Hawai‘i Nonpoint Source Management Plan

2021 – 2025

Hawai‘i State Department of Health
Clean Water Branch
Polluted Runoff Control Program

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ACRONYMS

BAV	Beach Action Value
BEACH	Beaches Environmental Assessment and Coastal Health
BMP	Best management practice
BWA	Brown Water Advisory
CCH	City and County of Honolulu
CE	Cooperative Extension
CIP	Capital Improvement Project
CMS	Comprehensive Monitoring Strategy for the Surface Waters of Hawaii
CNPCP	Coastal Nonpoint Pollution Control Program
CTAHR	College of Tropical Agriculture and Human Resources
CWA	Clean Water Act
CWSRF	Clean Water State Revolving Fund
CZARA	Coastal Zone Act Reauthorization Amendments of 1990
CZM	Coastal Zone Management
DBEDT	Department of Business, Economic Development and Tourism
DLNR	Department of Land and Natural Resources
DLNR-DAR	Division of Aquatic Resources
DLNR-DOBOR	Division of Boating and Ocean Recreation
DLNR-DOFAW	Division of Forestry and Wildlife
DOH	Department of Health
DOH-CWB	Clean Water Branch
DOH-HEER	Hazard Evaluation and Emergency Response Office
DOH-SDWB	Safe Drinking Water Branch
DOH-SWPB	Surface Water Protection Branch
DOH-WWB	Wastewater Branch
DWSRF	Drinking Water State Revolving Fund
EMD	Environmental Management Division
EPA	Environmental Protection Agency
EQIP	Environmental Quality Incentives Program
FAST	Funding Agency Support Team
GIS	Geographic information system
GRTS	Grants Reporting and Tracking System
HACD	Hawai‘i Association of Conservation Districts
HAR	Hawai‘i Administrative Rules
HAWP	Hawai‘i Association of Watershed Partnerships
HCRS	Hawai‘i Coral Reef Strategy
HDOA	Hawai‘i Department of Agriculture
HIMB	Hawai‘i Institute of Marine Biology
HRS	Hawai‘i Revised Statutes
KIRC	Kaho‘olawe Island Reserve Commission
KWRAS	Ko‘olaupoko Watershed Restoration Action Strategy
LTPG	Long-term performance goal
MKWP	Mauna Kahalawai Watershed Partnership
MS4	Municipal Separate Storm Sewer System

NOAA	National Oceanic and Atmospheric Administration
NERR	National Estuarine Research Reserve
NFWF	National Fish and Wildlife Foundation
NPDES	National Pollutant Discharge Elimination System
NPS	Nonpoint source
NRCS	Natural Resources Conservation Service
NWQI	National Water Quality Initiative
OP-CZM	Office of Planning, Coastal Zone Management Program
ORMP	Ocean Resources Management Plan
OSDS	Onsite disposal systems
PacIOOS	Pacific Islands Ocean Observing System
PCR	Polymerase chain reaction
PRC	Polluted Runoff Control
QAPP	Quality assurance project plan
RCPP	Regional Conservation Partnership Program
RFP	Request for proposals
SDWA	Safe Drinking Water Act
SKCP	South Kohala Coastal Partnership
SEP	Supplemental Environmental Project
SMA	Special Management Area
SOEST	School of Ocean and Earth Science and Technology
SWCD	Soil and Water Conservation District
TCD	Targeted Conservation Delivery
TMDL	Total Maximum Daily Load
TNC	The Nature Conservancy
TSS	Total suspended solids
UH	University of Hawai‘i
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WAU	Watershed assessment unit
WBP	Watershed-based plan
WMR2R	West Maui Ridge to Reef Initiative
WPP	Watershed Partnerships Program
WQS	Water quality standards
WRPP	Water Resources Protection Plan
WRRC	Water Resources Research Center

EXECUTIVE SUMMARY

The purpose of the *Hawai'i Nonpoint Source Management Plan* (*NPS Plan*) is to guide the State's nonpoint source (NPS) management efforts over a five-year period (2021-2025) by establishing goals, objectives, strategies, and milestones to reduce and prevent NPS pollution and improve water quality. Section 319 of the Clean Water Act (CWA) requires states to implement NPS management programs that identify measures to reduce pollutant loadings, identify programs to achieve these measures, and create a schedule of milestones for NPS management program implementation. In addition to meeting CWA requirements, the *NPS Plan* is intended to fulfill the Department of Health's (DOH) NPS management responsibilities pursuant to Chapter 342E, Hawai'i Revised Statutes (HRS).

Hawai'i's NPS management program's primary goal is to achieve and maintain water quality standards and designated uses of State waters by implementing a comprehensive NPS pollution control program that conducts watershed-based restoration and protection activities. The *NPS Plan* establishes six objectives to meet this goal:

1. Develop watershed-based plans (WBPs) or acceptable alternatives to guide effective NPS pollution control projects;
2. Restore and protect water quality;
3. Utilize partnerships and cooperate with other agencies to leverage resources available for NPS management;
4. Expand the NPS management program to include regulatory activities and additional watershed planning support;
5. Develop and implement the Coastal Nonpoint Pollution Control Program; and
6. Conduct and support water quality monitoring.

Chapter 1 of this document introduces the *NPS Plan* and identifies important updates from the 2015 version of the plan. Chapter 1 also provides the legal framework that guides NPS management programs and actions in Hawai'i, including the federal and state laws governing NPS pollution and water pollution in general.

Chapter 2 of the *NPS Plan* provides information on water quality and NPS pollution in Hawai'i, which provides the basis for watershed prioritization, objectives, and management actions described in later chapters of the plan. Chapter 2 provides an overview of impaired waterbodies and the pollutants causing water quality impairments, as well as nonpoint sources of pollutants and their environmental and public health impacts.

Chapter 3 provides information on the State's programs charged with managing NPS pollution and includes their NPS pollution related responsibilities and management actions, as well as associated *NPS*

Plan goals, objectives, and milestones. Federal and state water quality and watershed restoration initiatives are also described in this chapter.

Chapter 4 expands upon information in Chapter 3 to describe the State's approach to prioritizing watersheds for restoration and protection and managing NPS pollution on a priority watershed basis through coordination among the federal, state, and local programs and organizations.

Chapter 5 of the *NPS Plan* describes the goals, objectives, activities, milestones for the NPS management program for 2021 through 2025. For each of the six objectives, activities and milestones are included to guide and track the State's progress towards meeting its long-term water quality improvement goal.

Chapter 6 provides information on how the State's NPS management program and *NPS Plan* will be evaluated annually and revised in 2025.

1 INTRODUCTION

The importance of protecting and improving water quality to Hawai‘i cannot be overstated. Clean water is vital to public health, food, culture, recreation, research, and technology. Clean streams and coastal waters are also essential to Hawai‘i’s most important economic industry, tourism. Hawai‘i’s beaches and water recreation opportunities, such as surfing, snorkeling, boating, and swimming, are major reasons the State receives over 10 million visitors annually.[1]

With no point more than 30 miles from the ocean, Hawai‘i‘s entire land mass lies within the coastal zone, closely linking activities on land to coastal water quality. Land-based activities are the primary sources of NPS pollution, also known as polluted runoff. Nonpoint source pollution occurs when rainwater or snowmelt moves over the surface of the land or through the ground, carrying pollutants with it and depositing them into streams and lakes, coastal waters, groundwater, and wetlands. Common NPS pollutants include sediment, nutrients, bacteria, and toxic chemicals. Nutrients and organic chemicals can also leach into groundwater, which may contaminate drinking water sources and nearshore surface waters where ground waters discharge.

Because of its diffuse nature and broad range of sources, NPS pollution can be difficult to prevent and control. Human choices and actions, such as agricultural practices, wastewater disposal, hydrological modifications, and urban development, can result in NPS pollution problems that require management in order to restore water quality and protect human health and aquatic life. To manage NPS pollution, the State of Hawai‘i Department of Health (DOH), Clean Water Branch (DOH-CWB), Polluted Runoff Control (PRC) Program has updated *Hawai‘i’s NPS Management Plan* (*NPS Plan*), which was last revised in 2015. The updated *NPS Plan* covers a five-year period (2021-2025) and expands the State’s approach to NPS management.

The revised *NPS Plan* includes new objectives and milestones to measure progress towards meeting NPS management goals. Achieving these objectives will ensure that the State is meeting its Clean Water Act (CWA) Section 319 program goals to restore impaired waters and to protect high quality waters. This update also describes the State’s NPS management programs in greater detail, including their key NPS management objectives and activities. In addition, this *NPS Plan* provides more information on the watershed prioritization process and provides specific NPS objectives for priority watersheds. This update also places greater emphasis on strategic partnerships to improve water quality, particularly in priority watersheds. Greater impacts on protecting and restoring watersheds will be achieved with multiple agencies investing technical and financial resources to restore and protect natural resources in these priority watersheds.

[1] Hawai‘i Tourism Authority (2020). Hawaii Visitor Statistics Released for 2019. HTA Release 20-03. https://www.hawaiitourismauthority.org/media/4166/2020-01-29-hawaii-visitor-statistics-released-for-december-2019.pdf (accessed January 31, 2021).

Over the next five years, the State's NPS management program plans to increase in size and scope to address the State's water quality problems. The revised *NPS Plan* advances the creation of the DOH Surface Water Protection Branch (DOH-SWPB) in conjunction with the development of new statewide NPS pollution regulations (Chapter 11-56, Hawai'i Administrative Rules (HAR)). The new branch will formalize and consolidate voluntary and regulatory NPS management programs, which will provide a more comprehensive approach to addressing polluted runoff and improving water quality statewide.

The *NPS Plan* also has been updated to balance the following requirements and recommendations:

1. Federal requirements: CWA Section 319 and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 (CZARA);
2. State requirements: HRS Chapter 342E and HAR Chapter 11-54;
3. Priorities of federal, state, and local organizations that implement NPS-related programs or activities; and
4. Stakeholder recommendations from surveys and meetings.

The update process of the *NPS Plan* involved stakeholder surveys, stakeholder outreach in each county at five Joint Government Water Conferences in 2019, and planning sessions with key stakeholders and resource managers, including the Department of Land and Natural Resources (DLNR), the University of Hawai'i (UH), the Natural Resources Conservation Service (NRCS), the Hawai'i Association of Watershed Partnerships (HAWP), the U.S. Environmental Protection Agency (EPA), and other DOH water programs. Drafts of the plan were also reviewed by EPA, NRCS, DBEDT, DLNR, DOH water branches, the Hawai'i Department of Agriculture, UH, The West Maui Ridge to Reef Initiative, and The Nature Conservancy. In addition, the *NPS Plan* was released for a public comment period on the CWB website and received two responses, which were reviewed and considered in the final version of this plan.

1.1 Consistency with Federal and State Strategic Plans

The *NPS Plan* supports the following federal and state strategic plans:

1. **Fiscal Year 2018 – Fiscal Year 2022 U.S. EPA Strategic Plan:** The *NPS Plan*'s objectives link directly to Goal 1 (Core Mission), Objective 1.2 (Provide for clean and safe water), Strategic Measure 4: "By September 30, 2022, reduce the number of square miles of watershed with surface water not meeting standards by 37,000 square miles" (https://www.epa.gov/sites/production/files/2018-02/documents/fy-2018-2022-epa-strategic-plan.pdf).
2. **Water Quality Plan:** The *NPS Plan* describes the State's NPS pollution management priorities that align with DOH's water protection goals identified in the State's Water Quality Plan, which was updated in 2019 and is available at https://health.hawaii.gov/water/.
3. **Hawai'i Ocean Resources Management Plan (ORMP):** The ORMP is a State plan that provides a framework for the protection and management of ocean resources. Implementation of the *NPS*

Plan will provide metrics for land-based pollution mitigation goals in the ORMP, which can be found at the State of Hawai‘i Office of Planning website: https://planning.hawaii.gov/czm/ormp/.

4. **Sustainable Hawai‘i Initiative:** The *NPS Plan* includes partnering with DLNR to support the Initiative goals to protect 30% of priority watersheds by 2030 and effectively manage 30% of nearshore waters by 2030 (https://governor.hawaii.gov/sustainable-Hawai‘i-initiative/).

1.2 Legal Framework for NPS Management in Hawai‘i

Nonpoint source pollution control in Hawai‘i is guided primarily by two federal statutes—Section 319 of the CWA (hereafter “Section 319”) and Section 6217 of CZARA—and HRS Chapters 342D and 342E. Other sections and chapters of the CWA, HRS, and HAR also are important in providing the legal framework for NPS pollution management in Hawai‘i and are described below. A summary of federal and state statutes and programs critical to NPS pollution management can be found in Table 1.

The lead State agency responsible for managing NPS pollution in Hawai‘i is DOH. Within the DOH-CWB, the PRC Program is the lead program that manages NPS pollution. Other federal, state, and local programs that protect and restore watersheds and natural resources also conduct NPS mitigation efforts. These programs are described in Chapter 3.

Table 1. Core federal and state nonpoint source pollution control laws

Statute	Description	Administrators
CWA §319	Establishes the federal NPS grant program, which provides funding to states to implement NPS management programs	Federal: EPA State: DOH
CZARA §6217	Requires coastal states, which includes Hawai‘i, to develop and implement Coastal Nonpoint Pollution Control Programs to address NPS pollution in coastal zones	Federal: NOAA, EPA State: DBEDT, DOH
HAR §11-54	Establishes water quality standards for State surface waters	DOH
HRS §342D	Prohibits discharges of pollutants into State waters; requires DOH to “prevent, control, and abate water pollution in the State” and gives DOH the authority to establish water quality related standards and enforce water pollution laws	DOH
HRS §342E	Requires within DOH an NPS pollution management and control program to administer, enforce, and carry out all laws, rules, and programs relating to NPS pollution in the State	DOH

Key: CWA = Clean Water Act; CZARA = Coastal Zone Act Reauthorization Amendments of 1990; DBEDT = Department of Business, Economic Development and Tourism; DOH = Department of Health; EPA = U.S. Environmental Protection Agency; HAR = Hawai‘i Administrative Rules; HRS = Hawai‘i Revised Statutes; NOAA = National Oceanic and Atmospheric Administration

1.2.1 Section 319, CWA: Nonpoint Source Management Programs

In 1987, Congress passed the Water Quality Act of 1987, which amended the Federal Water Pollution Control Act, U.S.C. §1329, commonly known as the CWA. Section 319 established the national Nonpoint Source Management Program, which is administered by the EPA. Section 319 requires states to submit management programs for controlling NPS pollution and improving water quality to the EPA for approval in order to receive Section 319(h) NPS grants. These grants can be used to implement state NPS programs, including non-regulatory or regulatory programs for enforcement, technical assistance, financial assistance, education, training, technology transfer, and demonstration projects to implement best management practices (BMPs) and achieve water quality goals.

Section 319 requires each state NPS management program to identify BMPs to reduce NPS pollution, identify programs to achieve implementation of BMPs, establish a schedule containing annual milestones for NPS program implementation, and identify sources of assistance and funding. Section 319 also requires states to report annually on progress in meeting milestones, reducing NPS pollution, and meeting water quality improvement goals. In addition, Section 319 encourages a watershed-based approach to NPS pollution control. In 2013, the EPA provided states with Section 319 grant guidelines that include the "Key Components of an Effective State Nonpoint Source Management Program" that States should incorporate into their NPS management programs (Table 2). These key components are addressed in this plan.

Hawai'i's Section 319 program is the PRC Program within the DOH-CWB. Hawai'i's Section 319 grant award each year is approximately $1.2 million. The State also contributes approximately $800,000 (40% of the total budget) in non-federal matching funds pursuant to Section 319. At least 50% of the total Section 319 grant award the State receives must be used to implement approved watershed-based plans (WBPs), including conducting NPS pollution control projects, outreach, and water quality monitoring activities identified in the WBPs. The remaining grant funds (roughly 50%) can be spent on personnel, development of WBPs, water quality monitoring, and Total Maximum Daily Loads (TMDLs) that address nonpoint sources. More information on how the PRC Program administers the Section 319 grant can be found in Chapter 3.

1.2.2 Section 6217, CZARA: Protecting Coastal Waters

Under Section 6217 of CZARA, states with federally approved Coastal Zone Management (CZM) programs are required to prepare a Coastal Nonpoint Pollution Control Program (CNPCP) to enhance the effectiveness of CZM and NPS programs. The CNPCP is considered an expansion of the State's NPS management program developed under Section 319. The CNPCP consists largely of management measures that address NPS pollution in the coastal zone. Management measures are economically achievable management practices designed to reduce and prevent NPS pollution from six main sources: forestry, agriculture, urban areas, marinas, hydromodifications, and wetlands and riparian areas. The

Table 2. The U.S. Environmental Protection Agency's "Key Components of an Effective State NPS Management Program" and corresponding chapters in the *Hawai'i NPS Management Plan*	
Key Component	**Chapter**
1. The state program contains explicit short- and long-term goals, objectives, and strategies to restore and protect surface water and ground water, as appropriate.	3, 4, 5
2. The state strengthens its working partnerships and linkages to appropriate state, interstate, tribal, regional, and local entities (including conservation districts), private sector groups, citizens groups, and federal agencies.	3, 4, 5
3. The state uses a combination of statewide programs and on-the-ground projects to achieve water quality benefits; efforts are well-integrated with other relevant state and federal programs.	3, 4, 5
4. The state program describes how resources will be allocated between (a) abating known water quality impairments from NPS pollution and (b) protecting threatened and high quality waters from significant threats caused by present and future NPS impacts.	4, 5
5. The state program identifies waters and watersheds impaired by NPS pollution as well as priority unimpaired waters for protection. The state establishes a process to assign priority and to progressively address identified watersheds by conducting more detailed watershed assessments, developing watershed-based plans, and implementing the plans.	4
6. The state implements all program components required by section 319(b) of the Clean Water Act and establishes strategic approaches and adaptive management to achieve and maintain water quality standards as expeditiously as practicable. The state reviews and upgrades program components as appropriate. The state program includes a mix of regulatory, nonregulatory, financial and technical assistance, as needed.	1, 3, 4, 5, 6
7. The state manages and implements its NPS management program efficiently and effectively, including necessary financial management.	3
8. The state reviews and evaluates its NPS management program using environmental and functional measures of success and revises its NPS management program at least every five years.	6

CNPCP also includes a monitoring and tracking element to ensure that the management measures are effectively addressing NPS pollution.

Section 6217 is administered jointly by the U.S. National Oceanic and Atmospheric Administration (NOAA) and the EPA. The PRC Program and the Office of Planning CZM Program (OP-CZM; located in the Department of Business, Economic Development and Tourism, Office of Planning (DBEDT)) are charged with developing and administering Hawai'i's CNPCP, which is currently conditionally approved by NOAA

and EPA. Full approval of the CNPCP is a main objective of the State's NPS program in this plan and is anticipated by 2025. More information about the Hawai'i CNPCP can be found in Chapter 3.

1.2.3 Chapter 342D, HRS: Water Pollution

The Hawai'i legislature enacted HRS Chapter 342D (hereafter "Chapter 342D") to "prevent, control, and abate water pollution in the State." Chapter 342D is the state's equivalent to the CWA and states that "No person, including any public body, shall discharge any water pollutant into state waters, or cause or allow any water pollutant to enter state waters except in compliance with this chapter, rules adopted pursuant to this chapter, or a permit or variance issued by the director [of the DOH]." Chapter 342D does not distinguish discharges between point and NPS pollution. Chapter 342D also gives DOH the authority to administer and enforce Chapter 342D and administrative rules adopted pursuant to Chapter 342D.

1.2.4 Chapter 342E, HRS: Nonpoint Source Pollution Management and Control

Chapter 342E, HRS (hereafter "Chapter 342E") directly addresses NPS pollution management, requiring within DOH "a nonpoint source pollution management and control program to administer, enforce, and carry out all laws, rules, and programs relating to nonpoint source pollution in the State." Chapter 342E requires DOH to:

- Reduce, control, and mitigate NPS pollution in the State;
- Adopt rules necessary for the purposes of Chapter 342E;
- Develop plans, recommendations, and policies, and provide other support to further the State's capacity to carry out the requirements of any federal law, rule, or regulation pertinent to the management or mitigation of NPS pollution;
- Work cooperatively with other state, county, and federal agencies, to facilitate the monitoring of State waters that cannot attain or maintain state water quality standards without additional action to control NPS pollution;
- Identify categories of nonpoint sources that add significant pollution to impaired state waterbodies;
- Facilitate and provide funding for the implementation of BMPs, programs, projects, and measures to control identified categories of NPS pollution, and encourage NPS pollution mitigation practices;
- Identify public and private sources of expertise, technical assistance, financial assistance, educational assistance, training, and technology transfer;
- Convene statewide and regional public forums involving the general public, the regulatory community, and businesses and industries that may contribute to categories of NPS pollution for the purpose of establishing plans and developing strategies to control NPS pollution;
- Provide funding for public initiative projects to encourage education and prevention measures relating to NPS pollution;

- Propose legislation, alternate funding mechanisms, and new programs to improve the State's capacity to mitigate NPS pollution; and
- Review environmental assessments and environmental impact statements for the purposes of commenting on the effects that a proposed action would have on the level of NPS pollution generated in an area.

1.2.5 Chapter 11-54, HAR: Water Quality Standards

Chapter 11-54, HAR establishes Hawai'i's water quality standards (WQS), forming a legal basis for controlling pollution entering surface waters of the State. The core components of WQS are designated uses to identify the beneficial values of surface waters, water quality criteria necessary to achieve designated uses, and antidegradation requirements to protect existing and designated uses. The State has established WQS regulations based on a water body classification system whereby all similar types of water bodies are assigned uniform WQS.

Classification of State waters (§11-54-2). The State's surface waters are classified as inland or marine waters. Inland waters include streams, estuaries, lakes and reservoirs, wetlands, and anchialine pools. Marine waters are classified as embayments, open coastal, or oceanic waters.

Classification of water uses (§11-54-3). Inland and marine waters are further classified by their uses that the WQS aim to protect. Inland waters are classified as Class 1 (Class 1.a and Class 1.b) or Class 2 waters. The objective of Class 1 waters is to remain in their natural state as nearly as possible with an absolute minimum of pollution from any human-caused sources and to keep their wilderness character protected. The objective of Class 2 waters is to protect their use for recreational purposes, the support and propagation of aquatic life, agricultural and industrial water supplies, shipping, and navigation.

Marine waters are classified as Class AA or Class A waters. The goal for Class AA waters is to keep them in their natural, pristine state with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions and to keep the wilderness character of these areas protected. Class AA protected uses are oceanographic research, the support and propagation of shellfish and other marine life, conservation of coral reefs and wilderness areas, compatible recreation, and aesthetic enjoyment. The objective of Class A waters is to protect their use for recreational purposes and aesthetic enjoyment. Any other use is permitted for Class A waters as along as it is compatible with the protection and propagation of fish, shellfish, and wildlife and with recreation in and on these waters.

Water quality criteria. Chapter 11-54, HAR contains water quality criteria applicable to all State waters (§11-54-4), to inland waters (§11-54-5.2), and marine waters (§11-54-6). The narrative and numeric water quality criteria applicable to streams, estuaries, embayments, and coastal and oceanic waters form the basis for determining whether a waterbody is meeting its intended uses. Stream water quality criteria is divided into wet season criteria (November 1 through April 30) and dry season criteria (May 1 through October 31) (§11-54-5.2(b)). Embayments and coastal waters also have wet and dry season

criteria based on freshwater inflows from the land or discharges from the shoreline inputs (§11-54-6(a)(3) and 11-54-6(b)(3)). Chapter 11-54, HAR also contains recreational water quality criteria applicable to all State waters (§11-54-8) in order to protect the public from exposure to harmful levels of pathogens while participating in water-contact activities. Waters that fail to meet water quality criteria are considered impaired.

The WQS play a central role in the successful implementation of Hawai'i's surface water pollution control programs. To evaluate the need for revising or adding to State standards, the DOH-CWB is required by CWA Section 303(c) to conduct, at least once every three years, a comprehensive review of existing state WQS and recent WQS promulgated by the EPA. The review process allows the State to determine whether its WQS are adequate to maintain the designated uses of State waters. The most recent WQS review was in 2019, and the next review will be in 2022.

Antidegradation policy (§11-54-1.1). The State's general policy of water quality antidegradation includes the following:

(1) Existing uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.
(2) Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless the director [of health] finds, after full satisfaction of the intergovernmental coordination and public participation provisions of the state's continuing planning process, that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. In allowing such degradation on lower water quality, the director shall assure water quality adequate to protect existing uses fully. Further, the director shall assure that there shall be achieved the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control.
(3) Where existing high quality waters constitute an outstanding resource, such as waters of national and state parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected.

The State's entire antidegradation policy can be found in HAR §11-54-1.1.

1.2.6 Safe Drinking Water Act (SDWA)

The federal SDWA (42 U.S.C. §300f et seq.), originally passed by Congress in 1974, establishes the regulation of public drinking water supplies in the U.S. to ensure that the public has a safe and healthy source of drinking water. Under the SDWA, EPA sets legal limits on the levels of certain contaminants (e.g., Maximum Contaminant Levels) for drinking water. The SDWA applies to every public water system in the U.S. Under the SDWA, the EPA provides grants to implement state drinking water programs and to

help each state set up a special fund—the Drinking Water State Revolving Fund (DWSRF)—to assist public water systems in financing the costs of improvements.

The SDWA underwent significant amendments in 1986 and 1996 that require states to take additional actions to protect drinking water sources, including source water assessments of drinking water sources to identify significant potential sources of contamination and to determine how susceptible these sources are to threats. Amendments to various portions of the SDWA were also made in America's Water Infrastructure Act of 2018, including the expansion of source water protection-related eligibilities under the DWSRF Program's 15 percent set-aside for local assistance and other state programs. Updates to source water assessments and implementation of source water protection activities are now eligible for DWSRF 15 percent set-aside funds.

The DOH-SDWB is responsible for implementing the SDWA programs in Hawai'i. More information on the DOH-SDWB water quality management activities can be found in Chapter 3.

1.2.7 Additional sections of the CWA that pertain to water quality management

Section 106 of the CWA (33 U.S.C. §1256) provides water pollution control grants to states to assist states in administering programs for the prevention, reduction, and elimination of pollution. Section 106 also includes a Monitoring Initiative grant to states with the aim of achieving long-term monitoring program goals. In Hawai'i, the DOH-CWB administers the Section 106 grant, which provides funding for a large portion of water pollution control activities, including water quality monitoring and assessment and National Pollution Discharge Elimination System (NPDES) permitting, compliance, and enforcement. More information on how Section 106 is implemented by DOH-CWB can be found in Chapter 3. Section 106 also addresses groundwater protection, which is implemented by the DOH-SDWB. More information about how the DOH-SDWB administers the groundwater portion of the CWA 106 grants can be found in Chapter 3.

Sections 205(j) and **604(b)** of the CWA (33 U.S.C. §1285(j) and §1384(b), respectively) provide funding for water quality management planning, which includes, but is not limited to, identifying NPS pollution control measures to meet and maintain water quality standards and determining the nature, extent, and causes of water quality problems. Section 604(b) requires states to reserve funds for planning under CWA Section 205(j) or CWA Section 303(c). In Hawai'i, the DOH-CWB administers the Section 604(b) grant, allocating 40 percent of the grant funds to local agencies for water quality planning projects and using the remaining 60 percent on activities that include TMDL and WQS development.

Sections 303(d) and **305(b)** of the CWA (33 U.S.C. §1313(d) and §1315(b), respectively) drive Hawai'i's surface water quality assessment efforts. Section 303(d) requires states to develop a list of impaired and threatened waters (known as the "303(d) list") for which technology-based effluent limitations or other required pollution controls are not sufficient. Impaired waters are waters that do not meet the State's WQS, and threatened waters are waters that are at risk of failing to meet WQS (generally interpreted to

become impaired waters within two years). Impaired and threatened waters are prioritized in the 303(d) list based on the severity of the pollution and the designated use of the waterbody. Based on the 303(d) list, states develop TMDLs for the pollutant(s) causing impairments to facilitate bringing those impaired waters into attainment of the State's WQS.

Section 305(b) requires states to report on the status of their surface waters to the U.S. Congress biennially. In Hawai'i, the status of surface waters is assessed by comparing water quality data to narrative and numeric water quality criteria to determine whether water quality standards are being met and the extent to which water quality provides for the waters' designated uses. Section 305(b) also requires the State to describe the nature and extent of nonpoint sources of pollutants and recommend programs to control each category of such sources.

To address CWA Section 305(b) and 303(d) requirements, the DOH-CWB publishes the State of Hawai'i Water Quality Monitoring and Assessment Report (Integrated Report) every two years. More about the Integrated Report can be found in Chapter 3.

Beaches Environmental Assessment and Coastal Health (BEACH) Act amendments to the CWA (signed into law in 2000, adding section 303(i) of the CWA (33 U.S.C. §1313(i)) are designed to reduce the risk of disease to users of the nation's coastal recreation waters. The BEACH Act requires EPA to develop performance criteria for testing, monitoring, and notifying public users of possible coastal recreation water problems. In addition, the BEACH Act authorizes EPA to award program development and implementation grants to eligible states and local governments to support microbiological monitoring and public notification of the potential for exposure to disease-causing microorganisms in coastal recreation waters. The DOH-CWB receives BEACH Act grant funds to conduct coastal water quality monitoring and other activities required under the act. More information on DOH-CWB's BEACH Act grant activities can be found in Chapter 3.

2 WATER QUALITY IN HAWAIʻI

Because clean water is vital to Hawaiʻi's residents, visitors, and the local economy, monitoring and assessing water quality and protecting waters from pollution are priorities for the State's water programs. Identifying and addressing water quality impairments is one of the primary responsibilities of the DOH-CWB, which monitors and assesses the State's marine and inland surface waters every two years in the Integrated Report. The 2020 Integrated Report provides the most recent assessment of water quality in the state, and includes the CWA Section 303(d) list of impaired waters.

2.1 2020 Integrated Report

Conventional pollutants assessed in the 2020 Integrated Report include nutrients (total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, total phosphorus), and where applicable, total dissolved nitrogen, total dissolved phosphorus, total suspended solids (TSS), and orthophosphate (HAR §11-54-6(d)). Conventional pollutant indicators assessed in the 2020 Integrated Report include enterococci (an indicator of fecal pollution), turbidity (a measure of the relative clarity of a liquid and an indicator of suspended and dissolved solids), and chlorophyll *a* (an indicator of excess, bioavailable nutrients). Water quality data were assessed if there were sufficient and acceptable data and information for these pollutants. The 2020 Integrated Report can be found on the DOH-CWB website at: https://health.hawaii.gov/cwb/clean-water-branch-home-page/integrated-report-and-total-maximum-daily-loads/.

The 2020 Integrated Report divides water quality assessments in two broad categories: marine and inland. Because monitoring marine waters is a higher priority for the DOH-CWB (see Chapter 3 for information on the Hawaiʻi Coastal Monitoring Program), marine waters comprise the majority of assessed waters. In the 2020 Integrated Report, 150 of 563 marine waterbodies (27%) in the state were assessed, and two inland waterbodies were assessed. The number of marine waterbodies assessed by island are as follows: 14 out of 82 (17%) on Kauaʻi, 69 out of 191 (36%) on Oʻahu, one out of 17 (6%) on Lanaʻi, 44 out of 129 (34%) on Maui, and 22 out of 108 (20%) on Hawaiʻi Island. Sufficient shoreline data were not collected by DOH-CWB on Molokaʻi for the 2020 assessment. DOH-CWB assessed inland waterbodies on Kauaʻi, where monitoring is being conducted to demonstrate the effectiveness of Section 319-funded NPS pollution reduction projects. Turbidity and enterococci are the causes of water quality impairments for the two assessed inland waters on Kauaʻi.

