
HAWAII'S COASTAL NONPOINT POLLUTION CONTROL PROGRAM

MANAGEMENT PLAN

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Background

In recent years, it has become increasingly clear that the nation's coastal waters have serious water quality problems. Virtually everywhere, the problems result from what is commonly called *polluted runoff* or *nonpoint source pollution*. These terms both refer to pollutants that enter a body of water as a result of water flowing over the surface of the land, such as rainfall, irrigation, or snowmelt. Common nonpoint source pollutants include soil, fertilizers, animal wastes, oil, grease, litter, lawn clippings, and home lawn care chemicals. These and other pollutants end up in public waters all across the country.

The consequences of nonpoint source pollution are all too well known: increased risk of disease from water recreation, algae blooms, fish kills, destroyed aquatic habitats, and turbid waters. Though some polluted runoff results from natural causes, most results from people's activities on the land and water. Much nonpoint source pollution is preventable.

The importance of coastal water quality to the State of Hawaii cannot be overstated. Water quality is vital to Native Hawaiian cultural practices; leisure and recreation, such as swimming, boating, fishing, snorkeling, SCUBA diving, and surfing; tourism and economic strength; ecosystem and species health and diversity; fishing and other food-gathering activities; and research and technology. This document does not elaborate on why protecting water quality is important. Rather, its purpose is to describe existing mechanisms and proposed additional or revised mechanisms that will serve to restore impaired waterbodies and protect the overall water quality that is so vital to our State.

The Coastal Nonpoint Pollution Control Program

In 1990, the U.S. Congress adopted new requirements for states that have federally-approved coastal zone management (CZM) programs, of which Hawaii is one. The new requirements are designed to protect coastal waters from polluted runoff and restore coastal water quality that has deteriorated because of nonpoint source pollution.

What is Required: The new requirements specify that states with CZM programs must develop and implement ***coastal nonpoint pollution control programs*** to be approved by the federal National Oceanic and Atmospheric Administration (NOAA) and the Environmental Protection Agency (EPA). State programs are to be developed jointly by the coastal zone management agency and the water quality agency. (In Hawaii, that means the Office of State Planning's

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CZM Program and the Department of Health.) Programs developed by states are to be based on guidance developed by the EPA and NOAA.

The federal program requires that states implement a set of **management measures** based on guidance published by EPA. Management measures reflect the most effective approach using the best available and most cost-effective technology to prevent or minimize pollution that might result from a particular activity. As such, for a given activity, there is a given management measure or “goal” which may be implemented through specific **best management practices** (BMP). For example, in developing a new subdivision, an erosion control plan would be an appropriate management measure, which in turn might be implemented through the use of silt fences, phased land clearing, and other common erosion control practices.

EPA’s guidance contains 56 management measures separated into six groups. There are measures for agricultural activities, for forestry activities, for urban areas, for marinas, for hydromodification activities, and for protecting wetland and stream areas. States must implement measures in conformity with all the measures in the guidance, or justify why they will not be implemented or why alternative measures have been developed. The 56 management measures are intended to be the foundation for state coastal nonpoint pollution control programs.

After measures in conformity with EPA’s guidance are implemented, states must then implement additional measures for areas and activities that are a known threat to water quality. Hawaii’s draft management plan reflects the belief that the 56 measures in the guidance need to be implemented and then monitored as to their effectiveness before considering the implementation of any additional measures. The draft management plan does identify coastal waters that are threatened or impaired as a result of nonpoint source pollution.

Coastal Nonpoint Pollution Control Program Boundary: The federal program requires that NOAA review the inland boundary of state coastal zone management areas to determine if application of the coastal nonpoint pollution control program in this CZM area will be sufficient to “restore and protect coastal waters.”

Hawaii’s CZM area is defined in Chapter 205A, Hawaii Revised Statutes (HRS), as “all lands of the State and the area extending seaward to the limit of the State’s police power and management authority, including the U.S. territorial sea.” This area obviously includes all 614 watersheds within the State as well as coastal waters. Therefore, Hawaii’s coastal nonpoint pollution control program will be applied within the current CZM area.

Program Coordination: Hawaii has had an approved coastal zone management program since 1978. Hawaii has also had a federally-approved voluntary polluted runoff control program since 1987. The development of the coastal nonpoint pollution control program brings together the CZM Program’s

experience in coordination, and land and water use control, and Department of Health's (DOH's) expertise in water pollution management.

