

**HAWAII'S
COASTAL NONPOINT POLLUTION
CONTROL PROGRAM**

MANAGEMENT PLAN

Volume 1

Prepared By:

**Hawaii Coastal Zone Management Program
Office of State Planning
P.O. Box 3540
Honolulu, Hawaii 96811-3540**

June 1996

A publication of the Hawaii Office of State Planning, pursuant to National Oceanic and Atmospheric Administration Award Nos. NA47OZ0264 and NA57OZ0270. This document was prepared with the assistance of the Hawaii Department of Health, Pacific Environmental Research, Susan Miller and many others in government, the private sector, and non-governmental organizations.



Table of Contents

List of Figures.....	v
List of Tables	v
Acronyms	vi
Summary of Agencies Responsible for Management Measure Implementation.....	ix
Executive Summary	xv
PART I: INTRODUCTION	I-1
1. Hawaii’s Environment.....	I-2
2. Coastal Nonpoint Pollution Control Program Management Area	I-9
3. Types and Sources of Nonpoint Pollution in Hawaii.....	I-9
4. Hawaii’s Coastal Nonpoint Pollution Control Program Development	I-11
PART II: PROGRAM COORDINATION	II-1
1. Coordination with Water Quality Program.....	II-1
2. Coordination with Coastal Management Program	II-2
3. Hawaii’s Coastal Nonpoint Pollution Control Program Development	II-3
PART III: MANAGEMENT MEASURES FOR HAWAII.....	III-1
1. <i>Chapter 1: Introduction</i>	III-3
2. <i>Chapter 2: Agriculture</i>	III-5
Erosion and Sediment Control Management Measure	III-10
Management Measure for Wastewater and Runoff from Confined Animal Facilities	III-16
Nutrient Management Measure	III-23
Pesticide Management Measure	III-29
Grazing Management Measure	III-35
Irrigation Water Management Measure	III-41
Recommended Implementation	III-46
3. <i>Chapter 3: Forestry</i>	III-55
Preharvest Planning Management Measure	III-59
Streamside Management Zone	III-64
Road Construction/Reconstruction Management Measure.....	III-68
Road Management.....	III-72
Timber Harvesting	III-75
Site Preparation and Forest Regeneration Management Measure	III-79
Fire Management	III-82
Revegetation of Disturbed Areas	III-86
Forest Chemical Management.....	III-89
Wetlands Forest Management.....	III-94
Recommendations for Implementation.....	III-96

Table of Contents (continued)

4.	<i>Chapter 4: Urban Areas</i>	III-101
	New Development Management Measure	III-104
	Watershed Protection Management Measure	III-108
	Site Development Management Measure	III-112
	Construction Site Erosion and Sediment Control Management Measure	III-117
	Construction Site Chemical Control Management Measure.....	III-124
	Existing Development Management Measure	III-128
	New Onsite Disposal Systems Management Measure.....	III-131
	Operating Onsite Disposal Systems Management Measure	III-136
	Pollution Prevention Management Measure.....	III-139
	Golf Course Management Measure	III-148
	Management Measure for Planning, Siting and Developing Roads and Highways.....	III-154
	Management Measure for Bridges	III-155
	Management Measure for Construction of Roads and Highways	III-156
	Management Measure for Construction Site Chemical Control for Roads and Highways	III-157
	Management Measure for Operation and Maintenance of Roads and Highways	III-157
	Management Measure for Road, Highway, and Bridge Runoff Systems	III-160
5.	<i>Chapter 5: Marinas and Recreational Boating</i>	III-163
	Marina Flushing Management Measure.....	III-167
	Water Quality Assessment Management Measure	III-169
	Habitat Assessment Management Measure	III-171
	Shoreline Stabilization Management Measure	III-174
	Storm Water Runoff Management Measure	III-177
	Fueling Station Design Management Measure	III-179
	Sewage Facility Management Measure.....	III-181
	Solid Waste Management Measure	III-184
	Fish Waste Management Measure	III-187
	Liquid Material Management Measure.....	III-189
	Petroleum Control Management Measure.....	III-191
	Boat Cleaning Management Measure	III-193
	Public Education Management Measure	III-196
	Management of Sewage Facilities Management Measure.....	III-197
	Boat Operation Management Measure	III-199
	Recommended Implementing Actions.....	III-201