Out of the 150 marine waterbodies assessed statewide, 140 (93%) do not attain WQS for at least one conventional pollutant. Turbidity is the leading cause of impairment for marine waters, with 132 out of 140 (94%) of marine waters assessed for turbidity failing to meet turbidity criteria (Table 3; Figure 1). Nutrients are the second leading cause of marine water quality impairments in Hawaiʻi, with 55 out of

Table 3. Number of assessed water bodies that attained and did not attain State water quality standards for (indicators of) conventional pollutants in the 2020 Integrated Report								
Island	**Enterococci**		**Nutrients**		**Turbidity**		**Chlorophyll *a***	
	A	N	A	N	A	N	A	N
Kaua‘i	12	0	1	1	0	14	1	1
O‘ahu	54	2	12	6	6	54	5	10
Moloka‘i	NA	NA	NA	NA	NA	NA	NA	NA
Lana‘i	NA	NA	1	0	0	1	1	0
Maui	13	0	3	37	0	43	6	7
Hawai‘i	10	0	1	11	2	20	11	1
Total	89	2	18	55	8	132	24	19
Key: A = attainment of State water quality standards; N = non-attainment of State water quality standards; NA = not assessed								

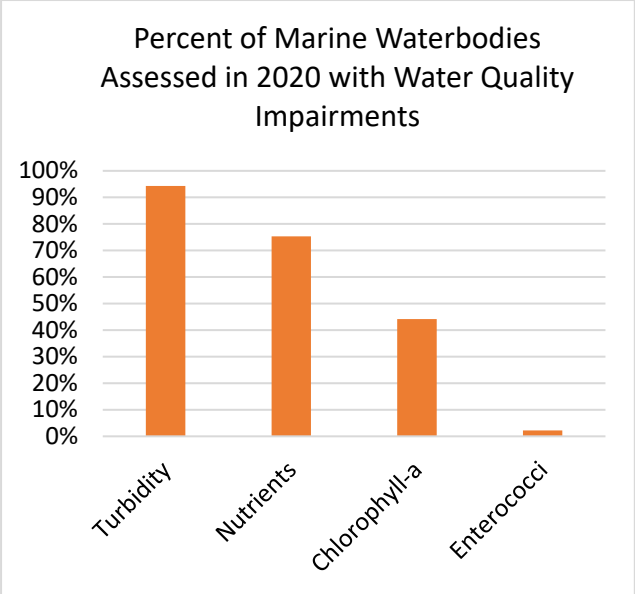

Figure 1. Percent of marine waterbodies assessed in 2020 with water quality impairments caused by turbidity, nutrients, chlorophyll a, and enterococci (Source: State of Hawai‘i Department of Health, “2020 State of Hawai‘i Water Quality Monitoring and Assessment Report”)

73 (75%) of assessed waters failing to meet the criteria for at least one nutrient (total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, and/or total phosphorus). Chlorophyll *a* is the third leading cause of marine waterbody impairments, with 19 out of 43 (44%) of assessed waters failing to meet water quality standards for chlorophyll *a.* There were two out of 91 (2%) assessed marine waters with impairments caused by fecal indicator bacteria (enterococci).

The DOH-CWB also assessed 71 out of 532 watershed assessment units (WAUs). Approximately 15% of the WAUs on Kaua‘i, 33% of WAUs on O‘ahu, 3% of WAUs on Lana‘i, 18% of WAUs on Maui, and 5% of WAUs on Hawai‘i Island were assessed for at least one pollutant; not all pollutants were assessed for every watershed due to unavailability of new data. (Sufficient new data for WAUs on Moloka‘i were not available for the 2020 Integrated Report.) Of the 71 WAUs assessed, 70 did not attain State WQS for at least one or more conventional pollutants. The standard for turbidity was exceeded the most frequently (68 of 69 assessed WAUs), followed by nutrients (35 of 39 assessed WAUs). Seventeen of the 32 WAUs assessed for chlorophyll *a* did not attain chlorophyll *a* criteria. Attainment of the fecal indicator bacteria (enterococci) recreational water quality standard was observed in 49 of 51 (96%) of WAUs assessed for fecal indicator

bacteria. Detailed watershed assessment results can be found in Chapter 2 of the 2020 Integrated Report.

The Integrated Report also is used to identify waters that need Total Maximum Daily Loads (TMDLs). The DOH-CWB has developed 20 TMDLs for impaired water bodies. All but one of these waterbodies have a TMDL for sediment-based pollutants (TSS or turbidity), which is consistent with the prevalence of statewide turbidity impairments identified in the 2020 Integrated Report, previous Integrated Reports, and the 303(d) list. The second most common TMDL is for nutrients (13 waterbodies, or 65%), followed by enterococci (seven water bodies, or 35%). All enterococci TMDLs are located on Kauaʻi, which is consistent with the 303(d) list. Chapter 3 provides more information about the State's TMDL program.

2.1.1 Clean Water Act Section 303(d) List of Impaired Waters

Waterbodies that do not meet the State numeric water quality criteria (classified as Category 5 in the Integrated Report) constitute the 303(d) list of impaired waters.

A total of 303 marine waterbodies and 119 inland waterbodies are on the 303(d) list (Table 4). Turbidity is the most common impairment for both marine and inland waters statewide; approximately 87% of marine and inland waters have turbidity impairments. Each island's most common impairment is turbidity. For marine waters, chlorophyll *a* is the next leading impairment (41% of listed marine waters), followed by nitrate + nitrite nitrogen, ammonium nitrogen, total nitrogen, and total phosphorus impairments (39%, 32%, 30%, and 16% of listed marine waters, respectively). Enterococci impairments characterize approximately 10% of marine waters on the 303(d) list.

In addition to turbidity, total nitrogen, nitrate + nitrite nitrogen, and total phosphorus are common impairments (54%, 52%, and 43%, respectively) of inland waters on the 303(d) list. In addition, 20% percent of listed inland waterbodies have enterococci/fecal indicator bacteria impairments, which are mostly found on Kauaʻi and Oʻahu. Trash and toxic pollutants are also notable impairments for inland waters on Oʻahu.

2.2 Nonpoint sources of pollution in Hawaiʻi

The 2020 Integrated Report identifies potential sources of pollutants that cause waterbody impairments. These sources include point sources and nonpoint sources. Point sources are controlled by federal and state regulations through permitting programs administered in Hawaiʻi by DOH. For example, under the NPDES program, the DOH-CWB issues permits that authorize the discharge of pollutants at concentrations that meet either technology or water quality based effluent limits, whichever is more stringent.

Table 4. Number of impaired waters and and their impairments, by island

MARINE WATERS													
	Total No. of Listed	Impairment											
Island	Waters	Turb	Chl *a*	TN	NO_3 +NO_2	NH_4	TP	PO_4	Ent	TSS	Trash	Path	Tox
Kaua‘i	41	37	6	3	7	7	2	0	7	1	0	0	0
O‘ahu	101	78	45	29	25	28	16	0	16	6	4	1	1
Moloka‘i	3	3	0	1	1	0	1	0	0	1	0	0	0
Lana‘i	6	5	4	2	0	1	0	0	0	0	0	0	0
Maui	89	82	53	36	64	45	10	0	5	2	0	0	0
Hawai‘i	63	58	15	21	22	16	18	10	1	0	0	0	0
Total	303	263	123	92	119	97	47	10	29	10	4	1	1

INLAND WATERS													
	Total No. of Listed	Impairment											
Island	Waters	Turb	Chl *a*	TN	NO_3 +NO_2	NH_4	TP	Fish Adv	Ent/ FIB	TSS	Trash	Path	Tox
Kaua‘i	29	27	0	9	11	4	7	0	12	1	0	0	0
O‘ahu	56	52	5	45	38	0	34	2	11	6	12	1	9
Moloka‘i	1	1	0	0	0	0	0	0	0	0	0	0	0
Lana‘i	0	0	0	0	0	0	0	0	0	0	0	0	0
Maui	13	10	1	3	4	0	2	0	0	0	2	0	0
Hawai‘i	20	13	1	7	9	2	8	0	1	0	0	0	0
Total	119	103	7	64	62	6	51	2	24	7	14	1	9

Impairment key: Turb = turbidity; Chl *a* = chlorophyll *a;* TN = total nitrogen; NO_3+NO_2 = nitrate + nitrite nitrogen; NH_4 = ammonium nitrogen; TP = total phosphorus; PO_4 = orthophosphate; Ent = enterococci; FIB = fecal indicator bacteria; TSS = total suspended solids; Path = pathogens; Tox = toxics (includes metals and organochlorine pesticides); Fish Adv = fish consumption advisory

Source: State of Hawai‘i Department of Health, “2020 State of Hawai‘i Water Quality Monitoring and Assessment Report”

According to the State’s 2020 Integrated Report, nonpoint sources of pollution in Hawai‘i are primarily land-based and include cesspools, agricultural land use, urban land use, and feral ungulate activity in conservation lands, which are described in more detail in the following sections. Most of these sources of pollution are accounted for in the Hawai‘i CNPCP, which identifies six categories of nonpoint sources of pollution: agriculture, forestry, urban areas, hydromodifications, marinas and recreational boating, and wetlands and riparian areas. Figure 2 summarizes the pollutants associated with these sources.

2.2.1 Sources of turbidity and TSS

Turbidity and TSS problems are pervasive in Hawai‘i and are most obvious after rain events in which runoff that carries sediment and other pollutants causes coastal waters to appear brown or have a turbid appearance. Sediment is one of the leading causes of turbidity and TSS impairments in Hawai‘i,

and also contributes to total phosphorus and ammonium impairments due to the adsorption of phosphorous and ammonium to soil particles. Sediment also transports chlorinated pesticides and heavy metals to water bodies.[2]

Sediment pollution is caused primarily by erosion, which in Hawai'i is exacerbated by frequent, high intensity rainfall events, steep slopes, and highly erodible volcanic soils. Sediment resuspension, which is caused by natural (e.g., wind or tides) or anthropogenic events (e.g., dredging), also contributes to

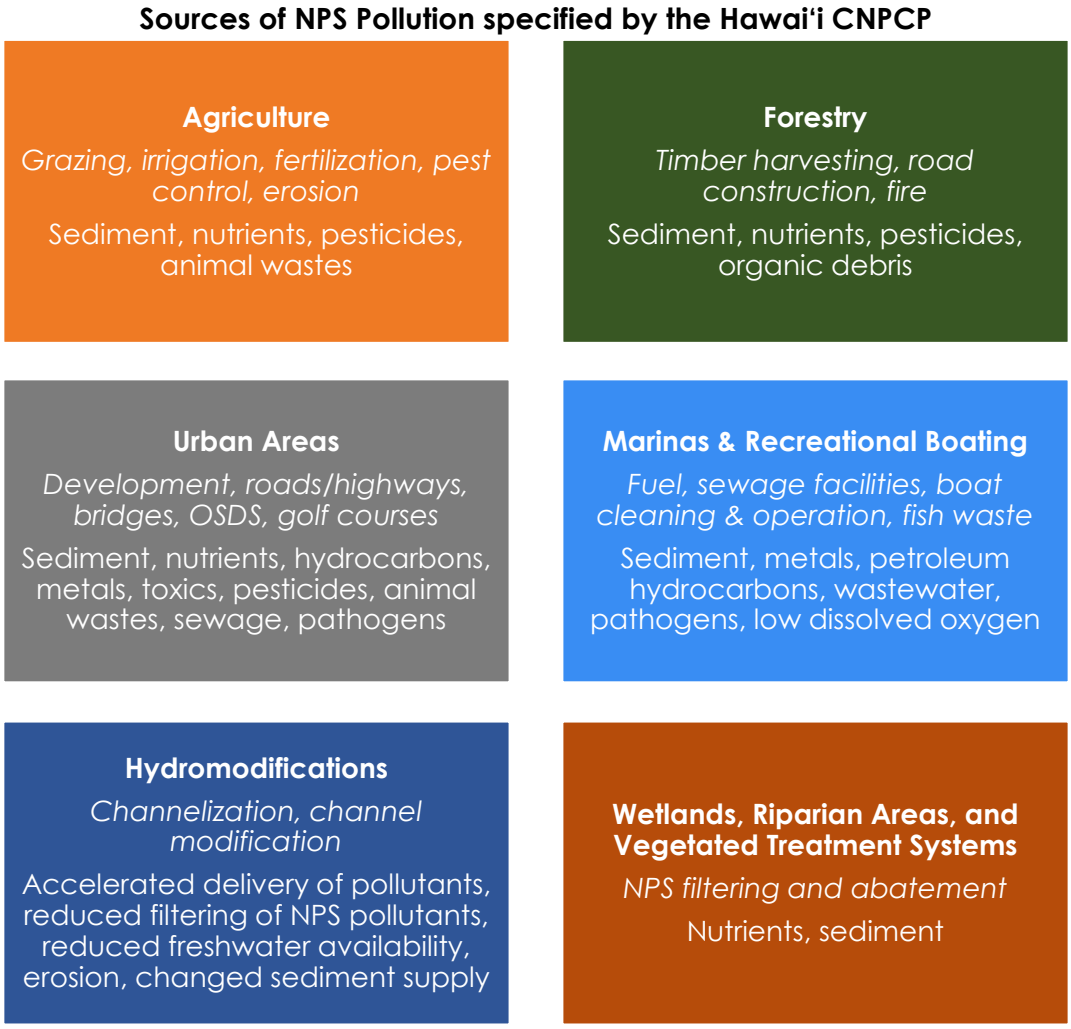

Figure 2. Sources of nonpoint source pollution identified by the CNPCP (Coastal Nonpoint Pollution Control Program) (U.S. Environmental Protection Agency (2003), "Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters," EPA-840-B-92-002. Office of Water: Washington, DC)

[2] Food and Agriculture Organization of the United Nations, "Chapter 2: Pollution by Sediments." http://www.fao.org/3/w2598e/w2598e05.htm (accessed January 31, 2021)

turbidity and TSS. Sediment pollution negatively impacts aquatic ecosystems, especially highly sensitive coral reefs, and is most likely the leading cause of alteration of reef community structure in Hawai'i.[3]

There are several types of erosion that generate sediment. Sheet and rill erosion, wind erosion, streambank erosion, road bank erosion, construction site erosion, and irrigation-induced erosion are common on agricultural lands.[4] Cover, cultivation practices, conservation practices, soil erodibility, slope, field layout, grazing management techniques, and the amount of rainfall are among the factors that affect soil erosion on agricultural lands, which in turn affects the amount of sediment and other pollutants that run off into streams and coastal areas.

In urban areas, construction and development activities such as clearing and grading are major sources of sediment that contribute to increased turbidity and TSS. High impervious surface cover in urban areas increases runoff and facilitates the transport of sediment and other particulates to streams and coastal areas. In addition, roads and highways tend to accumulate particulate matter, which when transported in runoff to surface waters contributes to high levels of TSS and turbidity.[5]

On conservation lands, which account for nearly 50% of land use in Hawai'i, major sources of sediment that contributes to turbidity and TSS are feral ungulates, which include feral pigs and goats. Ungulate activities, such as digging and uprooting native vegetation, increase soil erosion, decrease soil cover, and increase TSS in runoff.[6] Invasive plants in conservation lands also contribute to sediment runoff due to their shallow root systems, which fail to retain soil during rain events and can destabilize soil, leading to further erosion. Invasive species also disturb the structure and composition of forests, which may result in reduced understory plant cover and result in increased soil erosion.

Nutrients also contribute to turbidity. Highly enriched waters stimulate algae production, which increases turbidity. High levels of chlorophyll *a*, an indicator of excess bioavailable nutrients, can lead to high turbidity. More information about sources of nutrients can be found in Section 2.2.2.

[3] Friedlander, A.G. Aeby, R. Brainard, E. Brown, K. Chaston, A. Clark, P. McGowan, T. Montgomery, W. Walsh, I. Williams and W. Wiltse (2008). The State of Coral Reef Ecosystems of the Main Hawaiian Islands. pp. 219-261. In: Waddell, J.E. and A.m. Clarke (eds.), 2008. *The State of Coral Reef Ecosystems of the United States and Pacific Freely Associated States: 2008.* NOAA Technical Memorandum NOS NCCOS 73. NOAA/NCCOS Center for Coastal Monitoring and Assessment's Biogeography Team, Silver Spring, MD. 569 pp.

[4] Environmental Protection Agency. 2003. National Management Measures to Control Nonpoint Pollution from Agriculture. EPA 841-B-03-004. Washington, DC.

[5] Environmental Protection Agency. 2005. National Management Measures to Control Nonpoint Pollution from Urban Areas. EPA-841-B-05-004. Washington, DC.

[6] Bruland, G.L., Browning, C., Evensen, C. (2010). Effects of feral pigs (Sus Scrofa) on watershed health in Hawai'i: A literature review and preliminary results on runoff and erosion. Sustainability Science for Watershed Landscapes. J. Roumassett, K. Burnett, and A. Balisacan, eds. Institute of Southeast Asian Studies: Los Banos, Philippines, pp.251-277.

2.2.2 Sources of nutrients and chlorophyll *a*

Nutrients—primarily total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, and total phosphorus—are the State's second most pervasive surface water quality problem. Sources of nutrients common in urban and agricultural areas include fertilizers, sewage, and animal waste (Table 5). On agricultural lands, nutrients are applied in several different forms and come from various sources, including commercial fertilizer, manure, sludge, legumes and crop residues, irrigation water, and wildlife. Past industrial agricultural fertilizer application has been found to be a source of nitrates in groundwater in Hawai'i.[7] In conservation areas, feral ungulate waste can contribute nitrogen and phosphorous (as well as pathogens) to surface waters, and invasive plant species such as albizia can increase nitrate + nitrite concentrations in surface waters.[8] In all land use contexts, sediment may transport adsorbed nutrients such as phosphorous into waters.

Onsite disposal systems (OSDS) such as cesspools and septic systems are potential sources of nutrient pollution and are located on all land use types in Hawai'i. Cesspools, of which there are approximately 90,000 statewide, can collectively release as much as 23,700 pounds of nitrogen and nearly 6,000 pounds of phosphorus into the ground each day. To control pollution from cesspools, the State Legislature created the Cesspool Conversion Working Group to develop a comprehensive cesspool conversion plan by 2023. (See Chapter 2, Section 3.2 for more information about cesspool conversions.)

Nutrient pollution poses human health risks, such as methemoglobinemia (blue baby syndrome), which occurs when elevated nitrogen levels interfere with the transport of oxygen in the blood stream of young children. In addition, excess nutrients such as nitrogen and phosphorous in water bodies can cause elevated chlorophyll *a* and eutrophication, which results in algal blooms, dead zones, and fish kills.[9] Algal blooms also increase turbid conditions and may physically smother coral, resulting in habitat degradation, shifts in food resources, and loss of biodiversity. Eutrophic waters, and the nutrient pollution that causes them, pose a serious threat to for coral reefs, fisheries, recreation, and tourism.

2.2.3 Sources of fecal indicator bacteria (enterococci)

Sources of fecal indicator bacteria include sewage systems (including OSDS such as cesspools), wild and domestic animal waste, animal manure, and soil (Table 5). Large wastewater discharges often result from broken sewer lines. Sewage from OSDS that are not operating properly or are improperly sited are also a source of fecal indicator bacteria. Enterococci and other pathogens in surface waters pose risks to human health by causing gastroenteritis, skin infections, and other illnesses.

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[7] State of Hawai'i Department of Health (2018). Upcountry Maui Groundwater Nitrate Investigation Report: Maui, Hawaii. https://health.hawaii.gov/wastewater/files/2018/02/Upcountry_report.pdf (accessed January 31, 2021)

[8] Wiegner, T.N., F. Hughes, L.M. Shizuma, D.K. Bishaw, and M.E. Manuel (2013). Impacts of an Invasive N_2-Fixing Tree on Hawaiian Stream Water Quality. Biotropica 54(4): 409-418.

[9] National Oceanic and Atmospheric Administration, "What is eutrophication?" https://oceanservice.noaa.gov/facts/eutrophication.html (accessed January 31, 2021)

Table 5. Conventional pollutants, sources, and State Water Quality Standards applicability

Pollutant	Sources	Water Quality Standards	
		Inland Waters	Marine Waters
Bacteria (Enterococci)	Wastewater and sewage from wastewater treatment plants and systems, animal waste, stormwater runoff, improper land application of manure, soil[10]	All	All
Total Nitrogen	Fertilizer, wastewater, animal waste, atmospheric deposition[11]	All except standing waters	All
Ammonium Nitrogen	Sewage effluent, runoff from land where manure has been applied or stored;[12] atmospheric deposition	Only estuaries	All
Nitrate + Nitrite Nitrogen	Fertilizers, human sewage, animal waste, invasive species, atmospheric deposition	All except standing waters	All
Total Phosphorous	Soil erosion, fertilizer applications, agricultural practices, organic wastes in sewage and industrial effluent[13]	All except standing waters	All
Chlorophyll *a*	Fertilizers, septic systems, sewage treatment plants, urban runoff[14]	Only estuaries	All
Turbidity	Soil erosion, waste discharge, urban runoff, eroding stream banks, agricultural practices, excessive algal growth;[15] dredging, natural resuspension events;[16] feral ungulates, invasive plants	All except standing waters	All
Total Suspended Solids	Construction, agricultural activities,[17] soil erosion, waste discharge, urban runoff, eroding stream banks, excessive algal growth, dredging, feral ungulates, invasive plants	Only Streams	None

[10] Environmental Protection Agency (2016). National Aquatic Resource Surveys. https://www.epa.gov/national-aquatic-resource-surveys/indicators-enterococci (accessed January 31, 2021)
[11] Environmental Protection Agency (2017). National Aquatic Resource Surveys: https://www.epa.gov/national-aquatic-resource-surveys/indicators-nitrogen (accessed January 31, 2021)
[12] U.S. Geological Survey. Water Science School: Nitrogen and Water. https://www.usgs.gov/special-topic/water-science-school/science/nitrogen-and-water?qt-science_center_objects=0#qt-science_center_objects (accessed January 31, 2021)
[13] U.S. Geological Survey. Water Science School: Phosphorous and Water. https://www.usgs.gov/special-topic/water-science-school/science/phosphorus-and-water?qt-science_center_objects=0#qt-science_center_objects (accessed January 31, 2021)
[14] Environmental Protection Agency (2016). National Aquatic Resource Surveys: https://www.epa.gov/national-aquatic-resource-surveys/indicators-chlorophyll (accessed January 31, 2021)

In addition to enterococci, untreated wastewater contains pathogens such as protozoa, viruses, and other bacteria that can cause gastroenteritis, Hepatitis A, conjunctivitis, leptospirosis, salmonellosis, and cholera. Pharmaceuticals in wastewater, including hormones, also may adversely affect human health and aquatic organisms.

2.2.4 Other NPS Pollutants

In addition to sediment, nutrients, and bacteria, organic chemicals from pesticides, petroleum products, paints, solvents, pharmaceuticals, disinfectants, and personal care products are also found in surface waters and groundwater in Hawai'i. Some of these chemicals are classified as toxic pollutants in HAR Chapter 11-54 because they pose significant health risks to humans and marine organisms. Sources of these pollutants are diverse, but are generally released into the environment by humans in urban and agricultural areas. Heavy metals, which are often associated with industrial and military operations, are another potentially harmful group of NPS pollutants and are classified as toxic pollutants in HAR Chapter 11-54. Mercury and lead can contaminate soils and water and bioaccumulate in fish, and consumption of these metals by humans may cause serious acute and chronic health conditions.[18]

[15] Environmental Protection Agency (2012). Water: Monitoring and Assessment, 5.5. Turbidity. https://archive.epa.gov/water/archive/web/html/vms55.html (accessed January 31, 2021); Environmental Protection Agency (2005). Protecting water quality from agricultural runoff. EPA 841-F-05-001. https://www.epa.gov/sites/production/files/2015-09/documents/ag_runoff_fact_sheet.pdf (accessed January 31, 2021)
[16] Jones, R., N. Giofre, H.M. Luter, T.L. Neoh, R. Fisher, and A. Duckworth (2020). Responses of Corals to Chronic Turbidity. *Scientific Reports* 10:4762. https://doi.org/10.1038/s41598-020-61712-w (accessed January 31, 2021)
[17] Oki, D.S. (2003). Surface Water in Hawaii: U.S. Geological Survey Fact Sheet 045-03, 6 p.
[18] Environmental Protection Agency (2021). Potential Well Water Contaminants and Their Impacts. https://www.epa.gov/privatewells/potential-well-water-contaminants-and-their-impacts (accessed January 31, 2021)

3 NONPOINT SOURCE MANAGEMENT PROGRAMS IN HAWAIʻI

The primary agency responsible for NPS management in Hawaiʻi is DOH. Within the DOH Environmental Management Division, the DOH-CWB is the primary branch that addresses NPS pollution and its impacts on water quality. The two other state agencies that play a major role in NPS management are DBEDT and DLNR (Figure 3).

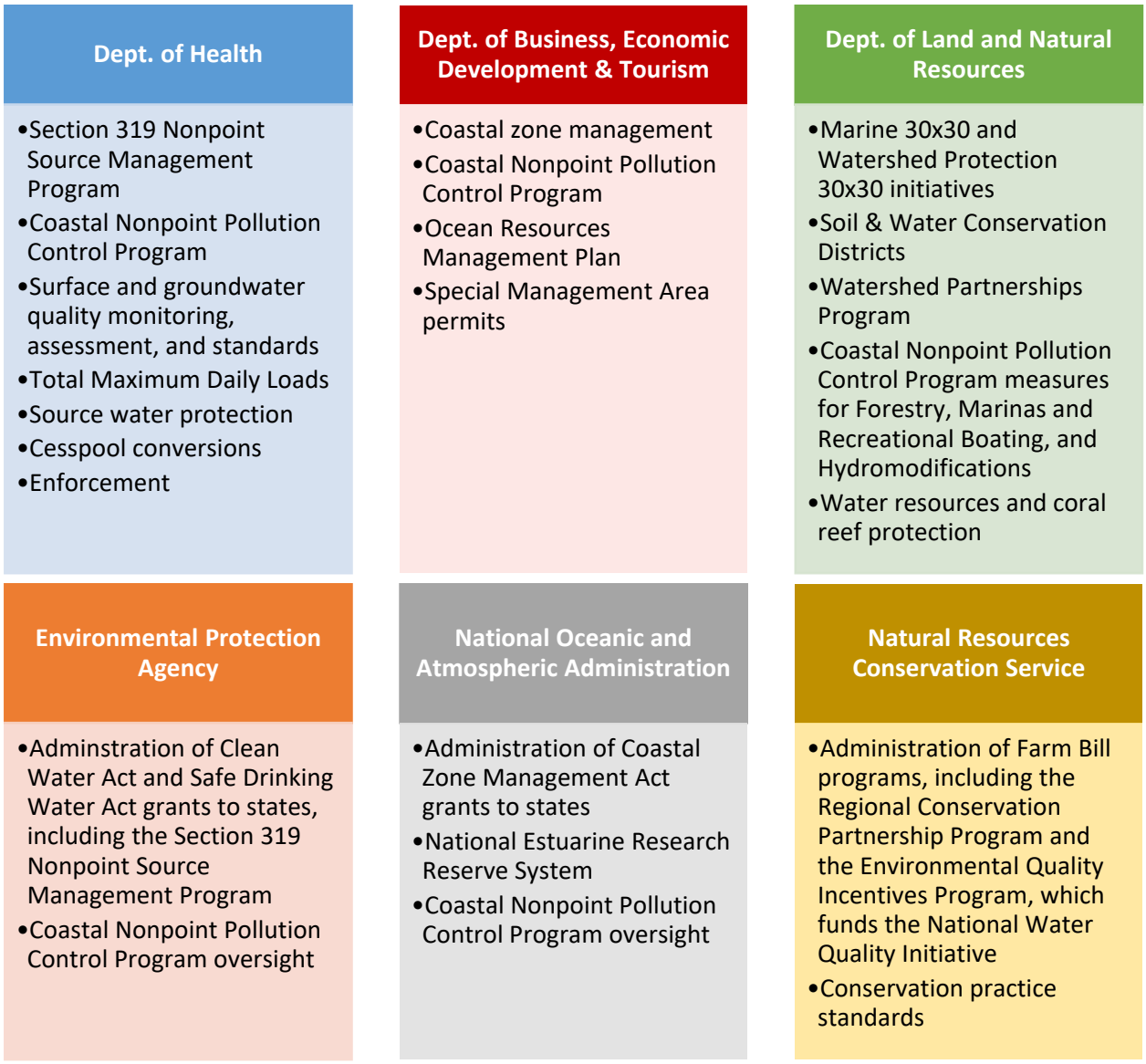

Figure 3. The three main State of Hawai'i agencies and three main federal agencies with nonpoint source pollution control responsibilities

Federal agencies with NPS management responsibilities that are active in Hawai'i include the EPA, NOAA, and NRCS (Figure 3). Local agencies also address NPS pollution through their respective planning, permitting, public works, water supply, and storm water departments and programs. In addition, locally based, collaborative watershed groups, such as those that comprise the Hawai'i Association of Watershed Partnerships, mitigate NPS pollution through watershed protection activities.

The following sections provide information on each NPS management agency's mission, key tasks and responsibilities, and NPS-related objectives and benchmarks.

3.1 Department of Health, Clean Water Branch (DOH-CWB)

Mission: To protect the public health of the residents and tourists who recreate in and on Hawai'i's coastal and inland water resources, and to protect and restore inland and coastal waters for marine life and wildlife.

Summary: The DOH-CWB implements the Surface Water Quality Management Program for recreational and ecosystem protection through a coordinated approach that includes water quality monitoring and assessment, permitting**,** enforcement, and polluted runoff management. Its core functions are to:

- Protect, restore, maintain, and improve surface water quality;
- Conduct monitoring and assessment of marine and inland waters;
- Establish pollution reduction targets;
- Update water quality standards;
- Issue NPDES permits and Water Quality Certifications;
- Enforce illegal discharges; and
- Implement projects to reduce and prevent NPS pollution.

Within DOH-CWB, there are five sections/programs: Enforcement and Compliance, Engineering, Monitoring and Analysis, Polluted Runoff Control, and Quality Assurance / Quality Control. The two sections that are critical to the State's NPS management efforts are the PRC Program and the Monitoring and Analysis Section, which are described below.

Websites:

- DOH-CWB main webpage: https://health.hawaii.gov/cwb/
- Clean Water Branch System: https://eha-cloud.doh.hawaii.gov/cwb/#!/landing
- PRC Program: http://health.hawaii.gov/cwb/clean-water-branch-home-page/polluted-runoff-control-program/
- PRC Program / Section 319 projects: https://eha-cloud.doh.hawaii.gov/cwb/#!/project/list
- Watershed-based plans: https://eha-cloud.doh.hawaii.gov/cwb/#!/watershed-based-plan/list

- Integrated Report and TMDLs: http://health.hawaii.gov/cwb/clean-water-branch-home-page/integrated-report-and-total-maximum-daily-loads/

Nonpoint source management actions, objectives, and milestones:

- Administer the CWA Section 319 and CWA Section 106 grant programs to protect and restore state waters.
    - Improve water quality through NPS control projects, watershed coordinators, watershed planning, water quality monitoring, and targeted outreach and events.
        - Ocean Resources Management Plan (ORMP) metrics: Pollutant load reductions achieved annually by implementing Section 319 projects; number of impaired streams reported in the Integrated Report
    - Develop and implement a federally approved CNPCP for the State to protect coastal waters from NPS pollution.
    - Develop and implement WBPs and TMDLs.
    - Collaborate with federal, state, and local agencies to implement NPS control activities and identify NPS priorities for the state.
    - Monitor and assess water quality and identify water quality problems caused by NPS pollution.
    - Sponsor NPS-related events and workshops and provide water quality related educational materials to organizations and schools.
- Establish the Surface Water Protection Branch within DOH to develop and administer NPS pollution control rules and policies.
    - Regulate sources of NPS pollution pursuant to NPS pollution control rules.
    - Expand watershed planning capacity and increase the number of WBPs, thereby increasing the number of watersheds in which Section 319 water quality improvement and protection projects can be implemented.

3.1.1 Section 319 Polluted Runoff Control Program

The PRC Program is responsible for the administration of the State's Section 319 NPS grant program. The PRC Program's mission is to protect and improve the quality of Hawai'i's water resources by preventing and reducing NPS pollution. Its highest priority is to invest in the restoration of NPS-impaired waters through implementation of WBPs.

The PRC Program is funded through the Section 319 grant administered by the EPA and receives approximately $1.2 annually, which is split between Watershed Project Funds and NPS Program Funds (Table 6). At least 50% of the Section 319 grant must be used as Watershed Project Funds. As required by Section 319, the State contributes approximately $800,000 (40% of the total budget) in non-federal matching funds. This funding supports NPS projects aimed at water quality restoration and protection, as well as staff and technical assistance to implement the State's *NPS Plan*.