The intent of the coastal nonpoint pollution control program is to build upon, rather than duplicate, existing programs. The array of existing programs will be loosely bound together in a "network" under the rubric of the coastal nonpoint pollution control program. Ultimately, there will be one statewide program for the management and control of polluted runoff, elements of which will be implemented by a number of existing agencies.

Coordination has been a central theme of the developing phases of the coastal nonpoint pollution control program in Hawaii. While the CZM Program has had the lead in coordinating the development of the overall program, the development of the separate program elements themselves has been a shared responsibility. The CZM Program and DOH, with significant assistance from other State, federal, and county agencies, non-governmental organizations, and individuals, have jointly developed Hawaii's coastal nonpoint pollution control program management plan. The coastal nonpoint pollution control program will continue to rely on the resources, expertise, programs, and authorities of other agencies and organizations during its continuing development and implementation. In addition, opportunities for public participation will continue to be a part of Hawaii's coastal nonpoint pollution control program.

Management Measures: As noted above, EPA/NOAA guidance -- which contains 56 management measures -- provides the foundation for state programs. Management measures are akin to goals which states must address through the implementation of regulatory or non-regulatory nonpoint source pollution control mechanisms and land or water users must implement through the application of BMPs. The management measures are to be based on technical and economic achievability, rather than on cause-and-effect linkages between particular land use activities and particular water quality problems. In this sense, coastal nonpoint pollution control programs are preventive rather than reactive. The legislative history made it clear that the intent of technology-based management measures was to allow states to concentrate their resources initially on developing and implementing measures that experts agree will reduce pollution significantly.

In its coastal nonpoint pollution control program management plan, a state must respond to each of the management measures contained in the EPA/NOAA guidance by either (1) providing for the implementation of that measure or a comparable alternative, or (2) justifying why the management measure is not included in the program. Hawaii is not excluding any management measures from its program at this time, though some alternative measures have been substituted for EPA measures. In their management plans, states must describe how they will ensure implementation of each management measure.

This Executive Summary outlines each land or water use category for which there are management measures, lists the management measures, and highlights the implementing actions that have been recommended to facilitate

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effective implementation of the coastal nonpoint pollution control program. This information is provided by land or water use category.

Agriculture

In the past decade, the types and distribution of agricultural activities in Hawaii have changed significantly, changing from sugarcane and pineapple plantation agriculture to a more diversified agriculture. This transition brings with it some inherent economic and environmental uncertainties. New crops will bring new cultivation practices and will use different quantities and types of fertilizers and pesticides. This transition, albeit economically wrenching, also provides a critical opportunity to examine the practices farming operations currently use, or are likely to use, while diversified agricultural operations are being expanded and practices and activities are being defined.

There are management measures for *erosion and sediment control; wastewater and runoff from confined animal facility; nutrient management; pesticide management; grazing management; and irrigation water management*. The chapter on Agriculture describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions.

Recommended Implementation: A non-regulatory agricultural Pollution Prevention Plan (PPP) Program is recommended for the implementation of the agriculture management measures. This new program would provide incentives to land users to develop [with assistance from Natural Resources Conservation Service and Cooperative Extension Service (CES)] and implement pollution prevention plans covering erosion control, nutrient and pesticide management, runoff from confined animal facilities, grazing management, and irrigation management, as applicable. These plans would specify the best management practices (BMPs) to be used to prevent or reduce polluted runoff from the lands covered by each plan. The following recommendations will be explored in more detail in the coastal nonpoint pollution control program implementation plan.

A. Establish Organizational Structure and Adequate Program Funding

- Draft and implement statutory and regulatory amendments, as needed, to implement this organizational structure and provide program funding. Establish incentive mechanisms to encourage participation in the non-regulatory PPP Program and enact a Bad Actor Law as a regulatory backup.
- Appropriate sufficient funding to the Soil and Water Conservation Districts (SWCD) to support at least one full-time technical staff and part-time clerical support *per district*.
- Draft formal Memoranda of Understanding (MOUs) between agencies having technical and management expertise with respect to agricultural practices and polluted runoff control to ensure their commitment to implementing this program.

B. Develop Education and Training Materials

- Develop an operator handbook of PPP Program requirements, benefits, specification for plans and plan components for each management measure, and incentives.
- Create model PPP plans for various crop categories that can be used by operators or plan preparers as the framework for drafting individual plans.
- Develop a BMP manual for agricultural practices appropriate to Hawaii.
- Develop easy-to-read educational materials in the various languages of Hawaii for wide distribution by extension agents, agricultural supplies stores, and others.
- Produce training materials for conducting trainings of operators and plan preparers, including local case studies, and island-specific soil and crop information.

