Category 4b Demonstration for the Coastal Pathogen Source Reduction Strategy

Planning Unit

Planning and Stewardship Division

North Coast Regional Water Quality Control Board

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1. Introduction

This document summarizes the North Coast Regional Water Quality Control Board's (North Coast Water Board) Category 4b demonstration of the Coastal Pathogen Source Reduction Strategy (Implementation Plan) for six Humboldt County coastal streams impaired for Water Contact Recreation (REC-1) beneficial use (BU), six Humboldt County ocean beaches impaired for REC-1 and/or Shellfish Harvesting (SHELL) BU, five Mendocino County ocean beaches impaired for SHELL BU, and one Sonoma County beach impaired for REC-1 and SHELL BU. The goal of the Implementation Plan is to restore supporting conditions for beneficial uses and ensure compliance with water quality standards at these impaired waterbodies.

1.1. Background

Section 303(d) of the Clean Water Act (CWA) and the U.S. Environmental Protection Agency's (USEPA) 1992 supporting regulations (see 40 CFR 130.7) require states, territories, and authorized tribes (herein referred to as states) to develop lists of waters impaired or threatened by pollutants (i.e., Section 303(d) list) and to develop Total Maximum Daily Loads (TMDLs) for these waters.

USEPA's supporting regulations also recognize that alternative pollution control requirements may preclude the need for a TMDL. Specifically, impaired waters are not required to be included on a State's Section 303(d) list if technology-based effluent limitations required by the CWA, more stringent effluent limitations required by state, local, or federal authority, or "[o]ther pollution control requirements (e.g., best management practices) required by local, [s]tate or [f]ederal authority" are stringent enough to implement applicable water quality standards (see 40 CFR 130.7(b)(1)). These alternatives to TMDLs are commonly referred to as "Category 4b" waters, as described in USEPA's Integrated Reporting Guidance (IRG) for Sections 303(d), 305(b), and 314 of the CWA (United States Environmental Protection Agency, 2005, 2006).

Beginning with the 2002 reporting cycle, USEPA's IRG recommends that States use the following five reporting "categories" to report on the water quality status of all waters in their State:

Category 1: All BUs are supported, no use is threatened;

Category 2: Available data and/or information indicate that some, but not all of the BUs are supported;

Category 3: There is insufficient available data and/or information to make a BU support determination;

Category 4: Available data and/or information indicate that at least one BU is not being supported or is threatened, but a TMDL is not needed;

Category 5: Available data and/or information indicate that at least one BU is not being supported or is threatened, and a TMDL is needed.

As the above categories show, waters assigned to Category 4 and 5 are impaired or threatened; however, waters assigned to Category 5 represent waters on a State's Section 303(d) list. Similar to Category 5, waters in Category 4 are also impaired or threatened; however, other conditions exist that no longer require them to be included on a State's Section 303(d) list. These conditions, which are referred to as subcategories of Category 4 in USEPA's IRG are described below:

Category 4a: TMDL has been completed;

Category 4b: TMDL is not needed because other pollution control requirements are expected to result in the attainment of an applicable water quality objective (objective) in a reasonable period of time;

Category 4c: The non-attainment of any applicable objective for the waterbody is the result of pollution and is not caused by a pollutant. Examples of circumstances where an impaired segment may be placed in Category 4c include waterbodies impaired solely due to lack of adequate flow or to stream channelization.

According to USEPA's Integrated Report Guidance (IRG), EPA will evaluate on a case-by-case basis a State's decisions to exclude certain segment/pollutant combinations from Category 5 (the Section 303(d) list) based on the Category 4b alternative. The USEPA's IRG indicates that States should provide in their Section 303(d) list submission a rationale that supports their conclusion that there are "other pollution control requirements" stringent enough to achieve applicable water quality standards within a reasonable period of time. Specifically, USEPA requests that States address the following six elements in their Category 4b demonstrations:

1. Identification of segment and statement of problem causing the impairment;

2. Description of the pollution controls and how they will achieve objectives, including a description of the "requirements" under which the controls will be implemented;

3. An estimate or projection of the time when objectives will be met;

4. Schedule for implementing pollution controls;

5. Monitoring plan to track effectiveness of pollution controls; and

6. Commitment to revise pollution controls, as necessary

1.2 Category 4b Elements

The six elements of a Category 4b demonstration are described in this document in the following sections:

1. Identification of segment and statement of problem causing the impairment – Section 2 (Problem Statement) and Section 4 (Identification of Impaired Waterbodies)

2. Description of the pollution controls and how they will achieve objectives, including a description of the “requirements” under which the controls will be implemented – Section 5 (Source Control Actions)

3. An estimate or projection of the time when objectives will be met – Section 7 (Projection of Timeline for Meeting objectives)

4. Schedule for implementing pollution controls – Section 5 (Source Control Actions)

5. Monitoring plan to track effectiveness of pollution controls – Section 8 (Monitoring and Reporting), Section 9 (Interested Parties Outreach), and Section 10 (Adaptive Management)

6. Commitment to revise pollution controls, as necessary – Section 9 (Interested Parties Outreach) and Section 10 (Adaptive Management)

2. Problem Statement

The Category 4b demonstration addresses six sampling stations in six REC-1 impaired coastal streams in Humboldt County, six Water Contact Recreation (REC-1) and/or Shellfish Harvesting (SHELL) impaired ocean beaches in Humboldt County, five SHELL impaired ocean beaches in Mendocino County, and one REC-1 and SHELL impaired ocean beach in Sonoma County.

Under the Coastal Pathogen Project (Project) North Coast Water Board staff evaluated fecal indicator bacteria, microbial source tracking, land cover, land use, and cattle grazing presence data to help identify likely pathogen sources. Staff determined that the key sources of fecal waste discharge to the streams and beaches sampled include 1) aging or failing sewer infrastructure and sanitary sewer overflows (human feces), 2) septic tank leachate (human feces), 3) runoff of dairy and/or non-dairy cattle fecal waste from grazing lands (cattle feces), 4) runoff of dog feces from streets, backyards, and ocean beaches (dog feces), 5) runoff of fecal matter from ruminant wildlife (deer and elk feces) in the area, 6) runoff of human fecal waste originating from transient or unhoused populations in the area (human feces), and 7) gull feces deposited at beaches which are the natural habitats of shorebirds (gull feces).

All stream and beach samples evaluated were collected in areas primarily influenced by upstream forested regions that transition to urban developed areas in the downstream portions of the watersheds, near the mouths of the streams and rivers adjacent to Humboldt Bay and the Pacific Ocean. Dairy and beef cattle grazing operations are also present in the downstream areas of the watersheds of some of the sampling stations analyzed. Therefore, the major land covers associated with fecal waste in the sampled areas are forests, urban/developed areas, and grassland/shrubs. The major land uses contributing to fecal waste in the areas sampled are developed sewered use, developed unsewered use (onsite wastewater treatment systems [OWTS], or septic systems), undeveloped land, and grazing. Detailed information on the assessment conducted to identify sources of fecal waste can be found in the technical report entitled “Assessment of Land Cover, Land Use, and Microbial Source Tracking Data from 28 coastal streams, and 12 Ocean Beaches in the North Coast Region” (North Coast Regional Water Quality Control Board, 2024)

An overview of the Project area is displayed in Figure 1.

Figure 1 Overview of Project Area

3. Water Quality Objectives

3.1 North Coast Water Board Objective for REC-1 Beneficial Use: Inland Surface Waters, Enclosed Bays, and Estuaries

Water Contact Recreation (REC-1) is defined as the uses of water for recreational activities involving body contact with water, where ingestion of water is reasonably possible. These uses include, but are not limited to, swimming, wading, water skiing, skin and scuba diving, surfing, white water activities, fishing, or use of natural hot springs.

The Water Quality Control Plan for the North Coast Region (Basin Plan) of the North Coast Water Board establishes numeric bacteria water quality objectives (objectives) for REC-1 beneficial use for inland surface waters, enclosed bays, and estuaries for the protection of beneficial uses (Table 1) (North Coast Regional Water Quality Control Board, 2018).

The applicable numeric objective for the protection of waters with the REC-1 beneficial use was adopted under the statewide Bacteria Provisions and a Water Quality Standards Variance Policy (Bacteria Provisions), which superseded the Regional numeric objective in 2019 (State Water Resources Control Board, 2019a). The statewide Bacteria Provisions will ultimately be incorporated into the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Water Resources Control Board, 2019a). The adopted statewide Bacteria Provisions establish objectives for the protection of the REC-1 beneficial use based on the USEPA federal Recreational Water Quality Criteria (RWQC) estimated illness rate (NGI) of 32 per 1,000 recreators and the associated numeric thresholds based on salinity levels. (State Water Resources Control Board, 2018, 2019a; United States Environmental Protection Agency, 2012).