Table 6. Clean Water Act Section 319(h) Nonpoint Source Grant appropriation for the State of Hawai'i and approved uses

Allocation	Approximate Amount (Annual)	Approved Uses
Watershed Project Funds	$600,000	Restore and protect waters through implementation of watershed-based plans or acceptable alternative plans, which may include: ➢ NPS pollution control projects ➢ Education and outreach ➢ Water quality monitoring ➢ Technical assistance for BMP prioritization and implementation ➢ Watershed coordinators
Nonpoint Source Program Funds	$600,000	➢ Watershed-based plan development ➢ TMDLs (must include NPS pollutant loads) ➢ National Water Quality Initiative water quality monitoring ➢ Coastal Nonpoint Pollution Control Program development ➢ Personnel ➢ All activities approved for Watershed Project Funding

As a Section 319 grant condition, the PRC Program creates annual workplans that provide information on how the program and its partners will implement the *NPS Plan* each year. These workplans include specific strategies, tasks, outputs, and milestones for meeting the obligations set forth in the *NPS Plan.* These workplans, as well as PRC Program mid-year and end-of-the-year reports that provide status updates on workplans, are submitted to the EPA for approval.

Nonpoint Source Pollution Control Projects

The PRC Program invests Watershed Project Funds towards on-the-ground efforts to reduce or prevent NPS pollution in watersheds with DOH-approved WBPs and alternative plans. These Watershed Project Funds are made available to the public through a Request for Proposals (RFP) or to a state or county agency through direct disbursement. All Section 319 grant recipients contribute a minimum of 25% in non-federal matching funds. Project selection during the RFP procurement process is based on several criteria, including measurable water quality improvement outcomes, cost effectiveness, and stakeholder support. The PRC Program will continue to conduct an RFP annually to provide opportunities for NPS pollution control projects in watersheds with approved WBPs. Requests for proposals will be conducted in July each year to ensure that the PRC Program can encumber its anticipated Section 319 grant award (available in October) by the end of the following federal fiscal year.

The PRC Program also works directly with state and county agencies to implement NPS pollution control projects. Because Section 319 grant conditions allow direct disbursement to these entities, the PRC Program has increased the number of projects it coordinates with state and county partners over the

past five years. Working with partners generally allows for greater flexibility in developing and financing NPS control projects.

Organizations awarded Section 319 grant funds must implement projects that aim to restore impaired waterbodies or protect high quality waters by preventing or reducing NPS pollution. On-the-ground NPS control projects generally include one or more of the following:

- Agricultural BMPs (Figures 4 and 5),
- Streambank and riparian restoration (Figures 6 and 7),
- Feral ungulate management (Figure 8),
- Invasive species control (Figure 9), and
- Stormwater runoff BMPs.

Figure 4. Cover crops planted as part of the Section 319-funded "Agricultural Stewardship for the Ma'ili'ili Watershed project, which was completed in 2018 by O'ahu Resource Conservation and Development Council

Nonpoint source pollution control projects also engage the local community through education and outreach activities, including workshops for farmers, volunteer days to assist in restoration activities and water quality monitoring, public school participation in native plant restoration, community talk story gatherings, and education guides and tools (Figure 10). In addition, organizations that receive Section 319 funds are required by DOH to publish press releases at the beginning and completion of their projects to provide the wider public with information about their NPS mitigation efforts. Section 319 Watershed Project Funds also support watershed coordinators who work with stakeholders in the community on water quality improvements activities. These coordinators also provide outreach at events and meetings and assist with Section 319 projects and planning.

Figure 5. A 7,000 square foot vegetative buffer established between a former piggery operation and a stream channel as part of the Section 319-funded "Buffers and BMPs for Windward O'ahu" project (2019-2021) conducted by the O'ahu Resource Conservation and Development Council

The PRC Program also implements supplemental environmental projects (SEPs), which are funded through settlement agreements between the State and dischargers who violate the CWA or the terms of their NPDES permits. Recent funding for SEPs supported the development of a WBP and will continue to support restoration project in Ma'ili'ili watershed on O'ahu over the next few years.

Figure 6. In-stream habitat enhancement and bank stabilization along Waipa Stream. These activities were funded as a component of "Watershed Implementation Project for the Ahupua'a of Waipa" (2016-2019), a Section 319-funded project conducted by The Waipa Foundation.

The PRC Program monitors project progress through project site visits, project effectiveness monitoring, water quality monitoring, and reports submitted by grant recipients. Project effectiveness monitoring is a required component of NPS pollution control projects. This monitoring, which may include water quality monitoring, erosion pin monitoring, vegetation monitoring, and photo-point monitoring, is conducted to estimate pollutant load reductions and/or water quality improvements achieved as a result of the project's implementation. The PRC Program reports pollutant load reductions resulting from Section 319-funded projects in the EPA's national Grants Reporting and Tracking System (GRTS). Water quality assessments and load reductions specific to projects are also reported in the PRC Program's annual End of Year Report (Section 319 Annual Report).

The PRC Program also submits documentation of water quality improvements, including the attainment of WQS for specific water bodies targeted by Section 319 projects, to the EPA. Once approved by the EPA, these water quality improvements are published as Nonpoint Source Success Stories. These stories include information on actions taken using Section 319 funds to restore waterbodies impaired by NPS pollution. The most recent success story was published for He'eia Stream in 2020 for attaining total phosphorus, turbidity, and nitrate + nitrite nitrogen WQS as a result of the implementation of three phases of Section 319-funded He'eia Stream restoration and outreach projects. The PRC Program anticipates at least one additional Nonpoint Source Success Story (targeting turbidity and nutrients) in a priority watershed by 2025.

All Section 319 project information, including project descriptions, locations, and grant award details, is available on the State's Environmental Health Portal Clean Water Branch System. Current Section 319 projects (as of 2020) can be found in Appendix A. Information about the PRC Program, including Section

319 grant information, plans, and reports, can be found on the DOH-CWB website at http://health.hawaii.gov/cwb/clean-water-branch-home-page/polluted-runoff-control-program/.

Figure 7. Streambank restoration in progress (left) and educational sign (right) funded as part of a Section 319-funded project, "Implementation of Best Management Practices in the Wai'ula'ula Watershed" (2014-2018), which was implemented by Hawai'i Sea Grant

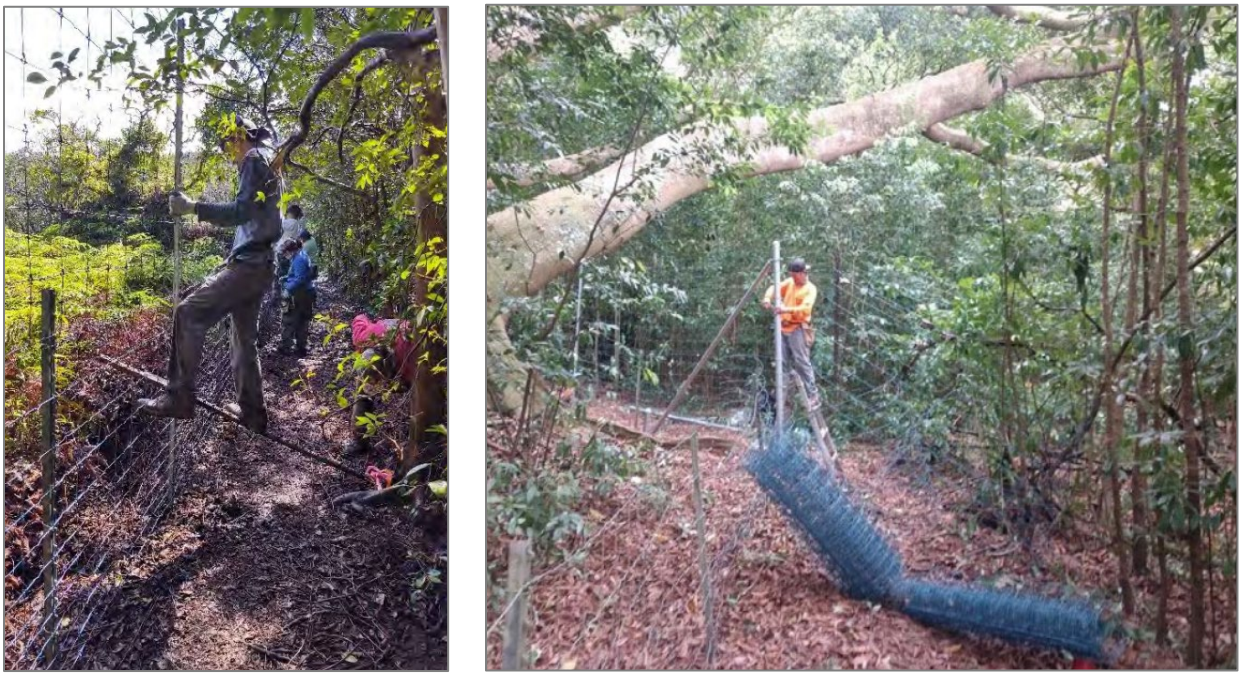

Figure 8. Ungulate exclusion fence being retrofitted and improved (left) and installed (right) as part of the Section 319-funded "Polluted Runoff Control Project for West Maui" (2018-2022) being implemented by the Department of Land and Natural Resources, Division of Forestry and Wildlife

Figure 9. As part of the Section 319-funded "He'eia Fishpond Mangrove Island Removal Project" (2017-2020) conducted by Hawai'i Sea Grant, invasive mangroves were removed within and around the perimeter of the fishpond, which removed cattle egret habitat and a major source of fecal inputs into the fishpond.

Figure 10. A farm workshop on pest identification (left) and a farm tour outreach event (right) conducted by O'ahu Resource Conservation and Development Council as part of its Section 319-funded "Agricultural Stewardship in the Ma'ili'ili Watershed" project (2016-2018)

Coastal Nonpoint Pollution Control Program (CNPCP)

The purpose of the CNPCP is "to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other State and local authorities." The CNPCP identifies management measures for major sources of coastal NPS pollution, including agriculture, forestry, urban areas, marinas, hydromodifications, and wetlands. Management measures are defined in CZARA Section 6217 as "economically achievable measures for the control of the addition of pollutants from existing and new categories and classes of nonpoint source pollution, which reflect the greatest degree of pollutant reduction available through the application of the best available nonpoint pollution control practices, technologies, processes, siting criteria, operating methods, or other alternatives." These management measures must be implemented across each state's coastal zone, which in Hawai'i encompasses the whole state. Descriptions of the management measures can be found in the 2010 update to the State's CNPCP management measures and in the *Hawai'i Watershed Guidance*.

The OP-CZM and the PRC Program jointly administer Hawai'i's CNPCP. Developing a fully approved CNPCP is a priority for both programs. Currently, the CNPCP is conditionally approved by NOAA and EPA; five out of 49 of the required management measures still require approval. In 2020, NOAA approved the State's work plan to submit a fully approvable CNPCP to NOAA and EPA by August 2024 (Appendix B). Although the Hawai'i CNPCP has not been fully approved, nearly all management measures are implemented and enforced statewide by various state and county agencies, as identified in the 2010 CNPCP.

The CNPCP also requires the State to implement administrative elements such as public participation, administrative coordination, monitoring and tracking, and enforceable policies and mechanisms, which includes DOH's authority to enforce the State's WQS.

CNPCP website: http://planning.hawaii.gov/czm/initiatives/coastal-nonpoint-pollution-control-program/

Watershed-based Plans

Watershed-based plans are vital for identifying strategies and priority projects to address NPS problems in specific watersheds. They include necessary information to drive sound investments with a likelihood of contributing to water quality improvements. The PRC Program relies on WBPs to identify watershed restoration projects that have the greatest likelihood to contribute to water quality improvements. Watershed-based plans also contain important information on key stakeholders, financial and technical assistance available to implement NPS pollution control projects, monitoring recommendations, and metrics for achieving water quality goals.

Importantly, Section 319 Watershed Projects Funds can only be used in watersheds with approved WBPs. Currently, the state has 14 approved WBPs that cover 44 watersheds on five islands (Table 7).

Table 7. Watersheds with approved watershed-based plans and alternative plans (2020)	
Kauaʻi	
Hanalei Bay	Nawiliwili Bay
Hanalei	Nawiliwili
Waioli	Puali
Waipa	Huleʻia
Waikoko	
Oʻahu	
Ala Wai (Makiki*, Mānoa*, Palolo*)	Kaneʻohe
Honouliuli	Keaʻahala
Kaiaka Bay	Heʻeia
Kiʻikiʻi (Kaukonahua*, Poamoho*)	Kahaluʻu (ʻAhuimanu*, Waiheʻe*)
Paukauila (Helemano*, ʻOpaeʻula*)	Haiamoa
Kapakahi	Kaʻalaea
Koʻolaupoko	Waiahole
Makapuʻu	Waianu
Kahawai	Waikane
Waimanalo	Hakipuʻu
Kaʻelepulu	Kualoa
Kawainui	Maʻiliʻili
Puʻu Hawaiiloa	Wailupe
Kawa	
Molokaʻi	
Kawela (alternative plan)	
Maui	
West Maui	Southwest Maui
Wahikuli	Hapapa
Honokowai	Wailea
Kahana	Moʻoloa
Honokahua	
Honolua	
Kahoʻolawe	
Hakioawa	
Kaulana	
Big Island	
Kawaihae (Pelekane Bay*)	
Waikoloa (Waiʻulaʻula*)	
Note: Watersheds are based on State Commission on Water Resources Management (Commission) watershed names and delineations. * Watersheds identified in watershed-based plans whose names are not recognized by the Commission.	

Approved WBPs in Hawai‘i can be found at https://eha-cloud.doh.hawaii.gov/cwb/#!/watershed-based-plan/list. The PRC Program approves WBPs based on specific criteria set forth by the EPA—specifically, the nine required elements of WBPs that are critical for achieving improvements in water quality. These nine required elements are:

a. Identify causes and sources of pollution;
b. Estimate pollutant loading into the watershed and the expected load reductions;
c. Describe management measures that will achieve load reductions and targeted critical areas;
d. Estimate amounts of technical and financial assistance and the relevant authorities needed to implement the plan;
e. Develop an information/education component;
f. Develop a project schedule;
g. Describe the interim, measurable milestones;
h. Identify indicators to measure progress; and
i. Develop a monitoring component.

There are two key resources available for developing WBPs in Hawai‘i: EPA’s *Handbook for Developing Watershed Plans to Restore and Protect Our Waters* and OP-CZM’s *Hawai‘i Watershed Guidance.* EPA’s *Handbook* describes the nine required elements of WBPs and provides suggestions and examples on how to satisfy these requirements. The *Hawai‘i Watershed Guidance* was developed in 2010 to provide state-specific assistance to develop effective WBPs that incorporate EPA’s nine elements and CNPCP management measures.

Watershed-based plans are often developed by local watershed groups and state and county agencies like Soil and Water Conservation Districts, which generally receive some financial or technical support from the PRC Program. Funding is often a limiting factor for developing a WBPs. Watershed-based plans that address the EPA’s nine elements generally cost over $150,000 to develop because of the technical nature of several of the nine elements, including collection and analysis of water quality data, siting BMPs, and estimating pollutant load reductions needed to meet water quality standards. The PRC Program provides funding for WBPs through Section 319 Program Funds every three to four years, or when adequate funds exist. Investigating ways to fund WBP development is included as an objective in this plan (see Chapter 5, Objective 1).

To increase stakeholder involvement in WBP development, the PRC Program will start conducting a special procurement to implement new WBPs within one year of their approval by DOH. Stakeholders are more likely to participate in WBP development with the knowledge that there are targeted funding opportunities to implement the WBP soon after its completion. This procurement will target the project schedule outlined in the WBP (element f), and may be via an RFP, RFQ, or direct disbursement to another government agency.

The PRC Program will be prioritizing a combined TMDL implementation plan / WBP development approach for new DOH-developed WBPs. Because TMDLs developed by the DOH-CWB include some of

the required nine elements of WBPs, and because TMDLs involve considerable stakeholder engagement, they form a strong foundation for WBPs and provide the data and stakeholder support needed to plan and implement BMPs to make progress towards achieving WQS. The PRC Program is currently utilizing the 2019 Waikele Stream TMDL to develop a combined TMDL implementation plan / WBP for Waikele watershed and will coordinate additional combined plans with the DOH-CWB Monitoring and Analysis Section.

The PRC Program also updates WBPs that were developed prior to the EPA's nine element requirements and, that may require additional strategies and BMPs to meet WQS or address new sources of NPS pollution, or that may require additional planning to meet water quality goals. The PRC Program plans to begin updating the Koʻolaupoko Watershed Restoration Action Strategy in 2024 to more effectively address impaired waters in the Koʻolaupoko region. The PRC Program will be investigating ways to finance and update other WBPs by using data and strategies from other watershed management plans and working with partners. (See Chapter 5, Objective 1 for more details.)

Alternative Plans

In certain circumstances, EPA and DOH recognize that an alternative to a nine element WBP may provide an effective roadmap to achieve the water quality goals of Section 319-funded restoration or protection efforts. The EPA may approve the use of Section 319 funds to implement alternative plans in the following circumstances:

- When responding to a NPS pollution emergency or an urgent NPS public health risk;
- When addressing a water quality impairment that is not specific to a pollutant;
- When protecting assessed, unimpaired, or high quality waters; or
- When addressing an isolated, small-scale water quality problem resulting from one or a few sources of pollution.

Alternative plans must include specific elements and receive DOH and EPA approval before they can be implemented using Section 319 funds. There is currently only one approved alternative plan in the State, which was developed by TNC and the East Molokaʻi Watershed Partnership for the Kawela watershed on Molokaʻi. More details on alternative plans can be found in Section IX of the EPA's "Nonpoint Source Program and Grants Guidelines for States and Territories."

Section 319 Water Quality Monitoring

The PRC Program conducts and funds water quality monitoring to determine the effectiveness of its NPS pollution control projects. Several Section 319 grant recipients conduct stream water quality monitoring as part of their projects to track water quality improvements that result from their projects' BMPs. In addition, the PRC Program provides funding for citizen water quality monitoring groups in priority watersheds to assist in evaluating Section 319 projects and other projects being implemented from

WBPs. The PRC Program also provides technical assistance for monitoring activities, such as review of monitoring plans and data management. Section 319 water quality monitoring is generally coordinated with the DOH-CWB's Monitoring and Analysis Section to avoid duplicative monitoring and to include assessments of Section 319-funded monitoring data in the Integrated Report.

3.1.2 Monitoring and Analysis Section (Monitoring Section)

The DOH-CWB Monitoring Section is responsible for all activities associated with statewide surface water quality monitoring and analysis. The Monitoring Section's long-term goal is to maintain surface waters for the health and safety of people, plants, and animals by routine water quality monitoring (Figure 11), assessment of statewide water quality data, identification of sources of water pollution, TMDL development and implementation, and WQS revision. The Monitoring Section achieves the following six CWA monitoring objectives:

1) Assess recreational beaches statewide to protect public health;
2) Establish, review, and revise the State's WQS;
3) Assess State waters and determine WQS attainment;
4) Identify impaired waters and develop plans to restore their designated uses;
5) Identify causes and sources of water impairments through targeted monitoring strategies; and
6) Support implementation and evaluation of water quality management programs.

Comprehensive Monitoring Strategy for the Surface Waters of Hawai'i (CMS)

In 2020, the DOH-CWB developed the CMS for generating and gathering analytical water quality data for both inland and coastal waters throughout the State. The strategy is designed to determine what the overall quality of the State's waters are, as well as the sources of pollution impacting the State's streams and coastal areas. The CMS lays out the use of both probabilistic and targeted methods to conduct assessments and provides information regarding the level of resources available so that the DOH can balance its approach to best meet the needs of the State.

The objectives of the surface water CMS are to ensure monitoring approaches are adequate to:

1) Assess status and condition of Hawai'i's surface waters to determine problem areas and those needing protection and define trends in waterbodies across the State;
2) Evaluate the conditions associated with nonattainment of State water quality standards and degradation of Hawai'i's surface waters;
3) Determine the sources and magnitude of pollutant loading;
4) Evaluate the effectiveness of management strategies to address pollutant sources and improve water quality;
5) Evaluate water quality standards for potential revision; and

6) Support special studies and investigate novel water quality research methods to support future assessments.

The CMS is implemented by DOH; however, it is inclusive of data collected by other state, local, and federal agencies and non-governmental partner organizations that meet data acceptability requirements described in the strategy. The CMS recognizes that monitoring activities need to be well-planned and conducted in partnership with internal and external organizations. These partnerships will allow state funds to be leveraged with resources from other state, federal, local, and private sources. Objective 6 of this plan (Chapter 5) includes investigating ways to coordinate and support water quality monitoring across the State.

Hawai‘i Coastal Monitoring Program

Figure 11. Clean Water Branch staff conducting water quality sampling

The DOH-CWB prioritizes monitoring efforts on recreational beaches in support of the BEACH Act, which requires the State to develop performance criteria for testing, monitoring, and notifying public users of possible coastal recreation water problems. The Monitoring Section implements this program and has identified beaches throughout the state and classified them according to usage, accessibility, available facilities such as showers and restrooms, and potential threat of pollution. Beaches are ranked by tiers that indicate the frequency of monitoring that the beaches receive. Tier 1 beaches are given the highest priority and are monitored weekly on all islands as follows: 10 on Kaua‘i, 22 on O‘ahu, 16 on Maui, and 11 on Hawai‘i. Tier 2 beaches are monitored at a lower frequency and may be changed at any time because they are monitored as resources allow—typically once per month on Kaua‘i; once every two months on O‘ahu, Maui, and the Hilo region of Hawai‘i Island; and once every 5-6 weeks in the Kona region of Hawai‘i Island. Twenty-eight Tier 2 beaches are monitored on Kaua‘i, 26 on O‘ahu, 39 on Maui, and 35 on Hawai‘i Island. Tier 3 beaches are monitored as resources permit. An inventory of beach monitoring sampling sites (including maps, site coordinates, and a general description) is available on the DOH-CWB website at http://health.hawaii.gov/cwb/site-map/clean-water-branch-home-page/sample-sites/. Monitoring data are assessed every two years in the State’s Integrated Report pursuant to CWA Section 305(b).

The Monitoring Section’s routine monitoring efforts in support of the BEACH Act focuses on identifying fecal indicator bacteria (enterococci) to assess their potential public health risks. When a threshold concentration of enterococci (130 colony forming units/100mL, or Beach Action Value (BAV)) is

exceeded during routine sampling, the Monitoring Section must confirm the exceedance with follow-up sampling and provide notification of the exceedance to the public on the DOH-CWB Water Quality Notification and Advisories website and through a notification email to all subscribers. Exceedance of the BAV in a confirmatory sample will immediately trigger a public advisory and follow-up sampling. An advisory consists of sign posting on the beach, advisory posting on the DOH-CWB website, and emails to all subscribers informing them of the advisory. The DOH-CWB does not close beaches in response to any advisory but does issue advisories to inform the public about water quality conditions so that personal decisions may be made based on individual risk tolerances.

The advisory most linked to NPS pollution is the Brown Water Advisory (BWA). Brown Water Advisories are preemptive advisories and provide additional protection to Hawai'i's beach users above those required by the BEACH Act. Brown Water Advisories are so named because surface water runoff often carries soil and sediment and other pollutants that can cause water at the beach to appear brown or have a turbid appearance. A BWA is issued when there is a strong likelihood that the BAV will be exceeded and may pose a risk to the public from elevated pathogen levels. Brown Water Advisories are often triggered in the event of heavy rain or if a Flash Flood Warning is issued by the National Weather Service, or if conditions occur that may result in surface runoff into the ocean. The public is informed of a BWA through the DOH-CWB's notification system.

In addition to its BEACH Act monitoring sites, the DOH-CWB monitors other recreational beaches. While the focus of BEACH Act monitoring is enterococci, the broader coastal monitoring effort includes chemical and nutrient monitoring at additional coastal locations. The Monitoring Section conducts coastal monitoring for total nitrogen, ammonium nitrogen, nitrate + nitrite nitrogen, total phosphorus, chlorophyll *a*, TSS, turbidity, pH, dissolved oxygen, temperature, and salinity. Total dissolved nitrogen, total dissolved phosphorous, and phosphate are tested for only specific marine waters per HAR §11-54-6(d)). Samples are analyzed by DOH laboratories on Kaua'i, Maui, Hilo, and O'ahu. Contract laboratories are utilized in Kona and O'ahu.

State of Hawai'i Water Quality Monitoring and Assessment Report (Integrated Report)

Every two years, the Monitoring Section conducts comprehensive water quality assessments and publishes its findings in the Integrated Report, which documents the status of the State's water quality (pursuant to CWA Section 305(b)) and provides a list of impaired waterbodies and associated pollutants and pollutant indicators (pursuant to CWA Section 303(d)). The Integrated Report represents water quality assessment decisions based upon analysis of water quality monitoring data *vis-à-vis* the State's WQS. Current and previous Integrated Reports are available on the DOH-CWB's webpage.

Decisions for listing/delisting water bodies for pollutants are based on the quality and quantity of data and applicable numeric criteria. The DOH-CWB is the primary source of the data assessed in the Integrated Report. Additional data sources include NPDES permitted facilities, private contractors, federal and state agencies, and non-governmental organizations. Data must meet specific criteria to be included in the Integrated Report, as described in the DOH-CWB's Data Acceptance Criteria. The

parameters typically assessed in the Integrated Report include enterococci, turbidity, TSS, chlorophyll *a*, total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, and total phosphorus.

The Integrated Report carries over the assessment results from previous Integrated Reports to document trends and changes in water quality. The Integrated Report not only identifies areas in need of restoration but serves as a baseline to validate the State's efforts to improve water quality and eventually de-list impaired waters that have been rehabilitated. Impaired waters identified in the Integrated Report may be targeted for further monitoring activities to develop TMDLs, to plan and evaluate Section 319 projects, and to set requirements for NPDES permits and CWA Section 401 Water Quality Certifications.

Water Quality Standards (WQS) Program

The State's WQS (HAR Chapter 11-54) establishes a legal basis for controlling pollutants from entering State waters. As described in Chapter 1.2.5, the goals of the WQS program are to develop scientifically based WQS that meet federal requirements, specify beneficial uses for State waters and the criteria necessary to protect these uses, and define antidegradation requirements to protect existing and designated uses. The triennial WQS review involves the public participation process, which includes public comment on any aspect of the State WQS. In addition, the WQS review process includes consideration of updating WQS based on revisions to federal WQS made by the EPA. The most recent WQS review was in 2019, and the next review will occur in 2022. For more information on the State's WQS, please visit the DOH-CWB's website at https://health.hawaii.gov/cwb/clean-water-branch-home-page/water-quality-standards/.

Total Maximum Daily Load (TMDL) Program

The DOH-CWB Monitoring Section develops water pollution reduction plans, or TMDL plans, for waterbodies that do not meet WQS and are on the 303(d) impaired waters list. A TMDL is a calculation of the maximum amount of a pollutant a waterbody can receive and still meet WQS. The objective of a TMDL is to determine the loading capacity of the waterbody and to allocate that load among different pollutant sources so that the appropriate control actions can be taken and WQS achieved. The TMDL process is important for improving water quality because it serves as a link in the chain between WQS and implementation of control actions designed to attain those standards. These control actions can take the form of permits for point sources and polluted runoff control projects for nonpoint sources.

The DOH-CWB Monitoring Section's TMDL Program goals are:

1. Quantitatively assess watershed-scale water quality problems, contributing sources, and pollutant load reductions;
2. Provide analytical basis for planning and implementing pollution controls; and
3. Provide assistance with identifying restoration projects that will improve water quality and protect public and environmental health.

The TMDL process begins with the Integrated Report, which identifies impairments and pollutants causing the impairments. Waterbodies for TMDL development are prioritized (low, medium, high) based on the number of parameters not attaining State water quality standards, severity of exceedances, recovery potential, community and stakeholder involvement, and resource availability. During TMDL development, DOH-CWB estimates the pollutant loads from permitted point source discharges (wasteload allocation) and from nonpoint sources (load allocation). Landowners, local government agencies, and the public are involved throughout the TMDL's development. Once the TMDL is completed, the wasteload allocation portion is implemented through NPDES permits and enforced by the DOH-CWB Enforcement and Compliance Section.

TMDL implementation plans are sometimes developed to address the TMDL load allocations (from nonpoint sources), which are not regulated by NPDES permits. TMDL implementation plans to address load allocations can be combined with watershed-based planning for more comprehensive NPS management in an impaired watershed. The PRC Program is currently using Section 319 funds to develop a combined TMDL implementation plan / WBP for Waikele watershed by using the loading data from the Waikele Stream TMDL established in 2019.

There are currently multiple TMDLs for 20 waterbodies in Hawai‘i (Appendix C). The majority of TMDLs address impairments caused by excessive turbidity, TSS, and nutrients. DOH-CWB is currently developing a TMDL for Kaelupulu Stream on O‘ahu, which it plans to complete by 2022.

Monitoring Partnerships and Special Studies

The Monitoring Section works with federal, state, and nonprofit organizations to assess water quality at various locations throughout the State. Collaborative monitoring projects usually provide additional water quality data for assessment and also can elucidate water quality pollution problems, including pollutant sources. In addition, partnerships enable DOH-CWB to support monitoring projects that are outside the scope of the State's WQS for surface waters, including pesticide monitoring projects. These efforts, combined with the Coastal Monitoring Program, provide a more comprehensive picture of the status of water quality in Hawai‘i and can help shape policy, management decisions, and strategies regarding water resource use.

Example of monitoring collaborations and special studies include:

- Partnership with UH to assess water quality at various locations throughout the state via the Pacific Islands Ocean Observing System;
- Partnership with the DOH Hazard Evaluation and Emergency Response Office (DOH-HEER), Hawai‘i Department of Agriculture (HDOA), and the U.S. Geological Society (USGS) to conduct statewide pesticide sampling; and
- Partnership with USGS to monitor and assess chemical water contaminants, including herbicides, pharmaceuticals, and hormones.

Over the next five years, DOH-CWB will explore opportunities to increase stream monitoring through partnerships and through supporting local nonprofit monitoring groups, as well as leverage credible data from other organizations to support the nearshore, reef flat, and offshore coastal monitoring programs. Studies that are important within the next decade to characterize waterbody conditions and address upcoming issues include:

- Bioassessment development, including completing a benthic macroinvertebrate index, exploring a stream algal Index, and a GIS modeling approach to estimating statewide stream health;
- Development of coral reef bioassessment tools to monitor coral reef health, including collaboration with other agencies (e.g., DLNR, UH Hawai‘i Institute of Marine Biology, NOAA National Coral Reef Monitoring Program);
- Application of existing estuarine and coastal wetland and watershed health assessment tools;
- The status of new and emerging contaminants; and
- How climate change will impact water quality.

Future research-based topics may include investigation via new and upcoming analytical methods, including those that mimic biological receptors rather than measuring specific compounds. Such topics may be investigated by DOH-CWB or others in the future. The goal is to gather information via state-of-the-art research that can monitor cellular responses, biological species, or communities of organisms. These special studies or research projects are intended to compliment, but not replace traditional analytical methods often used to establish WQS.

3.2 Department of Health, Wastewater Branch (DOH-WWB)

Mission: To ensure that wastewater is properly treated and disposed of without contaminating or polluting water resources or posing a risk to public health and safety.

Summary: The DOH-WWB administers the statewide engineering functions relating to water pollution control, the municipal and private wastewater treatment works program, the individual wastewater systems program, and the Clean Water State Revolving Fund (CWSRF) program. The DOH-WWB is divided into two sections: the Construction and Operations Section and the Planning and Design Section. The Construction and Operations Section regulates and enforces existing wastewater systems in accordance with HAR Chapter 11-62 (Wastewater Systems) and also performs annual operation and maintenance inspections of wastewater treatment plants. The Planning and Design Section reviews and approves new wastewater systems, water reclamation facilities, and projects and issues individual permits for wastewater sludge reuse facilities. Additionally, the Planning and Design Section assists with performing land use reviews and managing the CWSRF program, which provides financial assistance for wastewater pollution control projects necessary to prevent contamination of groundwater and coastal water resources and to protect and promote the health, safety, and welfare of Hawai‘i’s residents.

Website: https://health.hawaii.gov/wastewater/

Nonpoint source management actions, objectives, and milestones:

- Lead the State's efforts to eliminate cesspools and replace them with improved onsite systems or sewer connections.
    - Collaborate with state and county agencies and organizations to develop a long-range comprehensive cesspool conversion plan that identifies priority areas for cesspool replacements, appropriate onsite wastewater system technologies for Hawai'i, and financing options for homeowners.
    - Complete the State's Comprehensive Cesspool Conversion Plan in 2023.
- Provide assistance with the Hawai'i CNPCP Onsite Disposal System Management Measure.
- Investigate opportunities to partner on NPS management planning and projects utilizing both CWSRF and Section 319 funds.