Table of Contents (continued)

6.	<i>Chapter 6: Hydromodification - Channelization, Channel Modification, Dams, Streambank and Shoreline Erosion</i>	III-205
	Management Measure for Physical and Chemical Characteristics of Surface Waters	III-209
	Instream and Riparian Habitat Restoration Management Measure	III-212
	Management Measure for Erosion and Sediment Control of Dams	III-214
	Management Measure for Chemical and Pollutant Control from Dams	III-217
	Management Measure for Protection of Surface Water Quality and Instream and Riparian Habitat from Dams	III-220
	Management Measure for Eroding Streambank and Shorelines	III-223
	Recommended Implementing Actions	III-226
7.	<i>Chapter 7: Wetlands and Riparian Areas</i>	III-231
	Management Measure for Protection of Wetlands and Riparian Areas	III-236
	Management Measure for Restoration of Wetland and Riparian Areas	III-239
	Management Measure for Vegetated Treatment Systems	III-241
	Recommended Implementing Actions	III-242
8.	<i>Chapter 8: General Recommendations</i>	III-245
	1. Strengthening Existing Regulations	III-245
	2. Improving Coordination	III-246
	3. Developing and Implementing BMPs	III-248
	4. Encouraging and Facilitating Community-Based Watershed Management	III-249

PART IV:	CRITICAL COASTAL AREAS AND ADDITIONAL MANAGEMENT MEASURES	IV-1
	1. Identification of Threatened or Impaired Coastal Waters	IV-1
	2. Identification of Land and Water Uses	IV-26
	3. Identification of Critical Coastal Areas	IV-27
	4. Implementation of Additional Management Measures	IV-27
	5. Technical Assistance	IV-28

PART V:	PUBLIC PARTICIPATION	V-1
	1. Opportunities for Public Participation During the Program Development Process	V-1
	2. Future Opportunities for Public Involvement	V-7
	3. Public Education	V-8

Table of Contents (continued)

PART VI:	ADMINISTRATIVE COORDINATION	VI-1
	1. Involved Federal Agencies	VI-2
	2. Involved State Agencies	VI-4
	3. Involved County Agencies.....	VI-9
	4. Coordination Strategies	VI-11
PART VII:	MONITORING AND TRACKING TECHNIQUES	VII-1
	1. Monitoring Plan	VII-2
	2. Overview of Water Quality Monitoring Workplan.....	VII-6
	3. Specific Workplans for Water Quality Monitoring Activities	VII-12
	4. Tracking Management Measure Implementation	VII-22
PART VIII:	GLOSSARY	VIII-1
PART IX:	REFERENCES	IX-1
Appendix A:	Working Group and Focus Group Participants and Mailing Lists	A-1
Appendix B:	Golf Course Management Measure Bibliography	B-1
Appendix C:	Watershed Planning Efforts.....	C-1

List of Figures

	<u>Page</u>
Figure I-1	Watershed Delineations I-4
Figure III-1	Agricultural Pollution Prevention Plan ProgramIII-48

List of Tables

Table III-1	Current Acreage for Major Agricultural Activities in Hawaii III-6
Table III-2	Distribution of Resident and <i>De Facto</i> Population for Hawaii III-101
Table III-3	Percent Land Area in Urban Use and Percent of Population in Urban Areas, By County III-101
Table III-4	Sources of Urban Runoff Pollutants III-103
Table III-5	Range of Functions of Wetlands and Riparian Areas III-232
Table IV-1	Types and Sources of Pollutants Affecting Water Quality Limited Segments..... IV-7
Table VII-1	Water Quality Monitoring CategoryVII-4
Table VII-2	Monitoring Parameters and Water Quality Standards VII-13
Table VII-3	DOH Toxic Contaminants Screening for 1991.....VII-17

