and subcontractors or teaming partners) based on skill set and availability. Generally, specific tasks are



delegated by the Executive Director to HOK's Project Coordinator and/or HOK's Community Coordinator, with overall management provided by the Executive Director. HOK's team is structured to provide clients and project partners with a clear chain of command by first identifying a lead for the project to act as a single point of contact for project communications.

### **Project Execution (work flow and responsibilities)**

Throughout the duration of a project, the most critical component for success is communication within HOK and with the client or funder. As a small organization, HOK is extremely effective at coordinating and communicating among staff. HOK conducts weekly project status meetings to discuss staff schedule, outline project needs and identify upcoming action items. Our project management approach is based on consistent application of the following principles:

- Early assignment of responsibilities in which each member of the project team clearly understands their role in the project and what they will be responsible for delivering.
- Clearly outlining project objectives, which involves communicating cost, schedule and quality objectives from the beginning of the project.
- Continuity of personnel is highly important for ensuring information and knowledge is retained and maintained throughout the duration of the project
- Timely identification of problems and solutions is critical to the long term success of a project in that problems are identified and addressed **before** they become major issues with significant repercussions.

### **Quality Control**

Quality work products are of extremely high priority to the HOK team and our staff strives to achieve quality outcomes for all of our projects. In order to ensure quality work products, HOK's initial project screening process works on identifying which projects have the greatest potential to protect water quality and ocean health, and also determine which projects have the highest probability for success in both the present and the future.

For some projects, HOK develops a Quality Assurance Project Plan (QAPP), which is then approved by the regulating agency, such as the Hawai'i Department of Health, as was the case for HOK's Rain Garden Co-op Program. In general, most of HOK's projects have some sort of work plan or planning document to outline the work flow and responsibilities. However, many of our grant projects do not require detailed planning documents and therefore, HOK implements our own checks and balances to ensure quality, efficiency and effectiveness in each of our projects.

When projects have been selected and funding has been secured, throughout project development and implementation, HOK's primary means of building quality into every step of the process is through regular reviews of work products. For all project work products, HOK staff ensures that documents, design plans, and final deliverables are double checked within the organization or by an outside engineering, landscape architect or technical consultant. These checks and balances ensure that quality products are produced for our clients and funders.



One example of our quality control process as it relates to our field activities is demonstrated through the process of conducting field work, data entry, data analysis and monitoring. Prior to conducting field work, HOK's Executive Director ensures that field staff has reviewed project planning documents and design plans prior to conducting field work. Verbal and electronic communication of expectations is also used regularly within HOK, due to our small staff size. Once staff is out in the field, sampling sheets are completed on-site at the time sampling occurs. HOK utilizes an iPad for collecting data in the field in an effort to save paper and time. Duplicate paper sheets are available for all monitoring activities should the iPad fail. Data from the iPad is next exported into an electronic spreadsheet and stored on the office hard drive. Hard copies of the spreadsheets are photo copied and entered into electronic spreadsheets by HOK staff. Electronic copies of all documents are backed up on external hard drives and a remote cloud based file storage database.

Proof of our quality control is in our work products, which we believe speaks for themselves. The best way to determine HOK's level of quality in our work products is to visit a project site(s), attend one of our training sessions, and/or volunteer at one of our community work days to gain an understanding of the quality projects we put forth into the community.

### **Past Performance**

HOK watershed management efforts focuses primarily in the Ko'olaupoko region watersheds but can extend to other watersheds and project sites across the State of Hawai'i.

HOK's staff is highly experienced and knowledgeable of both Federal (EPA) and State (HDOH) watershed planning and water quality goals and requirements. HOK's staff is also extremely knowledgeable of Hawai'i specific ecosystems and natural resources, thus ensuring that projects are designed specifically for Hawai'i's unique environment. HOK takes into account specific design elements regarding soils, plants and climate, as well as acknowledging Hawai'i's unique political, social and cultural elements that are necessary to incorporate into the development of projects in Hawai'i. Please see Attachment 2 - Project Examples for summaries and highlights of many of our recent projects.

### **Capacity**

HOK is not a traditional A/E firm, but is instead a non-profit that is able to accomplish the work of a large A/E firm at a fraction of the price. HOK has completed a number of projects involving construction, including our large scale storm water retro-fit projects and rain gardens. Due to the nature of watershed management work, our projects also including planning, design, education and outreach components that do not count toward the overall construction costs of a projects. The following tables identify some of HOK's project costs by category and by project:



### Class of Work and Project Type Specialization

Type of Project	Total Number of Projects Completed	Total Project Cost (including construction)
Watershed Restoration	5	\$1,250,000.00
Commercial Storm Water Management	4	\$611,000.00
Residential Storm Water Management	1	\$107,000.00
Watershed Planning	3	\$275,000.00
Water Quality Monitoring	1	\$40,000.00
Watershed Education and Outreach	2	\$80,000.00

### Present/Completed Projects

Project Name	Total Project Cost (including construction)
He'eia Stream Restoration	\$747,500
Hakipu'u Stream Restoration	\$75,000
Kaha Community Gardens	\$200,000
Popoi'a Street Storm Water Retro-fit	\$60,000
Windward Community College Low Impact Retro-fit	\$75,000
Waikiki Aquarium Rain Garden	\$15,000
Residential Rain Garden Co-op	\$107,000
Urban Sub-Basin Action Plan	\$30,000
Ko'olaupoko Watershed Restoration Action Strategy	\$200,000

### Grant Funding and Fundraising

As a community supported non-profit, tax-deductible donations allow HOK to provide environmental education and perform necessary long-term maintenance of our project sites, ensuring the perpetuation of these projects and continued protection of water resources into the future.

