Photo: Newaukum River, looking upstream from Kirkland Road vicinity (NHC, 2025)

Section 319 Nonpoint Source Management Program Plan

Upper Chehalis River Basin (WRIA 23)

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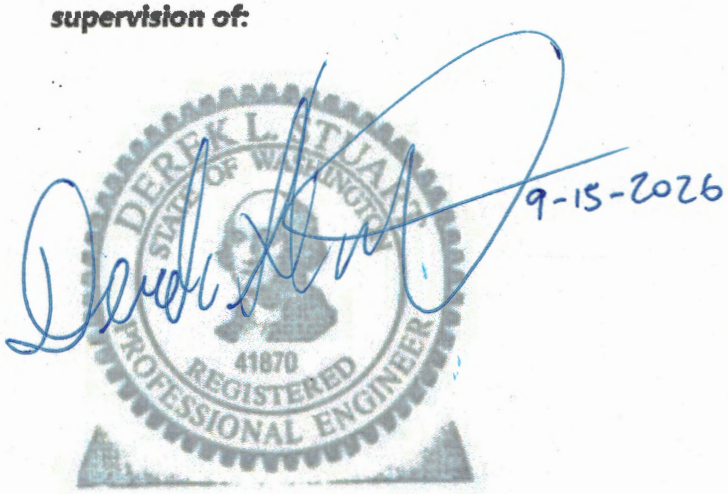

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EXECUTIVE SUMMARY

The Confederated Tribes of the Chehalis Reservation developed this Section 319 Nonpoint Source (NPS) Management Program Plan to establish a coordinated framework for protecting and improving water quality in the Upper Chehalis River Basin, corresponding to Water Resource Inventory Area 23 (WRIA 23). The plan translates the findings of the accompanying *Chehalis Basin Nonpoint Source Pollution Assessment Report* into a practical program of prioritized management actions, implementation responsibilities, monitoring, and adaptive management. It is intended to protect high-quality waters, reduce existing impairments, support aquatic habitat and culturally important resources, and prevent further degradation associated with land use, runoff, and hydromodification.

Watershed Conditions and Management Priorities

The Upper Chehalis watershed includes forested headwaters, agricultural valleys, rural-residential areas, developed corridors, floodplains, wetlands, and major tributaries such as the Black, Newaukum, Skookumchuck, and South Fork Chehalis Rivers. Tribal lands are situated along the mid-basin Chehalis River mainstem, approximately between River Miles 55 and 45. The program therefore considers both conditions within and near tribal lands and hydrologically connected upstream areas that may influence water quality entering and passing through those lands.

The NPS Assessment documented recurring concerns associated with elevated stream temperature, depressed dissolved oxygen, fecal coliform and *E. coli* bacteria, nutrient enrichment, and episodic sediment impacts reflected in total suspended solids and turbidity. These impairments are not distributed uniformly. Forested headwater subbasins generally exhibit fewer documented impairments, while agricultural, mixed rural-residential, and developed portions of the watershed show a greater overlap of temperature, dissolved oxygen, bacterial, nutrient, and runoff-related concerns.

Potential contributing factors include reduced riparian shade, low summer flows, agricultural runoff, livestock access, manure and nutrient management, onsite sewage systems, developed-area runoff, altered channels and floodplains, forest roads, erosion, and problematic stream crossings that contribute to erosion, sediment delivery, or altered drainage. Because monitoring records vary in period, duration, seasonal coverage, sample size, and spatial representativeness, priorities are not based on individual station results or land-cover percentages alone. The plan considers the combined weight of documented impairment, likely source pathways, land use, hydrologic connectivity, applicable Total Maximum Daily Loads (TMDLs), expected water-quality benefit, and current and previously identified projects and programs.

Appropriate management actions are selected based on the specific conditions and NPS concerns identified within each priority area. Initial implementation generally emphasizes the mid-basin Chehalis River corridor and contributing portions of the Black River, Newaukum River

system, Skookumchuck River, Salzer Creek, South Fork Chehalis River, and Middle Chehalis River subbasins. Lower watershed-planning priority does not preclude implementation where updated monitoring, field conditions, landowner interest, regulatory requirements, or a strong project opportunity justify action.

Program Framework and Management Actions

The program's overarching goal is to reduce the frequency and severity of water-quality impairments caused by NPSs while protecting aquatic resources that are ecologically, culturally, and economically important to the Tribe. The program will pursue this goal by implementing locally appropriate best management practices (BMPs), protecting relatively unimpaired waters, addressing cumulative watershed stressors, supporting salmonid habitat and migration, coordinating with implementation partners, and using monitoring and adaptive management to evaluate progress.

The program is structured around a watershed-based framework. In this plan, a watershed-based framework/approach means identifying water-quality problems at the reach and subbasin scale, evaluating contributing source areas and pollutant pathways, and targeting BMPs where they are expected to provide the greatest water-quality and ecological benefit.

The proposed actions, including applicable BMPs, to achieve the intended goal are organized into 11 implementation themes:

1. Agricultural source controls
2. Septic-system management
3. Runoff and stormwater controls
4. Riparian buffer establishment and restoration
5. Stream, wetland, and floodplain restoration
6. Flow conservation, groundwater recharge, and complementary water management
7. Forest-road and forest-harvest management
8. Sediment-control, crossing, ditch, and drainage improvements
9. Fish-passage improvements
10. Conservation easements and land acquisition
11. Outreach, monitoring, reporting, and adaptive management

These themes incorporate the full set of program actions identified in this report. Because many watershed projects provide multiple benefits, each future site-specific project is assigned one primary implementation theme for planning, budgeting, scheduling, and reporting. Secondary components and associated water-quality benefits may be cross-referenced.

The current plan also reviews 48 completed, ongoing, planned, or conceptual projects and programs previously identified for WRIA 23, through the 2020 Addendum to the Chehalis Watershed Management Plan. These include numerous streamflow, groundwater-recharge,

wetland, floodplain, habitat, fish-passage, and land-protection initiatives, with the largest concentrations in the Newaukum River system and Black River subbasin.

The 2020 Addendum's inventory provides a foundation for coordination and may directly or partially support several implementation themes. However, because the Addendum was prepared primarily for streamflow restoration (water quantity oriented) and net ecological benefit, it is not a complete inventory of NPS-control measures. Septic-system management, livestock and manure controls, bacterial source reduction, conventional stormwater treatment, and forestry-related sediment control remain primarily supported by the NPS Assessment, applicable TMDLs, and existing source-control programs.

Table 4.1 of this report provides the central implementation framework for the program by linking each implementation theme to its associated management actions and BMPs, targeted land uses and water-quality parameters, potential responsible/involved entities, high-priority and lower-priority areas for action implementation, and relationship to previously identified projects. The 11 implementation themes serve as the program's primary organizational groups, with individual management actions and practices grouped under the theme that best represents their primary purpose. The table is intended to guide annual work planning and project development while allowing priorities to be refined through field verification, monitoring, partner coordination, and adaptive management.

Appendix B of this report also presents the previously identified project inventory and the complementary technical basis and justifications for the priority areas selected under each implementation theme.

Administration, Partnerships, and Five-Year Implementation

The program will be administered through the Tribe's Environmental Program within the Natural Resources Department. The proposed core staffing structure includes a Program Lead, project implementation coordinator(s), a Water Quality Specialist, outreach and technical-assistance support, and administrative support. Consultants, contractors, agencies, conservation districts, local governments, nonprofit organizations, utilities, landowners, and project sponsors will provide additional technical and implementation capacity.

Potential partners vary by action and primarily include the U.S. Environmental Protection Agency, Washington State Department of Ecology, Natural Resources Conservation Service, Washington Department of Fish and Wildlife, U.S. Geological Survey, Washington Department of Natural Resources, Washington State Department of Agriculture, conservation districts, Lewis and Thurston Counties, the Cities of Chehalis and Centralia, the Chehalis Basin Partnership, the Chehalis River Basin Land Trust, the Coast Salmon Partnership, The Nature Conservancy, and participating landowners and facility owners.

A planning-level budget framework allocates approximately 10–15 percent of program resources to project management and administration, 15–20 percent to monitoring and data

management, 5–10 percent to outreach and technical assistance, 10–15 percent to detailed BMP design, and 40–60 percent to implementation contracts and other professional services. Actual funding and staffing will be phased according to project type, scale, and readiness, grant availability, partnership contributions, permitting, and annual work-plan priorities. Inclusion of an action or project in this plan does not indicate that funding has been secured.

Implementation is structured around an initial five-year cycle. Year 1 will focus on confirming priorities, reviewing available monitoring information, screening and verifying source pathways, establishing partnerships, engaging landowners, developing candidate projects and associated preliminary designs, and initiating pilot or readily implementable BMPs. Years 2 and 3 will emphasize detailed design, permitting, expanded implementation and stakeholder engagement, operation and maintenance, effectiveness monitoring, and adaptive refinement. Years 4 and 5 will focus on completing or expanding effective projects, evaluating outputs and water-quality trends, maintaining installed measures, documenting lessons learned, and preparing priorities for the next planning cycle.

Annual work plans will convert the program-level priorities into specific commitments based on available capacity and funding. For each selected BMP, the Tribe will document the project type, location, treatment extent, design basis, responsible entity, partners, anticipated schedule and cost, expected water-quality benefit, monitoring approach, and long-term operation and maintenance requirements.

Monitoring, Performance Evaluation, and Expected Outcome

Program progress will be evaluated based on both project implementation and environmental (water quality) metrics. Tracking will include the number and type of BMPs planned, designed, permitted, installed, and maintained; the area or stream length treated; the number of livestock-access, manure-management, septic, stormwater, crossing, drainage, and sediment-source concerns addressed; restored wetland, floodplain, channel, and fish-passage connectivity; landowner and partner participation; and the condition and maintenance of completed projects.

Water-quality evaluation will consider trends in the frequency, magnitude, and seasonal occurrence of temperature, dissolved oxygen, bacteria, nutrients, total suspended solids, and turbidity concerns. These trends will be interpreted together with streamflow, climate, monitoring frequency, data quality, upstream activities, and other watershed influences rather than attributed to individual projects without adequate supporting evidence.

This plan establishes a flexible, assessment-based framework rather than a fixed list of construction commitments. Its effectiveness will depend on sustained Tribal leadership, stable staffing, cooperative partnerships, landowner participation, project-specific source confirmation and sustainable funding, reliable monitoring, long-term maintenance, and periodic refinement as new information and implementation experience emerge. The approach provides a foundation for coordinated, accountable NPS management throughout WRIA 23 while protecting water quality and aquatic resources important to the Tribe and basin.

TABLE OF CONTENTS

EXECUTIVE SUMMARY **V**

Watershed Conditions and Management Priorities v

Program Framework and Management Actions vi

Administration, Partnerships, and Five-Year Implementation vii

Monitoring, Performance Evaluation, and Expected Outcome viii

1 OVERVIEW **1**

2 INTRODUCTION **3**

2.1 Program Goals, Objectives, and Strategies 4

2.2 Geographic Scope of the Program and Relation to Other Plans 5

3 MANAGEMENT PROGRAM SUMMARY **5**

3.1 Tribal Authority 6

3.2 Administrative Location, Program Structure, and Staffing Approach 6

3.3 Implementation Approach, Cooperation, and Coordination 9

4 MANAGEMENT PROGRAM DESCRIPTION **10**

4.1 List of Program Actions 10

4.2 Program Structure, Milestones, and Progress Tracking 18

4.3 Watershed-Based BMP Planning 19

4.3.1 Incorporation of CWMP 2020 Addendum Projects and Programs into NPS 319 Actions 19

4.3.2 Subbasin/Reach-Based BMP Prioritization 20

4.3.3 BMPs Implementation Schedule and Annual Work Planning 40

5 REFERENCES/SOURCES OF INFORMATION **48**

APPENDICES **50**

APPENDIX A **50**

Treatment as a State (TAS) approval 50

APPENDIX B **53**

Projects previously identified in 2020 Addendum to CWMP and complementary priority assessment 53

B.1 Overview 54

B.2 Previously Identified Projects 54

B.3 Supplementary Assessment of BMP Selection 62

B.3.1 Agricultural Source Controls 62

B.3.2 Septic-System Management 62

B.3.3 Runoff and Stormwater Controls 63

B.3.4 Riparian Buffer Establishment and Restoration 64

B.3.5 Stream, Wetland, and Floodplain Restoration 65

B.3.6 Flow Conservation, Groundwater Recharge, and Complementary Water Management 65

B.3.7 Forest-Road and Forest-Harvest Management 66

B.3.8 Sediment-Control, Crossing, Ditch, and Drainage Improvements 67

B.3.9 Fish-Passage Improvements 67

B.3.10 Conservation Easements and Land Acquisition 68

B.3.11 Outreach, Monitoring, Reporting, and Adaptive Management 69

TABLES

Table 3.1	Estimated percentage-based budget allocation by category.	8
Table 4.1	Proposed NPS management actions and watershed implementation priorities by implementation theme.	24
Table 4.2	Anticipated program-level schedule for BMP planning, design, implementation, monitoring, and adaptive management.	46
Table B.1	WRIA 23 projects identified in the 2020 Addendum to the Chehalis Watershed Management Plan (NHC, 2020).	56

FIGURES

Figure 1.1 Chehalis River Basin. 2
Figure 3.1 Suggested Administrative Chart for the NPS Management Program. 8
Figure 4.1 AI-generated illustration of livestock exclusion fencing (left) and a photo of raingarden and green roof treatment facilities constructed to treat runoff from new development (right). 11
Figure 4.2 Photo of community group removing invasive blackberries (left) and AI-generated illustration of planting of native vegetation within a riparian corridor (right). 13
Figure 4.3 Engineered Large woody debris (LWD) used to stabilize bank erosion; on Newaukum River (left) and Chehalis River at Ceres Hill Rd. (right) (NHC, 2015, 2021). 13
Figure 4.4 Photos of a livestock manure dry stack (left) and runoff holding ponds (right) used to improve the water-quality of runoff from agricultural operations (Livestock and Poultry Environmental Learning Community, 2019b, 2019a). 14
Figure 4.5 Photos showing the use of cover crops (left) and prairie strips (right) BMPs for soil conservation in cropland areas (Sustainable Agriculture Research and Education, 2026; University of Michigan, 2026). 14
Figure 4.6 Photos of constructed Beaver Dam Analogs (BDAs) using post-assisted methods, during construction (left) and post-construction (right) (NHC, 2025). 15
Figure 4.7 Illustration of a relief culvert design for an industrial forest road taken from WA DNR Forest Practices Illustrated Guidebook (WA DNR, 2026). 16
Figure 4.8 Construction site erosion and sediment control measures, silt fencing (left) and curb inlet protection (right) (Washington Stormwater Center and Minnesota Pollution Control Agency, 2026). 16
Figure 4.9 Post-construction examples of fish passage barrier replacement and riparian restoration projects in Western Washington (NHC, 2026a; WSDOT, 2015). 17
Figure 4.10 Spatial distribution of mapped Agriculture/Bare land within highest implementation-emphasis locations for *agricultural source controls*. 29
Figure 4.11 Low-intensity residential and rural zoning within highest implementation-emphasis locations for *septic-system management*. 30
Figure 4.12 Low-developed and high-developed areas within highest implementation-emphasis locations for *runoff and stormwater controls*. 31
Figure 4.13 Riparian zones within highest implementation-emphasis locations for *riparian buffer establishment and restoration*. 32
Figure 4.14 Water, agriculture, and low developed land covers within highest implementation-emphasis locations for *stream, wetland, and floodplain restoration*. 33
Figure 4.15 Highest implementation-emphasis locations for *flow conservation, groundwater recharge, and complementary water-management*. 34

Figure 4.16 Mature forest and clear-cut/shrub land covers within highest implementation-emphasis locations for *forest-road and forest-harvest management*. 35
Figure 4.17 Agricultural, forested, clear-cut/shrub and low developed land covers within highest implementation-emphasis locations for *sediment-control, crossing, ditch, and drainage improvements*. 36
Figure 4.18 Fish passage barrier and potential barrier distribution across WRIA 23 to be considered for *fish-passage improvements*. 37
Figure 4.19 Agricultural, low developed, water and forested land covers within highest implementation-emphasis locations for *conservation easements and land acquisition*. 38
Figure 4.20 Highest implementation-emphasis locations for *outreach, monitoring, reporting, and adaptive management*. 39

APPENDICES

Appendix A Treatment as a State (TAS) approval

Appendix B Projects previously identified in the 2020 Addendum to CWMP and complementary priority assessment

ACRONYMS AND ABBREVIATIONS LIST

Acronym / Abbreviation	Definition
7-DADMax	7-Day Average of the Daily Maximum Temperatures
ASRP	Aquatic Species Restoration Plan
BDA	Beaver Dam Analog
BIA	Bureau of Indian Affairs
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
cfs	Cubic Feet per Second
CWA	Clean Water Act
CWMP	Chehalis Basin Watershed Management Plan
DO	Dissolved Oxygen
DNR	Department of Natural Resource, Washington State
EPA	Environmental Protection Agency
E. coli	Escherichia coli
FC	Fecal Coliform
FEMA	Federal Emergency Management Agency
FIN	Freshwater Information Network
FSA	Farm Service Agency
FTE	Full-Time Equivalent
GI	Green infrastructure
GIS	Geographic Information System
IN	Inorganic Nitrogen
NRCS	Natural Resources Conservation Service
LID	Low Impact Development
Ln	Natural Logarithm
LWD	Large Woody Debris
MAR	Managed Aquifer Recharge
MF	Middle Fork
MP	Milepost

Acronym / Abbreviation	Definition
N	Nitrogen
NLCD	National Land Cover Database
NTU	Nephelometric Turbidity Unit
NEB	Net Ecological Benefit
NF	North Fork
NHD	National Hydrography Dataset
NPS	Nonpoint Source
NWI	National Wetlands Inventory
O&M	Operation and Maintenance
P	Phosphorus
pH	Potential/Power of Hydrogen
QA/QC	Quality Assurance/Quality Control
RM	River Mile
Rd	Road
SF	South Fork
TAS	Treatment as a State
TC	Thurston County
TMDL	Total Maximum Daily Load
TP	Total Phosphorus
TSS	Total Suspended Solids
US	The United States
USFS	U.S. Forest Service
USGS	The United States Geological Survey
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
WA	State of Washington
WDFW	Washington Department of Fish and Wildlife
WQ	Water Quality
WQX	Water Quality Exchange

Acronym / Abbreviation	Definition
WQP	Water Quality Portal
WQS	Water Quality Standards
WRIA	Water Resource Inventory Area
WSDA	Washington State Department of Agriculture
WWTP	Wastewater Treatment Plant

GLOSSARY

Term	Definition
7-DADMax - 7-day average of daily maximum temperatures	The arithmetic mean of seven consecutive daily maximum water temperatures. The 7-DADMax for a given day is calculated by averaging that day's daily maximum temperature with those from the three preceding and three following days.
Action Group	One of the six plan-specific groups used in Section 4.1 of the current report to organize and number program actions primarily according to the water-quality concern or supporting program function they address. Action groups are an organizational convention of this Plan and the Program Actions organized under these groups contribute to the watershed-based strategy described in the report.
BMPs - Best Management Practices	Physical, structural, or managerial practices approved by the Department of Ecology that, when implemented individually or in combination, are designed to prevent or reduce pollutant discharges to waters of the State of Washington. BMPs are selected based on the identified source, stressor, site conditions, and expected benefit.
BOD - Biochemical Oxygen Demand	A measure of the amount of oxygen required by microorganisms to decompose organic matter in water over a specified incubation period, usually five days at 20 °C (reported as BOD_5). BOD is an indicator of the organic pollution load and the potential for oxygen depletion in receiving waters.
DO - Dissolved Oxygen	The concentration of oxygen gas dissolved in water, typically expressed in milligrams per liter (mg/L) or as a percentage of saturation.
E. coli - Escherichia coli	A bacterium from the Enterobacteriaceae family commonly found in the intestinal tracts of warm-blooded animals. Its presence in water samples indicates fecal contamination and the possible presence of enteric pathogens.
FC - Fecal Coliform	That portion of the coliform bacterial group found in the intestinal tracts and feces of warm-blooded animals, detected through the production of acid or gas from lactose in a suitable culture medium within 24 hours at 44.5 ± 0.2 °C.
Implementation Theme	A plan-specific, solution-oriented grouping of related program actions based on their principal source-control mechanism, management practice, or implementation activity. The 11 implementation themes (defined under Section 4.3.2) are used to organize implementation priorities, responsibilities, scheduling, and reporting of the program actions under the watershed-based strategy described in this report.

Term	Definition
Lake	A standing water body, including reservoirs, characterized by a mean detention time greater than 15 days. Mean detention time is defined as the ratio of a reservoir's mean annual minimum total storage to the 30-day, 10-year low flow entering the reservoir.
Lower Chehalis	The State of Washington Water Resource Inventory Area (WRIA) 22, covering the Lower Chehalis Watershed within the Chehalis River Basin.
NPS - Nonpoint source	Pollution that enters surface or ground waters from diffuse, unconfined sources rather than from a discrete conveyance. Examples include runoff from agricultural fields, urban areas, forestlands, and atmospheric deposition, as well as discharges from boats or marine vessels not regulated under the National Pollutant Discharge Elimination System (NPDES).
NPS Category:	A broad land-use, activity, or source classification that generates or contributes to nonpoint source pollution. EPA uses source categories to organize NPS assessment and management. Applicable categories are addressed in this Plan through one or more implementation themes and program actions.
pH	The negative logarithm (base 10) of the hydrogen ion concentration in water, used to express the degree of acidity or alkalinity of a solution.
Pollution	Any contamination or alteration of the physical, chemical, or biological properties of state waters, including changes in temperature, taste, color, turbidity, or odor, or the discharge of substances (liquid, gaseous, solid, radioactive, or other) that may render such waters harmful or injurious to public health, welfare, aquatic life, or designated beneficial uses.
Priority Area [for Action Implementation]	A reach, subbasin, or other area where a particular management action receives greater relative implementation emphasis based on identified impairments, source categories and pathways, land use, hydrologic connectivity, expected benefit, and other implementation considerations. It does not by itself represent a ranking of impairment severity.
Program Action	A specific management measure, BMP, or supporting program activity identified and numbered in Section 4.1. Program actions are cross-walked to the implementation themes in Table 4.1 according to their principal implementation function and collectively support implementation of the watershed-based strategy.
Salmonid spawning, rearing, and migration for naturally limited waters	A subcategory of the aquatic life use designation for waters where salmonid use (spawning, rearing, or migration) is naturally limited by inherent physical, chemical, or biological characteristics of the stream or water body.

Term	Definition
Source Pathway	The physical or hydrologic route by which a pollutant or other NPS influence is transported from its source to a receiving water.
Stressor	A physical, chemical, or biological parameter or condition that directly or indirectly contributes to an adverse water-quality or aquatic-ecosystem response. In this Plan, stressors include conditions such as elevated temperature, low dissolved oxygen, excess nutrients, bacteria, sediment/turbidity, flow alteration, and physical habitat alteration.
Subbasin	Planning areas dividing up WRIA 22 and 23 based on tributary and reach (there are 14 subbasins in WRIA 23 discussed in this report)
The Chehalis Basin	The entire Chehalis River Basin including both Lower Chehalis (WRIA 22) and Upper Chehalis (WRIA 23) watersheds.
TSS - Total Suspended Solids	The total mass of particulate matter suspended in water, typically expressed in milligrams per liter (mg/L). TSS includes silt, clay, organic material, and other fine particles that can reduce water clarity, affect light penetration, and contribute to sedimentation in aquatic habitats. TSS is distinguished from suspended sediment concentration (SSC): SSC is measured as the dry weight of all sediment in a known volume of a water–sediment mixture, whereas TSS is measured from a subsample using methods originally developed for wastewater analysis (John R. Gray et al., 2000).
Turbidity	An optical property that measures the scattering of light by suspended particles in water, expressed in nephelometric turbidity units (NTU). Turbidity is determined using a calibrated turbidimeter and reflects water clarity, which can affect photosynthesis, habitat quality, and drinking water treatment requirements.
Upper Chehalis	The State of Washington Water Resource Inventory Area (WRIA) 23, covering the Upper Chehalis Watershed within the Chehalis River Basin.

1 OVERVIEW

The Confederated Tribes of the Chehalis Reservation (the Tribe) prepared this document to establish a comprehensive Nonpoint Source (NPS) Management Program Plan that builds directly on the findings of the accompanying Chehalis Basin NPS Pollution Assessment report (NHC, 2026b) and guides coordinated actions to protect and restore surface waters affected by NPS pollution in the Chehalis River Basin. Readers are strongly encouraged to first review that report (NHC, 2026b), which forms the foundation of the current plan.

The Chehalis River Basin (Figure 1.1) encompasses a diverse network of rivers, tributaries, floodplains, wetlands, and riparian corridors that support important aquatic habitats, water supply uses, recreation, and culturally significant resources. Within the basin, the Upper Chehalis Watershed (WRIA 23) contributes the majority of upland drainage and plays a critical role in determining downstream water quality conditions in the Chehalis mainstem and lower basin. The accompanying NPS Assessment Report focused primarily on the Upper Chehalis Basin, while recognizing its hydrologic and water quality connectivity to downstream waters in WRIA 22.