Cesspool Conversion Efforts

One of the top priorities for the DOH-WWB is eliminating cesspools. Because cesspools discharge raw human sewage into the ground with limited to no treatment, the waste can contaminate groundwater, drinking water sources, streams, and the ocean by releasing disease-causing pathogens as well as nutrients into the environment. Hawai'i's cesspools, of which there are approximately 90,000, release approximately 55 million gallons of untreated domestic wastewater into the ground each day. Untreated wastewater contains pathogens such as bacteria, protozoa, and viruses that can cause gastroenteritis, Hepatitis A, conjunctivitis, leptospirosis, salmonellosis, and cholera. Pharmaceuticals in wastewater, including hormones, also may adversely affect human health and aquatic organisms. Hawai'i's cesspools also release as much as 23,700 pounds of nitrogen and nearly 6,000 pounds of phosphorus into the ground each day, which can stimulate undesirable algae growth, degrade water quality, and negatively impact coral reefs. Human health risks from cesspool nutrient contamination include methemoglobinemia (blue baby syndrome), which occurs when elevated nitrogen levels interfere with the transport of oxygen in the blood stream of young children.

The DOH-WWB seeks to protect public health and preserve Hawai'i's natural resources by working with stakeholders on developing a long-range plan for cesspool conversions. In 2017, Act 125 mandated that all cesspools (except for those granted an exemption) be upgraded or converted to a septic system or aerobic treatment unit or connected to a sewer system by 2050. In 2018, Act 132 established a Cesspool Conversion Working Group (CCWG) to research methods and data to develop a long-range, comprehensive plan for cesspool conversions statewide.

Cesspool Conversion Working Group Objectives

1. Develop a long-range, comprehensive statewide plan for cesspool conversion of all cesspools by 2050.
2. Consider and recommend means by which DOH can ensure that cesspools are converted to more environmentally responsible waste treatment systems or connected to sewer systems.
3. Identify areas where data is insufficient to determine a priority classification of cesspools for conversion and determine methods and resources needed to collect that data and conduct analysis of those areas.
4. Modify, amend, and develop definitions and criteria for priority upgrade areas, as identified in DOH-WWB's report conducted pursuant to Act 125, Session Laws of Hawai'i 2017; identify the preferred alternative waste treatment systems or sewerage connections for these priority areas; and consider and make recommendations on whether cesspools in these priority areas should be required to convert sooner than 2050.
5. Examine financing issues and the feasibility of various mechanisms, including grants, loans, tax credits, fees, special assessment districts, requirements for conversion at point of sale, and any other appropriate mechanisms for accomplishing and funding cesspool conversion, or any combination of these mechanisms.
6. Consider owners' ability to pay for cesspool conversions, and especially how assistance can be provided for lower-income homeowners.
7. Consider the most cost-effective approach to cesspool conversion.
8. Identify physical, practical, and financial impediments that may be encountered by landowners who are required to connect pre-existing cesspools to a sewer system or convert cesspools to an individual waste treatment system and recommend solutions to those impediments.
9. Consider the best policies, practices, and laws from other jurisdictions related to cesspool conversions.
10. Include feedback from each county's community members, wastewater divisions, and boards of water supply.
11. Consider alternative wastewater equipment and technologies appropriate to the various areas where cesspools are located that may better protect the environment at lower or comparable cost and how the equipment or technologies can be incorporated as part of the long-term solution to wastewater treatment issues.
12. Research and recommend measures to encourage and stimulate research and innovation for new wastewater technologies, including systems that treat waste not only for bacteria but also to remove nutrients and contaminants that impact the environment.
13. Evaluate mandatory versus voluntary participation in the cesspool conversion plan.
14. Consider whether exemptions should be granted for some mandatory conversions based upon geology, topography, soil type, availability of land, or other relevant factors and make recommendations to the department relating to establishing rules for those exemptions.
15. Consider and recommend means by which DOH can ensure that cesspools are converted to more environmentally responsible waste treatment systems or connected to sewer systems.

Cesspool Conversion Timeline

2015 Act 120: Provided a temporary income tax credit for the cost of upgrading or converting a qualified cesspool to a septic tank system or an aerobic treatment unit system, or connecting to a sewer system. A taxpayer could apply for a tax credit of up to $10,000 for each qualified cesspool. The tax credit started in tax year 2016 and ended in tax year 2020.

2017 Act 125: Required replacement of all cesspools by 2050; required DOH to investigate the number, scope, location, and priority of cesspools that require conversion based on each cesspool's impact on public health; required DOH to assess the feasibility of a grant program to assist low-income cesspool owners with conversions; required DOH to submit findings and recommendations to the legislature; expanded criteria for qualified cesspools.

2017 Report to the 29th Legislature, "Relating to Cesspools and Prioritization for Replacement." DOH identified 14 critical areas with high concentrations of cesspools that should receive priority for replacement

2018 Act 132: Established the CCWG and set objectives for the group to accomplish, including a long-range, comprehensive cesspool conversion plan; provided DOH and UH with funding to conduct research to meet the CCWG's objectives.

2019 Completed reports:

- "Financing Cesspool Conversions in Hawai'i" (https://health.hawaii.gov/wastewater/files/2019/10/FinancingConversions.pdf)
- "A Multi-State Regulation and Policy Survey of Onsite Wastewater Treatment System Upgrade Programs" (https://health.hawaii.gov/wastewater/files/2019/11/OnsiteReport.pdf)
- "Investigation of Cesspool Upgrade Alternatives in Upcountry Maui" (https://health.hawaii.gov/wastewater/files/2020/05/cesspool_upgrade_alternatives.pdf)

2020 Completed reports:

- "Identifying Potential Knowledge Gaps for Hawai'i's Cesspool Conversion Plan" (https://health.hawaii.gov/wastewater/files/2020/04/Identifying_Potential_Knowledge_Gaps.pdf)
- Report to the Legislature (for the 2021 session): Cesspool Conversion Interim Report of progress made on the Cesspool Conversion Working Group's priorities

2021 Studies and reports to be completed:

- Delta 15-N Sewage Contamination Project / Nearshore Sewage Pollution Study (UH)

- Cesspool conversion technology research (DOH)
- Cesspool conversion finance research (DOH)
- Report to the Legislature (for the 2022 session): Cesspool Conversion Interim Report of progress made on the Cesspool Conversion Working Group's priorities
- Reprioritization of cesspool priority areas (UH)

2022 Report & Plan:

- Report to the Legislature (for the 2023 session): Cesspool Conversion Final Report with Cesspool Conversion Plan

Cesspool Resources:

- CCWG website: https://health.hawaii.gov/wastewater/ccwg/
- Cesspools in Hawai'i: https://health.hawaii.gov/wastewater/cesspools/

3.3 Department of Health, Safe Drinking Water Branch

Mission: To safeguard public health by protecting Hawai'i's drinking water sources (surface water and groundwater) from contamination and assure that owners and operators of public water systems provide safe drinking water to the community.

Summary: The DOH-SDWB accomplishes its mission by ensuring that the State's drinking water supply meets federal and state drinking water standards through its Source Water Assessment and Protection Program, the Underground Injection Control Program, and the Groundwater Protection Program. The DOH-SDWB also hosts an online Safe Drinking Water Information System Viewer (https://eha-cloud.doh.hawaii.gov/sdwb/#!/home), which includes a groundwater contamination viewer that identifies contaminants that have been detected and confirmed in drinking water wells, select non-potable wells, and freshwater springs throughout Hawai'i.

The DOH-SDWB administers the Drinking Water State Revolving Fund (DWSRF), which was created under the SDWA to finance state drinking water system infrastructure improvements. The DWSRF supports projects and activities aimed at protecting Hawai'i's drinking water quality. DWSRF local assistance set-aside funds can be used to address NPS activities through established wellhead protection or source water protection plans. The State may also develop a loan program with the 15% set-aside funds to provide funds for land acquisition and conservation easements in targeted areas.

The DOH-SDWB also prepares the State's Water Quality Plan, which is an integral component of the Hawai'i Water Plan. The purpose of the Water Quality Plan is to ensure the protection of human health and ecological systems by outlining a path forward to protect, restore, and enhance water quality in Hawai'i. It describes the DOH water programs that are responsible for protecting the State's surface and groundwater quality. The Water Quality Plan was updated in 2019 and contains detailed information on

the DOH-SDWB programs and other DOH water programs, including their goals, priorities, status, and recommended actions.

Websites:

- Main DOH-SDWB webpage: https://health.hawaii.gov/sdwb/
- DOH-SDWB System: https://eha-cloud.doh.hawaii.gov/sdwb/#!/home
- Water Quality Plan: https://health.hawaii.gov/water/files/2019/03/FINAL-DOH-Water-Quality-Plan-2019.pdf
- 2018 Groundwater Status Report: https://health.hawaii.gov/sdwb/files/2020/04/HI.2018GroundwaterStatusReportWithAppendices.pdf

Nonpoint source management actions, objectives, and milestones:

- Implement the Hawai‘i Groundwater Protection Strategy to mitigate priority groundwater contamination threats and prevent contamination.
- Update the DOH Water Quality Plan to ensure protection of Hawai‘i’s water quality for safe consumption, recreation, and environmental health.
- Increase coordination between related water and protection programs to improve effectiveness and reduce duplicative efforts.
- Conduct research and studies as part of the CCWG, including the Act 132 Nearshore Sewage Pollution Study

Hawai‘i Groundwater Protection Program

The overall goal of the Hawai‘i Groundwater Protection Program is to protect human health and sensitive ecosystems through the protection and enhancement of the groundwater quality throughout the State of Hawai`i. The major goals of the Hawai‘i Groundwater Protection Strategy are:

- Monitor and assess groundwater quality;
- Identify and prioritize groundwater contamination threats; and
- Mitigate priority contamination threats and prevent contamination.

The Hawai‘i Groundwater Protection Strategy, which is included in the DOH-SDWB’s “2018 Groundwater Status Report,” represents a coordinated effort to protect groundwater and source waters by the DOH-SDWB, DOH-WWB, DOH-CWB, DOH-HEER, and the DOH Solid and Hazardous Waste Branch using various funding sources, including groundwater and surface water grants from the EPA as well as the CWSRF and the DWSRF. The strategy was approved by EPA Region 9, on June 29, 2017, and is the guiding document for the future of groundwater protection in Hawai‘i. Plans are underway to develop and begin implementation of the Hawai‘i Groundwater Quality Standards.

Hawai‘i Legislature Act 132 Nearshore Sewage Pollution Study

The 2018 Hawai‘i State Legislative Session passed Act 132, Relating to Cesspools, that among other things directed the UH Water Resources Research Center (WRRC) and DOH to conduct a comprehensive statewide study of sewage contamination in nearshore marine areas, known as the Act 132 Nearshore Sewage Pollution Study. The DOH-SDWB is providing critical technical support to the investigation by developing statewide estimates of the coastal wastewater nutrient load, while the DOH-CWB is providing critical sampling and data analysis support. The major goals of the Act 132 Nearshore Sewage Pollution Study are:

- Provide high resolution estimates of the coastal wastewater nutrient load;
- Use algal tissue nitrogen and nitrogen isotope data to assess the degree of wastewater impact and evaluate agreement with coastal wastewater load estimates; and
- Determine which coastlines of the state are most impacted by terrestrial-derived wastewater pollution.

The Act 132 Nearshore Sewage Pollution Study represents a coordinated effort between the WRRC, DOH-SDWB, and DOH-CWB using legislative appropriated funding for the future of coastal water protection in Hawai‘i.

3.4 Department of Business, Economic Development and Tourism, Office of Planning, Coastal Zone Management Program (OP-CZM)

Mission: To provide for the effective management, beneficial use, protection, and development of Hawai‘i’s coastal zone.

Summary: Hawai‘i’s CZM Program was enacted to provide a common focus for state and county actions dealing with land and water uses and activities in the coastal zone management area, which encompasses the entire state. As the State’s resource management policy umbrella, OP-CZM is the guiding perspective for the design and implementation of allowable land and water uses and activities throughout the state. Within the scopes of their authorities, all agencies must assure their statutes, ordinances, rules, and actions comply with the OP-CZM objectives and policies. In this way, a network of state and county agencies bound by the statute helps carry out OP-CZM’s requirements, objectives and policies statewide. Two of these objectives (HRS sections 205A-2(c)(1)(B)(vi) and 205A-2(c)(4)(E)) include NPS pollution management to enhance, maintain, and restore coastal water quality.

Coastal zone management focuses largely on balancing the needs of economic development and conservation of resources in a sustainable manner. OP-CZM focuses its work on the complex resource management problems of coastal areas that are under the highest stress. Within a framework of cooperation among federal, state, and local levels, OP-CZM employs a wide variety of regulatory and non-regulatory techniques to address coastal issues and uphold environmental law. Among them are

stewardship, planning, permitting, education and outreach, technical assistance to local governments and permit applicants, policy development and implementation, and identification of emerging issues and exploration of solutions.

Websites:

- OP-CZM main webpage: http://planning.hawaii.gov/czm/
- CNPCP: http://planning.hawaii.gov/czm/initiatives/coastal-nonpoint-pollution-control-program/
- ORMP website: http://planning.hawaii.gov/czm/ormp/
- ORMP dashboard: http://planning.hawaii.gov/czm/ormp/dashboard/
- Special Management Areas: http://planning.hawaii.gov/czm/special-management-area-permits/

Nonpoint source management actions, objectives, and milestones:

- Develop and implement a federally approved CNPCP for the State to protect coastal waters from NPS pollution.
    - Coordinate CNPCP management measure development with DOH, counties, state, and federal partners.
- Implement land-based pollution reduction strategies via the ORMP and track progress in meeting land-based pollution goals.
- Support and oversee the Special Management Area permit program to protect coastal resources, including water quality.
- Promote the development of WBPs using the *Hawai'i Watershed Guidance*, which was developed by OP-CZM in 2010.

Coastal Nonpoint Pollution Control Program

The purpose of the CNPCP is "to develop and implement management measures for nonpoint source pollution to restore and protect coastal waters, working in close conjunction with other State and local authorities." OP-CZM and the PRC Program jointly administer Hawai'i's CNPCP. More information about the CNPCP can be found in Chapters 1.2.2 and 3.1.1.

Ocean Resources Management Plan

Another important component of the OP-CZM is the ORMP, which is required under HRS Chapter 205A-62(1). Unlike plans that are created and administered by a single entity, the ORMP is unique in its collaborative implementation that includes federal, state, county, and community representation. The plan seeks to connect land and sea, preserve ocean heritage, promote collaboration and stewardship, and adapt to changing conditions. Since 1985, longstanding partners have jointly addressed the State's shared ocean and coastal resource management priorities as set forth by each plan update.

The 2020 ORMP update establishes focus areas, focus area goals, and corresponding metrics to track progress towards meeting goals. One focus area is land-based pollution, which addresses polluted runoff and its impacts on water quality. This ORMP focus area also addresses NPS pollution in urban areas, where the main focus area goals are "facilitating broad adoption of green infrastructure practices to reduce polluted runoff from urban areas." In addition, the ORMP addresses land-based pollution coming from forested conservation areas. Metrics to track progress towards the land-based pollution focus area (with reporting agency) include:

- Number of fenced acres in DLNR priority watersheds (DLNR);
- Miles of fencing inspected and maintained at DLNR priority watersheds (DLNR);
- Number of impaired streams and TMDLs reported in the DOH Integrated Report (DOH);
- Percentage of wastewater recycled annually (DOH);
- Pollutant load reductions achieved annually by implementing Section 319 projects (DOH); and
- Number of hits to the DOH water quality portal (DOH).

Each agency reports metrics to OP-CZM, who tracks them and provides information to the public on progress towards meeting focus area goals via the ORMP Dashboard.

Special Management Area (SMA) Permits

The SMA permit was established in Hawai'i in 1975 with the enactment of Act 176, known as the Shoreline Protection Act. The SMA permit regulates permissible land uses that are already allowed by land use policies including zoning designations, county general plans, and community development plans. To protect coastal resources, the SMA permit ensures that alterations or additions to coastal lands cause "minimum adverse effect to water resources" and minimizes "any development which would adversely affect water quality" and fish and wildlife habitat. To this end, applicants seeking an SMA permit may be required to prepare an environmental assessment, environmental impact statement, and/or other technical studies. The SMA permitting system is implemented by each of the four counties according to their own ordinances and rules, with oversight and support from OP-CZM.

3.5 Department of Land and Natural Resources

3.5.1 Division of Forestry and Wildlife (DLNR-DOFAW)

Mission: To responsibly manage and protect watersheds, native ecosystems, and cultural resources and provide outdoor recreation and sustainable forest products opportunities, while facilitating partnerships, community involvement and education.

Summary: DLNR-DOFAW manages State-owned forests, natural areas, public hunting areas, and plant and wildlife sanctuaries. DLNR-DOFAW implements several conservation programs aimed at protecting rare and endangered species and also administers several landowner assistance programs to protect

forest, wildlife, and water resources on private lands. Collectively, DLNR-DOFAW's programs protect Hawai'i's unique and fragile ecosystems and freshwater resources. DLNR-DOFAW's efforts to protect the State's land and water resources play a critical role in NPS pollution control, particularly by preventing and reducing soil erosion on public and private forested conservation lands.

Websites:

- Main webpage: https://dlnr.hawaii.gov/dofaw/
- Watershed Partnerships Program: https://dlnr.hawaii.gov/ecosystems/wpp/
- 30x30 Watershed Forests Target: https://governor.hawaii.gov/wp-content/uploads/2016/09/30 x 30-Watershed-Forests_FINAL.pdf
- Sustainable Hawai'i Initiative 30x30 Watershed Protection Dashboard: https://dashboard.hawaii.gov/en/stat/goals/5xhf-begg/4s33-f5iv/wtjm-96jt
- Report to the 31st Legislature, 2021 Regular Session: https://files.hawaii.gov/dlnr/reports-to-the-legislature/2021/FW21-NARS-FY20.pdf

Nonpoint source management actions, objectives, and milestones:

- Provide technical and financial support for Watershed Partnerships through the Watershed Partnerships Program.
    - Fund Watershed Partnership projects that restore native habitat and control sources of soil erosion, such as feral ungulates and invasive plants.
- Make progress in meeting the Sustainable Hawai'i Initiative 30x30 watershed protection goal, including expanding watershed management efforts to increase the area of protected priority watershed areas, securing State Capital Improvement Project (CIP) funding, and leveraging federal, state, county, and private funds.
    - ORMP metrics: Number of fenced acres in DLNR priority watersheds, miles of fencing inspected and maintained in DLNR priority watersheds.
- Collaborate with DOH and other partners to implement NPS pollution control projects that support watershed protection in priority watersheds.
    - Continue to support existing Section 319 projects (Appendix A).
- Implement CNPCP management measures for forestry (via implementing "Best Management Practices for Maintaining Water Quality in Hawai'i") and marinas and recreational boating.
- Participate in multi-agency collaborative efforts that address NPS pollution, including the West Maui Ridge to Reef Initiative (WMR2R).

Watershed Partnerships Program (WPP)

Through State General Funds and CIP funding, DLNR-DOFAW provides support for the WPP, which provides technical assistance and financial resources to the Watershed Partnerships to help implement watershed management plans and projects that protect native ecosystems. Watershed Partnerships are

voluntary alliances of public and private landowners dedicated to the protection of Hawai'i's forested watersheds for water recharge and other ecosystem services through collaborative management. (More information about Watershed Partnerships can be found in Chapter 3.8.) The WPP provides approximately $2.2 million annually in grants to Watershed Partnerships to carry out their missions.

Sustainable Hawai'i Initiative and Priority Watershed Areas

One component of the Sustainable Hawai'i Initiative is the 30x30 watershed protection goal to protect 30% (253,000 acres) of the State's highest priority watersheds by 2030. Approximately 20% of land area in Hawai'i is identified as priority watersheds (Figure 12); currently, approximately 17% of these lands are under a high level of protection. Priority watersheds under high level protection are defined as upland native forests that are fenced from non-native ungulates (pigs, goats, deer, sheep, and cattle). These non-native animals trample and eat plants, spread invasive weeds, cause erosion, and foul streams with waste and sediment. These areas are also where intensive weed control and native plantings are focused. Priority watershed areas exist across private, federal, and state lands that are managed collectively through Watershed Partnerships. Protecting these priority watershed areas is a critical tool for adapting to climate change's drying effects and will make Hawai'i more resilient to extreme weather events by reducing drought, landslides, flooding, and runoff.

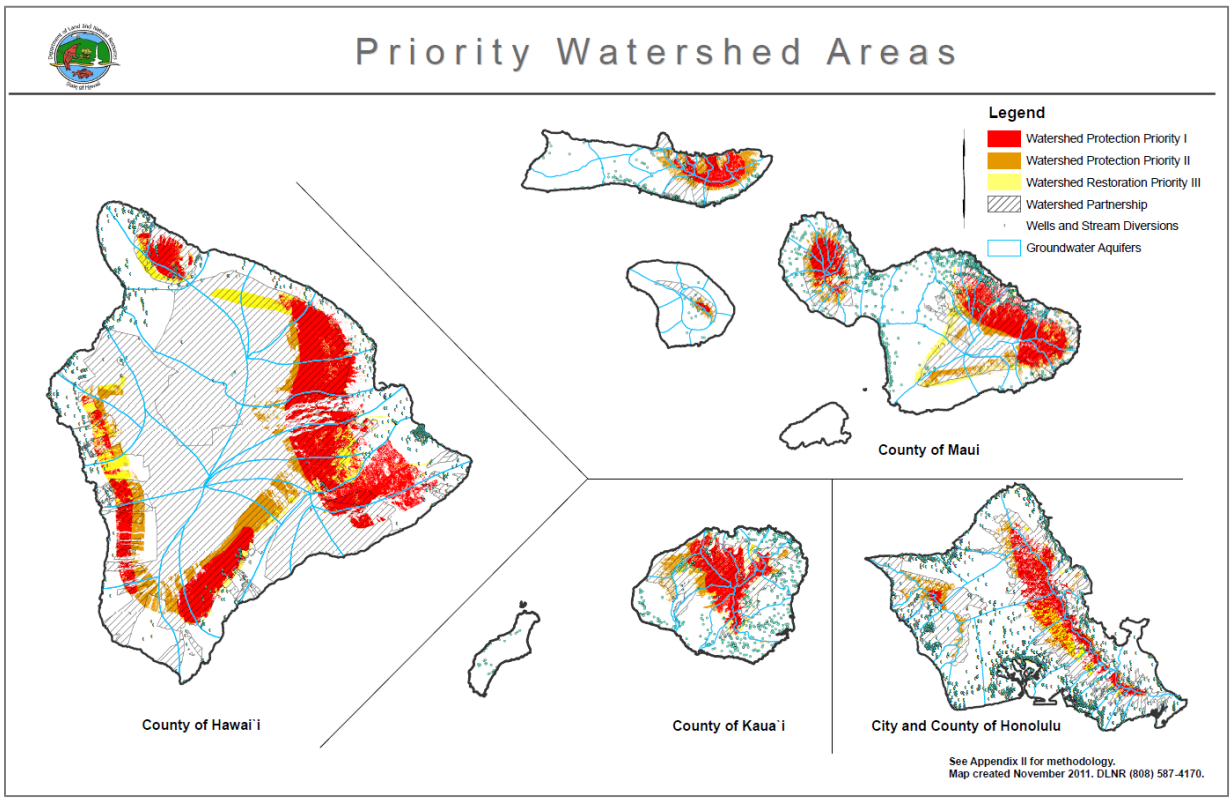

Figure 12. Department of Land and Natural Resources priority watershed areas

Meeting the 30% watershed protection target involve the following activities:

- Managing priority watersheds through fencing, invasive species (ungulates and plants) removal, planting native trees, and other protection and restoration activities;
- Improving hunting and hiking access;
- Preventing wildfires;
- Respecting the cultural significance of forests;
- Encouraging mauka to makai watershed management; and
- Securing long-term watershed funding.

To reach the goal of 30%, DLNR-DOFAW will need approximately $6 million per year ($300k/mile) in funding to build approximately 151 miles of fence. DLNR-DOFAW will continue to secure the needed CIP funding for fencing projects to meet this goal.

3.5.2 Division of Aquatic Resources (DLNR-DAR)

Mission: To work with the people of Hawai‘i to manage, conserve and restore the state’s unique aquatic resources and ecosystems for present and future generations.

Summary: DLNR-DAR manages the state’s aquatic resources and ecosystems through programs in ecosystem management, place-based management, and fisheries management. Major program areas include projects to:

- Protect and restore the aquatic environment;
- Protect threatened and endangered aquatic species and their habitats;
- Conserve and restore endemic and indigenous aquatic species and their habitats;
- Combat the introduction of invasive species and reduce their impact on ecosystems;
- Effectively manage fisheries; and
- Carry out education and outreach to the public.

Under the Sustainable Hawai‘i Initiative, DLNR-DAR is leading the Marine 30×30 Initiative to achieve effective management in 30% of Hawai‘i’s nearshore waters by 2030. The Marine 30x30 Initiative focuses on developing and strengthening the essential components of effective management of Hawai‘i’s nearshore waters for healthy reefs, fish, and communities. Marine 30x30 Initiative components include the development of a resilient marine managed area network, statewide fisheries rules, outreach and enforcement strategies, and effectiveness monitoring. DLNR-DAR plans to conduct stakeholder scoping from 2020-2021 and begin the rulemaking process for marine managed areas and fisheries in 2022.

DLNR-DAR conducts routine marine monitoring, which employs numerous methodologies developed by DLNR-DAR scientists in collaboration with NOAA, USGS, and UH. Marine monitoring includes surveys of

abundance of herbivorous fish, smaller cryptic fish and recruits, urchins and other mobile invertebrates, benthic habitat cover, coral health, and biological diversity.

DLNR-DAR is also the lead agency responsible for coordinating Hawai'i's coral reef management efforts and addressing major threats to coral reefs. DLNR-DAR updates the Hawai'i Coral Reef Strategy (HCRS) periodically to reflect new priorities for coral reef management in Hawai'i. The most recent update was completed in 2020 and established four pillars with corresponding goals and objectives for coral reef conservation, management, and restoration, including mauka interventions to reduce NPS pollution. One of the key sources of coral reef decline identified in the HCRS is land-based sources of pollution. Controlling land-based pollution is a key management activity performed by DLNR-DAR and its partners to protect reefs and is aligned with NPS mitigation efforts performed by DOH and other federal, state, and local organizations.

DLNR-DAR works with partners to target coral reef management activities in priority areas that include South Kohala and West Maui, which are priority restoration watershed areas for the State's NPS program (Chapter 4). DLNR-DAR is also one of the lead partners for the WMR2R, which implements actions to reduce land-based pollution. DLNR-DAR provides funding and support for the WMR2R, including funding for the West Maui Ridge to Reef Watershed Coordinator to assist with implementing the HCRS and WBPs in the region.

DLNR-DAR also works with federal, state, local, and non-profit partners to restore estuaries, freshwater wetlands, and streams to reduces land-based sources of pollution and to encourage mauka to makai watershed management. DLNR-DAR surveys and monitors these brackish and freshwater ecosystems periodically to assess the health and effectiveness of its restoration projects.

Websites:

- Main webpage: https://dlnr.hawaii.gov/dar/
- Marine 30x30 Initiative: https://dlnr.hawaii.gov/marine30x30/
- Holomua: Marine 30x30: https://dlnr.hawaii.gov/dar/files/2020/12/HolomuaMarine30x30_Roadmap_web.pdf
- Hawai'i Coral Reef Strategy 2030: https://dlnr.hawaii.gov/coralreefs/files/2020/08/Hawai'i-Coral-Reef-Strategy-2030-Final.pdf
- DLNR-DAR monitoring: https://dlnr.hawaii.gov/coralreefs/monitoring/
- DLNR-DAR projects and reports: https://dlnr.hawaii.gov/coralreefs/reports/

Nonpoint source management actions, objectives, and milestones:

- Implement the Hawai'i Coral Reef Strategy 2030 and coordinate mauka intervention actions with federal, state, and local organizations.

    - Develop the foundation of a Watershed Restoration Program to support water quality management from ridge to reef.
    - Strengthen and expand existing water quality restoration in West Maui and South Kohala.
- Continue to provide leadership for the WMR2R and support the West Maui Ridge to Reef Watershed Coordinator.

3.5.3 Division of Boating and Ocean Recreation (DLNR-DOBOR)

Mission: To preserve Hawai'i's natural and cultural resources while ensuring public access to State waters and enhancing the ocean experience.

Summary: DLNR-DOBOR manages and promotes statewide ocean recreation and coastal area programs for ocean waters and navigable streams, including small boat harbors, launching ramps, offshore mooring areas, designated ocean water areas, and designated ocean recreation management areas. DLNR-DOBOR's regulatory scope covers a wide range of ocean-related matters, from issuance of use permits for harbors and ocean recreation management areas to regulation of ocean activities, such as diving, kayaking, surfing, and jet skiing.

DLNR-DOBOR is the primary agency responsible for reducing and preventing polluted runoff from marinas and boating activities through implementation of CNPCP marinas and recreational boating management measures. These management measures address marina flushing, shoreline stabilization, storm water runoff, fueling station design, sewage facility management, solid and fish waste management, petroleum control, boat cleaning, boat operation, and public education. Many of these management measures are incorporated into DLNR-DOBOR's rules (Chapter 13-232, HAR).

Websites:

- Main webpage: https://dlnr.hawaii.gov/dobor/
- Strategic Action Plan (2019): https://dlnr.hawaii.gov/dobor/files/2019/09/DOBOR-Strategic-Plan-2019_webpost.pdf

Nonpoint source management actions, objectives, and milestones:

- Implement applicable CNPCP management measures for marinas and recreational boating.
- Update "Managing Boat Wastes: A Guide for Hawai'i Boaters" (with support from UH and DOH) and distribute at DLNR-DOBOR facilities and trainings.
- Implement "Modernizing Ocean Recreation Management in Hawai'i: Strategic Action Plan – 2019," which includes addressing water quality threats by abating water pollution and controlling shoreline erosion, as well as performing other regulatory functions pursuant to HRS Chapter 200-3.

3.5.4 Hawai‘i Association of Conservation Districts (HACD) and the Soil and Water Conservation District (SWCD) Program

Mission: Coordinate and facilitate partners and governmental agencies in identifying and implementing projects and practices to assure the protection of Hawai‘i’s environment.

Summary: HACD encompasses 16 SWCDs statewide. SWCDs work in a variety of ways, often with other federal, state, and local organizations and businesses, to implement conservation practices to help protect and sustain Hawai‘i’s natural environment. These practices include soil and water conservation planning, flood prevention, reforestation, and other natural resources conservation activities. Since 1967, DLNR has provided the SWCDs with funding and administrative support.

One of the primary NPS-related activities the SWCD performs is providing technical assistance for conservation plans and approving conservation plans. In conjunction with the SWCDs, agricultural producers develop conservation plans to manage the natural resources on their farms or ranches. A conservation plan combines the producer’s business and personal goals with science-based knowledge to protect natural resources. With assistance from SWCDs, producers select the best combination of conservation practices and BMPs to meet their resource needs and management goals. Conservation plans are also developed by planners employed by HACD, NRCS field office staff, and on O‘ahu, the O‘ahu Resource Conservation and Development Council.

In addition, SWCDs implement NPS pollution control projects that address resource needs of landowners and improve water quality. For example, in 2020 the Central Maui SWCD and the PRC Program signed an MOA to conduct an 18-month riparian restoration and ungulate exclusion project to control sediment and nutrient runoff in Hapapa watershed. In addition, SWCDs also participate in local initiatives that protect natural resources, such as the WMR2R. The West Maui SWCD, in coordination with DLNR-DAR and DOH, provides financial support for the WMR2R Watershed Coordinator. SWCDs also develop WBPs; the Southwest Maui Watershed Plan (2019), the Wai‘ula‘ula Watershed Management Plan (2011), and the Pelekane Bay Watershed Management Plan (2005) were all prepared by SWCDs. (See the DOH-CWB System at https://eha-cloud.doh.hawaii.gov/cwb/#!/watershed-based-plan/list to view and download these WBPs.)

Websites:

- Main webpage: https://dlnr.hawaii.gov/swcd/
- Conservation planning: https://dlnr.hawaii.gov/swcd/conservation-planning/

Nonpoint source management actions, objectives, and milestones:

- Provide assistance with conservation planning, including review and approval of conservation plans.

