A native mussel with a cluster of attached zebra mussels found on Beconia Beach on the south basin of Lake Winnipeg. Photo credit: C. Parks, Province of Manitoba.

Dreissenid Mussel Rapid Response in the Columbia River Basin: Recommended Practices to Facilitate Endangered Species Act Section 7 Compliance

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Pacific States Marine Fisheries Commission by:
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AIS	Aquatic Invasive Species
ARPA	Archaeological Resources Protection Act
BMPs	Best Management Practices
CRB	Columbia River Basin
DPS	Distinct Population Segments
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
HDPE	High Density Polyethylene
KCl	Potassium Chloride (Potash)
MAC	Multi-agency Coordination
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
PBF	Physical and Biological Features
PCB	Polychlorinated biphenyl
PCE	Primary Constituent Element
PSMFC	Pacific States Marine Fisheries Commission
QA/QC	Quality Assurance/Quality Control
SDS	Safety Data Sheet
SPCC	Spill Prevention, Control, and Countermeasures Plan
USFWS	United States Fish and Wildlife Service
WRP	Western Regional Panel on Aquatic Nuisance Species

CHAPTER 1. INTRODUCTION AND BACKGROUND

This document is intended to be a living document, reviewed and updated at least annually, and on an as-needed basis, to ensure the CRB states and Treaty Tribes have access to the latest information to inform a dreissenid response in the CRB.

Background

Since their introduction to the Great Lakes region of North America in the 1980s, invasive dreissenid mussels (zebra mussels [*Dreissena polymorpha*] and quagga mussels [*Dreissena rostriformis bugensis*]) have expanded their distribution in North America. From 2012–2017, the states of Washington, Oregon, Idaho, and Montana intercepted a total of 313 dreissenid-fouled watercraft that originated from throughout North America (http://psmfc.maps.arcgis.com/apps/webappviewer/index.html?id=aa6a6527a26a44ddbff097b99241462e). In 2016, invasive mussel larvae were discovered in Tiber and Canyon Ferry Reservoirs in Montana—this was the first documented detection of dreissenids near the perimeter of the Columbia River Basin (CRB). The westward expansion of dreissenids has been aided by unintentional pathways, including transport of watercraft, and precipitates the need for contingency plans and other planning efforts to facilitate rapid response (Bossenbroek et al. 2007). Rapid response includes actions that natural resource managers must be prepared to take in the event of a dreissenid introduction.

The Columbia River Basin Interagency Invasive Species Response Plan: Dreissenid Species (a.k.a. CRB Plan) was developed in September 2008 (and updated in 2011, 2014, and 2017) to facilitate the coordination of a rapid, effective, and efficient interagency response to delineate, contain, and when feasible, eradicate dreissenids if introduced to CRB waters. The scope of the CRB Plan incorporates waters in the CRB, including the states of Washington, Oregon, Idaho, and Montana, and reservation and ceded lands of Columbia River Treaty Tribes. The plan highlights the coordination and management structure of a response, the responsibilities and roles of entities involved, notification lists and procedures, and a scientific review and compilation of information associated with different types of control options. The CRB Plan has been tested since its inception via a series of exercises and workshops in the CRB states, and has been updated at regular intervals as new information has become available.

Section 7(a)(1) of the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531-1544, 87 Stat. 884) directs all Federal agencies to use their existing authorities to carry out directs all Federal agencies to ensure, in consultation with the U.S. Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS), that their actions do not jeopardize listed species, or destroy or adversely modify critical habitat. Critical habitat is defined in section 3 of programs to conserve threatened and endangered species.

Section 7(a)(2) of the ESA the ESA as: (1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the ESA, on which are found those physical or biological features (a) essential to the conservation of the species and (b) which may require special management considerations or protection; and (2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Although ESA sections 7(a)–(d) continue to apply to agency responses to acts of God, disasters, casualties, national defense, or security emergencies, etc., the regulations implementing these sections (described below) provide for expedited procedures to accommodate the need for Federal agencies to respond promptly to emergency circumstances.