C. Revise State Land Lease Requirements

- Include a requirement for development and implementation of PPPs for all land leases for crop cultivation and grazing.
- Classify State lands leased for grazing according to their carrying capacity and adjust lease rates for each parcel to reflect its stated carrying capacity.
- Establish natural resource criteria to be used to determine planning and treatment levels that meet acceptable parameters and/or conditions. The criteria should be stated in either qualitative or quantitative terms.
- Lengthen duration of leases to ensure that operators will realize the long-term economic benefits of installing costly improvements.

D. Develop Hawaii-Specific Soils Information

More Hawaii-specific soils research should be done to enhance publicly-available information and further develop Hawaii-specific BMPs for agriculture.

- Develop a database containing cross-referenced information for decision-making on suitable practices and products for a particular site.

E. Establish Inverted Water Rate Structure

- Emphasize an inverted water rate structure on a per acre basis when setting water rates.

F. Integrate the PPP Planning Process into Watershed Planning

- Encourage agricultural operators to participate in a watershed planning process. The PPP Program should be viewed as one component in a broader watershed planning process.

G. Change the Voting System for the SWCDs

- Change the voting structure of the SWCDs so that it is more equitable to the smaller farmers.

Forestry

At this time, commercial forestry operations in Hawaii are limited in scope and area. Due to the small base of operations, forestry in Hawaii is not a significant contributor to polluted runoff. However, the management measures for forestry

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are still relevant to Hawaii because there is the potential for significant growth in the forest products industry in the near future. The acres of fallowed land left by the downsizing of Hawaii's sugar industry have created the potential for a growing commercial forestry industry. Many of the same attributes that made plantation sugar a viable industry are also conducive to commercial forestry. Since commercial forestry is not being undertaken on a large scale in Hawaii at this time, there are few mechanisms currently in place that specifically address forestry activities and their impacts on water quality.

There are management measures for *preharvest planning management; streamside management zones (SMZs); road construction/reconstruction; road management; timber harvesting; site preparation and forest regeneration; fire management; revegetation of disturbed areas; forest chemical management; and wetlands forest management*. The chapter on Forestry describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions..

Recommended Implementing Actions: It is recommended that the implementation of the forestry management measures build upon existing regulatory and non-regulatory mechanisms, with an emphasis on encouraging participation in voluntary, incentive-driven programs. It is also recommended that existing laws, regulations, and incentive programs be reviewed and amended to improve agency coordination and to optimize their effectiveness for forestry activities. As forestry activities increase and BMPs for forestry are further developed, other implementation mechanisms may be considered that more directly address forestry's contribution to polluted runoff. The following recommendations will be explored in more detail in the coastal nonpoint pollution control program implementation plan.

A. Develop tree farm property tax classification

- Work with the counties to develop a county tree farm property tax classification for land dedicated to sound forest management based on approved plans. This will provide a powerful incentive for land users to participate in the Tree Farm Program. While the County of Hawaii has already initiated this process, it needs to be completed. In addition, the value of existing or growing forest trees should be exempted from assessed value for property taxes, eliminating a tax incentive for premature harvest and recognizing the longer rotation ages needed for forest management.

B. Provide adequate financial support for research and development activities, education and technical assistance

- Support continued BMP development by forestry professionals.
- As BMPs are researched and trials are conducted to provide a sound basis for BMPs in Hawaii, develop a manual describing forestry BMPs.
- Seek FY97 funding of the Tropical Forestry Plan produced by the U.S. Department of Agriculture as required by the federal Hawaii Tropical Forestry Act. This Plan would provide funding to the U.S. Forestry Service (USFS), much of which would, in turn, be made available to the Department of

Land and Natural Resources (DLNR)-Division of Forestry and Wildlife (DOFAW) in grants.

- Consider developing a forestry extension system through University of Hawaii's CES to provide specialized assistance, training, and research.

C. Support coordination among agencies

- Draft formal MOUs between agencies having technical and management expertise with respect to forestry practices and polluted runoff control.
- Draft statutory or regulatory amendments, as needed, to implement the organizational structure, provide program funding, enact a Bad Actor Law, and establish incentive mechanisms.