- Implement soil and water conservation plans, WBPs, and projects that protect water quality.
- Coordinate implementation of NPS control projects with partners, including projects in priority restoration watersheds.
- Support state and local efforts to mitigate NPS pollution, including the WMR2R.

3.5.5 Kahoʻolawe Island Reserve Commission (KIRC)

Mission: To implement the vision for Kahoʻolawe.

Vision: The kino of Kanaloa is restored. Forests and shrublands of native plants and other biota clothe its slopes and valleys. Pristine ocean waters and healthy reef ecosystems are the foundation that supports and surrounds the island. Nā poʻe o Hawaiʻi care for the land in a manner, which recognizes the island and ocean of Kanaloa as a living spiritual entity. Kanaloa is a puʻuhonua and wahi pana where native Hawaiian cultural practices flourish. The piko of Kanaloa is the crossroads of past and future generations from which the native Hawaiian lifestyle is spread throughout the islands.

Summary: In 1994, KIRC was established by the State of Hawaiʻi under HRS Chapter 6K to manage Kahoʻolawe, its surrounding waters, and its resources in trust for the general public and for a future Native Hawaiian sovereign entity. KIRC facilitates restoration and revegetation of Kahoʻolawe through five main programs: Restoration, Cultural, Ocean, Reserve Operations, and Administration and Outreach.

Website: http://www.kahoolawe.hawaii.gov/home.php

Nonpoint source management actions, objectives, and milestones:

To restore native ecosystems and control the severe erosion that is prevalent on Kahoʻolawe, KIRC plants native species that include trees, shrubs, vines, grasses, and herbs. Only about 820 acres of the 12,800 most severely eroded acres can be replanted; the remaining land is barren hardpan-soil compacted so severely that it cannot readily absorb water. More than 400,000 native plants have been reintroduced to date.

In addition to plantings, marine debris removal and monitoring continue to be carried out. More than 40 tons of marine debris have been removed from Kahoʻolawe over the past three years. Grant-funded aerial surveys help to monitor the rate of influx of marine debris re-introduction, thereby setting focal points for future removal projects. Underwater surveys and collaborations with partners including The Nature Conservancy (TNC), NOAA's Humpback Whale Sanctuary, and UH have helped KIRC inventory nearshore fish populations and coral abundance.

Since 2004, KIRC has collaborated with DOH on several NPS pollution control and restoration projects totaling over $4 million in Section 319 funds and matching State funds combined. In 2009, the EPA

recognized KIRC's and the PRC Program's success in improving water quality in Hakioawa and Kaulana watersheds, where collaborative projects continue into the present. KIRC and the PRC Program plan to implement a project in Hakioawa watershed in 2021 to maintain the infrastructure and BMPs installed during previous Section 319-funded projects. KIRC has also received CIP funds to conduct restoration activities that include extensive native dryland forest plantings over 100 acres. In addition, KIRC is developing a WBP for Kamohio watershed.

In February 2020, the Kahoʻolawe brush fire scorched roughly 30% of the island (9,000 acres). One of the KIRC's priorities is to revegetate the burned areas with native plants, thereby reducing erosion and making the area more resilient to fires in the future.

3.5.6 Commission on Water Resource Management (Commission)

Mission: To protect and manage the waters of the State of Hawaiʻi for present and future generations.

Summary: The Commission was established under the State Water Code (HRS Chapter 174C) in order to protect and enhance Hawaiʻi's water resources through wise and responsible management. The Commission's primary responsibilities are to implement and administer the provisions of the State Water Code by planning, surveying, regulating, monitoring, and conserving the State's water resources within established plans that have been adopted by the Commission.

The Commission is responsible for preparing and implementing the Water Resources Protection Plan (WRPP), which is a key component of the Hawaiʻi Water Plan. The objective of the WRPP is to protect and sustain ground and surface water resources, watersheds, and natural stream environments statewide. Such protection requires a comprehensive study of occurrence, sustainability, conservation, augmentation, and other resource management measures. The WRPP was updated in 2019 and contains more details about monitoring goals, which can be found at https://dlnr.hawaii.gov/cwrm/planning/hiwaterplan/wrpp/.

Website: https://dlnr.hawaii.gov/cwrm/

Nonpoint source management actions, objectives, and milestones:

The Commission's tasks included in the WRPP that involve NPS pollution management include:

- Monitoring groundwater and surfaces water resources, in coordination with USGS, DOH, and other agencies; and
- Administering regulatory permits, including Stream Channel Alteration Permits and Stream Diversion Works Permits. These permits are also ways the state implements CNPCP management measures for hydromodifications, which ensures that water quality and instream and riparian habitat are evaluated for proposed channelization or channel modifications.

3.6 University of Hawai‘i

3.6.1 Sea Grant College Program (Hawai‘i Sea Grant)

Mission: The UH Sea Grant College Program supports an innovative program of research, education, and extension services, directed to the improved understanding and stewardship of coastal and marine resources of the state, region, and nation.

Summary: Hawai‘i Sea Grant is part of a national network of 34 programs that promote better understanding, conservation, and use of coastal resources. Hawai‘i Sea Grant works in partnership with the UH’s School of Ocean and Earth Science and Technology (SOEST) and NOAA to identify Hawai‘i’s critical resource management issues and guide cutting-edge scientific research to address these challenges. Realizing the necessity of collaboration to address coastal resource issues, Hawai‘i Sea Grant also provides links between academia, federal, state, and local government agencies, industries, and local community members.

Hawai‘i Sea Grant has four focus areas which explore pressing issues related to the health and well-being of the State’s coasts and coastal economies:

- Healthy Coastal Ecosystems,
- Sustainable Fisheries and Aquaculture,
- Resilient Communities and Economies, and
- Environmental Literacy and Workforce Development.

Website : http://seagrant.soest.hawaii.edu/

Nonpoint source management actions, objectives, and milestones:

Hawai‘i Sea Grant and the PRC Program have implemented NPS pollution control projects in He‘eia watershed and Waikoloa watershed and will be implementing an additional project in He‘eia watershed starting in 2020 (Appendix A).

Main actions include:

- Implement NPS pollution control projects, conduct water quality monitoring, and conduct water quality related research in He‘eia watershed;
- Update “Managing Boat Wastes: A Guide for Hawai‘i Boaters” (with support from DLNR-DOBOR and DOH) to help implement the Hawai‘i CNPCP Marinas and Recreational Boating management measures; and
- Assist with restoration, monitoring, and research activities in He‘eia (especially in the He‘eia National Estuarine Research Reserve) in coordination with federal, state, and local partners.

3.6.2 College of Tropical Agriculture and Human Resources (CTAHR)

Mission: The College of Tropical Agriculture and Human Resources creates and delivers knowledge that supports and strengthens families, agricultural and food systems, and the natural environment. It educates and serves the people of Hawai'i and those from around the world with integrity and excellence.

Summary: CTAHR is UH Mānoa's agricultural resource college and includes Cooperative Extension (CE), which provides practical applications of science to support local food systems, healthy living, youth development, and the stewardship of natural resources for future generations. Cooperative Extension agents are available for individual consultations and provide educational workshops and short courses covering topics in agriculture, including soil, nutrient, and pest management.

Websites: https://cms.ctahr.hawaii.edu/; CE website: https://cms.ctahr.hawaii.edu/ce/

Nonpoint source management actions, objectives, and milestones:

CTAHR CE agricultural programs that pertain to NPS pollution management include soil and crop management, livestock and range management, and pest control. CTAHR works with farmers to conduct soil nutrient testing, develop soil management strategies, and provide workshops and trainings. These activities improve soil, nutrient, and pest management that reduce water pollution from erosion, fertilizers, pesticides, and herbicides.

From 2019 through 2022, CTAHR is collaborating with the PRC Program to implement soil management strategies and soil testing technologies to reduce nutrient loadings across a range of intensive vegetable farming systems in Ma'ili'ili watershed and Kaiaka Bay watersheds (Appendix A). CTAHR has also provided technical assistance and workshops on pest management and other topics for farmers for Section 319 projects.

3.6.3 He'eia National Estuarine Research Reserve (NERR), administered by the Hawai'i Institute of Marine Biology (HIMB)

Mission: To practice and promote stewardship through Native Hawaiian philosophies and values. NERR efforts are supported by indigenous knowledge, innovative research, education, and training that nourishes healthy and resilient ecosystems, economies, and communities.

Summary: Designated as the 29th NERR in 2017 by NOAA, the He'eia NERR represents a strong partnership among federal, state, and community-based entities, all committed to a vision of resilient estuaries and coastal watersheds where human and natural communities thrive. The He'eia NERR encompasses 1,385 acres of unique and diverse upland, wetland, stream estuarine, coastal, and marine habitats.

The primary research question for the He‘eia NERR is: What are the most effective ecosystem-based management strategies that contribute to the resilience and integrity of Pacific Island estuarine ecosystems, measured as a suite of ecosystem services, considering anthropogenic drivers in the context of sociocultural and environmental factors? To answer this question, NERR partners are carrying out biocultural restoration practices and an integrated research and monitoring program.

Websites:

- Main NERR webpage: https://heeianerr.org/
- NOAA NERR program: https://coast.noaa.gov/nerrs/
- He‘eia NERR Management Plan 2016-2021: https://coast.noaa.gov/data/docs/nerrs/hawaii-reserve-final-mgmt-plan.pdf

Nonpoint source management actions, objectives, and milestones:

NERR partners plan to continue to implement restoration projects, including invasive species removal in the He‘eia watershed along with reestablishment of indigenous resource management systems such as He‘eia Fishpond, indigenous agroforestry, and agro-ecological systems like lo‘i kalo and loko wai systems, along with associated native biodiversity. In addition, comprehensive water quality monitoring is being conducted throughout the NERR to track watershed health and answer the NERR’s primary research question. Two Section 319 projects to reduce turbidity and nutrient loadings in He‘eia Stream and He‘eia Fishpond are being implemented by TNC and Hawai‘i Sea Grant through 2022 (Appendix A), and additional projects will be developed with partners in the watershed through 2025 in an effort to bring He‘eia Stream into attainment of WQS for total nitrogen and nitrate + nitrite (dry season).

3.6.4 Water Resources Research Center (WRRC)

Mission: To promote understanding of critical state and regional water resource management and policy issues through research, community outreach, and public education.

Summary: WRRC conducts research on water-related issues distinctive to Hawai‘i and other Pacific Islands and provides outreach to increase public awareness about water quality issues and the importance of WRRC’s research across the Pacific. WRRC is one of the lead programs providing guidance, research, and outreach for the State’s cesspool conversion efforts. WRRC has been researching OSDS for over a decade, including studies on OSDS conditions, treatment technologies, and management in Hawai‘i.

Website: http://www.wrrc.hawaii.edu/

Nonpoint source management actions, objectives, and milestones:

Research that the WRRC conducts that has applications for NPS management include:

- Quantitative real-time PCR-based test for enterococci as a rapid beach management tool in Hawai‘i;
- Stream pesticide and nutrient loads from baseflow, surface runoff, and sediment contributions; and
- OSDS technologies and management options.

WRRC also is active in the CCWG and, in coordination with DOH, is conducting the Act 132 Nearshore Sewage Pollution Study (see Chapter 3.3), which will be completed in 2021.

3.6.5 Pacific Islands Ocean Observing System (PacIOOS)

Mission: To empower ocean users and stakeholders throughout the Pacific Islands by providing accurate and reliable coastal and ocean information, tools, and services that are easy to access and use.

Summary: PacIOOS is based within SOEST and is one of the eleven regional associations of the U.S. Integrated Ocean Observing System, which is a federally (NOAA) authorized program that works with national, regional, and private-sector partners to ensure compatible and consistent ocean and coastal data collection, management, and information. Aiming to promote a safe, healthy, and productive ocean and resilient coastal zone, PacIOOS collects real-time data on ocean conditions, forecasts future events, and develops user-friendly tools to access this information. In collaboration with a large network of partners, PacIOOS helps inform decision-making in Pacific communities on a daily basis.

Websites:

- Main webpage: https://www.pacioos.hawaii.edu/
- Strategic Framework 2018-2022: http://www.pacioos.hawaii.edu/wp-content/uploads/2017/11/PacIOOS_Strategic_Framework_2018-2022.pdf;
- Water quality buoy observations: https://www.pacioos.Hawai‘i.edu/water-category/wqbuoy/

Nonpoint source management actions, objectives, and milestones:

PacIOOS will continue to implement its Strategic Framework 2018-2022 to achieve its mission. Thematic areas of the framework include water quality, coastal hazards, ecosystems and living marine resources, and marine operations. The State can use PacIOOS's data to assess water quality trends and target areas where water pollutants exceed water quality standards. PacIOOS maintains nearshore sensor observations in Hawai‘i, which may provide reference condition data for measuring the impacts of NPS control projects and for developing TMDLs. PacIOOS data that are particularly useful for State water

quality assessments include temperature, salinity, and turbidity as well as currents, ocean acidification, and coral health.

3.7 Hawai‘i Department of Agriculture (HDOA)

Mission: To further expand the role of Hawai‘i’s agricultural industry to benefit the well-being of our island society by diversifying the economy, protecting resources important for agricultural production, and gaining greater self-sufficiency in food and renewable energy production.

Summary: HDOA’s goals are to conserve and develop essential agricultural resources and infrastructure; to gain access to and develop local, domestic, and international markets for Hawai‘i's agricultural products; to conserve and protect suitable agricultural lands and water; to promote Hawai‘i's food self-sufficiency; to raise awareness of the importance of agriculture to the State's economy, environment, and as a profession; to implement programs to safeguard Hawai‘i's farmers, consumers, and natural resources; and to prevent the introduction and establishment of plants, animals, and diseases that are detrimental to Hawai‘i's agriculture and environment. HDOA develops the State’s Agricultural Water Use and Development Plan, which is a component of the Hawai‘i Water Plan.

Website: http://hdoa.hawaii.gov/

Nonpoint source management actions, objectives, and milestones:

HDOA implements CNPCP management measures for agriculture and also has a cooperative agreement with USGS to conduct pesticide monitoring. HDOA’s primary NPS-related management actions are:

- Require conservation plans on State lands leased for agriculture, and
- Implement measures to ensure safe and effective pesticide use.

3.8 Hawai‘i Association of Watershed Partnerships (HAWP)

Mission: Sustain, promote, and build capacity for Watershed Partnerships in Hawai‘i.

Summary: HAWP was established in 2003 to build public and private support for watershed protection. The ten Watershed Partnerships that comprise HAWP manage over 2.2 million acres of forested watershed lands, which are vital to maintaining water quality and water supply in Hawai‘i. Watershed Partnerships are voluntary alliances of public and private landowners committed to the common value of protecting watersheds for water recharge, conservation, and other ecosystem services through collaborative management. Currently, over 74 public and private partners are involved in one or more of the following Watershed Partnerships:

- Kaua‘i Watershed Alliance,
- Ko‘olau Mountains Watershed Partnership,
- Wai‘anae Mountains Watershed Partnership,
- East Moloka‘i Watershed Partnership,
- Mauna Kahalawai Watershed Partnership,
- East Maui Watershed Partnership,
- Leeward Haleakala Watershed Restoration Partnership,
- Kohala Watershed Partnership,
- Three Mountain Alliance, and
- Mauna Kea Watershed Alliance (Figure 13).

Website: http://hawp.org/

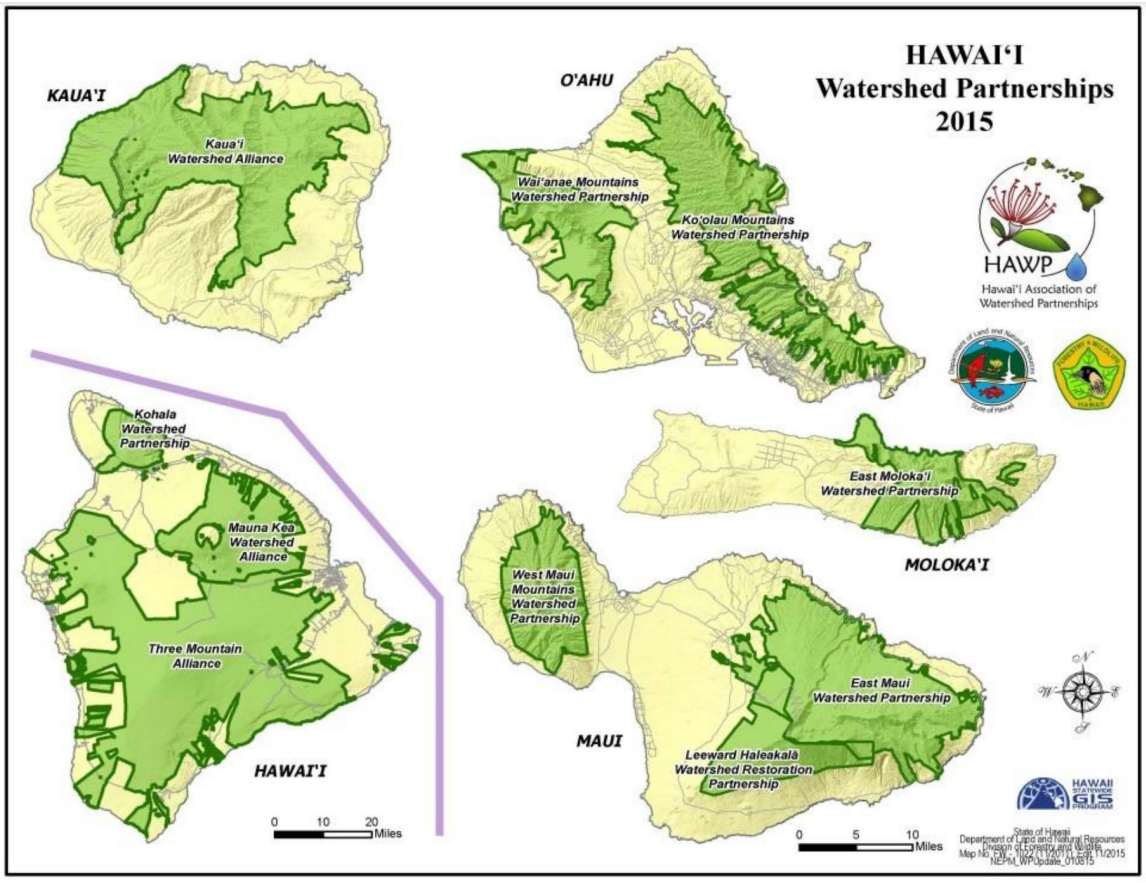

Figure 13. Watershed Partnerships that comprise the Hawai‘i Association of Watershed Partnerships

Nonpoint source management actions, objectives, and milestones:

HAWP manages threats within the State's priority watershed areas (Figure 12). Most Watershed Partnership management actions are habitat based and revolve around combating the main threats of feral ungulates and invasive species in forested areas within watersheds. Actions include fencing and ungulate removal, invasive species control, rare plant outplanting and native habitat restoration, and outreach and education. These management actions make a critical difference by benefitting native forests, watersheds, and coastal and coral reef areas by reducing erosion and sediment and nutrient runoff into surface waters.

HAWP's objectives include developing sustainable funding sources to support implementation of management plans developed under the Watershed Partnerships and increasing the effective management and protection of mauka watershed areas by raising the capacity of watershed partnerships, facilitating sharing of watershed management expertise, and building public support for protecting watershed values.

Over the next five years, DLNR-DOFAW's Watershed Partnerships Program will continue to provide funding for the Watershed Partnerships to protect priority watershed areas, with additional financial assistance from State CIP funds and DOH's Section 319 NPS grant program (Chapter 5, Objective 2).

3.9 Federal Agencies

3.9.1 U.S. Environmental Protection Agency (EPA)

Mission: To protect human health and the environment.

Summary: EPA works to ensure that:

- Americans have clean air, land, and water;
- National efforts to reduce environmental risks are based on the best available scientific information;
- Federal laws protecting human health and the environment are administered and enforced fairly, effectively and as Congress intended;
- Environmental stewardship is integral to U.S. policies concerning natural resources, human health, economic growth, energy, transportation, agriculture, industry, and international trade, and these factors are similarly considered in establishing environmental policy;
- All parts of society—communities, individuals, businesses, and state, local and tribal governments—have access to accurate information sufficient to effectively participate in managing human health and environmental risks;
- Contaminated lands and toxic sites are cleaned up by potentially responsible parties and revitalized; and

- Chemicals in the marketplace are reviewed for safety.

To accomplish this mission, the EPA:

- Develops and enforces regulations;
- Gives grants;
- Studies environmental issues;
- Sponsors partnerships;
- Teaches people about the environment; and
- Publishes information.

Websites:

- Main webpage: https://www.epa.gov/
- CWA Section 319 grant program: https://www.epa.gov/nps/319-grant-program-states-and-territories

NPS management responsibilities: The EPA delegates CWA and SDWA programs to the DOH and provides grant funding to achieve CWA and SDWA goals. Under the CWA, the EPA provides grant funding for NPS pollution management, surface and groundwater quality monitoring and assessment, NPDES, enforcement, the DWSRF and CWSRF, and other water programs. Another NPS-related program that EPA oversees (with NOAA) is Hawai'i's CNPCP.

The EPA's Fiscal Year 2018 - Fiscal Year 2022 Strategic Plan describes how the EPA will work toward its mission to protect human health and the environment and provides measures to evaluate success. The EPA and its associated state programs will implement water quality restoration and protection strategies outlined in the Strategic Plan to meet long-term performance goals (LTPGs), including LTPG-1.2.2: "By September 30, 2022, reduce the number of square miles of watershed with surface water not meeting standards by 37,000 square miles."

3.9.2 National Oceanic and Atmospheric Administration (NOAA)

Mission: To understand and predict changes in climate, weather, oceans and coasts; to share that knowledge and information with others; and to conserve and manage coastal and marine ecosystems and resources.

Summary: NOAA exercises its direct authority to regulate and sustain marine fisheries and their ecosystems, protect endangered marine and anadromous species, protect and restore habitats and ecosystems, conserve marine sanctuaries and other protected places, respond to environmental emergencies, and aid in disaster recovery.

Websites:

- Main webpage: https://www.noaa.gov/
- CNPCP: https://coast.noaa.gov/czm/pollutioncontrol/
- NERRS: https://coast.noaa.gov/nerrs/
- National Coral Reef Monitoring Program: https://www.coris.noaa.gov/monitoring/

NPS management responsibilities: NOAA's direct NPS management-related activity is overseeing the CNPCP with EPA. It also administers the NERR System, which protects estuarine habitat and supports coastal management in Hawai'i within the He'eia NERR. NOAA's Coral Reef Conservation Program is a lead agency for the West Maui Ridge to Reef Initiative, which implements an integrated and comprehensive approach to reduce land-based sources of pollution to help restore coral reef ecosystems. NOAA also administers the National Coral Reef Monitoring Program and has a cooperative agreement with SOEST to administer PacIOOS.

3.9.3 U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS)

Mission: Deliver conservation solutions so agricultural producers can protect natural resources and feed a growing world.

Summary: The NRCS helps private landowners improve the health of their operations while protecting natural resources and ensuring the long-term sustainability of American agriculture. NRCS provides financial and technical assistance to farmers, ranchers, and non-industrial private forest landowners or managers to implement conservation practices. NRCS administers many different Farm Bill programs including the Environmental Quality Incentives Program (EQIP), the Regional Conservation Partnership Program (RCPP), the Agricultural Conservation Easement Program, the Conservation Stewardship Program, and the Conservation Technical Assistance Program. The NRCS also uses Farm Bill program funds to protect sources of drinking water.

Websites:

- National: https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/
- Pacific Islands Area: https://www.nrcs.usda.gov/wps/portal/nrcs/site/pia/home/
- National Water Quality Initiative: https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/?cid=stelprdb1047761
- RCPP: https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/rcpp/

NPS management responsibilities: NRCS implements the National Water Quality Initiative (NWQI) to improve water quality in designated watersheds and help States make progress in removing waterbodies from the CWA Section 303(d) list of impaired waters. The NWQI aims nationally to reduce sediment loss from cropland, across all watersheds, by 772,000 tons, phosphorous loss by 2,052,750

pounds, and nitrogen loss by 9,058,800 pounds. NRCS has developed edge-of-field pollutant reduction goals for the NWQI to show progress in achieving water quality improvements. These reductions will help address water quality impairments or concerns identified in each NWQI watershed and contribute towards restoring waters to their designated uses.

The NWQI strategically targets EQIP funds to participating farmers and ranchers to address agricultural sources of water pollution, including nutrients, sediment, pesticides, and pathogens. Through the NWQI, the NRCS offers financial and technical assistance to farmers and forest landowners interested in improving water quality and aquatic habitats in watersheds with impaired streams. NRCS helps producers implement conservation and management practices through a systems approach to prevent, control, and trap nutrient and manure runoff.

NRCS's lead State partner for the NWQI is DOH, whose primary role is to monitor water quality, assess the impacts of EQIP-funded conservation practices on water quality, and to track water quality improvements over time. As of 2020, the following watersheds have been targeted for treatment through the NWQI: Hilo Bay watersheds, West Maui watersheds, and Pelekane Bay (South Kohala). EQIP funds are made available to producers within these watersheds to implement conservation practices that will improve water quality. The NRCS and DOH plan to increase the number of NWQI watersheds by two over the next five years. The NRCS and DOH plan to select watersheds where both Section 319 funds and NWQI funds will be available for conservation practice implementation in Targeted Conservation Delivery (TCD) areas. TCD is a new approach being employed by NRCS to solve high priority natural resource concerns in a focused and strategic manner with local partners.

NRCS also administers the RCPP, which promotes coordination of NRCS conservation activities with partners to address on-farm, watershed, and regional natural resource concerns. Through RCPP, NRCS seeks to co-invest with partners to implement projects that demonstrate innovative solutions to conservation challenges and provide measurable improvements and outcomes tied to the resource concerns they seek to address.

NRCS's established conservation practice standards are used extensively in conservation planning on agricultural lands. Conservation practices are implemented as part of Hawai'i's CNPCP management measures for agriculture, including conservation practices for nutrient management, irrigation, grazing, and erosion and sediment control.

3.9.4 U.S. Army Corps of Engineers (USACE)

Mission: To provide vital public engineering services in peace and war to strengthen our Nation's security, energize the economy, and reduce risks from disasters.

Summary: As the nation's environmental engineer, USACE is protecting and restoring the nation's environment including critical efforts in the Everglades, the Gulf Coast and along many of the major

waterways. USACE is also cleaning sites contaminated with hazardous, toxic, or radioactive waste in an effort to sustain the environment.

Websites:

- Main webpage: https://www.usace.army.mil/
- USACE Honolulu: https://www.poh.usace.army.mil/

NPS management responsibilities: USACE implements Hawai'i CNPCP management measures for hydromodifications and wetlands, which includes administration of the CWA Section 404 permit program to regulate the discharge of dredged or fill material into U.S. waters, including wetlands. USACE requires Section 404 permits for channel modification projects and requires an evaluation of all potential impacts, including environmental impacts, of these projects.

USACE is a lead agency in West Maui Ridge to Reef Initiative and developed West Maui's Kahana, Honokahua, and Honolua WBP in 2016. This plan is being implemented by partner agencies in West Maui. USACE also provides funding for ecosystem restoration and flood control projects, which have beneficial water quality impacts.

3.9.5 U.S. Geological Survey (USGS)

Mission: The USGS mission is to monitor, analyze, and predict current and evolving dynamics of complex human and natural Earth-system interactions and to deliver actionable information at scales and timeframes relevant to decision makers.

Summary: As the Nation's largest water, earth, and biological science and civilian mapping agency, USGS collects, monitors, analyzes, and provides science about natural resource conditions, issues, and problems. Its diverse expertise enables it to carry out large-scale, multidisciplinary investigations and provide impartial scientific information to resource managers, planners, and other customers. The USGS Pacific Islands Water Science Center conducts hydrologic monitoring and investigative studies on a wide variety of issues affecting water resources in the State of Hawai'i and the U.S. Affiliated Pacific Islands. In partnership with federal, state, and local agencies, the USGS provides data and information to assist these agencies in managing water resources.

Websites:

- Main webpage: https://www.usgs.gov/
- USGS Pacific Island Water Science Center: https://www.usgs.gov/centers/piwsc/science
- Coral Reef Project: https://www.usgs.gov/centers/pcmsc/science/coral-reef-project-hawai-i?qt-science_center_objects=0#qt-science_center_objects

NPS management responsibilities: USGS provides important water quality data to support NPS management decisions and works collaboratively with state agencies to monitor water quality, water resources, and coral reef habitat. In recent years, the USGS has worked with the HDOA and DOH to initiate a pesticide monitoring program for surface waters. HDOA and USGS continued their cooperative agreement for pesticide monitoring in Hawai'i, in which HDOA funded the USGS to conduct pesticide monitoring through 2020. The USGS also conducts studies on sediment transport and assists agencies and organizations with water quality data needs. The USGS will continue to be a lead partner agency for the West Maui Ridge to Reef Initiative and will continue to work with the National Park Service, several universities, and national historical parks and sites on the Big Island as part of its Coral Reef Project.

3.10 Counties

Summary: Each of the State's four counties—County of Kaua'i, City and County of Honolulu, County of Maui, and County of Hawai'i—address point source and NPS pollution through their respective planning, permitting, public works, water supply, and environmental services departments and through policies outlined in county general plans and specific community development plans. County general plans provide guidelines within each county for decision-making regarding future growth and development and protection of natural and cultural resources. In addition, each county prepares a County Water Use and Development Plan, which is a component of the Hawai'i Water Plan that sets forth water use and allocations within each county.

Counties are also responsible for stormwater management and erosion control during development to protect sensitive natural features. Stormwater management occurs through Municipal Separate Storm Sewer System (MS4) permit requirements, if applicable, and/or county codes the prescribe stormwater mitigation methods. For example, county grading and grubbing ordinances require permits or an approved conservation plan before any grading, grubbing, excavating, and stockpiling activities commence.

Counties also implement several CNPCP management measures, particularly measures designed to control runoff in urban areas. In addition, counties administer SMA permits and shoreline setback provisions to ensure that natural resources, including State waters, within an SMA are protected and preserved.

Websites:

- County of Kaua'i: http://www.kauai.gov/
- City and County of Honolulu: http://www.honolulu.gov/
- County of Maui: https://www.mauicounty.gov/
- County of Hawai'i: https://www.hawaiicounty.gov/

4 PRIORITIZING WATERS AND WATERSHEDS FOR NPS MANAGEMENT

To focus efforts on restoring impaired waters and protecting unimpaired waters, DOH works with partners to prioritize watersheds and to identify sources or potential sources of NPS pollutants that may impact water quality. Restoring waters refers to implementing management measures to bring waters on the state's CWA Section 303(d) impaired waters list up to WQS and to restore the designated uses of these waters. Protecting waters refers to implementing management measures to protect high quality waters from NPS pollution or to ensure that assessed unimpaired waters continue to meet WQS.

Prioritizing waters serves an important purpose for meeting water quality goals. By leveraging restoration efforts and the technical and financial resources of several agencies and organizations within a priority watershed, there is greater potential to restore and protect waters and other natural resources within the watershed. Partnerships are therefore key to the success of restoring and protecting priority watersheds, with each partner playing an important role in one or more aspects of NPS pollution management.

This chapter provides information on the watershed prioritization process and criteria for NPS management, identifies priority watersheds, and identifies NPS management objectivities and activities for these priority watersheds. Because the national Section 319 NPS program and the DOH's priority continue to be restoring water quality within watersheds, the prioritization process focuses on prioritizing watersheds for restoration. To maximize water quality benefits, protection activities will be conducted in watersheds designated as priority watersheds for restoration. Protection efforts will generally be targeted at mauka conservation areas of priority watersheds, where DLNR priority watershed areas (Figure 12), source water areas, and high quality waters tend to be located, while restoration projects will be implemented from mauka to makai or as prescribed by WBPs.

4.1 Priority Watershed Restoration Criteria

Prioritizing waters and watersheds for restoration is based on four main criteria: 1) the watershed has at least one waterbody on the CWA Section 303(d) list; 2) the watershed has a DOH-approved WBP; 3) the watershed or waterbody is the focus of an active partnership or organization that aims to improve or protect water quality and natural resources in the watershed; and 4) water quality monitoring is conducted in the watershed (Figure 14).

1. **The watershed has waterbodies that are on the CWA Section 303(d) impaired waters list**

   In order to restore a waterbody, it must already be assessed by DOH-CWB and have documented impairments. The Integrated Report identifies waters on the 303(d) list as well as watershed assessment units with impaired waters. The Integrated Report also identifies which pollutants are causing the impairments.