In 2017, the USFWS contracted with Pacific States Marine Fisheries Commission (PSMFC) to develop this manual to inform, expedite, and facilitate Section 7 consultations to include response actions that will minimize impacts of invasive mussel control and eradication attempts on listed species and their designated critical habitats. The effort to produce this manual is intended to improve coordination, collaboration, and preparedness among the many entities that would be engaged in invasive mussel rapid response actions in the CRB.

Emergency consultation is an expedited consultation process that considers listed species concerns while

Triggering an Endangered Species Act Consultation

Section 7 (a)(2) of the ESA requires Federal agencies to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any federally listed threatened or endangered species, or to result in the destruction or adverse modification of designated critical habitat.

When a Federal agency determines that its action "may affect" a listed species and/or designated critical habitat, the agency is required to consult with the USFWS and/or the National Marine Fisheries Service (NMFS) to ensure the above standards are met.

Even if a non-federal jurisdiction is leading a rapid response operation, an associated federal action may trigger a need for compliance with Section 7 of the ESA, such as:

- Actions on federal land
- Actions that require a federal permit
- Actions that require a federal license
- Actions using federal funds
- Actions implemented by federal agency employees

allowing an action agency to respond to an emergency situation. Chapter 2 of this manual provides more information on the emergency consultation process.

Purpose of this Manual

This manual is intended to be used in conjunction with the CRB Plan and any associated rapid response plans (e.g., state plans) to implement an immediate and effective response to an introduction of dreissenid mussels in the CRB. This manual describes: the core elements of the emergency consultation process; the proposed action; and listed species and critical habitats occurring within the U.S. portion of the CRB. This manual also describes best management practices that can be used to avoid or minimize adverse impacts to listed species and critical habitat, and steps involved in post-emergency consultation.

The purpose of this manual is to:

- Delineate a suite of most-likely rapid response eradication actions for a potential introduction of dreissenids within CRB states;
- Provide an assessment of the potential for those actions to affect ESA-listed species and critical habitats; and
- Present best management practices (BMPs) that can avoid, reduce, or eliminate adverse effects of the rapid response actions on listed species and/or critical habitat. The BMPs are recommendations that action agencies can use to reduce their effects to listed species and their habitats after engaging emergency consultation procedures with USFWS.

Scope and Intent of this Manual

Information in this manual is intended to facilitate emergency consultation procedures for Federal actions associated with an introduction of dreissenids in the U.S. portion of the CRB. This manual is not meant to be a comprehensive guide for dreissenid mussel response in the CRB; the CRB plan serves that function. The information in this manual could help inform the listed species/critical habitat portion of a National Environmental Policy Act (NEPA) analysis. Emergency response activities not statutorily exempt from NEPA may require the development of a brief Environmental Assessment that describes the need, alternatives, environmental impacts of proposed actions and alternatives, and the list of agencies and persons consulted. Similarly, information contained in this manual could help State and other non-Federal agencies comply with the ESA (e.g., Section 6 or Section 10). However, this manual does not directly address NEPA or ESA compliance for non-federal actions, which are addressed, to some degree, in the CRB plan (Heimowitz and Phillips

State Response Actions and Section 6 of the ESA

In general, State response actions involving emergency circumstances and take of listed species are likely to have a Federal nexus that will facilitate take coverage under the emergency consultation provision of the implementing regulations for section 7 of the ESA. Take is defined under the ESA to include: kill, harm, harass, capture, pursue, hunt, shoot, wound, trap, capture, or collect, or attempt to engage in such conduct. In addition, Section 6 of the ESA allows for the take of listed species by a state agency when it is either:

(a) an action carried out by the state agency (or its designated agent) that is signatory to a current and valid Section 6 cooperative agreement with the Service; is carried out for conservation purposes consistent with the cooperative agreement, a species' specific recovery plan, and the ESA; and is not reasonably anticipated to result in death, disabling, out-of-state removal, introduction outside of native range, or captivity exceeding 45 days of any federally-endangered species. See Appendix A for the underlying regulatory provision from 50 CFR § 17.21(c)(5).

(b) in accordance with a Section 10 permit issued by the Service.

The Service has determined that rapid response to eradicate an incipient introduction of zebra or quagga mussels into the Columbia Basin would fall under the "conservation purposes" criterion in (a).