D. Facilitate the direct lease of State lands

- Facilitate the direct lease of State lands most suited to forestry in order to encourage responsible forest management. A direct lease recognizes the high up-front costs and long-term return on investment inherent to forestry operations which normally work to a disadvantage during a bid process. In order to secure a direct lease on State lands, however, a land user should be required to develop and implement a management plan specifying BMPs for nonpoint source pollution control.

Urban

Oahu is by far the most urbanized of the Hawaiian Islands and has the highest population density. During urbanization, pervious spaces, including vegetated and open forested areas, are converted to land uses that usually have increased areas of impervious surface. This results in increased runoff volumes and pollutant loadings. In this manner, as population density increases, there is a corresponding increase in pollutant loadings generated from human activities. These pollutants typically enter surface waters via runoff without undergoing treatment.

There are management measures for *new development; site development (including roads, highways, and bridges); construction site erosion and sediment control (including roads, highways, and bridges); construction site chemical control (including roads, highways, and bridges); existing development; new and operating on-site disposal systems (OSDSs); pollution prevention; golf course management; operation and maintenance of roads, highways, and bridges; and road, highway, and bridge runoff systems*. The golf course management measure has been developed specifically for Hawaii and is not contained in EPA's guidance document. The chapter on Urban describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions..

Recommended Implementing Action: The following recommendations will help strengthen the implementation of the urban management measures. In addition, please refer to the recommendations under "Hydromodifications."

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A. Maintain Pre-development Runoff Rates

- Use existing flow models for peak discharge and total runoff to ensure that the portion of the 2-year/24-hour storm event that is designed to be discharged offsite does not exceed pre-development discharged flows. If pre-development discharge baseline data are not available for comparison, post-development modeled flows should be compared to modeled flows calculated using pre-development land use and drainage criteria.

B. Calibrate Existing Models

- Conduct research to calibrate computer runoff models so that they can be used reliably under a wide range of conditions and circumstances in Hawaii.

C. Minimize Development of Areas Susceptible to Erosion

- The County of Hawaii and City and County of Honolulu should consider adopting ordinances or other appropriate controls to minimize or avoid development of areas that are particularly susceptible to erosion or sediment loss. Such mechanisms could be modeled after those of Maui and Kauai counties.

D. Revise County Requirements for Erosion and Sediment Control Plans

- Require erosion and sediment control plans for projects on less than 5 acres which disturb over 5,000 square feet of land on the site. Currently, such projects must receive a grading permit but are not required to develop erosion and sediment control plans.
- Include, at a minimum, specific language for narrative performance standards to ensure that, to the extent practicable, sediment is retained onsite during and after construction.

E. Develop a BMP Manual of Construction Practices

- Develop a manual of Hawaii-appropriate BMPs for construction activities, including sections on practices for erosion and sediment control, and chemical usage and runoff control. A BMP manual would help to standardize acceptable practices and assist contractors in selecting appropriate practices that would be acceptable and applicable in all counties and for State projects.

F. Inspect Nonpoint Source Pollution Control Practices with Other Construction Activities

- Integrate inspections for erosion and sediment control, and chemical control practices with the standard construction inspection programs for all counties.

G. Revise Chapter 128D, HRS, to Include Prevention Program

- DOH should revise Chapter 128D, HRS, to include requirements for preventive actions such as a spill prevention program.

H. Provide Education for Construction Supervisors on Construction Chemicals and Require Trained Supervisors On-Site

- Require at least one construction supervisor who has completed an education program on construction chemical usage on-site at all times during the application or use of chemicals.

I. Clarify Coordination of Responsibilities Among Agencies

- Clarify responsibilities between the State and counties for erosion and sediment control to avoid duplications of effort or assumptions of responsibility. Currently, the responsibilities for erosion and sediment control with respect to construction activities are contained within four mechanisms.
- State and county agencies responsible for overseeing chemical usage and control for construction activities should coordinate to develop a standard and consistent set of guidelines and requirements. Consistent requirements and guidelines should include, but not be limited to, sections on allowable chemicals and acceptable disposal options.
- A coordinated effort between the state and counties is needed so that all county ordinances or other guidelines specify which permit(s) are required for which situations. A consistent set of requirements, guidelines and policies between all counties would avoid confusion for contractors who build in different counties.

J. Train Fertilizer Applicators

- Train fertilizer applicators on proper calibration of equipment and application. Soil analysis information should be used to determine fertilizer needs.