2. **The watershed has an approved WBP or acceptable alternative to a WBP**

   Watershed-based plans are a criterion for two reasons: 1) Section 319 Watershed Project Funds can only be used to fund NPS pollution control projects in watersheds with approved WBPs and alternative plans; and 2) WBPs provide guidance for a broad range of watershed restoration activities designed to improve water quality, from BMP implementation to education and outreach. Importantly, WBPs estimate pollutant load reductions needed to improve water quality and meet WQS and provide details on potential projects that can be implemented to achieve load reductions. Watershed-based plans also provide information on financial and technical resources available to implement NPS pollution control measures.

3. **The watershed has active partnerships that involve community groups, watershed groups, and/or federal, state, or local agencies**

   Watersheds with active partnerships and/or watershed groups are a main criterion for several reasons. First, these partnerships or organizations demonstrate long-term, local commitment to protecting and restoring water quality and other natural resources in watersheds. These groups and organizations are dedicated to restoration efforts occurring locally, educating and engaging their community, and ensuring that BMPs are operated and maintained so that water quality and watershed health continues to improve. In addition, active partnerships in the watershed, such as the Watershed Partnerships, can employ a more comprehensive approach to restoring and protecting watersheds through the combined expertise of partners and the ability to leverage technical and financial resources. A coordinated approach to managing NPS pollution among various agencies and organizations has the potential to have a greater impact on water quality than a single agency or organization working alone in a watershed.

4. **The watershed has a water quality monitoring program**

   A water quality monitoring program or routine water quality monitoring is necessary to determine whether BMPs and other management measures aimed at improving water quality to attain WQS are effective. DOH is charged with monitoring and assessing water quality for the State, but other agencies and institutions such as USGS, UH, and DLNR also monitor water quality, pollutants, and biological indicators of water quality. In addition, local water quality monitoring organizations provide regional water quality data that are not collected by DOH or other agencies.

Figure 14. Watershed restoration prioritization criteria developed by the Department of Health, Clean Water Branch

4.2 Priority Watershed Protection Criteria

The goal of protecting waters is to maintain their quality by preventing NPS pollution's negative impacts. Pursuant to the State's antidegradation policy in HAR Chapter 11-54, protection is primarily targeted at pristine, high quality waters. High quality waters are surface waters that 1) meet the State's WQS or 2) have not been assessed but are found in healthy functioning watersheds or healthy functioning areas of watersheds. These areas are generally found in higher elevation native forests and often overlap with drinking water source areas and DLNR priority watershed areas (Figure 12). There are also coastal waterbodies that meet WQS for all assessed parameters.

DOH does not have a formal list of high quality waters, and not all WBPs identify waters for protection. Therefore, DLNR priority watershed areas as well as DOH-SDWB drinking water protection criteria are used to identify watershed protection areas (Table 8). While DOH does not prioritize watersheds specifically for protection because of its focus on restoring waters, protecting waters will continue to be a priority for DOH, particularly in priority watersheds where protection efforts are implemented via partnerships.

Identifying watersheds for protection also enables Section 319 Watershed Project Funds to be used for protection activities. The PRC Program will partner with the Watershed Partnerships Program to implement watershed protection projects in priority watersheds. For each of the next three WPP Grant

Table 8. Watershed protection criteria by state department

Department	Summary of Watershed Protection Criteria
Department of Health, Clean Water Branch	• High quality or unimpaired waters • Identified for protection in a watershed-based plan • Protection activities can be conducted in conjunction with restoration activities in the same watershed
Department of Health, Safe Drinking Water Branch	• Susceptibility of drinking water sources to contamination based on numerical groundwater flow and transport modeling and GIS analysis

Department of Land and Natural Resources, Division of Forestry and Wildlife	• Priority I and II watersheds
	  ○ Intact native forests
	  ○ High groundwater recharge (source water areas)
	  ○ Threat of conversion to alien forests
	• Priority III watersheds
	  ○ Enhanced groundwater recharge
	• Natural Area Reserves
	  ○ Intact native ecosystems

cycles (2021-2022, 2023-2024, 2025-2026), the PRC Program will provide Section 319 Watershed Project Funds for watershed protection projects in South Kohala, West Maui, and/or He‘eia priority watersheds, and potentially other eligible Section 319 watersheds. Protection projects generally involve ungulate fencing, invasive species removal, and planting native species to control erosion, reduce sediment and nutrient runoff, and increase groundwater recharge. The PRC Program will also investigate ways to monitor and assess water quality in watershed protection areas with the DOH-CWB Monitoring Section and partners as part of Section 319 project effectiveness monitoring.

4.3 Priority Watersheds

Priority watersheds that the State will focus resources on for NPS management are 1) South Kohala (Kawaihae and Waikoloa watersheds) on Hawai‘i Island, 2) West Maui (Wahikuli, Honokowai, Kahana, Honokahua, and Honolua watersheds) on Maui, and 3) He‘eia watershed on O‘ahu.

4.3.1 South Kohala: Kawaihae and Waikoloa Watersheds

Kawaihae watershed, also known as Pelekane Bay watershed, and Waikoloa watershed are located in South Kohala in northwest Hawai‘i Island (Figure 15). Both watersheds extend from Kohala Mountain (5,260 feet above sea level) at higher elevations down to the Pacific Ocean at their lowest elevations. Waikoloa watershed also includes a leeward portion of Mauna Kea.

South Kohala is a new priority watershed area for DOH. While DOH has worked with other state agencies and institutions, including the Mauna Kea SWCD, the University of Hawai'i, DLNR-DOFAW, and the Kohala Watershed Partnership/The Kohala Center, to implement Section 319 projects in South Kohala over the past ten years, the region has not been a major focus for DOH. However, with two large partnerships (South Kohala Coastal Partnership (SKCP) and Kohala Watershed Partnership) active in the region, DOH recognized an opportunity to contribute to these partnerships' efforts to reduce land-based pollution, improve water quality, restore watersheds, and protect coral reefs. The Kohala Watershed Partnership and the SKCP are implementing a wide range of planning, restoration, and monitoring activities in the region. Managing coral reefs in South Kohala has been a priority for DLNR-DAR's Coral Reef Program for the past 10 years and will continue to be through 2030. In addition, NRCS, in partnership with DOH, plans to implement the NWQI in South Kohala, and is currently working with partners to assess the watersheds and stakeholder interest during the readiness phase of the NWQI.

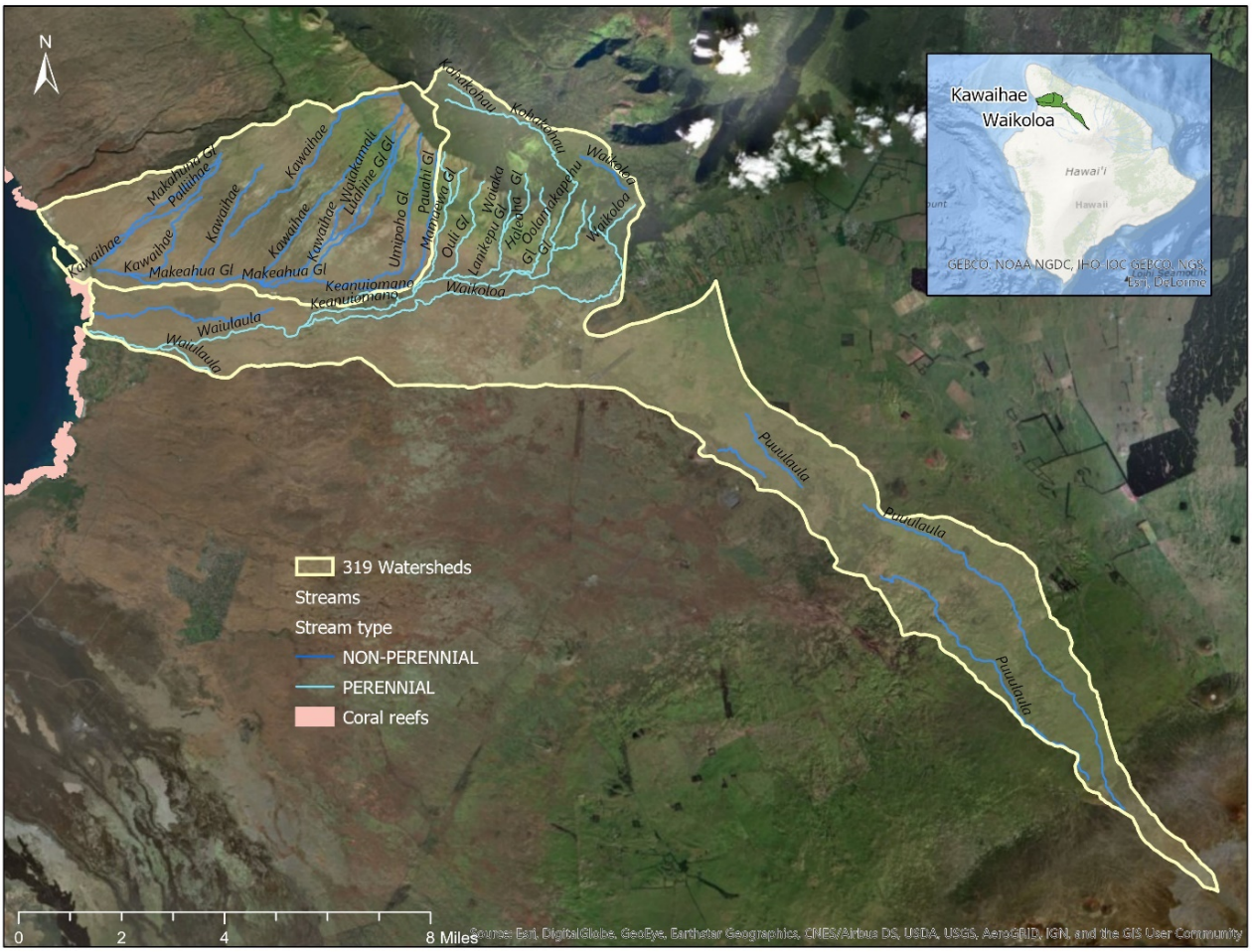

Figure 15. Kawaihae and Waikoloa priority watersheds on Hawai'i Island

Priority watershed criterion 1: Water quality impairments/CWA Section 303(d) List

Kawaihae and Waikoloa watersheds have waterbodies that are on the 303(d) list for turbidity, nutrients, and chlorophyll *a* (Table 9). They are prioritized as "Low" for TMDLs in the 2020 Integrated Report. All assessed waterbodies are marine Class A waters; inland waters in these watersheds have not been assessed in the Integrated Report. All waters in these watersheds that DOH has assessed for fecal indicator bacteria meet the recreational water quality standards.

Many threats to water quality in South Kohala have been identified by the SKCP in the South Kohala Coastal Action Plan 2030. Nutrient pollution and sedimentation at stream discharges are among the high priority threats to water quality. According to the Pelekane Bay Watershed Plan and the Waiʻulaʻula Watershed Management Plan, sources of turbidity and nutrients in these watersheds include agriculture, urban runoff, OSDS, soil and streambank erosion, erosion caused by feral ungulates, wildfire, flooding, and stream diversions.

Table 9. Water quality impairments in Kawaihae and Waikoloa watersheds

WATERSHED	WATERBODY/ SAMPLING LOCATION	WET/DRY SEASON	IMPAIRMENTS (2020 IR)	YEAR ASSESSED BY DOH
Kawaihae	Kawaihae Harbor	Dry	Turbidity	2014
	Pelekane Bay	N/A	Total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, total phosphorus, turbidity, chlorophyll *a*	2014
Waikoloa	Spencer Beach Co. Park	N/A	Turbidity, chlorophyll *a*	2016
	Waiʻulaʻula	N/A	Total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, total phosphorus, turbidity, chlorophyll *a*	2014

Priority watershed criterion 2: Approved WBPs

Both Kawaihae and watersheds have approved WBPs:

- Kawaihae watershed: Pelekane Bay Watershed Management Plan (2005). Management goals include:
    - Increase/Restore Groundcover Density and Quality,
    - Minimize Fires,
    - Reduce sedimentation in Pelekane Bay, and

    - Measure the success and effectiveness of watershed restoration and protection activities.
- Waikoloa watershed: Wai'ula'ula Watershed Management Plan (2011). Goals include:
    - Reduce nutrient loads,
    - Prevent an increase in sediment loads,
    - Reduce wildfire occurrences and associated impacts to water quality and ecosystem health,
    - Reduce the volume and increase the quality of stormwater runoff in the urban and suburban areas of Waikoloa watershed, and
    - Restore and enhance riparian buffers that serve as protective filters for streams in Waikoloa watershed.

DLNR-DAR's Hawai'i Coral Reef Strategy 2030 also identifies goals and objectives for South Kohala, including support for NPS pollution mitigation projects in mauka areas of the watersheds. Additionally, active partnerships in South Kohala have plans that incorporate watershed management plan goals:

- South Kohala Coastal Action Plan 2030
    - A climate-smart conservation action strategy that includes resilient ocean policy, soil and watershed management, clean water management, county and community conservation planning, community connectivity and stewardship, and climate-smart threat assessment.
    - NPS-related objective (Strategy 2, Objective 2): Reduce sedimentation of stream channels and nearshore waters by increasing soil retention in 80% of highly erosive areas in Pelekane (Kawaihae) and Honokoa watersheds, increasing drought-tolerant vegetative cover of riparian areas, and effectively managing ungulates.
- Kohala Watershed Partnership Management Plan (2007)
    - Sets management goals, identifies information needs, and prescribes monitoring activities to improve water and environmental quality and protecting the watershed's economic, socio-cultural, and ecological resources.
    - Management Goal 1: Protect Water Resources.
    - Management Goal 3: Control Non-Native Animal Populations within Designated Areas.
    - Management Goal 5: Prevent and Minimize Wildfires.

Priority watershed criterion 3: Committed watershed or waterbody group or organization

The State is a partner in two partnerships, the Kohala Watershed Partnership and the SKCP, that aim to restore and protect the South Kohala area.

- Kohala Watershed Partnership
    - Manages 68,000 acres of forest and grass lands on the windward and leeward slopes of the Kohala Mountains

    - Includes the following large landowners in Kawaihae and Waikoloa watersheds:
        - DLNR-DOFAW
        - Parker Ranch
        - Department of Hawaiian Homelands
        - Queen Emma Land Co.
        - Hawai‘i County (Department of Water Supply)
- South Kohala Coastal Partnership
    - Includes 60 organizations and agencies; led by DLNR-DAR, NOAA, and TNC
    - Implements the South Kohala Conservation Action Plan 2030, which includes six key strategies to achieve a restored, healthy, abundant, and resilient South Kohala coastal system

In addition, in 2019, the NRCS began the NWQI Readiness Phase in South Kohala, with the goal of beginning full implementation of the NWQI with state partners in 2021.

Priority watershed criterion 4: Water quality monitoring

The DOH currently conducts coastal marine water quality monitoring at four locations in Kawaihae and Waikoloa watersheds, and in 2021 may begin stream monitoring for turbidity to determine Section 319 project effectiveness in protecting water quality in the mauka areas of the watershed. A citizen science organization, Hawai‘i Wai Ola, collects water quality data in South Kohala and is currently working with DOH to complete a quality assurance project plan (QAPP) so that the data it collects can be assessed in the Integrated Report. In addition, as part of the NWQI Implementation Phase planned for 2022, DOH is committed to continue to conduct water quality monitoring and assist with monitoring efforts in South Kohala.

The SKCP implements a Resilient Ocean Policy that includes monitoring in South Kohala to quantify effects of fisheries management and marine managed areas on South Kohala’s reef ecosystems and coastal/marine food resources, including biological, climate, socio-economic, and other indicators. Coral reef monitoring is conducted by NOAA, DLNR-DAR, TNC, and UH. In addition, SKCP implements a Clean Water Management strategy to ensure safe and abundant groundwater entering coastal waters and to monitor the effectiveness of water improvement in adjacent coastal waters. Hawai‘i Wai Ola is a critical part of this monitoring effort. UH-funded PacIOOS also collects water quality data in Pelekane Bay.

Nonpoint Source Management for South Kohala Priority Watersheds 2021-2025

The main objective of prioritizing Kawaihae and Waikoloa watersheds for NPS management is to improve water quality and restore the four impaired coastal waterbodies in the region (Table 9). In Kawaihae watershed, the focus will be on reducing sediment loads that contribute to the watershed’s turbidity impairment. In Waikoloa watershed, the focus will be on implementing projects that reduce turbidity and nutrients. Protecting high quality waters in mauka watershed areas is another objective for

these priority watersheds. Additional objectives include watershed-based planning and expanding water quality monitoring to better document and assess water quality trends.

The following are activities the State plans to carry out to meet its priority watershed objective over the five-year period of the plan:

- Implement at least one new Section 319 restoration project that reduces turbidity, nutrients, and chlorophyll *a* in South Kohala watersheds
    - Work with partners to identify and implement the project(s) to improve water quality for a specific waterbody or receiving water
- Implement at least one Section 319 funded protection project in South Kohala in conjunction with DLNR-DOFAW's Watershed Partnerships Program
- Conduct water quality monitoring and assessments as part of the NWQI and the SKCP to demonstrate the effectiveness of NRCS conservation practices, Section 319 polluted runoff control projects, and other restoration efforts in the watershed
    - Investigate opportunities for monitoring streams and other surface waters in the area, e.g., Waiʻulaʻula Stream, to determine the effects of pollution reduction projects on water quality
    - Provide support for and coordinate water quality monitoring efforts in the region
- Develop a WBP and watershed assessment for Honokoa watershed to expand the area eligible for NWQI and Section 319 water quality improvement activities
- Investigate updating the Pelekane Bay WBP with NWQI watershed assessment data and with information from Kohala Watershed Partnership and SKCP management plans
- Implement Watershed Protection 30x30 and Marine 30x30 initiatives

4.3.2 West Maui: Wahikuli, Honokowai, Kahana, Honokahua, and Honolua Watersheds

The Wahikuli, Honokowai, Kahana, Honokahua, and Honolua watersheds in West Maui (Figure 16) were designated as priority watersheds in 2015 by DOH and will continue to be a priority for the next five years. West Maui is also a priority for DLNR-DAR, whose Hawaiʻi Coral Reef Strategy 2030 contains objectives towards reducing NPS pollution in this region. The U.S. Coral Reef Task Force designated West Maui as a priority watershed in 2010. In addition, West Maui was selected by NRCS for the NWQI Readiness Phase in 2018 for both surface water and source water programs. Restoration and protection efforts in the five watersheds are coordinated by the WMR2R, a multi-agency effort to restore and enhance the health and resiliency of West Maui coral reefs and near-shore waters through the reduction of land-based pollutants, specifically sediment and nutrients.

As part of the WMR2R, the State has made significant investments in West Maui over the past years to improve water quality and protect coral reefs. Collectively, DOH and DLNR have invested $2.8 million in Section 319 polluted runoff control projects and a watershed coordinator in West Maui since 2010. DOH, DLNR, and their partners are currently implementing sediment and nutrient reduction projects in

these watersheds as well as conducting water quality monitoring (Appendix A). More information about Section 319 projects in West Maui can be found on the Polluted Runoff Control Projects section of the DOH-CWB System at https://eha-cloud.doh.hawaii.gov/cwb#!/landing.

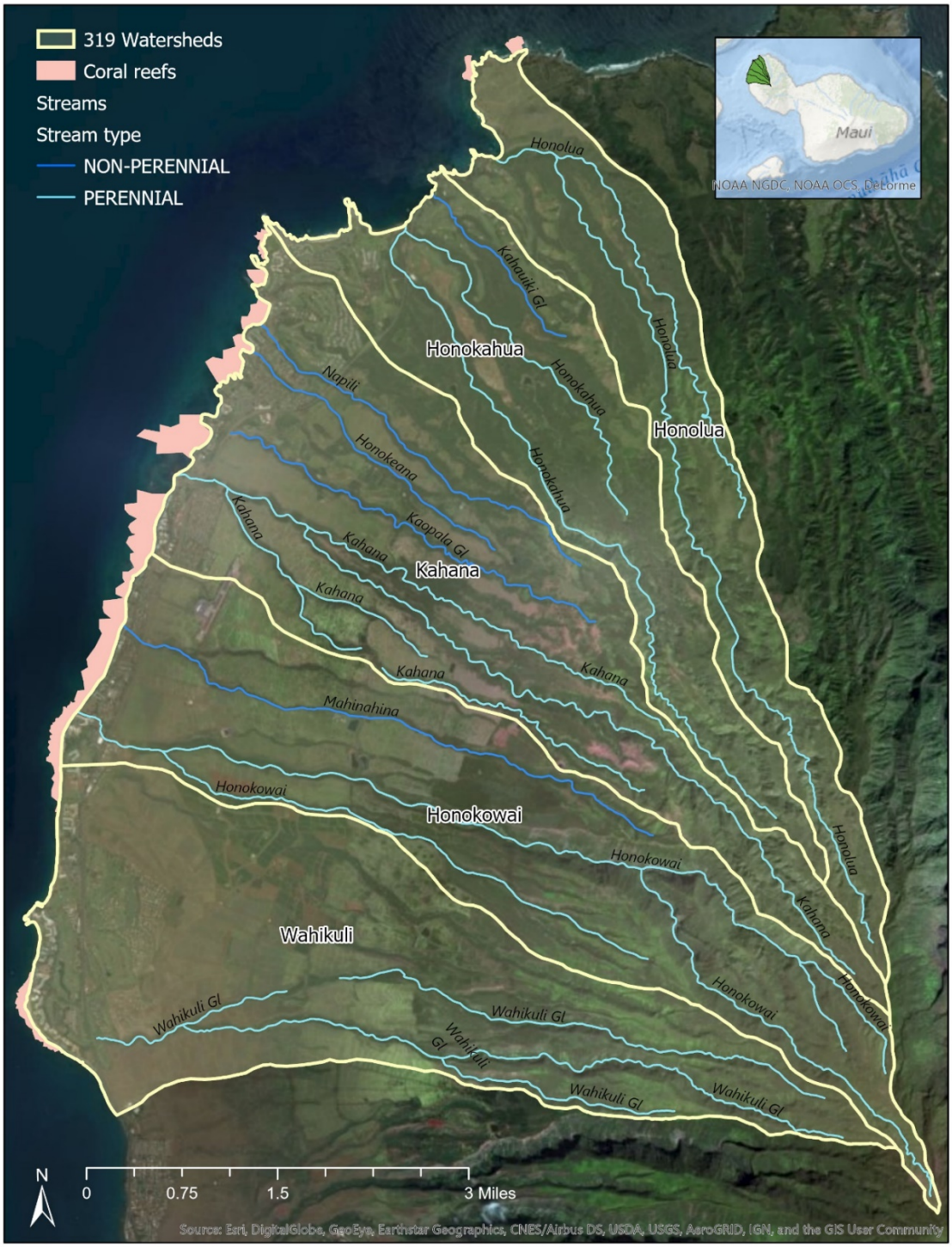

Figure 16. West Maui priority watersheds

Priority watershed criterion 1: Water quality impairments/CWA Section 303(d) List

The West Maui watersheds have 20 waterbodies that are on the 303(d) list of impaired waters (Table 10). Nearly all impaired waterbodies are coastal waters; only two streams in the region have been assessed in the Integrated Report, but these assessments were done prior to 1998 and were based on visual criteria rather than on water quality data. All waters assessed by DOH in the five West Maui watersheds have at least one nutrient impairment and have nitrate + nitrite nitrogen, turbidity, and chlorophyll *a* impairments.

According to the two watershed plans for West Maui (Wahikuli-Honokowai Watershed Management Plan; Kahana, Honokahua, and Honolua Watershed Management Plan), the sources of turbidity and nutrients in these watersheds are agricultural lands/activities, urban runoff, and conservation lands. Agricultural lands comprise over half of the total land area of the West Maui watersheds. On these lands, historic and current fertilizer application, dirt roads, and fallow fields are sources of sediment and nutrients and are the primary causes of elevated nutrients and turbidity. Urban NPS pollution sources include golf courses, residential and commercial developments, groundwater from the Lahaina Wastewater Reclamation Facility, and impervious surfaces (which cover nearly 50 percent of developed land in the Wahikuli and Honokowai watersheds). Finally, on conservation lands, disturbance of ground cover by feral ungulates, alien plant species, and illegal dirt bike use contribute to sediment and nutrient problems in West Maui.

Table 10. Water quality assessment and land use information for the West Maui watersheds

WATERSHED	ACRES	AGRICULTURAL DISTRICT ACRES	NUMBER OF ASSESSED WATER-BODIES	IMPAIRMENTS (2020 INTEGRATED REPORT)
Wahikuli	6,420	3,393	3	Nitrate + nitrite nitrogen, turbidity, chlorophyll *a*
Honokowai	5,631	3,088	4	Total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, turbidity, chlorophyll *a*
Kahana	5,864	3,625	9	Total nitrogen, nitrate + nitrite nitrogen, ammonium nitrogen, total phosphorus, turbidity, chlorophyll *a*
Honokahua	3,117	2,172	2	Nitrate + nitrite nitrogen, ammonium nitrogen, turbidity, chlorophyll *a*
Honolua	3,028	766	2	Enterococci, nitrate + nitrite nitrogen, ammonium nitrogen, turbidity, chlorophyll *a*

Priority watershed criterion 2: Approved WBPs

Both watersheds have DOH-approved WBPs, which were prepared as part of the West Maui Ridge to Reef Initiative:

- Wahikuli-Honokowai Watershed Management Plan (2012) [Vol. 1] [Vol. 2]
- West Maui Watershed Plan: Kahana, Honokahua and Honolua Watersheds (2016) [Characterization Report] [Strategies and Implementation Report]

In addition, the Hawai'i Coral Reef Strategy 2030 identifies goals and objectives for West Maui, including support for NPS pollution mitigation projects in mauka areas of the watersheds.

Priority watershed criterion 3: Committed watershed or waterbody group or organization

There are two major active partnerships that the State participates in to restore and protect natural resources in West Maui: the WMR2R and the Mauna Kahalawai Watershed Partnership (MKWP).

- West Maui Ridge to Reef Initiative
    - The WMR2R objective is "to restore and enhance the health and resiliency of West Maui coral reefs and near-shore waters through the reduction of land-based pollution threats from the summit of Pu'u Kukui to the outer reef."
    - The WMR2R Working Group and Funding and Agency Support Team (FAST) represents interests in agriculture, land development, resort operation, soil conservation, traditional Native Hawaiian knowledge, marine conservation, coastal water quality, recreational ocean use, and fishing.
    - WMR2R partners completed 18 pollution reduction projects from 2013-2018 (Figure 17), with additional restoration projects being implemented currently (Appendix A).
    - The WMR2R watershed coordinator, whose position is funded by DLNR-DAR and DOH Section 319 funds, provides key outreach and planning support, including facilitating the working group and prioritizing NPS management projects and water quality monitoring among partners.
- Mauna Kahalawai Watershed Partnership
    - MKWP's goal is "to protect the native forest that generates most of Maui's fresh water supply."
    - The total land area managed by MKWP is 47,321 acres. Partners include:
        - County of Maui, Department of Water Supply,
        - Kamehameha Schools,
        - DLNR-DOFAW,
        - Makila Land Company, LLC,
        - Ka'anapali Land Management Corp.,
        - Maui Land & Pineapple Company, Inc.,

- Kahoma Land Company, LLC,
- Wailuku Water Company, LLC, and
- TNC.

  - MKWP has protected 104 miles of perennial streams, built 22.2 miles of fences to protect 29,962 acres of forest, and has protected 23,310 acres of critical habitat for endangered plants.

In addition, in 2018, the NRCS and state partners began the NWQI readiness phase in West Maui. NWQI implementation largely hinges on whether there are enough eligible landowners in the region and whether these landowners are interested in applying for EQIP funds as part of the NWQI.

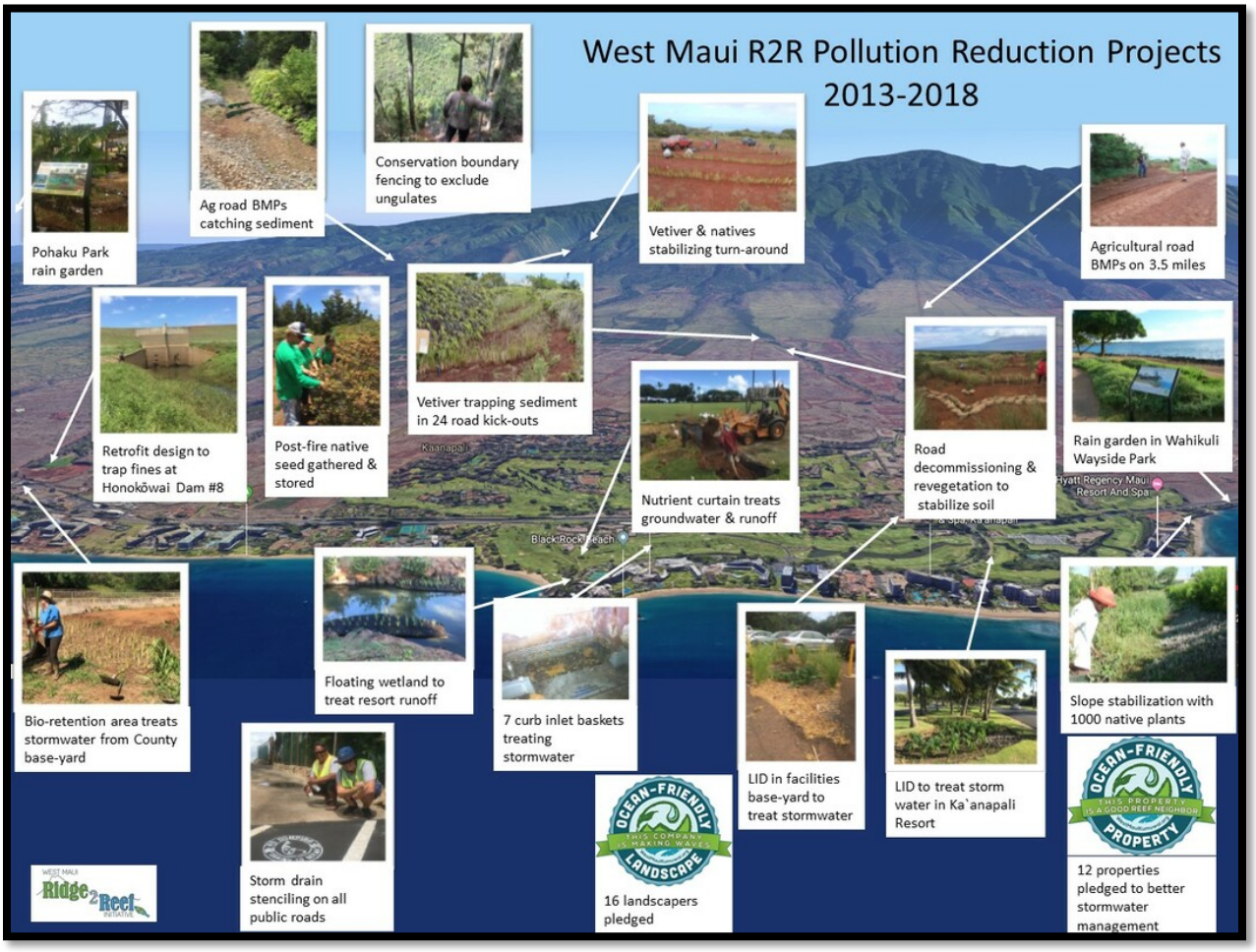

Figure 17. West Maui Ridge to Reef Initiative pollution reduction projects 2013-2018

Priority watershed criterion 4: Water quality monitoring

The DOH-CWB conducts marine water quality monitoring and assessments at 12 beaches/coastal areas in the West Maui watersheds (2020 Integrated Report). In addition to the State's water quality monitoring, Hui O Ka Wai Ola, a local water quality monitoring organization of volunteers and scientists, monitors coastal water quality. DOH and the Hui collaborate on monitoring efforts. Because the Hui has a DOH-approved QAPP, the Hui's data is assessed by DOH in the Integrated Report. DOH also plans to provide funding for the Hui's coastal water quality monitoring efforts to evaluate the effectiveness of Section 319 projects in the region. In addition, as part of two Section 319 projects, stream monitoring will be conducted to measure water quality improvements.