2008). This manual discusses a subset of the treatment options listed in the CRB plan, focusing on the treatments most likely to be used in open water-systems. If a treatment is not included in this manual, the action agency can obtain species-specific best-management practices for ESA listed species via the emergency consultation process.

The focus of this manual is ESA listed species under the jurisdiction of the U.S. Fish and Wildlife Service. Guidance on protecting non-listed species (i.e., state listed sensitive species) is not included as part of this manual.

Quagga and Zebra Mussels (*Dreissenid spp*).

This manual focuses on members of the genus *Dreissena*, including zebra mussels (*Dreissena polymorpha*) and quagga mussels (*Dreissena rostriformis bugensis*). Although there are differences in the biology of these two species, they share many similar life history traits and cause similar adverse environmental and economic impacts. Both species have European origins and were introduced to the United States in the 1980s via ballast water discharge in the Great Lakes region. Both zebra and quagga mussels can attach to a broad range of surfaces, including pilings, pipes, rock, cement, steel, rope, crayfish, other bivalves, aquatic plants, and each other, forming dense colonies. Both zebra and quagga mussels reproduce with external fertilization; eggs and sperm are released into the water column, with larvae (veligers) emerging within three to five days from fertilized eggs (Benson et al. 2018). Reproduction is triggered by water temperature, and in some locations, reproduction can occur continually throughout the year (Benson et al. 2018).

Environmental Effects

The environmental impacts of zebra and quagga mussels to lakes and rivers is profound. Both species compete effectively with many native species and may completely replace native mussels, causing dramatic alterations of the native food chain (Hogan et al. 2007). The introduction of zebra and quagga mussels into the CRB, which drains 258,500 square miles in seven western states and Canada, has the potential to threaten native species, particularly salmon and trout and essential fish habitat (Pacific Fishery Management Council 2014), as well as cultural, industrial, agricultural, recreational, navigation, and subsistence use of waters.

Once established, dreissenid mussels can dramatically alter the ecology of a water body and associated fish and wildlife populations. As filter feeders, they selectively remove phytoplankton and other particles from the water column, shifting production from the pelagic to the benthic portion (Sousa et al. 2009). In Lake Michigan, dreissenid invasions have caused significant phytoplankton community structure shifts, including dominance in cyanobacteria (deStasio et al. 2014). In Lake Simcoe, Ontario, Canada, there were significant and sustained declines in phytoplankton biovolumes and chlorophyll *a* during the 12 years following invasion by dreissenids (Baranowska et al. 2013).

Dreissenids have accelerated the decline of freshwater bivalves, nearly extirpating native unionids 25 years after invasive mussels were introduced to the Great Lakes region (Burlakova et al. 2014). By attaching themselves to the surfaces of other bivalves, dreissenid mussels can starve freshwater mussels and drive indigenous populations to local extinction (Montgomery and Wells 2010). Dreissenid mussels can also affect dissolved oxygen through respiration, and dissolved calcium carbonate concentrations through shell building (Strayer 2009). The filtering capabilities of dreissenids increase water transparency, decrease chlorophyll concentrations, and increase the amount of pseudofeces (Claxton et al. 1998). Increases in pseudofeces reduce oxygen levels, which makes water pH more acidic and toxic (Snyder et al. 1997). Increased water clarity increases light penetration and causes growth in aquatic plants (Zhu et al. 2006). Dreissenids also bioaccumulate pollutants, which can be passed up the food chain, increasing wildlife exposure to organic pollutants (Snyder et al. 1997). Polychlorinated biphenyl (PCB) concentrations in mussel tissue are correlated to sediment PCB levels, indicating mussels may provide an entry point for PCBs into nearshore benthic food webs (Macksasitorn et al. 2015).

Research on natural enemies of dreissenids in Europe and North America illustrate that 36 species of birds and 38 species of fish each dreissenid adults, and 15 species of fish eat dreissenid veligers (Molloy 2008). Other predators include copepods and coelenterates (veligers) and leeches, crabs, crayfish, and rodents (adult mussels) (Molloy 2008). However, it is generally accepted that North American predators cannot eliminate zebra mussel populations, and at best, may play a limited role suppressing mussel populations (Molloy 2008).

