



EXECUTIVE CHAMBERS

HONOLULU

November 20, 2002

BENJAMIN J. CAYETANO  
GOVERNOR

Mr. Robert Wayland, Director  
Office of Wetlands, Oceans and Watersheds  
Mail Code 4501T  
USEPA  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

**RE: EPA Watershed Initiative Nominations**

Dear Mr. Wayland:

This letter is in response to the US Environmental Protection Agency's (EPA) request for nominations with regard to the EPA Watershed Initiative, I hereby nominate the Hanalei Heritage River Program on the island of Kaua'i, for consideration to this initiative.

The Hanalei Heritage River Program was initiated in 1998 with the federal designation of Hanalei River as an American Heritage River (AHR). The goal of this program is to support local efforts for ecologic restoration, community development, and historic and cultural preservation. To this means, the Hanalei community used traditional consensus-based decision making to develop a 5-year Watershed Action Plan.

The Hanalei Bay Watershed encompasses the five ahupua`a of Wainini, Hanalei, Waipa, Wai`oli and Waikoko. The ahupua`a is a land and traditional resource management division in Hawai`i, consisting of lands from the mountain peaks to the off shore coral reefs. Noted for its wealth of natural, cultural, and heritage resources, the Hanalei Bay Watershed supports valuable uses and attributes such as residential and resort development, agriculture, recreation, biodiversity, and preservation of a native culture.

The Hanalei Heritage River Program has successfully implemented a number of projects in their 5-year watershed action plan, including water quality monitoring in Hanalei River and Bay, long-term ecological monitoring, and a riparian restoration trial project. The Hanalei Heritage River Program has a credible record for community cooperation and agency collaboration. This initiative would help address the top priorities of the watershed action plan: sedimentation, wastewater treatment and total maximum daily loads of pollutants.

Thank you for your consideration.

Aloha,

BENJAMIN J. CAYETANO

# Hanalei Heritage River Program

**Environmental Protection Agency  
Watershed Initiative Grant Proposal**



**PO Box 1285  
Hanalei HI 96714  
(808)826-1985  
(808)826-1012 FAX  
hanaleiriver@hawaiian.net**

**November 2002**

## **Hanalei Watershed Characterization**

The greater Hanalei Bay watershed (Figure 1) extends from the top of Mount Wai‘ale‘ale (5,148 ft) to the coral reefs off Pu‘u Po‘a and Makahoa Points (Figure 2) on the north shore of the island of Kaua‘i Hawaii. The Hanalei Bay watershed is 23.7 sq. miles and includes the ahupua‘a of Wainini, Hanalei, Waipa, Wai‘oli and Waikoko. The ahupua‘a is a land and traditional resource management division in Hawaii, consisting of lands from the mountain peaks to the off shore coral reefs. Noted for its wealth of natural, cultural, and heritage resources, this watershed supports an array of valuable uses and attributes such as residential and resort development, agriculture, recreation, biodiversity, and preservation of a native culture. Hanalei Valley farmers produce over 67% of the state’s taro, a staple in the traditional Hawaiian diet. It is a multi jurisdictional area, comprised of the Hanalei National Wildlife Refuge, Halele‘a State Forest Reserve, Kaua‘i County beach parks and private land holdings.

The Hanalei River is approximately 16.2 miles long. Its headwaters receive intermittent but extremely heavy rainfall (450 inches/year). Hanalei River long-term average discharge is 140 million gallons per day (gpd), with low flow averages of 20-50 million gpd and as high as 6 billion gpd (Berg et al. 1997). Estimates of 7560+/-2910 Mg sediment per year are removed from the upper Hanalei River valley by the river. This sediment yield translates into a denudation rate of 0.07-0.16 mm per year (Calhoun and Fletcher, 1999).

The entire Hanalei Bay coastal area is within a Wastewater Critical Area. Hanalei town is a densely populated rural village surrounded by wetlands. Single-family homes are now being used as multi-family vacation rentals and are being converted to restaurants, etc. without up-grading wastewater systems. Shallow groundwater is polluted by these cesspools and septic systems and flows directly to Hanalei Bay and River, causing public health concerns about the waters. Like many coastal towns, Hanalei lacks centralized wastewater collection and treatment.

Both the Hanalei River and the Hanalei Bay are actively used for personal recreation and commercial activities. In a 2002 national ranking of public beaches, Hanalei Bay was ranked the nation's # 2 best beach by "Dr. Beach" ([www.drbeach.org](http://www.drbeach.org)). The Hawai'i visitor industry actively promotes Hanalei Bay as "must see". The river is a popular venue for recreational paddling, kayaking, fishing (for both estuarine fish and endemic freshwater 'o'opu), crabbing and prawning. Local families regularly supplement their diet with species caught in the river and bay. For the lower income population, this is a vital resource. The river is a favorite site for children to swim, since it is both shallow and protected from the surf. Commercial companies based directly on the river offer kayaking and snorkeling tours of the river. Tour companies embark from the river for trips to the famed Na Pali coast. Both commercial and recreational fishing boats launch from these sites. Popular county parks and a campground are located at the river mouth and along the Bay. Honored in song and story, it is an area of unique cultural significance to Hawai'ian people. In June 1998, the Hanalei River was designated an American Heritage River. The Hanalei River Program (HHRP) is in the third year of the implementation of a community developed Watershed Action Plan. On-going activities in this plan include an assessment and inventory of ahupua'a resources (Griffin, 2000), riparian vegetation restoration, water quality sampling, and in-stream resource monitoring. Monthly community meetings are held to share findings and coordinate effort. A quarterly newsletter is produced and regular televised programs provide education and outreach.

### **Problem**

Hanalei River and Bay are polluted by sediments, nutrients, and bacteria and are listed on Hawai'i's 2002 303(d) list of impaired waters. The Waipa and Wai'oli streams are listed as waterbodies requiring future monitoring. There is an urgent need for a comprehensive watershed approach to reducing wastewater contamination (pathogenic bacteria), nutrients, and sediment in the greater Hanalei watershed, which can be implemented with funding from this Watershed Initiative. Hanalei town has approximately 225 cesspools, 75 septic systems, and 2 package treatment plants with injection wells. Most homes in

Hanalei town are situated between the Hanalei River and Wai‘oli Stream, just inland from the beach. The HHRP is working closely with a University of Hawai‘i urban planning practicum class, funded by the USDA Natural Resources Conservation Service (NRCS), to address watershed wastewater issues. Studies by the HHRP of enterococci levels in the Hanalei River, its tributaries, pondfields and impoundment outfalls, began in the summer of 2000 using innovative IDEXX bacterial testing technologies. Geometric means (Appendix 1 and Figure 3) indicate levels of indicator bacteria far surpassing EPA’s Ambient Water Quality Criteria for bacteria (U.S. EPA, 1986). Values for Hanalei Bay at Kaua‘i County beach parks also exceed EPA’s criteria. The Hawai‘i DOH has monitored these sites on a weekly basis for a number of years and their mean values are consistent with those of the more extensive HHRP sampling program. A strong periodicity in values plotted over time (Figure 3) suggests lunar influenced tidal flushing of groundwater contaminated by cesspools and septic systems in riparian areas along the Hanalei River and in sandy coastal areas along Hanalei Bay. The community has demanded that these waters be fishable and swimmable.

No routine testing for nutrients associated with wastewater contamination of groundwater and the nearshore waters of Hanalei Bay have been performed. Some historic data is available for surface waters of Hanalei River and Hanalei Bay. Concentrations of nutrients increase along the lower reaches of the Hanalei River, are much higher during seasonal flooding, and often exceed State standards. This may be caused by run-off from agriculture and ranching practices in the middle reaches of the River and/or groundwater contamination by cesspools in the urban area. Berg (1995) specifically noted increasing nutrient loads in the reaches of the Hanalei River receiving return water from taro pondfields and waterbird impoundments within the Hanalei National Wildlife Refuge. Berg et al. (1997) provided a study of the hydrology and land use effects on the Hanalei River for a 4.5-month period during the winter of 1994-1995. They report that “ turbidity and suspended sediment concentration were clearly linked to taro production and although suspended sediment yield doubled through the Refuge from 2 to 4 lbs/acre/day, individual taro outflow ditches could add over 37 lbs/acre/day to the River. Because of the

high precipitation, steep terrain, and short transport distances, natural sediment production during high flow events probably drastically overwhelms sediment production from land management, but sediment plumes emanating from taro acreage are nevertheless often visible in the River”.

There is a compelling need to develop best management practices (BMPs) for ranch lands, wetland agriculture and forest reserves. Control of alien species in the upper Hanalei Watershed forests is important because there is evidence that alien species increase erosion processes on Hawai‘ian soils. For example, it is known that introduced tree species along the stream bank have been a major concern in shifting and eroding portions of the Hanalei River course, while feral pig rooting has been shown to increase stream flow sediment by 30% on other Pacific Islands.

Chronic sedimentation affects the streambed spawning grounds of the Hawai‘ian ‘o‘opu. Abundance and recruitment of o‘opu is an indicator of the health of the Hanalei River. Coral recruitment and the health of the coral reef ecosystem in Hanalei Bay is affected by polluted river discharge on the reefs of Pu‘u Po‘a. Coral recruitment is an important indicator of coral reef health and recovery. Rate of coral settlement is very sensitive to sedimentation, nutrients and environmental contaminants including pesticides. Pesticides have been used to control invasive species, but they degrade the pristine nature of the river itself and have unknown impacts on the coral reefs. Only trace amounts of pesticides have bioaccumulated in Hanalei River biota (Orazio et al. 2002)

### **Comprehensive Description of Watershed Plan**

The Hanalei Heritage River Program developed a watershed action plan (WAP) in 1999, based on a complete watershed assessment (Griffin, 2000) and a series of facilitated Hanalei community meetings. The WAP is included as Appendix 2 because it is so extensive. Projects of highest community priority are designated as “keystone” and include improving water quality so that it is fishable and swimmable, reducing turbidity, and reducing sediment in the River. The HHRP has been implementing the WAP as funds have become available through grants from private and government agencies. HHRP is prepared to

implement development of TMDLs, sediment control, and wastewater contamination reduction immediately upon funding by this Initiative.