Table 1 North Coast Water Board Objective for REC-1 Beneficial Use

NUMERIC OBJECTIVE FOR THE PROTECTION OF REC-1 BENEFICIAL USE			
Applicable Waters	**Objective Elements**	**Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators**	
		Magnitude	
	Indicator	GM (cfu/100 mL)	STV (cfu/100 mL)
All waters where salinity is equal to or less than 1 ppth 95 percent or more of the time	*Escherichia coli* (*E. coli*)	100	320
All waters where the salinity is greater than 1 ppth more than 5 percent of the time	Enterococci	30	110
The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner			
NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate	GM = geometric mean STV = statistical threshold value cfu = colony forming units	mL = milliliters ppth = parts per thousand	

3.2. North Coast Water Board Objective for REC-1 and SHELL Beneficial Use: Ocean Waters

3.2.1 North Coast Water Board REC-1 Objectives for Ocean Waters

The North Coast Water Board Basin Plan establishes that the provisions of the State Water Board Water Quality Control Plan for Ocean Waters of California (Ocean Plan) apply to ocean waters within the North Coast Region (North Coast Regional Water Quality Control Board, 2018; State Water Resources Control Board, 2019b).

Statewide Enterococci Objective for REC-1 in Ocean Waters

As stated in the Ocean Plan, “Within a zone bounded by the shoreline and a distance of 1000 feet from the shoreline or the 30-foot depth contour, whichever is further from the shoreline, and in areas outside this zone used for water-contact sports, as determined by the North Coast Water Board (i.e., waters designated as REC-1), but including all kelp beds, the following water quality objectives shall be maintained throughout the

water column" (State Water Resources Control Board, 2019b). The Ocean Plan further includes the following numeric objectives for enterococci as described below.

A six-week rolling geometric mean (GM) of enterococci not to exceed 30 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a statistical threshold value (STV) of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner (Table 2) (State Water Resources Control Board, 2019b).

Table 2 Enterococci REC-1 Water Quality Objective for Water-Contact in Ocean Waters

Objective Elements	**Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators**	
	Magnitude	
Indicator	GM (cfu/100 mL)	STV (cfu/100 mL)
Enterococci	30	110
The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner		
NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate	GM = geometric mean STV = statistical threshold value cfu = colony forming units	mL = milliliters ppth = parts per thousand

3.2.2 North Coast Water Board SHELL Objective for Ocean Waters

Shellfish Harvesting (SHELL) is defined as the uses of water that support habitats suitable for the collection of filter feeding shellfish (e.g., clams, oysters and mussels) for human consumption, commercial or sport purposes.

The North Coast Water Board Basin Plan establishes that the provisions of the Ocean Plan apply to ocean waters within the North Coast Region (North Coast Regional Water Quality Control Board, 2018; State Water Resources Control Board, 2019b).

Statewide Total Coliform Objective for SHELL in Ocean Waters

The Ocean plan specifies that, “all areas where shellfish may be harvested for human consumption, as determined by the North Coast Water Board, the following bacterial objectives shall be maintained throughout the water column (State Water Resources Control Board, 2019b):

The median total coliform density shall not exceed 70 per 100 mL, and not more than 10 percent of the samples shall exceed 230 per 100 mL.”

The Ocean Plan does not specify a time-frame for the calculation of exceedances of the SHELL objective. However, State Water Resources Control Board staff recommend the use of a 30-day rolling window to calculate exceedances of the SHELL objective in ocean waters (J. Kaplan, personal communication, September 7, 2022).

4. Identification of Impaired and Polluted Waterbodies

4.1 Impaired Streams

This section provides details on the six REC-1 impaired stream segments in Humboldt County identified as impaired on the 2024 303(d) List for not meeting the REC-1 beneficial use (Table 3) (State Water Resources Control Board, 2024).

Table 3 Impaired Coastal Streams in Humboldt County

Impaired Waterbody	Waterbody ID (WBID)	Impairment Status	Sampling Station Name and Code
Eureka Plain HU, Elk River Watershed, Lower Elk River and Martin Slough	CAR1100004020140113044906	REC-1 Impaired	Elk River at Highway 101 (110EL1278)
Eureka Plain HU, Elk River Watershed, Lower Elk River and Martin Slough	CAR1100004020140113044906	REC-1 Impaired	Martin Slough at Pine Hill Road (110MS1481)
Eureka Plain HU, Gannon Slough	CAR1100005219990617095337	REC-1 Impaired	Gannon Slough near Highway 101 (110GS1625)
Eureka Plain HU, Jolly Giant Creek	CAR1100005119990617151229	REC-1 Impaired	Jolly Giant Creek at Samoa Boulevard (110JG0264)
Mad River HU, Norton Creek	CAR1091002019990617100545	REC-1 Impaired	Norton Creek at Highway 101 (109NR1488)
Trinidad HU, Little River HA	CAR1082001219990617111952	REC-1 Impaired	Little River at Highway 101 (108LR0663)

4.1.1 Streams with At Least One Exceedance of the REC-1 Objective

In addition to source control actions to restore supporting conditions to impaired waters, this document also provides source control strategies for 17 sampling stations in 13

coastal streams in Humboldt County that have not been evaluated for pathogen impairment but have data showing at least one exceedance of the REC-1 BU (Table 4).

Table 4 Sampling Stations in Humboldt County Streams with At Least One Exceedance of the REC-1 Objective

Stream Name	Station Name and Code
Campbell Creek	Campbell Creek at 14th Street & Union Street (110GS6500)
Campbell Creek	Campbell Creek at 7th Street (110GS5000)
Cooper Gulch	Cooper Gulch at Myrtle Avenue & 8th Street (110CG5000)
Elk River	Elk River at Zanes Road (110ER6642)
Grotzman Creek	Grotzman Creek at Bayside Road (110GR0500)
Jacoby Creek	Jacoby Creek at Old Arcata Road (110JC0966)
Jolly Giant Creek	Jolly Giant Creek at 14th Street near M Street (110JG0516)
Jolly Giant Creek	Jolly Giant Creek at 7th and J Streets (110JG0331)
Jolly Giant Creek	Jolly Giant Creek at 9th and J Streets (110JG0378)
Jolly Giant Creek	Jolly Giant Creek at Alliance Road near 17th Street (110JG0580)
Liscom Slough	Liscom Slough at Jackson Road (110UNSJXN)
Martin Slough	Martin Slough at Campton Street & Fern Street (110MS6750)
McDaniel Slough	McDaniel Slough at Q Street (110MD3750)
Salmon Creek	Salmon Creek at Eel River Drive (110SA1720)
Swain Slough	Swain Slough at Elk River Road (110SS9000)
Unnamed Slough	Unnamed Slough at Lanphere Road (110UNSLPHR)
Unnamed Slough	Unnamed Slough at Ranch Road (110UNSRNCH)

4.2 Impaired Ocean Beaches

This section provides details on the 12 ocean beaches in Humboldt, Mendocino, and Sonoma Counties identified as impaired for not meeting the REC-1 and/or SHELL beneficial use (Tables 5, 6, and 7) (State Water Resources Control Board, 2024).

Table 5 Impaired Ocean Beaches in Humboldt County

Impaired Waterbody	Waterbody ID (WBID)	Impairment Status	Sampling Station Name and Code
Clam Beach (near Mad River mouth)	CAC109100112011071211351 7	SHELL Impaired	Clam Beach at Mad River (109MA0001)
Clam Beach (near Strawberry Creek)	CAC1091002020070319150720	REC-1 & SHELL Impaired	Clam Beach at Strawberry Creek (109SW0001)
Luffenholtz Beach	CAC1081001220070319155307	REC-1 & SHELL Impaired	Luffenholtz Beach at Luffenholtz Creek (108LF0001)
Moonstone County Park	CAC1081001220070319154339	SHELL Impaired	Moonstone Beach at Little River (108LR0001)
Old Home Beach	CAC1081001220120426090438	SHELL Impaired	Old Home Beach at Scenic Drive (108HBOHB1)
Trinidad State Beach	CAC1081001220070319161337	REC-1 & SHELL Impaired	Trinidad State Beach at Mill Creek (108ML0001)

Table 6 Impaired Ocean Beaches in Mendocino County

Impaired Waterbody	Waterbody ID (WBID)	Impairment Status	Sampling Station Name and Code
Big River Beach at Mendocino Bay	CAC11330045200810132352l6	SHELL Impaired	Mendocino Bay at Big River (113BI0001)
Caspar Headlands State Beach	CAC11330045200810291543 29	SHELL Impaired	Caspar Beach at Caspar Creek (113CA0001)
Hare Creek Beach	CAC11320041200810132229l3	SHELL Impaired	Hare Beach at Hare Creek (113HC0001)
MacKerricher State Park (near Virgin Creek)	CAC11320057201107121449 23	SHELL Impaired	MacKerricher State Park at Virgin Creek (113VR0001)
Pudding Creek Beach	CAC11320050200810132246 04	SHELL Impaired	Pudding Beach at Pudding Creek (113PD0001)

