

Appendix D

Surface Water and Groundwater Quality Standards

CLEAN WATER ACT

The federal Clean Water Act (CWA) of 1972 and subsequent amendments require the identification and cleanup of polluted surface waters and regulate water quality standards for surface waters. The Washington State Department of Ecology (Ecology) is responsible for implementing certain measures of the CWA, including establishing surface water quality standards to protect public health and welfare and the quality of surface water.

Section 303(d) of CWA requires Washington to develop a list of waterbodies that do not meet applicable state water quality standards. When water quality fails to meet state water quality standards, CWA requires the development and implementation of a cleanup plan. This typically involves the development of a total maximum daily load (TMDL), where Ecology determines the sources of pollutants and sets the maximum amount of pollutants that each source can discharge to a waterbody.

The Washington State Water Quality Assessment by Ecology lists the water quality status for waterbodies in the state. In September 2015, Ecology submitted its proposed updated Water Quality Assessment categories and 303(d) list to U.S. Environmental Protection Agency (USEPA) for their review and approval. As of July 2016, USEPA approved this latest Water Quality Assessment (Ecology 2016). The Water Quality Assessment identifies the following five categories of water quality impairments:

- Category 1 – Meets tested standards for clean waters
- Category 2 – Waters of concern
- Category 3 – Insufficient data
- Category 4 – Polluted waters that do not require a TMDL and have pollution problems that are being solved in one of three ways:
 - Category 4a – Has a TMDL
 - Category 4b – Has a pollution control program
 - Category 4c – Is impaired by a non-pollutant
- Category 5 – Polluted waters that require a TMDL or water quality improvement project (listed waters)

TOTAL MAXIMUM DAILY LOAD

CWA requires states to establish TMDL programs for parameters not meeting applicable surface water quality standards as identified on Section 303(d) water quality impaired lists. A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet the water quality standards. A TMDL also identifies the sum of allowable loads of a single pollutant from all point and nonpoint sources, and determines a margin of safety to ensure protection of the waterbody in case there are unknown pollutant sources or unforeseen events that may impair water quality.

The following TMDL Implementation Plans are in place in the upper Chehalis River Basin (Water Resource Inventory Area [WRIA] 23) and lower Chehalis River Basin (WRIA 22):

- Grays Harbor/Chehalis Fecal Coliform Bacteria TMDL (Rountry and Pelletier 2002)
- Upper Chehalis Dissolved Oxygen TMDL (Jennings and Pickett 2000)
- Upper Chehalis Temperature TMDL (Ecology 2001)
- Upper Chehalis Fecal Coliform TMDL (Ahmed and Rountry 2004)
- Upper Chehalis River Dry Season TMDL (Pickett 1994a)
- Black River Wet Season Nonpoint Source TMDL (Coots 1994)
- Black River Dissolved Oxygen and Phosphorus TMDL (Pickett 1994b)
- Upper Humptulips River Water Temperature TMDL (Graber and Stoddard 2003)

WASHINGTON STATE WATER QUALITY STANDARDS

Surface water quality standards for Washington State, provided in Table D-1, are established by Ecology in Washington Administrative Code (WAC) 173-201A (Ecology 2012). The purpose of these standards is to identify designated beneficial uses, establish specific criteria, and establish policies for anti-degradation to protect Washington’s surface waterbodies. These standards state that the Chehalis River and tributaries are protected for the following use designations under WAC 173-201A.