Surface waters within the basin support multiple beneficial uses, including salmonid spawning, rearing, and migration, primary and secondary contact recreation, agricultural water supply, and ecological habitat functions. Forestlands dominate much of the headwater and upland areas, while agricultural, rural residential, and urban land uses are concentrated in mid-basin and mainstem corridor areas, particularly near Centralia, Chehalis, and along major tributaries such as the Black River, Newaukum River, Skookumchuck River, and South Fork Chehalis River (NHC, 2026b).

The NPS Pollution Assessment report (NHC, 2026b) identified persistent water quality impairments across multiple parameters and documented numerous NPS pollution sources and contributing factors throughout the basin. It should be noted that point sources may also contribute to some observed impairments; however, the Assessment did not quantify the relative influence of point and nonpoint sources due to the scope of the study.

Based on analysis of historical TMDLs, previous studies, and current monitoring data from Ecology's Freshwater Information Network (FIN) and tribal water-quality data obtained from the Water Quality Portal (WQP) dataset, the most significant impairments include elevated water temperature (7-DADMax exceedances), depressed dissolved oxygen (DO) concentrations, fecal coliform (FC) and *E. coli* bacteria exceedances, and episodic sediment-related impacts reflected in turbidity and total suspended solids (TSS). Nutrient enrichment, particularly total phosphorus (TP) and inorganic nitrogen (IN) species, contributes indirectly to these impairments by promoting eutrophic conditions, increased biochemical oxygen demand (BOD), and biologically driven variability in DO and pH.

Spatial analysis in the NPS Pollution Assessment report demonstrated that these impairments are not uniformly distributed across the basin (NHC, 2026b). Forested headwater subbasins generally exhibit lower exceedance rates and greater resilience, while agricultural, mixed rural–residential, and urban-influenced subbasins show higher frequencies and magnitudes of exceedances across multiple parameters. Low-gradient mainstem reaches and agriculturally influenced tributaries exhibit the strongest overlap of thermal stress, low DO, and bacterial contamination, particularly during summer low-flow and storm-driven runoff periods. These findings indicate that cumulative and interacting NPS stressors, rather than isolated sources, are driving water quality impairment in the Upper Chehalis Basin, demanding a watershed-based approach to resolve/mitigate the impairments.

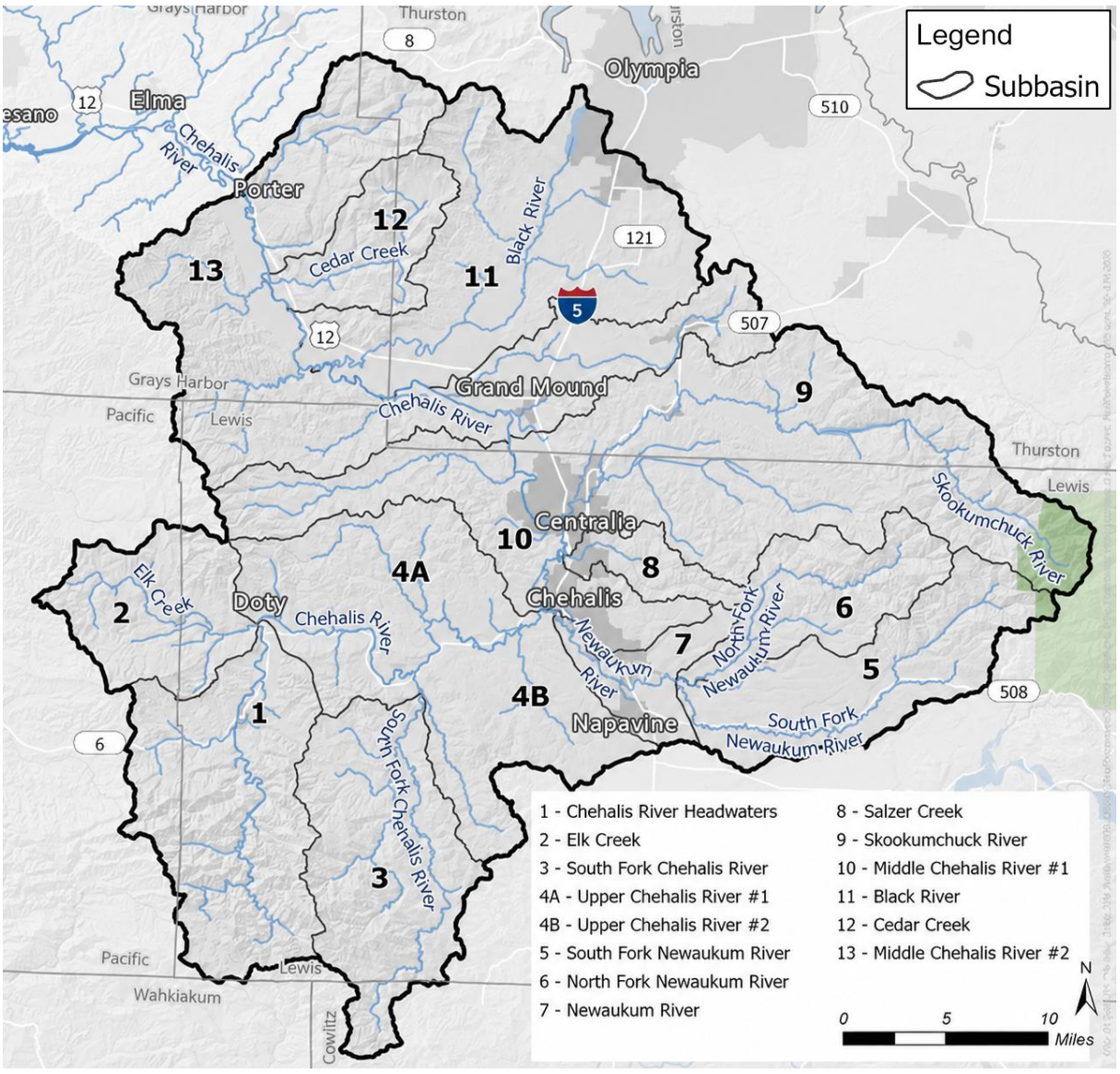

Figure 1.1 Chehalis River Basin.

The environmental setting of the basin presents both challenges and opportunities for NPS management. Seasonal hydrology characterized by high winter flows and low summer baseflows, coupled with wide floodplains, modified channel morphology, and altered riparian conditions, increases vulnerability to temperature, DO, and bacteria impairments. At the same time, extensive forest cover, intact riparian corridors in some subbasins, and ongoing restoration and stewardship efforts provide a strong foundation for effective NPS pollution control (NHC, 2026b).

Evaluation within the study area in the NPS Assessment Report (NHC, 2026b) revealed a strong correlation between land use and water quality impairments, particularly in mid-basin subcatchments that are considerably impacted by agricultural and development-related stressors from commercial, residential, and industrial land uses. The assessment confirmed a clear need for a coordinated, watershed-based NPS management program to protect high-quality waters, restore impaired reaches, and prevent further degradation as land use pressures continue. Proactive NPS management is essential to avoid more costly remediation in the future and to sustain the basin's ecological, cultural, and economic values. Special considerations relevant to this program include the basin's importance to salmonid populations, the cultural significance of aquatic resources to the Tribe, and the need for coordination across jurisdictional boundaries involving tribal, federal, state, county, municipal, and private lands. Addressing NPS pollution in the Chehalis Basin requires collaborative approaches that integrate land stewardship, habitat protection, water quality improvement, and community engagement.

It should be noted that the Tribe was granted Treatment as a State (TAS) approval by the U.S. Environmental Protection Agency (EPA) on March 7, 1995, to administer environmental regulatory programs in the area, particularly for administration of water-quality standards (WQS), Section 106 pollution control, and Section 303(c) without an enforcement component. Certification of Tribal authority to administer WQS, Section 106 pollution control, and Section 303(c) is documented in the TAS approval and supporting documentation, which are included in Appendix A.

The NPS Pollution Assessment report for the Chehalis River Basin (NHC, 2026b) laid the foundation for the development of the current management program. Basin-wide maps illustrating major rivers and tributaries, subbasin boundaries associated with stream networks, land use patterns, monitoring locations, and spatial exceedance patterns for multiple water quality parameters, developed under the previous report, are used in this plan to identify water resources requiring management and to support spatial prioritization of NPS management actions.

2 INTRODUCTION

The purpose of this NPS Management Program Plan is to provide a structured framework for addressing NPS pollution affecting water quality within the Chehalis River Basin, with particular

emphasis on the Upper Chehalis Watershed (WRIA 23). This plan translates the findings of the Chehalis Basin NPS Pollution Assessment report into a high-level coordinated program of management actions designed to protect high-quality waters, restore/mitigate impaired reaches, and prevent future degradation associated with land use, runoff, and hydromodification.

2.1 Program Goals, Objectives, and Strategies

The overarching goal of the NPS Management Program Plan is to reduce water quality impairments caused by NPS pollution and to support the long-term protection of aquatic resources that are ecologically, culturally, and economically important to the Tribe. Specific program objectives include:

- Reducing the frequency and magnitude of exceedances for key water quality parameters identified in the assessment report, including temperature (7-DADMax), DO, FC and *E. coli*, sediment-related indicators (TSS and turbidity), and nutrient-related (TP and IN) stressors.
- Protecting and maintaining high-quality waters and relatively unimpaired headwater and tributary systems through preventative and conservation-based management practices.
- Addressing cumulative and interacting NPS stressors at the watershed and subbasin scale.
- Supporting salmonid spawning, rearing, and migration uses through improvements in thermal regime, oxygen availability, habitat condition, and water quality.
- Promoting implementation of effective and locally appropriate Best Management Practices (BMPs) across agricultural, rural residential, urban, forested, and riparian land uses.
- Strengthening coordination among tribal, federal, state, county, municipal, and private stakeholders to support integrated watershed management through the implementation of multi-purpose projects.

To achieve these objectives, the NPS Management Program Plan will employ a watershed-based strategy that integrates assessment-driven prioritization, implementation of BMPs, water quality monitoring, and adaptive management. Key strategies include:

- Using subbasin-scale assessment results and spatial exceedance analyses to prioritize management actions where impairments are most severe or persistent.
- Building upon existing TMDL implementation efforts, restoration/mitigative projects, and stewardship programs already active within the basin.
- Emphasizing voluntary, incentive-based BMP implementation where appropriate.
- Supporting education, outreach, and technical assistance for landowners, industries, the public, and local governments to promote the adoption and long-term maintenance of effective NPS controls and to protect waters that currently exhibit high water quality.

- Incorporating monitoring and data evaluation to track progress, evaluate BMP effectiveness, refine management actions over time, and engage additional stakeholders through clear communication of mitigation outcomes.

2.2 Geographic Scope of the Program and Relation to Other Plans

The geographic focus of the NPS Management Program Plan is the Upper Chehalis Watershed (WRIA 23), which contributes the majority of upland drainage and exerts strong influence on downstream water-quality conditions. Within WRIA 23, priority attention will be given to subbasins and reaches identified in the assessment report (NHC, 2026b) as exhibiting recurring or multiple water-quality impairments, including portions of the Chehalis mainstem and major tributaries such as the Black River, Newaukum River, Skookumchuck River, and South Fork Chehalis River. Tribal lands are located along the mid-basin Chehalis River mainstem, approximately between River Mile (RM) 55 and RM 45; therefore, the program will also consider hydrologically connected upstream sources and management actions that may protect water quality entering and passing through tribal lands.

The Upper Chehalis Watershed spans multiple counties, including Lewis, Thurston, Pacific, Grays Harbor, and a small portion of Cowlitz County. The program recognizes that water-quality impairments are not confined by jurisdictional boundaries. Accordingly, implementation activities may occur on tribal trust lands, fee lands within the reservation, and non-tribal lands upstream or adjacent to reservation waters where cooperative actions are necessary to protect downstream resources. The program will emphasize collaboration with local governments, conservation districts, state and federal agencies, and private landowners to address NPS pollution sources contributing to impacts on tribal waters.

This NPS Management Program is intended to complement and support existing water quality, habitat, and watershed management efforts within the Chehalis Basin. The program aligns with the goals and recommendations of historical TMDLs (Anise Ahmed & Dave Rountry, 2004; Butkus, 1999; Coots, 1994; Ecology, 2001; Kahle Jennings & Paul Pickett, 2000), watershed planning efforts under the Chehalis Basin Watershed Management Plan (CWMP) (Chehalis Basin Partnership, 2004; NHC, 2020), habitat restoration initiatives, and ongoing monitoring programs identified and listed in the assessment report (NHC, 2026b). Coordination with the objectives and strategies of these implemented or ongoing efforts will help ensure efficient use of resources, avoid duplication, incorporate lessons learned, and maximize environmental benefits.

3 MANAGEMENT PROGRAM SUMMARY

This section summarizes the institutional framework under which the NPS Management Program will be implemented by the Tribe. It describes tribal authorities, the administrative

placement of the program within tribal governance, coordination with other tribal and external programs, and the overall approach for implementing a watershed-based NPS program consistent with the findings of the Chehalis Basin NPS Pollution Assessment report.

3.1 Tribal Authority

As mentioned, the Tribe was granted TAS status by EPA to administer environmental regulatory programs in the area, particularly for administration of WQS, Section 106 pollution control, and Section 303(c). By submission of the NPS Assessment and the current report, the Tribe also seeks an authority approval providing the legal and administrative foundation for development and implementation of the NPS Management Program and associated water-quality protection activities. As noted, documentation of TAS approval and previous certification of tribal authority - associated with administration of standards, Section 106 pollution control, and Section 303(c) - is included in Appendix A.

The NPS Management Program is designed to be consistent with applicable tribal policies, natural resource management objectives, and water-quality goals articulated in the Chehalis Basin NPS Pollution Assessment report. The program also aligns with federal Clean Water Act objectives and supports implementation of TMDL-related recommendations identified in previous studies for the Chehalis River Basin.

The Tribe has anti-degradation ordinances incorporated into its effective code and WQS. An update to these provisions is currently in progress, and the revised WQS are under review by the EPA.

3.2 Administrative Location, Program Structure, and Staffing Approach

The NPS Management Program will be administered within the tribal governing body under the environmental program of the natural resources management function of the Tribe. Program administration will be coordinated with existing tribal water-quality programs, environmental reviews, watershed planning, and natural resource conservation and restoration activities all defined under the Environmental Program to ensure consistency across programs and efficient use of staff and funding resources.

The program will maintain working relationships with other tribal departments and governance structures involved in community outreach, fisheries management and habitat restoration, flood program, and forestry program, recognizing the interrelated nature of water quality, habitat condition, and culturally significant resources. Key governance relationships include:

- Oversight and administration by the environmental programs manager within the Natural Resources Department;
- close coordination with other programs defined under Natural Resources Department, the Fisheries Department, and the Tribal Historic Preservation Office;
- informal liaisons with counties, state (Ecology), local conservation districts, and watershed partners through Environmental Programs Manager, Natural Resources Department; and
- formal consultation with federal entities such as EPA, U.S. Forest Service (USFS), U.S. Fish and Wildlife Service (USFWS), and Bureau of Indian Affairs (BIA).

Staffing levels should be phased in alignment with program progress and milestones discussed in the next sections. Initial core staffing for a five-year NPS program should include (at minimum):

- Program Lead (1 Full-Time Equivalent, FTE) - oversees grants and partnerships, oversees different projects defined under the program, coordinates annual work plans and reporting, liaison to Tribal Committee/Council and external partners. Program Lead could be Environmental Programs Manager within the Natural Resources Department of the Tribe.
- Project Implementation Coordinators (0.5-1 FTE for each project) - scope, design, manage installation, and O&M of BMPs, work with contractors and NRCS/EPA/Conservation Districts etc., and report to the program lead.
- Water-Quality Specialist (1 FTE) - manages design and implementation of monitoring program, quality assurance/quality control (QA/QC), data analysis, and GIS integration with exceedance datasets (FIN/WQP).
- Outreach and Technical Assistance (0.5 FTE) - develops landowner and stakeholder outreach, workshops, and hands-on technical support for BMP adoption.
- Administrative support (0.25 FTE) - assists with invoicing, contracting, and documentation.

It should be noted that this list reflects the tribal core staffing only and is separate from the consultants and contractor staff required to design, review, survey, construct, and/or implement the projects defined under the program. Figure 3.1 illustrates the suggested administrative chart for this program.

There are several promising opportunities for funding collaboration and partnership, including with the State of Washington - particularly the WDFW and Ecology - as well as with counties and conservation districts. Additional opportunities may also exist to collaborate with the NRCS on projects that align with shared conservation and restoration priorities.

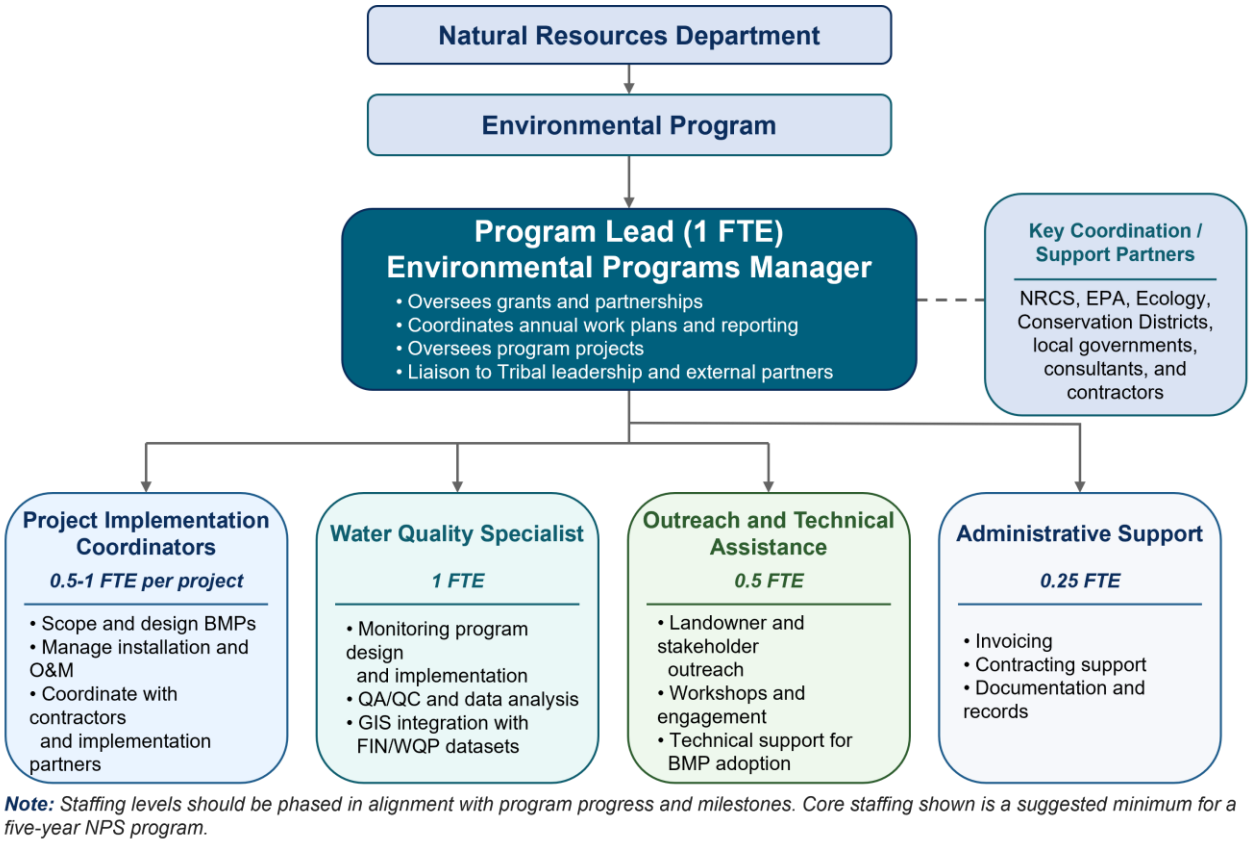

Figure 3.1 Suggested Administrative Chart for the NPS Management Program.

The table presents the estimated percentage allocation of the total program budget at a high planning level, broken down by the principal budget categories required to implement the program within the study area.

Table 3.1 Estimated percentage-based budget allocation by category.

Budget Category	Estimated Range of the Total Budget (%)
Project Management and Administration	10-15%
Monitoring and Data Management	15-20%
Outreach & Technical Assistance	5-10%
BMPs Detailed Design	10-15%
Implementation Contracts & Other Professional Services	40-60%

3.3 Implementation Approach, Cooperation, and Coordination

The NPS Management Program will be implemented using a watershed-based framework, consistent with the spatial analyses and findings presented in the assessment report. The watershed-based approach is recommended due to the cumulative, land use related, and interconnected nature of NPS pollution sources identified across subbasins in the Upper Chehalis Watershed. A watershed-based approach is particularly recommended because:

- impairments are linked to spatially distributed landscape-scale drivers (riparian condition, agricultural practices, urban runoff, low summer flows, etc.);
- it enables prioritization of reaches and subbasins where co-occurring stressors produce the greatest ecological benefit from BMPs; and
- it supports integrated monitoring, adaptive management, and multi-partner implementation across different jurisdictional boundaries.

This approach allows the program to prioritize actions based on subbasin-scale water-quality conditions, land use patterns, and documented exceedance trends, rather than addressing individual sources in isolation. As mentioned, the watershed-scale planning approach also supports coordination across jurisdictional boundaries and aligns with EPA guidance for effective NPS management. Within this approach, successful implementation of the NPS Management Program will depend on coordination with multiple partners and programs operating within the Chehalis River Basin. The Tribe will coordinate with federal, state, county, municipal, and local entities involved in water quality, land management, agriculture, livestock industry, fisheries, forestry, transportation, and habitat restoration. The program will also coordinate with other federally/locally funded projects undertaken by the Tribe to ensure consistency with water-quality goals and to avoid potential conflicting actions. A list of planned, ongoing, and completed projects within WRIA 23 is provided in the following section of this report and was considered during the BMP selection process.

Cooperative reporting and data sharing mechanisms through online platforms such as Microsoft 365 will be used where appropriate to securely share data, track progress, and support integrated watershed management efforts. Formal data-sharing agreements and standardized QA/QC protocols will support further cooperative reporting and data sharing.

Local and regional expertise will be integrated into program planning and implementation through collaboration with technical specialists and stakeholders familiar with basin conditions. A list of potential partners for effective implementation of the program is provided in Table 4.1 under the "Potential Responsible / Involved Entities" column.

To maximize technical excellence and local acceptance the program will:

- contract with local technical experts and consultants (e.g., geomorphologists, hydrologists, hydraulic engineers, planners, fisheries biologists, agronomists) where internal capacity is limited; and

- coordinate monitoring and reporting with Ecology, EPA, USGS, NRCS, WDFW, Conservation Districts, Lewis and Thurston Counties, Cities of Chehalis and Centralia, and the Chehalis Basin Partnership to avoid duplication, promote consistent methods, and to enable data sharing (e.g., WQP/FIN integration).

4 MANAGEMENT PROGRAM DESCRIPTION

The Chehalis Basin NPS Management Program Plan is structured to address the key water-quality impairments identified in the NPS Assessment Report, focusing on DO, temperature (7-DADMax), bacterial contamination (FC and *E. coli*), sediment-related parameters (TSS and turbidity), and nutrient enrichment (TP and IN). The program applies a watershed-based approach that prioritizes actions according to subbasin- and reach-specific impairments, source pathways, and land-use conditions. The actions described in this section emphasize measurable outcomes, long-term sustainability, adaptive management, and collaboration with Tribal, local, state, and federal partners. This section first presents the program actions, followed by the program structure and milestones, the watershed-based spatial prioritization of BMPs, and a high-level five-year implementation schedule and annual work-planning framework.

4.1 List of Program Actions

The NPS Assessment Report identified a broad suite of potential BMPs and program actions that can be implemented throughout the watershed to mitigate water-quality impairments (NHC, 2026b). For purposes of establishing and numbering the program actions, Section 4.1 organizes these actions into six action groups primarily based on the water-quality concern or supporting program function they address.

It should be noted that the individual actions may address more than one water-quality parameter and may therefore provide benefits relevant to more than one action group. For the purpose of action implementation planning, the numbered program actions established below are subsequently reorganized in Section 4.3.2 into 11 implementation themes based on their primary source-control mechanism, management practice, or implementation activity.

1. Bacterial Contamination

    - Sources: livestock access to streams, failing septic systems, stormwater runoff from developed and agricultural lands.

- Goals: sustainably reduce bacterial (FC and *E. coli*) exceedances at critical stations to meet WQS.
- Program Actions:

1.1. Livestock exclusion fencing and off-stream watering (e.g., pasture pumps), example shown in Figure 4.1.
1.2. Riparian buffer establishment and restoration.
1.3. Septic-system inspection, routine maintenance, repair, and replacement, supported by homeowner outreach, technical and financial assistance, and enforcement by the applicable health authorities.
1.4. Runoff and stormwater controls for agricultural and developed lands, including retention and treatment practices.
1.5. BMP workshops and technical assistance for farmers and landowners to reduce manure delivery to waterways and support compliance with applicable WQS.
1.6. Low Impact Development (LID) for new and redevelopment and stormwater retrofits of existing development at parcel and community scales, see example shown in Figure 4.1 or other BMPs in an Ecology's Manual (Ecology, 2024).
1.7. Smart agriculture and sensor-based nutrient and irrigation management.
1.8. Targeted monitoring, evaluation of likely contributing source areas, and reporting in subbasins with higher implementation emphasis and mainstem reaches[1].

Figure 4.1 AI-generated illustration of livestock exclusion fencing (left) and a photo of raingarden and green roof treatment facilities constructed to treat runoff from new development (right).

