APPENDIX C: REGIONAL and WATERSHED APPROACHES

1. Watershed-Based Management Activities

Since the goal of the coastal nonpoint pollution control program is the protection of coastal water quality, a coordinated management system is needed to address a myriad of land use, social, economic, geologic, biological and technological factors. A comprehensive management system needs to include a coordinated governance structure, integrate planning across all levels (State, regional, County, and sector), and incorporate better planning approaches. One effective way to address the goals and requirements of the coastal nonpoint pollution control program planning process is to collectively address all uses and activities upstream from coastal waters employing an integrative regional and/or watershed framework. Such an approach can integrate coastal and land based resources management, rather than approaching management sectorally. Thus, the goal of the watershed/regional approach is not to supersede existing planning and management efforts, but to provide a broader framework for integrating and extending such efforts. It can maximize the use of human and financial resources by providing a framework for more effective agency coordination and for linking planning and management activities within a specific area, as well as ensuring compatibility among existing plans and policies.

Such a planning approach would also consider and address the impact of external plans, activities and forces outside the specified area. Where environmental management has in many places become too large a task for government agencies alone to manage, a watershed and/or regional approach provides a more inclusive process of management, encouraging the collaboration of local residents. With its focus on local watersheds, this approach can also build upon a strong sense of community identification with specific regions or watersheds that commonly occurs throughout Hawaii.

2. Watershed Planning and NPS Pollution Control: The Roles of Community

Communities have important roles to play in many practical aspects of watershed management and monitoring. They should be involved in decision making processes in watershed planning, protection and management. It is also possible and advantageous to cooperate with community members when conducting research into many scientific aspects of watershed processes and dynamics. Active public participation in the development and implementation of pollution reduction projects is seen by the Environmental Protection Agency (EPA) and others as an effective supplement and alternative to solutions based solely on engineering structures and imposed government programs.

From an overall nonpoint source pollution management perspective, communities in Hawaii need to be involved. Community involvement is an essential component in the development of holistic and long-term regional or watershed plans and policies which are locally pertinent, and can effectively protect Hawaii's water quality. As a key element in the design of strategies to reduce polluted runoff, community cooperation could be a major component in Hawaii's future watershed and regional management schemes.

Hawaii's topography and cultural landscape reinforce this concept. Many communities in Hawaii are situated in clearly distinguishable and discrete watersheds, with short and well-defined stream systems that drain distinct basins, and which contain an assortment of land uses. Communities themselves often have a strong knowledge of and sense of identity with the valley or watershed in which they live. In this respect, many of Hawaii's watersheds are ideally suited for the design of comprehensive watershed management schemes, as they naturally form well-defined hydrological units with interrelationships specific to those resident communities. There are a number of roles communities may play in watershed and regional approaches to planning:

(a) Research and Monitoring: Trained volunteers represent a skilled labor force capable of collecting a wide range of watershed related data, such as the characterization and classification of stream corridor habitat, chemical and biological sampling, stream flow, rainfall, and turbidity. Coordinated sampling efforts can yield important data from activities related to the monitoring activity, such as sighting and protection of endangered species, and gathering of historical and cultural information (land use, local knowledge of rainfall patterns, tidal action, etc.). An extraordinary breadth of monitoring and research activities is being carried out by communities around the United States, as described in the EPA's 1994 *National Directory of Volunteer Environmental Monitoring Programs.*

(b) Watchdogs and Stewards: Self-policing qualities emerge from the involvement of communities in their own watershed resource management . In addition to being less costly in the long term, these have the added benefit of being likely to identify and respond to problems in a more timely matter than centrally managed controls. They may react to problems before they escalate into crisis proportions. People are often all too aware of the polluting actions going on around them. They often know the areas better than government officials do. By rooting the public involvement campaign in the community and letting the community define as much as possible the problems and mechanisms for a solution, the program begins and stays as a community program rather than a government program in which the community is allowed to participate.

(c) Education: In the case studies explored below, there is ample evidence of the educational benefits to communities through involvement in nonpoint source pollution management. Beyond the more obvious examples of the involvement of students of all ages in the monitoring of stream quality, mapping and other exercises, there are other dimensions to the process that are more subtle. Protecting aquatic resources raises awareness, and a sense of stewardship

beyond the core individuals involved. By exemplifying for others that educating oneself and acting on that awareness is meaningful and possible within the community, nonpoint source pollution activities generated locally also have a community development component as well.

(d) Collaboration: A collaborative approach has proven effective in improving the rapport between community members, landowners, governmental agencies, scientists and other relevant groups. This collaboration can be advantageous for all parties concerned, enabling enhanced flows of information, and creating a forum where complex multi-faceted polluted runoff problems can be discussed. Building this type of communications network also provides a means by which to resolve conflicts. Creating a forum which allows for direct public involvement in the design of watershed management policies accomplishes the need to be sensitive to local needs and community concerns.

Another level of collaboration is possible in cooperative efforts to reduce polluted runoff. This includes combined efforts in reducing nonpoint source pollution loads through collective research and mitigation measures, and collaborating in identifying needed behavioral changes. Community-based approaches to watershed management are perhaps best known for their ability to develop and mobilize an organized and enthusiastic volunteer labor force for stream clean-ups, beach litter pick ups, and habitat enhancement. Communities are a source of people power, and if provided the tools of trained expertise combined with local knowledge, represent strong allies in the effort to control polluted runoff.

3. Case Studies: Community Based Watershed Management in Hawaii

This section presents several case studies of community watershed management efforts in Hawaii. This compilation is not an exhaustive treatment of all activities, nor does it uniformly address the details of each individual study. Rather, it is a preliminary effort to bring together and examine some key aspects of the Hawaii experience. Efforts were made to gather material on a variety of approaches, differing in the nature of their origins, goals, the types of collaboration achieved, their sources of funding, and their geographic location and scope. Taken together the details of these case studies provide a broad brush picture of current community watershed management activities around the state. Beyond these case studies, however, it remains clear that numerous other cases await evaluation and documentation.

A. Waimanalo Community Water Quality Protection Activities, Oahu

Waimanalo is a case in which a community has been drawn together around a common concern: the continuing deterioration of water quality in Waimanalo Bay. In particular, the community was concerned about the highly visible polluting activities of several local agricultural businesses. The Waimanalo story is one of successful networking, community-building and education, but also one

of variable success in enlisting agency support, as well as frustrated collaboration efforts.

In 1990 Waimanalo community residents worried about local water quality, expressed to the Waimanalo Neighborhood board their continuing concerns about the deteriorating water quality of the Waimanalo Bay, and the persistent violation of water pollution laws by the Meadow Gold Dairy. These community concerns were carried by the Neighborhood Board to the Department of Health (DOH). Some time thereafter, DOH issued a notice of violation to Meadow Gold Dairy and posted polluted water signs along Waimanalo stream. The Waimanalo Neighborhood Board also requested that DOH assess civil penalties against Meadow Gold Dairy for water pollution violations, although no action ensued.

In 1991, Waimanalo community resident members of the Sierra Club and the Surfrider Foundation next asked both of these organizations, represented by the Sierra Club Legal Defense Fund, to pursue legal action against the Dairy for its water polluting violations. Shortly after the Sierra Club Legal Defense Fund filed its intent to sue, DOH announced a proposed settlement for water pollution violation by the Dairy. Also during this period, the Waimanalo Neighborhood Board established a Water Resources Committee to 1) identify current and potential sources of water pollution, 2) gather information from previous water quality studies and on regulatory policies, 3) establish a dialogue with state/city agencies and elected officials, and 4) expand water quality monitoring and clean-up activities.

In 1992, this Water Resources Committee submitted comments against DOH proposed settlement. The Court subsequently rejected the proposed settlement. The Court also granted Sierra Club and Surfrider Foundation status as plaintiffs-intervenors for the same water pollution violations alleged by the State against Meadow Gold Dairy. Meanwhile, the Water Resources Committee also authored a House Concurrent Resolution requesting DOH to prepare a plan to strengthen the water quality sampling program for Waimanalo Bay and to develop a citizen water monitoring program (H.C.R. 363). Representative Jackie Young submitted House Concurrent Resolution 363 which passed the 1992 Legislative session. DOH was requested to collaborate with the Waimanalo Water Resources Committee and the Water Resources Research Center of the University of Hawaii in the preparation of the plan. This plan was never prepared.