### **Descriptions of Proposed Projects to Improve Water Quality**

Total Maximum Daily Loads: TMDLs will provide both baseline measurements and guidelines for improvement and, when coupled with pilot projects listed below to improve water quality, will give us the framework for future land management. Baseline data must be collected first, before actions are initiated.

(1a) Hawai'i DOH, with Initiative funds, will contract for TMDLs to EPA specifications of total suspended solids (TSS), turbidity and nutrients (TN, TP & NO<sub>3</sub>) for the freshwater flow in non-tidally influenced reaches of the Hanalei River, between the USGS gauging station and the upper reaches of tidal head in the Hanalei River. The new USGS sediment gauge will provide data on sediment flux.

HHRP, has already begun the development of four of the nine basic elements of the DOH TMDL (GIS maps and tables, databases, visual assessments, website).

(1b) HHRP, with Initiative funds, will contract for TMDLs to EPA specifications of TSS, turbidity, nutrients, and enterococci bacteria for the Hanalei estuary (from 5 km above the mouth of the River to the Hanalei Landing beach site at its mouth). This is innovative, as it would be the first TMDL for a tidal estuary in Hawai'i and also the first TMDL of enterococcus bacteria. The contractor will be required to establish a Hawaii DOH approved Quality Assurance Project Plan and modeling system.

### Wastewater Treatment:

(2a) To address bacterial contamination of the rivers and groundwater within the lower Hanalei watershed, we will replace, with Initiative funding, all 12 of the existing antiquated cesspools for single-family homes in the Wastewater Critical Area and riparian zones of Hanalei River and Waipa Stream. Innovative on-site treatment systems, using the best available technology/advanced wastewater standards will be constructed at these high-risk, outlying sites along the rivers.

(2b) The County of Kaua'i will pay for replacement of cesspools at Hanalei Pavilion and Wai'oli beach parks with new septic systems and improve maintenance of septic systems at all three Hanalei beach parks. Portable toilets will be brought in to augment the facilities during large community events.

(2c) HHRP, with its current program funds, will continue community strategic planning for a centralized wastewater collection and treatment system in Hanalei Town which will include scale, design criteria, location, discharge options, costs, and funding options. A centralized wastewater treatment system is recommended to minimize groundwater contamination by pathogenic bacteria and nutrients in the lower watershed.

Sediment Control:

(3a – Agriculture) Innovative BMPs for sediment control from traditional taro agricultural outflows and impoundments will be designed and implemented in cooperation with the Hanalei taro farmers, US Fish & Wildlife Service (USFWS) and the U.S. Bureau of Reclamation. Three selected outflow drains on the Hanalei River (Berg, 1995) and one drain on Waipa Stream will be modified and monitored to compare with unmodified drains. BMPs for cultivation and harvesting taro, slowing flow rates in outflow drains by increasing depth and width, installing baffles, sediment screens, and livestock fencing, coupled with a regular maintenance schedule will be implemented (Appendix 3). These BMPs would be designed primarily to reduce sediment load, but could also reduce nutrient load by uptake of riparian or aquatic vegetation, and decrease pathogenic bacteria, as they do not survive in soils. This Initiative will provide materials, while FWS will provide expert consultants, heavy machinery, and operators.

(3b-Forest): The US Geological Survey (USGS) and NRCS will develop BMPs for soil erosion control in the upper watershed. The USGS will determine relative plant and animal densities in the upper watershed to establish GIS maps that, combined with NRCS data (soil type, slope, and rainfall) will be used to develop models demonstrating how management of alien plants and animals might improve water quality. USGS will also establish a community-accessible database (Hawai'i Ecosystems At-

Risk, [www.hear.org](http://www.hear.org)) stored on the Pacific Basin Information Node server of USGS. Initiative funding will be used to upgrade equipment to monitor sediment loading, while USGS and NRCS will provide expert staffing. BMPs cannot be implemented within the short time frame of this Initiative.

### **Monitoring and Evaluation-- Measuring the Effectiveness of the Actions**

The TMDLs for the river and the estuary will provide baseline measurements of water quality.

Subsequent monitoring of total sediment, nutrient, and bacteria loading for each of the following sections of the Hanalei River will measure the effectiveness of the pilot projects in reducing pollution. (Figure 2):

- A. Higher elevation forested areas, mainly the Halele‘a State Forest Reserve
- B. Ranch land, wetland agricultural and wildlife impoundments of the valleys
- C. Lower valley reaches including urban coastal areas

Specific Watershed monitoring, from the mountain to the reef, includes:

- 1) HHRP will monitor for turbidity, nutrients, and enterococci bacteria on a monthly basis, including both low flow and three extreme high flow events, in the Hanalei River at the meeting of Sections A-B and B-C, and at the lower reach of four waterways entering Hanalei Bay (Hanalei River, Wai‘oli, Waipa and Waikoko streams, Figure 2).
- 2) The coral reefs of Pu‘u Po‘a and Makahoa Points delineate the mouth of Hanalei Bay. Several sites will be selected along a gradient from the reef area directly falling under the influence of river pollutants to a control site outside of the river influence. Changes in coral and algal cover during this project will be documented using digital images that are analyzed and ultimately archived in the National Oceanographic Data Center. These data are useful in detecting long-term environmental trends, but we propose to increase the acuity of our monitoring by measuring coral recruitment at several locations in the bay. Coral recruitment at each of the reef areas will be examined using two approaches; settlement plates and fixed photoquadrat plots. These methods will detect recruitment of colonies over time at each site in relation to changes affected in water quality.

3) Long term ecological monitoring (LTEMP) of populations of 'o'opu in the Hanalei River and Waipa streams will continue to be done by Dr. Adam Asquith (NOAA/University of Hawaii Sea Grant) and HHRP. Adult fish populations will be monitored weekly at three locations in the lower part of the river (Figure 4). Data will be collected from three permanent transects at each of the monitoring sites. Reproduction will be measured by sampling o'opu larvae at one location. In addition to adult counts and reproduction, HHRP will also monitor recruitment. Recruitment will be measured by capturing returning juveniles in Plexiglas box traps at the three sites, identifying, counting and releasing them.

### **Description of Watershed Project Management and Stakeholder Involvement**

#### Project Leaders:

Dr. Carl J. Berg, Jr. (Ph.D. Zoology, University of Hawai'i, 1971) was a university professor (CCNY) and research scientist (Harvard University, Marine Biological Laboratory in Woods Hole MA, and Florida Marine Research Inst.) before returning to Hawai'i in 1990. He worked for the Hawai'i DOH, monitoring water quality in the ocean and streams, before retiring in 1993. He has published 40 scientific articles, edited books and book chapters. He is Water Quality Project coordinator for the Hanalei Heritage River Program, which was awarded an Environmental Achievement Award from Region IX of the U.S. Environmental Protection Agency. He was recently nominated for Governor Cayetano's Kilohana Award for Outstanding Volunteerism. He will be Chief Scientist for this project.

Makaala Kaaumoana (B.S./M.S. Biological Sciences, Stanford University), retired teacher, was elected as the Program Coordinator of the Hanalei Heritage River Program in July 1999. Guiding the community aspects of the program, she is responsible for outreach and providing the public with an active voice and role in Hanalei's American Heritage River Watershed Action Plan.

Jan Surface (B.S. Watershed Science, Utah State Univ./ M.S. Agricultural & Biological Engineering, Cornell University) is Watershed Coordinator for HHRP. She was a Hydrologist for the USGS in Ithaca,

New York for 13 years; Puerto Rico for 3 years; Mt St Helens National Volcanic Monument for 1 year. She will be the Administrator of this Watershed Initiative grant.

Rachel Ross, Lead Field Technician, has a B.S. in Water Resources Management from UC Berkeley. Currently assisting in field collection for water quality and LTEMP programs, she is also certified in SCUBA and will assist in coral reef monitoring.

Technical Expertise:

**NRCS:** BMPs for agriculture, erosion control (Dudley Kubo); **USGS:** biological surveys, hydrology, sedimentation studies (Dr. Gordon Tribble, Dr. William Steiner); **CRAMP:** benthic community monitoring, coral reef recruitment (Dr. Paul Jokiel, Dr. Alan Friedlander); **FWS:** BMPs (Mike Hawkes); **NOAA / University of Hawaii Sea Grant:** native fish surveys, larval recruitment (Dr. Adam Asquith); **Hawaii DOH:** total maximum daily load (Dr. June Harrigan).

Other Stakeholders:

Waipa Foundation, Kayak Kaua'i, Kayak Hanalei, Hanalei Hawai'ian Civic Canoe Club, Kaua'i Taro Growers Association, Hawai'ian Farmers of Hanalei, Kamehameha Schools, Kaua'i North Shore Business Council, County of Kaua'i (Building Division, Parks and Recreation Department, Dept. of Business, Economic Development and Tourism), State of Hawai'i (Office of Hawaiian Affairs, Tourism Authority, Dept. of Land & Natural Resources, Hawai'i Dept. of Health), USDA Forest Service, NOAA/National Marine Sanctuary, University of Hawai'i.

**Description of Outreach Activities**

Project descriptions and reports will be disseminated to other locales with similar environmental conditions via the web sites for American Heritage Rivers Initiative, Coastal America, EPA Watershed Initiative, USGS, NRCS, University of Hawai'i and related links. Hawai'i and Region IX partners such as

Guam and American Samoa and locations with similar issues such as Florida, Puerto Rico, and the US Virgin Islands will be targeted via the EPA Watershed web site. Project staff will present reports at state, national, and international watershed conferences.