Table D-1
Washington State Surface Water Quality Standards

PARAMETER	STANDARD PER WAC 173-201A
FRESHWATER STANDARDS APPLICABLE TO THE CHEHALIS BASIN	
Temperature	<p>Char Spawning and Rearing: Not to exceed 12°C due to human activities.</p> <p>Core Summer Salmonid Habitat¹: Not to exceed 16°C due to human activities.</p> <p>Salmonid Spawning, Rearing, and Migration AND Salmonid Rearing and Migration Only¹: Not to exceed 17.5°C due to human activities.</p> <p>When natural conditions exceed the specified criteria above, the state allows no temperature increases that would raise water temperature by more than 0.3°C.</p>
DO	<p>Char Spawning and Rearing AND Core Summer Salmonid Habitat: Not to drop below 9.5 mg/L.</p> <p>Salmonid Spawning, Rearing, and Migration: Not to drop below 9.5 mg/L.</p> <p>Salmonid Rearing and Migration Only: Not to drop below 8.0 mg/L.</p> <p>When natural conditions drop below the specified criteria above (or within 0.2 mg/L of the criteria), human actions considered cumulatively may not cause DO to decrease more than 0.2 mg/L.</p>
Turbidity	<p>Char Spawning and Rearing AND Core Summer Salmonid Habitat AND Salmonid Spawning, Rearing, and Migration: Not to exceed 5 NTU over background when the background is 50 NTU or less or a 10% increase in turbidity when the background turbidity is more than 50 NTU.</p> <p>Salmonid Rearing and Migration Only: Not to exceed 10 NTU over background when the background is 50 NTU or less or a 20% increase in turbidity when the background turbidity is more than 50 NTU.</p>
pH	<p>Char Spawning and Rearing AND Core Summer Salmonid Habitat: Not to vary from the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.2 unit.</p> <p>Salmonid Spawning, Rearing, and Migration AND Salmonid Rearing and Migration: Not to vary from the range of 6.5 to 8.5, with a human-caused variation within the above range of less than 0.5 unit.</p>

PARAMETER	STANDARD PER WAC 173-201A
Bacteria – fecal coliform organism ²	<p>Extraordinary Primary Contact Recreation: Levels must not exceed a geometric mean value of 50 colonies per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 100 colonies per 100 mL.</p> <p>Primary Contact Recreation: Levels must not exceed a geometric mean value of 100 colonies per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies per 100 mL.</p> <p>Secondary Contact Recreation: Levels must not exceed a geometric mean value of 200 colonies per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 400 colonies per 100 mL.</p>
Toxic, radioactive, or deleterious material ³	Levels must be below those levels that have the potential, either singularly or cumulatively, to affect characteristic water uses adversely, cause acute or chronic conditions to the most sensitive biota dependent upon that water, or adversely affect public health. The presence of materials or their effects, excluding those of natural origin, must not impair aesthetic values, which offend the senses of sight, smell, touch, or taste.
MARINE WATER QUALITY STANDARDS APPLICABLE TO GRAYS HARBOR	
Temperature	<p>Excellent Quality⁴: Not to exceed 16°C due to human activities; when natural conditions exceed 16°C, the state allows no temperature increases that would raise water temperature by more than 0.3°C.</p> <p>Good Quality⁵: Not to exceed 19°C due to human activities; when natural conditions exceed 19°C, the state allows no temperature increases that would raise water temperature by more than 0.3°C.</p>
DO	<p>Excellent Quality⁴: Lowest 1-day minimum 6.0 mg/L; when natural conditions lower the DO below 6.0 mg/L or within 0.2 mg/L of the criteria, human actions considered cumulatively may not cause DO to decrease more than 0.2 mg/L.</p> <p>Good Quality⁵: Lowest 1-day minimum 5.0 mg/L; when natural conditions lower the DO below 5.0 mg/L or within 0.2 mg/L of the criteria, human actions considered cumulatively may not cause DO to decrease more than 0.2 mg/L.</p>
Turbidity	<p>Excellent Quality⁴: Not to exceed 5 NTU over background when the background is 50 NTU or less or a 10% increase in turbidity when the background turbidity is more than 50 NTU.</p> <p>Good Quality⁵: Not to exceed 10 NTU over background when the background is 50 NTU or less or a 20% increase in turbidity when the background turbidity is more than 50 NTU.</p>
pH	Excellent Quality and Good Quality^{4,5}: Not to vary from the range of 7.0 to 8.5, with a human-caused variation within the above range of less than 0.5 unit.
Bacteria – fecal coliform organism	<p>Primary Contact Recreation⁴: Levels must not exceed a geometric mean value of 14 colonies per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 43 colonies per 100 mL.</p> <p>Secondary Contact Recreation⁵: Levels must not exceed a geometric mean value of 70 colonies per 100 mL, with not more than 10% of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 208 colonies per 100 mL.</p>

PARAMETER	STANDARD PER WAC 173-201A
Toxic, radioactive, or deleterious material	Levels must be below those that have the potential, either singularly or cumulatively, to affect characteristic water uses adversely, cause acute or chronic conditions to the most sensitive biota dependent upon that water, or adversely affect public health. The presence of materials or their effects, excluding those of natural origin, must not impair aesthetic values, which offend the senses of sight, smell, touch, or taste.