In 1993, the Water Resources Committee authored a $45,000 grant proposal, for a grant subsequently awarded by the USGS through the University of Hawaii Water Resources Research Center, and administered by the University of Hawaii Environmental Center, to develop a Master Plan for water quality assessment in Waimanalo. The plan was to also initiate a project which included: 1) community education to reduce water pollution, 2) training community volunteers in sampling techniques, 3) compilation of previous water quality studies, and 4) range finding and baseline water quality monitoring utilizing community volunteers and University of Hawaii graduate students. The one-year grant was awarded. However, the project did not achieve the stated goal to develop a Master Plan for water quality assessment in Waimanalo, and the

project reports were not shared with the Waimanalo community. The project also did not conduct community education activities to reduce water pollution, train community volunteers in sampling techniques, or baseline water quality monitoring.

Meanwhile a second proposed settlement was filed to resolve all of the water pollution violation claims against Meadow Gold Dairy. The proposed settlement included a $130,000 gift for Waimanalo water quality activities to be administered by the Hawaii Community Foundation. This proposed settlement was accepted by the court. Also, Representative Jackie Young worked with Save Our Bays & Beaches (SOBB) and the Waimanalo Resources Committee to author Bill 1563 requesting the Department of Health to establish a pilot program to create and test a model of water quality surveying and sampling using volunteers in Kailua and Waimanalo, and to appropriate $45,000. This bill passed, and DOH subsequently contracted with University of Hawaii Sea Grant Extension Service to develop a Kailua & Waimanalo Water Quality Monitoring Program. The goals of the program include: 1) to help develop educated and involved community members that are committed to preserving and protecting Hawaii's water resources, 2) to organize community volunteers to collect usable water quality information relating to the local watershed and bays, 3) to develop community-based solutions to pollution problems and 4) to develop a program that can be replicated elsewhere in Hawaii. An advisory council was formed to design and implement the program, facilitated by Sea Grant. Four stream teams were established to monitor water quality using Hach test kits. These stream teams are still informally continuing monitoring and other efforts.

In both 1994 and 1995, bills to continue and expand the pilot program to create and test a model of water quality surveying and sampling using volunteers were submitted to the Legislature but did not pass. The Kailua and Waimanalo Volunteer Water Quality Monitoring Program also submitted an unsuccessful $10,000 grant submittal to DOH for EPA §319 monies for continuation of the project. Recently, however, Waimanalo Community Development Corporation and Waimanalo Health Center have been awarded a $60,000 one-year grant to establish a Waimanalo Watershed Council for 1) community education, 2) volunteer water quality monitoring, 3) watershed management plan, and 4) stream stewardship. They have also submitted an additional proposal to develop and support this project.

Contact: Nancy Glover, Ph.D., Water Resource Committee Chair, Waimanalo Neighborhood Board, and Waimanalo Community Development Corporation (808)259-8946

B. Kailua & Waimanalo Bays Volunteer Water Quality Monitoring Program, Oahu

Over the past few years, there has been increasing public concern over the quality of both Kailua Bay and Waimanalo Bay. Both these Bays have experienced periods of poor water quality caused by point and nonpoint sources of pollution. These water quality problems were initially thought to be caused by failing

cesspools, antiquated sewer lines, and a waste water treatment plant that periodically flooded during heavy rains. However, a DOH assessment of the area's coastal waters pointed to a more complex picture, with bacteriological counts indicating that polluted runoff was playing a far greater role than previously thought.

Agreed upon by all parties involved was the need for comprehensive information on the impact of point and nonpoint pollution the area's coastal and riparian environments. This required frequent sampling of the streams, ponds and bays of the Kailua and Waimanalo watershed areas to provide the baseline data on the sources and impact of area pollution. Unfortunately, the state lacked the necessary funds for such a long-term sampling program. Additionally, given the current and planned housing and agricultural developments in Waimanalo further community educational efforts were sorely needed to achieve any long term reduction of nonpoint source pollution. Representative Jackie Young worked with SOBB and the Waimanalo Water Resources Committee to author Bill 1563 requesting DOH to establish a pilot program to create and test a model of water quality surveying and sampling using volunteers in Kailua and Waimanalo, and to appropriate $45,000. This bill passed, and DOH subsequently contracted with University of Hawaii Sea Grant Extension Service to develop a Kailua & Waimanalo Water Quality Monitoring Program. See page C- 5 for a description of the program goals. An advisory council was formed to design and implement the program, facilitated by Sea Grant. Four stream teams were established to monitor water quality using Hach test kits. These stream teams still informally continue monitoring and other efforts.

Excerpts from Kailua & Waimanalo Bay Project Report to Legislature, 1994

On neutral venues for meetings:

"Given the need to hold meetings in situations which were neutral and open to any member of the community, regular meetings took place in public venues easily accessible and acceptable to the participants. These venues included public libraries and school meeting rooms, rather than volunteer's private residences."

On collaboration:

"Close collaboration was sought between governmental agencies, the scientific community, and community members. When initially soliciting the help of potential scientific cooperators, we emphasized that the project was a collaborative effort between community, landowners, government, private industry, academics and scientists. This usually served to mitigate many of the suspicions and skeptical attitudes some experts have towards volunteers and the community. We also stressed that the volunteers were able to assist the scientists in their field of research, and that the program aimed to work with government researchers and community in a mutually beneficial and cooperative manner.""

Partnership defined:
"It is important to emphasize that this was a partnership among government, private landowners, university, and concerned volunteers. This was not a vigilante environmental program. Private property rights were respected, and every effort was made to include landowners in the program. Also, all community meetings were conducted by a trained facilitator to ensure effective and highly participatory interaction."

Beginning in October of 1993, the Pilot Program sought to determine what volunteers could realistically and usefully do in monitoring water quality, what training and education programs work in Hawaii, and how a community could collaborate with governmental agencies and the scientific community to cooperatively manage watershed areas. The project was judged successful in educating community members to assist in the protection of water resources. The education and training of community volunteers empowered those members to take an active and collaborative role in the management of their water resources and environment. Collaboration between government agencies, scientific cooperators, and community members was a key element to the success of this aspect of the program.

The Pilot Program was also judged successful in producing a training manual, based on mainland models, but designed for Hawaii's watersheds and stream ecosystems. This manual was developed as a guide for other communities seeking to establish their own volunteer water quality monitoring programs. This manual is presently available in draft form. Upon its completion, it can serve to guide future similar programs in other areas of Hawaii.

Contact: Nancy Glover, Ph.D., Water Resource Committee Chair, Waimanalo Neighborhood Board, and Waimanalo Community Development Corporation (808) 259-8946

C. Kawai Nui Marsh, Community Wetlands Protection, Oahu

Kawai Nui Marsh is the largest wetland on the island of Oahu, and is home to all of Hawaii's four endangered waterbird species (the Hawaiian Stilt, Hawaiian Coot, Hawaiian Duck and Hawaiian Gallinule). A portion of the marsh has been designated as protected habitat for the recovery of these endangered species. In the late 1950's, several Kailua groups began advocating use of Kawai Nui's periphery for public park purposes. By the late 1960s, the Lani-Kailua Branch of the Outdoor Circle (LKOC) led a lobby for the City and County of Honolulu's acquisition for a park site, in place of a proposed housing development requiring massive dredge and fill. Tests proved the housing development to be unfeasible and repeated flooding ultimately forced the City to purchase 750 acres of the Marsh for flood basin management. An earthen dike was built by the U.S. Army Corps of Engineers (USACOE) along its *makai* (ocean side) perimeter. By 1973, the City proposed acquisition of an additional 2509 acres lying *mauka* (mountain side), ostensibly for park purposes, and Kawai Nui's four native waterfowl were

declared to be Endangered. The landowner responded by proposing plans for a large shopping center. At this point, LKOC moved at once to form a large coalition of community organizations on behalf of public park acquisition. Their "ad hoc Committee for Kawai Nui," led by homemakers, students, *kupuna* (elders), scientists, and academicians, reached out to diverse groups, ranging from Life of the Land, the Conservation Council of Hawaii, the Sierra Club, Hawaii Audubon Society, American Pen Women, the Kaho'olawe 'Ohana, the Congress of the Hawaiian People, and others.

Planners and scientists presently revealed that the supposed park plans of the City were actually intentions to develop a massive landfill. The ad hoc Committee developed a educational slide show (a critically acclaimed program funded by The Outdoor Circle, and shown by volunteers over 300 times) to educate politicians and community groups statewide. Meanwhile Board members of the LKOC developed a comprehensive resource inventory for the State Land Use Commission, which led to the re-designation of some of the additional wetlands in Kawai Nui from urban zoning to conservation zoning. In subsequent years, three other subdivision proposals, a second proposed Honolulu landfill, and proposed interceptor sewer lines through the Marsh were defeated by a highly mobilized, informed community, precluding further development.