The Hanalei community will be invited to participate in community meetings about this watershed initiative, and volunteer participation will be encouraged. Newsletters will be produced for distribution throughout the community providing project updates and opportunities for involvement. Community forums on specific projects will be convened, video recorded and broadcast on local public access television with tapes available for borrowing at the Kaua'i public libraries and the HHRP office.

Communication and coordination with partnering government agencies will occur in regular email correspondence and meetings will be convened with all agencies involved invited.

### Project Schedule

|                   | 2003 | F | M | A | M | J | J | A | S | O | N | D | 2004 | F | M | A | M | J | J | A | S | O | N | D | 2005 | F | M | A | M | J | J | A | S | O | N | D |   |   |
|-------------------|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|------|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EPA Funding       |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * |   |
| River TMDL        |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Estuary TMDL      |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * |   |   |   |   |   |   |   |      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| Replace cesspools |      |   |   |   |   |   |   |   |   | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * |      |   |   |   |   |   |   |   |   |   |   |   |   |   |
| FWS BMPs          |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| USGS Gauge        |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| USGS Study        |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| NRCS Study        |      |   |   |   |   | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| CRAMP             |      |   |   | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Design STP        | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| HHRP Monitoring   | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |
| LTEMP             | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | *    | * | * | * | * | * | * | * | * | * | * | * | * | * |

## **Bibliography**

- Berg, C.J. Jr., 1993, A Comparison of Hanalei Bay Sampling for 1992 and 1993: Hawaii State Department of Health, internal report, 6 p.
- Berg, Neil, 1995, Effects of Fertilizer and Herbicide Application on Chemical Water Quality at the Hanalei National Wildlife Refuge: 19 p.
- Berg, N., B. McGurk, and R.S. Calhoun, 1997, Hydrology and Land Use Effects on the Hanalei National Wildlife Refuge, Kaua'i, Hawai'i: USDA Forest Service, Interagency Agreement 14-48-0001-94588, Final Report, 62 p.
- Calhoun, R.S. and C.H. Fletcher III, 1999, Measured and Predicted Sediment Yield from a Subtropical Heavy Rainfall, Steep-Sided River Basin, Hanalei, Kaua'i, Hawai'ian Islands: *Geomorphology*, v. 30, p. 213-226.
- Griffin, J., 2000, An Ahupua'a Assessment and Monitoring Program to Help Malama Hanalei Ahupua'a: Duke University Masters Thesis, 84 p.
- Orazio, C., R. Gale, J. Meadows, K. Feltz, P. Peterman, K. Echols, T. May, R. Wiedmeyer, M. Walther, W. Brumbaugh, C. Berg, and W. Steiner, 2002, Survey of Organic Chemical Contaminants in Water, Sediment and Biota Sampled from the Hanalei River, Kaua'i in December 2001: US Geological Survey Report Number CERC-8335-FY03-31-01, 17 p.
- US Environmental Protection Agency, 1986, Ambient Water Quality Criteria for Bacteria: EPA-44-0584002.

**Budget for Hanalei Heritage Program's EPA Watershed Initiative Grant**

| TASK   | GRANT \$\$ |           | IN-KIND \$\$ |           |
|--|------------|-----------|--------------|-----------|
|  | Year 1     | Year 2    | Year 1       | Year 2    |
| Adam Asquith, University of Hawaii<br>Sea Grant (from Kamehameha Schools)  | 0          | 0         | \$20,000     | \$20,000  |
| NRCS Exclusion Fence Installation<br>(Waipa Foundation Labor)              | 0          | 0         | \$26,000     | 0         |
| NRCS Exclusion Fencing Materials   | \$31,200   | 0         | 0            | 0         |
| Waipa Foundation (Kamehameha School)                                       | 0          | 0         | \$80,000     | \$80,000  |
| USGS/NRCS streamflow, sediment, biota                                      | \$70,000   | \$75,000  | 0            | 0         |
| FWS—BMP's for sediment   | \$12,500   | \$500     | 0            | 0         |
| Coral Reef Monitoring/Recruitment  | \$39,000   | 0         | \$5,600      | 0         |
| Cesspool Replacement<br>(12 homes @ \$10K per home)                        | \$60,000   | \$60,000  | 0            | 0         |
| TMDL, Estuary Portion of River   | \$120,000  | 0         | 0            | 0         |
| TMDL, Freshwater Portion of River  | \$75,000   | 0         | 0            | 0         |
| County Public Bathroom Upgrade<br>(Hanalei Pavilion and Waioli Beach Park) | 0          | 0         | \$25,000     | \$25,000  |
| Monitoring Equipment and Supplies (HHRP)                                   | \$5,000    | \$5,000   | 10,000       | 10,000    |
| Scientific Coordinator (HHRP)<br>(16 hrs/wk @ \$40/hr plus 13% Fringe)     | \$37,606   | \$37,606  | 0            | 0         |
| Program Coordinator (HHRP)<br>(24 hrs/wk @ \$25/hr plus 13% Fringe)        | \$35,256   | \$35,256  | 0            | 0         |
| Operations Coordinator (HHRP)<br>(24 hrs/wk @ \$25/hr plus 13% Fringe)     | \$35,256   | \$35,256  | 0            | 0         |
| Lead Field Technician (HHRP)<br>(24 hrs/wk @ \$20/hr plus 13% fringe)      | \$28,205   | \$28,205  | 0            | 0         |
| WQ Volunteers (HHRP)   | 0          | 0         | \$10,000     | \$10,000  |
| Travel (mainland and intrastate conferences)                               | \$4,500    | \$4,500   | 0            | 0         |
| Outreach (4 forums, 8 quarterly newsletters)                               | \$1,600    | \$1,600   | \$3,400      | \$3,400   |
| Fiscal Administration/Overhead (10%)                                       | \$55,512   | \$28,292  | 0            | 0         |
| <b>TOTAL</b>   | \$610,635  | \$311,215 | \$180,000    | \$148,400 |
| <b>GRAND TOTAL</b>   | \$921,850  |           | \$328,400    |           |