Notes:

DO = dissolved oxygen

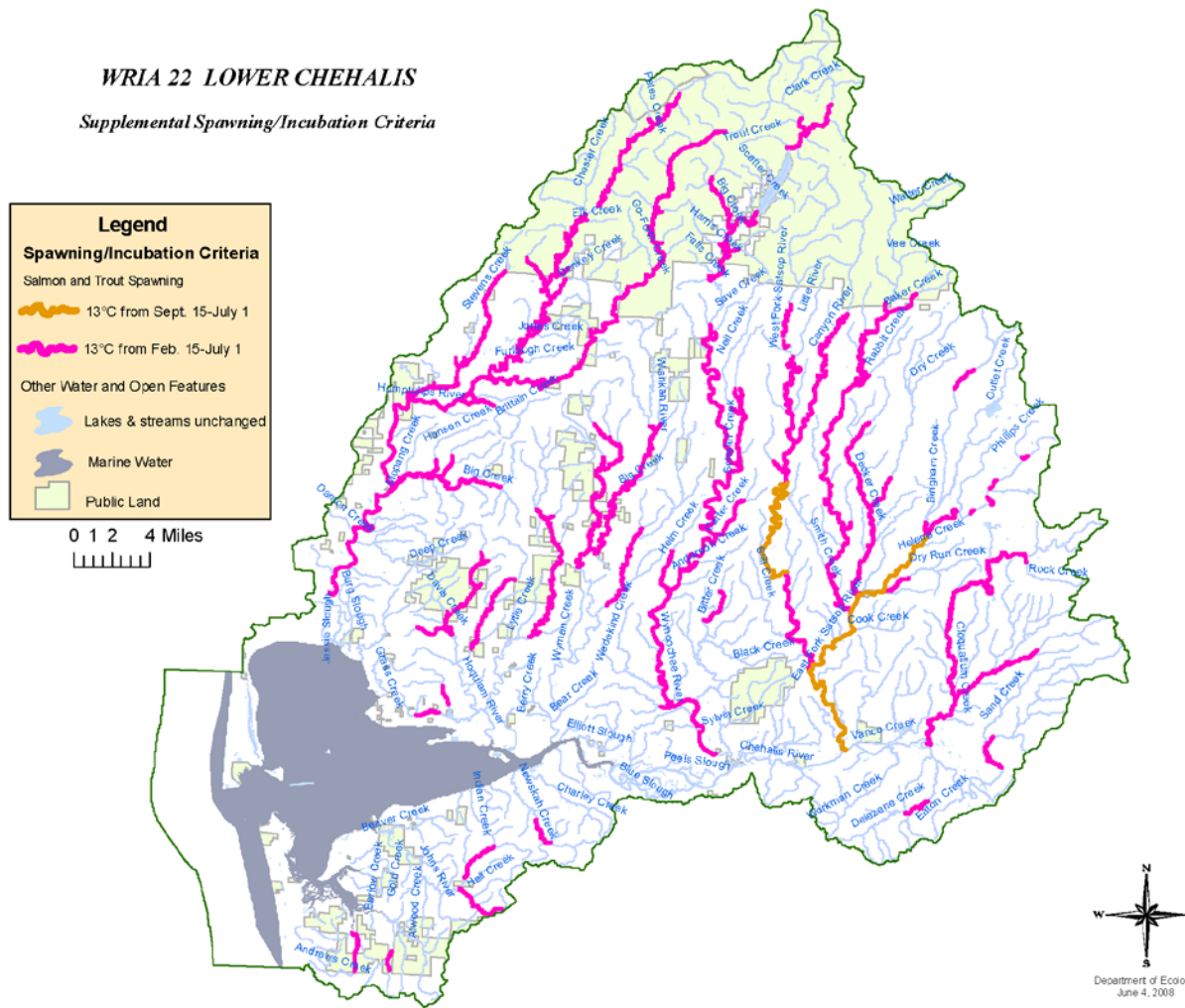
mg/L = milligram per liter

mL = milliliter

NTU = Nephelometric Turbidity Unit

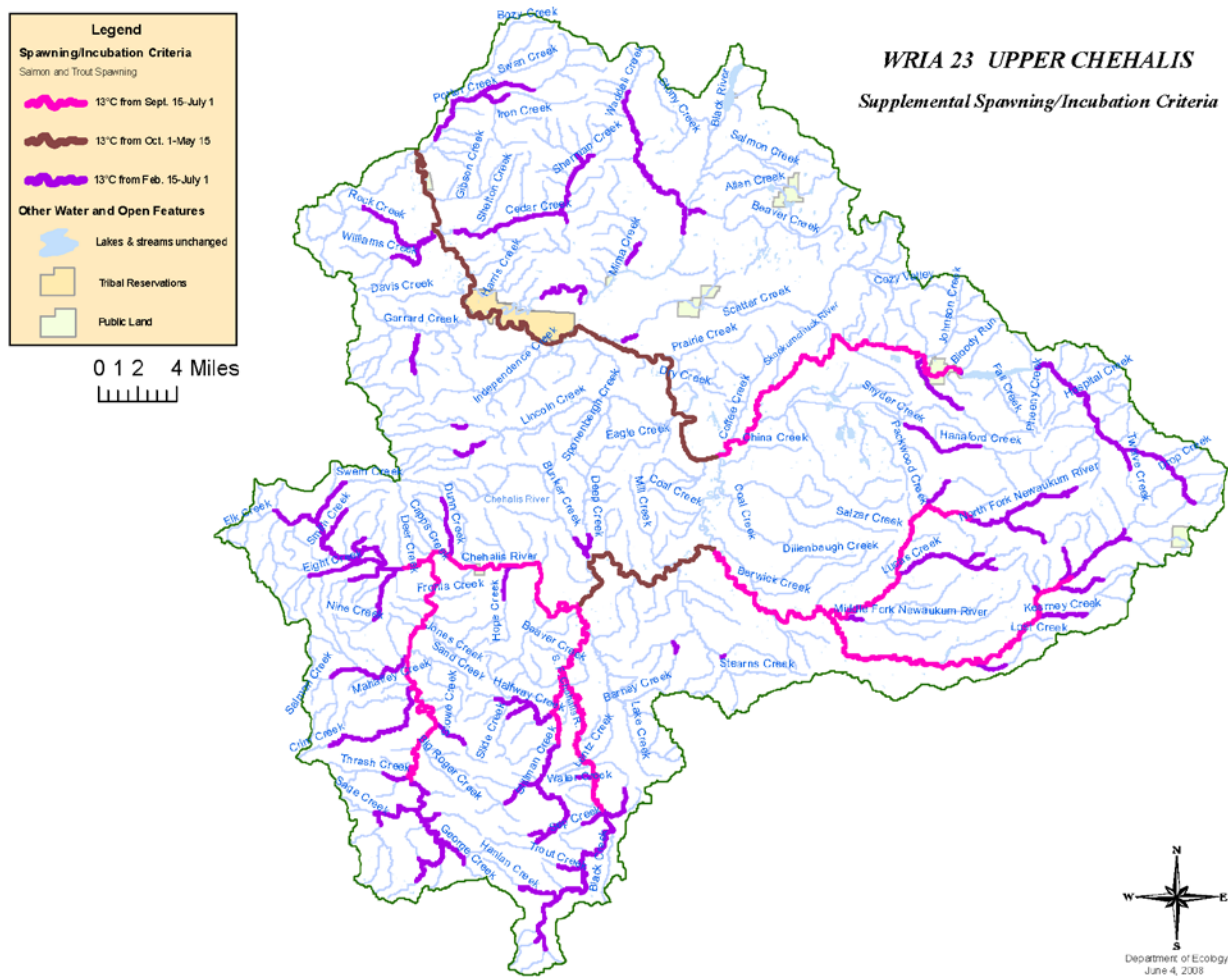
1. Per WAC 173-201A-200 and Ecology Publication 06-10-0138, additional temperature criteria apply to the Chehalis River and its tributaries for spawning and incubation protection at 13°C for targeted time periods (Ecology 2011). Stream segments where applicable are shown in Figures D-1 and D-2.
2. The Chehalis River is designated as Primary Contact Recreation where the Fecal Coliform Standard is 100 colonies per 100 mL downstream of river mile (RM) 90.2
3. Applicable to all Aquatic Life Uses
4. Applicable to Grays Harbor west of longitude 123°59 W
5. Grays Harbor east of longitude 123°59 E to longitude 123°45'45" W (Cosmopolis Chehalis River, RM 3.1), special condition – DO shall exceed 5.0 mg/L

Figure D-1
WRIA 22 Supplemental Spawning/Incubation Criteria



Source: Ecology 2011

Figure D-2
WRIA 23 Supplemental Spawning/Incubation Criteria



Source: Ecology 2011

Table D-2
Aquatic and Recreational Use Designations for Freshwaters of the Chehalis River and Major Tributaries