K. Develop a Watershed Analysis and Evaluation Program

- In cooperation with community representatives, researchers, and other agencies, DOH's Environmental Planning Office should develop a watershed analysis and evaluation program to target watersheds that have been defined in the latest Section 305(b) report as "Water Quality Limited Segments" (WQLSs) and are affected by urban runoff pollutants.

L. Add Illegal Disposal Clause to Chapter 11-62, HAR

- DOH should revise Chapter 11-62, HAR, to include language specifying that the improper disposal of household hazardous or toxic materials, such as motor oil and solvents, is illegal and subject to a stiff fine.

M. Enforce Single Family Zoning

- The counties should improve enforcement of single family zoning requirements. It is common for areas zoned "single family residential" to have multiple units within the same dwelling. However, the additional residents in these units add significant amounts of wastewater to On-Site Disposal Systems (OSDS) that are likely not designed to handle the increased loads.
- DOH should coordinate with the counties to ensure that OSDSs with adequate capacities are used by all dwellings.

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N. Encourage Conversion of Cesspools

- DOH, in cooperation with the counties, should provide technical and financial incentives to encourage homeowners in CWDAs to convert existing cesspools.

O. Discourage the Use of Some Products

- DOH, in cooperation with the counties, should disseminate public informational materials to discourage residents from using products, such as phosphate detergents, acid or organic chemical additives, sodium hypochlorite-based drain cleaners, and certain other household chemicals, and garbage disposals, that can damage OSDs and negatively affect the environment.

P. Encourage Conversion of Existing Fixtures to Low-Flow

- All counties should institute rebate programs to encourage home owners to convert existing inefficient toilets and other water fixtures to low flow fixtures. Consideration should be given to making a similar offer for more water-efficient replacements for other high water use appliances (*i.e.*, dishwashers and washing machines).

Q. Develop a Pollution Prevention Resource Guide

- Develop and distribute a Pollution Prevention Guide to residents of the State.

R. Reinstate and Enhance Hazardous Materials Collection

- Reinstate and enhance the “Amnesty Day” program for all islands.

S. Promote Use and Production of Electric and Hybrid Vehicles

- Consider tax credits for the purchase of electric or hybrid cars and motorcycles and for Hawaii-based companies doing research on making them more affordable and energy efficient.

T. Expand State Automobile Inspection

- Include an environmental inspection of a car’s pollution potential as part of its annual safety inspection.

U. Explore Incentives for Reduced Automobile Use

- Consider an “environmental user fee” for the use of automobiles. Although there are many alternatives for this user fee, an added “environmental” gasoline tax of 5 to 10 cents or more is suggested.

V. Develop a BMP Manual for Golf Courses

- Develop a manual of golf course management practices appropriate for Hawaii’s soils and micro-climates and distribute to golf course developers and superintendents.

W. Coordinate Water Quality Monitoring Adjacent to Golf Courses

- Extend water quality monitoring programs to areas adjacent to golf courses not currently being monitored and clarify the monitoring responsibilities of government agencies, university researchers, golf course developers, and other participants.

X. Explore Alternatives to Roadside Spraying

- The Department of Transportation (DOT) and the counties should explore alternatives to the use of pesticides for weed control along roadsides and in drainage systems.

Y. Identify and Implement Retrofit Projects, as Needed, to Address Polluted Runoff from Existing Roads, Highways, and Bridges

- DOT should identify priority and watershed pollutant reduction opportunities and establish schedules for implementing appropriate controls. Improvements to existing urban runoff control structures on roads, highways, and bridges adjacent to surface waterbodies will reduce polluted runoff into these waterbodies.

Marinas and Recreational Boating

The management measures for marinas are applicable to the facilities and their associated shore-based services that support recreational boats and boats for hire. The following operations/facilities are covered by these management measures:

- Any facility that contains 10 or more slips, piers where 10 or more boats may tie up, or any facility where a boat for hire is docked;
- Boat maintenance or repair yards that are adjacent to the water;
- Any federal, State, or local facility that involves recreational boat maintenance or repair that is on or adjacent to the water;
- Public or commercial boat ramps;
- Any residential or planned community marina with 10 or more slips; and
- Any mooring field where 10 or more boats are moored.

There are management measures for *marina flushing; water quality assessment; habitat assessment; shoreline stabilization; storm water runoff; fueling station design; sewage facility siting and design; solid waste management; fish waste management; liquid material management; petroleum control management; boat cleaning management; public education; maintenance of sewage facilities; and boat operation*. The chapter on Marinas and Recreational Boating describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions.