**TOTAL COST \$1,250,250**  
**TOTAL MATCH \$328,400 (26.3%)**

Figure 1. Site Location Map for Hanalei Bay Watershed, Kaua'i Hawai'i

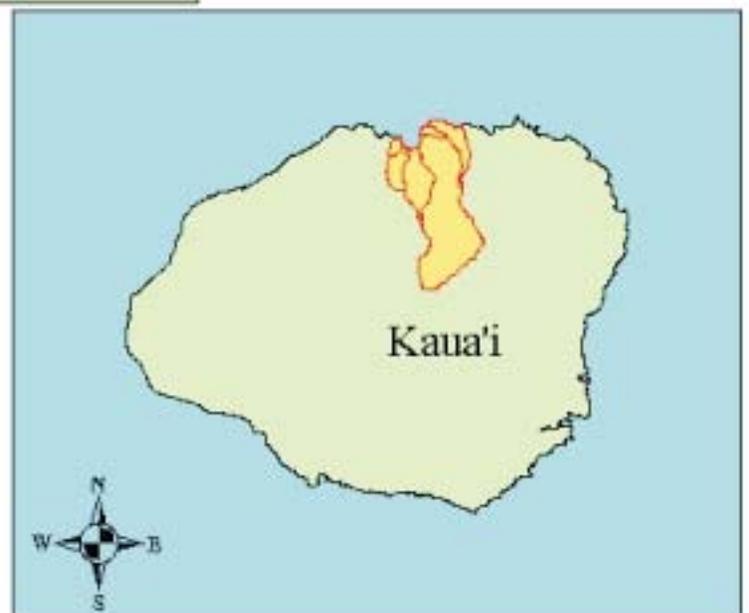
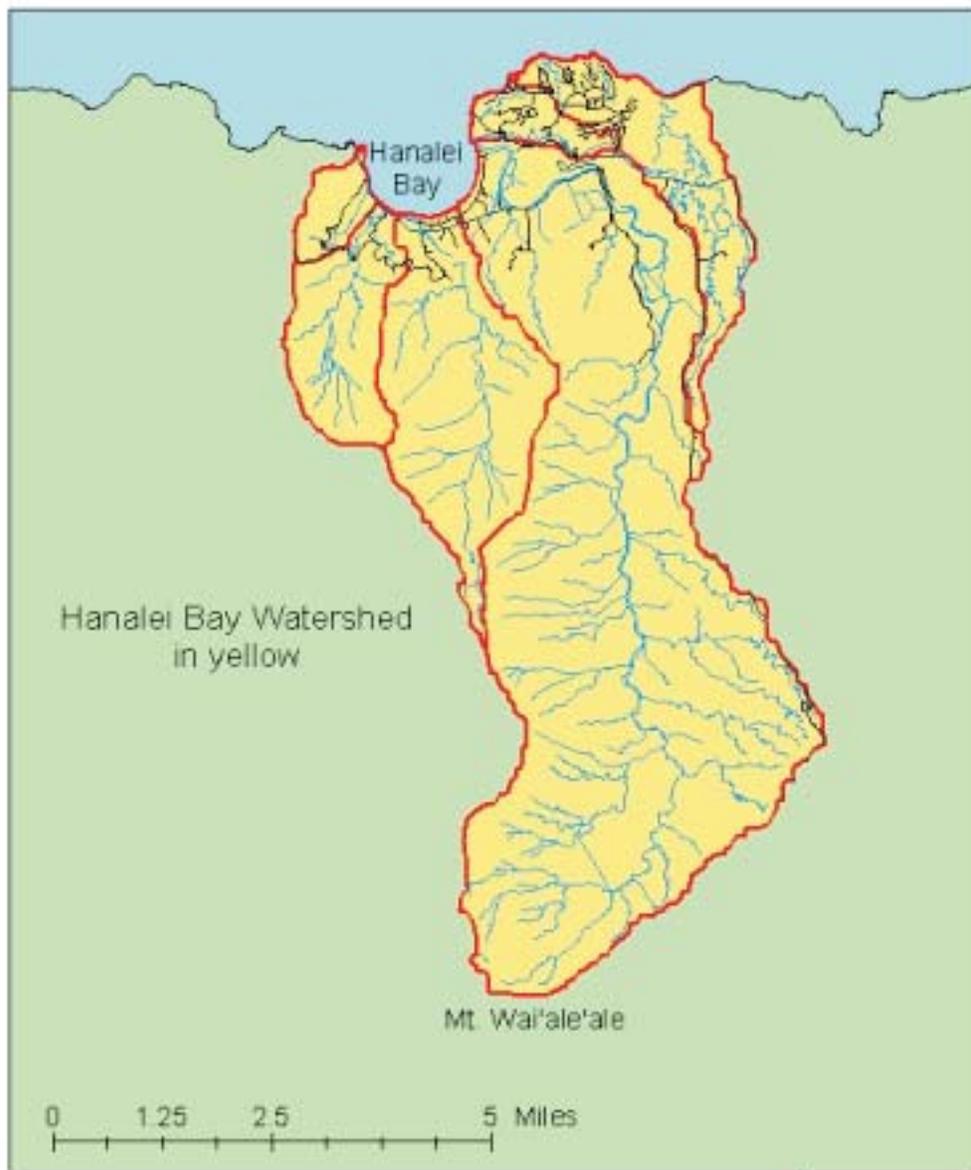
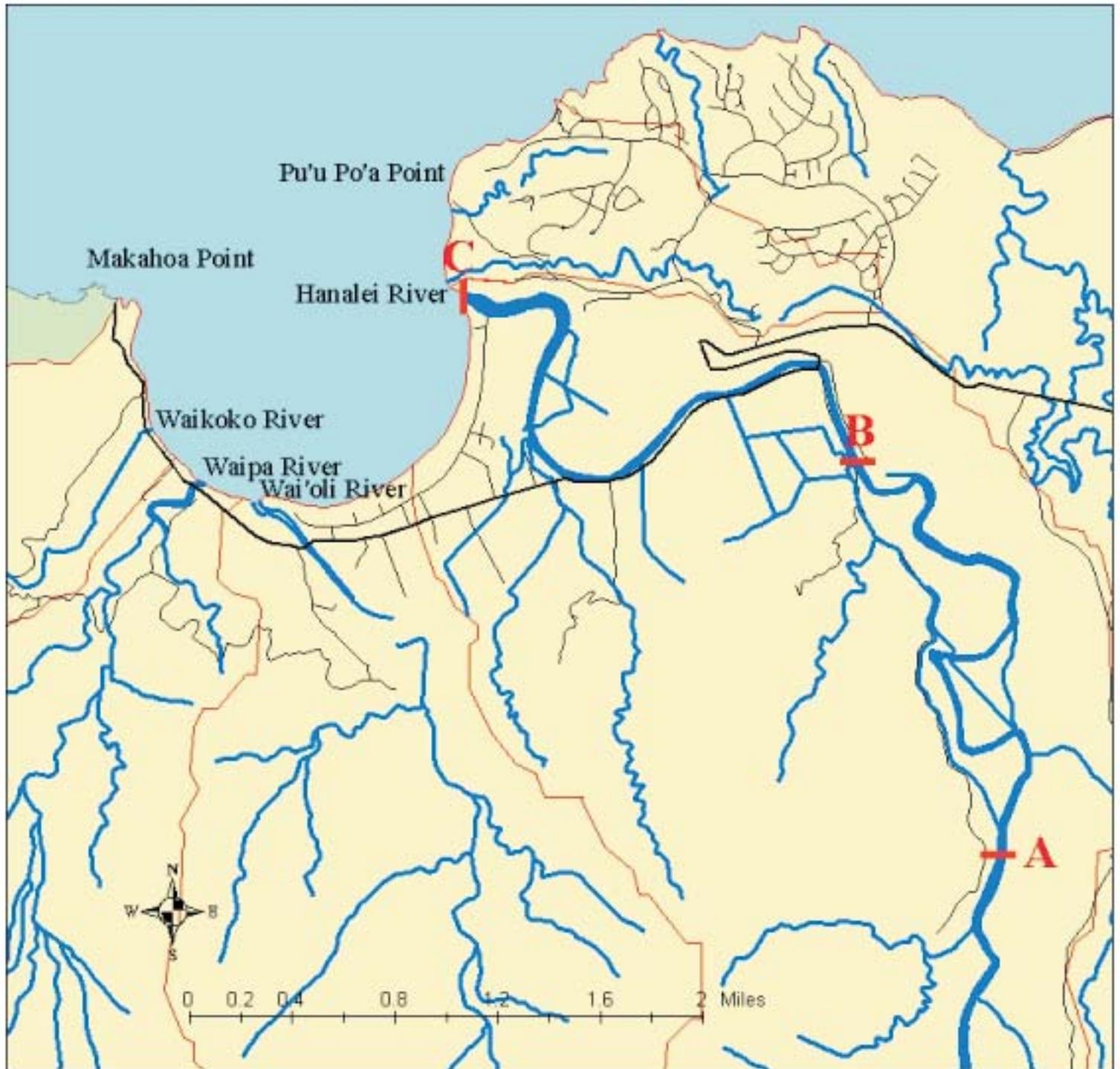


Figure 2. Hanalei Bay Site Map, including Total Maximum Daily Load (TMDL) Sampling Sections, Kauai, Hawai'i



**A** to **B**  
TMDL Sampling Sections

Figure 3. Enterococcus bacteria (Weekly Geometric Means) at the Hanalei Bay Landing, April 2001 through April 2002, Hanalei Bay, Kaua'i, Hawai'i

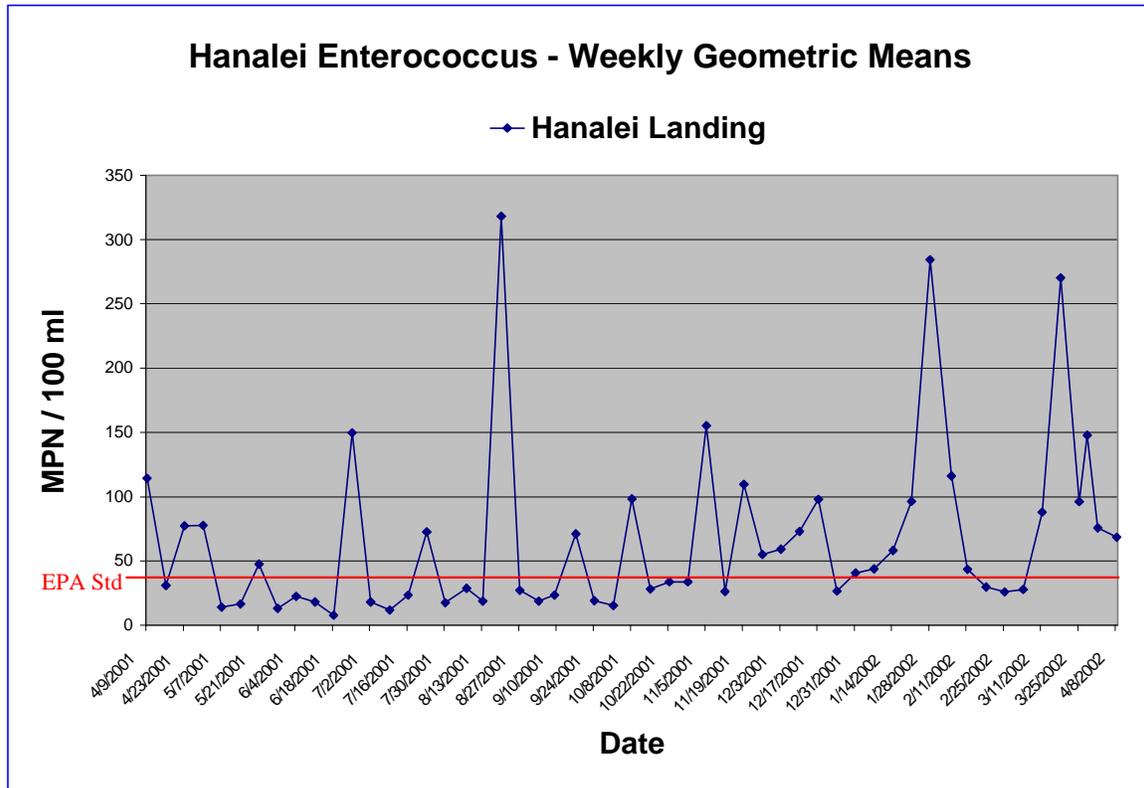
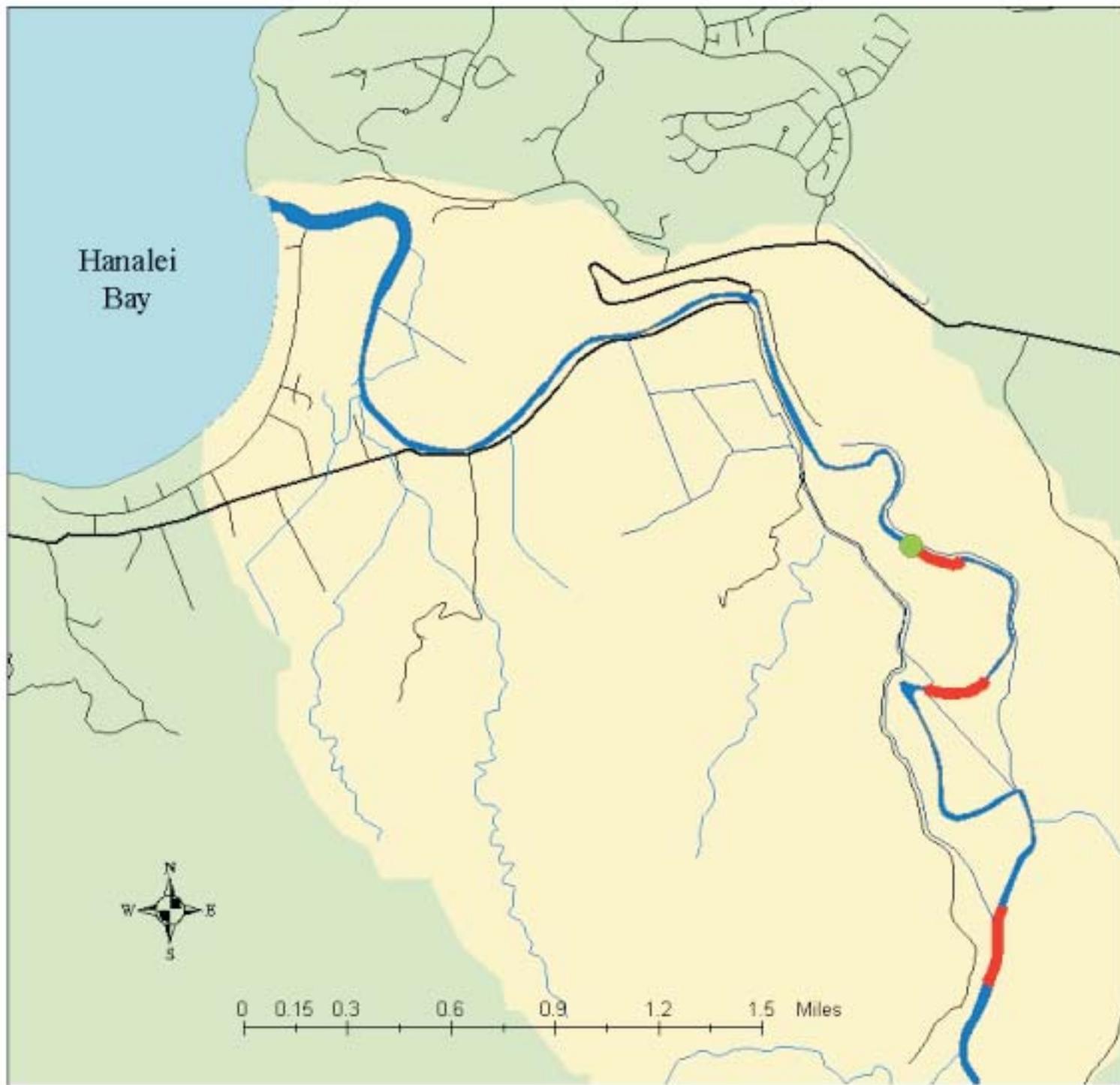