RIVER/STREAM SEGMENT	AQUATIC LIFE USES				RECREATIONAL USES		
	CHAR SPAWNING/ REARING	CORE SUMMER HABITAT	SPAWNING/ REARING	REARING/ MIGRATION ONLY	EXTRA-ORDINARY PRIMARY CONTACT	PRIMARY CONTACT	SECONDARY CONTACT
CHEHALIS RIVER							
RM 3.1 to 90.2 (including tributaries)			●			●	
RM 90.2 to East/West Fork confluence (including tributaries)		●				●	
East Fork/West Fork	●				●		
SOUTH FORK CHEHALIS RIVER							
Mouth to RM 0.5			●			●	
Above RM 0.5		●				●	
Above RM 0.5	●				●		
BLACK RIVER							
Mouth to headwaters			●			●	
BUNKER CREEK							
Creek and all tributaries		●				●	
CEDAR CREEK							
Mainstem and tributaries above US 12		●				●	
CLOQUALLUM CREEK							
Mouth to headwaters		●				●	
ELK RIVER							
West Branch and tributaries above RM 2		●				●	
GARRARD CREEK							
South Fork and tributaries above RM 5.5							
HOQUIAM RIVER							
Above RM 9.3		●				●	
To RM 9.3				●			●
East Fork above RM 5.5 (Lytle Creek)		●				●	
Middle Fork above RM 1		●				●	

RIVER/STREAM SEGMENT	AQUATIC LIFE USES				RECREATIONAL USES		
	CHAR SPAWNING/ REARING	CORE SUMMER HABITAT	SPAWNING/ REARING	REARING/ MIGRATION ONLY	EXTRA-ORDINARY PRIMARY CONTACT	PRIMARY CONTACT	SECONDARY CONTACT
HUMPTULIPS RIVER							
Mouth to RM 4.5			●			●	
RM 4.5 to Olympic Forest boundary		●				●	
Olympic Forest boundary to headwaters		●			●		
East Fork above RM 21	●				●		
West Fork at Petes Creek	●				●		
JOHNS RIVER							
River and North Fork		●			●		
LINCOLN CREEK							
North Fork and tributaries above RM 2		●				●	
South Fork and tributaries above RM 12		●				●	
NEWAUKUM RIVER							
River and tributaries		●				●	
North Fork above RM 15	●					●	
South Fork above confluence with Frase Creek	●					●	
STEARNS CREEK							
Unnamed tributary at RM 7		●				●	
ROCK CREEK							
All waters upstream of confluence with Chehalis River		●				●	
SCATTER CREEK							
From RM 1.5 to headwaters		●				●	
SATSOP RIVER							
From RM 0.5 to headwaters		●				●	
River, West Fork, and Robertson Creek	●				●		
River, Middle Fork, and upstream RM 26.5	●				●		

RIVER/STREAM SEGMENT	AQUATIC LIFE USES				RECREATIONAL USES		
	CHAR SPAWNING/REARING	CORE SUMMER HABITAT	SPAWNING/REARING	REARING/MIGRATION ONLY	EXTRA-ORDINARY PRIMARY CONTACT	PRIMARY CONTACT	SECONDARY CONTACT
SKOOKUMCHUCK RIVER							
Mouth to Hanaford Creek		●				●	
Confluence of Hanaford Creek to headwaters		●			●		
Above Hospital Creek	●				●		
WILDCAT CREEK							
Mainstem and tributaries above confluence with Cloquallum Creek		●				●	
WISHKAH RIVER							
Mouth to RM 6				●			●
RM 6 to 16			●			●	
RM 16 to confluence with West Fork		●				●	
West Fork and tributaries to headwaters		●			●		
East Fork and tributaries above RM 1		●				●	
WYNOOCHEE RIVER							
RM 1.5 to Olympic National Forest RM 45.8		●				●	
Olympic National Forest RM 45.8 to dam		●			●		
Above Wynoochee Dam	●				●		

Notes:

RM = river mile

For a detailed list of all designated uses for all waterways, see Table 602 in WAC 173-201A.

RM is based on distance from the confluence with the mainstem Chehalis River. RM designations are approximate.