Recommended Implementing Actions: The following recommendations suggest actions that will improve the implementation of the management measures for marinas and recreational boating.

A. Continue long-range planning and policy development efforts for marina development, and related efforts to develop marina siting, design, and construction guidelines for Hawaii

- OSP, in conjunction with DLNR, should continue to facilitate the long-range planning of marina development and expansion.
- Revise and implement the *Draft Planning and Evaluation Guidelines for Private Sector Marina Development* (OSP 1993) to provide design, siting, construction, and operations criteria for *both* private and public marinas.

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- DOH should develop a standardized protocol for marine water quality monitoring before, during, and after any coastal construction, including marina development.
- The State should develop a manual of structural and non-structural BMPs for marinas that may be used to meet the criteria established in the State's guidelines for marina development and expansion.
- Develop a statewide marina operations and maintenance manual for new and existing marinas. This manual would provide descriptions of management measures and practices to reduce polluted and explain how marina users will benefit and can do their share.

B. Support and facilitate continuing public outreach and boater education efforts

- Develop a comprehensive public education program for marina operators and the boating community.
- Support public education seminars, workshops, and meetings instituted in conjunction with the dissemination of the guide.
- Investigate ways to most-effectively communicate with the boating and marina communities, including appropriate signage, community bulletin boards, and a computer "Boater/Fisher-Net."

C. Improve enforcement of existing boating regulations

- Provide adequate resources for enforcement officers, including additional staff and boats.

D. Pursue alternative funding mechanisms for managing and improving State boating facilities

DLNR-Division of Boating and Ocean Recreation (DOBOR) has initiated an investigation into ways to increase revenues for managing and improving the State's boating facilities. It is currently considering several options, including increasing existing slip and user fees, and instituting new fees for certain uses.

- Consider other revenue-generating alternatives, such as boat and trailer taxes, and the establishment of a special fund supported by ecology vanity license plates.

E. Undertake a statewide suitability analysis for marina siting

- Instigate a project to guide the location of new and expanding marinas and associated activities through a statewide suitability analysis. Such an analysis could designate areas that are and are not suitable for marina development, taking into account criteria for flushing and circulation, exposure and other navigational safety concerns, biological, water quality and habitat factors, and recreational and cultural values.
- Conduct comprehensive nearshore and reef surveys to identify additional areas of special shallow water habitats, and areas where turbidity may be of concern to biological resources.

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- F. Explore various public-private partnerships for managing and developing public boating facilities
- Encourage DLNR-DOBOR to work with harbor advisory committees to coordinate management efforts at existing facilities.
 - Promote public-private partnerships in the management of existing marina facilities, expansion of these facilities, or construction of new public marinas in order to benefit from private sector expertise in marina management.
- G. Improve coordination among federal, State, and county agencies that play a role in marina design, siting, construction, and operation and maintenance
- Improve coordination among existing regulatory programs to facilitate appropriate and efficient design, construction, and management of marinas.

Hydromodifications

According to EPA's guidance document, "hydromodification" means "alteration of the hydrologic characteristics of coastal and noncoastal waters, which in turn could cause degradation of water resources." In other words, any alteration to a stream or coastal waters, whether a diversion, channel, dam, or levee, is considered a hydromodification. Because of Hawaii's sub-tropical climate, "flashy" storm events consisting of high peak discharges and large volumes of runoff are common. In order to protect life and property located close to streams, county drainage standards were developed to safely handle these runoff volumes. Consequently, many streams, especially in urban areas, have been channelized in the form of concrete box culverts that drastically alter their physical, chemical, hydrological, and ecological characteristics. DLNR's Hawaii Stream Assessment (1990) concludes that over 19% of Hawaii's 376 perennial streams have been channelized to some degree, including most of those on Oahu. In recent years, the realization of the impacts of channelization on habitat and water quality has brought about a paradigm shift where the goal now is to balance flood control and nonpoint source pollution control.

The hydromodification management measures will affect all land use activities, especially those associated with agriculture, forestry, and urban development. Therefore, these management measures should be considered in conjunction with the management measures for agriculture, forestry, urban areas and, to a lesser extent, marinas. In addition, the management measures for other land use categories are also relevant to the protection of streams and riparian areas.

There are management measures for *physical and chemical characteristics of surface waters; instream and riparian habitat restoration; erosion and sediment control for dams; chemical and pollutant control for dams; protection of surface water quality and instream and riparian habitat; and eroding streambanks and shorelines*. The chapter on Hydromodifications describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions.