[1] Including monitoring locations relevant to tribal lands and contributing areas such as the Black, Newaukum, and Skookumchuck Rivers.

2. Temperature (7-DADMax)

    - Sources: reduced riparian shading, altered channel morphology, low summer baseflows, and stormwater heating.
    - Goals: reduce the frequency and severity of temperature exceedances and make measurable progress toward meeting applicable core-summer, spawning-period, and incubation-period standards by improving thermal resilience.
    - Program Actions:

        2.1. Riparian planting and re-vegetation with native trees and shrubs, example shown in Figure 4.2.
        2.2. Stream-channel and floodplain restoration, including channel naturalization, side-channel reconnection, and width-to-depth ratio stabilization where appropriate.
        2.3. Large woody debris (LWD), engineered log jams, and bioengineering measures, particularly for shading, thermal refuge, and re-aeration; example shown in Figure 4.3.
        2.4. Flow conservation through irrigation efficiency and groundwater protection.
        2.5. Floodplain storage, groundwater-recharge, and hyporheic exchange enhancement practices.
        2.6. Stormwater infiltration practices as outlined in the Ecology manual (Ecology, 2024).

3. Nutrients

    - Sources: agricultural fertilizers, dairy waste, septic systems.
    - Goals: reduce phosphorus (P) and nitrogen (N) loading to prevent eutrophication and associated DO depletion.
    - Program Actions:

        3.1. Nutrient and manure management, including appropriate application rates and timing and improved manure storage, containment, and handling.
        3.2. Smart agriculture approaches (sensor-based irrigation and nutrient control where feasible).
        3.3. Retention and treatment of agricultural runoff, example shown in Figure 4.4.
        3.4. Use of cover crops, prairie strips (strips of native vegetation integrated into cropland), and/or filter or buffer strips on agricultural lands to promote soil conservation and control of nutrients; example shown in Figure 4.5.

Figure 4.2 Photo of community group removing invasive blackberries (left) and AI-generated illustration of planting of native vegetation within a riparian corridor (right).

Figure 4.3 Engineered Large woody debris (LWD) used to stabilize bank erosion; on Newaukum River (left) and Chehalis River at Ceres Hill Rd. (right) (NHC, 2015, 2021).

Figure 4.4 Photos of a livestock manure dry stack (left) and runoff holding ponds (right) used to improve the water-quality of runoff from agricultural operations (Livestock and Poultry Environmental Learning Community, 2019b, 2019a).

Figure 4.5 Photos showing the use of cover crops (left) and prairie strips (right) BMPs for soil conservation in cropland areas (Sustainable Agriculture Research and Education, 2026; University of Michigan, 2026).

4. DO (influenced by temperature and nutrients noted above)

    - Sources: organic loading from agricultural lands, nutrient enrichment, low-flow conditions, and thermal stress.
    - Goals: maintain DO concentrations above applicable WQS and improve conditions in impaired reaches.
    - Program Actions (also impacting temperature and/or nutrients):

        4.1. Riparian restoration for shading and cooling, example shown previously in Figure 4.2.

4.2. Nutrient and manure management on agricultural lands (e.g., manure storage ponds and manure containment facilities, example shown previously in Figure 4.4).
4.3. Wetland restoration and floodplain reconnection, including nature-based solutions such as Beaver Dam Analogs (BDAs; as shown in Figure 4.6) and vegetated ditches, to improve hydrologic connectivity, nutrient retention, and flow moderation.
4.4. Maintaining minimum flows (e.g., 500–1000 cfs) during seasonal discharge limits.

Figure 4.6 Photos of constructed Beaver Dam Analogs (BDAs) using post-assisted methods, during construction (left) and post-construction (right) (NHC, 2025).

5. Sediment / TSS

- Sources: forestry operations, unpaved roads, bank destabilization, urban and agricultural runoff.
- Goals: reduce episodic high sediment loads and improve habitat quality and channel stability.
- Program Actions:

5.1. Shoreline stabilization, revegetation, and management of invasive vegetation.
5.2. Forest road abandonment or improvements, including drainage and stream crossing improvements (e.g., Figure 4.7), seeding, mulching, and erosion control (see other BMPs in DNR (2026). Similar measures can also be applied to recreational trail management.
5.3. LWD, engineered log jams, and log deflectors to improve sediment sorting, reduce localized erosion, stabilize banks, and restore channel complexity.
5.4. Engineered sediment control structures, such as sediment traps, sediment retention basins.

5.5. Temporary erosion and sediment control measures such as silt fencing, catch-basin inserts (Figure 4.8), grade-control structures, or check dams.
5.6. Stream-crossing, culvert, ditch, and drainage improvements where existing infrastructure contributes to erosion, sediment delivery, headcutting, or floodplain disconnection.

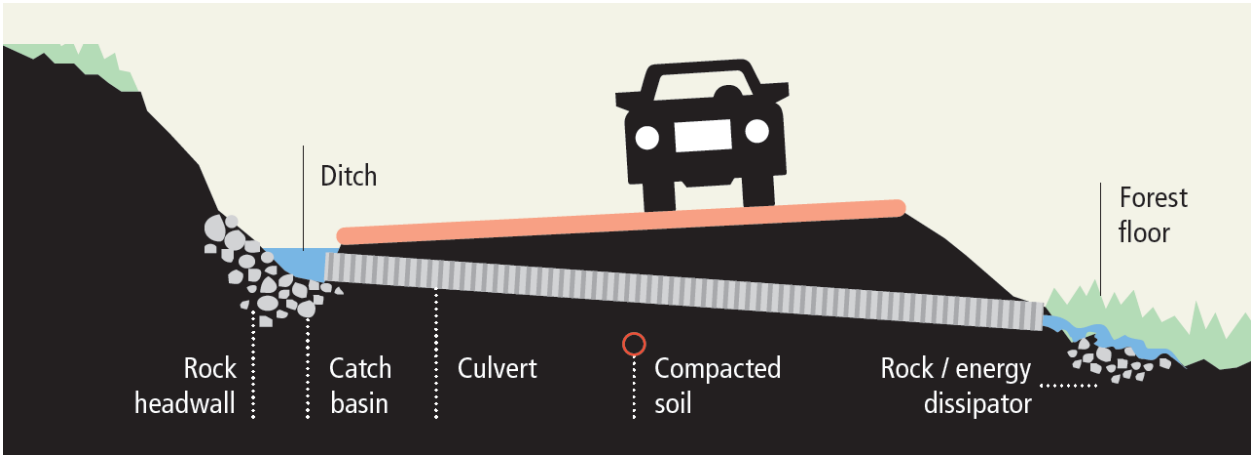

Figure 4.7 Illustration of a relief culvert design for an industrial forest road taken from WA DNR Forest Practices Illustrated Guidebook (WA DNR, 2026).

Figure 4.8 Construction site erosion and sediment control measures, silt fencing (left) and curb inlet protection (right) (Washington Stormwater Center and Minnesota Pollution Control Agency, 2026).

6. Cross-Cutting and Complementary Program Actions

- Goals: support ecosystem restoration, water-quality improvement, sustainable land management, and coordinated watershed protection possibly beyond individual grant cycles.
- Program Actions:

6.1. Public outreach, education, and technical assistance.
6.2. Forest harvest and post-harvest vegetation management.
6.3. Wildlife habitat restoration, off-channel refuge alcoves, and spawning habitat restoration (e.g., spawning pads).
6.4. Stormwater retrofits (e.g. bioretention or other technologies listed in the Stormwater Management Manual for Western Washington)
6.5. Conservation easements and land acquisition to protect or restore natural land cover and ecological function.
6.6. Fish passage improvements, including construction or retrofit of fish-passable crossings (e.g., Figure 4.9) and modification of gated culverts and pump stations to reduce barriers to aquatic species.
6.7. Seasonally target the implementation and operation and maintenance (O&M) of BMPs to critical water-quality periods identified through monitoring, including summer low-flow and high-temperature conditions and wet-season or storm-event periods.
6.8. Complementary water-management actions, including water reuse, diversion relocation, and voluntary instream-flow transactions where feasible, effective, and consistent with legal, agricultural, and community objectives.
6.9. Continued implementation and effectiveness monitoring, project tracking, periodic reporting, and adaptive refinement of BMP priorities and designs.

Figure 4.9 Post-construction examples of fish passage barrier replacement and riparian restoration projects in Western Washington (NHC, 2026a; WSDOT, 2015).

4.2 Program Structure, Milestones, and Progress Tracking

The program will operate through a combination of Tribal staff, technical partners, consultants, and contractors, coordinated under the Environmental Program within the Natural Resources Department of the Confederated Tribes of the Chehalis Reservation, with implementation supported through close coordination and cooperation with local jurisdictions, landowners, and other watershed partners. It will use a watershed-based framework that prioritizes actions according to the frequency and severity of documented impairments, coincident exceedances, likely source pathways, dominant land uses, hydrologic connection to tribal lands, expected water-quality benefit, stakeholder involvement, and project readiness. Initial emphasis will be placed on the reaches and subbasins with higher implementation emphasis, identified in Section 4.3, including the mid-basin Chehalis River corridor and contributing portions of the Black River, Newaukum River, Skookumchuck River, Salzer Creek, and Middle Chehalis River subbasins. Local experts, technical partners, and contractors will support source evaluation, BMP design, permitting, construction, monitoring, O&M, and reporting.

The program milestones are aligned with the five-year implementation framework described later in Section 4.3. The first year will emphasize monitoring review, source screening, field verification, partnership development, landowner outreach, feasibility assessment, project development, and implementation of pilot or readily implementable BMPs. Years 2 and 3 will emphasize detailed design, permitting, expanded implementation, effectiveness monitoring, O&M, and adaptive refinement. Years 4 and 5 will focus on completing and expanding effective BMPs, evaluating water-quality trends, maintaining installed measures, documenting program performance, and preparing recommendations for the next planning cycle.

The program will generally progress through the following milestones, with detailed activities and sequencing provided in the next Section:

- **Year 1 – Program initiation and project development:** confirm implementation priorities, establish partnerships, develop candidate projects, and initiate pilot or readily implementable BMPs.
- **Years 2–3 – Expanded implementation and adaptive refinement:** detailed design and advance priority BMPs, broaden participation, evaluate early performance, and refine implementation based on monitoring and project experience.
- **Years 4–5 – Program evaluation and continued implementation:** complete or expand effective BMPs, assess program outcomes, address remaining needs, and prepare recommendations for the next planning cycle.
- **Beyond Year 5 – Long-term continuation:** maintain and replace BMPs as needed, sustain monitoring and partnerships, and update the program through adaptive management.

To quantitatively evaluate the progress of the program several measurable outcomes will be evaluated annually under each program's milestone. Measurable outcomes to be assessed under the program's milestones include:

- number and type of BMPs planned, designed, permitted, installed, and maintained;
- area or length of riparian buffers restored;
- area of agricultural, developed, forested, wetland, or floodplain land treated;
- number of livestock-access, manure-management, septic-system, stormwater, crossing, drainage, or sediment-source problems addressed;
- extent of restored floodplain, wetland, or channel connectivity;
- number of landowners, community members, agencies, and other stakeholders participating;
- number or extent of identified sediment-source areas treated and estimated reduction in sediment delivery;
- completion and maintenance status of installed BMPs; and
- trends in the frequency, magnitude, and seasonal occurrence of exceedances for temperature, DO, FC, *E. coli*, TP, IN, TSS, and turbidity at relevant monitoring stations.

Water-quality trends will be interpreted together with climatic conditions, streamflow, monitoring frequency, data quality, upstream activities, and other watershed influences.

4.3 Watershed-Based BMP Planning

As noted, BMP implementation under this program will be guided by a subbasin-scale, land-use-based prioritization process throughout the Upper Chehalis Watershed informed by historical TMDLs, prior studies, existing implementation programs, and current exceedance analyses from FIN and WQP monitoring data, all evaluated and summarized in the NPS Pollution Assessment report. Subbasins and reaches with multiple or recurring impairments - such as elevated temperature, low dissolved oxygen, bacterial contamination, nutrient enrichment, or episodic sediment loading - receive greater implementation emphasis where the identified action is appropriate to the dominant source pathway and land-use setting.

4.3.1 Incorporation of CWMP 2020 Addendum Projects and Programs into NPS 319 Actions

In order to effectively identify applicable BMPs, existing and previously proposed watershed projects were carefully reviewed so that the management program can build on completed work, coordinate with ongoing efforts, and avoid duplicating planned or conceptual projects. Table B.1 in Appendix B compiles the projects identified for WRIA 23 by previous studies, particularly CWMP Addendum (NHC, 2020); it is not a list of projects independently selected or prioritized by the 2026 NPS Management Program. The inventory includes projects at different

stages of development and implementation and provides each Addendum project's ID, full name, location, relationship to the subbasins used in the Assessment and Management Plan, and primary goal. Where the 2020 Addendum provided a numerical project-cost estimate, Table B.1 also presents an adjusted planning-level cost in 2025 US dollars, calculated by applying about a 30 percent increase to the original estimate.

The 2020 Addendum was prepared primarily to address streamflow restoration (water quantity based) and demonstrate net ecological benefit (NEB); therefore, it is not a complete inventory of NPS-control measures. The tabulated projects/programs were reviewed and cross-checked against the impairments, source pathways, land uses, and priority areas identified in the NPS Assessment Report. Some of those identified projects/programs directly support the BMP actions selected in the following section of the report (e.g., for groundwater recharge), while others provide complementary or secondary water-quality benefits through flow enhancement, riparian or floodplain restoration, fish-passage improvement, habitat restoration, or land protection.

This cross-check helped identify where previous projects may align with, complement, or provide supporting context for prioritized BMP actions assigned to specific reaches and subbasins consistent with the findings of the NPS Assessment Report. Findings of the NPS Assessment report was the main and sometimes only source for identifying actions that are not comprehensively addressed in the 2020 Addendum, including livestock and manure management, septic-system controls, bacterial source reduction, conventional stormwater treatment, and forestry-related sediment control.

The results of this comparison and BMP prioritization are presented in two related tables. Table B.1 (Appendix B) provides the inventory of previously identified projects and their locations and objectives, while Table 4.1 identifies the proposed NPS management actions and shows where those previously identified projects in WRIA 23 may support or complement implementation of the current NPS Management Program. Project IDs from Table B.1 (Appendix B) are used in Table 4.1 as concise cross-references between the two tables.

The 2020 Addendum projects do not independently establish NPS priorities. Spatial priorities and management actions in Table 4.1 are based primarily on the NPS Assessment, with the Addendum inventory used as supporting information to identify existing project opportunities, potential coordination, and implementation readiness. As noted, the Addendum project IDs are used only for cross-reference and do not replace the program-action numbering or establish a separate priority-class system.

4.3.2 Subbasin/Reach-Based BMP Prioritization

Table 4.1 translates the program actions established in Section 4.1 into watershed-based implementation priorities. The actions - originally organized and numbered under the six action

groups in Section 4.1 - are cross-walked into 11 implementation themes based on their principal source-control mechanism, management practice, or implementation activity, while retaining their original program-action numbers. Table 4.1 includes all program actions identified in Section 4.1.

For each implementation theme, Table 4.1 identifies the associated program actions, their original action group(s) assigned in Section 4.1, dominant land-use setting, targeted water-quality parameters, potential responsible/involved entities, and the reaches or subbasins where implementation of those actions should receive higher or lower relative emphasis. These implementation priorities identify where the listed management action is considered most or least appropriate at the watershed-planning scale; they do not represent a ranking of water-quality impairment severity. Higher-priority areas reflect the Assessment findings, including the geographic distribution and frequency of exceedances, coincident impairments, likely source pathways, dominant/targeted land uses, and previously documented concerns. Lower-priority areas indicate a lower relative need for that action at the watershed-planning scale; they do not preclude implementation where field conditions, new monitoring information, landowner interest, regulatory needs, or a strong project opportunity justify action.

The final column provides a concise relationship to the previously identified projects or programs in Table B.1 (Appendix B). “Directly supported” indicates that one or more listed projects closely match the action type and location. “Partially supported” identifies projects with a related but narrower purpose or with water-quality benefits that are secondary to their streamflow, habitat, flood-reduction, or NEB objectives. “Assessment-based” indicates that the action is principally supported by the NPS Assessment Report rather than by a specific Addendum project. Project IDs are provided only as cross-references to Table B.1 (Appendix B).

The Targeted Parameter(s) column distinguishes direct treatment objectives from indirect or associated water-quality benefits. Final project selection and design will require site-level confirmation, landowner and sponsor coordination, feasibility assessment, and consideration of permitting, funding, O&M, and monitoring needs. Implementation priorities may be refined through adaptive management as additional data and project-status information become available.

Because many watershed projects (listed in Table B.1 in Appendix B) are multipurpose, the implementation themes in Table 4.1 are distinguished by their principal source-control mechanism, management practice, or construction activity. Each site-specific project is assigned to one primary implementation theme. Secondary components and associated water-quality benefits may be cross-referenced under other themes but are not counted as separate projects or implementation commitments. Basinwide or programmatic actions may support more than one theme; however, each project subsequently developed under those programs will receive one primary classification.

For purposes of Table 4.1, the implementation themes are defined as follows:

- **"Agricultural source controls"** address pollutants generated by agricultural operations through livestock exclusion and management, manure and nutrient management, erosion control, irrigation management, and other on-farm source-reduction practices. Riparian planting or channel restoration associated with an agricultural project is classified separately according to its principal treatment activity.
- **"Septic-system management"** addresses pollutant releases from onsite sewage systems through inventory, inspection, maintenance, repair, replacement, homeowner assistance, and related health-department programs. It does not include municipal stormwater or sewer-system improvements.
- **"Runoff and stormwater controls"** address runoff from developed areas, roads, parking areas, and connected drainage systems through source control, infiltration, filtration, detention, outfall treatment, and drainage-system retrofits. Floodplain or wetland projects that only provide incidental runoff attenuation are classified under stream, wetland, and floodplain restoration.
- **"Riparian buffer establishment and restoration"** consists primarily of vegetation-focused treatment along streams, wetlands, and drainage corridors, including buffer establishment or widening, native planting, invasive-species control, livestock exclusion needed for buffer recovery, and long-term vegetation maintenance. Projects dominated by channel modification, wetland construction, or floodplain reconnection are classified under stream, wetland, and floodplain restoration, even where riparian planting is included.
- **"Stream, wetland, and floodplain restoration"** addresses physical or hydrologic alteration of aquatic and floodplain systems through channel restoration, floodplain reconnection, wetland restoration, side-channel or alcove creation, large wood, bank-armoring removal, ditch abandonment, and BDAs. Riparian planting and flow benefits may be included as project components but do not create separate projects under other themes.
- **"Flow conservation, groundwater recharge, and complementary water-management actions"** address seasonal-flow limitations through water-right acquisition or modification, diversion relocation, operational releases, irrigation efficiency, managed aquifer recharge, and other measures whose principal purpose is to conserve, store, or augment streamflow. Physical channel, wetland, or floodplain construction are classified under the corresponding restoration theme.
- **"Forest-road and forest-harvest management"** consists of preventive and operational practices applied across forest lands, including harvest planning, road-system management, road maintenance or decommissioning, erosion prevention, and protection of stream-adjacent areas. Discrete repairs at confirmed sediment-delivery sites are classified under sediment-control, crossing, ditch, and drainage improvements.

- **"Sediment-control, crossing, ditch, and drainage improvements"** address identified sediment-delivery pathways through site-specific stabilization, drainage correction, ditch treatment, erosion repair, and replacement or modification of problem crossings. Where correction of a fish barrier is the principal project purpose, the project is classified under fish-passage improvements.
- **"Fish-passage improvements"** consist primarily of correcting documented barriers through culvert replacement, bridge installation, removal or modification of artificial barriers, and associated channel transitions. Sediment transport, channel restoration, riparian treatment, and water-quality improvements are supporting components unless they constitute a separate project.
- **"Conservation easements and land acquisition"** protect existing or restorable watershed functions through acquisition, easements, or other long-term land-protection agreements. These actions are preventive or enabling measures and are not counted as restoration implementation unless physical restoration work is separately undertaken.
- **"Outreach, monitoring, reporting, and adaptive management**" includes the cross-cutting activities needed to support implementation, evaluate effectiveness, document progress, engage landowners and partners, and refine future priorities. These activities support all physical implementation themes but are not themselves counted as construction or restoration projects.

The detailed basis for the higher- and lower-priority areas for action implementation identified in Table 4.1 is provided in Appendix B. The appendix summarizes the relevant land-use conditions, station exceedance results, historical findings, TMDL information, likely source pathways, and previously identified projects considered for each implementation theme. Because monitoring records differ in period, sample size, seasonal coverage, and spatial representativeness, station results (NPS Pollution Assessment report) are interpreted together with land use, source-pathway evidence, project information, and data-quality limitations rather than used alone to assign implementation priorities. These supporting data are presented separately from Table 4.1 to keep the prioritization table concise while documenting the technical rationale for the selected reaches, subbasins, and project areas.

Table 4.1 Proposed NPS management actions and watershed implementation priorities by implementation theme.

Implementation Theme — Program Action No.	Action Group(s)	Targeted Land Use(s)	Targeted WQ Parameter(s) / Other Benefits	Potential Responsible / Involved Entities	Priority Areas for Action Implementation (Reaches/Subbasins)	Lower-Priority Areas for Action Implementation (Reaches/Subbasins)	Relationship to 2020 Addendum Projects, listed in Table B.1
Agricultural source controls — Actions: 1.1, 1.5, 1.7, 3.1 to 3.4, and 4.2	Bacterial Contamination; Nutrients; DO	Agriculture / Bare	Directly: FC, *E. coli*, TP, IN, DO Indirectly: TSS	NRCS; Conservation Districts; WSDA; Ecology; Tribe; Lewis County Farm Bureau; participating landowners	**Highest implementation emphasis:** Black River (11); agricultural portions of the South Fork and North Fork Newaukum Rivers and connected agricultural areas of the Newaukum mainstem (5, 6, and 7); agricultural portions of Middle Chehalis River #1 (10); Salzer Creek (8); and South Fork Chehalis River (3). **Additional implementation emphasis:** agricultural portions of Middle Chehalis River #2 (13), Skookumchuck River (9), and Upper Chehalis River #2 and #1 (4B and 4A).	Chehalis River Headwaters (1); Elk Creek (2); Cedar Creek (12)	Partially supported by BW-02. The remaining livestock, manure, bacterial, nutrient, and runoff-control actions are based primarily on the Assessment Report, applicable TMDLs, and existing agricultural programs.
Septic-system management — Action: 1.3	Bacterial Contamination	Developed Low	Directly: FC, *E. coli* Indirectly: TP, IN, DO	Lewis County Health Department; Thurston County Health Department; Tribe; Washington Department of Health; property owners	**Highest implementation emphasis:** unsewered Developed Low and rural-residential portions of Salzer Creek (8); Middle Chehalis River #1 (10), particularly the Dillenbaugh/Berwick Creek area and unsewered Centralia–Chehalis fringe; Newaukum River (7); and the lower Skookumchuck River corridor (from the mouth upstream toward Hanaford Creek) and connected unsewered rural-residential areas (9). **Additional implementation emphasis:** Upper Chehalis River #2 (4B); South Fork Chehalis River (3); Black River (11); and Middle Chehalis River #2 (13).	Chehalis River Headwaters (1) Localized onsite-septic concerns may still be evaluated where county records, historical findings, field observations, or monitoring indicate a potential problem, including the historically identified areas in Elk Creek (2).	Assessment- and TMDL-based; no direct Addendum septic-system management project was identified. EW-01 is indirectly related because it addresses vulnerability to septic contamination in the Galvin area. The action is otherwise supported by documented bacterial and nutrient concerns and by TMDL recommendations for septic-system inventory, inspection, maintenance, repair or replacement, and monitoring-guided follow-up.
Runoff and stormwater controls — Actions: 1.4, 1.6, 2.6, and 6.4	Bacterial Contamination; Temperature (7-DADMax); Cross-Cutting and Complementary Program Actions	Developed Low; Developed High	Directly: FC, *E. coli*, TSS/turbidity, TP, IN, and temperature where heated runoff or loss of infiltration is a documented source Indirectly: DO	Cities of Chehalis and Centralia; Lewis and Thurston Counties public works and stormwater programs; Port of Chehalis; Ecology; Tribe; property owners and project sponsors	**Highest implementation emphasis:** developed drainage areas within the Centralia–Chehalis corridor, including the lower Skookumchuck River and China Creek area in Skookumchuck River (9), the Centralia reach of Middle Chehalis River #1 (10), lower urbanized areas of Salzer Creek and Coal Creek drainage areas (8), and the Rochester/Albany Street drainage area and other developed portions of Black River (11). **Additional implementation emphasis:** developed portions of Upper Chehalis River #2 (4B), and developed areas within Newaukum River and Berwick Creek drainage areas (7) and Middle Chehalis River #2 (13), only where drainage mapping, outfall inspections, or wet-weather monitoring confirms a direct runoff pathway to impaired waters.	Chehalis River Headwaters (1), Elk Creek (2), and Cedar Creek (12), because developed land and municipal stormwater infrastructure are limited.	Directly supported by B-05 and, at the planning level, BW-05. Partially supported by CS-00, CS-02, and H-00, which provide related flood-storage, infiltration, wetland-restoration, runoff-attenuation, or contaminant-filtering functions. Broader control of bacteria, nutrients, sediment, and heated runoff remains primarily Assessment- and TMDL-based. The Addendum defined starting points through CS-00 in the Salzer/Coal Creek area and CS-02 in the Chehalis urban corridor to support flood hazard reduction and flood storage improvement.
Riparian buffer establishment and restoration — Actions: 1.2, 2.1, 4.1, and 5.1	Bacterial Contamination; Temperature (7-DADMax); DO; Nutrients; Sediment / TSS	Agriculture / Bare; Developed Low; Clearcut/Shrub	Directly: Temperature, FC, *E. coli*, TSS, TP, IN Indirectly: DO	USDA FSA; NRCS; Conservation Districts; Tribe; WDFW; Washington DNR; participating landowners	**Highest implementation emphasis:** degraded riparian and agricultural reaches of Black River (11), particularly the Black River confluence/B-04 and willing-landowner riparian-treatment opportunities developed under B-03; South Fork Newaukum River RM 10.9–13.0/N-04 (5), Berwick Creek between Rush and Bishop roads/N-13, and verified riparian gaps along the agricultural lower Newaukum mainstem (7); Stillman Creek RM 0–2.5/C-00 and other verified livestock or agricultural riparian gaps in South Fork Chehalis River (3); and lower Salzer Creek (8), where inadequate shade or buffer width and a direct agricultural or developed-land pollutant pathway are confirmed.	Chehalis River Headwaters (1); Elk Creek (2); Cedar Creek (12), where effective mature riparian cover is present	Supported by the explicit riparian planting, revegetation, or bank-treatment components of C-00, CS-00, N-04, and N-13, and by B-04 where the selected restoration design includes riparian treatment. CH-00, H-00, EW-00, and SK-02 are complementary only where their final designs include a distinct riparian component. These projects as a whole are classified primarily under stream, wetland, and floodplain restoration.