HOK also provides services on a cost recovery basis. Fee-for-service projects may involve technical consultation, watershed restoration planning and design, capacity building and trainings throughout O'ahu and the State of Hawai'i.



## **Volunteers**

HOK relies heavily on in-kind volunteer hours to support our project work. Since 2009, 10,000 volunteers have contributed over 25,000 hours of community service to HOK projects. Volunteers provide the man power to accomplish our lofty project goals and help to maintain our continuously growing number of projects sites. Through volunteer engagement and activism, these volunteer events provide invaluable opportunities for HOK to educate community members about watershed management and water quality issues in Hawai'i, as well as provide volunteers an opportunity to give back to their community and do their part in protecting the island's natural resources.

## **Partnerships**

Every project involves a significant community component from seeking project input, design alternatives or involvement in long-term maintenance. Therefore, in addition to HOK's staff and immediate resources, HOK frequently partners with other community organizations to broaden our reach and enhance project capacity. In many cases, HOK is the technical lead for the project and manages both grant administration and project implementation. Past and current partners have included Hui Ku Maoli Ola, Papahana Kuaola, Paepai o He'eia, Kako'o Oiwi, and Hawai'i Pacific University, just to name a few.

**Attachment 1: Resumes**



*hui o ko'olaupoko*

# Todd Cullison

## Executive Director

### Education

B.A. English with emphasis on technical writing / Minor in Business (2000)

1-year course work completed towards Masters Degree in Community Based Restoration

### Experience

Years with HOK: 8

Total Years: 16

### HOK Projects

- ✓ He'eia Stream Restoration
- ✓ Hakipu'u Stream Restoration
- ✓ Kaha Garden
- ✓ Popoi'a Street Storm Water Retro-fit
- ✓ Windward Community College Low Impact Retro-fit
- ✓ Residential Rain Garden Co-op Program
- ✓ He'eia Rain Garden
- ✓ Hawaii Pacific University Rain Garden
- ✓ Waikiki Aquarium Rain Garden



### Hui o Ko'olaupoko

Executive Director *Kailua, HI* (2006 - Present)

- Responsible for implementation and administration of 501 (c) (3) non-profit vision and strategies
- Provide overall project management for HOK projects including budget tracking, government liaison and technical review
- Manage staff (4 FTE)
- Creation of Strategic Business Plan with 5-year budget forecast
- Secured and administered 2.5 million dollars in grant funds
- P.I./project manager on multiple federally funded restoration grants
- Prioritize, plan and coordinate watershed restoration and monitoring efforts
- Communication, administration and interaction with Board of Directors
- P.I. water quality investigations on a fee-for service basis
- Developed fee-for-service structure
- Lead author, watershed planning documents
- Provided rain garden training to community groups, O'ahu, Maui

### Kailua Bay Advisory Council

Watershed Restoration Action Strategy Coordinator *Kailua, HI* (2006)

- P. I/author for a Watershed Restoration Action Strategy focused on Ko'olaupoko, accepted by Hawaii Department of Health and EPA
- Supervise staff including project manager and GIS researchers
- Create opportunities and partnerships for on-the-ground watershed restoration, monitoring and education

### Columbia River Estuary Study Task Force

Director of Watershed Programs, *Astoria, OR* (2001 - 2006)

- Created and managed 501(c) 3 non-profit organization (North Coast Watershed Association)
- Coordinated watershed restoration and monitoring for 4 community-based watershed councils
- Secured over 1.3-million dollars in grant funds for restoration, monitoring and planning
- Generated and tracked project budgets for watershed restoration and monitoring
- Provide on-site construction management for fresh water and estuarine restoration projects
- Conducted education and outreach to state and local elected officials and municipalities
- Facilitated 300+ community meeting
- Recruited, trained and organized volunteers for restoration projects
- Liaison with federal, state and local permitting agencies

### Center for Environmental Education

Project Coordinator, *Pullman, WA* (2000)

### Groundworks Institute

Environmental Education Coordinator, *Pullman, WA* (1998 - 2000)



*hui o ko'olaupoko*

# Kristen Nalani Mailheau

## Community Coordinator

### Education

B.A. Environmental Studies – focus on Hawaiian Resource Management and Conservation (2005)

### Registrations/Certifications

Pesticide Applicator Certification (expired)