Table 7 Impaired Ocean Beach in Sonoma County

Impaired Waterbody	Waterbody ID (WBID)	Impairment Status	Sampling Station Name and Code
Campbell Cove	CAC1152100020070319132228	REC-1 & SHELL Impaired	Campbell Cove at Bodega Bay (115BBCCB1)

5. Source Control Actions

North Coast Water Board staff have used the results of the microbial source tracking, land cover, land use and cattle presence analysis together to identify major controllable anthropogenic contributors (dog, human, cattle) of fecal waste to the waterbodies targeted for source control. North Coast Water Board staff will focus on addressing controllable sources, i.e., sources associated with anthropogenic activities resulting in human, dog, or cattle waste rather than wildlife fecal sources (gulls, shorebirds, non-bovine ruminants [deer, elk, etc.]). The focus on anthropogenic sources is due to the fact that human health risks associated with human and cattle feces are higher than those associated with gull or shorebird feces, and pathogen concentrations in dog fecal waste have been found to be significantly higher than in shorebird fecal waste (Griffith et al., 2013; Koskey et al., 2014; Wright et al., 2009). Therefore, fecal pollution resulting from human activity (human, pet, and cattle waste) is significantly more harmful to human health (priority = high) than fecal pollution associated with wildlife (deer, elk, gull and shorebird waste) (priority = low).

North Coast Water Board staff have summarized the specific contributors in Table 8, associated with each major controllable anthropogenic source category that has been identified in the waterbodies targeted for source control.

Table 8 Sources of Controllable Anthropogenic Fecal Bacteria to Waterbodies Evaluated

Source Category	Source Contributors
Human waste	Sanitary sewer systems
Human waste	Transient encampments
Human waste	Onsite Wastewater Treatment Systems
Dog waste (Municipal stormwater runoff)	Dog walking
Dog waste (Municipal stormwater runoff)	Residential yards
Dog waste (Direct deposition)	Dogs accompanying beachgoers
Cattle waste	Dairy cattle

Source Category	Source Contributors
Cattle waste	Non-dairy cattle

5.1. Coastal Pathogen Source Reduction Strategy

North Coast Water Board staff have developed the Coastal Pathogen Source Reduction Strategy (Implementation Plan) to address the controllable anthropogenic sources of fecal pollution identified in the waterbodies evaluated. The Implementation Plan addresses source control measures for six streams listed as REC-1 impaired on the Section 303(d) List of Impaired Water Bodies (Section 303[d] List), and for nine beaches listed as REC-1 and/or SHELL impaired on the Section 303(d) List. In addition, the Implementation Plan addresses 13 streams, currently not impaired, but have at least one exceedance of the REC-1 objective.

5.1.1. Action and Watch Lists

North Coast Water Board staff have analyzed available fecal indicator bacteria, microbial source tracking, land cover, land use, and grazing presence data collected from the waterbodies sampled and identified those waterbodies that are both impaired for REC-1 and/or SHELL beneficial use and have a controllable anthropogenic source of fecal pollution (from human, dog, and cattle sources), and also streams that have at least one exceedance of the REC-1 objective as well as having a controllable anthropogenic source of fecal pollution.

For the purpose of source control staff have placed all sampled REC-1 and/or SHELL impaired waterbodies that also have controllable anthropogenic sources of fecal pollution on an Impaired Waterbody Action List (the Action List). Waterbodies that have at least one exceedance of the REC-1 objective and also have controllable anthropogenic sources of fecal pollution have been placed on a “Waterbody Watchlist” (the Watch List).

All six REC-1 impaired streams and nine REC-1 and/or SHELL impaired beaches have been placed on the Action List. Three REC-1 and/or SHELL impaired beaches without anthropogenic sources of fecal pollution have been identified as having natural background sources of fecal pollution (gulls, shorebirds, deer, and elk) and further details about these three beaches is provided in Section 6 (Natural Background Sources). These three beaches will remain on the Section 303(d) List unless a natural background exclusion is sought under a future project.

Sampling stations from 13 Humboldt County streams that are currently not impaired, but that have at least one exceedance of the REC-1 objective have been placed on the

Watch List. Addressing these 13 streams now will prevent them from becoming impaired in the future.

5.1.2. Overview of Regulatory and Non-Regulatory Source Control Mechanisms

Source control for waterbodies on both the Action and Watch Lists will be achieved through the use of regulatory and non-regulatory source control mechanisms used by entities with jurisdiction in the sampled areas. North Coast Water Board staff have met with interested parties including internal and external regulatory staff and agencies implementing source control actions. During these coordination meetings, Planning staff identified locations on the Action List and Watch List under each jurisdiction and obtained agreement from those entities regarding Implementation Plan actions that will be pursued. In addition, some entities provided details about current regulatory and non-regulatory mechanisms being employed in their jurisdictions to address human, dog, and cattle waste associated with the waterbodies of interest. Further source control details for Action List and Watch List waterbodies, and the waterbodies influenced by natural background sources, are provided in Sections 5.2, 5.3, and 6 respectively. An overview of the regulatory mechanisms to control water pollution due to dog, human, and cattle fecal waste in the areas sampled is provided below:

Phase II Municipal Separate Stormwater System (MS4) Permit: The Phase II Small MS4 General Permit Water Quality Order (WQO) 2013-0001-DWQ (https://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.html) regulates the discharge of pollutants from small municipal separate stormwater systems (for municipalities of less than 100,000 people). Currently, the State Water Resources Control Board is in the process of updating this permit (https://www.waterboards.ca.gov/water_issues/programs/stormwater/phase_ii_municipal.html). The updates specifically add statewide requirements for pet waste control and management. If adopted as proposed, the updated permit will be implemented by regulatory agencies to address dog fecal waste in addition to the existing human fecal waste regulatory requirements. The Phase II MS4 permit will address human and dog fecal waste reaching waterbodies due to stormwater runoff.

Sanitary Sewer Systems (SSS) General Order: The Statewide General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2022-0103-DWQ (Sanitary Sewer Systems General Order) requires public agencies that own or operate sanitary sewer systems to develop and implement sewer system management plans and report all sanitary sewer spills to the State Water Board's online California Integrated Water Quality System Project (CIWQS) Sanitary Sewer System Database Sanitary Sewer System (https://www.waterboards.ca.gov/ciwqs/publicreports.html). The Sanitary Sewer Systems General Order is implemented by regulatory agencies and overseen by North

Coast Water Board staff to address water pollution caused by human fecal waste originating from faulty sewer systems carrying wastewater.

Humboldt, Mendocino, and Sonoma County Local Area Management Program (LAMP) Requirements: The Water Quality Control Policy for Siting, Design, Operation and Maintenance of Onsite Wastewater Treatment Systems (OWTS) Onsite Wastewater Treatment Systems (OWTS) Policy (https://www.waterboards.ca.gov/water_issues/programs/owts/summary.html) as amended on April 18, 2023, establishes a statewide, risk-based, tiered approach for the regulation and management of OWTS installations and replacements, and sets the level of performance and protection expected from OWTS. Humboldt (https://humboldtgov.org/685/Land-Use-Program), Mendocino (https://www.mendocinocounty.gov/departments/public-health/environmental-health/land-use), and Sonoma (https://permitsonoma.org/divisions/engineeringandconstruction/wellandsepticsystems/septicsystems/owtsmanual). Counties each have their own Local Agency Management Program (LAMP) which have been prepared pursuant to, and describe each County's compliance with, the OWTS Policy. Regulatory agencies employ LAMPs to address water pollution caused by human fecal waste originating from faulty OWTS/septic systems.

Dairy Permit Requirements: The General Waste Discharge Requirements (GWDR) for Dairies in the North Coast Region, Order No. R1-2019-0001 (https://www.waterboards.ca.gov/northcoast/water_issues/programs/dairies/) regulates the management of process water, manure, and other organic materials at dairies, including the application of such materials to land.

Enforcement Program: In the absence of Waste Discharge Requirements (WDRs) or a waiver of WDRs to regulate fecal waste discharge for non-dairy confined animal facilities and grazing operations site-specific instances of significant fecal pollution contributions resulting from non-dairy cattle grazing may be addressed through the Enforcement Program (https://www.waterboards.ca.gov/northcoast/water_issues/programs/enforcement/) of the North Coast Water Board, as needed. Currently, enforcement action is underway in non-dairy cattle grazing ranches upstream of the Little River at Highway 101 and Moonstone Beach at Little River sampling stations that will address any cattle fecal waste contributing to the impairment of REC-1 and/or SHELL beneficial use in these waterbodies.