Figure 4. Long Term Ecological Monitoring (LTEMP) Sampling Sites, Hanalei River, Kaua'i, Hawai'i



-  Fish Count Transects
-  Larvae Sampling Site

Appendix 1. Enterococcus indicator Bacteria, Geometric Means, Hanalei River at Weke Road, Hanalei Bay Landing, Hanalei Bay Pavilion, and Hanalei Bay at Pinetrees, April 2001 to April 2002

**Hanalei Heritage River  
One-Year Study (4/7/01 to 4/8/02)**

|                  | River |      | Landing |       | Pavilion |       | Pinetrees |       |
|------------------|-------|------|---------|-------|----------|-------|-----------|-------|
| n=               | 217   |      | 217     |       | 217      |       | 217       |       |
| median           | 167   |      | 41      |       | <10      |       | <10       |       |
| geometric mean   | 173.1 |      | 45.0    |       | 10.6     |       | 10.7      |       |
| # <10            | 2     | 0.9% | 29      | 13.4% | 123      | 56.7% | 129       | 59.4% |
| # <33            | 21    | 9.7% | 101     | 46.5% | 193      | 88.9% | 187       | 86.2% |
| maximum          | 6,488 |      | >24,192 |       | >24,192  |       | 3,784     |       |
| average salinity | 3.0   |      | 27.5    |       | 35.0     |       | 35.6      |       |

| Project  | Description  | Plan of Action   | Partners & Leads  | Accomplishments and Participation   |
|--|--|--|---|---|
| <b>(1a/1b)</b> Total Maximum Daily Loads (TMDL)    | TMDL for fresh water section and estuary of Hanalei River  | Contract out Estuary TMDL<br>DOH to do TMDL for fresh water reaches  | Leads: DOH, HHRP<br>Partners: Waipa Foundation, DOH   | Commitment for TMDL received from DOH, Cooperation with Waipa Foundation secured  |
| <b>(2a/2b)</b> Wastewater Treatment for Hanalei    | Provide wastewater treatment for Hanalei Watershed   | convene community discussion on wastewater treatment options & develop wastewater treatment plan   | Leads: HHRP, DOH, County Public Works<br>Partners: Waipa Foundation, University of Hawaii   | 5/02 HHRP attended a Constructed Wetlands for Wastewater Treatment Workshop HHRP<br>9/02 University of Hawaii Practicum on wastewater treatment |
| <b>(3a/3b)</b> Sediment Control<br><b>KEYSTONE</b> | design and implement a sediment load and budget study in the Hanalei River watershed   | Implement BMPs for sediment control<br>Monitor turbidity, flow, sediment load  | Leads: USGS, FWS, HHRP, Waipa Foundation<br>Partners: USGS, NRCS, FWS, Waipa Foundation   | USGS real-time gauge installed  |
| River's Meander-Cutoff Repair<br><b>KEYSTONE</b>   | Repair cutoff in a way that will provide water to farmers/refuge and provide for healthy instream ecosystem                    | Continue discussions & public awareness<br>Gauge FWS intake & instream flow<br>DU to complete engineering.   | Leads: Taro Farmers Assoc, FWS<br>Partners: FWS, COE, DLNR, DU  | 9/99 HHR forum to devise low-tech plan<br>3/00 FWS to gauge/monitor intake/outfall<br>03/01 DU hired for engineering                            |
| Scenic Views Protection<br><b>KEYSTONE</b>         | Identify and protect scenic views from roads, beaches, and other public places   | Compile existing data (include issues of night views, e.g. ambient light, street lights, etc)<br>Do community survey   | Leads: County of Kauai<br>Partners: Kauai Land Trust (lead), US Fish & Wildlife Service, Princeville Corporation<br>County of Kauai, Limu Coalition | General Plan Update Completed but Club Med site did not get included (no development scheduled)   |
| Watershed Master Plan<br><b>KEYSTONE</b>           | Comprehensive, community plan to define & maximize sustainable interaction with the ahupua'a mauka to makai (mountains to sea) | Develop scope of work<br>Develop GIS strategy<br>Inventory & Assessment, do & publish<br>Resource task force<br>Community Education<br>NRCS Cooperative River Basin Study<br>FWS Comprehensive Conservation Plan | Leads: FWS, NRCS, HHRP<br>Partners: NRCS, FWS, COE, USGS, DLNR, UH & SeaGrant   | 3/00-Task force commitments, FWS/HHR to do prelim. Scoping meeting<br>9/02 NRCS Funds UH Practicum  |

| Project                         | Description   | Plan of Action   | Partners & Leads   | Accomplishments and Participation   |
|---------------------------------|---|--|--|---|
| Inventory & Assessment (I & A)  | I & A of entire watershed, mauka to makai, for purpose of identifying and publishing existing resources and gaps in information | Get funded planner<br>Develop scope of work<br>Compile existing data<br>Identify GIS/GPS expertise/training<br>Establish GIS program<br>Identify data gaps | Leads: HHRP<br>Partners: NRCS, COE, DLNR, UH, Hawaii Helicopters                             | scope of work completed, compiled existing data,<br>Identified GIS/GPS expertise, Held GIS training, established GIS program, Identified Data gaps<br>2000 Griffin Thesis completed |
| Physical I & A                  | Flood plain study, water movement and budget analysis   | Develop scope of work (e.g. Instream flow, Hanalei Tunnel)<br>Develop mapping strategy<br>Compile existing data<br>Identify data gaps                      | Leads: FEMA, COE<br>Partners: COE, USGS, FEMA, FWS   | 3/00 USGS gauge construction (rain gauge & satellite telemetry) completed Forum on Flooding in Hanalei  |
| Infrastructure & Land Use I & A | Transportation & Rec facilities<br>Zoning, actual use, build-out projections<br>Prime Ag land identification<br>Public access   | Develop scope of work<br>Develop mapping strategy<br>Compile existing data<br>Identify data gaps   | Leads: NRCS, DOT, COK Planning<br>Partners: NRCS, COK planning, DOT, Hanalei Roads Committee | Kauai County updated General Plan included identification of land use designations<br>HHRP Obtained GIS data layers   |
| Natural I & A                   | I & A of instream and riparian natural resources- including estuary & bay   | Develop scope of work<br>Establish GIS program<br>Compile existing data<br>Identify data gaps<br>Vegetative cover survey<br>Native/alien species survey    | Leads: HHRP, UH Sea Grant, DAR<br>Partners: NRCS, DAR  | 2/00 CRAMP/Alan Friedlander- bay data<br>HHRP established GIS<br>NRCS in-stream training<br>HHRP LTEMP project  |
| Cultural & Historic I & A       | Archeological sites and sacred places<br>Place names<br>Scenic view plains<br>Historic sites                                    | Develop scope of work<br>Develop mapping strategy<br>Compile existing data<br>Identify data gaps<br>Record Oral Histories from Kupuna                      | Lead: HHRP<br>Partners: NRCS, COK planning, DOT, DLNR, FWS                                   | 10/02 recorded forum series on place names with Bruce Wichman<br>FWS Archeological Study on Refuge  |