Economic Effects

The economic costs associated with dreissenids are significant. The economic impact of zebra and quagga mussels to the hydropower systems on the Columbia and Snake Rivers is of particular concern. If introduced into the CRB, dreissenid mussels could affect all submerged components and conduits of this system, including fish passage facilities, navigation locks, raw water distribution systems for turbine cooling, fire suppression, irrigation, trash racks, diffuser gratings, and drains.

The following studies are examples of documented and estimated costs of a dreissenid introduction:

- The infestation of zebra mussels in the Great Lakes has cost the power industry \$3.1 billion between 1993–1999, including a total economic impact of more than \$5 billion (WRP 2009). The power generation industry in the Great Lakes expends \$1.2 million annually per power plant to monitor and control zebra mussels, and \$1.7 million annually to research better zebra mussel control methods. Water treatment plants pay \$480,000–\$540,000 annually to control zebra mussels, and municipal water treatment facilities pay \$353,000 annually to control zebra mussels (Colautti et al. 2006).

- In the Lower Colorado River, the Hoover dam has incurred, or planned, costs totaling \$10,231,208 for construction, supplies, services, and operations and maintenance to address dreissenid mussel infestations since invasive mussels were first discovered in 2007 (Bureau of Reclamation 2016).

- Annual welfare losses (i.e., costs or loss of benefits) of a dreissenid invasion in the CRB is estimated at $64 million, although that estimate did not include losses related to fish and wildlife resources (Warziniack et al. 2011).

- The direct economic impacts (impacts to dams, removal from boat launches, direct impacts to fishing) of invasive mussels to the State of Washington is estimated to be $43,112,000. Total economic activity at risk is 500 lost jobs and $27.8 million in labor income (Community Attributes, Inc. 2017).

- Idaho estimated an infestation of zebra mussels would cost the state $94,474,000 to hydropower facilities, other dams, drinking water systems, golf courses, boat facilities and maintenance, hatcheries and aquaculture industries, loss of angler days, and irrigation (Idaho Aquatic Nuisance Species Task Force 2009).

- A recent economic study commissioned by the Montana Invasive Species Council (Nelson 2019) estimated that if dreissenid mussels were to colonize all water bodies in Montana, the potential economic damages would total between $72.4 to $121.9 million in mitigation costs, $23.9 to $112.1 million in lost revenue, and $288.5 to $497.4 million in property value losses. Excluding property value losses, the top three stakeholder industries facing the largest potential economic impacts from dreissenid mussel invasion were tourism, hydropower, and irrigation, accounting for 60 to 75 percent of the total potential damages statewide (Nelson 2019).

Cultural Effects

Maintaining biocultural diversity and cultural resilience depends on continued access to culturally salient native biota (Pfeiffer and Ortiz 2007). Community members face challenges retaining, or reviving, their ancestral traditions when invasive species diminish cultural access (Pfeiffer and Voeks 2008). When invasive species displace culturally important native species, cultural storyscapes (i.e., the place-based intergenerational narrative maintained by a native society, which incorporates both tangible and intangible traditions) are affected by altering the character of sacred, or ritual sites, and displacing, or diminishing the growth of ethnobiologically important native species in ancestral gathering sites (Pfeiffer and Voeks 2008).

Invasive species also have indirect effects on culture, such as affecting human health and well-being through the use of toxic chemicals to mitigate biological invasions (Mackenzie 2003).

Culturally important native aquatic species have been displaced or reduced through the introduction of non-native species for recreational fishing, negatively impacting indigenous groups reliant on wild harvest of these species (Pfeiffer and Voeks 2008). Escaped farmed Atlantic salmon (*Salmo salar*) threaten wild salmonids in the Pacific Northwest, where native salmon are of significant cultural and spiritual importance to tribes (Pfeiffer and Voeks 2008). Invasive European green crab (*Carcinus maenas*) are displacing native marine and freshwater mussels, impacting tribes that harvest these native species for ornamental and ceremonial ware (Pfeiffer and Voeks 2008).

The most significant effects of invasive species have been introduced diseases that have produced catastrophic reductions in population and associated social breakdown in the Americas (Mitchell 2003) to cultural disorientation in Australia (Carey and Roberts 2002).