Implementation Theme — Program Action No.	Action Group(s)	Targeted Land Use(s)	Targeted WQ Parameter(s) / Other Benefits	Potential Responsible / Involved Entities	Priority Areas for Action Implementation (Reaches/Subbasins)	Lower-Priority Areas for Action Implementation (Reaches/Subbasins)	Relationship to 2020 Addendum Projects, listed in Table B.1
					Additional implementation emphasis: other riparian-deficient reaches of the Newaukum forks (5 and 6); Coal Creek/CS-00 and the CS-02 riparian-deficient portions of wetland and floodplain project areas in Middle Chehalis River #1 (10); riparian-deficient portions of Garrard Creek/EW-00 in Middle Chehalis River #2 (13); agricultural and rural reaches of Upper Chehalis River #1 and #2 (4A and 4B) where riparian gaps are mapped; and SK-02 at Skookumchuck RM 19–22 or lower Skookumchuck/China Creek reaches only where site assessment confirms riparian degradation.		
Stream, wetland, and floodplain restoration — Actions: 2.2, 2.3, 2.5 (physical floodplain and hyporheic-restoration component), 4.3, 5.3, and 6.3	Temperature (7-DADMax); DO; Sediment / TSS; Cross-Cutting and Complementary Program Actions	Water / Wetland; Agriculture / Bare; Developed Low	Directly: Temperature, TSS, TP, IN Indirectly: DO	Tribe; WDFW; Conservation Districts; Lewis and Thurston Counties; Cities of Chehalis and Centralia; Chehalis River Basin Land Trust; The Nature Conservancy; Coast Salmon Partnership; landowners and project sponsors	**Highest implementation emphasis**: Black River restoration areas associated with Holm Farm/Blooms Ditch and floodplain reconnection (B-00), willing-landowner wetland opportunities developed through B-03, and the Black River confluence (B-04) in Black River (11); South Fork Newaukum River RM 10.9–13.0 (N-04) and the Newaukum Lake/wet-meadow project area (N-02) in South Fork Newaukum River (5); Berwick Creek between Rush and Bishop roads (N-13) in Newaukum River (7); Stillman Creek RM 0–2.5 (C-00) in South Fork Chehalis River (3); Coal Creek and its approximately 80-acre floodplain-storage project area (CS-00) in Salzer Creek (8); and the former Chehalis WWTP/floodplain area, including approximately 10 acres of proposed wetland restoration (CS-02), in Middle Chehalis River #1 (10). **Additional implementation emphasis**: finalized Newaukum BDA locations under N-12 and other suitable BW-00/BW-03 locations in subbasins 5, 6, and 7; Garrard Creek and the adjacent Chehalis River floodplain/side-channel area (EW-00), the Sampson wetlands area (SC-03) in Middle Chehalis River #2 (13); China Creek/Agnew mill ponds (H-00) and Skookumchuck RM 19–22 (SK-02) in Skookumchuck River (9); and CH-00 in Chehalis River Headwaters (1), where relocation of flow to the historic oxbow and channel reconnection are the principal restoration activities.	Elk Creek (2); Cedar Creek (12); intact portions of Chehalis River Headwaters (1)	Directly supported, with an NPS qualification, by B-00; specific restoration projects developed under B-03; B-04; C-00; CH-00, CS-00; CS-02; EW-00; H-00; N-02; N-04; N-12; N-13; SC-03; and SK-02. The BDA and channel-restoration components of N-10 are secondary because N-10 is classified primarily under fish passage. BW-00 and BW-03 provide programmatic BDA and beaver-stewardship support.
Flow conservation, groundwater recharge, and complementary water-management — Actions: 2.4, 2.5 (groundwater-recharge and flow-storage component), 4.4, and 6.8	Temperature (7-DADMax); DO; Cross-Cutting and Complementary Program Actions	Agriculture / Bare; Developed Low; Water / Wetland	Directly: Temperature Indirectly: DO	Ecology; Chehalis Basin Partnership; Tribe; Cities of Chehalis and Centralia; Lewis and Thurston Counties; Conservation Districts; Boistfort Valley Water; Thurston Public Utility District; WDFW; water-right holders; water utilities and dam operators; participating landowners	**Highest implementation emphasis:** Allen Creek, Beaver Creek, and the Black River reach downstream of the former Cooke Aquaculture facility in Black River (11), associated with B-01 and B-02; the existing City of Chehalis diversion on the North Fork Newaukum River and the downstream Newaukum mainstem (6 and 7), associated with N-00; feasible managed-aquifer-recharge sites identified under N-09 in the South Fork and North Fork Newaukum Rivers (5 and 6), with downstream benefits to Newaukum River (7); the TransAlta water-right and dam-regulated Skookumchuck River reaches associated with SK-00 and SK-01 in Skookumchuck River (9); and	Chehalis River Headwaters (1); Elk Creek (2); Cedar Creek (12), unless a localized seasonal-flow need is identified	Directly supported by B-01, B-02, EW-01, N-00, N-09, SC-00, SC-01, SC-02, SK-00, SK-01, BW-02, BW-04, and BW-06. B-00, B-05, BW-00, BW-05, and SC-03 provide complementary storage, infiltration, beaver, recharge, or flow benefits but are classified primarily under stream and floodplain restoration, runoff and stormwater controls, or another physical-restoration theme.

Implementation Theme — Program Action No.	Action Group(s)	Targeted Land Use(s)	Targeted WQ Parameter(s) / Other Benefits	Potential Responsible / Involved Entities	Priority Areas for Action Implementation (Reaches/Subbasins)	Lower-Priority Areas for Action Implementation (Reaches/Subbasins)	Relationship to 2020 Addendum Projects, listed in Table B.1
					Scatter Creek, Prairie Creek, and associated recharge and storage project areas within Middle Chehalis River #2 (13), associated with SC-00, SC-01, and SC-02. **Additional implementation emphasis:** the Galvin groundwater-withdrawal reduction area associated with EW-01 in Middle Chehalis River #1 (10); irrigated agricultural areas where BW-02 can produce a measurable instream-flow benefit; and other locations in South Fork Chehalis River (3), Salzer Creek (8), Upper Chehalis River #1 and #2 (4A and 4B), or the mid-basin mainstem where water-use analysis, hydrogeologic investigation, and summer flow and temperature monitoring confirm a feasible flow-conservation, recharge, or trust-water opportunity.		
Forest-road and forest-harvest management — Actions: 5.2 and 6.2	Sediment / TSS; Cross-Cutting and Complementary Program Actions	Mature Forest; Clearcut/Shrub	Directly: TSS, turbidity Indirectly: temperature	Washington DNR; NRCS; USFS where applicable; Tribe; industrial and non-industrial private forest landowners (e.g., Weyerhaeuser, Port Blakely); forest-road owners and operators, Conservation Districts	**Highest implementation emphasis:** forest-road networks, active or recent harvest areas, and site-preparation areas with demonstrated sediment connectivity to streams within the contributing watershed upstream of Dryad Station - principally Chehalis River Headwaters (1), Elk Creek (2), and any contributing portions of Upper Chehalis River #1 (4A) confirmed through drainage mapping. **Additional implementation emphasis** should be placed on forested uplands and tributaries of South Fork Chehalis River (3), South Fork and North Fork Newaukum Rivers (5 and 6), and upper Scatter Creek within Middle Chehalis River #2 (13), where wet-weather monitoring, forest-road inventories, harvest records, unstable-slope or erosion mapping, or field observations confirm forestry-related sediment delivery. Other forested areas, including Skookumchuck River (9), may be added where comparable source-pathway evidence is developed.	Cedar Creek (12), where the Assessment does not identify a basinwide forestry-related sediment concern; Newaukum River mainstem (7); and predominantly agricultural, developed, or lower-valley portions of Salzer Creek (8), Middle Chehalis River #1 (10), Black River (11), and Middle Chehalis River #2 (13), where forestry has not been established as the dominant sediment-source pathway.	Primarily Assessment-based; partially supported by SC-04. SC-04 proposes protecting or managing forest in the upper Scatter Creek basin within Middle Chehalis River #2 (13) to increase stand age, lengthen harvest rotations, and improve hydrologic function. It supports the forest-harvest component of this action group but does not address the forest-road and sediment-source priorities associated with the Dryad contributing watershed.
Sediment-control, crossing, ditch, and drainage improvements — Actions: 5.4, 5.5, and 5.6	Sediment / TSS	Clearcut/Shrub; Mature Forest; Agriculture / Bare; Developed Low	Directly: TSS, turbidity	Washington DNR; USFS where applicable; Lewis and Thurston County Public Works; Cities of Chehalis and Centralia where applicable; Tribe; WDFW; Conservation Districts; NRCS where eligible; public and private road, crossing, and drainage-system owners; participating landowners and project sponsors	**Highest implementation emphasis:** discrete road-crossing, culvert, ditch, headcut, bank, and drainage failures with direct sediment connectivity to streams within the contributing watershed upstream of Dryad Station - principally Chehalis River Headwaters (1), Elk Creek (2), and contributing portions of Upper Chehalis River #1 (4A), and Newaukum River (7). **Additional implementation emphasis:** documented erosion and drainage problems in South Fork Chehalis River (3); the South Fork and North Fork Newaukum Rivers (5 and 6); lower Salzer and Coal Creek areas (8); Middle Chehalis River #1 (10); and Black River (11), where wet-weather monitoring, field inspection, drainage mapping, or design analysis demonstrates active sediment delivery to a receiving water.	Cedar Creek (12) and locations without documented erosion, drainage, or sediment-delivery problems	Primarily Assessment-based. Partially supported by B-08, CS-01, N-01, N-03, N-05 through N-08, N-10, and N-11. These projects may provide localized sediment benefits where crossing erosion, drainage failure, or disrupted sediment transport is documented, but they are classified primarily under fish-passage improvements. The broader sediment-control program, particularly upstream of Dryad and in Salzer Creek (8), remains Assessment-based. CS-01, N-05, N-06, N-08, and N-11 provide the strongest site-specific partial support because their project descriptions expressly identify improvements to sediment transport or sedimentation and water quality. B-08, N-01, N-03, N-07, and N-10 are classified primarily under fish-passage improvements and are cross-referenced under this theme

Implementation Theme — Program Action No.	Action Group(s)	Targeted Land Use(s)	Targeted WQ Parameter(s) / Other Benefits	Potential Responsible / Involved Entities	Priority Areas for Action Implementation (Reaches/Subbasins)	Lower-Priority Areas for Action Implementation (Reaches/Subbasins)	Relationship to 2020 Addendum Projects, listed in Table B.1
							only where project design or field inspection confirms a discrete erosion, drainage, scour, deposition, or sediment-delivery problem.
Fish-passage improvements — Action: 6.6	Cross-Cutting and Complementary Program Actions	Mature Forest; Agriculture / Bare; Developed Low; Water / Wetland	Primary ecological (Hydrologic Connectivity) Directly: TSS and turbidity where crossings contribute erosion or sediment delivery Indirectly: temperature, DO through restoration processes	WDFW; Lewis County Public Works; Thurston County Public Works; Lewis and Thurston Conservation Districts; Coast Salmon Partnership; Tribe; cities and other public or private road and crossing owners; participating landowners and project sponsors	**Highest implementation emphasis:** the coordinated barrier projects in the Newaukum system, including N-01, N-03, and N-10 in South Fork Newaukum River (5); N-05 and N-06 on Lucas Creek tributaries in North Fork Newaukum River (6); N-07, N-08, and N-11 on Berwick Creek in Newaukum River (7); and CS-01 at Labree Road in Middle Chehalis River #1 (10), immediately adjacent to the Newaukum River boundary. Implementation should be sequenced to address downstream barriers and other barriers that control access to cumulative upstream habitat. **Additional implementation emphasis:** B-08 at Jones Road/Salmon Creek in Black River (11) and EW-02 on Scammon Creek in Middle Chehalis River #1 (10).	No basinwide low-priority designation; priority should be determined by barrier severity, habitat gain, associated sediment effects, upstream and downstream barriers, and readiness	Directly supported by B-08, CS-01, EW-02, N-01, N-03, N-05, N-06, N-07, N-08, N-10, and N-11. These projects are classified primarily as barrier-correction projects; associated channel, sediment, riparian, BDA, and water-quality elements are supporting components. CH-00 also provides a substantial fish-access benefit but is classified primarily under stream, wetland, and floodplain restoration because its principal activity is relocation of flow to the historic oxbow and channel reconnection.
Conservation easements and land acquisition — Action: 6.5	Cross-Cutting and Complementary Program Actions	Mature Forest; Agriculture / Bare; Water / Wetland; Developed Low	Indirectly (preventive): Temperature, DO, TSS, FC, *E. coli*, TP, IN	Tribe; Volunteer and Non-Profit Organizations (e.g., Chehalis River Basin Land Trust, The Nature Conservancy); Chehalis Basin Partnership; WDFW; Conservation Districts; counties; willing landowners	**Highest implementation emphasis:** the Beaver Creek Conservation Easement/B-06 and Seiler Conservation Easement/B-07 properties in Black River (11); the Port Blakely Hanaford Acquisition/H-01 property along South Hanaford Creek in Skookumchuck River (9); and specific properties developed under B-03 in Black River (11) where a willing landowner and a defined easement, acquisition, or long-term protection agreement are identified. **Additional implementation emphasis**: a particular consideration should be given to property opportunities within the Black River, Newaukum, Salzer, Skookumchuck/Hanaford, and mid-basin corridors already prioritized under the applicable source-control or restoration themes.	No fixed low-priority basin; selection should consider ecological function, development risk, connectivity, restoration opportunity, and willing landowners	Directly supported in Black River (11) and Skookumchuck River (9) by B-06, B-07, and H-01; otherwise, opportunity-based. Preventive NPS benefits are supported by the Assessment. B-03 may also support this theme where a specific easement, acquisition, or long-term land-protection agreement is reached; otherwise, remains property- and landowner-dependent.
Outreach, monitoring, reporting, and adaptive management — Actions: 1.8, 6.1, 6.7, and 6.9	Cross-Cutting and Complementary Program Actions; Bacterial Contamination	All land-use settings	Indirectly: Temperature, DO, FC, *E. coli*, TP, IN, TSS	Tribe; Chehalis Basin Partnership; Quinault Indian Nation; The Nature Conservancy; Coast Salmon Partnership; Ecology; EPA; WDFW; USGS; counties and cities; Conservation Districts; project sponsors; participating landowners	**Highest implementation emphasis:** The Chehalis River mainstem near tribal lands, approximately RM 55 to RM 45 (borders of subbasins 11 and 13), and hydrologically connected upstream source areas as follows: Newaukum mainstem and forks (5, 6, and 7); Salzer Creek (8); Skookumchuck River (9); Middle Chehalis River #1 and #2 (10 and 13); Black River (11); South Fork Chehalis River (3); sediment-source areas upstream of Dryad **Additional emphasis:** Upper Chehalis River #1 and #2 (4A and 4B)	No low-priority designation applies to program reporting, data management, adaptive management, or project-specific effectiveness monitoring. Lower-frequency ambient and protection monitoring is appropriate in Chehalis River Headwaters (1), Elk Creek (2), and Cedar Creek (12), where the Assessment generally indicates lower impairment and less intensive land-use pressure.	Primarily Assessment-based, with technical support from BW-07. BW-07 supports summer temperature profiling and streamflow gain-and-loss monitoring in selected WRIA 23 streams within South Fork Chehalis River (3), the Newaukum system (5, 6, and 7), Salzer Creek (8), Skookumchuck River (9), Middle Chehalis River #1 and #2 (10 and 13), and Black River (11), with the purpose of identifying groundwater-discharge zones, thermal refugia, and reaches important for flow protection and restoration. BW-07 does not provide a complete bacteria, nutrient, sediment, outreach, or BMP-effectiveness monitoring program.

Note: Action numbers refer to the program actions established in Section 4.1. Priority and lower-priority areas indicate the relative emphasis for implementing the listed action and do not represent rankings of water-quality impairment severity. Project IDs in the final column are cross-references to the 2020 Addendum project inventory in Table B.1 and do not represent projects independently selected or prioritized by this NPS Management Program. Direct and indirect water-quality parameters indicate primary treatment objectives and associated or secondary benefits, respectively.

Table 4.1 crosswalks all program actions established under the six Section 4.1 action groups into 11 implementation themes. The implementation themes organize the actions according to their principal source-control mechanism, management practice, or implementation activity. Multipurpose actions are included in more than one theme where appropriate, allowing their different functions to be evaluated without creating a separate action-numbering system.

The spatial pattern shows recurring implementation emphasis in the South Fork, North Fork, and mainstem Newaukum River subbasins (5, 6, and 7); Salzer Creek (8); Skookumchuck River (9); Middle Chehalis River #1 and #2 (10 and 13); Black River (11); and agricultural, developed, or low-flow portions of the Upper Chehalis River subbasins (4A and 4B). South Fork Chehalis River (3) also receives targeted emphasis for agricultural, riparian, sediment, and monitoring actions. The concentration of higher-priority actions in these subbasins is consistent with the Assessment's identification of the "mid-basin" as the area with the greatest cumulative frequency of temperature, DO, and bacterial exceedances. The defined mid-basin generally extends along the Chehalis River from upstream of the Newaukum River confluence to below the Black River confluence (approximately RM 75.4 to RM 47.0) and receives drainage from several agricultural, rural-residential, and urban-influenced tributaries. Accordingly, the priorities shown in Table 4.1 emphasize source controls, stormwater and septic-system management, riparian and floodplain restoration, flow enhancement, and continued monitoring within the mainstem corridor and its contributing subbasins. Previously identified projects in Table B.1 (Appendix B) also provide opportunities to coordinate some of this work, particularly for flow, floodplain, wetland, habitat, and land-protection actions, but additional NPS-specific measures will be needed to address the bacterial, nutrient, agricultural, and developed-land sources documented in the Assessment.

Chehalis River Headwaters (1), Elk Creek (2), and Cedar Creek (12) are generally assigned lower relative priority in Table 4.1 where existing land cover, riparian condition, or monitoring results indicate fewer immediate NPS concerns. However, lower-priority designations do not exclude localized implementation opportunities where a specific and well-supported project opportunity exists. For example, CH-00 is a localized restoration project in Chehalis River Headwaters (1), despite the generally lower priority assigned to that subbasin for several NPS actions. For fish passage, conservation easements, land acquisition, and other opportunity-based actions, no basinwide low-priority areas were assigned because project selection depends primarily on site-specific conditions, ecological benefit, feasibility, and landowner willingness.

Figure 4.10 through Figure 4.20 provide spatial screening information for the 11 implementation themes identified in Table 4.1. The mapped priority basins represent areas where the corresponding management action receives greater implementation emphasis, while the supporting land-cover, hydrography, zoning, wetland, floodplain, or barrier datasets provide additional spatial context for identifying potential areas of application. These maps are intended for watershed-scale screening and do not independently identify pollutant sources or site-specific projects. Final project locations will require confirmation through monitoring, field

assessment, source-pathway evaluation, landowner coordination, and project-specific feasibility analysis. Figure 4.10 illustrates the distribution of mapped Agriculture/Bare land cover within the priority basins for agricultural source-control implementation. Agriculture/Bare areas were extracted from the National Land Cover Database (NLCD) to show where agricultural land use overlaps with the basins receiving the greatest implementation emphasis. The mapping provides a screening basis for identifying potential agricultural source areas; it does not imply that all mapped agricultural or bare lands are pollutant sources.

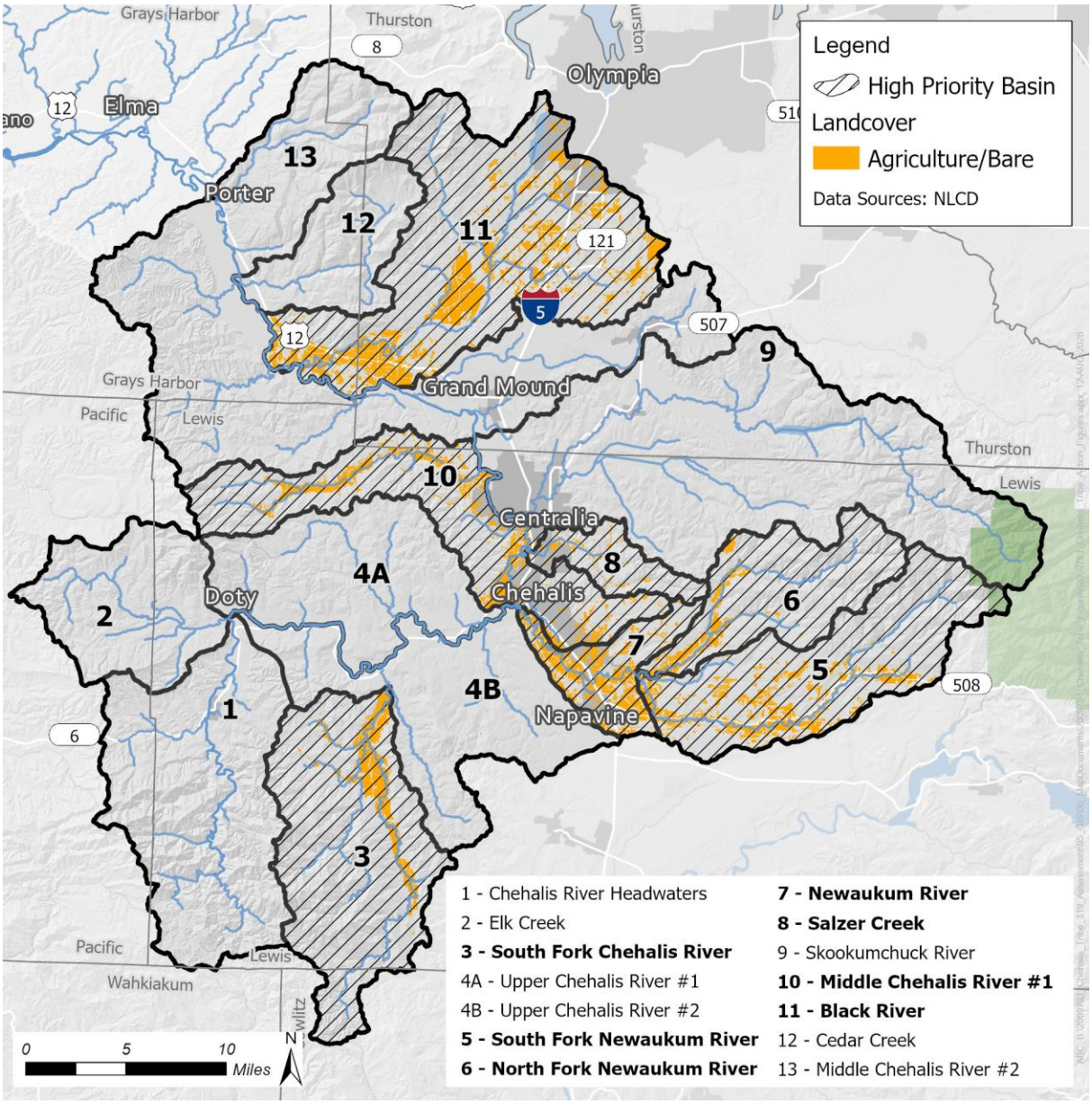

Figure 4.10 Spatial distribution of mapped Agriculture/Bare land within highest implementation-emphasis locations for *agricultural source controls*.

Figure 4.11 shows rural and low-intensity residential zoning within the priority basins for septic-system management, based on the Washington Zoning Atlas. These areas provide a screening indication of where onsite sewage systems may be more prevalent. The mapping does not identify individual septic systems, sewer-service boundaries, or system condition; therefore, implementation priorities should be refined using county septic records, sewer-service information, field observations, and targeted water-quality monitoring.