| Project  | Description  | Plan of Action  | Partners & Leads  | Accomplishments and Participation   |
|--|--|---|---|---|
| Resource Task Force  | Discuss/develop holistic approaches to stewardship & mitigating watershed impacts  | Solicit participants<br>Develop scope   | Lead: HHRP<br>Partners: NRCS, EPA, FWS  | 3/00 Confirmed participants- NRCS, EPA, FWS/Eco. Svc.<br>2001 Specific Tasks assigned<br>TASK FORCE AJOURNED  |
| Protocol for River Ecosys., Water Quality & LTEMP Volunteer Monitoring | Establish straightforward, community friendly, affordable standards for watershed monitoring to assist in early detection of undesirable change. Conduct periodic bioassessment surveys to evaluate health of native species population. | Bioassessment (develop proposal, find funding/agency)<br>Gather data to establish baselines | Leads: Carl Berg (HHRP) and Adam Asquith (Sea Grant)<br>Partners: EPA, USGS, DOH, UH, Surfriders, Kula School, DLNR-DAR, UH Stream Research | 3/00 WQ consultation-EPA (Clean Water Act review, DOH, Tesoro Grant for water quality supplies, IDEXX sealer and bacteria supplies purchases, LTEMP protocol established and monthly data collected on 'o'opu nakea fishery, HHR hired lead field technician, I identified appropriate fish and larval count protocols.<br><b>LTEMP and WQ CONTINUING</b> |
| WQ impact of summer boats  | Comparative analysis of water in strategic points in river and bay to assess impact of summer boats on swimmable conditions  | completed   | Leads: Carl Berg<br>Partners: EPA, DOH  | 3/00 Carl Berg developed protocol. DOH did testing. Report out 10/00, EPA provided lab supplies DOBOR initiated holding tank permitting process<br><b>COMPLETED</b>   |
| Leptospirosis Education & Study  | Identify Non-point sources of Leptospirosis (Rats, Ducks, etc.?)   | Community education   | Leads: Roger Fujioka, Adam Asquith<br>Partners: EPA, Jeff Goodman MD, DOH   | 1/01 Experts I identified Forum held and broadcast  |

| Project                                 | Description   | Plan of Action  | Partners & Leads  | Accomplishments and Participation  |
|---|---|---|---|--|
| Konohiki Council                        | Overfishing and overcrabbing are putting pressure on native species. Local council to manage Hanalei fisheries.   | Do more "talk story", education<br>Bioassessment & fish harvest survey<br>Identify fishery management models in Hawaii & Pacific  | Leads: Jeff Chandler, Dick Sloggett, Dave Stuart<br>Partners: DOCARE  | 4 community meeting held<br>Forum on Moomomi Fisheries<br>Discussion on who should enforce existing rules  |
| Identify appropriate boating facilities | For local recreational users, although some people are interested in a fresh look at commercial operations. Discussion should involve all interested parties (community, DLNR-DOBOR/DAR, County, boaters, aquatic scientists) | Find out/report status of court cases<br>Conduct a community poll<br>Inclusive discussions w/county & state<br>DLNR DOBAR-DOCARE/community discussion re mooring enforcement<br>Ramp Repair<br>Jurisdiction needs to be clarified with State & County   | Leads: DOBOR<br>Partners: DLNR DOBOR--DOCARE, COK Planning, Limu Coalition  | 10/00 DLNR issued new rules<br>6/00 DOBOR meeting re: moorings<br>HHR held a DOBOR/DOCARE community forum  |
| Riparian Stabilization/Enhancement      | Remove invasive plants/restore native or appropriate species, mitigate human impacts  | A-Hau removal/maintenance pilot project-find funding (applied-EPA 5 star grant)<br>B-Rte.560 Riparian Corridor Vegetation Maint. pilot- Identify native groundcovers, develop nursery, coordinate DOT/volunteers, develop a flora/fauna handbook with school children<br>C-Interpretive signs | Leads: A- HHRP, Adam Asquith<br>B-Caren Diamond, Marilyn Pollock, Kula School<br>Partners: EPA, Waipa Foundation, DOT, NRCS | 3/00 A-Prelim. Scope done<br>1/02-1/03 National Fish & Wildlife Foundation Grant for Hau Bush Removal and Native Plant Restoration<br>2002 Hanalei Elementary SchoolFlora/Fauna Handbook in progress |
| Berm Analysis                           | Flood Plain Impact, complete 2-D flood plain analysis   | FEMA review<br>community participation<br>FEMA to commission complete flood plain study   | Leads: DLNR, Co. of Kauai Public Works<br>Partners: FEMA, COE, USGS, FWS, NFIP  | COE completed study<br>3/00 FWS analyzed berms<br>9/00 HHR forum on bermas and flooding<br>2002 FEMA issues draft map update   |

| Project                          | Description  | Plan of Action   | Partners & Leads  | Accomplishments and Participation   |
|----------------------------------|--|--|---|---|
| Local flood alert system         | Alarm system for local community to gauge flooding status Real-time data from Hanalei Gauge in FY01  | Develop specific proposal<br>Identify agency sponsor & funding<br>USGS to install real time telemetry<br>Encourage investigation into indicators   | Leads: USGS<br>Partners: USGS, NRCS   | USGS installed real time telemetry on Gauge   |
| Refurbish Hanalei Bay facilities | The county and state facilities need attention   | Hanalei Landing, Pavilion and Waioli Beach Park Bathrooms upgraded   | Leads: COK Public Works<br>Partners: COK Public Works, County Council           | Hanalei Landing bathroom upgraded to ADA compliant, Pavilion and Waioli Beach Park bathroom treatment to be upgraded  |
| Authority for Local Community    | Processes for early community notification & participation in governmental actions & decisions   | Participate in Draft GPU review<br>Invite candidates & officials to endorse vision & plan, hold them accountable<br>Governmental forums in Hanalei<br>Local agreements re ahupua'a mgmt, statewide movement for ahupua'a authority<br>Determine status of North Shore Advisory Committee | Leads: COK<br>Partners: Hanalei Community Association, COE, DOT, HCA, FEMA, FWS | HHR Forum Series:<br>6/00 DLNR DOBOR Boating<br>8/00 DOT Proposed Hanalei Scenic Overlook<br>9/00 FEMA Flooding in Hanalei<br>9/00 USGS Story of Sediment<br>11/00 DOT Scenic Overlook<br>11/00 UH Hanalei Heritage<br>2/01 FWS Critical Habitat<br>3/01 FWS Critical Habitat Newcombs Snail<br>4/01 DLNR Archaeology of Halele'a<br>Kauai County General Plan now requires Land Use Decision Comment from Community Associations |
| Lands for Public Acquisition     | Identify private lands important for public acquisition, easements, protection   | Identify and contact landowner<br>Contact Kauai Land Trust<br>Identify funding sources   | Leads: Kauai Land Trust<br>Partners: Private Land Owners, HHRP                  | Specific potential lands identified and purchase negotiations ongoing<br>HHRP did a series of 3 forums  |
| Support Taro                     | Hanalei Valley produces 67% of Hawaii's taro, providing a unique and stunning cultural landscape, rural setting, open space, & native endangered waterbird habitat | Community awareness & education<br>Government & scientific communications<br>Taro in school lunch program<br>Taro value added product promotion  | Leads: Kauai Taro Growers Assoc.<br>Partners: COK, USDA, HCA, HHRP, FWS         | Poi page in newsletter<br>Taro festival participation<br>Advocacy for expansion of taro production in Hanalei Valley  |

| Project                                   | Description  | Plan of Action   | Partners & Leads  | Accomplishments and Participation  |
|---|--|--|---|--|
| Agricultural Pest and Disease Support     | Apple snails now occur in all of the taro fields in Hanalei and present numerous threats to the industry.    | Forum to discuss approaches (harvesting & marketing, biological controls)<br>Raise public awareness & interest   | Leads: KTGA<br>Partners: UH Sea Grant, HHRP, USDA, UH   | 10/02 Rodney Haraguchi is developing apple snail aquaculture project   |
| 25 year Plan for Hanalei Heritage Road    | Participate in the upcoming planning process for Rte. 560  | Convene Road Coalition<br>Help keep DOT project on its timetable (starting in Sept)  | Leads: Hanalei Roads Committee<br>Partners: DOT, HHRP, COK Planning   | 3/00 DOT recognizes Hanalei Roads Coalition as community participant<br>10/02 4 community meeting held to discuss plan<br>DOT consultant was chosen  |
| New Hanalei Overlook & FWS Visitor Center | Facilitate community participation in the design, concept, and scope of work being developed by State DOT.   | Contact consultant hired by DOT for this project<br>Provide a community forum<br>Identify community concerns<br>Assess benefit/cost to community<br>Update Community on DOT planning   | Leads: FWS, HHRP<br>Partners: DOT, Princeville Corp., HCA, Hanalei Roads Committee  | 3/00 DOT recognizes HHR as community participant<br>HHRP produced two forums on overlook issue   |
| Community Education and Information       | Community educational forums on issues pertinent to watershed science, resource management & local heritage. | Inform agencies of our interest in hearing their experts<br>Identify and invite experts in instream bioassessment<br>alien & native plants, fishery management, water quality, historical sites, hunting & gathering, taro support & other pertinent issues. | Leads: HHRP<br>Partners: EPA, USGS, NRCS, UH, 'Ilio'ulaokalani, Kauai Worldwide Com. Inc., Ho'ike, Hanalei School, Waipa Foundation, Limu Coalition | HHR Community Forums:<br>6/00 Talking Heads, local WQ issues<br>7/00 LTEMP training (3 forums)<br>7/00 DU-Objectives in Hawaii<br>8/00 Ahupua'a Health (GIS)<br>9/00 DU Stabilize cutoff<br>11/00 Mo'omomi Fishery<br>12/00 HHR vision Conference<br>1/01 WQ testing<br>2/01 Conserving our Coral Reefs<br>2/01 Ahupua'a Restoration<br>3/01 Wahi Pana, protocol for sacred places<br>3/01 Aquaculture in Hawaii<br>2002 Complete List of forums Available |