### Experience

Years with HOK: 5

Total Years: 9

### HOK Projects

- ✓ He'eia Stream Restoration
- ✓ Hakipu'u Stream Restoration
- ✓ Kaha Garden
- ✓ Waihe'e Fish Passage
- ✓ Popoi'a Street Storm Water Retro-fit
- ✓ Windward Community College Low Impact Retro-fit
- ✓ Residential Rain Garden Co-op Program
- ✓ He'eia Rain Garden
- ✓ Hawaii Pacific University Rain Garden
- ✓ Waikiki Aquarium Rain Garden



### Hui o Ko'olaupoko

Community Coordinator *Kailua, HI* (2008 - Present)

- Coordinating community outreach efforts including monthly volunteer activities, workshops, community events, presentations and other watershed projects
- Assist with preparation of grants and grant budgets for education, outreach, restoration and/or scientific monitoring
- Report and meet regularly with Executive Director and Board of Directors to review work in progress
- Maintain and update HOK's website and social media accounts
- Develop and distribute a monthly newsletter
- Recruit, train and oversee interns

### U.S. Army Garrison, Environmental Office, Natural Resources Section

Natural Resources Technician II *O'ahu, HI* (2006 - 2008)

- Implement natural resource management in the field including rare species monitoring of plants and animals, threat control (weeds and ungulates), hiking up to 10 miles per day, carrying a backpack with up to 35 pounds of weight, and camping in remote areas and rugged terrain for up to four (4) days at a time.
- Office work including recording, reviewing and analyzing data using database programs and GIS, maintaining field gear, scheduling, planning, logistics and documentation of day to day field work.
- Four months of intensive greenhouse work including propagating and transplanting rare native plants, disease and pest control.

### University of Hawai'i, Manoa, Department of Oceanography

Laboratory Technician, *Honolulu, HI* (2001 - 2005)

- Operate the Scanning Electron Microscope, assist with graduate student research and laboratory maintenance, help prepare for and attend research cruises.
- Attended a two week research cruise off coast of Seattle to observe underwater eruptions along the Juan De Fuca Ridge and sample seawater for methane.
- Assist with graduate student research and laboratory maintenance, sterilize and prepare filters for air sampling, maintain sampling site at Bellows Air Force Base, transport samples to laboratory, and prepare them for analysis.
- I was also in charge of maintaining the program while my supervisors were away on research cruises of durations of up to six weeks.

### Kokee Resource Conservation Program

Summer Intern, *Kokee, HI* (2005)

- Weed control using Escort, Garlon and AquaMaster, delineating and following field transects, teaching, training and supervising volunteers, conducting threat control around rare plant species, working with a GPS trail maintenance, and occasional work in the native plant nursery.
- Developed and conducted an herbicide trial on *Hedychium gardnerianum*, scheduled and coordinated field work, recorded and analyzed field data, presented findings in a final report to supervisor
- Assisted in writing the Cultural Impacts Assessment section of an Environmental Assessment for Koke'e and Waimea State Parks



*hui o ko'olaupoko*

# Annie Lovell

## Project Coordinator

### Education

B.A. Environmental Studies and Psychology (2008)

### Experience

Years with HOK: <1

Total Years: 5

### HOK Projects

- ✓ He'eia Stream Restoration
- ✓ Hakipu'u Stream Restoration
- ✓ Kaha Garden
- ✓ Popoi'a Street Storm Water Retro-fit
- ✓ Windward Community College Low Impact Retro-fit
- ✓ Residential Rain Garden Co-op Program
- ✓ He'eia Rain Garden
- ✓ Hawaii Pacific University Rain Garden
- ✓ Waikiki Aquarium Rain Garden



### Hui o Ko'olaupoko

Project Coordinator *Kailua, HI* (2013 - Present)

- Coordinating community outreach program to address residential water pollution within the He'eia community
- Researching and applying new and innovative community-based social marketing techniques within the program
- Conducting a literature review and data gathering for understanding non-point source pollution and its effects within the He'eia watershed
- Assisting with marketing, site assessment, project planning and installation for the Residential Rain Garden Co-Op program
- Rain garden monitoring and reporting
- Collaborating with HOK staff on grant writing and fundraising efforts
- Contributing to website content, social media and other public relations material

### EA Engineering, Science, and Technology, Inc.

Environmental Scientist and Business Development Coordinator / Proposal Manager *Honolulu, HI* (2009 - Present)

- Environmental scientist and task manager for water/wastewater, environmental planning/ natural resources protection, environmental compliance and remediation projects
- Wrote technical reports, work plans and other project planning documents
- Collected and analyze water quality sampling and monitoring data for various water and wastewater projects
- Developed and adhere to project budgets and schedules for multiple proposals and projects concurrently
- Managed and have written proposals for over \$40M in contracts for environmental consulting services for Federal, state and private clients
- Developed press releases, project summaries, award write ups, client appraisal forms, informational brochures and various marketing material
- Attended outreach events and professional association meetings

### Surfrider Foundation

Vice Chair (2012 - 2013) Member since 2010 *Oahu, HI* (2010 – Present)