City of Arcata Regulatory and Non-Regulatory Mechanisms: In addition to implementing regulatory mechanisms such as the Phase II MS4 permit and SSS General Order, the City of Arcata currently employs several additional regulatory and non-regulatory

mechanisms to address water pollution originating from dog, human, and cattle waste within the City of Arcata (E. Sinkhorn, personal communication, September 20, 2024). Specifically, 1) ending a grazing lease in the Jacoby Creek Gannon Slough Wildlife Area due to repeated failures to keep cattle out of protected areas, and appointing a new lessee with a result that all exclusion fences are now functioning properly; 2) collaborative approach to develop connections with the unhoused community through dedicated problem-oriented policing, working with social service partners and a company employing formerly unhoused individuals to address issues related to the unhoused community, and 3) finalizing a large Inflow and Infiltration Reduction Project, with construction expected to begin in 2025, aiming to significantly reduce groundwater and stormwater infiltration into the sewer system and wastewater outflow. In addition preliminary results from a 2019 Inflow and Infiltration Project have already shown a significant reduction in wet weather flows to the Arcata Wastewater Treatment Facility.

City of Eureka Regulatory and Non-Regulatory Mechanisms: In addition to implementing regulatory mechanisms such as the Phase II MS4 permit and Sanitary Sewer Systems General Order, the City of Eureka currently employs several additional regulatory and non-regulatory mechanisms to address water pollution originating from dog and human waste within the City of Eureka (K. Allen, personal communication, October 16, 2024). Specifically, constructing units to house unhoused people, moving encampments and removing debris, and providing dog waste bags at parks and trails within the city.

California Department of Parks and Recreation (State Parks) Pet and Human Waste Control Mechanisms: The State Parks Department relies on information and enforcement to control pet and human waste at beaches owned/operated by them. The State Parks website (parks.ca.gov/Dogs) lists laws that pet owners must be aware of including cleaning up after their pet. Pet signage that identifies pet access restrictions and pet waste stations are located within those state parks that allow pets. The California Code of Regulations, Title 14 (Natural Resources), Division 3 (Department of Parks and Recreation) contains sections related to the control of pet and human waste. Section 4312, Control of Animals, gives State Parks the authority to require pet owners to clean up after their pets. Section 4324, Sanitation, gives State Parks the authority to require human waste to only be placed into fixtures provided for that purpose. State Parks Peace Officers are responsible for issuing citations (D. Alderete, personal communication, February 10, 2025).

Humboldt County Public Works Department Pet Waste Control Mechanisms: Humboldt County Division of Environmental Services of the Humboldt County Public Works Department provides “one DOGIPOT dog waste bag box at each parking lot, North and South” at Clam Beach County Park (D. Davis, personal communication, February 13, 2025).

Jacoby Creek Land Trust Pet Waste Control Mechanisms: Dogs are prohibited on land managed by the Jacoby Creek Land Trust (S. Wyse Mietz, personal communication, January 24, 2025). Trinidad Coastal Land Trust Pet Waste Control Mechanisms: Dog waste control mechanisms implemented by the Trinidad Coastal Land Trust at the beaches managed by the trust are 1) signage at all sites managed by the Trinidad Coastal Land Trust "indicating that dog waste must be removed" and 2) provision of "dog waste disposal stations at the start of every trailhead as a mechanism to support proper waste management." (C. Nasr, personal communication, January 24, 2025).

Mendocino Land Trust Pet Waste Control Mechanisms: Dog waste control mechanisms implemented by the Mendocino Land Trust at Hare Creek Beach include 1) two management signs indicating that no trash (including pet waste) is to be left on the property, 2) once-monthly volunteer-led efforts to remove invasive plants and clean trash, 3) when encampments in the watershed grow in the summer and fall and result in people being active in the creek, the Trust works with the Mendocino County Sherrif's Department and also sends a 602 form to the Mendocino County Sherrif's Department each month allowing them to work on behalf of the Trust, and 4) during Coastal Cleanup Day every September, Land Trust members clear out all the trash accumulated from the encampments (N. Houtz, personal communication, February 10 2025).

5.2. Source Control for Action List Waterbodies

All six impaired streams and nine impaired beaches with anthropogenic sources of fecal pollution have been placed on the Impaired Waterbody Action List identified in this Implementation Plan. All Action List waterbodies were sampled under studies that had a completed Quality Assurance Project Plan (QAPP) at the time of data analysis. Source control is focused on addressing identified controllable anthropogenic contributors of fecal waste (dog, human, and cattle waste) through existing regulatory mechanisms.

Figure 2 displays the locations of the impaired stream stations on the Action List whereas Figures 3, 4, and 5 show the locations of the impaired beach stations on the Action List in Humboldt, Mendocino, and Sonoma Counties respectively. Table 9 provides the entities responsible for source control, source control mechanisms, and implementation timelines for the impaired streams on the Action List, and Tables 10,11, and 12 provide this information for the impaired ocean beaches on the Action List in Humboldt, Mendocino, and Sonoma Counties respectively. Individual sampling stations may have multiple entities responsible for the control of an anthropogenic source of fecal waste to that sampling station as described in Tables 9, 10, 11, and 12.

Tables 9 through 12 include the major controllable anthropogenic contributors to pathogen impairment in these waterbodies, the entities tasked with addressing the identified sources, the regulatory and/or non-regulatory mechanisms that direct the

necessary actions to achieve source control in these streams, and the implementation timeline. Source control for these six impaired streams and nine impaired beaches are to be prioritized by entities named in these tables, with a focus on addressing the identified controllable anthropogenic contributors of fecal waste (dog, human, and cattle waste). The mechanisms and timelines listed in the tables below have been agreed to by the regulatory agencies responsible for conducting source control. If the timelines listed in the tables below are not met, then the required timelines for source control will default to the timelines, schedules, and deadlines listed in the applicable permits/orders used for source control. In order to conduct source control in the Action List waterbodies regulatory agencies will follow the process of inventory, prioritization and mitigation.