Aims and Objectives of the Kawai Nui Heritage Foundation

*Continue to support the current Directional Plan and its democratic scientific process so the focus is on the whole and not its parts

*Continue to oppose inappropriate watershed developments impacting the Marsh

*Investigate impacts of residual sewage sludge from treatment plants formerly dumping in the Marsh

*Investigate residual and continuing leachate from Kapa'a Landfill overhanging marsh at 250' elevation

*Investigate unchecked insiltation from Kapa'a Quarry, Kapa'a Landfill, and Maunawilii development

*Keep existing waters and flows in the Marsh system (Kawai Nui source may be threatened at headwaters by Board of Water Supply transfers), and to continue flows to the sea

*Control nutrients and introduced vegetation, and investigate appropriateness of flood control dike height for Coconut Grove

*Comprehensive attention to all functions of the marsh, not just flood control in planning

*Monitor effect and impact of chemical runoff from adjacent golf course

*Continue providing speakers, tours, educational programs and materials

*Improve Kawai Nui's estuarine values for two endangered native species of goby

*Improve productive waters into Kailua Bay.

By 1976, when the Kawai Nui Heritage Foundation (KHF) was formed, 52 local and statewide community groups and public agencies (plus petitions with 30,000 signatures) had participated in and endorsed a consensus "Directional Plan," begun in 1974 by local volunteer architect/planner Robert A. Herlinger. In July of 1976, provided with materials furnished by KHF (aided by Bishop Museum's Department of Anthropology), on request of the National Park Service, Kawai Nui was declared eligible as a National Cultural, Archaeological and Historic District. In the early 1980s, KHF and LKOC received a CZM grant ($100,000 augmented by another $25,000 from the USACOE) for three years of studies by the Department of Planning and Economic Development, culminating in 1983's "Kawainui Management Plan," which made sweeping protective recommendations based on a body of knowledge provided by the public(s), the State, and volunteer scientists. Concurrently, the University's Environmental Center held a Kawai Nui interdisciplinary practicum and monitored the State's work. Between 1983 and 1990, KHF assisted the State in obtaining funds, and in condemnation proceedings to acquire lands fronting the marsh. In 1990, DLNR was given responsibility to develop implementation plans for Kawai Nui. Subsequent state-funded plans have been evaluated by the public using KHF's most recent "Direction Plan" for Kawai Nui.

Contact: Keith Kruger , Kawainui Heritage Foundation (808) 239-5958
Muriel Seto, Kawainui Heritage Foundation (808) 262-4900

D. Manoa Valley Streamside Park and Water Quality Studies, Oahu

A 1984 biota study by the U.S. Fish and Wildlife Service (USFWS) of 117 streams from Hawaii, Alaska, and the continental U.S. revealed that fish from Manoa Stream, Honolulu, not only had the highest concentrations of the pesticides chlordane, dieldrin and heptachlor, but the levels were over twice the concentrations found in fish from any other stream sampled in the survey. Additionally, the Manoa Stream fish contained three times the levels of lead as compared with fish from any other stream in the study. These and other findings have spurred community groups to action. Groups within the Manoa neighborhood organization Malama O Manoa have formed to address stream water quality issues in the watershed, and to develop plans for a new Manoa streamside park. The Manoa stream water quality group has divided responsibilities along professional skills and interests represented in the group,

covering chemical pollution issues, microbiological pollution issues, communications to disseminate sampling results and water quality action advisories to the community, and coordination with the larger organization board and outside organizations. The second group is presently working to establish a community linear park along a portion of the stream. The group has worked closely with the City and County of Honolulu, and land owners to build commitment and support for the park. Thus far $227,000 has been allocated by the City and County of Honolulu City Council for park design. The County Departments of Transportation Services and Parks and Recreation have also committed themselves to the planning and ongoing operation and maintenance of the park.

Malama O Manoa groups have sponsored stream water quality awareness campaigns and clean-ups, with one very successful effort having taken place last October 22. Malama O Manoa also convened a workshop last year, and will hold another this fall, gathering support from DOH environmental health administrators and the City and County of Honolulu's City Council. Participants included representatives from the University of Hawaii, the City Departments of Public Works, and Parks and Recreation, USFWS, DOH, CZM Program, and others. Malama O Manoa members have participated in several nonpoint source pollution control activities and programs sponsored by City and State agencies. Perhaps most notable amongst these activities are those for improvements of the Ala Wai Canal (the receiving body of water from Manoa Stream and nearby Palolo Stream).

Contact: Chuck Pearson (808) 521-9400 or Eric DeCarlo (808) 956-6473

E. CARE: Community Ahupua`a Resource Education, Kaneohe, Oahu

A Natural Resources Defense Council (NRDC) proposal was developed for a pilot project in urban nonpoint source pollution education (based on coastal nonpoint pollution control program development). The goal of the project was to develop a model that would empower a community in an urban *ahupua'a* to manage and control its sources of nonpoint pollution and thus protect its streams and coastal waters. The project duration was from October 1994- August 1995, with funding provided by Harold K.L. Castle foundation and Cooke Foundation, Ltd.

The *ahupua`a* of Kaneohe, which is extensively urbanized and includes a variety of land activities and three stream systems (both channelized and natural), was chosen as the location of the pilot activity because of its existing level of community education and involvement, including: Friends of Heeia State Park, Marine Education Program and their plan to restore native vegetation in the *ahupua`a*; Kaneohe Bay Master Plan and supporting Kaneohe Bay Regional Council; Kaneohe Urban Planning Committee: Vision 2020; and active Kaneohe and Kahaluu Neighborhood Boards.

Community members were recruited through presentations to these groups and to condominium associations, High School environmental clubs, the Windward Community College Marine Options program, local churches, youth groups, and

adult service clubs. Participants attended 5 monthly sessions to learn about the natural and cultural history of the *ahupua`a*, the impacts of land use activities and their effect on pollution of stream and coastal waters, and best management practices to reduce them. The project produced a number of products, including photo reconnaissance of 3 stream systems displayed as a map tied to pictures and as slides; a participants' collective map of community assets and problems; worksheets of nonpoint source pollution BMPs and BMPs appropriate to observed problems; a Project report (August 1995), and A "How /How Not To Do It" Manual.

Contact: Susan Miller, (808) 533-1075 ; or Maile Bay (808) 947-1523

F. Kaiaka Bay -Waialua Hydrologic Unit Area Project, Oahu

In 1991, the Kaiaka Bay-Waialua Hydrologic Unit Area (HUA) project on Oahu began. This five year project was established under a national USDA program to address water quality through interagency and public collaboration. The Kaiaka Bay-Waialua Bay HUA has a population of 53,650 people and covers about 70,700 acres. Urban/military lands make up 17% of the area, while the remainder is in forest reserve, and cropland, and pasture.

This project receives direction through an Interagency Coordinating Committee (ICC) whose members are representatives of CES, NRCS, DOH, USGS, HACD, DLNR, DOA, and FSA. In addition, a Local Advisory Committee provides community input and guidance. The goals of the project are to:

- Reduce agricultural chemical pollution of the Waialua Aquifer by promoting the wise use of nutrients and pesticides;
- Control sediment sources by reducing rill, sheet, and gully erosion on agricultural, conservation, urban, and military lands;
- Develop and implement an effective education and public involvement program;
- Implement a monitoring program to provide for ongoing water quality assessment; and
- Evaluate the effectiveness of implemented management practices on water quality.

Assistance provided to the HUA includes:

- Cost-sharing on the implementation of best management practices (FSA);
- Information and educational materials (CES Environmental Issues Office);
- Technical assistance (NRCS and West Oahu SWCD); and
- Monitoring activities in the bay (UH Leeward Community College, College Oceanography Lab).

Informational products available to the general public include a brochure providing a Kaiaka-Waialua Bay HUA Project overview and a four page newsletter called the *Kaiaka-Waialua Bay News* which is published quarterly. Four polluted runoff control projects have received Section 319(h), CWA, funding through DOH's Polluted Runoff Control Program. The total Section 319(h) grant

monies received for use in the HUA is $157,000; in-kind contributions provide an additional $130,000 from non-federal sources.

Contact: Cooperative Extension Service (808)956-4122; USDA/Natural Resources Conservation Service (808) 861-8523; or USDA/FSA (808) 541-2642

G. West Maui Watershed Management Project, Maui

The West Maui Watershed Management Project began in 1993. The primary goal of the project is to develop community-based watershed management, using an interest-based, collaborative approach to protect the water quality and ocean resources of West Maui.

The origins of this watershed Management Project are rooted in community action. In 1989 and 1990, algae blooms clouded the water off West Maui, smothering corals and causing reef die-off. Local residents took action in calling state and national attention to the problems. Eventually the community garnered Senator Daniel Inouye's support, and when Inouye wrote to the EPA, requesting help, a response ensued. EPA, NOAA, and DOH monies were allocated to 1) determine the cause of the algae blooms; and 2) find a solution.