- Support legislative initiatives, monthly beach clean ups and community outreach events to promote clean water, healthy oceans and beach access
- Interact with community members and educate volunteers about basic concepts in storm water management, water quality and natural resource protection
- Collaborate with local for-profit, non-profit and government entities to help SF O'ahu Chapter grow an "Ocean Friendly Garden" program
- Promote education and community outreach for the Ocean Friendly Garden program
- Co-presented "Ocean Friendly Gardens" talk and field trip at the SF Hawai'i Chapters Conference
- Leverage support for statewide storm water management and green infrastructure legislation

## Attachment 2: Project Examples

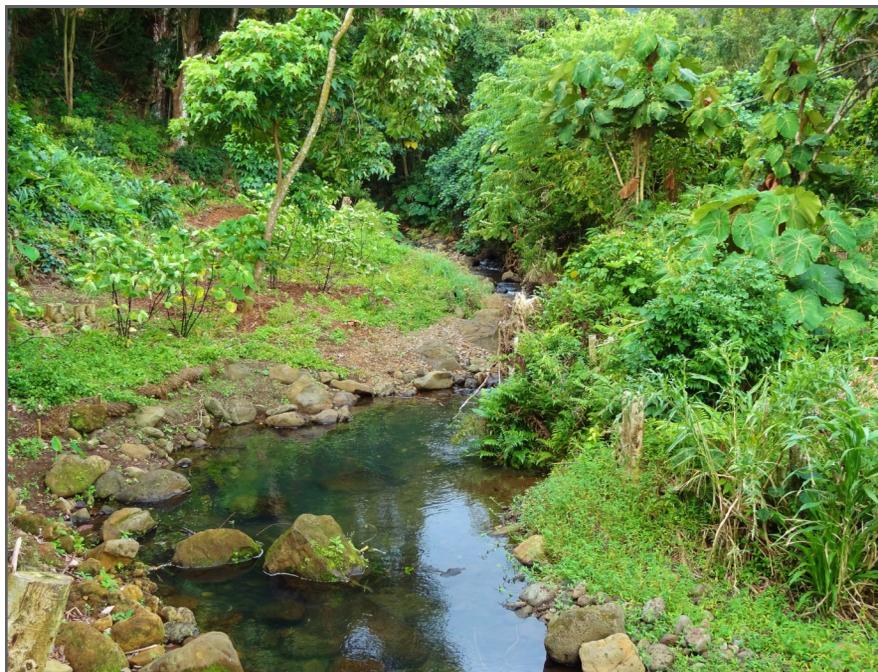
# Ecosystem Restoration

Hui o Ko'olaupoko works with various landowners and agencies to restore the land back to a native ecosystem, to the extent possible. Projects involve fencing, removal of invasive species and replanting with native plants.



## He'eia Stream Riparian Restoration -

Over 4,000 feet of riparian habitat has been restored with native vegetation and erosion controls to address invasive species, eroding stream banks and degraded water quality of upper He'eia Stream. Our project partners and thousands of community volunteers have dedicated their time to restore and maintain this beautiful and special project site.



**Waihe'e Fish Passage -** Involved modification of antiquated stream gauging station to allow for upstream migration of native aquatic species and exclusion of non-native aquatic species. (above)

**Hakipu'u Stream Riparian Restoration -** Work on this 1.8 acre site began in summer 2012 and involves the removal of invasive species and reforestation of native plant species along multiple head-water springs and 7,000 feet of riparian habitat. (left)

# He'eia Stream Restoration

This project involves the restoration of native vegetation along ~ 4,000 feet of riparian habitat in He'eia Stream. The project site was dominated by non-native vegetation and showing signs of stream bank erosion. Re-planting with native vegetation provides habitat for native wildlife, such as birds, slows erosion and provides cultural resources to local communities. Additionally, erosion control techniques have been used at the site to address eroding stream banks. Students from Hawai'i Pacific University conduct effectiveness monitoring of plant survival, erosion rates and water quality.

Project outcomes have included:

- ✓ **4,000 linear feet of stream bank restored with over 18,000 native plants**
- ✓ **600 linear feet of soft bio-engineering structures installed for erosion control**
- ✓ **Over 5,000 volunteers dedicating over 15,000 hours planting native vegetation**
- ✓ **Increased understanding of riparian restoration effectiveness in Hawai'i**

Project partners include Kamehameha Schools, Hui Ku Maoli Ola, Hawai'i Pacific University, community members and volunteers. Project funding provided by the U.S. Environmental Protection Agency and the State of Hawai'i Department of Health.



# Hakipu'u Stream Restoration

Since 2012, Hui o Ko'olaupoko has been working to restore 700 feet of riparian habitat on 1.8 acres of land surrounding the head-water spring area of upper Hakipu'u Stream.

Invasive plant species were removed and the area is being reforested with native vegetation. Native plants help to reduce the amount of sediment entering into Hakipu'u Stream and ultimately Kāne'ohe Bay. Additionally, enclosure fencing was installed to protect against domestic cattle and wild pigs destroying the native vegetation or eroding the stream banks. Project outcomes include:

- ✓ Restored 700 feet of stream
- ✓ Over 2,500 volunteers and 42,00 volunteer hours
- ✓ 7,000 native plants

Project partners and funders include National Oceanic and Atmospheric Administration, Hawai'i Community Foundation, Harold K.L. Castle Foundation, Kualoa Ranch, U.S. Fish and Wildlife Service, Fish Habitat Partnership.