Nonpoint Source Management in West Maui Priority Watersheds 2021-2025

The main NPS management objective in West Maui is to implement NPS pollution control projects with partners to reduce turbidity and nutrient loads and improve water quality. Protecting high quality waters by preventing erosion in the mauka regions of watersheds and supporting water quality monitoring are additional objectives.

The following are NPS management activities the State will conduct over the next five years:

- Implement the WMR2R
    - Partners identify and implement at least one new Section 319 restoration and/or protection project that targets turbidity or nutrients
    - Fund the WMR2R Watershed Coordinator position to coordinate restoration and protection activities, planning, and outreach to stakeholders
    - Provide support for the Hawai'i Coral Reef Strategy 2030 and the DLNR Watershed Protection and Marine 30x30 Initiatives in conjunction with the WMR2R
- Conduct water quality monitoring in collaboration with Hui O Ka Wai Ola, WMR2R partners, and the County of Maui
    - Investigate sustainable funding mechanisms and ways to expand inland water quality monitoring
    - Coordinate coastal and inland monitoring for Section 319 projects

4.3.3 He'eia Watershed

He'eia watershed, located on the windward side of O'ahu (Figure 18), was designated as a priority watershed in 2015 by DOH, and will continue to be a priority for the next five years. Since 2009, DOH has invested over $2 million in Section 319 funds towards NPS pollution reduction projects, including three phases of mauka to makai restoration projects conducted by a local nonprofit watershed management organization, Hui o Ko'olaupoko, to improve water quality in He'eia Stream. Other project

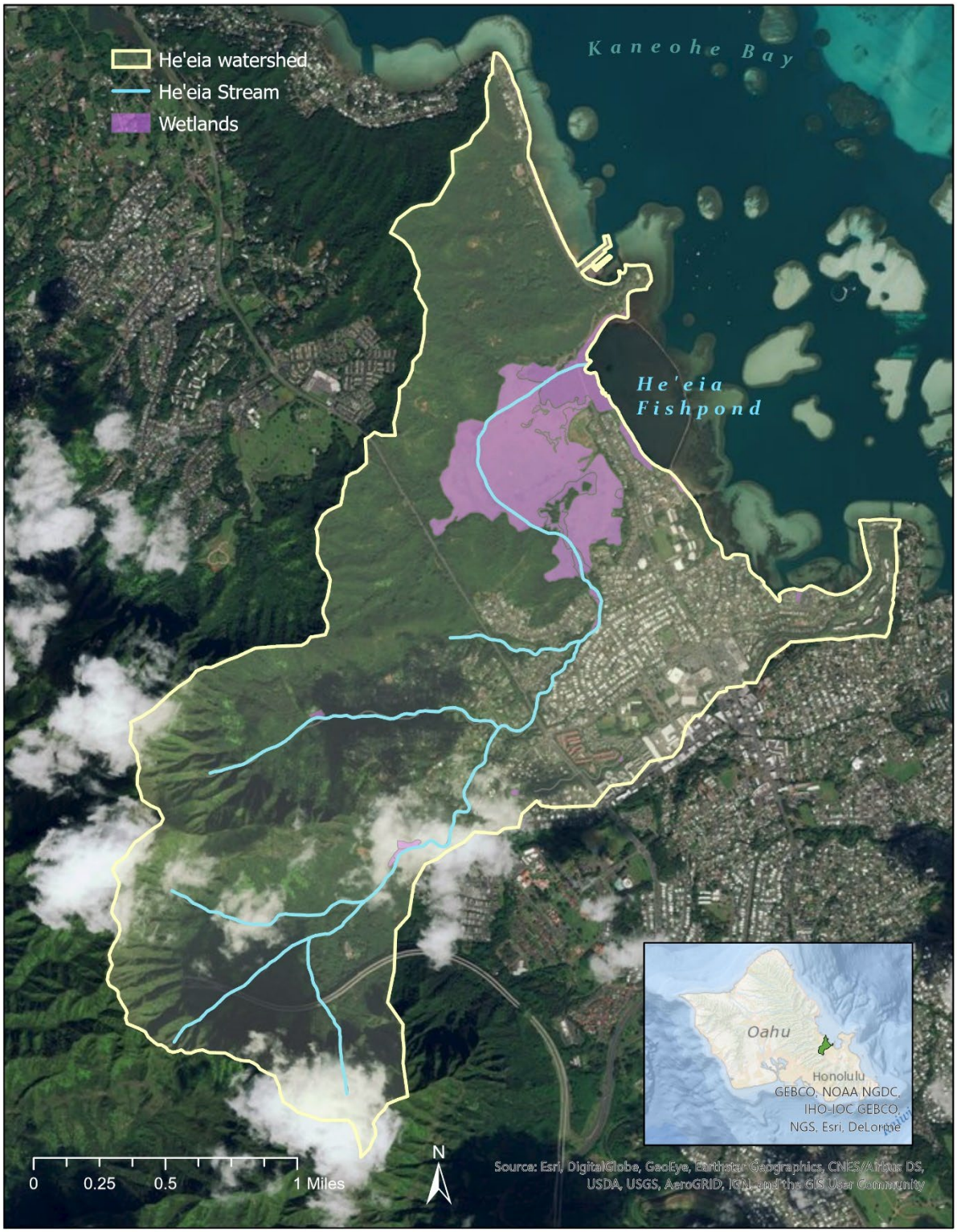

Figure 18. He‘eia watershed, a priority watershed on O‘ahu

partners included the native plant nursery Hui Ku Maoli Ola, Hawai'i Pacific University, Kama'aina Kids, and Papahana Kuaola, a Hawaiian educational and environmental community group. These efforts measurably improved water quality: in 2016, He'eia Stream was removed from the 303(d) list for total phosphorus and turbidity (wet season), and in 2018, it was removed from the 303(d) list for nitrate + nitrite nitrogen (wet season), attaining all uses for the wet season. In 2020, EPA recognized these water quality improvements as a Nonpoint Source Success Story.

In addition to He'eia Stream restoration work, Hawai'i Sea Grant has partnered with DOH and provided approximately $128,000 in additional funds on two projects to improve water quality in He'eia Fishpond. Additional partners include Paepae o He'eia, who manages the Fishpond, and Hui Ku Maoli Ola, which performs restoration services and operates the world's largest Native Hawaiian plant nursery. The first project, in which an invasive mangrove island that provided habitat for egrets was removed, resulted in increased freshwater volume influx and a decrease in the average abundance of a fecal biomarker specific to birds. The second project expands invasive mangrove removal and builds upon the water quality improvements from the first project. It aims to mitigate nutrients and sediment runoff into the fishpond via strategically placed rain gardens near two storm drain outlets (Appendix A).

In addition to the joint DOH and UH projects in He'eia, TNC is currently implementing a Section 319 funded project to manage ungulates and control erosion and nutrients in the watershed (Appendix A).

He'eia watershed will continue to be a priority for the next five years. Having steadily improved water quality in the stream over the past few years, DOH hopes He'eia Stream will attain all uses for the dry season with continued restoration efforts.

Priority watershed criterion 1: Water quality impairments/CWA Section 303(d) List

He'eia Stream is on the 303(d) impaired waters list for total nitrogen and nitrate + nitrite for the dry season. Severe erosion and stormwater runoff were identified as key issues contributing to impairments of He'eia Stream. Nitrate pollution is largely attributed to residential use of fertilizers and pesticides in developed areas where impervious surfaces increase stormwater runoff entering He'eia Stream. Past agricultural practices in the watershed were also identified as potential sources of nutrient impairment (Ko'olaupoko Watershed Restoration Action Strategy, 2007).

Priority watershed criterion 2: Approved WBPs

He'eia watershed is included in the DOH-approved Ko'olaupoko Watershed Restoration Action Strategy (KWRAS). A management plan specific to the estuarine region of He'eia is NOAA and OP-CZM's He'eia NERR Management Plan 2016-2021, which engaged stakeholders in the region to provide guidance and strategies for managing the NERR.

In addition, in 2012, the City and County of Honolulu (CCH) Board of Water Supply completed the Ko'olau Poko Watershed Management Plan to provide a balance between the preservation and

management of the Koʻolaupoko watersheds and sustainable groundwater and surface water use and development to serve present users and future generations. While this plan was primarily developed to meet the county water use and development planning requirements under the State of Hawaiʻi Water Code and CCH ordinance, the Board of Water Supply's Koʻolaupoko plan also developed a list of watershed protection strategies and projects, including Projects #15-18, which are located in Heʻeia watershed. These projects may be incorporated into the potential update of the KWRAS within the next five years and include information on anticipated pollutant load reductions and water quality outcomes.

Priority watershed criterion 3: Committed watershed or waterbody group or organization

There are several local organizations and active watershed stewardship groups that work towards protecting resources in Heʻeia watershed. In 2017, NOAA established the Heʻeia NERR, which encompasses 1,385 acres of unique and diverse upland, wetland, stream, estuarine, coastal, and marine habitats within the Heʻeia ahupuaʻa. In the NERR alone, partners that restore water quality include:

- Paepae o Heʻeia, a private, nonprofit organization formed in 2001 and dedicated to caring for Heʻeia Fishpond;
- Kākoʻo ʻŌiwi, a community-based non-profit organization working to restore agricultural and ecological productivity to nearly 405 acres within the wetlands of Heʻeia; and
- HIMB, a state university partner with NOAA that administers the Heʻeia NERR and oversees the NERR Research and Monitoring Program.

Other local and state partners in the watershed conducting water quality work include:

- Hui Kū Maoli Ola,
- Papahana Kuaola,
- Hui o Koʻolaupoko,
- DLNR,
- DOH,
- Hawaiʻi Sea Grant, and
- TNC.

Priority watershed criterion 4: Water quality monitoring

Since 2017, Heʻeia NERR has been coordinating monitoring efforts in the Heʻeia ahupuaʻa, which includes:

- Water quality:
    - Six sites along Heʻeia Stream, monitored monthly for turbidity, TSS, nutrients, chlorophyll *a*, and other water quality parameters;

    - Three multiparameter sondes installed at strategic locations (including He‘eia Stream, fishpond, and patch reef in Kāne‘ohe Bay) within the Reserve to measure turbidity, pH, oxygen, temperature, salinity, chlorophyll *a*, and depth;
    - Monthly grab samples collected to measure nutrients, chlorophyll *a*, and TSS every month at the sonde locations;
    - Microbial pathogens at He‘eia stream mouth and other above sites; and
    - Partnerships with UH to monitor water quality and biogeochemical parameters in He‘eia Fishpond.
- Fish:
    - Quarterly environmental DNA sampling for fish and invertebrates along the above-mentioned nine sites;
    - Biannual (twice yearly) visual monitoring at 24 sites in the He‘eia ahupua‘a; and
    - Biannual catch-and-release monitoring at the He‘eia Stream Mouth.
- Annual coral reef monitoring, including coral cover, fish abundance, sediment, and water quality, at 24 sites.
- Other associated monitoring such as waterbird and shorebird abundance and behavior, vegetation monitoring, and relative surface elevation tables (R-SETs) to measure relative elevation change of wetland sediments.

The DOH-CWB last assessed He‘eia Stream in the 2018 Integrated Report, when it attained WQS for all uses in the wet season. The DOH is currently funding a restoration project in He‘eia watershed that includes stream water quality monitoring, which is being conducted by TNC. The PRC Program intends to collect the minimum number of water quality samples in He‘eia Stream to be assessed in the Integrated Report. In addition, as part of its Section 319 project collaboration with DOH, UH will monitor concentrations of nutrients, sediment, microbial contaminants, and circulation and flow rate within He‘eia Fishpond to assess the impacts of NPS reduction projects and other restoration efforts in the fishpond.

Nā Kilo Honua O He‘eia also provides He'eia Coastal Ocean Observing System data and information related to monitoring, research, and restoration activities in the watershed.

Nonpoint Source Management in He‘eia Watershed 2021-2025

The main NPS management objective for He‘eia watershed is to achieve all WQS for dry season by reducing total nitrogen and nitrate + nitrite nitrogen in He‘eia Stream. By improving water quality in the stream, inputs of pollutants into He‘eia Fishpond will also decrease, and as a result water quality in the Fishpond will also improve.

The following are objectives and activities the State hopes to accomplish over the five-year period of the plan:

- Make progress in 1) meeting all WQS for He‘eia Stream for the dry season by reducing total nitrogen and nitrate + nitrite nitrogen concentrations and 2) improving water quality in He‘eia Fishpond
    - Identify and implement a minimum of one additional Section 319-funded project that will reduce total nitrogen and nitrate + nitrite nitrogen loads
    - Coordinate water quality monitoring and assessment with partners in He‘eia watershed
- Maintain WQS for the wet season by maintaining BMPs previously funded by DOH and partners and by supporting protection and restoration efforts in the He‘eia NERR
- Continue to monitor He‘eia Stream and assess the stream in the Integrated Report

5 GOALS, OBJECTIVES, ACTIVITIES, MILESTONES, AND OUTCOMES

The long-term goal of the State's NPS management program is:

> To achieve and maintain water quality standards and designated uses of State waters by implementing a comprehensive NPS pollution control program that conducts watershed-based restoration and protection activities.

To make progress towards meeting the long-term goal, DOH established six objectives based on the priorities and NPS management responsibilities of state, local, and federal agencies and institutions (Chapter 3). These objectives represent the core NPS management objectives for the State, and activities to achieve them are primarily led by DOH and its major state partners, OP-CZM and DLNR. Each objective provides an explanation for the effect it will have on water quality in Hawai'i, identifies activities necessary to achieve the objective, and milestones to evaluate whether objectives have been met. In addition, this chapter provides outcomes the State hopes to achieve by accomplishing these objectives.

The core NPS Program objectives and their respective activities and milestones are described below. For additional NPS management related activities by agency or organization, see Chapter 3. For specific NPS management objectives and activities in priority watersheds, see Chapter 4.

5.1 Objective 1: Develop WBPs or acceptable alternatives to guide effective NPS pollution control projects

Watershed-based plans that include EPA's nine elements provide the basis for the watershed approach to controlling nonpoint sources of pollution and improving water quality. Acceptable watershed plan alternatives also provide additional opportunities to mitigate critical NPS problems in watersheds.

In addition to traditional WBP development, the PRC Program is pursuing a TMDL / WBP approach, whereby implementation plans for the load allocation portion of TMDLs are combined with WBP requirements in one plan. This planning approach takes advantage of the TMDL process, which provides pollutant loadings from nonpoint sources that can be used to accurately estimate the pollutant load reductions needed to meet WQS. This approach also takes advantage of the extensive stakeholder participation involved in TMDL development, which is necessary to successfully develop and implement a WBP to meet water quality goals.

More information about WBPs, TMDL implementation plans, and alternative plans can be found in Chapter 3.1.1.

5.1.1 Objective 1 Activities and Strategies

1. Complete the Waikele Watershed WBP / TMDL Implementation Plan (2022) (DOH)
    a. Conduct procurement to implement the Waikele WBP (2022 or 2023)
2. Update the 2007 Koʻolaupoko Watershed Restoration Action Strategy (KWRAS) WBP for Koʻolaupoko moku (2023-2025) (DOH)
    a. Fund Koʻolaupoko watershed coordinator to conduct outreach, research, and engage stakeholders for the KWRAS update (2021-2022)
    b. Set aside 319 Program Funds and investigate additional WBP funding resources, such as CWA Section 604(b) (2021-2024)
    c. Coordinate WBP development with the Kaelepulu TMDL, with the potential to develop an implementation plan for the TMDL (2023-2025)
    d. Release RFP for WBP development (2023)
    e. Begin WBP update (2024)
3. Coordinate development of watershed-based plans across funding sources, programs, and agencies, including DOH, DLNR, NRCS, HAWP, and counties (2022-2025)
    a. Identify opportunities to integrate WBPs with other local management plans and NRCS watershed assessments (2022-2025) (DOH)
    b. Identify opportunities to develop a WBP that addresses source water protection (2021-2025) (DOH)
4. Investigate capacity to develop WBPs in-house, pending the creation of the DOH Surface Water Protection Branch (2024) (DOH)
5. Share WBP data, including GIS coverage, with partners and the Hawaiʻi Statewide GIS Program (2021-2025) (DOH)
6. Support TNC's development of Honokoa WBP development in the South Kohala priority watershed area (2021-2022) (NRCS, DOH, DLNR)

5.1.2 Objective 1 Milestones

1. Increase in the number of WBPs, thereby increasing the number of watersheds in which Section 319 water quality improvement and protection projects can be implemented
    a. Completion of the Waikele WBP (2022) results in one new watershed eligible for Section 319 Watershed Project Funds
    b. Progress towards updating the KWRAS WBP results in 18 watersheds with improved NPS control strategies
    c. Completion of the Honokoa WBP expands the South Kohala priority watershed region and water quality improvement opportunities
2. Watershed-based plans include the nine elements, reflect stakeholder participation, identify opportunities to leverage resources with partners, and identify ready-to-implement NPS pollution control projects

3. Expanded State capacity for WBP development, as reported by the WBP Development Strategy (2024) that includes:
    a. Partners and funding sources (including the CWA Section 604(b) and U.S. Bureau of Reclamation WaterSMART grants, DWSRF, and CWSRF);
    b. Inventory of watersheds with existing local management plans that can be integrated with WBPs;
    c. Evaluation of capacity to develop WBPs in-house;
    d. List of watersheds where WBP development is needed for restoration and protection;
    e. TMDL implementation plans that can potentially be integrated with WBPs; and
    f. Schedule for developing and updating WBPs
4. GIS layer for 319 watersheds, including WBP plan coverage and projects locations, with links to project, watershed, and WBP data hosted on the Environmental Health Portal, Clean Water Branch System) (2021-2025)

5.2 Objective 2: Restore and protect water quality

To meet the long-term goal of attaining WQS, Objective 2 aims to improve water quality by mitigating NPS pollution through Section 319 projects and other water quality improvement projects implemented by partners and/or through the major water quality / watershed restoration initiatives in the State (Table 11).

The national Section 319 NPS program and the PRC Program's priority continue to be restoring water quality so that waters can achieve WQS and their designated uses. Therefore, the PRC Program will allocate at least 75% (approximately $2.25 million) of its Watershed Project Funds to restoration projects, including water quality monitoring to assess the effectiveness of restoration activities, over the five years of this plan. The remaining 25% (approximately $750,000) of Section 319 Watershed Project Funds will be spent on protecting high quality waters.

5.2.1 Objective 2 Activities and Strategies

1. Conduct Section 319 RFP annually for watershed restoration projects outlined in WBPs and alternative plans for all Section 319 watersheds (2021-2025) (DOH)
2. In priority watersheds, identify projects from WBPs with partners and conduct procurements for targeted water quality improvement projects, to be funded with Section 319 Watershed Project Funds and 25% matching funds from partners (2021-2025) (DOH and partners)
    a. Implement NPS management activities in priority watersheds identified in Chapter 4.
3. Conduct Section 319 procurement with DLNR-DOFAW in conjunction with the Watershed Partnerships Program Grant to fund protection projects (2021, 2023, 2025) (DOH, DLNR)
4. Conduct special Section 319 procurements for newly approved WBPs (2022-2025) (DOH)
5. Implement priority initiatives for NPS pollution management (2021-2025) (Table 11)

Table 11. Summary of priority initiatives for NPS pollution management for 2021-2025

National Water Quality Initiative (NWQI)	**Lead agencies:** NRCS, DOH, SWCDs **Partner agencies:** DLNR **Primary goal:** Identify and restore impaired water bodies through voluntary conservation. **Key actions:** Provide financial and technical assistance where farms can use conservation practices to improve water quality; conduct water quality monitoring; expand the number of NWQI watersheds. **Current and planned watersheds:** Hilo Bay, Pelekane Bay, West Maui **Website:** https://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/water/?cid=stelprdb1047761
Sustainable Hawai'i Initiative	**Lead agency:** DLNR **Primary goal:** Protect 30% of priority watershed by 2030; achieve effective management inf 30% of Hawai'i's nearshore waters by 2030 **Key actions:** Control invasive plants and ungulates, maintain fencing, plant native plant species, prevent wildfires, improve hunting and hiking access; encourage mauka to makai management among partners and stakeholders; develop marine managed area plans; begin rulemaking process for marine managed areas and fisheries; conduct monitoring and enforcement activities **Website:** https://governor.hawaii.gov/wp-content/uploads/2017/01/Sustainable-Hawai27i-Initiative-Brochure.pdf
West Maui Ridge to Reef Initiative	**Lead agencies:** DLNR, USACE, NOAA, EPA, DOH, NRCS, USFWS, USGS, NFWF **Lead partners:** MKWP, West Maui SWCD, County of Maui, Hui O Ka Wai Ola, West Maui Kumuwai, Coral Reef Alliance, Maui Land & Pineapple Company, Inc., TNC, UH **Primary goal:** To reduce stressors and enhance the health and resiliency of West Maui coral reefs and nearshore waters through the reduction of land-based pollution threats from the summit of Pu'u Kukui to the outer reef. **Key actions:** Implement NPS pollution reduction strategies and projects in the Wahikuli and Honokowai Watershed Management Plan and in the Kahana, Honokahua, and Honolua Watershed Management Plan; coordinate and implement projects, monitoring, and other NPS reduction and coral reef protection efforts **Website:** https://www.westmauir2r.com/

6. Implement the ORMP and Watershed Protection 30x30 Initiative to address land-based pollution from forested conservation areas (2021-2025) (OP-CZM, DLNR)
7. Support open Section 319 projects (Appendix A) and oversee Section 319 projects to track progress towards water quality improvements (2021-2025) (DOH)
    a. Report Section 319 pollutant load reductions in GRTS and the ORMP dashboard annually (2021-2025) (DOH, OP-CZM)
8. Adapt annual Section 319 RFP to reflect new priorities for NPS management

9. Implement the Hawai‘i Groundwater Protection Strategy to mitigate priority groundwater contamination threats and prevent further contamination (2021-2025) (DOH)
10. Develop and begin implementation of the Hawai‘i Groundwater Quality Standards to protect groundwater and drinking water aquifers (2021-2025) (DOH)
11. Protect drinking water sources with the Wellhead Protection Financial Assistance Program funded by the DWSRF 15% Set-Asides (2021-2025) (DOH)
12. Investigate source water protection projects with partners, including NRCS, DOH water branches, DLNR, HAWP, and the Hawai‘i Rural Water Association (2021-2025) (DOH)

5.2.2 Objective 2 Milestones

1. A minimum of five restoration projects are funded or awarded through the annual Section 319 RFP process (2021-2025)
2. A minimum of three projects to restore priority watersheds and a minimum of three high quality waters or source water protection projects are supported via partnerships (2021-2025)
3. Water quality conditions are measurably improved in at least one priority watershed annually as a result of watershed restoration and protection projects funded or supported by DOH (2021-2025)
    a. Achievement of at least one Nonpoint Source Success Story for waterbodies in priority watersheds removed from the 303(d) list (2025)
4. Water quality improvements and pollutant load reductions resulting from Section 319 project implementation are documented in the Section 319 Annual Report, GRTS and, where applicable, the State’s Integrated Report (2021-2025)
5. The number of fenced acres in DLNR priority watersheds increases annually (2021-2025)
6. The Groundwater Status Report provides update on contamination threats, with potential groundwater quality improvements where NPS projects have been implemented, and establishes priorities for groundwater monitoring (2022)

5.3 Objective 3: Utilize partnerships and cooperate with other agencies to leverage resources available for NPS management

Nonpoint source pollution management will utilize partnerships to leverage financial and technical resources and stakeholder support. The main focus of these partnerships will be on implementing statewide and regional initiatives that aim to reduce land-based NPS pollutants and restore and protect watersheds. State and federal agencies will continue to work together to actively manage a variety of natural resources to restore and protect water quality.

5.3.1 Objective 3 Activities and Strategies

1. Implement statewide and regional initiatives to mitigate NPS pollution (Table 11) (2021-2025)
    a. Identify watersheds for expanding the NWQI (NRCS, DOH, SWCDs)

    b. Strengthen and expand existing water quality restoration in West Maui and South Kohala (DLNR, partners)
    c. Continue to implement 30x30 initiatives (DLNR, partners)
    d. Continue to partner on Section 319 funded restoration and protection projects (DOH, partners)
2. Develop a long-range comprehensive Cesspool Conversion Plan that identifies priority areas for cesspool replacements, appropriate onsite wastewater system technologies for Hawai'i, and financing options for homeowners (2021-2023) (Cesspool Conversion Working Group)
3. As part of the Hawai'i Coral Reef Strategy 2030's objective to develop a Watershed Restoration Program, investigate institutionalization of statewide and island coordinator positions to lead and facilitate collaborations within DLNR and with other partners and community members (2025) (DLNR)
4. Increase coordination between related water programs to improve effectiveness and reduce duplicative efforts (2021-2025) (DOH)
5. Continue to partner with the City and County of Honolulu and Waikiki Aquarium to sponsor the annual Mauka to Makai Earth Day event to promote public engagement and education in water quality stewardship
6. Identify and investigate new NPS partnership opportunities, including the RCPP and CWSRF programs (DOH, NRCS, partners)

5.3.2 Objective 3 Milestones

1. Two additional NWQI watersheds in the readiness phase or implementation phase (2025)
2. Progress towards meeting 30x30 goals, including 5% of additional priority watershed forests protected (2025)
3. New method for implementing NPS projects via partnerships pursed via application for RCPP funding (2023)
4. The foundations of a Watershed Restoration Program to address water quality and ecosystem health for aquatic resources are established (2025)
    a. Scope of watershed coordination responsibilities, locations where coordination is needed, and funding sources are identified
5. The State's Cesspool Conversion Plan is completed (2023)
6. Identification of additional priority watersheds in which mauka to makai initiatives to reduce NPS pollution can be implemented (2023-2025)
7. Coordinated or streamlined water quality related planning and implementation efforts within and between agencies (2021-2025)
8. Approximately 5,000 members of the public engaged annually in NPS related outreach events, projects, and activities conducted through partnerships (2021-2025)

5.4 Objective 4: Expand the NPS management program to include regulatory activities and additional watershed planning support

By 2024, the State plans to significantly expand its NPS pollution management program in size and scope with the creation of the DOH Surface Water Protection Branch (DOH-SWPB). The DOH-SWPB will formalize and consolidate voluntary and regulatory NPS management programs, which will provide a more comprehensive approach to addressing polluted runoff and improving water quality. The DOH-SWPB will administer the State's NPS policies and proposed NPS Pollution Control rules (HAR Chapter 11-56) and will also conduct additional watershed planning activities. The Section 319 NPS program (PRC Program) will move from DOH-CWB to DOH-SWPB so that all DOH NPS management activities are under one branch.

As of September 2020, the proposed DOH-SWPB is currently in the reorganization process per Administrative Directive No. 17-01. As part of the reorganization, six new positions for conducting compliance assistance and watershed planning activities are proposed. However, because of the current economic situation caused by the COVID-19 pandemic, these new positions will not be funded until the State's economy improves. It is difficult to predict when this will occur, but the DOH is optimistic that by 2024, the DOH-SWPB will be established and that the proposed NPS pollution control rules (HAR Chapter 11-56) will be in place for the new branch to administer.

The proposed HAR Chapter 11-56 incorporates three categories of management measures from the CNPCP: agriculture, forestry, and marinas and recreational boating. HAR Chapter 11-56 is one method the State is using to meet CZARA requirements and to improve management of specific NPS pollution sources. A public hearing for the proposed HAR Chapter 11-56 was held on February 1, 2021. The DOH-CWB received eight comments, all in support of the proposed rules. The proposed HAR Chapter 11-56 and a rationale for the rules are posted on the DOH-CWB website.

All Objective 4 activities, strategies, and milestones will be led by DOH. Dates for completion are not included because of the uncertainty regarding approval of and funding for the DOH-SWPB.

5.4.1 Objective 4 Activities and Strategies

1. Complete the DOH-SWPB reorganization and fill positions at the earliest opportunity
2. Take over administration of the Section 319 program and administer grants for NPS control projects, watershed coordinators, watershed planning, and targeted outreach to reduce NPS pollution
3. Develop policies and rules aimed at mitigating NPS pollution from all sources, including urban areas
4. Enforce NPS pollution violations and provide compliance assistance with HAR Chapter 11-56
5. Collaborate with federal, state, and local agencies to update the *NPS Plan* and administer and expand HAR Chapter 11-56

6. Investigate methods to store, send, and share data with other government agencies and the public on-line/electronically

5.4.2 Objective 4 Milestones

1. DOH-SWPB is established and fully staffed
    a. Internal procedures and practices are established
    b. Staff receive relevant training
    c. DOH-SWPB website and information sharing system is created
2. Documentation of procedures for administering and enforcing HAR Chapter 11-56
3. Updated *NPS Plan* completed with partner and stakeholder participation
4. Summary of Section 319 program activities, NPS compliance and enforcement activities, and watershed planning activities included in the branch's annual report
5. Schedule and scope of expanding HAR Chapter 11-56 established

5.5 Objective 5: Develop and implement the Coastal Nonpoint Pollution Control Program

Approval of the CNPCP will ensure that 1) major sources of NPS pollution are being addressed by management measures implemented statewide, and 2) the State retains over $1 million in federal funding for CZM and NPS programs. The CNPCP 5-Year Approval Work Plan (Appendix B) was approved by NOAA in 2020, and implementation of the work plan began in 2020 as the State (OP-CZM and DOH) continued its efforts to obtain approval of remaining conditions for the CNPCP. The management measures that still require approval are 1) New Development, 2) Operating Onsite Disposal Systems, 3) Planning, Siting, and Developing Roads and Highways, 4) Bridges, and 5) Operation and Maintenance (of Roads, Highways, and Bridges). In addition, the Monitoring and Tracking Administrative Element still requires approval. The State must submit these measures as part of the State's final CNPCP consistent to EPA and NOAA by August 30, 2024. Once federally approved, implementation of the CNPCP will begin in 2025.

Conditionally approved CNPCP management measures will continue to be implemented by various state and county agencies, although management measure implementation will not be evaluated via the CNPCP's Monitoring and Tracking Administrative Element until the CNPCP is fully approved. When the CNPCP is approved, the State will begin using the CNPCP's monitoring and tracking tools to evaluate the CNPCP's effectiveness in reducing pollutant loads and improving water quality over time. This evaluation, which will include an assessment of water quality data from the State's Integrated Report and monitoring data being collected by other state and federal agencies, will be included in the Section 319 Annual Report every five years. The evaluation will also include recommendations for improvement and additional management measures that may be needed. The State will provide tracking updates across management measures annually, with a focus on measures in priority watersheds, to ensure that

they are being implemented. Management measure tracking information will be provided annually in the Section 319 Annual Report.

Because the State is already implementing a work plan for the CNPCP that includes activities, strategies and milestones, this objective highlights the main activities and milestones from the workplan. Unless otherwise specified, activities will be led by OP-CZM and DOH. For a more detailed list of activities and milestones, see Appendix B.

5.5.1 Objective 5 Activities, Strategies, and Milestones

1. Complete the Monitoring and Tracking Administrative Element (2021)
2. Complete the New Development Management Measure by working with counties to ensure their ordinances are consistent with the CZARA Section 6217(g) guidance (2023)
3. Complete the Roads, Highways, and Bridges Management Measures (2023)
4. Complete the Operating OSDS Management Measure (2024)
5. Submit the CNPCP to NOAA and EPA for approval (2024)
6. After full approval, begin implementation and tracking of CNPCP management measures to evaluate the effectiveness of the CNPCP on water quality (2024-2025)
    a. Evaluation of the CNPCP provided in the Section 319 Annual Report (in five year cycles)
7. Update the "Managing Boat Wastes" guide and distribute it at DLNR-DOBOR's offices and at boat certification courses (2023) (DLNR-DOBOR, Hawai'i Sea Grant, DOH)

5.6 Objective 6: Conduct and support water quality monitoring

Water quality monitoring is a major component of NPS management. Water quality monitoring and assessments identify water quality problems and their potential sources, drive TMDL and WBP development, and track the effectiveness of restoration and protection projects and CNPCP management measures. State agencies that conduct water quality monitoring will continue to implement and coordinate their monitoring programs while supporting local water quality monitoring groups, which will increase the number of water bodies monitored and spread public awareness about local and state water quality and NPS management initiatives and opportunities. This objective also aims to increase the number of streams monitored as well as utilize groundwater monitoring and biological monitoring (in addition to surface water quality assessments) to evaluate the effectiveness of NPS management projects.