Meanwhile the County of Maui and community members initiated an Algae Task Force to scope out the problem. The report of the Task Force, published in 1992, recommended on-site coordination, cleaning of beaches, and the control and management of nutrients in the watersheds emptying into the West Maui shoreline. In addition, the task force noted a need to address nuisance algae washing up on the shoreline. As a temporary measure, the county has agreed to remove piles of algae from shoreline areas if community volunteers rake and pile it up. Another related problem was noted in July 1993, when a rainstorm caused massive amounts of sediment to be transported into the waters off West Maui. The nearshore ocean waters remained red and turbid for four months before winter swells removed the sediment.

The West Maui Watershed Management Project involves the collaboration of many people. A project Coordinator works with the community at large and with an advisory committee composed of a broad spectrum of community and government agency representatives. The Advisory Committee is currently working toward developing specific project objectives, and will involve the community in developing initiatives for water quality management, stormwater management, fertilizer use and prevention of soil erosion, and identifying at a more general level the combination of regulatory tools and voluntary actions needed to protect West Maui's coastal waters and ecosystems. Twelve scientific studies were launched to examine a variety of aspects of the problem, such as algae population dynamics, assessment of erosion and nutrient loads from various land uses, storm water and drainage management planning, feasibility of algae clean-up, and others. DOH's Polluted Runoff Control Program has targeted Section 319(h), CWA, implementation project funding to the West Maui

SWCD to assist it in carrying out particular water quality management recommendations that have resulted from this watershed management project.

In addition to the Advisory Committee activities and the array of scientific studies, the WMWMP has included ongoing agency coordination, public education and outreach efforts, presentations, brainstorming sessions, workshops and fora. The WMWMP has also established a new Volunteer Monitoring Coordinator position to promote citizen monitoring in the watershed.

Contact: Wendy Wiltse, Ph.D. project coordinator (808) 661-7856

H. Pelekane Bay Watershed Management Project, Hawaii

The Pelekane Bay Watershed Management Project is a multi-agency planning effort involving federal, state, and local government agencies, private landowners, and some community organizations. It represents a coordinated attempt to address the complexities of interagency planning and cooperation on a watershed-based issue. The goal is the protection and recovery of the increasingly degraded receiving waters of Pelekane Bay, through careful management of lands throughout the entire watershed feeding into the Bay. The effort is being led by a project coordinator based at the Mauna Kea SWCD supported through funding from NRCS.

Pelekane Bay is located on the northwest corner of the Island of Hawaii, just south of the Kawaihae Harbor and adjacent to the Puukohola Heiau National Historic Site. Its watershed includes the drainages of the Pauahi, Makeahua, Luahine, Palihae, and Makahuna Gulches in the center of the Kohala Coast. The bay is important as marine fish habitat, and has cultural and historical significance due to the submerged Hale o Ka o Puni Heiau and other cultural sites. In recent years, degradation of fish habitat and underwater cultural resources due to sediment loads contributed from agricultural runoff from extensive ranchlands in the watershed has been documented. In order to halt further degradation of Pelekane Bay and to restore the bay's productivity, both watershed management measures and sediment removal will be necessary. It is estimated that some 16,500 cubic yards of sediment, approximately two to three meters in depth, need to be removed from Pelekane Bay.

Due to widespread concern over the impacts of sediments on Pelekane Bay, a large coalition of local, State, and Federal agencies, private landowners, and other citizens are developing a long-term watershed management and marine recovery plan.

Pelekane Bay and its watershed and tributaries have not been designated as a WQLS and Pelekane Bay is designated a Class A water. However, several compelling factors contribute to the priority attention being given to water quality and watershed management issues in this area, including:

- The proposed project area has been designated by NMFS/USACOE *Marine Fish Habitat Restoration and Creation Program for the Pacific Islands* as the most appropriate project in the Pacific Islands.

- The submerged Hale o Ka o Puni Heiau in Pelekane Bay has important historical significance for the Hawaiian community, other local residents, and the National Park Service.

- The fish breeding habitat of the Bay and estuarine areas is unique and significant, supporting populations of mullet, aholehole, awa, and nehu. The Bay is one of the few locations which supports populations of the Black-tipped Reef Shark. This habitat is seriously compromised by the impacts of sedimentation.

- The close proximity of Spencer Beach Park and the Puukohola Heiau National Park contribute to making Pelekane Bay an important resource for cultural, recreational and tourism opportunities.

- A new boat harbor has been proposed which would involve the building of a new breakwater in the bay, with possible implications for sedimentation in nearshore waters.

The primary objective of the project is to reduce nonpoint source pollution from sediments entering Pelekane Bay, primarily through installing BMPs to control sediment loading in the low elevation, low rainfall region of the watershed. BMPs being considered include: improving vegetative cover through range management, livestock exclusion, and reseeding of grasslands; reducing wildfire hazards (and resulting loss of soil cover) through installing a firebreak system; regenerating forest cover in selected areas through tree planting and livestock exclusion; and installing sediment retention basins to reduce runoff velocities and allow remaining sediments to settle out before reaching Pelekane Bay. The ancillary objective is to renew productivity of the Pelekane Bay marine ecosystem through removal of some 16,500 cubic yards of existing sediments.

The following agencies, organizations, and groups have shown an interest in the Pelekane Bay Project: Mauna Kea SWCD, Queen Emma Foundation, DLNR-DOFAW, DOH, DLNR-DAR, DOT, DOA, DHHL, County of Hawaii, University of Hawaii at Hilo, Parker Ranch, USACOE, National Park Service, NMFS, USFWS, and NRCS. Although discussions have taken place concerning the project, specific contributions and roles have not been finalized.

Concern for the recovery of Pelekane Bay and management of upland watersheds has been expressed by diverse groups including local, state, and federal agencies, individual citizens, businesses, and cultural and other interest groups. Watershed management and bay recovery efforts will require coordinated planning and in-kind technical assistance from all of the interested and concerned parties.

Intensive involvement by community groups and other interested members of the public will be sought and encouraged throughout the project cycle. Such involvement will include planning and assessment activities, assistance with joint monitoring programs, and involvement in educational activities including development of materials and the creation and conduct of public forums for information and feedback.

Thus far, sources of funds for the Pelekane Bay Project include:

a. Agency in-kind contributions and volunteer efforts;
b. NRCS funds allocated to the Mauna Kea SWCD to hire a planning coordinator;
c. Section 319(h), CWA, Federal Nonpoint Source Pollution Control funds of $40,000. Private and agency in-kind contributions make up 40% of the total cost of this polluted runoff control project.

Technical assistance and other in-kind support is being sought from numerous agencies and private landowners. Numerous educational materials and activities are planned, including brochures, displays, fact sheets, newsletters, newspaper articles, public forums, and field trips.

Contact: Jim Trump (Island Harvest), Project Coordinator for the Pelekane Bay Watershed Project under the jurisdiction of the Mauna Kea SWCD (808) 884-5118 (fax: 884-5049).

I. The Natural Areas Working Group and Pilot Regional Forest Management Advisory Councils, Hawaii

The Regional Forest Management Advisory Councils (RFMACs) are a pilot effort to include community representatives in land-use planning efforts addressing management of state-owned lands. These lands do not necessarily represent distinct watershed units, but rather parcels of state land in which nearby communities have an active stake and interest. This effort to involve community members in intensive planning efforts regarding the management of state lands is one important outcome of a facilitated conflict-resolution process entitled the Natural Areas Working Group, or NAWG, whose initial phase took place from March 1994 - March 1995. NAWG discussions are ongoing.

The conflict which led to the NAWG meetings was a sharp difference in opinion between state agencies and various community interests, especially pig hunters, regarding conservation strategies on state-owned lands. The particular issue which inflamed the community was the building of fences to control feral pigs in portions of several Natural Area Reserves to promote better protection of endangered native ecosystems. The new RFMAC pilot will be tested during 1995 to determine whether a formal, long-term planning body involving community representatives can be set up to address the wide variety of interests in the management of state lands on the Big Island.

RFMACs being initiated in mid-1995 are a pilot community-based planning effort being tested during 1995 in Kohala on the Big Island. RFMACs are envisioned as one way to involve a diverse set of interests in the coordinated management of state lands under the jurisdiction of DLNR. Several important issues remain under discussion, such as the exact representation on each RFMAC, the number of RFMACs that should be established, regions to be involved in RFMACs, and the timing of the planning efforts.

The RFMAC pilot meetings are one significant outcome of a year-long facilitated conflict resolution process among several stakeholders who have long been at odds regarding the best way to manage state forest lands on the Big Island, especially the Natural Area Reserves (NARs). In this section, the history of the NAWG process will be discussed, to provide a detailed look into a process which has involved some of the most controversial resource management questions in the state.