# Kaha Garden



**Kaha Garden was developed in 2007 as a living example of how individual homeowners can help improve the local environment through the use of native vegetation and xeriscape gardens.**

The project replaced grass and invasive species along 150 yards of stream bank with native Hawaiian plants which can be used for soil stabilization, biofiltration and water conservation. All plant species in the garden can be found naturally in dry coastal areas throughout the Hawaiian Islands and can thrive with only water provided by rain events and occasional summer watering.

Many park users enjoy the renewed garden setting and visitors are able to walk along the pathways to see how plants may appear in their own yard. The project also included the installation of interpretive signs and the development of a website ([www.kahagardens.com](http://www.kahagardens.com)) designed by local elementary school students to further explain the benefits of native plant landscaping. Project funding provided by Hawai'i Department of Health, Clean Water Branch.

All garden maintenance and plant propagation is done solely by volunteers during various community workdays throughout the year.

**Project location within Kawainui Neighborhood Park at 750 Kaha Street in Kailua.**

# Waihe'e Fish Passage



**The objective of this project was to modify the historic stream gauging station to allow upstream migration of native aquatic species in a way that exclude non-native aquatic species as well as repair failing aspects of the structure.**

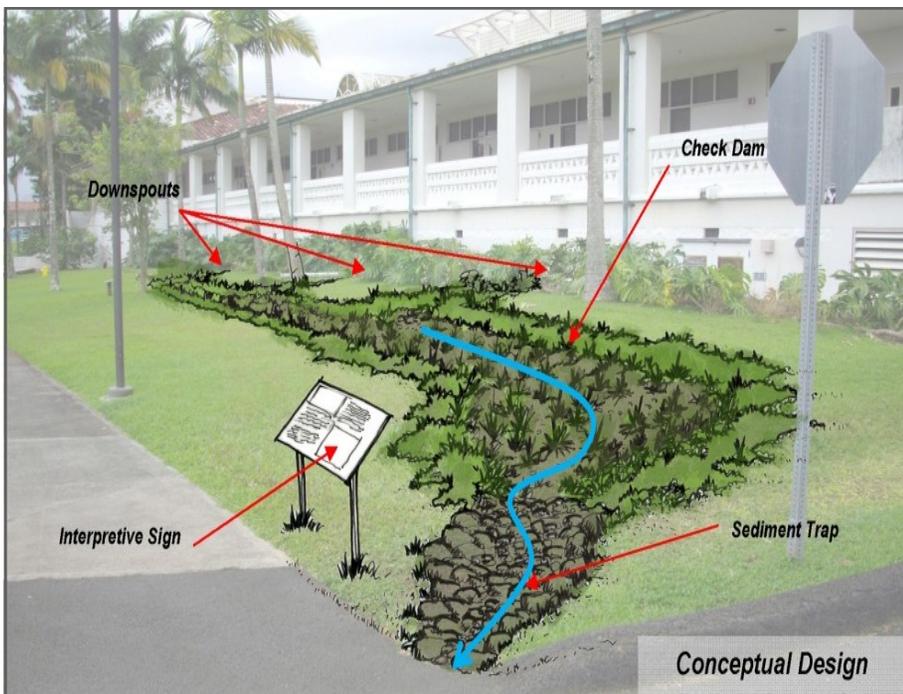
Waihe'e Stream, located in windward O'ahu, is a perennial stream that originates in the Ko'olau Mountains and runs approximately 2.9 miles before entering Kāne'ōhe Bay. At river mile 1.8 there is a structure that was originally built in 1935 and was used as a USGS stream gauging station. The structure had become undercut and posed a barrier for upstream migration of endemic and native aquatic species including: O'opu alamo'o (*Lentipes concolor*), O'opu naniha (*Stenogobius hawaiiensis*), O'opu nopili (*Sicyopterus stimpsoni*), and O'opu akupa (*Eleotris sandwicensis*) and one indigenous species, o'opu nakea (*Awaous guamensis*).

In August 2012, project work began to repair the front of the structure and a rock face was built up one side of the overhang to allow a slow, steady flow of water creating favorable conditions for O'opu migration. Additional work to repair other aspects of the structure took place in Summer 2013.

Funders and partners for this project include U.S. Fish and Wildlife Service, Hawai'i Fish Habitat Partnership, KEY Project, Honolulu Board of Water Supply, USGS, State of Hawai'i: Department of Aquatic Resources. Collectively, these groups have formed the Waihe'e Ahupua'a Initiative (WAI).

# Stormwater Management

In O'ahu, stormwater is routed directly off the land and into the nearest storm drain, stream and directly into the ocean, carrying with it a multitude of land-based pollutants. Hui o Ko'olaupoko implements projects that utilize rain water as a resource rather than a waste by designing and installing green infrastructure that mimics nature by capturing, storing, and/or directly infiltrating stormwater into the ground before it has the chance to become polluted runoff, which severely degrades our precious water resources.