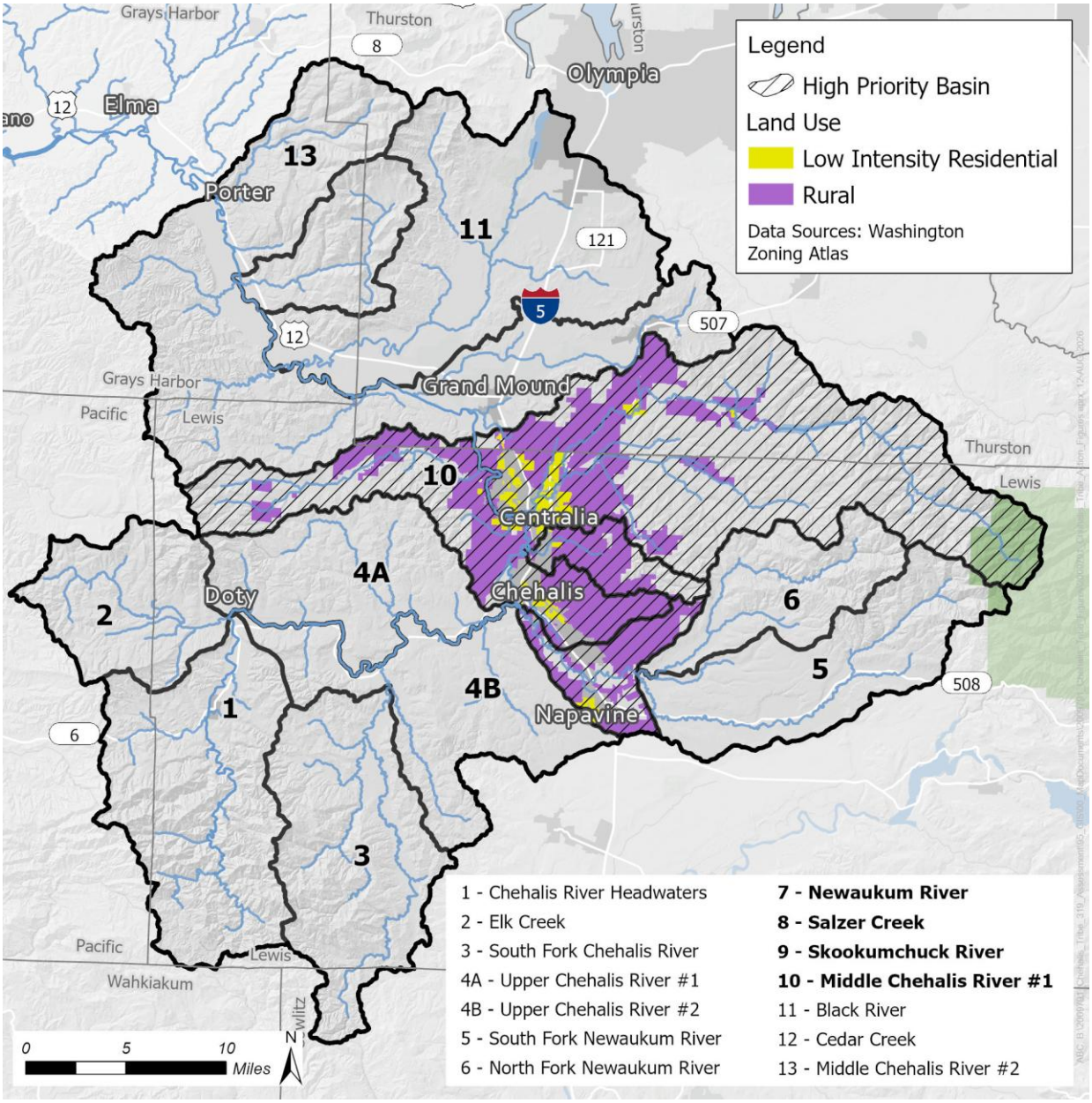

Figure 4.11 Low-intensity residential and rural zoning within highest implementation-emphasis locations for *septic-system management*.

Figure 4.12 shows NLCD Developed Low and Developed High land cover within the priority basins for runoff and stormwater controls. The mapped developed areas provide a screening indication of where impervious surfaces and developed drainage systems may contribute runoff to receiving waters. Actual implementation locations should be confirmed using drainage and outfall mapping, field inspection, and wet-weather monitoring because mapped development alone does not establish a direct stormwater pathway.

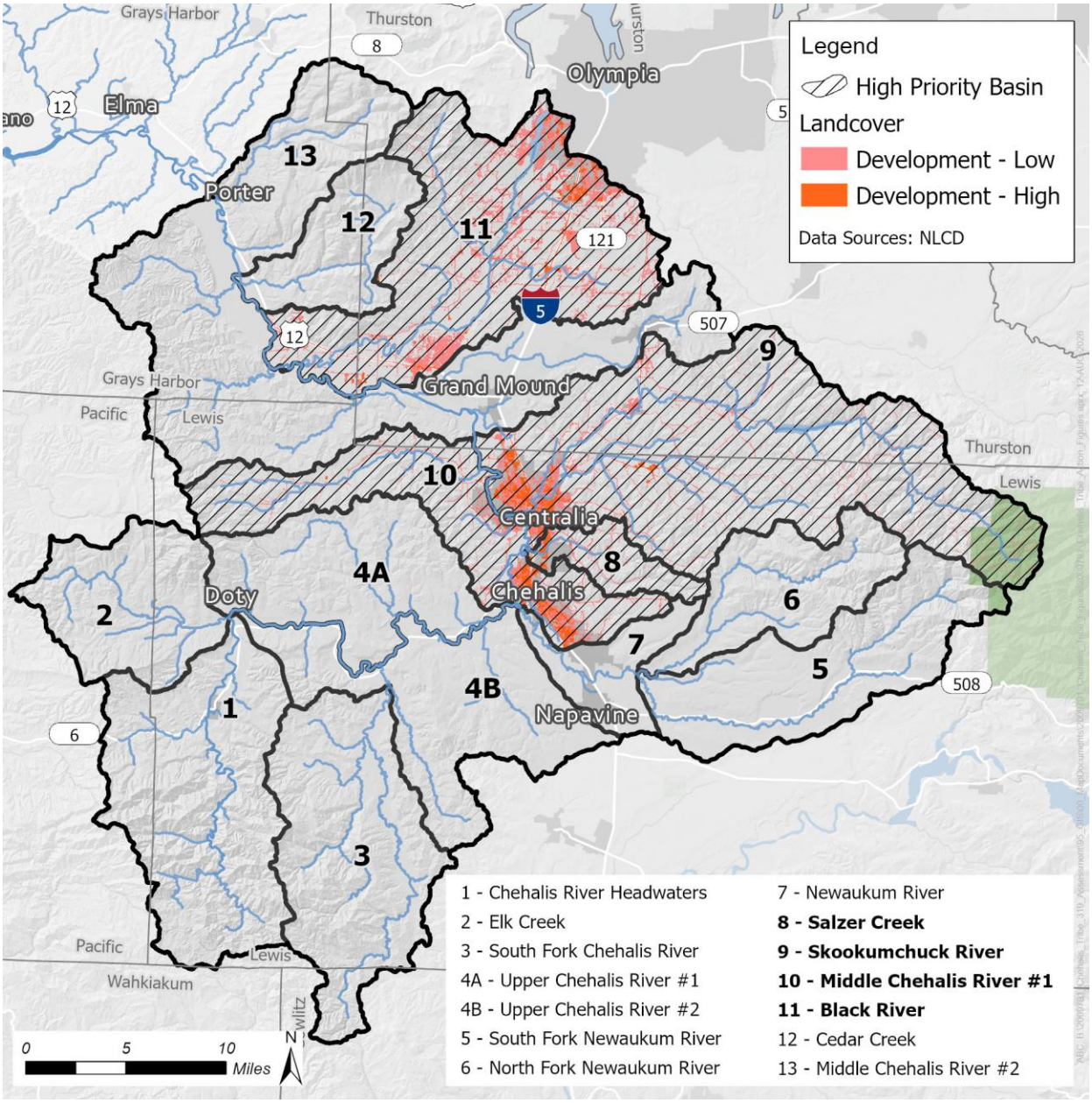

Figure 4.12 Low-developed and high-developed areas within highest implementation-emphasis locations for *runoff and stormwater controls*.

Figure 4.13 shows the National Hydrography Dataset (NHD) stream network within the priority basins for riparian buffer establishment and restoration, providing a spatial framework for identifying stream corridors where riparian assessment and treatment may be considered. The mapped stream network does not indicate existing buffer width, vegetation condition, shade, bank stability, or riparian degradation; these conditions require site-specific assessment before restoration actions are selected.

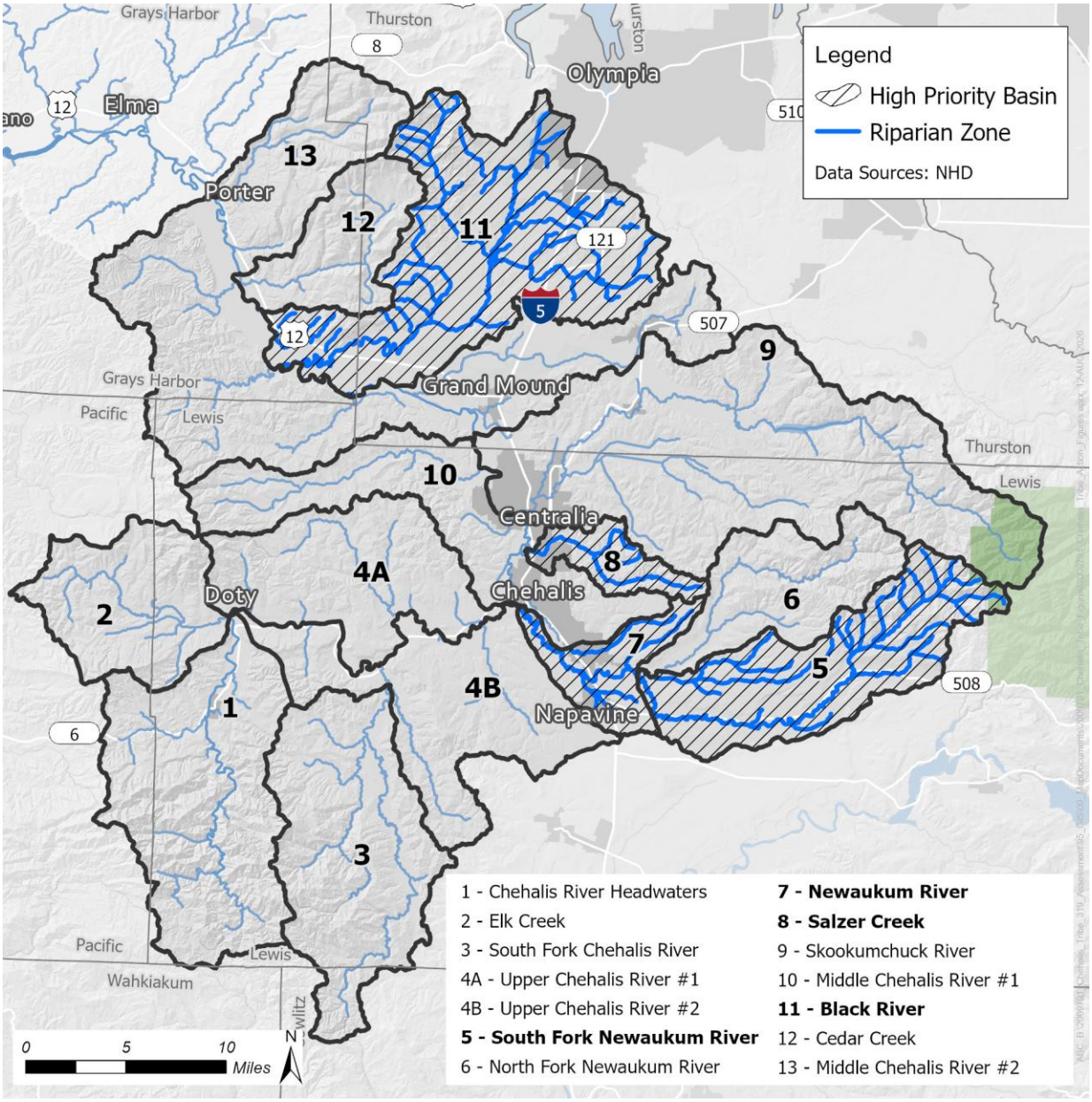

Figure 4.13 Riparian zones within highest implementation-emphasis locations for *riparian buffer establishment and restoration*.

Figure 4.14 provides spatial screening for stream, wetland, and floodplain restoration by showing selected land-cover areas within priority basins where they overlap mapped National Wetlands Inventory (NWI) wetlands, Federal Emergency Management Agency (FEMA) floodplains, and riparian management zones. These overlapping datasets identify areas where aquatic, wetland, floodplain, and adjacent land-cover conditions may warrant further restoration assessment. The mapped areas are not proposed restoration footprints; project suitability will depend on site-specific hydrologic, hydraulic, geomorphic, ecological, ownership, and feasibility conditions.

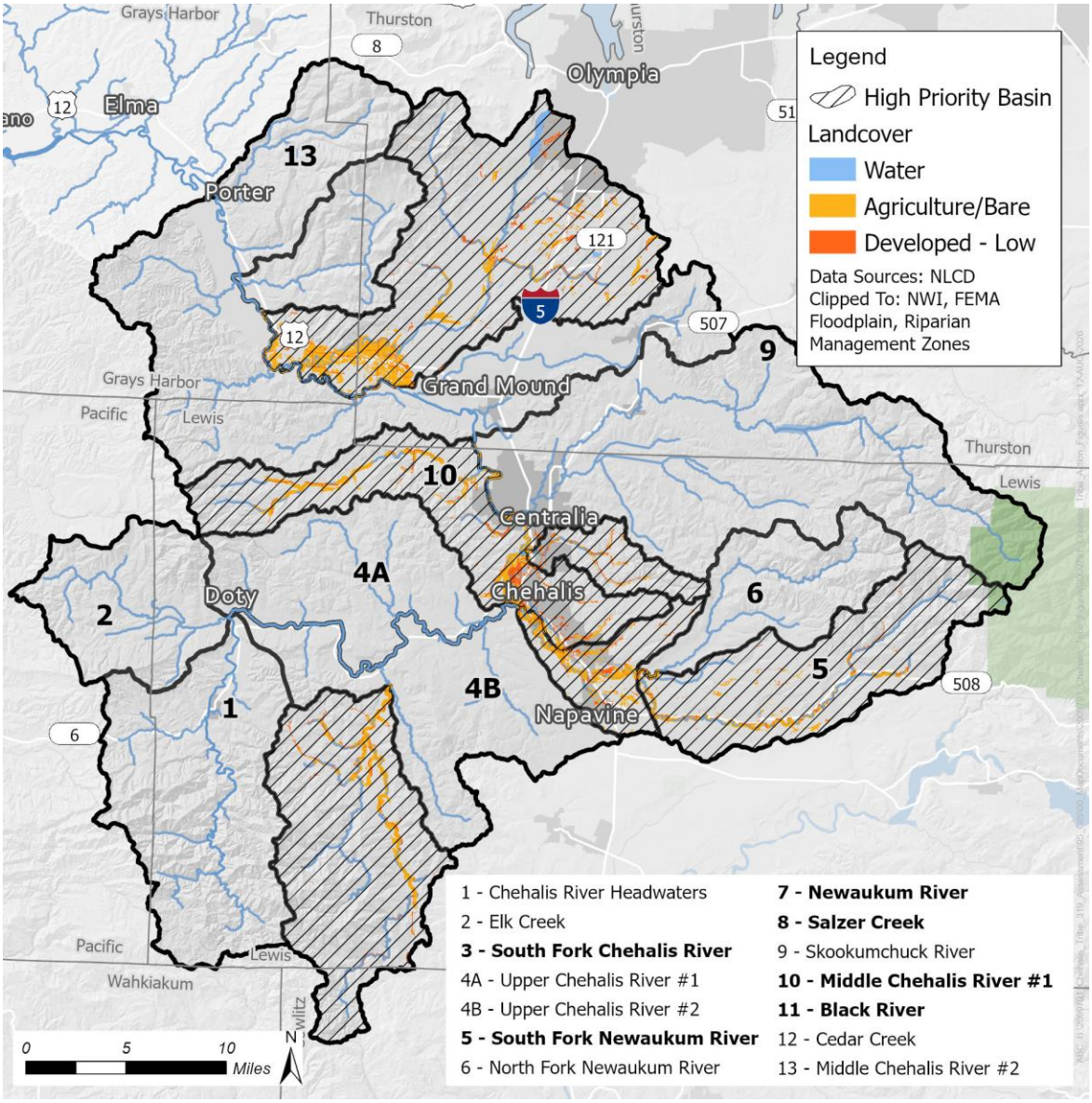

Figure 4.14 Water, agriculture, and low developed land covers within highest implementation-emphasis locations for *stream, wetland, and floodplain restoration*.

Figure 4.15 identifies the priority basins for groundwater recharge, flow storage, and related water-management actions. Site-specific opportunities will require additional evaluation of seasonal flow needs, hydrogeology, source-water availability, water rights, land availability, permitting, and the potential for a measurable instream-flow or temperature benefit.

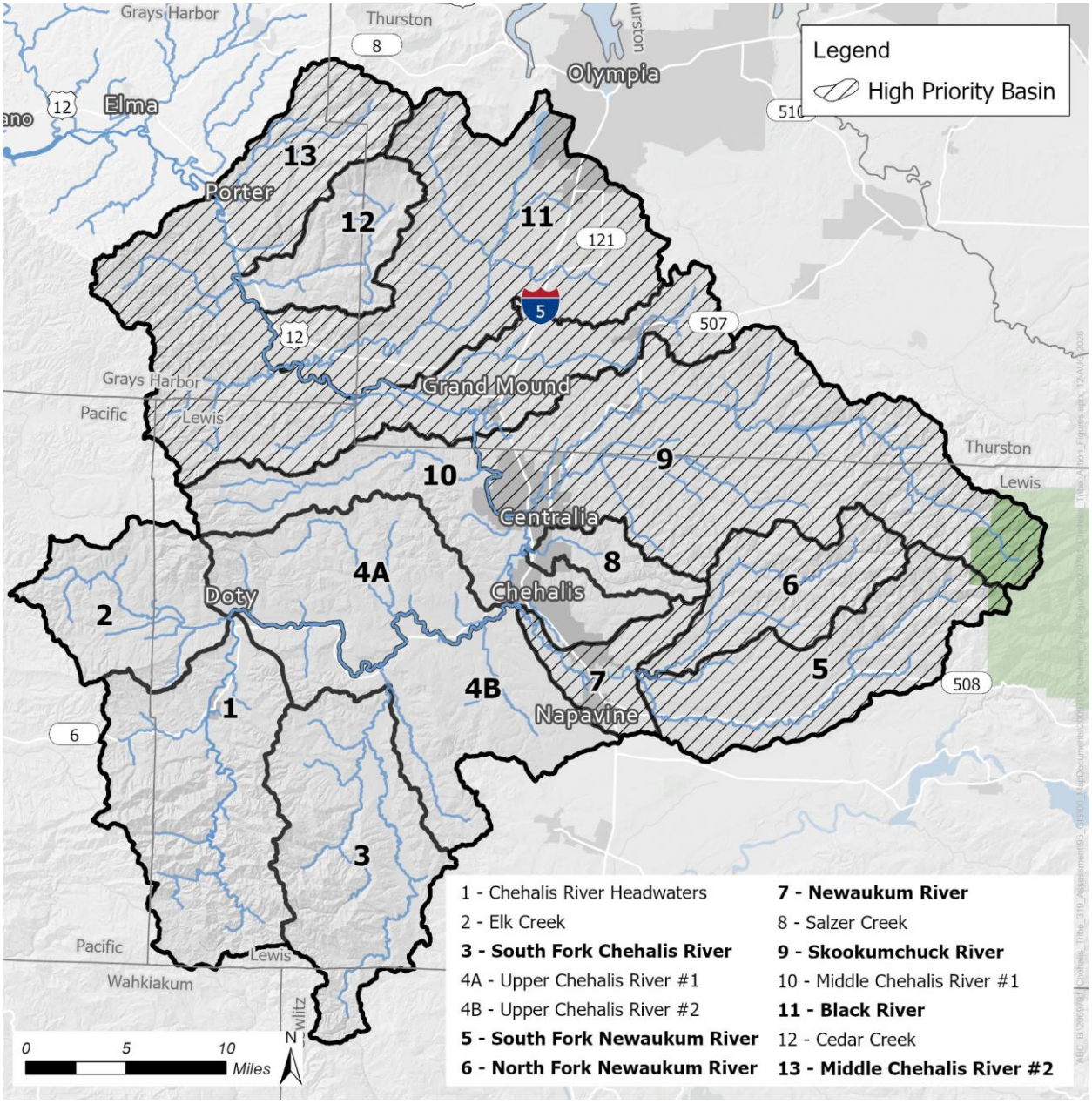

Figure 4.15 Highest implementation-emphasis locations for *flow conservation, groundwater recharge, and complementary water-management*.

Figure 4.16 shows NLCD Mature Forest and Clearcut/Shrub land cover within the priority basins for forest-road and forest-harvest management. The mapping identifies the general forest-land setting in which preventive road, harvest, site-preparation, maintenance, and erosion-control practices may be applicable. It does not identify forest-road locations or demonstrate sediment delivery; implementation should focus on sites where road inventories, harvest information, erosion mapping, field assessment, or wet-weather monitoring confirms connectivity to receiving waters.

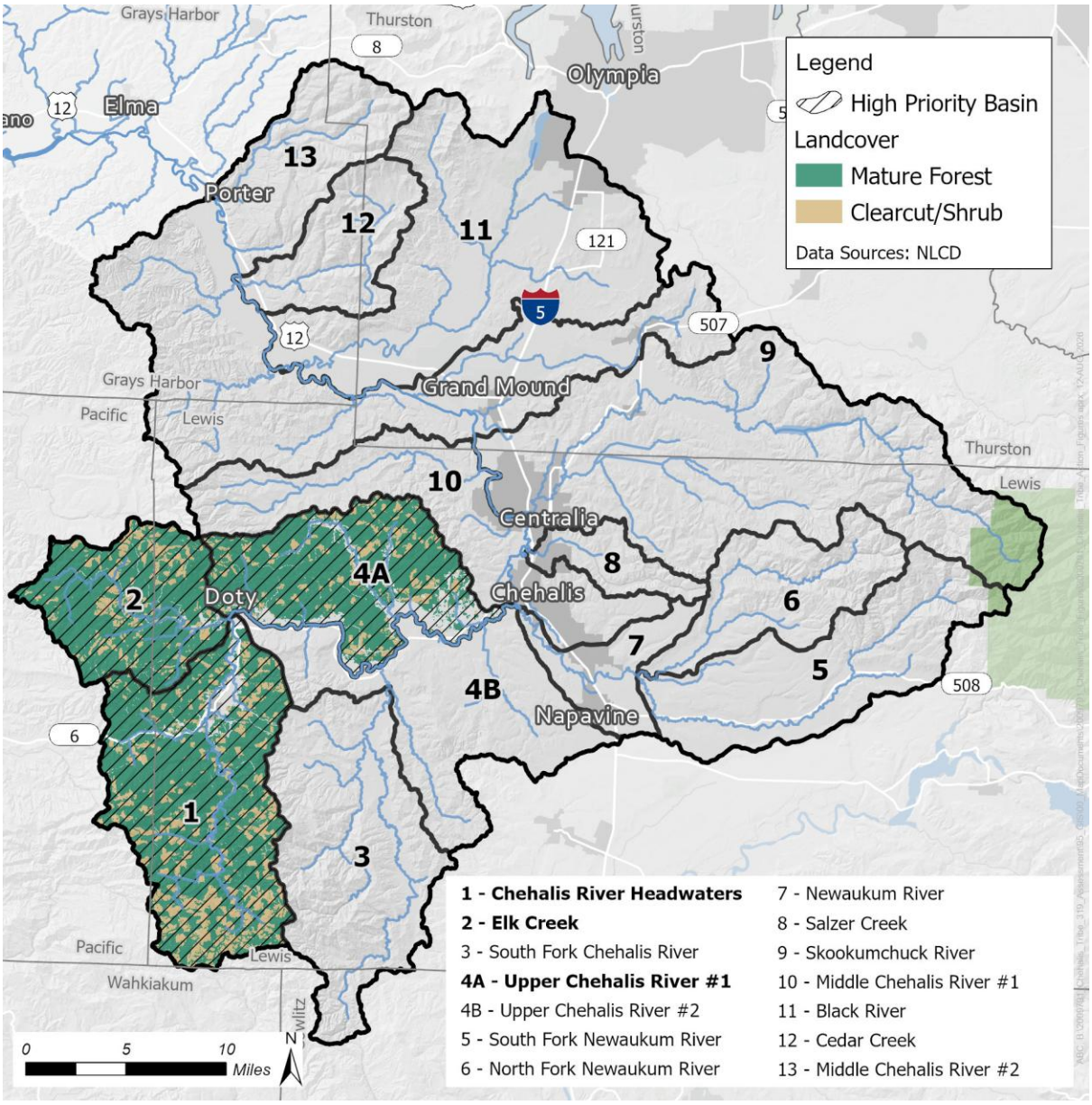

Figure 4.16 Mature forest and clear-cut/shrub land covers within highest implementation-emphasis locations for *forest-road and forest-harvest management*.