While the pilot RFMACs and the NAWG discussions do not focus explicitly on watershed management or water-quality issues, these efforts represent an important example of the processes which can be used for in-depth, substantive public participation in resource management planning. In this case, parties with diametrically opposed views on resource management methods gradually came to appreciate one another's points of view, and look for ways in which the needs of all the concerned parties could be addressed. The NAWG process and the upcoming RFMAC pilot planning effort can be seen as a useful model of possibilities for public participation in integrated watershed-based management. And while the RFMAC process is not strictly focused on watershed conservation or nonpoint source pollution, management strategies which result are also likely to have a positive effect on nonpoint source pollution control in the regions under consideration.

(a) Origins of the NARS Controversy and the NAWG process: The NAWG had its origins in long and volatile disputes among various groups with apparently competing interests in management of the Natural Area Reserves (NARS) and other State-owned lands on the Big Island. Hunters, environmentalists, and other interested parties found themselves "on opposite sides of the fence," as debates raged over whether to enclose portions of several Natural Area Reserves and reduce or eliminate pig populations within the fenced areas. As a result of this conflict, the State House of Representatives passed two resolutions in May 1993, intended to move interested parties along toward agreement:

- House Concurrent Resolution 183, House Draft 1: requested that DLNR hold facilitated public information meetings concerning management objectives and activities in the Pu`u o `Umi Natural Area Reserve.
- House Concurrent Resolution 185, House Draft 1: requested DLNR to accommodate the needs and interests of hunters in developing strategies to manage pig populations in the Laupahoehoe Natural Area Reserve.

Following these resolutions, two professional mediation facilitators from the Center for Alternative Dispute Resolution (Office of the Judiciary) were hired by

DLNR to work with agency representatives and representatives of diverse community interests in the Natural Areas Working Group. A series of facilitated meetings then took place from March 1994 through March 1995, in which the widely divergent positions of those involved gradually inched toward a consensus on recommendations. The NAWG continues to meet, primarily to oversee the development of the initial pilot Regional Forest Management Advisory Councils. Meetings will continue to be held regularly by both bodies at least through 1995.

The NAWG involved representation from diverse groups including hunters, Hawaiian culture preservationists, scientists, resource land managers, environmentalists, and other community members. Technical assistance has also been provided periodically by invited guests.

Groups and agencies participating in NAWG during 1994-95:
Wildlife Conservation Association of Hawaii
North Hilo Community Council
The Nature Conservancy of Hawaii
National Biological Service
DLNR Division of Forestry and Wildlife (DOFAW)
Pig Hunters of Hawaii
Waimea Puu Kapu Agriculture Association, and
Sierra Club Legal Defense Fund (SCLDF)

(b) Community Forest Mapping as a Tool for Public Participation in Land Use Planning and Management: To facilitate the sharing of local perspectives on these land use issues, a facilitator worked with two separate hunter's associations represented in the NAWG to conduct a "community forest mapping" activity. Through this process, the hunters were able to describe and map their understanding of various issues related to pig hunting in the areas with which they were familiar. These maps and summary papers were then presented to the NAWG group as a whole as part of the overall information-gathering phase of deliberations. Several important issues were brought out through this process concerning Seasonal pig migration patterns, increased erosion along fence lines caused by pigs using them as travel corridors; and increased risk factors to pig breeding areas due to fencing.

Observations and questions such as these suggest areas where more in-depth research and discussion are needed before appropriate land and game management plans can be finalized. The success of using the Community Forest Mapping tool with community members previously unfamiliar with mapping provides a good example of the viability of using such community-based analytical tools in general watershed-based planning. It is often the case that community members, farmers, and others who are in close, regular contact with forests or other watershed areas have a great deal of information about the natural

resources of a specific region. If this information can be tapped and summarized in forms which can be shared in a wider planning process, a much greater richness of information is available for use in decisions regarding land and water management.

At this time, the pilot RFMAC for 1995 is focusing on the Kohala Region. Future RFMACs are likely to concentrate on areas close to the original sites of controversy, such as the Hamakua area and forest areas in the upper Puna/South Hilo region (including federal, state, and other areas such as the Hawaii Volcanoes National Park, the Olaa Forest Reserve, Puu Makaala Natural Area Reserve, and the Upper Waiakea Forest).

(c) NAWG and RFMAC Objectives and Goals: The NAWG goal statement, was developed by the group in a consensus fashion. The NAWG goal reads as a question:

> *"How do we fairly balance and accommodate the various interests that have a stake in the Natural Area Reserves System (NARS) and maintain a healthy forest and social community?"*

With the successful completion of one year's worth of meetings and negotiations, the NAWG group's resulting list of 45 "recommendations" and a series of proposed "actions" represent the beginnings of an answer to their self-posed question

The pilot RFMACs are still in the formative stages at this time in terms of organization, membership, process, jurisdiction, and other major structural questions. Given the technical and political complexity of the tasks at hand for the RFMACs, it will be interesting to discover what forms of cooperative community-based planning may emerge. As a broad-based effort originating in and fueled by community concerns, the RFMAC idea may hold great promise as a model for other efforts in integrated watershed planning and management.

Overview of the NAWG Negotiation Process

The professional facilitation of the NAWG meetings by trained mediators had a powerful positive impact on the process and outcome of the effort. In early meetings, the facilitators set the tone of a consensual discussion process through techniques such as:
proposing "ground rules" and "rules of the road" regarding how to participate in group discussions amicably, with a tone of cooperation and respect, and with a commitment to long-term consensus-building
creating "guiding principles" that set the conceptual stage for the work at hand, setting up some basic directions and areas of agreement at an early stage as points to build upon;

preparing "group memory" notes of every meeting, which were circulated before the next meeting for contemplation and further discussion. These notes differ from standard "meeting minutes" in that they seek to record the process and content of actual points made during meetings, generally in the participant's own words;
using standard group facilitation techniques to keep discussions "on-track," helping people move toward areas of agreement.

The "Rules of the Road" of the Negotiation Process :

Use the broadest interest, not just personal view.
State when you are speaking on behalf of your organization.
Think consensus.
Be at every meeting.
All agreements are provisional until the end.

"Ground Rules" of the Negotiation Process:

- Everyone can participate
- It is OK to disagree
- Extend common courtesies
- No interruptions
- Ask questions first, comments will be taken afterwards.

(d) Recommendations and Actions Resulting from the NAWG: Recommendations drafted by the NAWG members were debated by the group until a list of consensus recommendations was arrived upon. The 45 recommendations are organized into three main categories: Resource Management, Community Participation, and Education. In addition to the recommendations list, "proposed actions" were also developed, for ongoing action and legislative attention.

Highlights of the recommendations include many ways to address the diverse interests of the community in land use planning and management. Under the "Resource Management" recommendations, there was a strong emphasis on involving the community in all stages of resource management, including mapping, resource assessments, research, monitoring efforts, maintenance programs, game management activities, habitat management, and public education. Such principles are examples of the degree of public involvement which might be possible or desirable in other integrated watershed management efforts.

The recommendations under the headings "community participation" and "education" are particularly exemplary in this light. These are:

- Monitor the growth of native species, introduce or add more native species in the appropriate areas, and get community groups (including those groups that work with school children) directly involved in both activities.
- Develop mechanisms for joint monitoring (community and government agencies) for birds, medicinal plants, water, weeds, native plants, cultural sites, etc.
- Develop and implement a mechanism that coordinates existing public and private stewardship/partnerships with the goals and interests of the community, such as the NAWG process.
- Look at increasing community participation in game management by having the various interests represented in the Animal Species Advisory Commission and island councils.
- Create a position in DLNR-DOFAW for a Volunteer Coordinator on each island.
- Work on statutory changes so that the community has more control over board, commission, and committee appointments. A beginning step could be voicing who the community recommends as a representative.

The education recommendations include:

- Create a forum (perhaps making the NAWG a non-profit entity) to carry on the task of working with the public on natural resource issues.
- Develop a "hands-on" educational program that includes all facets of the forests including both pig hunting activities and conservation efforts.
- Bring information gathered in the NAWG process back to the general public.
- Lobby for the creation of an Education/Information Specialist within the Big Island DLNR-DOFAW office.
- Modify and expand existing efforts and develop new ways to heighten public awareness of the dangers of alien pest species introductions.
- Expand and modify the Hunter Education Program to include conservation needs, and increase opportunities for participation.
- Develop a mechanism to convey information to the public regarding existing NARS activities and cooperative activities that are NARS-related.