Prior to implementation, potential sites are identified, prioritized and fully vetted for project feasibility. Next, we work to gain landowner consent, community and stakeholder consultation and conceptual design and engineering. Once funding is secured and the design is finalized, Hui o Ko'olaupoko works with community volunteers to do the project installation as well as ongoing maintenance and monitoring activities.



**Windward Community College Low Impact Retrofit** - Stormwater retrofits aim to re-develop existing infrastructure to capture stormwater before it becomes polluted runoff. This project was designed to capture stormwater runoff from 18,000 square feet of impervious surfaces (roof, road and parking lots) and directed into 3,000 square feet of rain gardens and native vegetation in front of the Hale 'Imiloa Science Building. (left and above)



**Rain Garden** - A deliberately built depression planted with native vegetation that allows stormwater to collect, briefly settle and then infiltrate into the ground. Rain gardens reduce the amount of land-based pollution entering into streams and the ocean by intercepting stormwater. (left)



**Pooi'a Street Stormwater Retrofit** - Installed pervious pavers and native plant filter strip along 12,000 sq. ft. of an existing parking lot owned by the City and County of Honolulu Parks. The project allows stormwater to be absorbed and filtered before entering into Ka'elepulu Stream. (above)



# Popoia Stormwater Retrofit



The goal of this project was to capture storm water and allow it to filter and infiltrate before polluted water has a chance to enter Ka'elepulu Stream. This project retrofitted 12,000 sq. ft. of an existing parking lot owned by City and County of Honolulu Parks Department adjacent to Ka'elepulu Stream in Kailua with the following elements:

- ✓ **Pervious pavers allow stormwater to infiltrate the parking area**
  - ✓ **Improved 360 feet of riparian habitat**
  - ✓ **Installation of native plants and rain gardens**
  - ✓ **Educational signage**

Volunteers maintain this project while learning about native Hawaiian plants and local watershed issues. Groups and individuals are welcome to malama these gardens by making arrangements with HOK for a group workday or maintain the gardens as their own schedule allows after they have completed a training session with HOK staff.

Funders and partners include the U.S. Environmental Protection Agency, Hawai'i Department of Health, City & County of Honolulu, Hawai'i Tourism Authority, Buzze's Original Steakhouse and many other local community groups and organizations.