Figure 4.17 shows selected NLCD land-cover classes within the priority basins for sediment-control, crossing, ditch, and drainage improvements. The mapped forested, clearcut/shrub, agricultural/bare, and low-developed areas illustrate the range of land-use settings in which discrete erosion and sediment-delivery problems may occur. The map is intended for source screening only; individual crossings, ditches, banks, drainage failures, or erosion sites require field confirmation of active sediment delivery before treatment is prioritized.

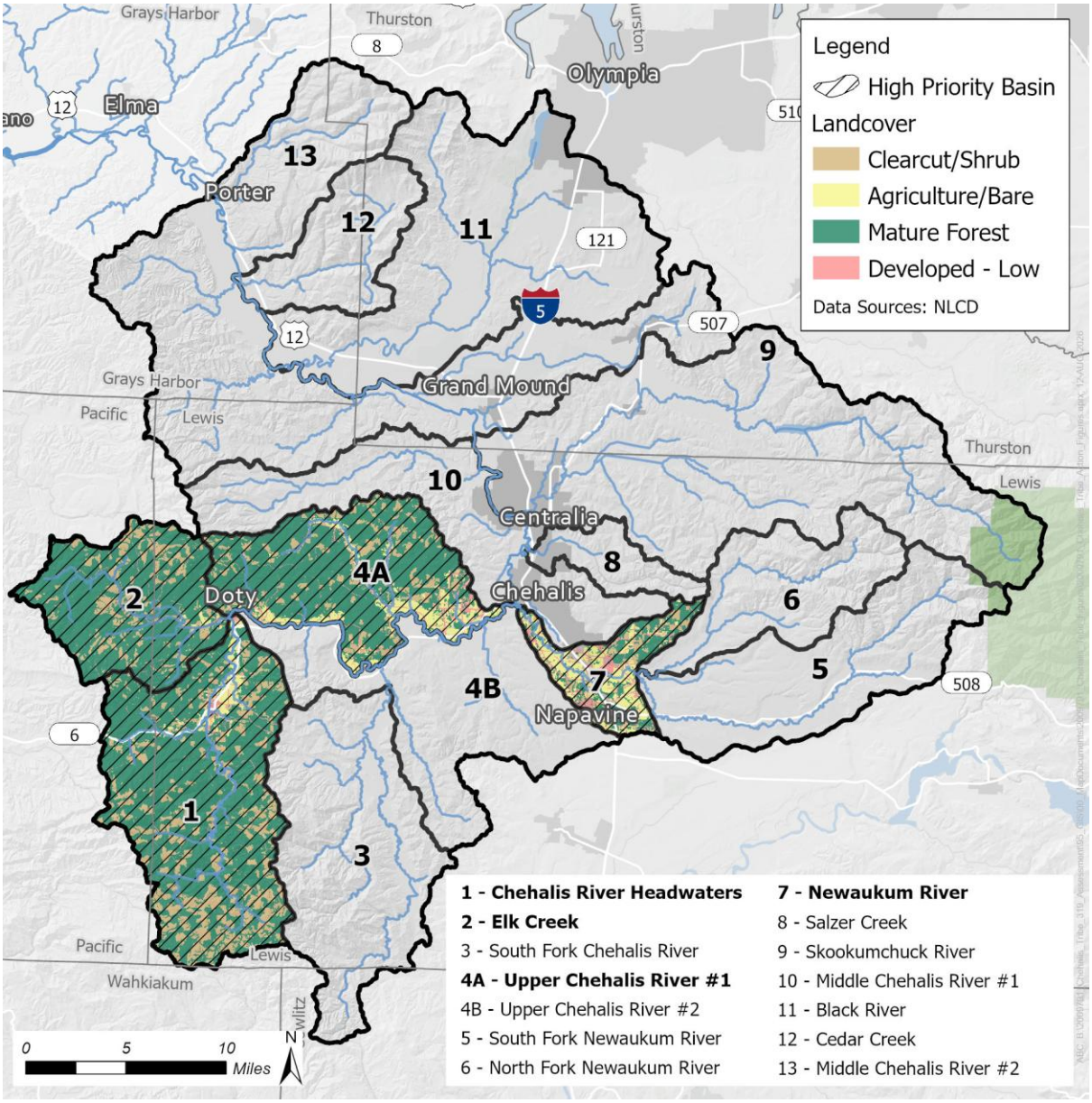

Figure 4.17 Agricultural, forested, clear-cut/shrub and low developed land covers within highest implementation-emphasis locations for *sediment-control, crossing, ditch, and drainage improvements*.

Figure 4.18 shows documented and potential fish-passage barriers from the WDFW dataset throughout the study area. Unlike the other implementation-theme maps, the barrier inventory is displayed basinwide rather than being limited to priority subbasins. The mapped points represent the broader barrier inventory and should not be interpreted as individually prioritized projects under this Plan.

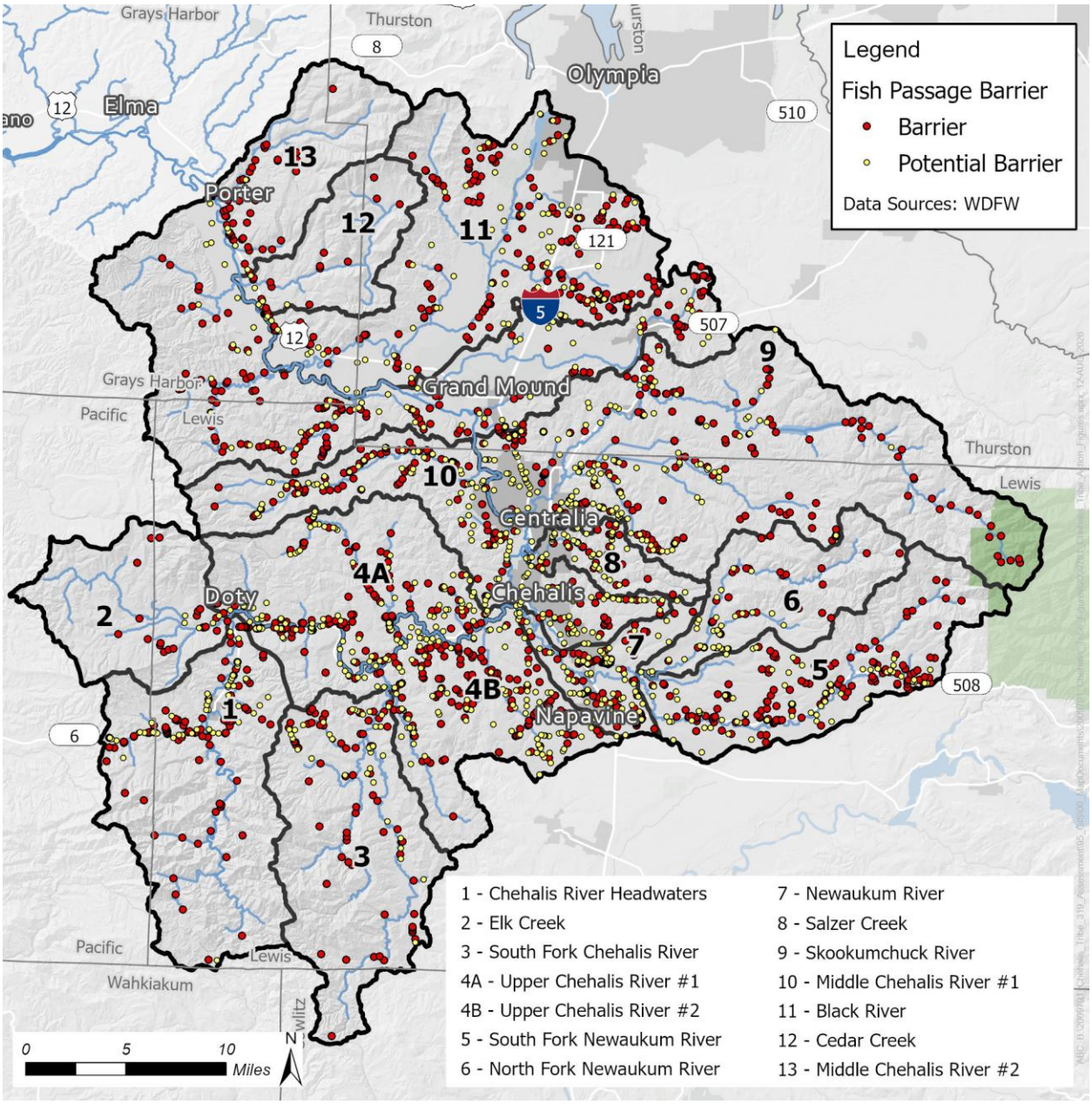

Figure 4.18 Fish passage barrier and potential barrier distribution across WRIA 23 to be considered for *fish-passage improvements*.

Figure 4.19 shows selected NLCD land-cover classes within the priority basins for conservation easements and land acquisition, including agricultural, developed-low, water, and mature-forest areas. The mapping provides landscape context for identifying properties where long-term protection could preserve riparian, wetland, floodplain, forest, or restoration-enabling functions. It does not identify candidate parcels or acquisition priorities; individual opportunities remain dependent on ecological and water-quality value, development or conversion risk, hydrologic connectivity, landowner willingness, cost, available budget, and long-term stewardship.

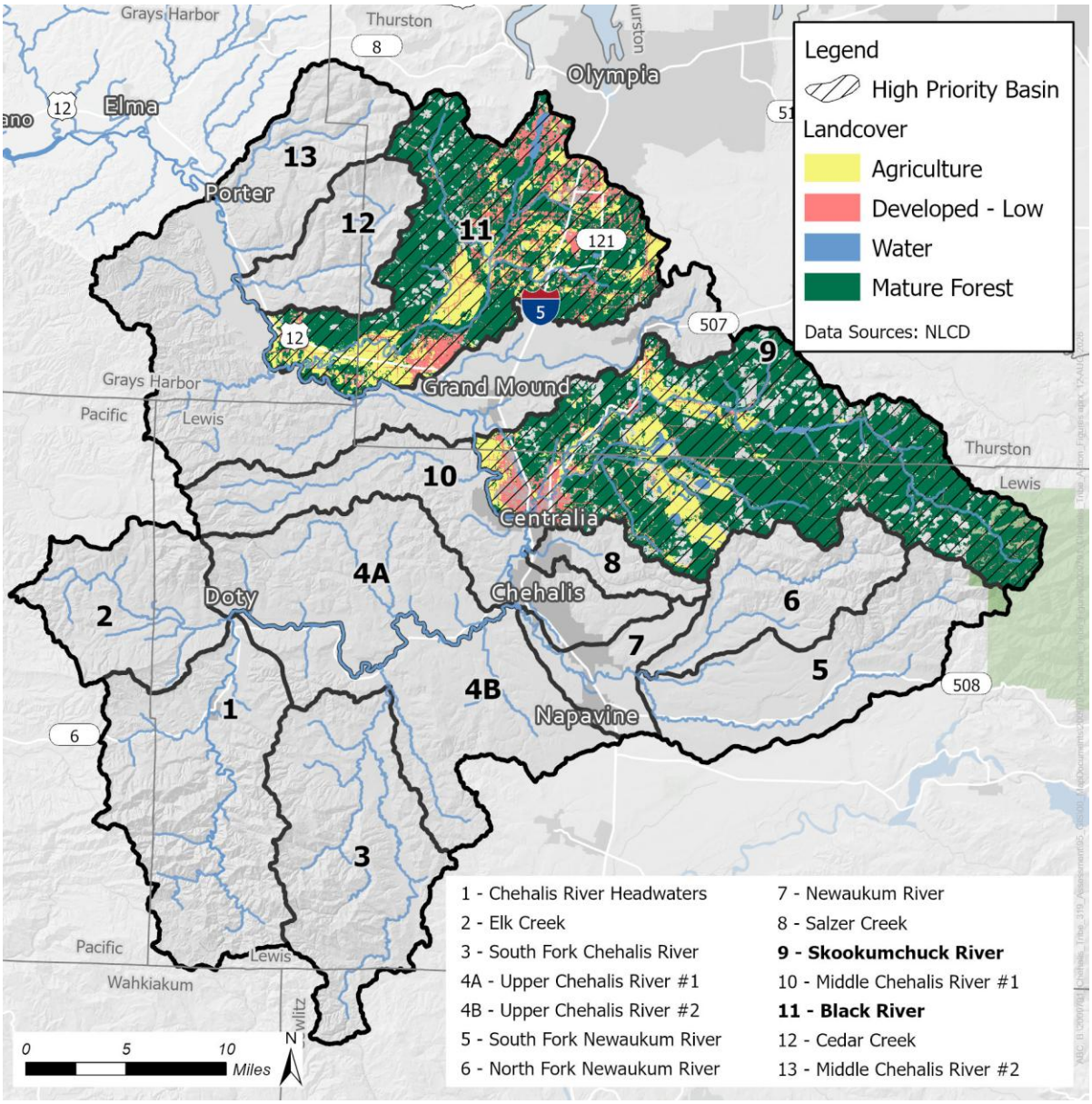

Figure 4.19 Agricultural, low developed, water and forested land covers within highest implementation-emphasis locations for *conservation easements and land acquisition*.

Figure 4.20 identifies the basins receiving the greatest implementation emphasis for outreach, monitoring, reporting, and adaptive management. No individual land-cover class is highlighted because these activities are cross-cutting and may support multiple source types and implementation themes. Monitoring and outreach within these areas should be further targeted according to identified impairments, monitoring gaps, targeted communities, likely source pathways, planned BMP implementation, and the need to evaluate conditions relevant to tribal lands.

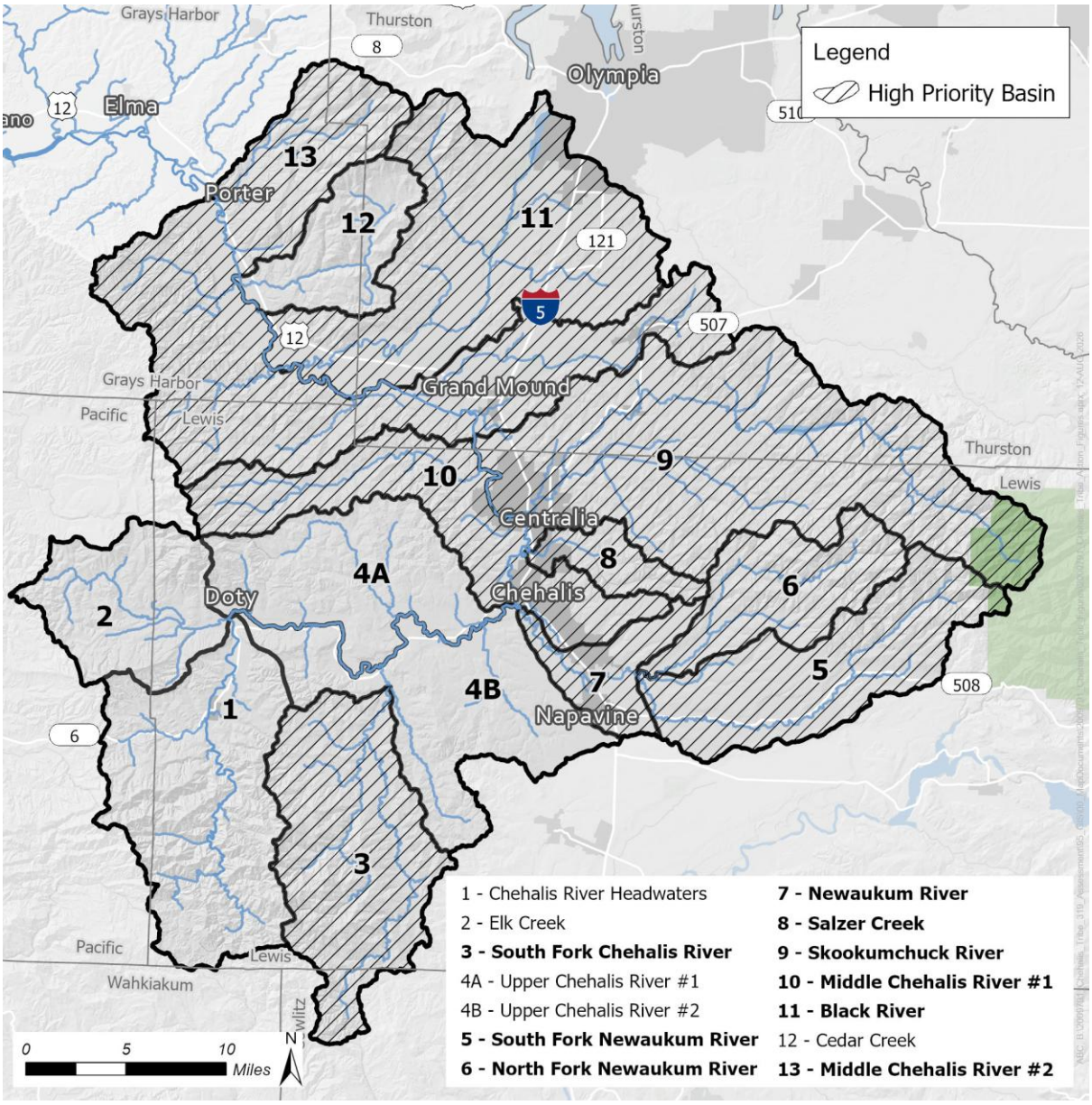

Figure 4.20 Highest implementation-emphasis locations for *outreach, monitoring, reporting, and adaptive management*.

The cross-reference between Table 4.1 and Table B.1 (Appendix B) also shows that previously identified projects provide the strongest direct support for fish passage[1], streamflow conservation, groundwater recharge, floodplain restoration, wetland restoration, and land protection. Support is more limited or indirect for agricultural source control, stormwater treatment, riparian water-quality functions, and sediment management, while septic-system actions and much of the forestry-related sediment-control program remain principally Assessment-based. This distinction provides a defensible basis for coordinating with existing projects while ensuring that implementation priorities continue to address the full range of NPS impairments documented in the Assessment.

It should be noted that each BMP listed in the table is directly/indirectly associated with a documented impairment, supported by water-quality data and historical findings. Rather than prescribing fixed site designs at this stage, the current strategy allows flexibility for adaptive management. BMPs can be refined later through field assessments, landowner engagement, and coordination with technical partners such as NRCS, conservation districts, local experts, and state agencies.

The listed BMPs will be implemented in phases over the five-year program cycle. Progress will be evaluated annually using the previously mentioned measurable indicators such as BMP installation counts, area treated, and trends in exceedance frequency at nearby monitoring stations. Results from ongoing monitoring will be used to refine priorities, adjust BMP types or locations, and inform future updates to the management program.

4.3.3 BMPs Implementation Schedule and Annual Work Planning

This section describes the implementation schedule and annual work-planning framework for the NPS Management Program. The schedule translates the watershed priorities identified in Table 4.1 into phased and trackable activities over a five-year program cycle. Implementation will remain adaptive and will be adjusted as needed based on available funding, staffing capacity, landowner and stakeholder participation, permitting requirements, monitoring results, and coordination with other watershed programs.

As mentioned, the priority areas for action implementation identified in Table 4.1 will receive the greatest initial implementation emphasis. However, the table does not establish a fixed order in which every BMP must be implemented. An Action in areas receiving higher implementation emphasis may require additional site assessment, landowner coordination, design, permitting, or

[1] Fish passage improvement may also have water quality benefits through restoration of past hydromodification/habitat alterations by removal of fish passage barriers at locations like roadway crossings. It may also provide localized sediment benefits where crossing erosion, drainage failure, or disrupted sediment transport is documented.

funding before construction can proceed. Conversely, an action in lower-priority areas for action implementation may advance earlier where a well-supported and cost-effective opportunity becomes available. Previously identified projects listed in Table B.1 (Appendix B) may also improve implementation readiness or provide opportunities for coordination, but they do not independently determine the program schedule.

An additional consideration for action implementation, where relevant and technically appropriate, will be the protection of water quality in the Chehalis River mainstem near tribal lands, located approximately between RM 55 and RM 45. However, it should be noted that because mainstem stations integrate inputs from large contributing areas, observed exceedances will not automatically be attributed to a specific tributary or land use. Source evaluation should combine station results with tributary monitoring, land-use information, field observations, seasonal patterns, storm-event or low-flow sampling, and available information on livestock access, septic systems, agricultural runoff, stormwater, riparian condition, flow, and other potential source pathways.

Proposed BMPs within upstream areas hydrologically connected to tribal lands may receive additional implementation emphasis where monitoring results and source-pathway evaluations indicate that they are likely to improve conditions entering, passing through, or immediately downstream of tribal lands. This consideration complements, rather than replaces, the Assessment-based subbasin priorities. For implementation planning, the Independence Road and Sickman Ford Road WQP stations are used as the primary nearby mainstem stations for evaluating upstream and downstream conditions relevant to tribal lands. The Prather and Porter FIN stations provide broader, longer-term mainstem context upstream and downstream. Together, these stations can support evaluation of cumulative temperature, DO, bacterial, and other water-quality conditions. Before numeric baselines or performance targets are established for the identified actions, the relevant datasets should be reviewed for consistency, record length, seasonal coverage, and data quality, including the identified concern regarding portions of the Sickman Ford temperature record.

Under this implementation framework, BMPs will be selected only where there is a reasonable technical relationship between the documented impairment, the suspected source or process, and the proposed management action.

Annual BMP selection will consider:

- severity, frequency, and geographic extent of documented impairments;
- occurrence of multiple or recurring exceedances at relevant monitoring stations;
- hydrologic connection to tribal lands and waters;
- strength of the relationship between the proposed BMP and the likely source pathway;

- location within a reach or subbasin with higher implementation emphasis, identified in Table 4.1;
- expected and measurable water-quality benefits;
- technical feasibility, landowner participation, permitting, funding, and project readiness;
- opportunities to coordinate with previously identified watershed projects (Table B.1 in Appendix B); and
- operation, maintenance, and long-term monitoring requirements.

The five-year program cycle is organized into sequential phases for developing, implementing, monitoring, and refining the BMP actions identified in Table 4.1. The high-level activities anticipated during each phase are described below.

Year 1: Monitoring review, source screening, and project development

Year 1 will focus on converting the watershed-level priorities in Table 4.1 into site-specific candidate projects. Work relevant to tribal lands will begin with confirmation of monitoring conditions and identification of the upstream areas most likely to influence the mainstem reach near the reservation.

Activities will generally include:

- reviewing available data from relevant stations, particularly Independence Road, Sickman Ford Road, Prather, and Porter;
- delineating tributaries and drainage areas and evaluating dominant land uses that may influence water quality in the tribal-lands reach;
- identifying monitoring gaps needed to distinguish potential contributing areas;
- conducting targeted tributary, storm-event, or summer low-flow monitoring where needed;
- establishing baseline periods and seasonal exceedance summaries for temperature, DO, FC, *E. coli*, nutrients, turbidity, and other relevant parameters;
- screening potential source areas and candidate BMP locations;
- coordinating with landowners, conservation districts, local governments, agencies, and other project sponsors;
- securing different funding sources for project design and implementation;
- completing feasibility assessments, preliminary designs, and Class C/D cost estimates;
- initiating pilot or readily implementable BMPs where adequate information and agreements are available; and
- preparing an annual report documenting findings, selected projects, monitoring results, expenditures, uncertainties, lessons learned, and recommended refinements.

Major milestones under this year are to complete data review, priority-source screening, candidate-project identification, partnership development, preliminary feasibility work, and implementation of ready or pilot actions.

Years 2–3: Source-focused BMP implementation and effectiveness monitoring

Years 2 and 3 will emphasize implementation of BMPs for which Year 1 screening establishes a reasonable relationship between an identified impairment, a contributing source or process, and a feasible management action. Priority will be given to projects in subbasins with higher implementation emphasis and to hydrologically connected areas where improvements may benefit the mainstem near tribal lands.

Activities will generally include:

- preparing detailed designs and Class B and A cost estimates for selected actions in the priority areas identified in the current study and confirmed or refined during the Year 1 phase;
- implementing agricultural, septic-system, stormwater, riparian, flow, sediment, or restoration BMPs in verified priority areas;
- expanding successful pilot actions;
- continuing tributary and mainstem monitoring;
- comparing conditions upstream and downstream of implemented BMPs where feasible;
- evaluating seasonal responses during summer low-flow periods and storm-driven runoff events;
- initiating and documenting O&M activities;
- assessing whether observed changes are consistent with expected BMP outcomes;
- updating annual priorities and adapting actions based on monitoring results, including shifting attention to different sources or locations, improving BMP effectiveness, and implementing additional measures as needed; and
- preparing and publishing interim progress reports to update current stakeholders, engage new stakeholders, and secure additional funding based on documented implementation progress and preliminary monitoring results.

Major milestones for Year 2 are to complete design and permitting for the first group of priority projects, initiate construction or implementation, establish project-specific O&M plans, and continue targeted monitoring.

Major milestones for Year 3 are to expand implementation, complete an interim program evaluation, assess early BMP performance, and refine priorities, budgets, and monitoring needs.

Years 4–5: Expanded implementation, trend evaluation, and program refinement

Years 4 and 5 will focus on completing or expanding effective BMPs, sustaining O&M, and evaluating whether the program is producing measurable improvements in the priority reaches and also near tribal lands.