Besides the list of Recommendations, the NAWG report includes a series of "Proposed Actions. The first and most detailed action is the establishment of pilot RFMACs, as outlined earlier. In addition, resolutions to the State Legislature were proposed, including:

- encouraging better enforcement of hunting and other regulations on DLNR lands;
- initiating an audit of the State's game management program;
- developing a joint monitoring program including public volunteers;
- involving the hunting community in the creation and management of game management plans;
    - establishing a structure for ongoing dialogue on game management between DOCARE and the hunting community;
    - expressing support for the NAWG process; and

- increasing community outreach through increased information and exchange between DLNR-DOFAW and Big Island communities.

(e) Lessons from the NAWG Process: The Natural Areas Working Group involved an extremely diverse group of people with nearly opposite points of view on how to manage lands in which they each have a strong stake. Both community members and agency representatives were involved, and many different communications styles and perspectives reflected strong cultural and other differences among the members. Nevertheless, using an intensive process led by highly-skilled facilitators, eventually a sense of mutual interests and potential compromises was achieved. While there were certainly aspects of the NAWG process and outcomes which were not well-received, the overall outcome appeared quite positive.

In any watershed-based planning process involving community members it is likely that many diverse points of view will be represented, sometimes in a highly polarized and charged fashion. The processes used by the NAWG, and the relative success it exhibited, provide one example of how a planning process genuinely representative of community interests might take place.

A few interesting insights from this project might be helpful to in other watershed-based planning efforts:

- While the initial impetus of the NAWG revolved around one issue (fencing) and one type of State-managed land (Natural Area Reserves), it quickly became clear that the interests involved were quite complex and "holistic," and readily cut across political and conceptual boundaries. Successful watershed-based planning must accommodate interests which do not follow property lines or lines of agency responsibility. Agencies and program representatives must be willing to discuss topics that may at first appear to fall outside of their strict areas of responsibility, in order to reach a mutual goal in everyone's best interests.
- Management questions and other information needs held by community members should be carefully addressed, and not glossed over with rapid or overly technical answers.
- Although community members may not be formally trained in specialties respected by agency professionals, their knowledge of particular resources in their own areas is often based upon decades of direct observation and experience, and can be very rich. Agency representatives must be willing to understand and appreciate the wisdom and experience of community members, even if it appears to differ from the perspectives with which they are familiar.
- The use of community-based analytical tools such as Community Forest Mapping is an important resource in an integrated planning effort. There is often a huge gap in communication styles between agency representatives and the community at large, since technical and cultural backgrounds often differ greatly. It is therefore critical that the community have the use of tools

which can help to crystallize and articulate their knowledge and points of view.

- When all participants in a multi-party planning process take the time to genuinely understand the information and experience offered by others, regardless of differences in cultural and communications styles, differences in opinion regarding how to manage specific areas can often be bridged.
- Joint research and management efforts involving community members side-by-side with agency representatives are often in everyone's best interests. By working together on practical tasks, differences in knowledge and perspective can be more readily overcome.

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4. Community-Based Watershed Planning Management in Other Regions

In examining the actual practices and projects under way in Hawaii, there is ample evidence to suggest that significant roles exist for community and non-government institutions in the monitoring, education, assessment and planning related to nonpoint pollution control. Outside of the Hawaiian experiences, and at a variety of levels of governance, watershed based management has been conceptualized as requiring involvement of aspects of community control. These are often functional strengths for which "top down" approaches are less well suited, including such processes as: developing the lines of communication and collaboration between local interests and stakeholders; localizing the level of general information available toward specific needs and contexts; guiding planning along interest-based consensus building paths; managing long term and site-specific monitoring; and fulfilling objectives of stewardship, such as stream clean-up and restoration efforts through the coordination of volunteers. Two case studies are presented below which illustrate extensive community-based watershed planning efforts; one in Napa California, and one in Hunter Valley, Western Australia.

A. Napa County Resource Conservation District's Land Stewardship Approach, Napa, California

It is with the identification of an overarching goal of watershed wide management on the part of the Napa Valley Resource Conservation District (RCD), and a specific set of tools to encourage interest-based land stewardship watershed planning that Napa Valley has distinguished itself as an example for other groups to explore. The framework for integrated resource management is outlined in the *Napa River Watershed Owner's Manual* (1994):

> *"Historically, natural resource management planning has been done based on one resource only, or to deal with a single problem. This*

plan is an attempt to begin integrating the many parts of the watershed through recommendations for land use practices and programs developed with the complexity of the system in mind. Stated problems are presented as interests to be addressed, rather than as the purpose of planning. Voluntary implementation of t he recommendations in this plan will not only help deal with identified problems, but will prevent others from occurring. Thus, this type of watershed planning is intended more as preventative maintenance than as an "after the fact" clean-up or mitigation program. Solutions to problems identified by citizens, agencies, public interest groups, etc., are more easily realized when problems are treated as interests to be addressed instead of positions to be defended. This plan is meant to provide the basis for a voluntary effort of the citizens of the Napa Valley to jointly address the concerns expressed while protecting and preserving their natural and community resources in an economically reasonable manner. As with personal health or home maintenance, preventative care is the least burdensome and least expensive way of keeping a watershed healthy."

Water resource planning and management in the state of California is facilitated by a structure of a State Water Resources Control Board, and nine Regional Water Quality Control Boards which carry regulatory authority. Of these nine, the San Francisco Bay Regional Water Quality Control Board was one of the first to carry out a region-wide water quality assessment. A database was compiled on each waterbody's current water quality condition, including the nature and source of possible impairments and potential threats. In 1990 the Napa River was designated as impaired over 40 of its 55 mile length, due to eutrophication, excess sedimentation, and fisheries habitat degradation.

The Regional Board adopted a Water Quality Control Plan for the San Francisco Bay Basin, listing the present and potential future beneficial uses of surface waters within the Basin that the Regional Plan must protect. The Napa Valley was selected as a first watershed to focus its efforts on watershed management planning. Thirteen beneficial uses were designated for principal water bodies within the 426 square mile watershed. These are:

- Municipal and Domestic Supply
- Fresh Water Replenishment
- Water Contact Recreation
- Warm Freshwater Habitat
- Wildlife Habitat
- Marine Habitat
- Preservation of Rare /Endangered Species
- Agricultural Supply
- Navigation
- Noncontact Water Recreation
- Cold Freshwater Habitat
- Fish Migration
- Fish Spawning

The Napa Valley's nonpoint source pollution problems stem from a wide variety of sources, especially erosion and sedimentation coming from hillside vineyards and other agricultural activities. These vary greatly depending on the type of farming practices used.

With the backdrop of these growing pressures on the water quality of the watershed, and an especially heavy rainfall event in 1989 creating substantial erosion, a new County Conservation Ordinance was passed in Napa County with recommendations on practices expected to significantly reduce the erosion and other pollutants entering the river system. Dennis Bowker, of the Napa County RCD, suggested that new hillside developments in compliance with the ordinance should only produce soil losses of around 5 tons/acre/year .

(a) Interest-based planning: The application of land stewardship concepts: Dennis Bowker has been active in presenting the Napa Valley's RCD approach to Land Stewardship Watershed Plan Development to other conservation districts around California, and increasingly beyond the region, having also brought these experiences to audiences in Hawaii.[1] In February of 1995, he conducted a two-day workshop on Maui, teaching through case examples and scenarios the fundamental concepts and tools of Stewardship approaches to planning and Watershed Based Approaches. Subsequent to the workshop, the consultants explored the connection between the watershed-based planning approach and the community involvement component:

"They play with each other well...they are both necessarily whole systems approach. The more complexity in the system, the more opportunity there is to find options. ..The Regional Board, while making progress on the question of water balance, came to support the whole basin (watershed) basis for the negotiation. They recognized that habitat, water quality, wetlands, nonpoint pollution and land use were all inter-connected, and this gave impetus to using local involvement in management planning and implementation"

In California, the basis of land use decisions is at the local level; this together with a lack of government funding for management and a related inability to focus on bad guys, gave way to "Regulation out, Cooperation in" ways of thinking about the problem and led to them to deal with the system within an interest- based process. Stated in another manner, the Napa County Resource Conservation District has taken issue with the prevailing approach of adversarial relationships and regulation-based planning, which have not produced the long term results necessary to shepherd the nation's natural environment into a healthy 21st century.