| Project                     | Description   | Plan of Action   | Partners & Leads   | Accomplishments and Participation   |
|-----------------------------|---|--|--|---|
| Youth Interpretive Program  | Engage local youth in exploring potentials of interaction with their culture and natural resources of ahupua'a, to, in the long term, promote economic opportunities & diversity. | Support Waipa Foundation in their efforts                                      | Leads: Waipa Foundation<br>Partners: Youth Environ Services, HHOOH Teen Force, FWS                 | 2002 Cultural Mapping of Waipa Ahupuaa, community health surveys completed  |
| Media Development           | Watershed and HHR project focused resources/library   | Community newsletter<br>Reference library<br>Web site                          | Leads:HHRP<br>Partners: Wasabi Designs   | Website created, quarterly newsletters published, reference library maintained, forum series available at Princeville public library and HHRP Library |
| Develop approach to Tourism | Promote increased awareness of local heritage & lifestyle. Explore ecotourism.  | Promote increased awareness of local heritage & lifestyle, Explore ecotourism. | Leads: KVB, HTA<br>Partners: EDA, SBA, Waipa Foundation  | 10/02 tourism survey conducted at Taro Festival   |
| Watershed Science Center    | Scientific facility where river and watershed related studies can take place  | Raise public awareness & interest<br>Identify location                         | Leads: HHRP<br>Partners: USDA RD, Kauai Public Land Trust, Nature Conservancy, Private Land Owners | Identification of potential site ongoing by Kauai Public Land Trust   |
| Cultural Center and Museum  | Central location for practitioners to teach, learn & market cultural skills. A "living collection" of local history & lifestyle   | Raise public awareness & interest<br>Identify location                         | Leads: Waipa Foundation<br>Partners: USDA RD, HHOOH, Hula Halau                                    | Traditional Halau Structures installed at HHOOH and Waipa Foundation  |
| Hanalei Gateway Sign        | Welcome to Hanalei sign on north side of bridge   | Design sign  | Leads: Hobey Beck<br>Partners: Hanalei Poi Company   | Location to be identified   |

| Project                                  | Description  | Plan of Action  | Partners & Leads  | Accomplishments and Participation   |
|--|--|---|---|---|
| Trail Restoration, Creation, Maintenance | In addition to traditional trails, a pedestrian path through town and riparian path from the bridge to the river mouth is desirable. | Identify old paths<br>Check with elders.<br>Check GPU for pedestrian pathway in Hanalei<br>Research TEA-21 funds<br>Interpretive signs with an advisory group | Leads: Na Ala Hele<br>Partners: HCA, NPS  | Na Ala Hele has held community meetings   |
| Revive Old Hanalei Road                  | Improve and allow public access to old highway for hiking and biking   | Develop route from Princeville to Hanalei town and/or river estuary<br>Need funding   | Leads: Na Ala Hele<br>Partners: FWS, North Shore Bike Club  | Identification of safety and logistical issues completed  |
| Interpretive Walking Tour                | Interpretive walking tour of Hanalei, possibly as a fundraising tool (sell pamphlets)  | Identify historical sites in Hanalei<br>Determine interest in Walking Tour  | Leads: Kauai Historical Society<br>Partners: HHRP, KVB, COK CDBG  | Community interest survey completed, historical sites identified  |
| Horse & wagon tour of Hanalei            | Interpretive driving tour of Hanalei   | Define project<br>Determine public support  | Leads: Princeville Ranch<br>Partners: Carswell Ranch  | discussion of logistics resulted in the need to find a safer braking system for wagons  |
| Publishing                               | Website, GIS, Newsletter, AHRI documents   | Identify equipment/publishing sources<br>children's flora/fauna handbook  | Leads: HHRP<br>Partners: Hanalei School, USGS, AHRI   | 10/00 Website on-line<br>8/00 GIS developed<br>quarterly newsletter published<br>8/01 & 10/02 AHRI Publications<br>Flora/Fauna Handbook ongoing |
| Marketing Community Events               | Promoting increased awareness of local heritage & lifestyle  | Develop public relations contacts<br>identify advertising sources<br>AHRI Conference in Hanalei May 2003  | Leads: HHRP<br>Partners: KKCR, KONG, Kauai Visitor Bureau, Hoike, COK CDBG                                    | 3/00 HHR quarterly newsletter debut, 3/26 KVB funded kupuna travel  |
| Accommodations                           | overnight and short-term visitors  | For HHR interns & visiting experts overnight & short term   | Leads: HHRP<br>Partners: FWS, Waipa Foundation, Limahuli Nat'l Bot. Garden, Camp Naue, Individual Home Owners | Visiting experts and interns have been accommodated by Waipa, Community Residents, Limahuli, and Camp Naue                                      |

| Project     | Description  | Plan of Action   | Partners & Leads  | Accomplishments and Participation   |
|-------------|--|--|---|---|
| HHR Program | The HHR Program is funded by the US Forest Service in a multi-program grant. | Acquire funding approval through 5/04  | Leads: HHR staff<br>Partners: USFS Region IV                      | US Forest Service has committed to funding HHRP through 5/04<br>Acquired 6/98-5/03 funding approval<br>7/98 HHRP Staff Elected  |
| Fundraising | The goal is for the HHR to become self supporting                            | Explore assessing transient summer boats in Bay<br>Tshirts- Solicit artists, printers & merchants on consignment basis<br>Participate in festivals & fairs to sell tshirts & posters<br>Explore custom license plates<br>Explore endowment funding | Leads: HHRP,<br>Partners: EPA, Kauai Northshore Business Council, | 3/00 EPA Grant Consultation, HHR develops logo and t-shirt for program promotion, sold t-shirts and posters at Taro Festival and Earth Day<br>11/02 ongoing funding development<br>6/02 HHRP staff attending fundraising workshop |

ACRONYMS: Army Corps of Engineers (COE), Community Development Block Grant, Housing and Urban Development (CDBG), County of Kauai (COK), Coral Reef Assessment and Monitoring Program (CRAMP), Cooperative River Basin Study (CRBS), Division of Aquatic Resources (DAR), Dept. of Land & Natural Resources (DLNR), Division of Boating & Ocean Recreation (DOBOR), Division of Conservation and Recreation Enforcement (DOCARE), Dept. of Health (DOH), Dept. of Transportation (DOT), Ducks Unlimited (DU), Economic Development Agency (EDA), Environmental Protection Agency (EPA), Federal Emergency Management Agency (FEMA), US Forest Service (FS), US Fish & Wildlife Service (FWS), Geographical Information System (GIS), Global Positioning System (GPS), General Plan Update (GPU), Hanalei Community Association (HCA), Hale Halawai Ohana O Hanalei (HHOOH), Hanalei Heritage River (HHR), Hawaii Tourism Authority (HTA) Inventory & Assessment (I & A), Kauai Taro Growers Association (KTGA), Kauai Visitors Bureau (KVB), Long-Term Ecological Monitoring Program (LTEMP), National Flood Insurance Program (NFIP), National Park Service (NPS), Natural Resources Conservation Service (NRCS), Small Business Administration (SBA), US Dept. of Agriculture Rural Development (USDA RD), University of Hawaii (UH), US Geological Survey (USGS), Water Quality (WQ)

## **NATURAL RESOURCES CONSERVATION SERVICE**

### **CONSERVATION PRACTICE STANDARD**

#### **FENCE CODE 382**

##### **DEFINITION**

A constructed barrier to livestock, wildlife or people.

##### **PURPOSES**

This practice may be applied as part of a conservation management system to facilitate the application of conservation practices that treat the soil, water, air, plant animal and human resource concerns.

##### **CONDITIONS WHERE THIS PRACTICE APPLIES**

This practice may be applied on any area where livestock and/or wildlife control is needed, or where access to people is to be regulated. Fences are not needed where natural barriers will serve the purpose.

##### **CRITERIA**

Fencing materials shall be of a high quality and durability, and the construction performed to meet the intended management objectives.

Fences shall be positioned to facilitate management requirements.

Standard or conventional (barbed or smooth wire), suspension, woven wire, or electric fences shall consist of acceptable fencing designs to control the animal(s) or people of concern and meet the intended life of the practice.

Height, number, and spacing of wires will be installed to facilitate control and management of the animal(s) and people of concern. Height, size, spacing and type of posts will be used that best provides the needs for the style of fence required and is best suited for the topography of the landscape.

##### **CONSIDERATIONS**

Consider installing fences in locations that will facilitate maintenance avoiding irregular terrain and/or water crossings.

Consider wildlife movement needs when locating fences.

Consider livestock management, handling, watering and feeding when locating fences. Boundary fences shall comply with state laws and standards for construction.

Where applicable, clear right-of-ways will be established which will facilitate fence construction and maintenance.

Consider soil erosion potential when planning and constructing a fence on steep slopes.

##### **PLANS AND SPECIFICATIONS**

Plans and specifications are to be prepared for specific field sites based on this standard and appropriate state or local statutes or laws.

## OPERATION AND MAINTENANCE

Regular inspection of fences should be part of an on-going management program. Inspection of fences after storm events is needed to facilitate the function of the intended use of the fence.

Maintenance and repairs will be performed as needed to facilitate the intended operation of the installed fence.

*Some items to be observed and/or corrected are:*

- \_ tension of wire;*
- \_ broken wires;*
- \_ holes in woven wire,*
- \_ staples pulled out;*
- \_ missing wire clips;*
- \_ post alignment; especially corner, gate, and end posts;*
- \_ post stability, rotting wooden posts;*
- \_ bent or broken posts;*
- \_ corroding steel posts or wire;*
- \_ broken welds on steel posts;*
- \_ sagging gates;*

### ***\_ bent or broken stays; and***

*\_ are the requirements for the intended purpose of the fence being fulfilled by the number, size, and spacing of the components of the fence?*

382 – Page 2 of 4 Fence  
Standard FOTG Section IV  
NRCS, HI  
August 2002

*Additional guidance is provided in the NRCS Hawaii Specification for Non-electric Fence, Electric Fence, and Game-proof Fence. Site-specific specifications are to be documented on the NRCS Hawaii Jobsheet for Non-electric Fence, Electric Fence, or Game-proof Fence, as appropriate and given to the client. Other documents such as worksheets, maps, and drawings may be used to plan and design the practice.*

# Waipā Foundation



P.O. Box 1189, Hanalei, HI 96714  
Email [s\\_sproat@hotmail.com](mailto:s_sproat@hotmail.com)

Phone (808) 826-9969  
Fax (808) 826-1478

November 7, 2002

Governor Ben Cayetano  
State Capitol  
415 South Beretania St  
Honolulu HI 96813

Dear Governor Cayetano.