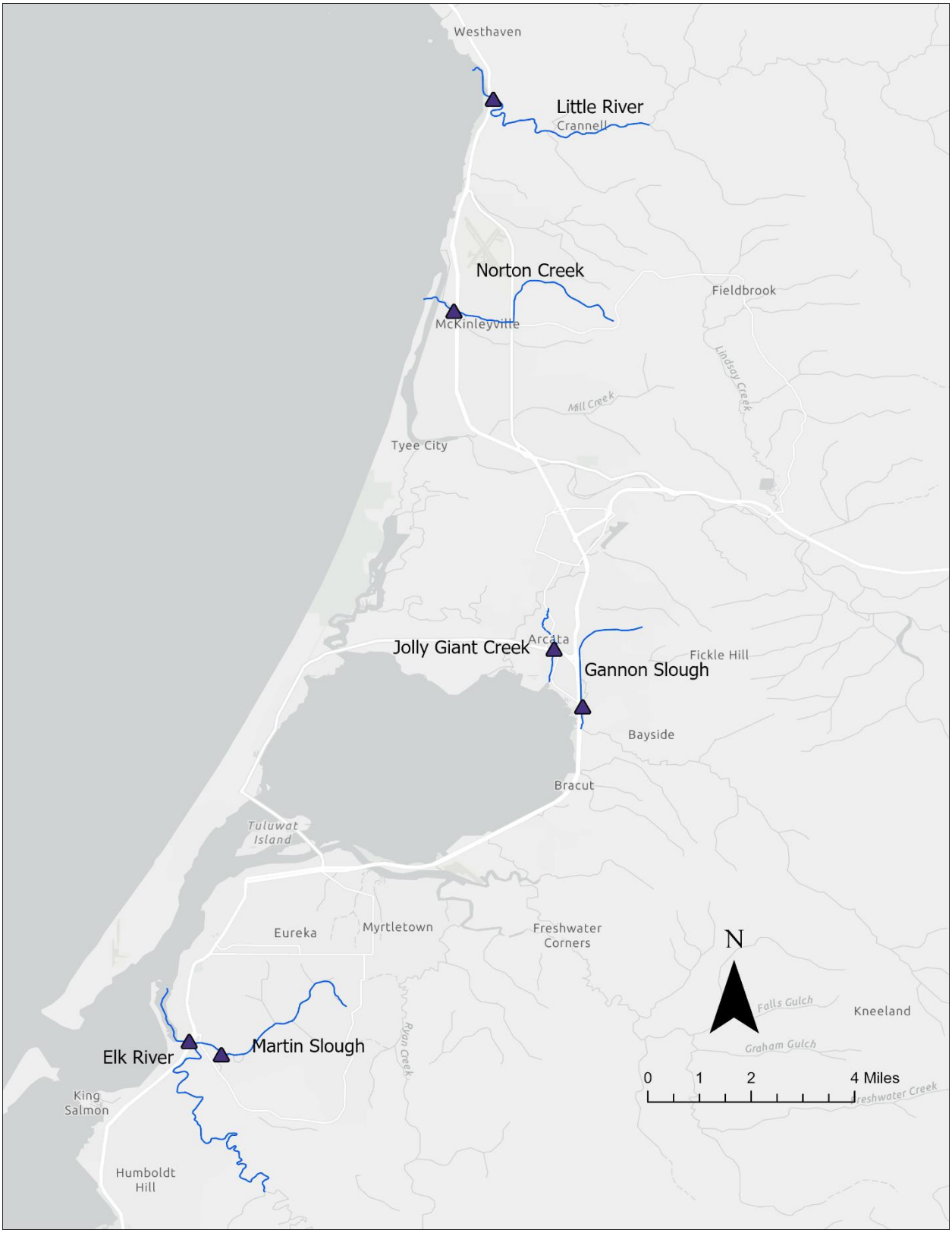

Figure 2 Locations of Impaired Stream Sampling Stations on the Action List

Table 9 Source Control for Impaired Stream Stations on the Action List

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Elk River at Highway 101	Dog	City of Eureka Public Works Department (PWD)	Future Phase II Municipal Separate Stormwater System (MS4) Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Elk River at Highway 101	Dog	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]	Ongoing
Elk River at Highway 101	Human	City of Eureka PWD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Elk River at Highway 101	Human	City of Eureka PWD	Existing Sanitary Sewer Systems (SSS) General Order Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Elk River at Highway 101	Human	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]	Ongoing
Elk River at Highway 101	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Martin Slough at Pine Hill Road	Dog	Humboldt County PWD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Martin Slough at Pine Hill Road	Human	Humboldt County PWD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Martin Slough at Pine Hill Road	Human	Humboldt County PWD	Existing SSS General Order Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Gannon Slough near Highway 101	Dog	City of Arcata Environmental Services Department (ESD)	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Gannon Slough near Highway 101	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]	Ongoing
Gannon Slough near Highway 101	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Gannon Slough near Highway 101	Human	City of Arcata ESD	Existing SSS General Order Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Gannon Slough near Highway 101	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]	Ongoing
Jolly Giant Creek at Samoa Boulevard	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Jolly Giant Creek at Samoa Boulevard	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]	Ongoing
Jolly Giant Creek at Samoa Boulevard	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit
Jolly Giant Creek at Samoa Boulevard	Human	City of Arcata ESD	Existing SSS General Order Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Jolly Giant Creek at Samoa Boulevard	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]	Ongoing
Norton Creek at Highway 101	Dog	Humboldt County PWD	Future Phase II MS4 Permit Requirements	No later than one year after Adoption Date of Phase II MS4 Permit

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Little River at Highway 101	Dog	North Coast Water Board Enforcement Unit	Enforcement Action at Grazing Operations in Watershed	Ongoing
Little River at Highway 101	Non-Dairy Cattle	North Coast Water Board Enforcement Unit	Enforcement Action at Grazing Operations in Watershed	Ongoing

[a] City of Eureka Regulatory & Non-Regulatory Mechanisms – Constructing units to house unhoused people, moving encampments and removing debris, and providing dog waste bags at parks and trails within the city.

[b] City of Arcata Regulatory & Non-Regulatory Mechanisms – Replacing polluting grazing lessee with new lessee using functioning exclusion fences, collaborative approach (problem-oriented policing, working with social service partners and formerly unhoused individuals), and finalizing a large Inflow and Infiltration (I&I) Reduction Project, to significantly reduce groundwater and stormwater infiltration into the sewer system and wastewater outflow.

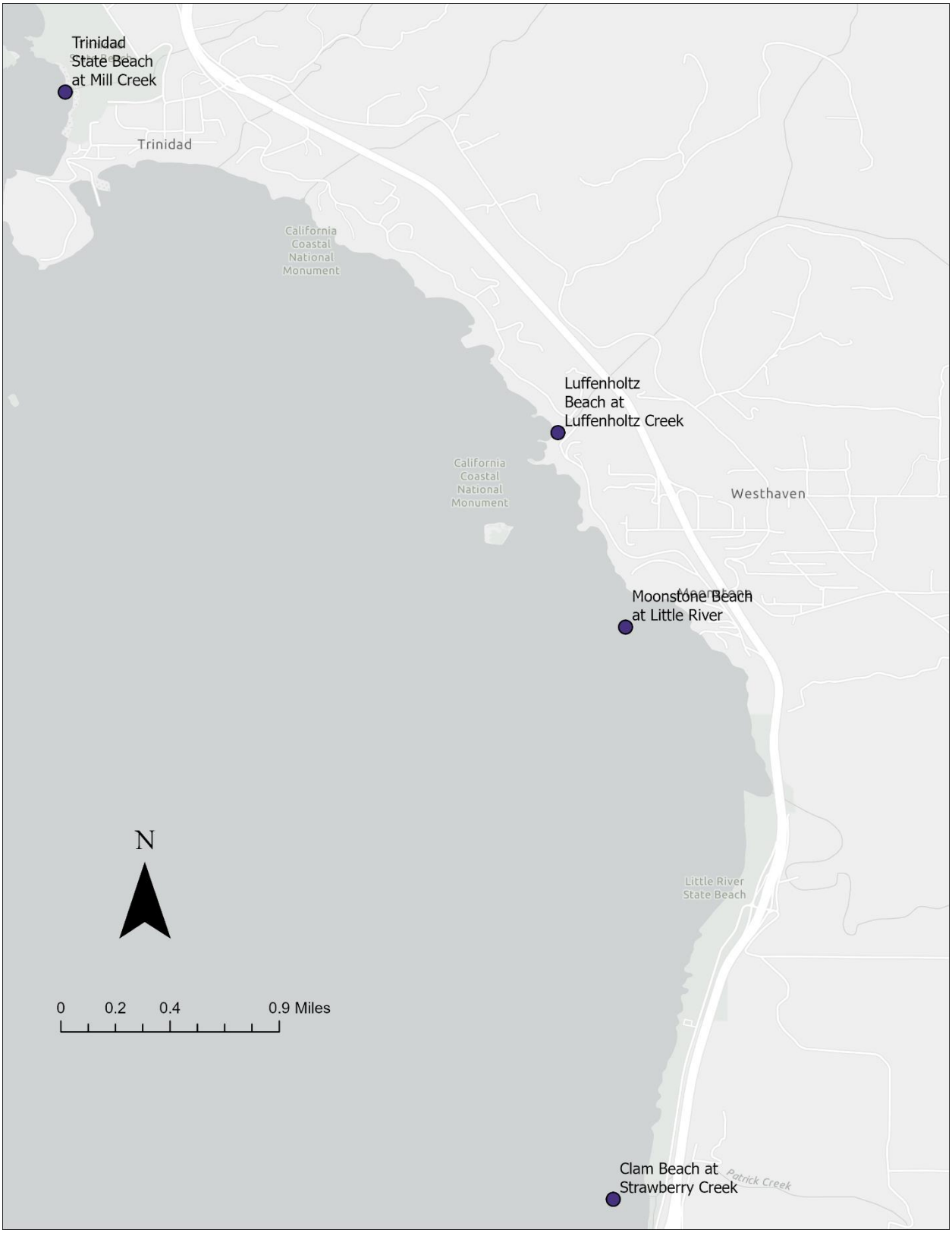

Figure 3 Locations of Impaired Beach Sampling Stations on the Action List (Humboldt County)

Table 10 Source Control for Impaired Beach Stations on the Action List (Humboldt County)

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Clam Beach at Strawberry Creek	Dog	Humboldt County PWD	Existing County Park Requirements for Pet Waste Disposal	Ongoing
Clam Beach at Strawberry Creek	Human	Humboldt County Division of Environmental Services (DES)	Existing Humboldt County Local Area Management Program (LAMP) Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Luffenholtz Beach at Luffenholtz Creek	Dog	Trinidad Coastal Land Trust	Existing Trust Requirements for Pet Waste Disposal	Ongoing
Moonstone Beach at Little River	Dog	Trinidad Coastal Land Trust	Existing Trust Requirements for Pet Waste Disposal	Ongoing
Moonstone Beach at Little River	Non-Dairy Cattle	North Coast Water Board Enforcement Unit	Enforcement Action at Grazing Operations in Watershed	Ongoing
Trinidad State Beach at Mill Creek	Dog	California Department of Parks and Recreation (State Parks)	Existing State Park Requirements for Pet Waste Disposal	Ongoing