"Land stewardship concepts allow development of long term planning and implementation that is based on the concerns and interests of landowners, agencies and other stakeholders instead of predetermined practices, programs, or legal decisions. Planning is done more completely, with all aspects of a watershed or other ecological system considered simultaneously. Technical resolutions to social problems are more likely, real solutions replace

[1] Invited in 1995 to speak at the Hawaii Association of Conservation Districts annual meeting , to the North Kona/ Kohala SWCD, to Kauai, and to Maui audiences.

compromises and the enhanced cooperation develops long term commitment to resource protection, instead of short term compliance with regulations or court edicts"

Land stewardship groups have been coordinated in a number of sub-watersheds by the Napa County RCD. These groups voluntarily agree to implement practices to protect the resources of their local watershed, and are assisted by a wide variety of cost-sharing programs that support environmentally sound management practices. One example is the Huichica Creek Land Stewardship, which was formed in 1988, and is formed of 63 landowners of the Huichica Creek basin, and over a dozen Federal, State, and local agencies. A watershed-wide natural resource protection and land management plan has been developed for Huichica Creek Watershed, and as a result of the cooperative efforts, demonstration programs and other stewardship efforts, the RCD was able to purchase a 21 acre parcel of land in the basin with a grant from the State Coastal Conservancy. On this parcel are combined demonstration projects and an educational facility for resource sensitive agriculture. Additional grants to support this effort come from the State Water Resources Control Board Division of Water Quality, the State Coastal Conservancy, and the California Department of Forestry and Fire Protection Forest Stewardship Program.

B. Hunter Valley Watershed Management and Community Planning, Australia

Perhaps owing due to varying degrees of water availability, a revealing difference in terminology exists between North Americans and Australians: the latter describe their watersheds as *catchments,* while the former describe them as water*sheds.* Whether getting 'rid of' or 'catching' water, concepts similar to the need for a more *integrated* and *participatory* watershed management approach as described in the Napa Valley case have strong adherents on the other side of the Pacific as well. In 1984 the New South Wales government began basing its planning upon a framework and policy collectively known as Total Catchment Management (TCM).

The TCM policy was initiated as a result of a national consensus between environmental groups, landholder representatives, the National Farmers Federation, and government that the of environmental problems resulting from agriculture - particularly, extensive and severe land degradation from soil erosion and salinization, needed to be addressed comprehensively and locally.

Out of this consensus then emerged a parallel federal program in Western Australia to work with rural groups in collaborative ways to address local land degradation issues. Launched as a Community Landcare Sub-Program of the National Soil Conservation Program, funding was subsequently provided to the states to implement their own Landcare programs. As part of the conditions of funding, states were required to draft plans for Landcare activities over the coming decade. While Landcare took many forms and was seen primarily as an institutional approach to rural environmental issues such as soil conservation, revegetation, wetland and habitat conservation and vermin and weed control, the interpretation of Landcare by NSW in their Draft Landcare Plan was more embracing both in the range of environmental concerns (i.e., in the inclusion of

urban and coastal issues, ground and surface water quality) and in the institutional focus (including rural people in its fulfillment).

The catchcry of TCM is "Community and Government Working Together". Along with the implementation of Landcare and its focus on local participatory action, community participation has clearly become an espoused cornerstone of natural resource management policy in NSW. The nature of the Total Catchment Management policy was such that its implementation was largely dependent on the initiative of government bodies and community groups within watershed areas. With the aim of improving communities' ability to implement the philosophy of TCM - *to make significant progress in dealing with land degradation in a manner leading to sustainable land use, while considering the welfare of individuals and community groups* - funding was sought from the Australian National Soil Conservation Program (NSCP) to work towards strategies for implementation. A multi-year project was begun in 1988, involving the Hunter Valley Conservation Trust (HVCT), a flood mitigation authority in New South Wales with a thirty-five year history , and a team of faculty and students of Agriculture and Rural Development at the University of Western Sydney, Hawkesbury. Numerous questions were examined concerning the application of integrated watershed principles and the inclusion of substantial community roles in a resource management process.

The Hawkesbury group entered into an unusual partnership with the Hunter Valley Conservation Trust, placing a high value on developing relationships and projects 'on the ground'. Their approach was to perform an extensive survey of the concerns and perceptions of multiple groups within the valley, utilizing techniques such as Rapid Rural Appraisal, workshops, individual interviews, and the collection of background data on the natural environment.[2] Numerous

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2 Hawkesbury's team embraced an approach known variously as Action Research, or Participatory Action Research, and provide the following interpretation of what distinguishes this from a more conventional approach to research:

A simple model of action research is one in which people who are concerned or involved in an issue and collaborate in the activities of planning, acting, reflecting, and evaluating in an ongoing way to improve a practical problem...It is in sharp distinction to the research often advocated as being needed for our current environment problems where "it is important that we research the issues first and when we are certain, we can act"...Action research, as a cyclical process and methodology, takes into account the uncertainty and the impossibility of accurate long term planning.

Essentially, this methodology emphasizes taking a variety of informed actions at the appropriate community level rather than waiting to develop a grand plan. These actions are reflected on, evaluated, and then further planning can take place. This cyclical process ensures informed action on the problem as well as generating learning for the participants and public knowledge for dissemination. As such, action research has in common many of the characteristics of "adaptive muddling"...which emphasizes a variety of explorations at the appropriate community level within a stable, supportive environment and applying the notion of distributive leadership within a group.

Action research, however, attempts to go further by emphasizing the process of learning and researching and, with that, constantly reflecting on the process used in specific situations. Thus, the aim of action research is not just improving the situation at hand but also improving the way the situation was improved (*i.e.*, the methodology or process used). Action research also incorporates the notions of public critique of process for the validation of knowledge generated by research. The basic tenet of action research is that it is self-critical through its emphasis on reflection on process and public critique of generated theories and methodologies. This leads to a sustainable methodology that is flexible, creative,

sub-projects, of prior origin or newly stemming from the partnership, were joined and carried out, and later served to work back toward the formation of a bigger picture of the question of how to implement TCM. These included:

- A review of the state of environmental information available on the catchment, with respect to its accessibility, consistency, amount, type, and other variables, and efforts to integrate and collate this information into a more usable form;
- A study of soil conservation efforts in a district with a 20 year history of farmer participation, surveying farmer attitudes and documenting processes of adoption of practices;
- A collaboration with a Senior Town Planner in developing a management strategy for a sub-catchment, holding workshops to bring government and farmer representatives together to work on land management issues;
- A Trees on Farm riverbank revegetation project, with field days, improved liaison with government agencies responsible for water and soil conservation;
- Interviews of farmers in discussion of landcare, TCM, and coordination with government departments.
- Work with local Department of Agriculture extension agents in establishing interest groups to discuss extension strategy and dynamics, and sustainable land use practices.
- Providing a seminar on the Role of Extension Staff in Supporting Landcare Groups to staff of HVCT, the Department of Agriculture, and the Soil Conservation Service

Reporting on the initial outcomes of the pilot projects in the Hunter Valley, the project organizers gained insights into many of the difficulties and apparent contradictions inherent in the meeting of government resource management policies (top-down) and the goals of including community (bottom-up) in a significant capacity. They made the following observations:

- There is a greater success with extension projects and activities that are initiated locally rather than government initiated and funded.
- Relationship building within groups, between farmers, and between farmers and extension officers is an important basis for effective, sustainable, self-help extension.
- There is a mismatch between some of the espoused philosophy to do with community action groups and the action that actually occurs in community groups and from their coordinating government organizations.
- Coordinating has to do with an internal attitude as well as an external structure. Participant attitudes towards communicating and sharing ideas and information (soft coordination) must accompany institutional coordinating structures.
- There is some mistrust "on the ground" of government policy makers and any grass-roots participation in policy making needs to be encouraged by "someone on the ground." The connection between government and

and evolutionary, it is not a template or a recipe but an approach that takes into account particular circumstances and draws widely from both the sciences and the arts as "ways of doing."

community needs to be established through persons with their roots in the particular community.

- Preparing a plan is not practical; ultimately it is a matter of an ongoing process of flexible and dynamic planning and monitoring.
- Often conflict is introduced into an area or a group by, for example, a new policy or a researcher discussing ideas and can be viewed positively as an important indicator of potential change.
- Grass-roots or bottom-up activity needs to be enabled from the top. Government organizations have a leadership role in providing structures and engaging in processes and practices that help grass-roots activity to be autonomous yet coordinated.

In examining the approaches taken toward watershed management, Peter Martin, of the faculty of Agriculture and Rural Development at Hawkesbury proposed a vision for environmental care into the future, naming it the "Communicative Catchment". He sought to capture the dominant thinking, policy initiatives, extension approaches and kinds of professional competence required of a series of catchment management perspectives, which pass from 'reduced' to 'mechanical' to 'complex' before reaching 'communicative', while accumulating greater recognition of complexity and demanding new skills of those involved, and increasing community responsibility and action. While there has been apparently little or no cross-fertilization of this vision with the Napa Valley Resource Conservation District's work of encouraging the formation of Land Stewardship Groups within watersheds, there is remarkable similarity between them. Martin explains this vision:

The communicative catchment is our vision of catchment management for the future and it incorporates the approaches developed through viewing catchments as reduced, mechanized, and evolving...this conception incorporates community in the management of the catchment as participants. Resource managers have a role as action researchers, facilitating and coordinating community involvement and action. In this catchment we see environmental issues being dealt with in a cooperative, strategic, and integrated way, emphasizing community responsibility and participation. This approach emphasizes effective communicative processes between individuals, as well as within and between institutions. People are encouraged to take responsibility for their own resource care and learn about their environment in an experiential way. This type of learning and problem solving encourages "sensitization" to environmental change and promotes contextual planning and problem solving as opposed to 'grand design" planning imposed from government.