Activities will generally include:

- completing remaining feasible priority projects;
- expanding successful BMPs to additional connected locations;
- continuing maintenance, repair, and replacement of installed measures;
- evaluating water-quality trends at the relevant mainstem and tributary stations;
- comparing conditions among Independence Road, Sickman Ford Road, Prather, Porter, and other suitable monitoring locations;
- evaluating whether exceedance frequency, seasonal severity, or event-related peaks have changed following BMP implementation, while considering other watershed, climatic, and monitoring influences;
- identifying remaining source areas, monitoring gaps, and implementation needs;
- documenting completed, ongoing, deferred, and unsuccessful actions; and
- preparing recommendations and an updated implementation framework for the next program cycle and long-term O&M.

Major milestones for Year 4 are to implement the next group of verified projects, continue O&M and effectiveness monitoring, and begin the five-year trend and program-performance evaluation.

Major milestones for Year 5 are to complete feasible priority projects, evaluate five-year outputs and outcomes, document remaining needs and lessons learned, and prepare the updated program framework and Years 6–10 potential priorities.

It is expected that monitoring, outreach, reporting, adaptive management, and O&M will occur throughout all five years for effective implementation of identified actions.

For each BMP advanced through an annual work plan, the Tribe will document the proposed BMP type, specific location, treatment extent or size, design basis, responsible entity, project partners, anticipated schedule and cost, expected water-quality benefit, monitoring approach, and O&M requirements. Each constructed or installed BMP will have a project-specific O&M plan or agreement before implementation. The plan will identify the BMP owner or responsible party, inspection and maintenance activities, inspection frequency, performance or maintenance triggers, corrective-action procedures, access requirements, recordkeeping responsibilities, anticipated service life, replacement needs, and the funding or in-kind resources expected to support long-term maintenance. O&M responsibilities may be assigned to the Tribe, landowner,

project sponsor, local government, facility owner, or another partner through the applicable agreement. Annual reporting will document inspection status, maintenance completed, unresolved deficiencies, and any BMPs requiring repair, replacement, or redesign.

Annual work plans will also identify funding sources, matching or in-kind contributions, contracting responsibilities, and funding limitations for each selected project. Potential funding may include Clean Water Act (CWA) Section 319 funds, Tribal resources, Ecology and Office of Chehalis Basin programs, NRCS and other agricultural-conservation programs, county or municipal programs, WDFW or habitat-restoration funds, and landowner or project-sponsor contributions, as applicable. Inclusion in this plan does not imply that any particular funding source has been secured. Section 319 funds will be used only for eligible activities and will not be used to replace independently required regulatory obligations. Table 4.2 summarizes the anticipated sequencing of BMP development, implementation, monitoring, and adaptive refinement over the five-year program cycle.

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Table 4.2 Anticipated program-level schedule for BMP planning, design, implementation, monitoring, and adaptive management.

Theme & Action	Year 1	Years 2–3	Years 4–5	Key implementation considerations
Agricultural source controls: 1.1, 1.5, 1.7, 3.1–3.4, and 4.2	Screen agricultural source areas, conduct outreach, assess livestock, manure, nutrient, irrigation, and runoff pathways	Implement and expand controls in verified source areas	Maintain BMPs, evaluate effectiveness, and expand where justified	Give added consideration to hydrologically connected areas where agricultural sources may influence the mainstem near tribal lands
Septic-system management: 1.3	Coordinate with health departments, identify priority areas, and review available evidence of failing or poorly maintained systems	Support targeted inspection, repair, replacement, or maintenance programs	Continue implementation and evaluate remaining needs	Source confirmation, property-owner participation, public-health authority, and available assistance programs
Runoff and stormwater controls: 1.4, 1.6, 2.6, and 6.4	Screen priority developed drainage areas, mapped outfalls, connected impervious areas, and existing stormwater facilities; conduct wet-weather source confirmation and identify retrofit opportunities	Implement feasible treatment, infiltration, and runoff-control projects	Expand successful measures and continue maintenance	Prioritize projects where drainage pathways are connected to impaired tributaries or the mainstem near tribal lands
Riparian buffer establishment and restoration: 1.2, 2.1, 4.1, and 5.1	Identify priority reaches, assess shade and bank condition, engage landowners, and prepare planting plans	Install riparian BMPs and conduct initial maintenance	Replace unsuccessful vegetation, control invasive species, and evaluate shade and survival	Consider thermal exceedances, source-area connectivity, planting season, fencing, and long-term maintenance
Stream, wetland, and floodplain restoration: 2.2, 2.3, 2.5, 4.3, 5.3, and 6.3	Complete feasibility, field assessment, conceptual design, and coordination	Implement ready or pilot projects and advance larger designs	Implement additional projects and evaluate performance	Hydraulic and geomorphic setting, land access, permitting, funding, and likely downstream benefit
Flow conservation, groundwater recharge, and complementary water management: 2.4, 2.5, 4.4, and 6.8	Conduct flow, hydrogeologic, and water-right screening	Implement feasible conservation, recharge, or water-management actions	Expand successful actions and evaluate flow and temperature response	Summer low-flow conditions, measurable instream benefit, water rights, hydrogeology, and permitting

Theme & Action	Year 1	Years 2–3	Years 4–5	Key implementation considerations
Forest-road and forest-harvest management: 5.2 and 6.2	Identify sediment-delivery risks and priority road or drainage sites	Implement preventive forest-road, harvest, site-preparation, maintenance, and decommissioning BMPs in verified source areas	Continue improvements and maintenance and evaluate sediment-source reduction and management effectiveness	Demonstrated road- or harvest-area connectivity to streams, ownership, unstable terrain, harvest timing, road access, and forest-practice requirements
Sediment-control, crossing, ditch, and drainage improvements: 5.4, 5.5 and 5.6	Verify discrete failing crossings, ditches, headcuts, banks, and drainage sites and confirm active sediment delivery	Design and construct priority improvements for sediment, erosion and drainage controls	Complete additional work, maintain installed measures, and evaluate sediment response	Direct sediment connectivity to receiving waters, infrastructure ownership, hydraulic capacity, fish passage, permitting, and whether another theme represents the project's primary purpose
Fish-passage improvements: 6.6	Update barrier status, habitat-gain estimates, and project sequencing; confirm associated sediment, hydraulic, and channel-connectivity concerns	Design and implement ready, high-benefit barrier corrections in the appropriate downstream-to-upstream sequence	Complete remaining feasible projects and monitor response	Barrier severity, cumulative accessible habitat, downstream barrier dependencies, associated sediment effects, sponsor readiness, and current project status
Conservation easements and land acquisition: 6.5	Confirm the current status of previously defined properties; identify other priority properties, willing landowners, and qualified easement or acquisition holders	Advance feasible easements or acquisitions	Continue opportunity-based protection and stewardship	Ecological and water-quality value, hydrologic connectivity, willingness, appraisal, funding, and long-term stewardship
Outreach, monitoring, reporting, and adaptive management: 1.8, 6.1, 6.7, and 6.9	Review station data, verify data quality and comparability, establish appropriate baselines, identify source-monitoring needs, and initiate outreach and project tracking	Continue mainstem and tributary monitoring and evaluate implemented BMPs as well as outreach and annual reporting	Complete trend and program-effectiveness evaluations, report outcomes, and update priorities for the next program cycle	Use Independence Road Bridge and Sickman Ford Road Bridge as the closest upstream and downstream WQP stations, respectively, with Prather and Porter providing broader upstream and downstream FIN context; verify data quality and record comparability before establishing numeric targets

Note: The schedule is a program-level framework rather than a fixed construction schedule. Monitoring results from stations relevant to tribal lands will be used as one implementation factor, together with impairment severity, hydrologic connectivity, source-pathway evidence, feasibility, funding, landowner participation, permitting, and project readiness. Annual work plans will identify the specific projects, locations, potential responsible/involved entities, schedules, budgets, performance measures, and operation and maintenance requirements.

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Final Report, Rev. R2
September 2026

APPENDICES

APPENDIX A

Treatment as a State (TAS) approval

EPA

Water Quality Standards Regulations: Confederated Tribes of the Chehalis Reservation

Presented are water quality standards in effect for Clean Water Act (CWA) purposes for this tribe.

The EPA is posting these standards as a convenience to users and has made a reasonable effort to assure their accuracy. For each document listed under "Tribal Standards in Effect for CWA Purposes", the EPA has made a reasonable effort to identify parts of the standards that are disapproved or are otherwise not in effect for CWA purposes. Additionally, please note the documents may also contain provisions that the EPA does not have the authority and duty to act on under the Clean Water Act because the provisions are not water quality standards.

- What is a New or Revised Water Quality Standard Under CWA 303(c)(3)? - Frequently Asked Questions (pdf) <https://www.epa.gov/sites/default/files/2014-11/documents/cwa303faq.pdf> (108.04 KB)

Authority to Administer Standards Program

This tribe was granted treatment in a manner similar to a state (TAS) on March 7, 1995.

Tribal Standards in Effect for CWA Purposes

The tribe's water quality standards were approved on February 3, 1997.

- Confederated Tribes of the Chehalis Reservation Water Quality Standards (pdf) <https://www.epa.gov/sites/default/files/2014-12/documents/confederated-tribes-chehalis.pdf> (1.78 MB) (Effective February 3, 1997)

Federally Proposed or Promulgated Standards

- None at this time.

Last updated on June 26, 2026

APPENDIX B

Projects previously identified in 2020 Addendum to CWMP and complementary priority assessment

Table B.1 WRIA 23 projects identified in the 2020 Addendum to the Chehalis Watershed Management Plan (NHC, 2020). 56

B.1 Overview

This appendix provides two complementary components supporting the NPS Management Program. First, it presents the inventory of previously identified projects and programs applicable to WRIA 23, including their locations, objectives, and relationships to the subbasins used in the Assessment and Management Plan. Second, it documents the technical basis for the priority and lower-priority areas for action implementation identified in Table 4.1 by summarizing relevant land-use conditions, monitoring results, historical findings, applicable TMDLs, likely source pathways, and identified project opportunities for each implementation theme.

The previously identified project inventory is based primarily on the 2020 CWMP Addendum. Because the Addendum was developed mainly to address streamflow restoration and demonstrate net ecological benefit, it is not a complete inventory of NPS-control measures. The projects and programs are therefore used to identify existing work, coordination opportunities, implementation readiness, and potential complementary water-quality benefits; they do not independently establish the spatial priorities of the NPS Management Program.

The NPS Assessment Report remains the primary basis for selecting and prioritizing NPS actions. Priority designations were developed by considering the combined weight of documented impairment, land use, likely source pathways, hydrologic connectivity, historical findings, applicable TMDLs, existing or proposed projects, and implementation feasibility. Land-cover percentages and individual station results were not used alone because they do not necessarily identify pollutant delivery or distinguish among contributing sources. Monitoring records also differ in period, sample size, seasonal coverage, and spatial representativeness. Mainstem and downstream results may reflect cumulative inputs from multiple areas and cannot independently attribute impairment to a particular tributary, land use, or source.

The project inventory and priority assessment should therefore be read together. The inventory identifies where previously proposed or ongoing work may directly support, partially support, or complement the implementation themes in Table 4.1, while the theme-specific narratives explain the broader Assessment-based rationale for the selected priority reaches, subbasins, and project areas.

B.2 Previously Identified Projects

Table B.1 identifies 48 projects and programs applicable to WRIA 23. The largest concentrations of previously identified projects are in the Newaukum River system with 14 projects and Black River subbasin with 9 projects. Other projects are located in the Scatter Creek area (five projects), Skookumchuck River (three projects), Salzer Creek and the Chehalis–Centralia area (three projects), along with South Fork Chehalis River, Chehalis River Headwaters, and Middle

Chehalis River subbasins. The inventory also includes several basinwide programs that may be applied at suitable locations throughout WRIA 23. Eleven projects specifically address fish-passage barriers, while many others focus on streamflow enhancement, groundwater recharge, floodplain and wetland restoration, habitat improvement, or land protection.

The inventory demonstrates that WRIA 23 already has a substantial foundation of completed, ongoing, planned, and conceptual watershed work that may support NPS-management objectives. However, the distribution of projects also reflects the streamflow-restoration and net-ecological-benefit purpose of the Addendum to CWMP (NHC, 2020). Important NPS source-control needs - including septic-system management, livestock and manure controls, bacterial source reduction, conventional stormwater treatment, and forestry-related sediment control - are comparatively underrepresented. The inventory should therefore be viewed as supporting context and an opportunity for coordination.1

Table B.1 WRIA 23 projects identified in the 2020 Addendum to the Chehalis Watershed Management Plan (NHC, 2020).

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
B-00	Holm Farm Ditch Removal with Floodplain Reconnection and Stream Re-Meandering (Thurston County ID 91)	Northwest of the north end of Crockett St NW, central Thurston County; Blooms Ditch and unnamed tributary ditches; 46.930241, -122.979312.	Black River (11)	$1,100,000	Remove incised ditches and possible drain tiles, re-meander Blooms Ditch, reconnect the floodplain, raise the seasonal water table, store and slowly release water, and improve wetland and aquatic habitat.
B-01	Allen Creek MAR site (Thurston County ID 84). Assessment/Design/Acquisition/ Construction.	East of Crockett St SW, central Thurston County; unnamed ditches feeding Allen Creek in the Beaver Creek system; 46.915593, -122.958451.	Black River (11)	Unknown	Divert a small portion of winter high flows to a managed aquifer recharge facility so groundwater storage can augment dry-season baseflow in Allen Creek, Beaver Creek, and the Black River.
B-02	Cooke Aquaculture Water Right – Black River Reach	Former Black River fish hatchery, 11405 Gate Road SW, Thurston County; 46.8436, -123.1200.	Black River (11)	Unknown	Acquire and use or protect the former hatchery groundwater right to increase cold-water flow in the Black River, with the option of permanent instream trust protection when direct augmentation is no longer needed.
B-03	Black River Basin Oregon Spotted Frogs, Farms & Wetlands Project	Black River basin, Thurston County; project sheet coordinate 46.914656, -123.016214.	Black River (11)	Unknown	Work with willing landowners to protect and improve Oregon spotted frog and wetland habitat while maintaining viable agricultural or other land uses, including development of stewardship, restoration, and protection projects.
B-04	Black River Confluence	Black River confluence area; 46.821109, -123.218675.	Black River (11)	Unknown	Complete geomorphic and hydraulic assessment and develop restoration actions to improve floodplain connectivity, riparian and channel processes, and salmon habitat at the Black River confluence.
B-05	Albany Street Stormwater Pond (Thurston County ID 65)	Immediately west of Albany St SW and Littlerock Rd SW, Rochester, Thurston County; 46.826812, -123.094227.	Black River (11)	$2,000,000	Infiltrate stormwater from approximately 30 acres of streets to increase groundwater recharge, reduce runoff and localized flooding, and support streamflow benefits in the Black River system.
B-06	Beaver Creek Conservation Easement	Near Littlerock, accessed from Littlerock Rd and 133rd St SW; along Beaver Creek; 46.8972, -123.016.	Black River (11)	Unknown	Acquire a perpetual conservation easement protecting more than 27 acres of young forest and mature riparian forest along Beaver Creek.
B-07	Seiler Conservation Easement	West of Mima Gate Road between Littlerock and Rochester, Black River subbasin; 46.8648, -123.088.	Black River (11)	Unknown	Establish a perpetual conservation easement to protect and maintain the parcel's diverse forest cover and associated watershed functions.
B-08	Jones Road at Salmon Creek Culvert Replacement	Jones Road at Salmon Creek, Thurston County; 46.94593638, -122.96059914.	Black River (11)	$910,000	Remove two partial-barrier culverts and replace them with a bridge to restore passage for coho and sea-run cutthroat and improve access to overwintering, rearing, and spawning habitat.

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
BW-00	Beaver Dam Analog Implementation	Prioritized locations in the Chehalis Basin; initial work includes tributaries of the Newaukum River.	Basinwide within WRIA 23; initial emphasis on South Fork Newaukum River (5), North Fork Newaukum River (6), and Newaukum River (7)	Unknown	Construct and monitor BDAs at prioritized locations to raise local groundwater levels, enhance wetland storage, and test improvements to streamflow, habitat, and water quality.
BW-02	Agricultural Irrigation Efficiencies & Water Conservation Program	Program may be applied in any planning subbasin.	All WRIA 23 subbasins where irrigated agriculture and willing landowners are present	Unknown	Provide technical assistance and irrigation management planning so agricultural landowners can improve infrastructure, timing, and application efficiency and conserve water.
BW-03	Eager Beaver Collaboration	Chehalis Basin; no fixed implementation site; project sheet coordinate 47.020588, -122.944291 (Olympia).	Basinwide within WRIA 23 where beaver habitat and willing landowners are present	Unknown	Work with landowners to increase tolerance for beaver, develop compatible beaver-habitat stewardship projects, and retain the streamflow, wetland, floodplain, and habitat benefits of beaver activity.
BW-04	Managed Aquifer Recharge (MAR) Opportunity Assessment	No sites selected; potential private and public sites throughout the Upper and Lower Chehalis River basins.	Potentially any WRIA 23 subbasin where hydrogeology, source water, land availability, and permitting are suitable	Unknown	Identify and assess managed aquifer recharge opportunities that can divert available winter water to groundwater storage and increase later-season baseflow.
BW-05	Stormwater Recharge Opportunity Assessment	No sites selected; most likely in developed areas with existing stormwater facilities, including Chehalis and Centralia.	Developed portions of WRIA 23, particularly Upper Chehalis River #2 (4B), Salzer Creek (8), Middle Chehalis River #1 (10), Black River (11), and Middle Chehalis River #2 (13)	$130,000 (Excluding Construction)	Identify stormwater retrofits or routing changes that increase infiltration beyond existing requirements, recharge groundwater, and support streamflow.
BW-06	Trust Water Rights Acquisitions	Basinwide; Appendix sheet specifically identifies Satsop, Skookumchuck, Black, Scatter, Newaukum, and Curtis subbasins.	WRIA 23 portions: South Fork Chehalis River (3), South Fork Newaukum River (5), North Fork Newaukum River (6), Newaukum River (7), Skookumchuck River (9), Black River (11), and Middle Chehalis River #2 (13)	Unknown	Identify, evaluate, acquire, and permanently protect suitable water rights in trust to increase or protect instream flow.
BW-07	USGS Groundwater Discharge Zone Delineation	Selected streams in the Black, Scatter, Newaukum, Skookumchuck, Cloquallum-N. Delezene, Curtis, and Chehalis-Salzer Addendum subbasins.	WRIA 23 portions: South Fork Chehalis River (3), South Fork Newaukum River (5), North Fork Newaukum River (6), Newaukum River (7), Salzer Creek (8), Skookumchuck River (9),	$100,000	Measure summer water-temperature profiles and streamflow gains and losses to delineate groundwater-discharge zones, thermal refugia, and reaches important for flow protection and restoration.

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
			Middle Chehalis River #1 (10), Black River (11), and Middle Chehalis River #2 (13)		
C-00	Chehalis Basin Early Action Reach Restoration Design: Stillman Cr. RM 0-2.5	Stillman Creek RM 0-2.5, tributary to the South Fork Chehalis River; 46.54, -123.14.	South Fork Chehalis River (3)	$5,400,000	Restore approximately three miles of Stillman Creek using large wood, side channels, backwater alcoves, and riparian planting to improve salmon and steelhead habitat and recover functions affected by the 2007 floods.
CH-00	Marker 19 Oxbow Restoration Project	West Fork Chehalis River, Section 17, Township 11N, Range 05W; 46.436389, -123.331667.	Chehalis River Headwaters (1)	$1,430,000	Relocate flow from the artificial road channel back into the historic oxbow, bypass an impassable bedrock cascade, and reconnect more than seven miles of high-quality fish habitat.
CS-00	Coal Creek Floodplain Storage	Coal Creek adjacent to National Avenue near Chehalis, on an approximately 80-acre City parcel; 46.684734, -122.964353.	Salzer Creek (8)	Unknown	Evaluate and develop floodplain storage and wetland/off-channel habitat on the City parcel to reduce peak flows, increase lateral infiltration, and slowly release stored water to Coal Creek.
CS-01	Berwick Creek at Labree Fish Passage Design/Construction	Berwick Creek at Labree Road MP 0.459; 46.62288, -122.93439.	Middle Chehalis River #1 (10); very close to its border with Newaukum River (7)	$156,000 (Excluding Construction)	Replace a partially passable box culvert with a fish-passable structure to restore upstream access, improve sediment transport and water quality, and improve floodplain connectivity.
CS-02	Flood Hazard Reduction Master Plan and Chehalis Wastewater Treatment Plant (WWTP) Project	City of Chehalis between the Chehalis River and Louisiana Avenue, and between Highway 6 and Airport Road; 46.66501, -122.96952.	Middle Chehalis River #1 (10)	Master Plan: $33,000 WWTP Phase 1: $3,680,000	Develop a flood-storage master plan, remove the former WWTP, restore approximately 10 acres of wetland, and create floodplain storage that slows releases and filters urban and agricultural contaminants.
EW-00	Garrard Creek Floodplain Restoration Opportunity Assessment	Garrard Creek and adjacent Chehalis River side-channel/floodplain area; 46.813652, -123.249261.	Middle Chehalis River #2 (13)	$91,000 (Excluding Construction)	Assess geomorphic, hydraulic, floodplain, riparian, and habitat conditions and identify feasible restoration actions, including side-channel, floodplain, large-wood, and BDA opportunities.
EW-01	Convert Galvin to Centralia Water	Galvin area near Galvin Road and Lincoln Creek Road; 46.74139, -123.02750.	Middle Chehalis River #1 (10)	$4,000,000 to $5,000,000	Extend the Centralia water system to Galvin so approximately 40 homes can discontinue shallow permit-exempt wells, reducing local groundwater withdrawals and vulnerability to septic contamination.
EW-02	Scammon Creek Hamilton Fish Passage Construction	Scammon Creek west of Centralia, approximately 1,600 feet upstream of its Chehalis River confluence; 46.71547, -122.99506.	Middle Chehalis River #1 (10)	$130,000	Remove the lowest privately owned barrier culvert on Scammon Creek to restore fish passage and complement removal of upstream county barriers.
H-00	China Creek Flood and Habitat Mitigation Phase 2	China Creek/Agnew mill ponds just outside downtown Centralia, parallel to N. Gold Street between Roswell Road and Marion Street; 46.725828, -122.947219.	Skookumchuck River (9)	$3,900,000	Increase mill-pond storage to reduce flooding in Centralia and restore a more natural China Creek channel, wetland, and fish and wildlife habitat.
H-01	Port Blakely Hanaford Acquisition	South Hanaford Creek near Teitzel Road, Centralia; 33-acre forested parcel; 46.744541, -122.885725.	Skookumchuck River (9)	Unknown	Acquire and protect a forested and wetland-bearing parcel along South Hanaford Creek to preserve natural land cover, hydrologic function, and habitat.

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
N-00	City of Chehalis Alternate Water Supply Intake	Existing City of Chehalis Newaukum water-supply diversion; 46.67845, -122.70550; proposed alternate withdrawal at the City's existing Chehalis River intake.	North Fork Newaukum River (6) and flow retained at the diversion would continue downstream Newaukum River (7)	$13,000,000	Relocate the City's Newaukum withdrawal to the downstream Chehalis River intake, leaving up to about 1.5 cfs in the lower Newaukum system during critical summer low flows and reducing stream temperature impacts.
N-01	MF Newaukum Trib-Kruger Fish Passage Construction	Unnamed tributary to Middle Fork Newaukum River at Kruger Road MP 1.201; 46.610022, -122.729902.	South Fork Newaukum River (5)	$1,324,000	Replace two barrier culverts with a fish-passable structure and restore channel conditions to provide unimpeded access to upstream coho, steelhead, and cutthroat habitat.
N-02	Newaukum Lake Restoration & Enhancement Planning	Newaukum Lake/pond and wet-meadow headwater area; 46.663563, -122.474786.	South Fork Newaukum River (5) – very upstream	Unknown	Plan pond and wet-meadow restoration using wood or other outlet-channel structures to increase water retention, hyporheic storage, late-season flow, and headwater habitat.
N-03	MF Newaukum Centralia (C.) Alpha Fish Passage Construction	Middle Fork Newaukum River at Centralia Alpha Road MP 15.79; 46.615526, -122.675614.	South Fork Newaukum River (5)	$1,135,000	Replace a barrier culvert with a fish-passable box culvert, regrade the channel, add streambed material and large wood, and restore access to coho, steelhead, and cutthroat habitat.
N-04	South Fork Newaukum Early Action Reach Restoration Project	South Fork Newaukum River RM 10.9-13.0; 46.5964, -122.85.	South Fork Newaukum River (5); very close to its border with (7)	$7,116,000	Restore reach-scale habitat and processes using large wood, bank treatment, side channels, backwater alcoves, riparian planting, bank-armoring removal, and floodplain reconnection.
N-05	Lucas Creek Trib MP 4.39 - Fish Passage Construction	Lucas Creek tributary at Lucas Creek Road MP 4.39; 46.6494751, -122.7043762.	North Fork Newaukum River (6)	$1,368,000	Replace a barrier culvert with a fish-passable box culvert, restore the channel, and improve fish passage, sediment transport, water quality, and access to upstream habitat.
N-06	Lucas Creek Trib MP 4.24 - Fish Passage Construction	Lucas Creek tributary at Lucas Creek Road MP 4.24; 46.651062, -122.704155.	North Fork Newaukum River (6)	$1,572,000	Replace a barrier pipe with a fish-passable box culvert, restore channel conditions, and improve passage, sediment transport, water quality, and access to upstream habitat.
N-07	Berwick Creek at Hogue Fish Passage Construction	Berwick Creek, tributary to Dillenbaugh Creek, at the Hogue property; 46.62503, -122.88438.	Newaukum River (7)	Unknown	Construct the designed bridge to remove the only private mainstem barrier on Berwick Creek and restore access to approximately 3.29 miles of habitat after downstream barriers are corrected.
N-08	Berwick Creek at Borovec Fish Passage Construction	Berwick Creek at Borovec Road MP 0.032; 46.619503, -122.9185486.	Newaukum River (7)	$1,329,000	Replace two velocity-barrier culverts with a fish-passable box culvert to improve passage, sediment transport, water quality, and access to upstream habitat.