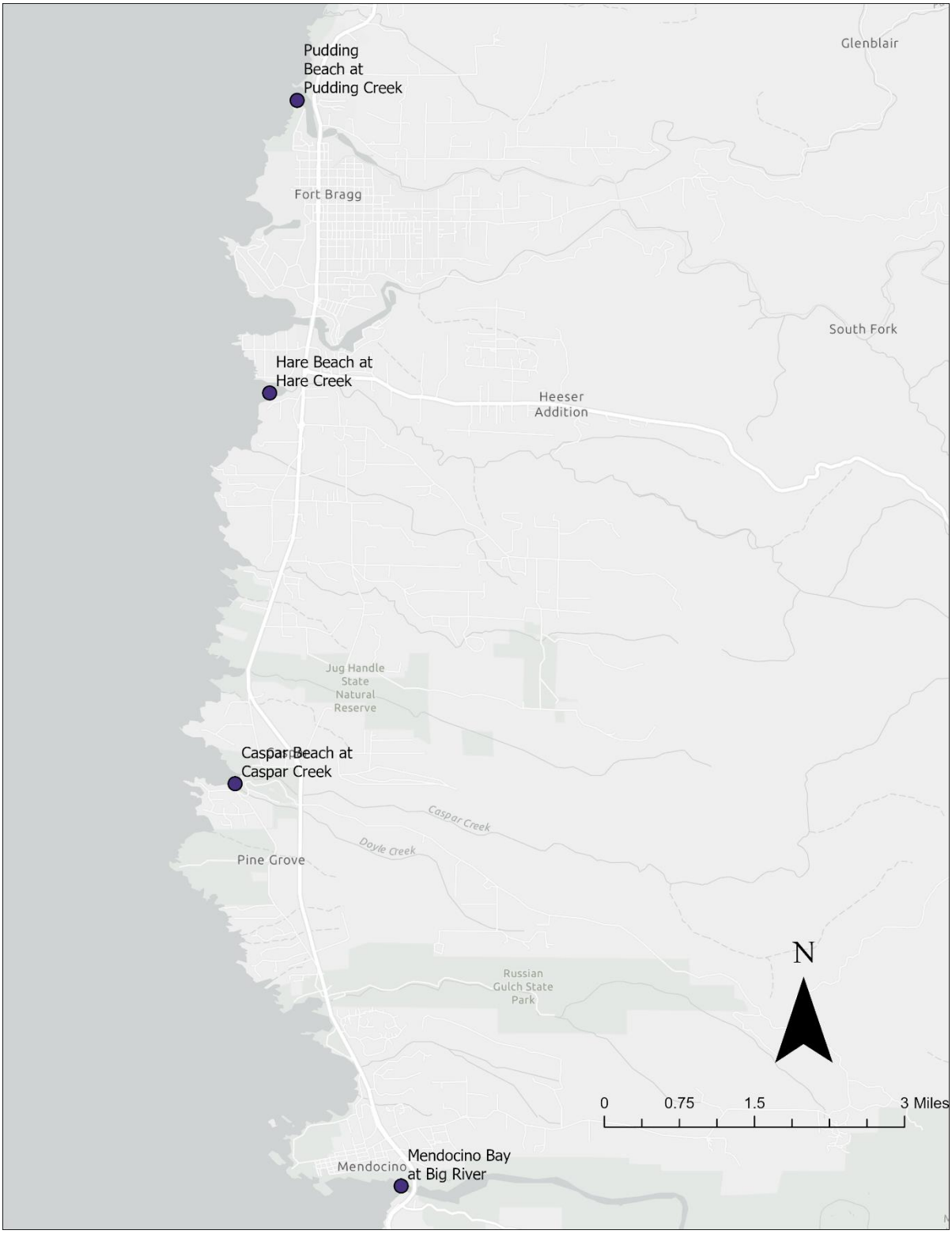

Figure 4 Locations of Impaired Beach Sampling Stations on the Action List (Mendocino County)

Table 11 Source Control for Impaired Beach Stations on the Action List (Mendocino County)

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Mendocino Bay at Big River	Dog	State Parks	Existing State Park Requirements for Pet Waste Disposal	Ongoing
Caspar Beach at Caspar Creek	Dog	State Parks	Existing State Park Requirements for Pet Waste Disposal	Ongoing
Hare Beach at Hare Creek	Dog	Mendocino Land Trust	Existing Trust Requirements for Pet Waste Disposal	Ongoing
Hare Beach at Hare Creek	Human	Mendocino County Department of Environmental Health (DEH)	Existing Mendocino County LAMP Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Pudding Beach at Pudding Creek	Human	Mendocino County DEH	Existing Mendocino County LAMP Requirements	No later than one year after Acceptance Date of 2028 Integrated Report by USEPA
Pudding Beach at Pudding Creek	Human	State Parks	Existing State Park Requirements for Human Waste Control	Ongoing

Figure 5 Location of Impaired Beach Sampling Station on the Action List (Sonoma County)

Table 12 Source Control for the Impaired Beach Station on the Action List (Sonoma County)

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism	Implementation Timeline
Campbell Cove at Bodega Bay	Dog	State Parks	Existing State Park Requirements for Pet Waste Disposal	Ongoing

5.3. Source Control for Watch List Waterbodies

All coastal stream samples which have not been evaluated for impairment of beneficial uses but do have at least one exceedance of the REC-1 objective have been placed on the Impacted Waterbodies Watch List. There are no ocean beach sampling stations that fit this criterion.

Source control for these coastal stream stations will also focus on addressing controllable anthropogenic contributors of fecal waste. Source control for these streams do not require a Category 4b demonstration, but will nevertheless be achieved by implementing the same mechanisms described in Section 5.2. Regulatory agencies have been advised, and have agreed, to address these Watch List streams soon after completing source control actions for the waterbodies on the Action List. Where Watch List locations are located upstream of Action List locations, source controls may need to be implemented in both locations simultaneously to achieve water quality standards. In order to conduct source control in the Watch List waterbodies, regulatory agencies will follow the process of inventory, prioritization and mitigation.

The locations of the stream sampling stations on the Watch List are displayed in Figure 6. A list of streams on the Watch List along with their controllable anthropogenic fecal water source contributors, governing regulatory agency, and regulatory mechanism for source control is provided in Table 13 below. Individual sampling stations may have multiple entities responsible for the control of an anthropogenic source of fecal waste to that sampling station as described in Table 13.

All waterbodies on the Watch List were sampled under studies that had a completed QAPP at the time of data analysis. The implementation timeline to address controllable anthropogenic fecal waste sources in these streams will be determined by the regulatory agencies implementing source control actions within those streams with a goal of addressing source control soon after, or concurrent with, source control actions for Action List waterbodies.