Acronyms

ACP	USDA-CFSA's Agricultural Conservation Program
ADSC	Agricultural Diagnostic Service Center
AMS	Acceptable Management System (developed by USDA-NRCS)
BMP	Best Management Practice
BOD	Biological oxygen demand
C&C	City and County of Honolulu
C&CDPW	City and County of Honolulu Department of Public Works
CDUA	Conservation District Use Application
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act (42 USC §9601 et.seq.)
CES	University of Hawaii Cooperative Extension Service
CFR	Code of Federal Regulations
cfs	Cubic feet per second
CMS	Conservation Management System (developed by USDA-NRCS)
CTAHR	University of Hawaii College of Tropical Agriculture and Human Resources
CWA	Clean Water Act
CWDA	Critical Wastewater Disposal Area
CWRM	Commission on Water Resource Management
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
CZM	Coastal Zone Management
DBEDT	Department of Business, Economic Development, and Tourism
DHHL	Department of Hawaiian Home Lands
DLNR	Department of Land and Natural Resources
DLNR-DAR	DLNR Division of Aquatic Resources
DLNR-DOBOR	DLNR Division of Boating and Ocean Recreation
DLNR-DOFAW	DLNR Division of Forestry and Wildlife
DOA	Department of Agriculture
DOH	Department of Health
DOH-CWB	DOH Clean Water Branch
DOH-PRC	DOH Polluted Runoff Control Program
DOH-WWB	DOH Wastewater Branch
DPED	Department of Planning and Economic Development (predecessor of DBEDT)
DPS	Department of Public Safety
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
FACTA	Food, Agriculture, and Conservation Trade Act of 1990
FIP	Forestry Incentive Program (NRCS)
FSA	USDA Farm Services Agency
GCA	General Contractors Association
GDSI	Geographic Decision Systems International
GIS	Geographic Information System
HACD	Hawaii Association of Conservation Districts

Acronyms (continued)

HAR	Hawaii Administrative Rules
HCC	Hawaii County Code
HFIA	Hawaii Forest Industry Association
HIOSH	Hawaii Occupational Safety and Health
HRS	Hawaii Revised Statutes
HSPA	Hawaiian Sugar Planters Association
IPM	Integrated Pest Management
KCC	Kauai County Code
LUC	Land Use Commission
MCC	Maui County Code
mgd	Million gallons per day
mg/L	Milligrams per liter
MLCD	Marine Life Conservation District
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MSD	Marine Sanitation Device
NAR	Natural Area Reserve
NARS	Natural Area Reserve System
NMFS	U.S. National Marine Fisheries Service
NOAA	U.S. National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint Source (Pollution)
NRDC	Natural Resources Defense Council
NRCS	USDA Natural Resources Conservation Service
OCEA	DLNR Office of Conservation and Environmental Affairs
OEQC	Office of Environmental Quality Control
ORMA	Ocean Recreation Management Area
ORMP	Ocean Resources Management Plan
OSDS	On-Site Disposal System
OSP	Hawaii Office of State Planning
OSWM	DOH's Office of Solid Waste Management
PAH	Polynuclear aromatic hydrocarbons
PER	Pacific Environmental Research
PPP	Agricultural Pollution Prevention Plan
PSA	Public service announcement
RMS	Resource Management System (developed by USDA-NRCS)
ROH	Revised Ordinances of Honolulu
RUSLE	Revised Universal Soil Loss Equation
SCAP	Stream Channel Alteration Permit
SCUBA	Self-Contained Underwater Breathing Apparatus
SGES	University of Hawaii Sea Grant Extension Service
SIP	Stewardship Incentive Program (DLNR)
SMA	Special Management Area
SOEST	University of Hawaii School of Ocean and Earth Science and Technology
SPAM	Stream Protection and Management (Plan)

Acronyms (continued)

STP	Sewage treatment plant
SWCD	Soil and Water Conservation District
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TORCH	The Ocean Recreation Council of Hawaii
TSS	Total suspended solids
UIC	Underground Injection Control (Line)
UH	University of Hawaii
USACOE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USCG	U.S. Coast Guard
USLE	Universal Soil Loss Equation
VTS	Vegetative Treatment System
VFS	Vegetative Filter Strip
WQLS	Water Quality Limited Segment
WRP	Wetland Reserve Program (NRCS)
WRRC	University of Hawaii Water Resources Research Center
WWTP	Wastewater treatment plant