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
N-09	Newaukum MAR	No site selected; potential private or public sites on the North Fork and South Fork Newaukum Rivers in central Lewis County.	Potential sites in South Fork Newaukum River (5) and North Fork Newaukum River (6), with downstream benefit to Newaukum River (7)	Unknown	Assess and develop managed aquifer recharge that diverts available winter surface water to groundwater storage and increases later-season baseflow in the Newaukum system.
N-10	Knutsen fish barrier correction and BDA project	Middle Fork Newaukum River, 3414 Centralia Alpha Road, Onalaska; 46.614808, -122.659178.	South Fork Newaukum River (5)	$215,000	Remove a fish-blocking culvert and earthen berm, install a fish-passable box culvert, reshape the stream through the pond, and install two BDAs.
N-11	Berwick Creek at Bishop Fish Passage Construction	Berwick Creek at Bishop Road MP 2.839; 46.61829, -122.9127.	Newaukum River (7)	$1,329,000	Replace two velocity-barrier pipes with a fish-passable box culvert to restore upstream access and improve fish passage, sedimentation, water quality, and riparian-habitat connectivity.
N-12	BDA Pilot Implementation	Five prioritized locations in tributaries of the Newaukum River; exact sites to be finalized through the Aquatic Species Restoration Plan (ASRP)-funded effort.	South Fork Newaukum River (5), North Fork Newaukum River (6), and Newaukum River (7)	$163,000	Permit, construct, and monitor five BDAs to test their ability to raise groundwater levels, enhance wetland storage, and improve streamflow, habitat, and water quality.
N-13	Berwick Creek Flood Reduction Restoration	Berwick Creek between Rush Road and Bishop Road near Chehalis; 46.619664, -122.908910.	Newaukum River (7)	$130,000 (Excluding Construction)	Restore approximately 1,000 feet of degraded Berwick Creek and about 1.29 acres of riverine wetland to reduce flooding and improve channel, wetland, riparian, and aquatic habitat.
SC-00	Scatter Creek Water Right Purchase and Dry-Season Streamflow Augmentation (TC #118/119)	Cooke Aquaculture facility on Scatter Creek at Case Road SW and the Grand Mound water system; 46.8288, -123.00000 and 46.79433, -123.02485.	Middle Chehalis River #2 (13)	Several million dollars	Purchase and reconfigure unused Cooke Aquaculture water rights to augment dry-season flow in Scatter and Prairie Creeks, retire part of the right for instream use, and support municipal supply without new permit-exempt wells.
SC-01	Weins Farm Off-Channel Water Storage-and-Release (Thurston County ID 90). Assessment/Design/Construction.	South of the James Road crossing of Scatter Creek, adjacent to the Chehalis River; 46.796675, -123.077055.	Middle Chehalis River #2 (13)	Unknown	Assess and develop off-channel floodwater storage and controlled release on the Weins Farm to support later-season streamflow, groundwater recharge, flood reduction, and floodplain and wetland habitat.
SC-02	Upper Scatter Creek Managed Aquifer Recharge (Thurston County ID 89)	East of Tenino and south of State Highway 507 SW; unnamed tributaries feeding Scatter Creek; 46.856, -122.80751.	Middle Chehalis River #2 (13)	$260,000–$650,000	Divert a small portion of winter high flow from a Scatter Creek tributary to a managed aquifer recharge gallery to increase groundwater storage and later-season streamflow.
SC-03	Sampson Wetlands Restoration and MAR Concept (Thurston County ID 81)	Churchill Road east of Tenino; ditches feeding the east/south branch of Scatter Creek; 46.848152, -122.795573.	Middle Chehalis River #2 (13)	Unknown	Combine winter-flow managed aquifer recharge with wetland restoration, ditch abandonment, and construction of a sinuous channel to increase groundwater storage, baseflow, and wetland habitat.
SC-04	TC #127 Scatter Creek Upper Basin Forestry	Upper Scatter Creek basin, Thurston County; a separate project information sheet was not found in the Appendix of the Addendum.	Middle Chehalis River #2 (13)	Unknown	Protect or manage upper-basin forest to increase stand age and lengthen harvest rotations, with the intended benefit of improving hydrologic function and streamflow. Goal is based on the Addendum's conservation/forest-management discussion because no separate Appendix B sheet was located.

Project ID	Full Project Name	Project Location	Subbasin(s)	Adjusted Estimated Cost	Project Goal
SK-00	TransAlta Water Right Acquisition	Skookumchuck subbasin; approximate diversion at RM 7.8; 46.805077, -122.862556.	Skookumchuck River (9)	$193,000 Phase I	Acquire all or part of TransAlta's senior surface-water right and protect the conserved water for instream flow, providing the Addendum's largest potential water offset.
SK-01	Skookumchuck Dam release	Skookumchuck Dam at RM 23.5; 46.785575, -122.718517.	Skookumchuck River (9)	Unknown	Assess and, if feasible, increase dam releases above current requirements to improve downstream low flows and aquatic habitat while addressing water-right and operational constraints.
SK-02	Skookumchuck RM 19-22 Early Action Reach	Skookumchuck River RM 19-22 immediately below the dam; 46.79027778, -122.73638889.	Skookumchuck River (9)	$2,340,000	Restore functioning stream processes below the dam using reach-scale habitat actions to benefit spring Chinook and other aquatic species.

Note:

- Project names, IDs, locations, and goals are based on the Addendum Appendix B project information sheets. Subbasin relationships use the subbasin naming and numbering convention applied in the Upper Chehalis NPS Assessment and Management Plan and the subsequent GIS location checks. BW-01 is excluded because it applies to Grays Harbor County within WRIA 22.

- Adjusted costs were calculated by multiplying the planning-level cost estimates reported in the 2020 Addendum by 1.30 (and reasonably rounded), as a simplified allowance for cost escalation from 2020 to 2025. The adjusted values are intended for planning and comparison only.

B.3 Supplementary Assessment of BMP Selection

The following sections supplement the inventory with the Assessment-based justification for the implementation priorities presented in Table 4.1.

B.3.1 Agricultural Source Controls

Agricultural source-control priorities emphasize areas where agricultural activity coincides with bacterial, nutrient, DO, sediment, or runoff concerns and where a plausible pathway exists between the agricultural source and receiving water. The ranking is not based solely on the 2023 Agriculture/Bare land-cover percentage because that category combines agricultural and bare lands and does not represent livestock density, manure-management conditions, or direct stream connectivity.

Black River (11) receives the highest initial emphasis despite its comparatively limited mapped Agriculture/Bare coverage because the Assessment identifies some of the watershed's strongest evidence of agricultural NPS effects, including severe low-DO conditions, bacterial and nutrient concerns, and historical pasture and dairy runoff. The Newaukum system (5, 6, and 7), Middle Chehalis River #1 (10), Salzer Creek (8), and South Fork Chehalis River (3) also combine agricultural land use with documented impairments and previously identified agricultural source concerns.

Middle Chehalis River #2 (13), Skookumchuck River (9), and Upper Chehalis River #2 and #1 (4B and 4A) remain additional priorities where site-level investigation confirms agricultural sources. These subbasins contain mixed agricultural, rural, developed, forested, and other influences, and mainstem monitoring does not establish agriculture as the sole source. Headwaters (1), Elk Creek (2), and Cedar Creek (12) receive lower basinwide emphasis because their land use and monitoring records provide less evidence of widespread agricultural pollutant delivery. BW-02 provides partial programmatic support through agricultural irrigation-efficiency and water-conservation assistance; broader livestock, manure, nutrient, and runoff controls remain primarily Assessment- and TMDL-based.

B.3.2 Septic-System Management

Septic-system priorities focus on unsewered Developed Low and rural-residential areas where bacterial or nutrient concerns, onsite-system vulnerability, and hydrologic connection to impaired waters overlap. Developed Low land cover is used as an initial screening indicator only; it does not distinguish properties served by sewers from those using onsite sewage systems. Final priorities therefore require sewer-service mapping, county septic records, system-condition information, field observations, and targeted monitoring.

Highest initial emphasis is assigned to Salzer Creek (8), Middle Chehalis River #1 (10), Newaukum River (7), and the lower Skookumchuck corridor (9). The lower Skookumchuck warrants targeted screening because the subbasin contained approximately 6.6% Developed Low land in 2023—about 8,450 acres because of its large area—and because the applicable TMDL identified a need for approximately 16% overall FC reduction and approximately 79% reduction during the September–November critical period. Available Skookumchuck-specific station records are historical or sparse, however, so the designation applies to connected unsewered rural-residential areas and source-confirmation activities rather than the entire subbasin.

Upper Chehalis River #2 (4B), South Fork Chehalis River (3), Black River (11), and Middle Chehalis River #2 (13) are additional priorities where records or monitoring indicate onsite-system effects. Developed Low land represented only approximately 2.6% of Headwaters (1), 1.6% of Elk Creek (2), and 2.0% of Cedar Creek (12) in 2023, supporting lower basinwide priority. Localized concerns may still be investigated, including historically identified areas in Elk Creek. No direct Addendum septic-management project was identified, although EW-01 is complementary because extending public water service to approximately 40 Galvin-area homes would reduce shallow groundwater withdrawals and vulnerability to septic contamination.

B.3.3 Runoff and Stormwater Controls

Stormwater priorities are limited to developed drainage areas where connected impervious surfaces, outfalls, roads, or municipal drainage systems coincide with documented receiving-water impairment and a plausible runoff pathway. Entire subbasins are not treated as stormwater priorities solely because they contain developed land.

The strongest combined evidence occurs in the Chehalis–Centralia corridor. At SR6-Chehalis, 44.4% of 27 core-summer temperature observations exceeded the applicable criterion, 50.7% of 75 DO observations were below criterion, and 21.2% of 80 FC samples exceeded criterion. At Mellen Street, corresponding rates were 44.8% of 29 temperature observations, 51.0% of 98 DO observations, and 16.0% of 81 FC samples. The longer-term Centralia FIN record also showed substantial bacterial and DO concerns. These receiving-water results do not independently identify stormwater as the cause but support runoff-focused investigation where developed drainage pathways are documented.

Priority areas therefore include lower Salzer and Coal Creek (8), the Centralia portion of Middle Chehalis River #1 (10), lower Skookumchuck River and China Creek (9), and the Rochester/Albany Street drainage area in Black River (11). Subbasin 9 contained approximately 8.4% combined Developed Low and Developed High land in 2023, concentrated in the lower corridor. Its available station evidence is historical or limited: the FIN Skookumchuck record showed DO below criterion in 34.8% of 23 observations collected during 1992–1997; the WQP mouth station contained only six DO observations from 2006–2009 and five FC samples from

2006–2017. Consequently, current wet-weather monitoring and outfall inspection are required before broader implementation.

Developed portions of 4B, 7, 11, and 13 remain site-specific priorities where direct drainage connectivity is confirmed. B-05 directly supports this theme by treating runoff from approximately 30 acres of Rochester streets. BW-05 provides planning-level support, while CS-00, CS-02, and H-00 provide complementary flood-storage, infiltration, wetland, and runoff-attenuation functions but are classified primarily under physical restoration.

B.3.4 Riparian Buffer Establishment and Restoration

Riparian priorities are assigned where documented temperature, bacterial, nutrient, DO, or sediment concerns coincide with a mapped or field-confirmed riparian deficiency and an identifiable restoration opportunity. Basinwide land-cover percentages provide screening context but do not measure actual streamside shade, buffer width, bank stability, livestock access, or vegetation condition.

South Fork Chehalis-HW6 had a 30.8% incubation-period temperature exceedance rate among 78 observations, DO below criterion in 31.6% of 76 observations, and FC exceedance in 51.4% of 37 samples. Newaukum-Chehalis had 36.8% core-summer temperature exceedance among 57 observations, DO below criterion in 20.8% of 226 observations, and FC exceedance in 39.5% of 71 samples. In the Black River corridor, DO was below criterion in 80.0% of 85 observations at Black River-HW13 and 87.5% of 72 observations at Howanut Bridge; Howanut also had 17.4% FC exceedance among 69 samples. Historical studies identified substantial riparian degradation and estimated that non-headwater reaches required approximately 12% to 42% additional shade.

These results support initial emphasis on identified degraded reaches in Black River (11), South Fork and lower Newaukum (5 and 7), Stillman Creek and other verified South Fork Chehalis reaches (3), and lower Salzer Creek (8). Additional implementation emphasis applies to confirmed riparian gaps in subbasins 4A, 4B, 5, 6, 9, 10, and 13.

C-00, N-04, and N-13 provide the clearest direct support through explicit planting, revegetation, or bank-treatment components. B-04 and other restoration projects provide support only where riparian treatment is included in the selected design. CH-00, H-00, and SK-02 are complementary rather than primary riparian projects unless their final designs contain a distinct vegetation component. Headwaters (1), Elk Creek (2), and Cedar Creek (12) contain approximately 94.4%, 97.4%, and 95.5% combined Mature Forest and Clearcut/Shrub cover, respectively, supporting no basinwide riparian-restoration designation where effective riparian cover remains present.

B.3.5 Stream, Wetland, and Floodplain Restoration

Priorities under this theme are limited to defined reaches and project areas where documented impairment, altered channel or floodplain processes, and an implementable restoration opportunity overlap. These projects may also provide riparian, flow, nutrient-retention, sediment, and habitat benefits, but they are classified here according to their principal physical or hydrologic restoration activity.

Black River receives high emphasis because DO was below criterion in 80.0% of 85 observations at Black River-HW13 and because B-00, B-03, and B-04 directly address ditching, wetland function, floodplain connectivity, and channel processes. In the Newaukum system, Newaukum-Chehalis had 36.8% core-summer temperature exceedance among 57 observations, 21.9% incubation-period exceedance among 210 observations, and DO below criterion in 20.8% of 226 observations. Defined opportunities include N-02, N-04, N-12, and N-13.

South Fork Chehalis-HW6 had 30.8% incubation-period temperature exceedance among 78 observations and DO below criterion in 31.6% of 76 observations, supporting the approximately three-mile C-00 restoration reach. The Centralia FIN station showed 39.1% core-summer temperature exceedance among 69 observations and DO below criterion in 43.3% of 227 observations, providing receiving-water context for CS-00 and CS-02.

CH-00 is also classified primarily under this theme because its principal activity is relocation of flow to the historic oxbow and channel reconnection; its substantial fish-access benefit is treated as a secondary benefit. Additional defined projects include EW-00, SC-03, H-00, and SK-02. N-10 is classified primarily under fish passage, while its BDA and channel-restoration elements are secondary components. The identified projects range from design and planning concepts to pilot, willing-landowner, and construction-ready actions. Their NPS benefits should be verified through project-specific design objectives and effectiveness monitoring.

B.3.6 Flow Conservation, Groundwater Recharge, and Complementary Water Management

Flow-management priorities require both a documented or plausible seasonal-flow limitation and a defined mechanism capable of conserving, protecting, storing, or augmenting flow. Flow augmentation may improve temperature where added or retained water is sufficiently cool, but it does not automatically improve DO. DO response depends on source-water quality, temperature, nutrient and organic loading, channel hydraulics, and receiving-water conditions.

In Black River, DO was below criterion in 80.0% of 85 FIN observations at Black River-HW13 and 87.5% of 72 WQP observations at Howanut Bridge. B-02 proposes approximately 0.8 cfs of cold-water augmentation during a three-month low-flow period, equivalent to approximately 141

acre-feet per year. B-01 would store winter water for later release to Allen Creek, Beaver Creek, and Black River.

In the Newaukum system, 36.8% of 57 core-summer temperature observations exceeded criterion and 20.8% of 226 DO observations were below criterion at Newaukum-Chehalis. N-00 could retain up to approximately 1.5 cfs in the North Fork and lower Newaukum during critical summer periods and was credited with approximately 280 acre-feet per year of water offset. N-09 provides a framework for MAR but remains conceptual pending confirmation of sites, source water, hydrogeology, and permitting.

SK-00 was credited with approximately 2,898 acre-feet per year, the largest individual offset in the Addendum, while SK-01 would evaluate increased dam releases. Because Skookumchuck-specific water-quality information is historical or limited, the priority is based principally on the defined projects and their quantified flow potential. In Middle Chehalis River #2, SC-01 and SC-02 were credited with approximately 5 and 26.8 acre-feet per year, respectively; SC-03 provides an estimated 46 acre-feet per year but is classified primarily as wetland and channel restoration. EW-01 provides direct complementary support by allowing approximately 40 Galvin-area homes to discontinue shallow permit-exempt wells.

Other areas remain site-specific until a measurable instream benefit, legally available water, suitable hydrogeology, operational feasibility, and sponsor readiness are established.

B.3.7 Forest-Road and Forest-Harvest Management

This theme addresses preventive and operational management of forest-road networks, harvest areas, and site preparation. The Assessment indicates that approximately 79% of forestland is in private industrial ownership and approximately 20% is state-owned or managed, making private forest landowners and Washington Department of Natural Resources (DNR) central implementation parties.

Available monitoring indicates an episodic, storm-related sediment concern rather than continuously elevated sediment throughout the forested watershed. Most FIN-station TSS medians were below approximately 20 mg/L and turbidity medians were generally approximately 3–6 NTU. Dryad, however, recorded TSS values approaching 750 mg/L and storm-related turbidity exceeding 600 NTU. Sporadic peaks also occurred at South Fork Chehalis-HW6, Centralia, and Curtis. Historical analyses identified the highest wet-season TSS concentrations and yields upstream of Dryad and associated them with forestry runoff, unstable riparian areas, steep headwaters, and intense precipitation, although no statistically significant long-term TSS trend was identified.

The 2023 land-cover results confirm that candidate areas remain strongly forested: Headwaters (1), Elk Creek (2), South Fork Chehalis (3), Upper Chehalis #1 (4A), South Fork Newaukum (5), and

North Fork Newaukum (6) contained approximately 94.4%, 97.4%, 88.8%, 83.3%, 80.2%, and 88.4% combined forest and clearcut/shrub cover, respectively. These values establish applicability but do not demonstrate sediment delivery.

Highest implementation emphasis is therefore limited to forest-road, harvest, and site-preparation areas with demonstrated stream connectivity, particularly within the Dryad contributing watershed. Other forested areas are included only where wet-weather monitoring, road inventories, harvest records, erosion mapping, or field observations confirm a source pathway. SC-04 provides partial support in upper Scatter Creek, but its scope, location, sponsor, and status should be confirmed because no separate Addendum project information sheet or coordinate was located.

B.3.8 Sediment-Control, Crossing, Ditch, and Drainage Improvements

This theme applies to discrete infrastructure or erosion problems after a direct sediment-delivery pathway has been confirmed. It is distinct from programmatic forest-road management and from fish-passage projects whose principal purpose is barrier correction.

Assessment monitoring indicates episodic, storm-driven sediment delivery. Most FIN-station TSS medians were below approximately 20 mg/L and turbidity medians were generally approximately 3–6 NTU, while Dryad recorded TSS values approaching 750 mg/L and turbidity exceeding 600 NTU during storm conditions. Historical analyses similarly found the greatest wet-season TSS concentrations and yields upstream of Dryad. Because the applicable turbidity criterion is based on an increase above background and the Assessment did not calculate station-specific exceedance percentages comparable to temperature, DO, or bacteria, isolated maximum values are used only as source-screening evidence.

Initial emphasis is assigned to confirmed failing crossings, ditches, headcuts, banks, culverts, or drainage facilities with direct stream connectivity, particularly in the Dryad contributing watershed and at verified sites in South Fork Chehalis, the Newaukum system, lower Salzer and Coal Creek, Middle Chehalis #1, and Black River.

CS-01, N-05, N-06, N-08, and N-11 provide the strongest partial project support because their descriptions expressly identify sediment-transport, sedimentation, or water-quality improvements. B-08, N-01, N-03, N-07, and N-10 remain primarily fish-passage projects and should be included under this theme only where design or inspection confirms a discrete erosion, scour, deposition, drainage, or sediment-delivery problem.

B.3.9 Fish-Passage Improvements

Fish-passage priorities are based primarily on verified barrier status, accessible habitat gain, sequencing with upstream and downstream barriers, associated hydraulic or sediment problems,

project readiness, and sponsor capacity. Basinwide land use and water-quality exceedance rates are not the primary basis for this theme.

The 2020 Addendum identified 11 WRIA 23 fish-barrier projects estimated to reconnect approximately 23.8 miles of accessible habitat. Estimated gains were approximately 5.0 miles for B-08, 3.5 miles for N-03, 3.3 miles for N-07, 3.1 miles for N-01, 1.9 miles for N-05, 1.8 miles for CS-01, 1.6 miles for N-11, 1.4 miles for N-06, 1.12 miles for N-10, 0.8 mile for EW-02, and 0.3 mile for N-08.

The largest concentration occurs in the Newaukum system, where several barriers form connected project sequences. Priority should account for downstream barriers that control access to cumulative upstream habitat. B-08 and EW-02 provide additional defined opportunities in Black River and Middle Chehalis River #1. Where barrier projects also improve sediment transport, channel form, riparian conditions, or water-quality, those functions are treated as supporting benefits. CH-00 provides substantial fish-access benefit but is classified principally as channel and floodplain restoration because its central action is relocation of flow to a historic oxbow rather than correction of a conventional road-crossing barrier.

B.3.10 Conservation Easements and Land Acquisition

Conservation priorities are property-specific and emphasize parcels where long-term protection would retain riparian, wetland, floodplain, forest, groundwater-discharge, or restoration-enabling functions and prevent a credible conversion threat.

The three defined Addendum properties would protect approximately 88 acres. B-06 would protect more than 27 acres of young forest and mature riparian forest along Beaver Creek. B-07 would protect approximately 28 acres and approximately 0.076 mile of stream associated with Mima Creek, where future subdivision and rural-residential development were identified as threats. H-01 would protect approximately 33 acres of forest adjoining South Hanaford Creek, including mapped wetlands and hydric soils, where timber harvest and subsequent conversion were identified as potential threats.

The Black River properties occur in a basin with substantial water-quality stress: DO was below criterion in 80.0% of 85 FIN observations at Black River-HW13 and approximately 87.5% of observations at Howanut Bridge. Black River also contained approximately 17.8% Agriculture/Bare and 16.6% combined developed land in 2023. These conditions support protection of remaining functioning lands, but they do not establish that an individual easement will produce a measurable change in station exceedance rates.

Additional properties should be ranked based on ecological and hydrologic function, conversion threat, connection to a priority restoration strategy, landowner willingness, cost, qualified easement-holder capacity, long-term stewardship, and additional protection beyond existing

ownership or regulation. B-03 supports this theme only where a specific easement or acquisition is developed; physical restoration projects arising under B-03 should be classified under the applicable restoration theme.

B.3.11 Outreach, Monitoring, Reporting, and Adaptive Management

Monitoring priorities emphasize the mid-basin mainstem near tribal lands and selected tributaries where coincident temperature, DO, bacterial, nutrient, or sediment concerns require source discrimination, baseline development, or BMP-effectiveness evaluation.

Independence Road Bridge is the closest upstream WQP station to tribal lands and Sickman Ford Road Bridge is the closest downstream WQP station. Prather and Porter provide broader upstream and downstream FIN context. At Independence Road Bridge, approximately 53% of core-summer temperature observations exceeded criterion, approximately 37% of DO observations were below criterion, and approximately 15% of FC samples exceeded criterion. The Porter FIN record showed approximately 35% thermal exceedance, 36% DO deficiency, and 24% FC exceedance. Numeric use of the Sickman Ford temperature record requires additional data-quality review.

Tributary records also support focused monitoring. Newaukum-Chehalis showed approximately 37% core-summer temperature exceedance, 21% DO deficiency, and approximately 40% FC exceedance. South Fork Chehalis-HW6 showed approximately 32% DO deficiency and 51% FC exceedance. Centralia showed approximately 39% to 40% thermal exceedance, 43% DO deficiency, and approximately 48% FC exceedance. Black River-HW13 showed approximately 80% DO deficiency.

Initial tributary, storm-event, summer low-flow, and source-pathway monitoring should therefore focus on Black River; the South Fork, North Fork, and lower Newaukum system; lower Salzer, Dillenbaugh/Berwick Creek, and the Chehalis–Centralia corridor; lower Skookumchuck and China Creek; potentially contributing drainage areas in Middle Chehalis River #2; South Fork Chehalis; and confirmed storm-related sediment sources in the Dryad contributing watershed.

These station results justify monitoring intensity but do not independently attribute impairment to a particular tributary or land use. Before establishing numeric baselines or performance targets, records should be screened for observation period, sample size, seasonal coverage, analytical method, spatial representativeness, and data quality. BW-07 directly supports summer temperature profiling and streamflow gain-and-loss monitoring but does not constitute a complete bacteria, nutrient, sediment, outreach, or BMP-effectiveness monitoring program.