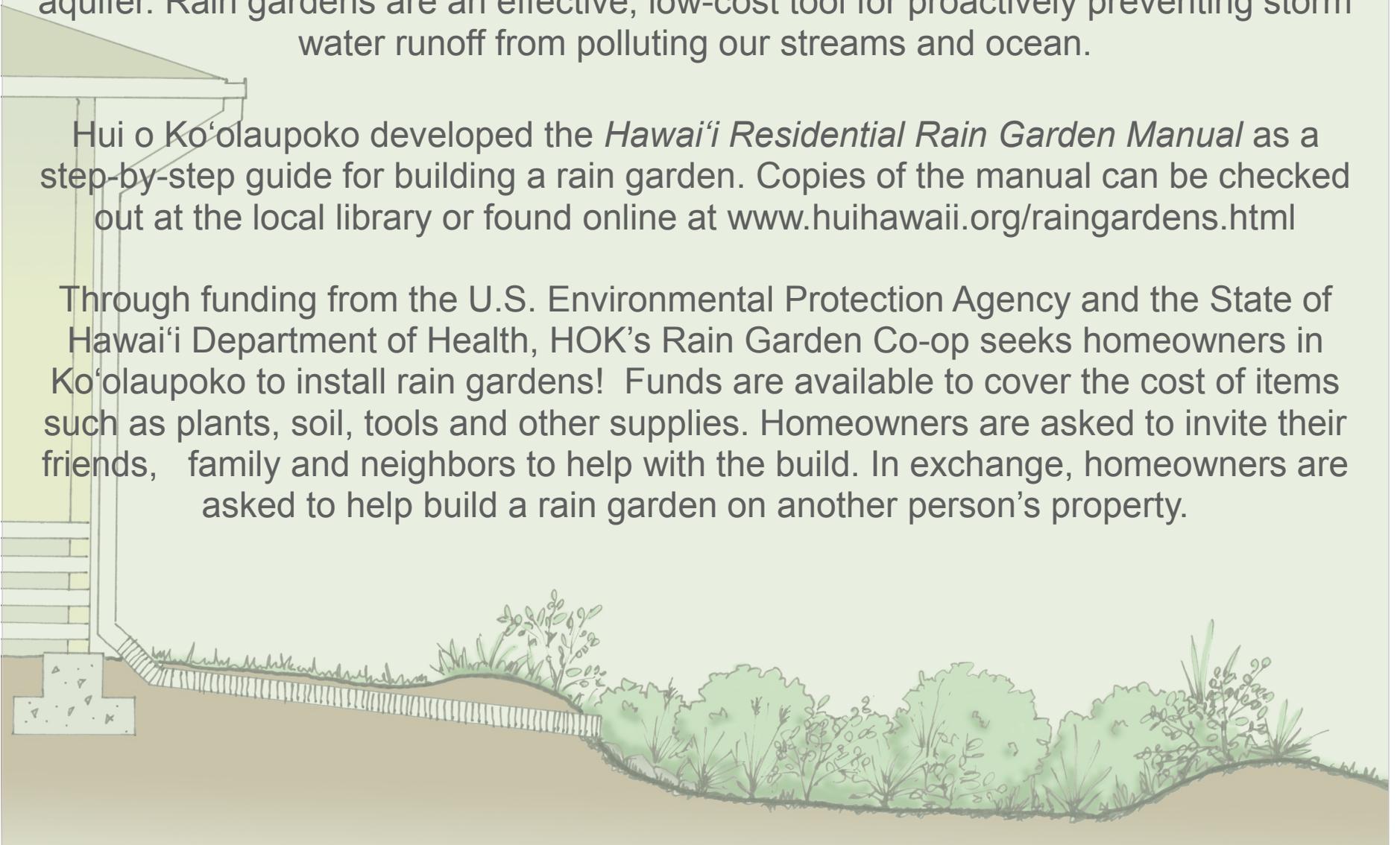
# Rain Garden Co-op



A rain garden is a deliberately build depression planted with native vegetation that captures storm water from impervious surfaces, such as roofs and driveways. Storm water that would otherwise become polluted runoff is instead filtered by native vegetation and soil before it is absorbed into the ground to re-charge the aquifer. Rain gardens are an effective, low-cost tool for proactively preventing storm water runoff from polluting our streams and ocean.

Hui o Ko'olaupoko developed the *Hawai'i Residential Rain Garden Manual* as a step-by-step guide for building a rain garden. Copies of the manual can be checked out at the local library or found online at [www.huihawaii.org/raingardens.html](http://www.huihawaii.org/raingardens.html)

Through funding from the U.S. Environmental Protection Agency and the State of Hawai'i Department of Health, HOK's Rain Garden Co-op seeks homeowners in Ko'olaupoko to install rain gardens! Funds are available to cover the cost of items such as plants, soil, tools and other supplies. Homeowners are asked to invite their friends, family and neighbors to help with the build. In exchange, homeowners are asked to help build a rain garden on another person's property.



# Rain Garden Manual

## Hawai'i Residential Rain Garden Manual

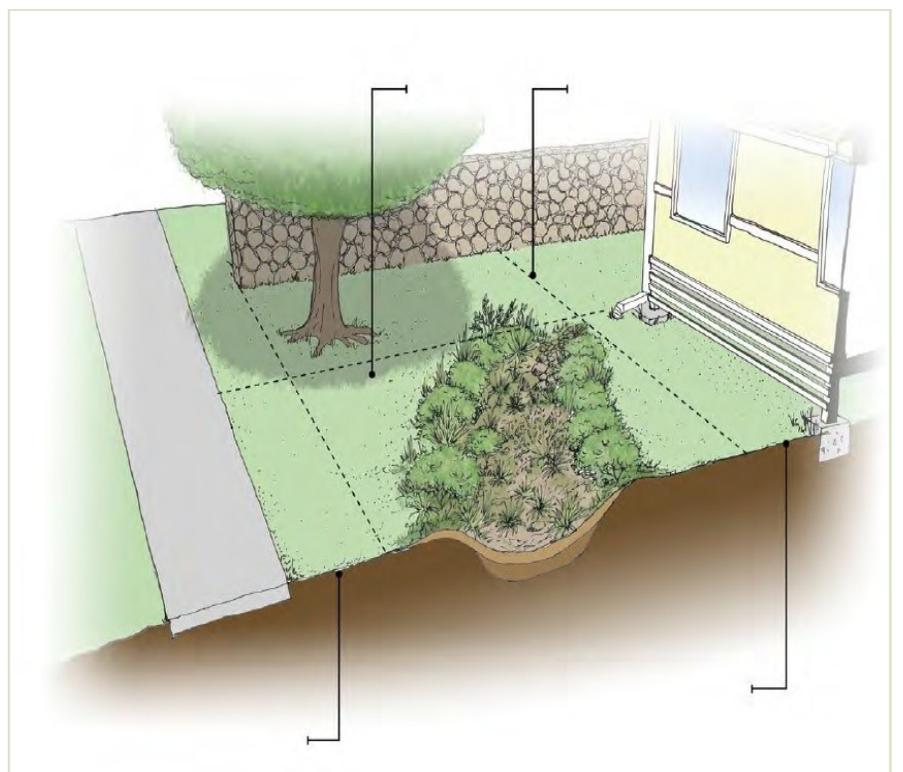


Hui o Kōolaupoko

The *Hawai'i Residential Rain Garden Manual* is a step-by-step guide for those interested in installing a rain garden at a home, school, public park, etc. and can be utilized throughout the State of Hawai'i.