Recommended Implementing Actions: The recommendations below are meant to address these concerns by eliminating the need for further channelization

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through protection of the stream resources, effective land use planning, modification of engineering techniques to control runoff, and improved coordination of permit review.

A. Establish new development planning and drainage criteria to reduce runoff volumes.

The drainage standards implemented by all counties are based primarily on flood control and safety criteria, not environmental criteria. To reduce the need for channelization and to protect the natural drainage systems and riparian and aquatic habitats, the following changes to the county drainage standards should be considered.

- Revise and implement criteria for new urban development and drainage/flood control to encourage onsite retention of surface drainage using a series of management practices designed to increase infiltration, reduce peak runoff, and limit discharged runoff to pre-development levels.
- Drainage standards should address the incremental impacts on surface waters of siting new developments.

B. Define streamside management zones (SMZs) that would come under more intense management.

A useful management tool for watershed planning is the establishment of streamside management zones (SMZs) or “buffer areas” around all perennial streams in the State. A SMZ is a designated area that consists of the stream itself and an adjacent area of varying width where management activities that might affect water quality, fish, or other aquatic resources are modified to mitigate the adverse effects. The SMZ is not an area of exclusion, but an area of closely managed activity.

- Consider alternative management policies and implementation options for SMZs. At this time, the State does not have a general, statewide policy on SMZs. However, the CZM Program is currently exploring alternatives for such a policy, in cooperation with DLNR and other State, federal and county agencies. There are several possible mechanisms for implementing SMZs around streams or stream segments that will be developed and examined in more detail during the CZM Program’s ongoing study.

C. Adopt and Implement Proposed Rules for a Stream Protection and Management System

- DLNR should support the adoption of the proposed changes to Chapter 13-169, HAR, to facilitate a coordinated and statewide approach to the management of streams and their ecosystems.
- Consider incorporating a long-range watershed planning and assessment approach into the Stream Protection and Management (SPAM) Plan for protecting perennial streams flowing into wetlands that serve as critical habitat for endangered waterbirds, as determined by USFWS and DLNR-DOFAW. The potential cumulative effects of development should be assessed using “build-out” scenarios guided by county general plans, development plans, current zoning, or other useful long-range planning tools.

D. Create a coordinated agency review process for development plans

- Designate a coordinating agency to “shepherd” permit applications through the agency review and comment process.
- Develop cooperatively a consistent and standardized routing process for review of permit applications between the relevant federal, State, and county agencies to ensure adequate opportunity for review and comment by agencies knowledgeable in assessing specific types of impacts.

E. Expand Operation and Maintenance Program for Existing Hydromodifications

- Include in the operation and maintenance program for existing modified channels provisions for the identification and implementation of opportunities to improve physical and chemical characteristics of surface waters in those channels, and to restore instream and riparian habitat.
- Include in the operation and maintenance programs for dams provisions for the assessment of surface water quality and instream and riparian habitat and potential for improvement of significant nonpoint source pollution problems that result from excessive surface water withdrawals.

F. Develop Instream Flow Standards

- CWRM should set instream flow standards or implement the instream flow program required under Chapters 174C-71(1) and 174C-71(4), HRS, respectively.

G. Ensure Consistency with County Erosion Control and Drainage Standards for State Dam Construction Projects

- Hawaii should ensure that the State dam construction projects follow appropriate erosion control and drainage standards. The State could articulate a consistent policy to follow the county grading and drainage standards for the county in which the dam is being constructed, or develop State grading and drainage standards that are at least as stringent as the standards in the most stringent county.
- DLNR should revise Chapter 13-190, HAR, or develop another mechanism to provide erosion and sediment control guidelines for dams. The chapter’s provision for inspection of dams every five years should also be revised to include nonpoint source pollution-related erosion and sediment control criteria.

H. Implement Mechanisms to Ensure Proper Use, Handling, Storage, Transportation, and Disposal of Construction Chemicals and Provide Adequate Spill Prevention and Response Planning

I. Consider Alternative Streambank Vegetation Control Methods

- The counties should consider alternative methods to control streambank vegetation. Streambank erosion and stream water pollutant loadings could be reduced by replacing the use of herbicides for vegetation management with weed-whacking or other mechanical methods.