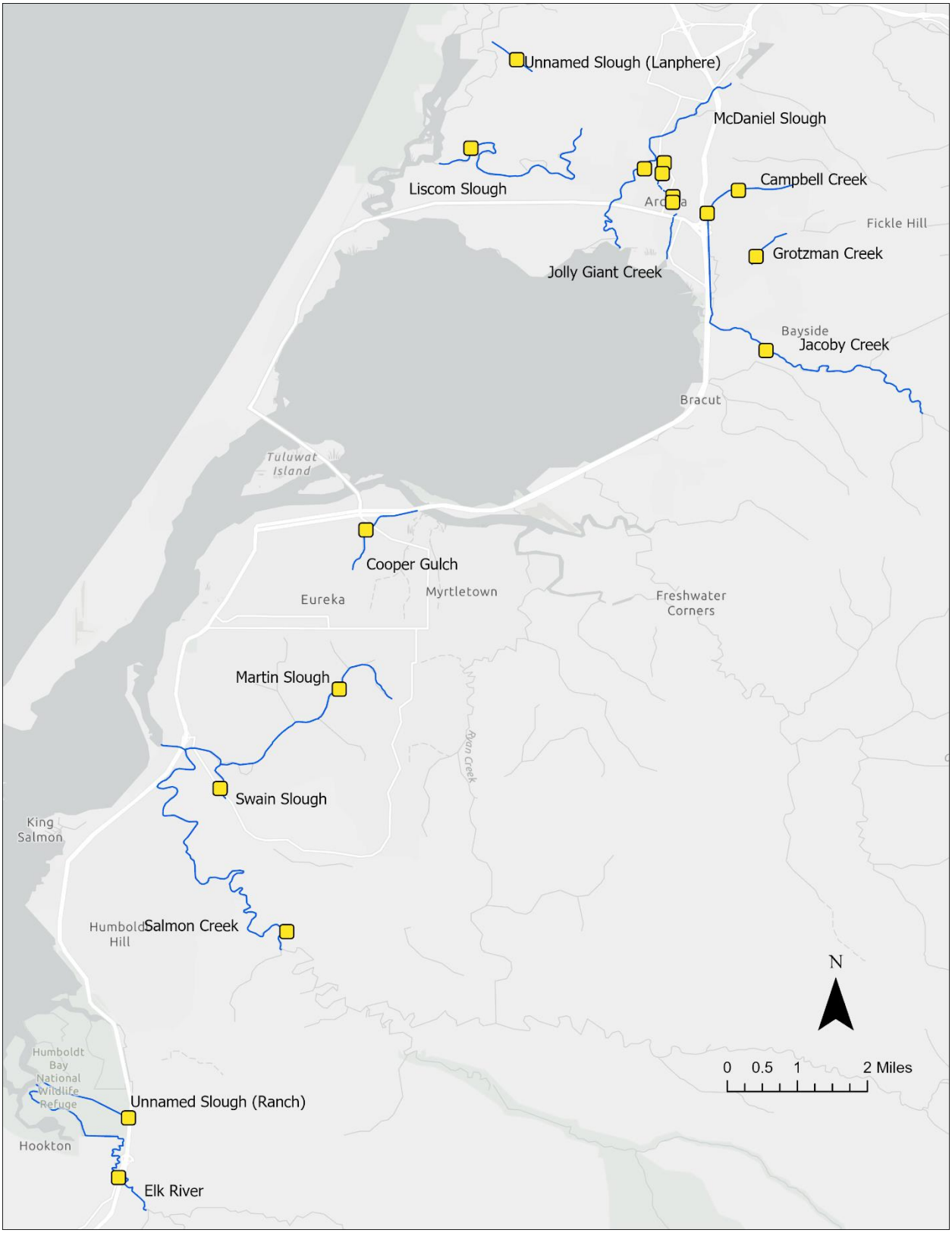

Figure 6 Locations of Stream Sampling Stations on the Watch List

Table 13 Source Control for Coastal Streams on the Watch List

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Campbell Creek at 14th Street & Union Street	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Campbell Creek at 14th Street & Union Street	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Campbell Creek at 14th Street & Union Street	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Campbell Creek at 14th Street & Union Street	Human	City of Arcata ESD	Existing SSS General Order Requirements
Campbell Creek at 14th Street & Union Street	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Campbell Creek at 7th Street	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Campbell Creek at 7th Street	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Campbell Creek at 7th Street	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Campbell Creek at 7th Street	Human	City of Arcata ESD	Existing SSS General Order Requirements
Campbell Creek at 7th Street	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Cooper Gulch at Myrtle Avenue & 8th Street	Dog	City of Eureka PWD	Future Phase II MS4 Permit Requirements
Cooper Gulch at Myrtle Avenue & 8th Street	Dog	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]
Cooper Gulch at Myrtle Avenue & 8th Street	Human	City of Eureka PWD	Future Phase II MS4 Permit Requirements
Cooper Gulch at Myrtle Avenue & 8th Street	Human	City of Eureka PWD	Existing SSS General Order Requirements
Cooper Gulch at Myrtle Avenue & 8th Street	Human	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]
Elk River at Zanes Road	Dog	North Coast Water Board Dairy Program	Dairy Program to address along with other farm practices

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Elk River at Zanes Road	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up
Grotzman Creek at Bayside Road	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Grotzman Creek at Bayside Road	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Grotzman Creek at Bayside Road	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Grotzman Creek at Bayside Road	Human	City of Arcata ESD	Existing SSS General Order Requirements
Grotzman Creek at Bayside Road	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jacoby Creek at Old Arcata Road	Dog	Jacoby Creek Land Trust	Dogs are prohibited on land managed by the Jacoby Creek Land Trust
Jolly Giant Creek at 14th Street near M Street	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Jolly Giant Creek at 14th Street near M Street	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at 14th Street near M Street	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at 14th Street near M Street	Human	City of Arcata ESD	Existing SSS General Order Requirements
Jolly Giant Creek at 14th Street near M Street	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at 7th and J Streets	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at 7th and J Streets	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at 7th and J Streets	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at 7th and J Streets	Human	City of Arcata ESD	Existing SSS General Order Requirements

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Jolly Giant Creek at 7th and J Streets	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at 9th and J Streets	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at 9th and J Streets	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at 9th and J Streets	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at 9th and J Streets	Human	City of Arcata ESD	Existing SSS General Order Requirements
Jolly Giant Creek at 9th and J Streets	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Jolly Giant Creek at Alliance Road near 17th Street	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at Alliance Road near 17th Street	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Jolly Giant Creek at Alliance Road near 17th Street	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
Jolly Giant Creek at Alliance Road near 17th Street	Human	City of Arcata ESD	Existing SSS General Order Requirements
Jolly Giant Creek at Alliance Road near 17th Street	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
Liscom Slough at Jackson Road	Dog	North Coast Water Board Dairy Program	Dairy Program to Address along with other farm practices
Liscom Slough at Jackson Road	Human	Humboldt County DES	Existing Humboldt County LAMP Requirements
Liscom Slough at Jackson Road	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up
Martin Slough at Campton Street & Fern Street	Dog	City of Eureka PWD	Future Phase II MS4 Permit Requirements
Martin Slough at Campton Street & Fern Street	Dog	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Martin Slough at Campton Street & Fern Street	Human	City of Eureka PWD	Future Phase II MS4 Permit Requirements
Martin Slough at Campton Street & Fern Street	Human	City of Eureka PWD	Existing SSS General Order Requirements
Martin Slough at Campton Street & Fern Street	Human	City of Eureka PWD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[b]
McDaniel Slough at Q Street	Dog	City of Arcata ESD	Future Phase II MS4 Permit Requirements
McDaniel Slough at Q Street	Dog	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]
McDaniel Slough at Q Street	Human	City of Arcata ESD	Future Phase II MS4 Permit Requirements
McDaniel Slough at Q Street	Human	City of Arcata ESD	Existing SSS General Order Requirements
McDaniel Slough at Q Street	Human	City of Arcata ESD	Existing and Upcoming Regulatory & Non-Regulatory Mechanisms[a]

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Salmon Creek at Eel River Drive	Dog	North Coast Water Board Dairy Program	Dairy Program to Address along with other farm practices
Salmon Creek at Eel River Drive	Dog	North Coast Water Board Enforcement Unit	Enforcement Action at Grazing Operations in Watershed if Needed
Salmon Creek at Eel River Drive	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up
Salmon Creek at Eel River Drive	Non-Dairy Cattle	North Coast Water Board Enforcement Unit	Enforcement Action at Grazing Operations in Watershed if Needed
Swain Slough at Elk River Road	Dog	North Coast Water Board Dairy Program	Dairy Program to Address along with other farm practices
Swain Slough at Elk River Road	Human	Humboldt County DES	Existing Humboldt County LAMP Requirements
Swain Slough at Elk River Road	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up

Station Name	Controllable Anthropogenic Fecal Source(s)	Regulatory Agency	Regulatory Mechanism
Unnamed Slough at Lanphere Road	Dog	North Coast Water Board Dairy Program	Dairy Program to Address along with other farm practices
Unnamed Slough at Lanphere Road	Human	Humboldt County DES	Existing Humboldt County LAMP Requirements
Unnamed Slough at Lanphere Road	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up
Unnamed Slough at Ranch Road	Dairy Cattle	North Coast Water Board Dairy Program	Existing Dairy Permit Requirements Prioritized for Compliance Inspection and Follow-up

[a] City of Arcata Regulatory & Non-Regulatory Mechanisms – Replacing polluting grazing lessee with new lessee using functioning exclusion fences, collaborative approach (problem-oriented policing, working with social service partners and formerly unhoused individuals), and finalizing a large Inflow and Infiltration (I&I) Reduction Project, to significantly reduce groundwater and stormwater infiltration into the sewer system and wastewater outflow.

[b] City of Eureka Regulatory & Non-Regulatory Mechanisms – Constructing units to house unhoused people, moving encampments and removing debris, and providing dog waste bags at parks and trails within the city.

6. Natural Background Sources

Fecal indicator bacteria data analysis showed that at least one exceedance of the REC-1 and/or SHELL objective was noted at three beach sampling stations currently listed on the Section 303(d) List as impaired for REC-1 and/or SHELL beneficial use. Microbial source tracking, land cover, land use, and grazing presence data analysis indicated that fecal pollution at these sampling stations is most likely due to natural wildlife contributors – gulls, shorebirds, deer, and elk with no evidence detected from available data pointing to anthropogenic fecal waste contributors (human, dog, or cattle) at these sampling stations. Therefore, these three sampling stations will remain on the Section 303(d) List unless a natural background exclusion is sought under a future project. Table14 lists these sampling stations and their impairment status.

Table 14 Sampling Stations with Natural Background Sources

Impaired Waterbody Name	Waterbody ID (WBID)	Impairment Status	Sampling Station Name and Code
Clam Beach (near Mad River mouth)	CAC109100112011071211351 7	SHELL	Clam Beach at Mad River (109MA0001)
Old Home Beach	CAC108100122012042609043 8	SHELL	Old Home Beach at Scenic Drive (108HBOHB1)
MacKerricher State Park (near Virgin Creek)	CAC113200572011071214492 3	SHELL	MacKerricher State Park at Virgin Creek (113VR0001)

7. Projection of Timeline for Meeting Objectives

The North Coast Water Board expects the waterbodies on the Action and Watch Lists to be meeting the REC-1 and/or SHELL objectives by 2035. This estimate accounts for time needed for 1) the adoption of, and compliance with, the updated Phase II MS4 Permit, 2) the inventory, prioritization and mitigation processes that will be undertaken by responsible agencies to conduct source control, and 3) current and planned outreach-based projects and design and construction projects in Eureka and Arcata to address contributions from transient communities and from sewer system wastewater exfiltration.