The manual provides information on:

- ✓ **Determining a good location**
- ✓ **Testing soil infiltration**
- ✓ **Calculating drainage area**
- ✓ **Size and design**
- ✓ **Native plant lists**
- ✓ **Equipment and supplies**
- ✓ **Build logistics**
- ✓ **Monitoring and maintenance**



Copies of the manual can be found at your local library or a free electronic copy can be downloaded from [www.huihawaii.org](http://www.huihawaii.org)

# Waikiki Aquarium Rain Garden

In April 2014, Hui o Ko'olaupoko installed a rain garden at the Waikiki Aquarium with the help of Aquarium staff and volunteers. Rain garden features include:

- ✓ 1,250 sq ft roof area directed into 150 sq ft rain garden
- ✓ Selected plants suitable for coastal environments
  - ✓ 8 different plant species
  - ✓ 130 native plants
- ✓ Provides educational tool for aquarium visitors

The rain garden was “unveiled” at the Aquarium's Mauka to Makai Environmental Expo to celebrate Earth Day 2014. At this event, Hui o Ko'olaupoko provided rain garden tours and educational information about rain gardens.



# Wahikuli Beach Park Rain Garden

As part of the West Maui Ridge 2 Reef Initiative, Hui o Ko'olaupoko was hired to provide a community rain garden training and facilitate the installation of a demonstration rain garden at Wahikuli Beach Park near Lahaina, Maui.

This rain garden captures water from the public beach showers and paved parking lot. With the help of over 70 community members, the rain garden was installed in the Spring of 2013.

The rain garden serves as an example of low impact design practices that require minimal expense and time, but are beautiful solutions to reducing the amount of polluted runoff going into our oceans.



Project funding was provided through a NOAA Coral Reef Conservation Program grant. Project partners included County of Maui Parks, Public Works and Planning Departments, Parsons, SCS Consulting, and Maui Nui Marine Resources Council.

# HPU Rain Garden



In the spring of 2013, Hui o Ko'olaupoko partnered with Hawai'i Pacific University (HPU) and students from the Environmental Science and Environmental Studies programs to install a demonstration rain garden at HPU Hawai'i Loa Campus.

Project highlights include:

- ✓ **166 square foot rain garden**
- ✓ **Captures rain water from the HPU Annex roof**
- ✓ **Installation of 75 native plants**

Native Hawaiian plants in this rain garden include carex, kupukupu, 'ohai, pohinahina, 'ae'ae, 'uki'uki, 'ahu'awa, and kalo.

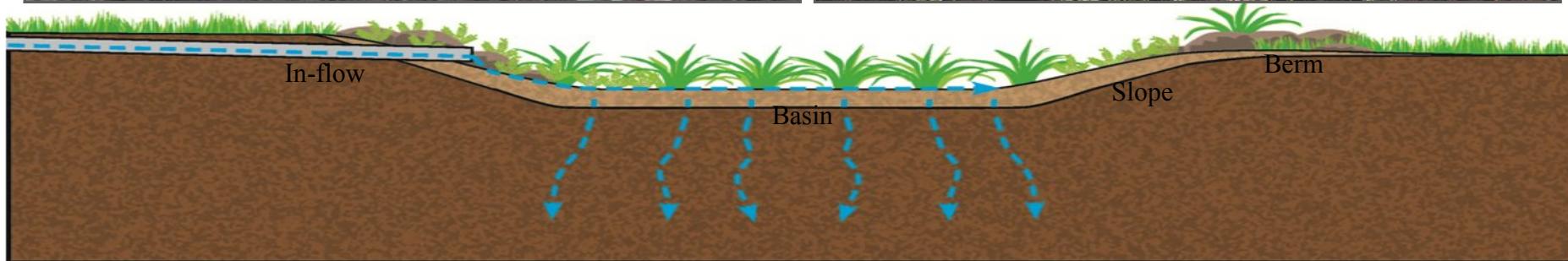
HPU students help to maintain the rain garden throughout the year and professors are able to use it as a tool for teaching students about low impact development, storm water best management practices, native Hawaiian plants and local watershed issues.

This project was the second public rain garden built under the HOK Rain Garden Co-op Program funded by the U.S. Environmental Protection Agency and Hawai'i Department of Health, Clean Water Branch.

# He'eia State Park Rain Garden

A demonstration rain garden was constructed at He'eia State Park in March 2011. This project was completed as a joint effort between Hui o Ko'olaupoko, Kama'āina Kids, University of Hawai'i and Oregon State Sea Grant Programs.

With the help of volunteers, the roughly 300 square foot rain garden was constructed and planted in just one day. The site is open to the public and was constructed to educate visitors about rain gardens and how they function.



# Windward Community College Low Impact Retrofit



This Low Impact Retrofit (LIR) is designed to capture storm water run-off from over 18,000 square feet of impervious surface from the roof, road and parking lots.

Hui o Ko'olaupoko and Windward Community College (WCC) partnered to install approximately 3,000 square feet of rain gardens and native vegetation in front of the Hale 'Imiloa Science Building. The rain gardens will capture and infiltrate the storm water runoff before it has a chance to carry pollutants into nearby Kea'ahala Stream and Kāne'ohē Bay.

Construction of the site began in March 2014, starting with excavation and formation of the rain garden basins and berms. Students, professors and community members helped HOK staff with the planting of over 2,000 native plants.

Long term maintenance of the project will be conducted by HOK with considerable support from WCC's Sustainability Club.