Particularly with regard to designing a management plan for nonpoint source pollution, with its inherently diffuse and complex nature, the conclusions made by the Hunter Valley researchers with respect to the need to shift perceptions and relationships of power and authority are of special significance. Included here are some of their more far reaching observations:

"The view of environmental problems being a result of an interaction between people and their environment rather than simply problems of the environment suggests that effective action emerges from a sensitization of people's perceptions to environmental change. Community involvement with these issues provides the experiential base for people to become more aware of their environment and can help to develop peoples' perceptual sensitivity to problems that occur slowly or are spatially distant."

"The development of community involvement requires the parallel change of our social institutions from the government level down to the community. The communicative catchment will not develop if government agencies do not refocus their roles away from centralized planning and control towards coordination and facilitation of community action. Similarly, the devolvement of power to people requires the community to be able to be responsible for their actions. The development of the communicative catchment is not a "grand" plan for the future but rather a vision that integrates our ethical principles of sustainability, participatory democracy, and community empowerment. "

5. Regional and Watershed Approaches: An Integrated Framework for Hawaii

(a) Nonpoint Source Pollution Responsibilities and the Regional and Watershed Approach: OSP is the State planning agency mandated with the responsibility of overall land use planning and policy. As the State planning office, OSP is also mandated with the responsibility to implement the Coastal Zone Management (CZM) Program, including the coastal nonpoint pollution control program responsibilities. Given that these mandates and responsibilities effectively link the causes and effects between land activities and ocean resources and includes a multiplicity of land uses, stakeholders, and interests, an integrated approach to polluted runoff control planning and management is needed. Because of OSP's unique position it would be the most likely agency to coordinate and facilitate the development of any integrated approach. Regional and watershed approaches are an integrated approach which have been used with a considerable amount of success.

Regional and Watershed Approach - Since the goal of the coastal nonpoint pollution control program is the protection of coastal water quality, a management approach must be able to address a wide variety of pollutant sources, land uses, and activities affecting the waterbody. A regional/watershed approach provides an integrative and cost-effective framework for evaluating and managing the totality of processes and agents affecting a waterbody.

- A regional/watershed approach enables a more inclusive process of management, where management agencies, land users, and residents can work together, pool talent, and share resources, ideas, and information.

- A regional/watershed approach enables managers to simultaneously assess the potential risks and problems of multiple land uses, allowing the analysis of absolute and relative pollutant loadings (a TMDL type of approach) so that relative risks from different land use problems can be compared.
- Since a regional/watershed approach can account for pollutant loadings from all land uses in a region or watershed, synergistic, linked, and cumulative effects of many activities can more easily be assessed and mitigated. For the same reasons, a regional/watershed approach to land use planning would be better able to anticipate the types and magnitudes of cumulative nonpoint source pollution problems.
- Since a regional/watershed approach can account for pollutant loads from different land uses, the approach allows for innovative mitigative practices such as the swapping of pollution control credits between land uses and forging partnership agreements or community contracts between agencies, communities and larger land users.
- Since a regional/watershed approach allows for relative pollution problems to be assessed, the land uses with the higher potential of nonpoint source pollution problems and/or the highest potential for cost-effective management can be prioritized for early implementation.

(b) Coastal Nonpoint Pollution Control Program Requirements and the Regional/ Watershed Approach: "Nonpoint pollution requires a nonpoint solution." Since virtually all of us are part of the problem, we all must be part of the solution. This requires a knowledgeable public, preferably working through a cooperative approach with everyone working towards a common goal. Since we cannot have pollution cops on every corner, it is clear that a regulatory approach alone will not work.

Government agencies are already underfunded in their management activities and often have more responsibilities than they can implement or enforce. Consequently, more regulation and regulatory enforcement, while sometimes needed, is not necessarily a solution. There is a vital need for a more efficient process that does not depend solely on agency staff and resources for statewide agency management.

The approach supports the sense of community that naturally stems from identification with a regional or watershed. Regions and watersheds in Hawaii are often the basis of community identification. As a few examples among many, residents of Palolo and Manoa watersheds on Oahu or Kau and Kona districts on the Big Island are generally proud to identify themselves by their watershed or region.

There is a willingness on the part of the community to share in cooperative management responsibilities if they can be recognized as partners in the decision-making process and if they can obtain some technical and financial assistance. Although communities provide a work force willing to build "sweat equity" to protect their environment, there are often "hard costs" that, while small, are often larger than neighborhoods can easily bear. Polluted runoff control requires some

training, education, and financial support that agencies or business interests can more easily supply.

In recognizing a sense of community in a regional/watershed process, all the agencies, residents and land users have the potential to be involved in planning and management. With a collaborative decision-making process, there is a sense of ownership of the decisions and a greater likelihood of self-policing to ensure compliance with locally-defined goals and standards set in the regional or watershed processes. With the development of stewardship as a mindset, the need for many individual mitigative actions or public education activities would likely be greatly reduced.

(c) Goals, Roles, and Expectations from Community Collaborations: Polluted runoff control requires the ability to anticipate, recognize, and manage problems statewide. These goals are beyond the capabilities of government agencies alone. Nonetheless, the regional/watershed process should not be viewed by agencies, land users or the community as a broad "take-over" of agency responsibilities. Instead, such an approach would augment existing agency planning and management tools. The regional/watershed process is an opportunity to more effectively accomplish nonpoint source pollution goals that are a priority for agencies, land users, and community members alike. Given that this is a new relationship between these entities, there needs to be a recognition of the reasonable expectations of the roles and responsibilities of all the parties.

As discussed above, community regional and watershed management approaches have successfully addressed polluted runoff problems. These successes collectively suggest a number of important roles for communities. These include support roles to assist agencies, as well as leadership roles in community projects that are coordinated with agency assistance. The potential community roles are collaboration, local expertise, research and monitoring, watchdog and stewardship, and education, as described at the beginning of this appendix.

(d) Supporting Regional and Watershed Approaches - An Agenda for Hawaii: The details of any regional/watershed-focused project would generally need to be defined within the implementation process itself. For example, specific actions would likely be dictated by the potential problems in the region or watershed, the dominant land uses, the existing knowledge, expertise and experience of the participants, and other site-specific factors. However, as a part of the coastal nonpoint pollution control program planning process, OSP can initiate the development of key components necessary to support regional/watershed planning and management in Hawaii. These first steps might include the following:

- Promote Regional/Watershed Approaches - Invitations to speak at neighborhood boards, land use management forums and other presentations and workshops are opportunities to promote regional/watershed approaches, and to be educated on the land use and nonpoint source pollution issues important to the community.

- Establish a Forum - OSP could take the initiative to open a dialog with the community, land users, and other state and county agencies to promote regional/ watershed approaches and discuss the issues and options for potential structures to implement the approach. OSP may want to accomplish this through a collaborative project with one of many community-organized institutions that already have recognition in the community. Such institutions might include the People's Water Conference or the Ahupua`a Action Alliance. The forum could be a watershed planning and management workshop or series of seminars designed to present the concepts of stewardship and regional / watershed approaches, identify key agencies and actors, existing projects, and stimulate discussion of the possible collaborative activities and structures.
- Initiate Partnerships - OSP could take some first steps to initiate partnerships on a case-by-case basis. This could be in the form of allocating some funding specifically as assistance funding to community-sponsored projects that meet a general set of criteria. This might be done through a "request for proposals" or other competitive bid process with an upper limit of funding for any one project. A preliminary objective might be to encourage collaborative projects that work at the watershed level to control nonpoint source pollution.
- Support Interest-Based Approaches and Conflict Resolution - OSP could help to present and outline conflict resolution processes. The workshop forum could be used to present alternative dispute resolution techniques and other conflict resolution processes that promote "win-win" solutions.
- Interagency Coordination - OSP could explore the further potential for collaboration and interagency coordination structures. These structures could help to solidify agency goals and policies, avoid duplication of programs, and determine the manner and extent to which agencies can collaborate. This would include defining roles supportive of community projects and potential avenues in which communities can assist agencies to carry out their nonpoint source pollution control mandates.

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