Wetlands and Riparian Areas

Wetlands and riparian areas can play a critical role in reducing nonpoint source pollution, by intercepting surface runoff, subsurface flow, and certain groundwater flows. Their role in quality improvement includes processing, removing, transforming, and storing such pollutants as sediment, nitrogen, phosphorus, and certain heavy metals. In general, wetlands in Hawaii vary substantially from wetland environments found in the continental United States. Hawaii's wetlands comprise some 110,800 acres. Of these, more than 80% are classified as palustrine scrub-shrub and forest wetlands, located at middle to high elevations as bogs and rainforest ecosystems. However, the majority of wetland protection and restoration efforts has focused on coastal wetlands.

There are management measures for *protection of wetlands and riparian areas*; *restoration of wetland and riparian areas*; and *vegetated treatment systems*. The chapter on Hydromodifications describes the management measures, their applicability, appropriate management practices, existing implementation mechanisms, and recommended implementing actions.

Recommended Implementing Actions: The absence of a clearly defined authority or policy direction at the State level, combined with the problem of conflicting definitions and assessments used by various agencies regarding wetlands and riparian areas, currently hinders the effectiveness of local planning and regulatory activities. Although new wetland and riparian area data-gathering and management efforts continue to be developed by State agencies and private organizations, the fragmented and sometimes conflicted nature of activities has precluded the development of clear and usable information for planning and management purposes at both the State and local levels.

The following recommendations suggest actions that will improve the implementation of the management measures for wetland and riparian areas.

A. Designate the CZM Program as Coordinator for Wetlands Management

- Designate the CZM Program as facilitator and coordinator for wetlands management in Hawaii. The State's CZM law, Chapter 205A, HRS, addresses the management of wetlands. While the CZM Program has limited in-house expertise on wetlands, it can tap into the broad range of expertise residing in its networked agencies. The cross-agency, cross-organizational approach can greatly expand resources and collaborative efforts in addressing wetland issues.
- Establish a comprehensive permit review function for wetlands within the CZM Program.

B. Establish and Coordinate an Interagency Wetlands Council

- As the coordinator for wetland management, the CZM Program should establish and coordinate an Interagency Wetlands Council.

C. Integrate the CZM Program's New Wetland Functions within OSP Planning Efforts

- Integrate above recommended approaches to improving wetland policy and planning within a broader statewide, watershed- or regionally-focused planning initiative by OSP.
- Within this structure, involve community groups in the implementation of State wetlands and watershed policies and plans.
- Allocate sufficient resources to implement the above recommendations. In addition, additional resources should be provided to DOH and DLNR, which play key roles in wetlands management.

Hawaii's Coastal Nonpoint Pollution Control Program Implementation Strategy

Hawaii's experience with pollution control suggests that a voluntary approach - information and education, technical assistance and demonstration projects - is probably the key to resolving most pollution problems. Regulatory and program enforcement mechanisms also have their place in the State's efforts to protect coastal water quality. Hawaii should be able to implement its coastal nonpoint pollution control program through a mix of regulatory and non-regulatory mechanisms. Effective program implementation will depend largely on effective interagency communication and coordination.

Where Do We Go From Here?

The intent of the coastal nonpoint pollution control program is to ensure that land and water uses in the coastal zone do not degrade water quality to the point where beneficial water uses are affected. And since every land and water use has *some* potential to result in pollution, the coastal nonpoint pollution control program should be comprehensive. However, a comprehensive approach to reducing polluted runoff will require several years to implement. Fortunately, the states have several years to implement their coastal nonpoint programs.

As noted above, Hawaii's program will require development of regulatory and non-regulatory mechanisms to implement several of the required management measures. Not all of these tasks can be accomplished at once. The highest priority problems will be addressed first. Coordination with other programs and organizations that share the objectives of the coastal nonpoint pollution control program will also be an early and an ongoing priority.

The coastal nonpoint pollution control program management plan is being submitted to NOAA and EPA for their review and approval.

During the next year, the State intends to develop an implementation plan that will specify how each of the recommendations will be accomplished, quantify fiscal and human resources needed to implement program changes, prioritize implementation, and establish timelines for implementation subject to availability of resources. It will also identify lead agencies and their roles, and provide draft language, as necessary, to enable these program changes. In addition, funding sources must be identified and internal agency work plans developed before implementation of new coastal nonpoint pollution control program components can occur. The implementation plan will be developed with extensive input from

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federal, State, and county agencies, non-governmental organizations, and interested individuals, using a number of mechanisms for public participation.

For More Information

For more information about the coastal nonpoint pollution control program, call the Hawaii CZM Program at 587-2880 or 1-800-468-4644 x72880 from the Neighbor Islands.