8. Monitoring and Reporting

The Implementation Plan requires responsible regulatory agencies and regulated entities to follow the monitoring and reporting requirements of the Phase II MS4 permit, the SSS Order, County LAMP Requirements, and Dairy GWDR Order. Furthermore, Humboldt, Mendocino, and Sonoma counties will continue to collect bacterial water quality data from all the beaches included in the Implementation Plan, under the BeachWatch Program, as required by Assembly Bill 411 (AB411). Under this program, fecal indicator bacteria data will be collected from these beaches, annually, from April 1 to October 31, and submitted to the California Environmental Data Exchange Network (CEDEN) California Environmental Data Exchange Network (CEDEN) database (https://ceden.org/about_us.shtml). In addition, monitoring data collected by regulatory agencies and regulated entities will also be submitted to the CEDEN database. All data submitted to CEDEN will be analyzed through the Integrated Report process.

Best management practices (BMPs) required by the regulatory and non-regulatory mechanisms used to control human, dog, and cattle fecal waste will help restore supporting conditions for beneficial uses and ensure compliance with water quality standards. The monitoring and reporting requirements and BMPs together will be used to measure the success of the control mechanisms implemented, and to adaptively manage source control activities over time.

Source control requirements include monitoring and reporting by implementing parties for:

1. The installation and maintenance of dog waste disposal stations (as per the Phase II MS4 permit pet waste requirements, and State, County, and local regulatory and non-regulatory requirements for dog waste disposal at parks, trails, and beaches);
2. The education and outreach activities conducted to inform the public about the negative water quality and public health impacts of improper disposal or non-disposal of dog waste (as per the Phase II MS4 permit pet waste requirements);
3. Compliance with applicable Waste Discharge Requirements (WDRs) and General Waste Discharge Requirements (GWDRs) (as per the SSS Order, the County LAMP requirements, and the Dairy GWDR Order);
4. Actions implemented to address contributions from runoff or direct deposition of fecal waste associated with homeless encampments (as per the Phase II MS4 permit pet waste requirements, current and ongoing City of Arcata and City of Eureka regulatory and non-regulatory mechanisms and requirements); and
5. Actions resulting from enforcement conducted to address site-specific fecal pollution contributions resulting from non-dairy cattle grazing.

9. Interested Parties Outreach and Coordination

Throughout the Project planning and implementation process, staff from the North Coast Water Board Planning Unit have met with both internal and external interested parties and regulatory agencies to provide updates on data analysis, plan monitoring studies, and obtain feedback on proposed source control actions. External regulatory and non-regulatory agencies and internal North Coast Water Board Permitting Units on the Interested Party list (Table 15) are aware of the waterbody Action and Watch lists and have agreed to prioritize them for control of anthropogenic fecal waste sources. Details of previous outreach meetings are provided in Table 15 below. Planning Unit staff have developed an Implementation Plan based on feedback received from interested parties. Planning Unit Staff will continue to meet with these parties as the project progresses through the approval process. In addition a fact sheet describing the project and the Implementation Plan have been sent to all external regulatory agencies and non-regulatory agencies that regulate or manage sampling stations on the Action and Watch Lists. Fact sheets have also been sent to Mendocino Land Trust, and the five Native American tribes in the areas where samples were collected.

Table 15 Details of Meetings with Interested Parties

Meeting Date	Interested Party	Meeting Details
April 3, 2020	Humboldt Waterkeeper	Impaired and Source Stream Data Assessment Update
April 28, 2020	North Coast Water Board Wastewater and Stormwater Units	Internal Planning for Jolly Giant Creek Monitoring Study
May 20, 2020	North Coast Water Board Wastewater and Stormwater Units	Internal Planning for Jolly Giant Creek Monitoring Study
June 29, 2020	City of Arcata Environmental Services Department (ESD)	Impaired and Source Stream Data Assessment Update; Planning for Jolly Giant Creek Monitoring Study
July 28, 2020	City of Arcata ESD; Humboldt Waterkeeper	Jolly Giant Creek Monitoring Study Design and Planning
October 5, 2020	City of Arcata ESD; Humboldt Waterkeeper	Planning for Jolly Giant Creek Monitoring Study Design and Planning
September 9, 2021	City of Arcata ESD	Sample Collection Planning for Jolly Giant Creek Monitoring Study

Meeting Date	Interested Party	Meeting Details
November 2, 2021	San Francisco Bay Regional Water Quality Control Board staff	Microbial source tracking Data Assessment Strategy Discussion
February 25, 2022	Humboldt County Public Health Laboratory	Jolly Giant Creek Monitoring Study Sample Analysis Planning
March 25, 2022	North Coast Water Board Planning, Adaptive Management Units	Project sampling station salinity determination field sampling planning
October 26, 2023	North Coast Water Board Wastewater, Stormwater, and Groundwater Units, Enforcement Unit, and Humboldt Bay Steward	Project Data Assessment Update
November 9, 2023	Humboldt Waterkeeper; City of Arcata ESD; Humboldt County Department of Environmental Health (DEH)	Humboldt Area Impaired Stream and Source Assessment Update
April 24, 2024	North Coast Water Board Stormwater Unit	Meeting to develop and submit dog waste requirements to State Board to include in draft Phase II MS4 permit
August 28, 2024	North Coast Water Board Stormwater Unit	Project Update and Development of stormwater runoff requirements of Implementation Plan
August 29, 2024	North Coast Water Board Wastewater Unit	Project update and Development of wastewater requirements of Implementation Plan
September 3, 2024	North Coast Water Board Groundwater Unit	Project update and Development of OWTS requirements of Implementation Plan
September 4, 2024	North Coast Water Board Southern Agriculture Unit (North Coast Water Board Dairy Program)	Project update and Development of dairy permit requirements of Implementation Plan
September 4, 2024	North Coast Water Board Agriculture and Enforcement Division Enforcement Unit	Project update, update on current enforcement action regarding non-dairy cattle ranch impacting several Project waterbodies and plan to address findings of non-dairy cattle waste in other sampled waterbodies

Meeting Date	Interested Party	Meeting Details
September 16, 2024	Humboldt Waterkeeper	Project Update and Implementation Plan discussion and feedback
September 16, 2024	Humboldt County DEH	Project Update and Implementation Plan discussion and feedback
September 18, 2024	North Coast Water Board Stormwater Unit	Provide comments to State Board on pet waste requirement in draft Phase II MS4 permit
September 19, 2024	City of Arcata DES	Project Update and Implementation Plan discussion and feedback
September 25, 2024	North Coast Water Board Tribal Liaison	Tribal Outreach Discussion
September 25, 2024	City of Eureka Public Works Department Engineering Division	Project Update and Implementation Plan discussion and feedback
January 8, 2025	California State Parks	Phase II MS4 Update
January 24, 2025	Office of Water Programs, California State University, Sacramento	California State Parks Dog Waste Control Mechanisms Initial Discussion
January 24, 2025	Trinidad Coastal Land Trust	Project Update and Implementation Plan discussion and dog waste control mechanisms discussion
February 3, 2025	Humboldt County DEH	Implementation Plan follow-up discussion
February 3, 2025	Mendocino County Department of Public Health – Environmental Health Division	Project Update and Implementation Plan discussion
February 3, 2025	Mendocino Land Trust	Project Update and Implementation Plan discussion
February 4, 2025	Humboldt County Public Works Department	Project Update and Implementation Plan discussion
February 6, 2025	U.S. Fish and Wildlife Service	Project Update and Implementation Plan discussion and confirmation of natural canid source of fecal contamination at sampling site
February 6, 2025	Jacoby Creek Land Trust	Project Update and Implementation Plan discussion

10. Adaptive Management

The Implementation Plan relies on environmental stewardship and adaptive management to 1) restore supporting conditions for beneficial uses in impaired waterbodies, 2) ensure compliance with water quality standards in impaired waterbodies, and 3) revise pollution controls if needed. Adaptive management relies on implementation of best management practices, compliance with applicable permit conditions and requirements, followed by monitoring and reporting that allows implementers to assess the effectiveness of specific actions. Environmental stewardship is the responsibility for environmental quality shared by all those whose actions affect the environment (United States Environmental Protection Agency, 2016). The Implementation Plan employs the implementation of regulatory and non-regulatory tools within a coordinated recovery framework that leverages the authorities, funding, and expertise of watershed stakeholders, including agencies, tribes, nongovernment organizations (NGOs), and private landowners. This approach relies on building partnerships to identify shared environmental concerns, identify strategic approaches to addressing those concerns, and by coordinating internally using the multiple regulatory and non-regulatory tools of the North Coast Water Board. Specifically, the Implementation Plan relies on the source control actions and monitoring and reporting requirements of existing regulatory and non-regulatory mechanisms, and approval and feedback from regulatory agencies on these mechanisms to restore supporting conditions for beneficial uses and ensure compliance with water quality standards in impaired waterbodies.

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