5.6.1 Objective 6 Activities and Strategies

1. Coordinate surface water quality monitoring efforts and ensure data collection across organizations and agencies is consistent with Integrated Report data acceptance requirements (2021-2025) (DOH)
2. Implement DOH-CWB's Comprehensive Monitoring Strategy (2021-2025) (DOH)

3. Identify and begin development of at least one new TMDL, including preliminary water quality monitoring studies and outreach (2021-2025) (DOH)
4. Expand water quality monitoring to include streams in priority watersheds and other Section 319 watersheds (2021-2025) (DOH)
5. Coordinate Section 319 project implementation with the NWQI and other current or planned surface water quality, groundwater quality, coral reef, and biological monitoring efforts (2021-2025) (DOH, NRCS, partners)
6. Expand and support community-based water quality monitoring and centralized data management to identify and track water quality impairments statewide (2021-2025) (DLNR)
7. Conduct outreach to agencies and organizations for water quality monitoring data that can be assessed in the Integrated Report, and to inform them of DOH's data acceptance requirements (2021-2025) (DOH)
8. Monitor groundwater and surfaces water resources, in coordination with USGS, DOH, and other agencies (2021-2025) (DLNR)
9. Update GIS layer for water quality impairments and share with other agencies and the public (2021, 2023, 2025) (DOH)
10. Update the CWB System with water quality news and sampling information, including BWAs (2021-2025) (DOH)

5.6.2 Objective 6 Milestones

1. At least two new inland waters are monitored and assessed in the Integrated Report (2024)
    a. Inland waters are added as appendices to DOH's inland waters QAPP
2. Community-based water quality monitoring groups receive technical and/or financial assistance from DOH and/or DLNR (2021-2025)
3. Increase in number of coastal waterbodies assessed (2022, 2024)
4. Completion of the Kaelepulu TMDL (2022) and development of at least one additional TMDL (2022-2025)
5. Improved water quality data management and sharing results in more data assessed in the Integrated Report, less duplicative monitoring efforts, and more targeted implementation of water quality improvement projects and TMDLs (2025)
    a. Comprehensive list and map of water quality related monitoring and assessments to utilize more data in Integrated Report assessments and avoid duplicative monitoring efforts (2023)
6. Section 319 Annual Report utilizes additional data sources, including groundwater data and indicators of water quality (e.g., coral reef data, biological assessments) to document water quality improvements (2023-2025)
7. Water quality information remains updated and available to the public through the DOH-CWB website and notification system (2021-2025)

5.7 Outcomes

As a result of implementing the *NPS Plan,* the State hopes to achieve the following outcomes:

- ✓ Water quality conditions are measurably improved in all priority watersheds, resulting in at least one Nonpoint Source Success Story.
    - Waters in West Maui and South Kohala show progress towards meeting turbidity and nutrient WQS.
    - He‘eia Stream makes progress towards achieving all dry season WQS.
- ✓ As a result of restoration and protection activities, no new water waterbody impairments in priority watersheds are added to the 303(d) list.
- ✓ The number of watersheds managed for NPS pollution and natural resource conservation increase, resulting in improved water quality and greater protection of aquatic and terrestrial ecosystems.
- ✓ Nonpoint source regulations and a new NPS branch more effectively address major sources of NPS pollution.
- ✓ Increased resource leveraging and data sharing via partnerships and statewide initiatives result in more effective NPS management and new approaches to improving water quality.
- ✓ Water quality monitoring is expanded, resulting in an increase in the number of inland waters monitored and assessed. Additional water quality data provide more guidance for NPS management activities and are utilized to evaluate the effectiveness of the State’s NPS program.
- ✓ The State’s CNPCP is fully approved, and management measure implementation results in improved coastal water quality.
- ✓ New and updated WBPs/TMDL implementation plans more effectively target sources of NPS pollution and expand the scope of water quality improvements to groundwater and/or source waters.

6 EVALUATING HAWAIʻI'S NPS MANAGEMENT PROGRAM

The State reviews and evaluates its NPS management program annually in the Section 319 Annual Report. The report includes an assessment of the State's progress towards meeting its objectives and long-term goal, and reports on whether milestones for each objective have been achieved and whether outcomes were met. The NPS management program's main assessment tools mentioned in this plan include the Integrated Report, GRTS, ORMP metrics, and CNPCP management measure tracking tools. The most important measures of success are water quality data demonstrating improvements and the removal of waters from the 303(d) list.

The Section 319 Annual Report is prepared by the PRC Program in October, submitted to the EPA, and posted on the PRC Program's website once approved by the EPA. Section 319 Annual Reports will also serve as a way to evaluate CNPCP implementation after the CNPCP is fully approved by NOAA and EPA.

The PRC Program will adaptively manage the program and review and upgrade program components as appropriate based on its annual evaluations. Each year, the PRC Program prepares a workplan of its planned activities for the federal fiscal year (October – September) to meet the objectives in the *NPS Plan.* The workplan, which is approved by EPA, serves as an opportunity to add or modify strategies, activities, and milestones in the *NPS Plan*. This adaptability is particularly important due to significant delays resulting from the COVID-19 pandemic and uncertainty around State and federal funding for NPS-related activities. This adaptability also is important so that the PRC Program can address new or urgent water quality problems or change the timing and the requirements of its RFP based on funding availability and new priorities. Changes to the *NPS Plan* strategies, activities, and milestones are reported in the Section 319 Annual Report.

The *NPS Plan* itself is updated every five years by DOH, with significant input from state and federal partners. With the proposed creation of the DOH Surface Water Protection Branch and NPS regulations, the PRC Program anticipates the next update process to involve additional stakeholder outreach and include more objectives regarding NPS compliance and enforcement.

Appendix A Current Section 319 Projects

Project Title (Watershed), Contractor	Project Description & Status	Pollutant Load Reductions	Start-End Dates & Funding
Ma‘ili‘ili Reservoir Mitigation Project (Ma‘ili‘ili), Hui Ku Maoli Ola	Restoration of the reservoir in Ma‘ili‘ili watershed includes improving wetland and wildlife habitat, trapping NPS pollutants before they are deposited into Ma‘ili‘ili Stream and educating local school children about NPS prevention methods. Outreach and education will consist of activities in the community to encourage participation during scheduled workdays at the project site. Participants will assist in site preparation, plant native vegetation, and assist with maintenance. (Due to the COVID-19 pandemic restrictions, the education and outreach portion of the project may be modified to comply with State and County orders.) The contractor has received a 12-month access permit from the landowner, Dept. of Hawaiian Homelands, and is in the process of obtaining a NPDES permit from DOH-CWB. Due to delays in the issuance of permits by government agencies and the challenges and restrictions associated with the COVID-19 pandemic, the Contractor has requested a 6-month no-cost extension.	• Total nitrogen: 1,000 lb/year • Total phosphorus: 200 lb/year • Sediment: 100 ton/year	2/29/16-2/28/21 Funded by a DOH and CCH SEP agreement $727,080 (SEP) $201,560 (match)
West Maui Ridge to Reef Priority Watershed Coordinator (West Maui), Department of Land and Natural Resources (DLNR)	The Watershed Coordinator continues to conduct education and outreach and coordinate various water quality improvement projects among partners in the West Maui watersheds. The Watershed Coordinator is conducting at least 40 outreach events, including community events and workshops. Other outreach consists of press releases for events and water quality improvement projects, social media campaigns, targeted email announcements, regular updates to the West Maui Ridge to Reef website and assisting PRC with coordinating implementation projects in West Maui.	N/A	11/14/16 - 11/13/20 $192,400 (§319(h)) $22,330 (match)
DLNR, Div. of Forestry and Wildlife: Polluted Runoff Control Project for West Maui (West Maui), DLNR	DLNR will installing new ungulate control fence and retrofit existing fencing to exclude feral ungulates in Pu‘u Kukui Watershed Preserve in Honolua, Honokahua, and Kahana watersheds. DLNR will also retrofit an existing ungulate control fence to exclude feral ungulates from the Kapunakea Preserve in Wahikuli and Honokowai watersheds. All fencing materials in the steepest regions of the project area (PKW Sections #4 and 5) have been procured and dropped along the fence installation line. The contractor is currently working on installing and retrofitting the fence this area.	• Sediment: 40 ton/year	1/30/18-1/29/22 $735,161 (§319(h)) $184,000 (match)

Project Title (Watershed), Contractor	Project Description & Status	Pollutant Load Reductions	Start-End Dates & Funding
Pelekane Grazing Improvement Project (Kawaihae), DLNR	DLNR will implement agricultural BMPs in Pelekane to reduce sediment, total nitrogen, and total phosphorus. Activities include 1) repairing an existing damaged paddock fence in Pelekane Bay to allow for controlled and rotational grazing in various paddocks; 2) installing a new paddock fence to create a lower paddock and upper paddock for rotational grazing; and 3) relocating a watering trough away from Mekeahua Stream to move cattle to desired areas for grazing. The project was extended by an additional 12 months at no-cost due to staffing changes with the sub-contractor. (The new staff members required additional time to become familiar with the project requirements and deliverables.)	• Sediment: 10 ton/year • Total nitrogen: 1,467 lb/year • Total phosphorus: 1,833 lb/year	1/31/18-1/30/21 $90,000 (§319(h)) $22,500 (match)
Waimanalo Stream Restoration and Community Outreach - Phase 3 (Waimanalo), Oʻahu Resource Conservation & Development Council (ORCD)	ORCD has developed 5 of the required 5 new conservation plans and has established a BMP Investment Fund to administer cost-share grants to at least 5 farms. ORCD will also evaluate the long-term effectiveness of BMPs previously implemented (in Phases I and II) and provide updated load reductions. ORCD hosted a field day in November 2019 that featured agricultural BMPs designed to reduce NPS pollution. The contractor will conduct additional education and outreach activities throughout the watersheds. The contractor requested a no-cost 6-month extension as they needed additional time to implement its education and outreach activities due to COVID-19 pandemic challenges and restrictions. DOH has approved its request for extension.	• Sediment: 100 ton/year • Total nitrogen: 87.5 lb/year • Total phosphorous: 32.5 lb/year	12/4/18-6/3/21 $247,716 (§319(h)) $73,587 (match)
Watershed Implementation Project for the Ahupuaʻa of Waipa – Phase 2 (Waipa), The Waipa Foundation	The Waipa Foundation will build upon the progress made in the Waipa Phase 1 project by: 1) replacing 5 existing cesspools along the Waipa, Waioli, and Waikoko Stream watersheds with alternative Individual Wastewater Systems (IWS); 2) continuing the feral ungulate removal program implemented in Waipa Phase 1; 3) restoring 1 acre of the lower Waipa Stream riparian corridor and re-treating the areas of the Waipa Stream that were damaged by the April 2018 floods; 4) implementing taro loʻi management practices; and 5) maintaining BMPs installed in Waipa Phase 1. The contractor has requested a 12-month no-cost extension.	• Total suspended solids: >40,000 lb/year • Fecal Coliform: ~$2x10^{15}$ CFU/year	3/20/19-3/19/21 $350,998 (§319(h)) $110,375 (match)
Buffers and BMPs for Windward Oʻahu (Kahaluʻu, Waiheʻe, and Haiamoa), ORCD	ORCD has developed and obtained approval for 2 of 5 new conservation plans for local farmers in the Kahaluʻu, Waiheʻe, and Haiamoa watersheds and will assist the farmers in implementing BMPs that improve water quality from the conservation plans. The contractor is in the process of developing 3 more new conservation plans. The contractor will also restore	• Sediment: 162 ton/year • Nitrogen: 300 lb/year • Phosphorus: 150 lb/year	4/11/19-10/10/21 $304,726 (§319(h)) $78,770 (match)

Project Title (Watershed), Contractor	Project Description & Status	Pollutant Load Reductions	Start-End Dates & Funding
	300 feet of riparian buffer along the Kahaluʻu and Waiheʻe streams. ORCD co-sponsored a field day with the Koʻolau Mountains Watershed Partnership in November 2019 in Waiheʻe valley to demonstrate successful riparian restoration techniques.		
Treatment Train: An Ahupuaʻa Approach to Watershed Best Management Practice in West Maui (West Maui), Maui Land & Pineapple Company, Inc. (MLP)	MLP will implement a series of treatment measures and BMPs strategically placed for a sequential, multi-layered approach (Treatment Train) to reduce nonpoint source pollution in the Puʻu Kukui Watershed Preserve located within the Honolua, Honokahua, Kahana, and Honokowai watersheds of West Maui. The Treatment Train will include the following BMPs: push pile stabilization, establishment of a native plant nursery and seed bank, landscape restoration, stream and gulch restoration, loʻi restoration, conservation fence maintenance, feral ungulate management, and invasive plant management.	• Sediment: 178.05 ton/year • Phosphorus: 206 lb/year • Nitrogen: 516 lb/year	5/1/19-5/1/22 $599,999 (§319(h)) $549,557 (match)
Implementing Soil Management Strategies on Oʻahu (Honouliuli, Maʻiliʻili, and Kaiaka Bay), University of Hawaiʻi College of Tropical Agriculture and Human Resources	This project will improve water quality by implementing nutrient and soil management strategies. The contractor will work with participating farmers to utilize nitrate and phosphate technologies to reduce the amount of fertilizer applied and apply appropriate soil amendments on six farms in the Honouliuli, Maʻiliʻili, and Kaiaka Bay watersheds. The contractor will also conduct education and outreach on soil and nutrient management by providing one-to-one training to participating farmers, conducting training workshops to interested farmers, and developing two training video presentations.	• Total phosphorus: 6,450 lb/year • Total nitrogen: 6,181 lb/year	8/12/19-8/11/22 $349,923 (§319(h)) $94,461 (match)
Koʻolaupoko Moku Watersheds Coordinator (Koʻolaupoko Moku), Hui o Koʻolaupoko	The Watersheds Coordinator will collect data and complete reports on past and current monitoring projects, implementation projects, and outreach efforts/projects in the Koʻolaupoko Moku Watersheds. The Watersheds Coordinator will also develop and implement an outreach plan to establish stakeholder support for the planned update to the Koʻolaupoko Watershed Restoration Action Strategy (KWRAS).	N/A	12/24/19-6/23/22 $150,559 (§319(h)) $48,126 (match)
Expanding Water Quality Improvement Projects in Heʻeia Fishpond (Heʻeia), UH Sea Grant College Program	UH Sea Grant, in partnership with Paepae o Heʻeia and Hui Kū Maoli Ola, will remove 5.25 acres of invasive red mangrove and hau from Heʻeia Fishpond and install rain gardens in front of two storm drain outlets to reduce nutrient and sediment concentrations in Heʻeia fishpond. In addition, UH Sea Grant will monitor water quality and circulation to determine the project's impact on pollution reduction in Heʻeia's waterways. Outreach efforts will educate local stakeholders and community members on the connection between a healthy invasive-free ahupuaʻa system and improved water quality.	• Total phosphorus: 9 lb/year • Total nitrogen: 48 lb/year • Total suspended solids: 2,342 lb/year	3/31/20-3/30/22 Extension to 6/30/22 pending $301,600 (§319(h)) $71,105 (match)

Project Title (Watershed), Contractor	Project Description & Status	Pollutant Load Reductions	Start-End Dates & Funding
Waikele Watershed TMDL Implementation Plan (Waikele), PG Environmental, LLC	This hybrid TMDL implementation/watershed-based plan is being developed to integrate the Waikele TMDL load allocations for sediment and nutrients and the nine elements of a watershed-based plan.	N/A	5/15/20-5/14/22 $149,985 (§319(h)) $0 (match)
Keokea Riparian Rehabilitation (Central Maui), Central Maui Soil and Water Conservation District	This project will establish a protected riparian corridor to reduce the amount of sediment discharged from Keokea Gulch. The Central Maui Soil and Water Conservation District will install approximately 373 feet of ungulate fencing to complete a 7.28-acre ungulate-free pen that will act as a sediment filter for sheet flow from adjacent lands into Keokea Gulch, remove non-native plants, and install approximately 6,400 native plants such as a‘alii, pili grass, and mao.	• Sediment: 154 ton/year • Nitrogen: 1,323 lb/year • Phosphorus: 253 lb/year	7/9/20-1/8/22 $49,999 (§319(h)) $12,500 (match)
Expanding Stream Gulch Restoration Actions in Wahikuli, West Maui (West Maui), The Coral Reef Alliance	The Coral Reef Alliance will implement a multi-phase BMP installation project along a steep and highly erosive gulch in the Wahikuli watershed to reduce sediment. The planned BMPs include vetiver sediment traps, native grass sediment traps, check dams, and coconut coir corridors.	• Sediment: 45 ton/year	11/11/20-11/10/23 $215,010 (§319(h)) $76,970 (match)
He‘eia Watershed Ungulate-Exclusion Fencing and Erosion Control (He‘eia), The Nature Conservancy	This project will focus on reducing sediment, total nitrogen, and total suspended solids in the He‘eia watershed by installing an ungulate fence in the 22-acre sub-watershed above the He‘eia estuary and coordinating with community partners/groups to remove feral ungulates in the fenced area and restore native vegetation.	• Nitrogen: 160 lb/year • Sediment: 540 ton/year	11/23-20-11/22/23 $210,930 (§319(h)) $52,730 (match)

Appendix B CNPCP 5-Year Approval Work Plan

Hawaii Coastal Nonpoint Pollution Control Program
CNPCP 5-Year Approval Work Plan: Response for NOAA-312 Review Necessary Action

Final Work Plan Document due February 1, 2020 Program

A. Purpose

This document has been prepared in accordance with Section 6217 (g) of the Coastal Zone Management Act Reauthorization Amendments of 1990 (CZARA), specifically to address the August 2008 to August 2018 NOAA 312 Evaluation Findings published August 2019, pursuant to Section 312 of the federal Coastal Zone Management Act. The Hawaii Coastal Zone Management (CZM) Program submits this Work Plan specifically to meet the Section 312 Necessary Action and to supplement documentation initially submitted by the State to NOAA and EPA in 2015 and thereafter.

"Necessary Action: The Hawaii Coastal Zone Management Program must work with the NOAA Office for Coastal Management to develop and submit a work plan with interim benchmarks and a timeline for meeting the outstanding conditions of its conditionally approved coastal nonpoint source pollution program by February 1, 2020. The documentation indicating how the State of Hawaii has met the outstanding conditions must be submitted no later than August 30, 2024."

Hawaii's national Coastal Nonpoint Source Pollution Control Program (CNPCP) is administered jointly by the State Department of Health (DOH) Clean Water Branch (CWB) Polluted Runoff Control (PRC) Program and Department of Business, Economic Development, and Tourism (DBEDT) Office of Planning (OP) Coastal Zone Management (CZM) Program. This CNPCP 5-Year Approval Work Plan (Work Plan) is developed in response to the Submissions of the Hawaii CZM and PRC Program's resulting Interim Decision Document (IDD); and the Conditions for Hawaii to obtain full Program approval. Those categories have been addressed and are listed as follows:

1. Fully Approved/Exempt CNPCP Categories and Management Measures (MM):
    a. Agriculture
    b. Forestry
    c. Marina and Boating (all 15 MM)
    d. Hydromodification (all 4 MM)
    e. Wetland and Riparian Areas (all 3 MM)
    f. Urban Areas (7 of 12 MM)
        1) New Onsite Disposal Systems approved on 8/9/2019. A formal interim decision document on this measure was received from NOAA and EPA Region 9 on November 15, 2019.

2. Remaining Management Measures needing approval:
    a. Urban Areas – New Development
    b. Urban Areas – Operating Onsite Disposal Systems
    c. Urban Areas – Roads, Highway, & Bridges
        1) Operation and Maintenance
        2) Planning Siting Designing
    d. Monitoring and Tracking

The Hawaii CZM and PRC Program have worked with NOAA Office for Coastal Management (NOAA- OCM) and EPA-Region 9 (EPA-R9) to develop the Necessary Action Work Plan to address the remaining conditionally approved CNPCP Management Measure.

This Work Plan provides a strategy for the Hawaii CZM and PRC Programs to complete development for implementation of the CNPCP. This document is designed to build upon Hawaii's current efforts and to supplement documentation initially submitted by the State to NOAA and EPA in 1996 and thereafter. All previous program materials or products submitted by Hawaii between 1996 - 2019 will be incorporated by reference.

The Hawaii CZM and PRC Program submit this Work Plan to satisfy and document Hawaii's efforts to specifically meet the Section 312 Necessary Action. This Work Plan contains interim benchmarks and a timeline for meeting the outstanding conditions of the CNPCP's conditionally approved coastal non-point program. The final documentation indicating how Hawaii has met the outstanding conditions will be submitted to NOAA-OCM no later than August 30, 2024.

B. Hawaii's Strategy to Address Category Approval

Hawaii will seek to engage and schedule regular consultations with the NOAA and EPA representatives concerning the development of each of these remaining categories. Hawaii plans to use these opportunities to submit drafts, discuss potential strategies and review these approaches to best adapt and address each category or IDD-related Condition.

1. Urban – New Development
   a. Hawaii's IDD Conditions:
      - Within three (3) years, the State will include in its program management measures in conformity with the 6217 (g) guidance for New Development.

      - Within one (1) year, the State will develop a strategy that demonstrates the ability to ensure implementation of the New Development Management Measure throughout the 6217 management areas.

   b. Strategy:
      The New Development Management Measure controls urban runoff from new development and redevelopment. In order to obtain approval for this Management Measure, Hawaii will develop a strategy that demonstrates the ability to ensure implementation of the New Development MM. NOAA and EPA indicated that Hawaii could meet this condition if three (3) of the four (4) counties have programs and policies consistent with the New Development MM or an NPDES municipal separate storm sewer (MS4) permit that exempt them from this Management Measure. Currently, City and County of Honolulu and Hawaii County either have rules consistent with the New Development MM or MS4 permits that exempt them from this Management Measure.

      The Hawaii CZM Program will continue to work with the remaining counties to obtain the adoption of an ordinance to ensure the stormwater control practices will be consistent with the Section 6217 (g) guidance for New Development. Maui county passed an ordinance in January 2012, stating that the Director of Public Works may require post-construction stormwater best management practices and adopt rules to implement this section. Hawaii CZM Program is in discussion with Maui County Department of Public Works to obtain assurance of these BMP requirements. The Hawaii CZM Program is analyzing the Kauai Interim Construction BMP's for Sediment and Erosion Control for the County of Kauai and Ord No. 808 to ensure they are consistent with the New Development Management Measure.

c. Benchmark:
   1) Hawaii will conduct quarterly meetings between the Hawaii CZM and PRC Programs to ensure adequate program progress, and report on status of tasks.
      - Schedule: Quarterly

   2) Hawaii will finalize and submit to NOAA and EPA-R9 coordination and regulatory Enforcement Mechanisms (EM) that address these Management Measures for three (3) of the four (4) counties.
      - Schedule: Submission of this information and data for completion of the Management Measure – March 2020.

2. Urban – Operating Onsite Disposal Systems (OSDS)
   a. Hawaii's IDD Conditions:
      - Within three (3) years, the State will include in its CNPCP measures and enforceable policies a mechanism for denitrifying OSDS, where applicable, and a program that ensures inspection of OSDS at a frequency adequate to ascertain system failures that are in conformity with the 6217(g) guidance for operating onsite disposal systems.

   b. Strategy:
   On May 2, 2019, NOAA and EPA-R9 provided feedback on the PRC Program's February 6, 2019 email regarding the State's strategy for meeting the Operating OSDS Management Measure. NOAA and EPA-R9 indicated the following in their response:

   1) Hawaii has met the condition for denitrifying OSDS.
   2) Hawaii is not required to inspect cesspools because their operation will be prohibited in 2050 by State law.
   3) State regulations satisfy inspection requirements for aerobic treatment units (ATUs), but more information regarding the proportion of OSDS that are ATUs should be provided.
   4) Hawaii still needs to demonstrate that its inspection strategy for septic systems will cover approximately 90% of the systems over the next 15 years.

   The Management Measure for Operating OSDS requires the development of an inspection program for septic systems. Because reducing pollution caused by OSDS is a priority for DOH and the State Legislature, Hawaii is pursuing a regulatory approach to address OSDS inspections. The two inspection strategies under consideration are: 1) mandatory pump-outs or inspections of septic systems at least once every five years, and 2) mandatory point-of-sale inspections. These options, which were approved by EPA and NOAA as meeting the OSDS Management Measure requirements, will either necessitate amendments to Chapter 11-62 ("Wastewater Systems"), Hawaii Administrative Rules (HAR), or legislative action. DOH is also in the process of drafting administrative rules (HAR Chapter 11-56, "Nonpoint Source Pollution Control") and could, if the other strategies fail, incorporate OSDS inspections into these rules. The PRC Program will continue to work with the DOH Wastewater Branch, DOH Surface Water Protection Branch (to be established in 2020), the Deputy Attorney General, and other agencies involved in OSDS management and research to refine these strategies and develop an inspection program.

   c. Benchmark(s):
      1) Hawaii will conduct quarterly meetings between the Hawaii CZM and PRC Programs to ensure adequate program progress, and report on status of tasks.
         - Schedule: Quarterly

2) The PRC Program will coordinate with the DOH Wastewater Branch and Deputy Attorney General to pursue legislative action that requires point-of-sale inspections of septic systems statewide and the establishment of an OSDS inspection program within DOH. A bill is expected to be introduced in the 2020 state legislative session. If it fails, it will likely be revised and reintroduced in the 2021 legislative session. Within one year of enactment, HAR Chapter 11-62 will be revised by DOH to reflect the new inspection program and will be submitted to the governor for approval.
   - Schedule: Write-up of the Operating OSDS MM, including the bill (if passed) and corresponding rule changes, submitted to NOAA and EPA by June 2023.

3) If a bill to mandate point-of-sale inspections is unsuccessful by 2021, the PRC Program will work the DOH Wastewater Branch to amend HAR Chapter 11-62 to include mandatory pump-outs and/or inspections of septic systems and develop inspection policies and procedures. (This is a less controversial approach than mandatory point-of-sale inspections)
   - Schedule: Rules signed by the governor by September 2022. Documentation of the amended rules and DOH inspection procedures and policies included in the write-up of the Operating OSDS MM for submission to EPA and NOAA by December 2022.

4) The DOH Surface Water Protection Branch and PRC Program will draft an appendix to HAR Chapter 11-56 that includes OSDS inspection requirements consistent with the OSDS Management Measure. (This benchmark is applicable only if Benchmarks 2 and 3 are not achieved.)
   - Schedule: Rules signed by the governor by December 2023. Documentation of the appendix addressing OSDS inspections and a write-up of the Operating OSDS MM submitted to EPA and NOAA by March 2024.

3. Urban – Roads Highway and Bridges
   a. Hawaii's IDD Condition:
      - Within three (3) years, the state will include in its CNPCP management measures in conformity with the 6217(g) guidance for roads, highways and bridges under DOT jurisdiction (construction site chemical control, runoff systems, and operation and maintenance); and all management measures for roads, highways and bridges not under DOT jurisdictions.

   b. Strategy:
      The Roads, Highways, and Bridges MM including planning, siting and developing roads and highway; operation and maintenance of roads, highways, and bridges; and siting, designing and maintenance of bridge structures. In order to obtain approval of the Roads, Highways, and Bridges MM Hawaii must incorporate pollution prevention procedures into the operation and maintenance of roads, highways, and bridges to reduce pollutant loading to surface waters. For State roads, counties are required to adopt the State Department of Transportation's (DOT's) BMP guide and contract clauses. For local roads not under the State DOT jurisdiction, each county must have policies and procedures in place to meet the conditions of the management measure. The CZM Program and PRC Program have begun investigating ways to meet these conditions, including current coverage by Chapter 343, HRS and Chapter 11-200, HAR, and ways to facilitate county adoption of the State DOT BMP manual for local roads.

      Hawaii will continue to coordinate with each county in identifying the regulatory and/or voluntary programs in place to ensure the Section 6217 (g) guidance requirements are met for (1) planning, siting, and developing and (2) operation and maintenance of State and local roads, highways, and bridges.

c. Benchmark(s):
   1) Hawaii will conduct quarterly meetings between the Hawaii CZM and PRC Programs to ensure adequate program progress, and report on status of tasks.
      - Schedule: Quarterly

   2) CZM Program will coordinate with State and counties to document management measures in conformity with the Section 6217(g) guidance for roads, highways and bridges under State DOT jurisdiction.
      - Schedule: Hawaii CZM Program will complete the development of the documentation by October 2020

   3) CZM Program will coordinate with State and counties to develop and document how counties are meeting management measures in conformity with the 6217(g) guidance for roads, highways, and bridges not under State DOT jurisdiction.
      - Schedule: Hawaii CZM Program will complete the development of the documentation by October 2020

   4) Submit to NOAA and EPA documentation of Hawaii's CNPCP management measures in conformity with the 6217(g) guidance for Roads, Highway and Bridges under and not under the State DOT jurisdiction.
      - Schedule: Hawaii CZM Program will submit the documentation showing compliance with the Road, Highways and Bridges MM by January 2021.

4. Monitoring and Tracking
   a. Hawaii's IDD Conditions:
      - Within one (1) year, the State will include in its CNPCP, a plan that enables the State to access overtime the extent to which implementation of management measures are reducing pollution loads and improving water quality.

   b. Strategy:
      Hawaii has developed a strategy to determine overall effectiveness of the CNPCP through its surface water and groundwater quality monitoring and assessment programs and its various tracking tools, such as the Ocean Resources Management Plan, the Grants Tracking and Reporting System, Hawaii's Nonpoint Source Management Plan, and potentially HAR Chapter 11-56. The Monitoring and Tracking write-up, which was reviewed by EPA-R9 in 2018, will be submitted after it incorporates the DOH Clean Water Branch's new comprehensive monitoring strategy, which will be completed in early 2020.

   c. Benchmark(s):
      1) Hawaii will conduct quarterly meetings between the Hawaii CZM and PRC Programs to ensure adequate program progress, and report on status of tasks.
         - Schedule: Quarterly

      2) DOH will complete its comprehensive monitoring strategy and incorporate it into the final draft of the Monitoring and Tracking submittal document.
         - Schedule: Monitoring and Tracking submitted to NOAA and EPA by June 2020.

C. Hawaii's CNPCP Final Findings Documentation

Hawaii will assist federal agency review partners with compilation of materials to address the public notice requirement for program approval, as needed.

a. Benchmark(s):
   1) Hawaii will assist the federal agency partners with compilation of materials, prior to public notice of program approval, as needed for all categories and measures approved per the federal guidance and the 2012 Interim Decision Documents and subsequent responses and determinations.
      - Schedule: July 2024

   2) Hawaii will coordinate and provide verification to ensure that the published rationale in the Federal Register is legally accurate, up-to-date, and defensible.
      - Schedule: August 30, 2024

Appendix C Total Maximum Daily Loads

List of all approved Total Maximum Daily Loads for water bodies in Hawai‘i

	Water Body	Pollutants	Year Approved
Kaua‘i	**Hanalei Bay**		
	Hanalei Bay	Enterococci, Turbidity/TSS	2012
	Hanalei Estuary	Enterococci, Turbidity/TSS	2008
	Hanalei Stream	Enterococci, Turbidity/TSS	2008
	Waikoko Estuary	Turbidity/TSS	2008
	Waioli Estuary	Turbidity/TSS	2008
	Waipa Estuary	Turbidity/TSS	2008
	Waipa Stream	Turbidity/TSS	2008
	Nawiliwili Bay		
	Hule‘ia Stream	Enterococci, N+N, TN, TP, TSS	2008
	Nawiliwili Stream	Enterococci, N+N, TN, TP, TSS	2008
	Papakolea Stream	Enterococci, N+N, TN, TP, TSS	2008
	Puali Stream	Enterococci, N+N, TN, TP, TSS	2008
O‘ahu	**Ala Wai**		
	Ala Wai Canal	TN, TP	1996, revised 2002
	Kaiaka Bay		
	Kaukonahua Stream (N. Fork)	TN, Turbidity	2010
	Kaukonahua Stream (S. Fork)	TN, Turbidity	2010
	Ko‘olaupoko		
	Kamo‘oali‘i Stream	TN, TP, TSS	2010
	Kane‘ohe Stream	TN, TP, TSS	2010
	Kapa‘a Stream	TN, TP, TSS	2007
	Kawa Stream	TN, TP, TSS	2002, revised 2005
	Waimanalo	Nitrate, TDP, TSS	2001
	Waikele		
	Waikele Stream	N+N, TN, Turbidity	2019

Acronym key:
N+N = Nitrate + Nitrite Nitrogen
TDP = Total Dissolved Phosphorous
TN = Total Nitrogen
TP = Total Phosphorous
TSS = Total Suspended Solids