Waipā Foundation would like to support your nomination of the Hanalei Heritage River program for a US Environmental Protection Agency Watershed Initiative grant. Waipā Foundation currently partners with the Hanalei Heritage River Program's water quality sampling and riparian restoration projects.

Waipā Foundation will participate in the Hanalei Watershed Initiative project by collaborating in the Best Management Practices (BMPs) for sediment control. BMPs for cultivation and harvesting kalo, slowing flow rates in outflow drains, livestock fencing, and regular maintenance will be implemented.

Waipā Foundation will also offer support of this initiative through a substantial in kind match. Waipā Foundation, funded by Kamehameha Schools, will begin a community-based stream monitoring and research program in the ahupua'a of Waipā. Base-line data on stream flow, stream fauna, water quality and water use in Waipā will guide ahupua'a restoration. Stream flow will be diverted to a historical auwai (irrigation ditch) for traditional use (kalo cultivation), and the impact of the diversion will be monitored. Waipā Foundation will also offer, as an in kind match, the labor to install livestock fencing.

We support the Hanalei Watershed Initiative, and look forward to continuing our partnership through this Watershed Initiative Grant. If you have any questions or would like to receive more information on Waipā Foundation's Programs, please contact me by telephone at (808)639-1815.

Sincerely,



Stacy M. Sproat  
Executive Director



## United States Department of the Interior

### FISH AND WILDLIFE SERVICE

Kaua'i NWR Complex

P.O. Box 1128

Kilauea, HI 96754

November 7, 2002

Robert Wayland, Director  
Office of Wetlands, Oceans, and Watersheds  
USEPA  
Rm. 7130  
1301 Constitution Ave, NW  
Washington, DC 20004

Subject: EPA Watershed Initiative

Dear Mr. Wayland:

The U.S. Fish and Wildlife Service, Hanalei National Wildlife Refuge will lend our support to the Hanalei Heritage River Program grant proposal under the EPA Watershed Initiative. Hanalei NWR contains about 900 acres astride the Hanalei River with 180 acres of wetland taro farming on the refuge. Taro farming activities result in the discharge of sediments and nutrients through agricultural drains into the Hanalei River. The Refuge would cooperate with the Hanalei Heritage River Program to use best management practices to reduce the sediments and nutrients in agricultural drain discharges. The refuge would assist with staff and equipment as needed to construct, modify and maintain farm drain structures, in addition to working with refuge farmers to modify activities that generate high sediment and nutrient loads.

Also, the Refuge would support and cooperate in the replacement and upgrading of sewage systems for selected refuge farmers living on refuge owned lands in Hanalei NWR along the Hanalei River.

Sincerely,

Michael M. Hawkes  
Refuge Manager

BENJAMIN J. CAYETANO  
GOVERNOR OF HAWAII



BRUCE S. ANDERSON, Ph.D., M.P.H.  
DIRECTOR OF HEALTH

STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. BOX 3378  
HONOLULU, HAWAII 96801

In reply, please refer to:  
File:

EPO

October 14, 2002

Carl Berg, Ph.D.  
c/o Hanalei Heritage River  
P.O. Box 1285  
Hanalei, Hawaii 96714

Dear Dr. Berg:

In response to recent discussions about Department of Health (DOH) participation in development of a Total Maximum Daily Load (TMDL) report for the Hanalei River, island of Kauai, my staff and I have agreed, pending funding availability, to participate in the Hanalei Watershed Initiative project by preparing TMDLs for selected pollutants in the fresh water portion of the river system. We understand that other partners in the project have agreed to provide flow data from the upper part of the river, GIS products and other information that will enable computation of TMDLs for the headwater reaches, the lower estuarine reach, and the marine portion around the discharge point into Hanalei Bay, and that preparation of TMDLs for the remaining fresh water reaches of the river should be undertaken in concert with the work of these other participants.

In order to maximize opportunities for coordination among partners it would be preferable for the entire TMDL study to be funded from the Watershed Initiative grant, as we cannot assure you in advance that annual grant funds available to the DOH in federal fiscal year 2004 will be sufficient to support the fresh water TMDL component for the mid-river reaches during the study period for the headwaters and estuary.

We support the Hanalei Watershed Initiative project, and hope that the planned partnership to establish TMDLs for the Hanalei River will become a reality. If you have any questions or would like to receive more information regarding DOH's Total Maximum Daily Load Program, please contact me by telephone at (808)586-4424, or via e-mail to [lgill@mail.health.state.hi.us](mailto:lgill@mail.health.state.hi.us).

Sincerely,

A handwritten signature in black ink, appearing to read "Gary Gill".

GARY GILL  
Deputy Director  
Environmental Health Administration



Natural Resources Conservation Service  
P.O. Box 50004  
Honolulu, HI 96850

United States Department of Agriculture

*Our People...Our Islands...In Harmony*

October 28, 2002

Governor Ben Cayetano  
State Capitol  
415 South Beretania St.  
Honolulu, HI 96813

Dear Governor Cayetano,

This letter is to lend my support for your nomination of the Hanalei Heritage River program for an U.S. Environmental Protection Agency (EPA) Watershed Initiative grant. The newly-established Watershed Initiative program is intended to provide states and local communities with the funds to protect and restore water resources through community-based and locally-appropriate methods.

The Hanalei Heritage River program was initiated in 1998 with the federal designation of the Hanalei River as an American Heritage River (AHR). Hanalei was one of 13 rivers so designated from hundreds of nominations. The AHR designation focused existing federal programs and provided basic administrative support for the leadership of the Hanalei Heritage River Hui. The goal of the AHR Initiative is to support local efforts for ecologic restoration, community development, and historic and cultural preservation. The AHR Initiative intends for the local programs to become self-supporting and federal administrative funding, under AHR, is to end in 2004.

The Hanalei community used traditional consensus-based decision making to develop a watershed-wide Vision and a Five-Year Watershed Action Plan. The Hui has successfully implemented a number of projects in the Action Plan, including nearshore water quality monitoring in Hanalei Bay and a riparian restoration trial program that is evaluating management options for the rampant ha'u growth in the lower river reaches. The USDA Natural Resources Conservation Service will assist with hydrologic and sediment inventory and analyses of the upper watershed and Hanalei River system.

Other elements of the Action Plan have yet to be started and many of the efforts await funding assistance. The EPA's Watershed Initiative is timely. Its grants can ensure that important elements of the Action Plan are undertaken to move toward the Hanalei Watershed vision.

I thank you for your support of the Hanalei community, which is trying to ensure a culturally-connected and economically and environmentally sustainable future.

Sincerely,

KENNETH M. KANESHIRO  
State Conservationist

cc: Makaala Kaaumoana, Program Coordinator, Hanalei Heritage River Program

The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

An Equal Opportunity Provider and Employer

# UNIVERSITY OF HAWAII AT MANOA

Hawaii Institute of Marine Biology

Paul L. Jokiel • Coral Reef Studies  
P.O.Box 1346, Coconut Island, Kaneohe, Hawaii 96744-1346 USA  
Phone:808-236-7440 • FAX:808-236-7443 • E-mail: jokiel@hawaii.edu

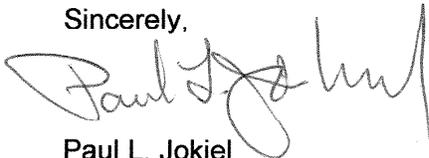
13 November 2002

Robert Weyland  
United States Environmental Protection Agency  
1200 Pennsylvania Avenue  
Washington D.C.

To Whom It May Concern:

This letter documents my commitment in kind (State of Hawaii Salary and Fringe Benefits) to the Hanalei River Watershed Project Watershed Initiative as stated in the proposal. As Principal Investigator for the Hawaii Coral Reef Assessment Monitoring Program (CRAMP) I can assure you of a strong ongoing commitment to this work. The coral reefs of Hanalei Bay are directly impacted by activities on the Hanalei River watershed. We are in a position to measure changes on the reef that result from changes in land management practices. We have been monitoring the reefs Hanalei Bay for several years and intend to expand our work to include monitoring of coral recruitment as part of this initiative.

Sincerely,



Paul L. Jokiel  
Researcher

# UNIVERSITY OF HAWAI'I

---

Sea Grant Extension Service  
School of Ocean and Earth Science and Technology

11 November 2002

Office of the Governor  
State Capitol  
415 S. Beretania  
Honolulu, HI 96813

Dear Governor Cayetano,

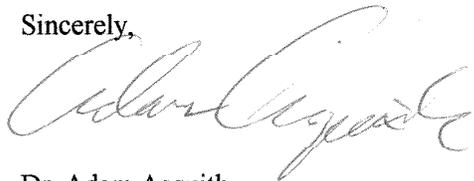
I have reviewed the Hanalei Heritage River Program's proposal for the Environmental Protection Agency Watershed Initiative Grant. The proposal is appropriate and achievable. I am glad to provide assistance to their program as I have done in the past.

As you know, we have successfully trained over a dozen volunteers to conduct monitoring of native fishes in the Hanalei River and Waipa Stream. The data these volunteers collect are novel, professional and important.

I am working closely with the Waipa Foundation in restoration and management of that watershed and our work there is a natural component to the new proposal. In addition, I will continue to assist in volunteer training, data interpretation, providing technical assistance and outreach for the stream monitoring components of their program.

I hope the merits of the proposal are recognized and look forward to working with the Hanalei Heritage River Program and the community toward understanding and managing the natural resources in the larger Hanalei watershed.

Sincerely,



Dr. Adam Asquith  
Extension Specialist