WASHINGTON STATE GROUNDWATER QUALITY STANDARDS

Groundwater quality standards for Washington State are established by Ecology in WAC 173-200 (Ecology 1990). The goals of these standards are as follows:

- Protect existing and future beneficial uses through the reduction or elimination of the discharge of contaminants to groundwater
- Maintain the highest quality of groundwater

The anti-degradation policy to protect the quality of groundwater requires that existing and future beneficial uses be maintained and protected with no degradation of high-quality groundwater. Throughout the state, groundwater supports a variety of beneficial uses, and these standards establish maximum contaminant concentrations for the protection of these beneficial uses. The specific maximum concentrations for primary and secondary contaminants are identified in Table D-3.

**Table D-3
Washington State Groundwater Quality Standards**

CONTAMINANTS	CRITERION PER STANDARD	
PRIMARY CONTAMINANTS		
Barium	1.0	mg/L
Cadmium	0.01	mg/L
Chromium	0.05	mg/L
Lead	0.05	mg/L
Mercury	0.002	mg/L
Selenium	0.01	mg/L
Silver	0.05	mg/L
Fluoride	4	mg/L
Nitrate (as N)	10	mg/L
Endrin	0.0002	mg/L
Methoxychlor	0.1	mg/L
1,1,1-Trichloroethane	0.20	mg/L
2-4 D	0.10	mg/L
2,4,5-TP Silvex	0.01	mg/L
Total coliform bacteria	1 CFU	per 100 mL
SECONDARY CONTAMINANTS		
Copper	1.0	mg/L
Iron	0.30	mg/L

CONTAMINANTS	CRITERION PER STANDARD	
Manganese	0.05	mg/L
Zinc	5.0	mg/L
Chloride	250	mg/L
Sulfate	250	mg/L
Total dissolved solids	500	mg/L
Foaming agents	0.5	mg/L
pH	6.5 to 8.5	
Corrosivity	Non-corrosive	
Color	15 color units	
Odor	3 threshold odor units	

Notes:

1. Per WAC 173-200

CFU = colony-forming unit

mg/L = milligram per liter

mL = milliliter

References

- Ahmed, A., and D. Rounry, 2004. *Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load*. Washington State Department of Ecology Publication No.-04-10-041. May.
- Coots, R., 1994. *Black River Wet Season Nonpoint Source Total Maximum Daily Load Study*. Washington State Department of Ecology Publication No. 94-104. June.
- Ecology (Washington State Department of Ecology), 1990. *Water Quality Standards for Ground Waters of the State of Washington (Washington Administrative Code 173-201A)*. Olympia: Washington State Department of Ecology. Available from: <https://fortress.wa.gov/ecy/publications/documents/173200.pdf>.
- Ecology, 2001. *Upper Chehalis River Basin Temperature Total Maximum Daily Load*. Publication No. 99-52. July. Available from: <https://fortress.wa.gov/ecy/publications/documents/9952.pdf>.
- Ecology, 2011. *Waters Requiring Supplemental Spawning and Incubation Protection for Salmonid Species*. Publication No. 06-10-038. Published June 2006. Revised January 2011. Available from: <https://fortress.wa.gov/ecy/publications/documents/0610038.pdf>.
- Ecology, 2016. 2014 Water Quality Assessment and 303d List. Cited September 28, 2016. Available from: <http://www.ecy.wa.gov/programs/wq/303d/currentassessmt.html>.
- Graber, C., and R. Stoddard, 2003. *Upper Humptulips River Temperature Total Maximum Daily Load. Detailed Implementation Plan*. Olympia: Washington State Department of Ecology. Publication No. 03-10-042. June.
- Jennings, K., and P. Pickett, 2000. *Revised Upper Chehalis River Basin Dissolved Oxygen Total Maximum Daily Load, Submittal Report*. Olympia: Washington State Department of Ecology.
- Pickett, P., 1994a. *Upper Chehalis River Dry Season Total Maximum Daily Load Study*. Olympia: Washington State Department of Ecology. Publication No. 94-126. July. Available from: <https://fortress.wa.gov/ecy/publications/documents/94126.pdf>.
- Pickett, P., 1994b. *Black River Dry Season Dissolved Oxygen and Phosphorus Total Maximum Daily Load Study*. Olympia: Washington State Department of Ecology. Publication No. 94-106. June. Available from: <https://fortress.wa.gov/ecy/publications/documents/94106.pdf>.
- Rounry, D., and G. Pelletier, 2002. *Grays Harbor/Chehalis Watershed Fecal Coliform Bacteria Total Maximum Daily Load Submittal Report*. Olympia: Washington State Department of Ecology. Publication No. 01-10-025 WQ. December. Available from: <https://fortress.wa.gov/ecy/publications/documents/0110025.pdf>.