Invasive species create changes in narratives and lexicons, causing native peoples to designate invasive species based on their place, or culture, of origin (Pfeiffer and Voeks 2008). Some invasive species that displace culturally important native species either serve to facilitate, or impoverish, culture (Pfeiffer and Voeks 2008).

Cultural attachment to, and acceptance of, invasive species can perpetuate invasive species spread and introduction (Pfeiffer and Voeks 2008).

The Consequences of No Action

This manual has been prepared to facilitate a rapid response to an introduction of dreissenids in the CRB because the anticipated consequences of taking no, or delayed, action would include long-lasting, significant, and detrimental economic, environmental, and social effects that would change ecosystem function and processes throughout the CRB and affect the quality of life for people who live in the Basin. Because of these well-documented consequences, this manual has been prepared assuming that a federal agency would be engaged in a prompt response to an introduction of dreissenids in the CRB. However, there are many factors influencing whether or not attempts to eradicate dreissenids in any CRB water body will be successful (especially if dreissenids become established in large river systems, or large water bodies). In addition, the potential impacts of response actions to listed species and critical habitats are never fully known prior to control actions. It is entirely possible that well-intentioned response tactics (particularly those with known non-target effects, such as aqueous biocides) would simultaneously fail to stop the spread of a dreissenid mussel invasion while potentially degrading the condition of imperiled fish and wildlife and their habitats. Therefore, at the time of an actual response, it is prudent to weigh the short-term and long-term economic and environmental costs of eradication attempts with the likely long-term costs of managing established populations of dreissenids.

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CHAPTER 2. THE EMERGENCY CONSULTATION PROCESS

Process Overview

The implementing regulations for Section 7 of the ESA at 50 CFR 402.05 provide for consultation to be conducted in an expedited manner under emergency circumstances. The regulations state that such provisions apply "…to situations involving acts of God, disasters, casualties, national defense or security emergencies, etc." The Endangered Species Consultation Handbook (USFWS and NMFS 1998) further clarifies emergency circumstances include "…response activities that must be taken to prevent imminent loss of human life or property." The USFWS considers an incipient dreissenid outbreak in the CRB to meet the regulatory definition of an emergency situation given the clear and significant threat to property if invasive mussels become established. The National Marine Fisheries Service would consider such an outbreak a key decision point. **During any emergency situation, the first priority is protecting human safety and health. Where listed species and critical habitats are involved, the USFWS and NMFS also place a priority on providing recommendations/technical assistance to Federal response agencies for avoiding and minimizing any adverse effects to listed species and critical habitats likely to be caused by response efforts without impeding the protection of human health and safety.**

In emergency situations, consultation does not occur on the emergency; rather, consultation is conducted on the agency response to the emergency, and consultation is handled in an expedited manner. If a formal consultation is required, it is initiated as soon as practicable after the emergency is under control.

Typically, when an emergency situation occurs, the Federal action agency contacts:

- The USFWS Regional Ecological Services Office (either Region 1 or 6 for the CRB) by telephone if an emergency event is determined to be in proximity to listed species or critical habitat and warrants Section 7 consultation. See Appendix B for a list of the FWS Ecological Services Section 7 contacts for the CRB States.

- National Oceanic and Atmospheric Administration Fisheries staff in the West Coast office by email if an emergency event may occur in locations where ESA-listed species exist and to determine the potential effects on those species and/or designated critical habitat. The contact should occur as quickly as possible following the onset of the emergency.

Detailed guidance on emergency consultation procedures is provided on pages 8-1 through 8-6 of the Endangered Species Consultation Handbook (USFWS and NMFS 1998) and excerpted below.

PROCEDURES FOR HANDLING EMERGENCY CONSULTATIONS

(A) Initial Contact by the Action Agency

The initial stages of emergency consultations usually are done by telephone or facsimile, followed as soon as possible (within 48 hours if possible) by written correspondence from the Services. This provides the Services with an accurate record of the telephone contact. This record also provides the requesting agency with a formal document reminding them of the commitments made during the initial step in emergency consultation (Figure 8-1). During this initial contact, or soon thereafter, the Services' role is to offer recommendations to minimize the effects of the emergency response action on listed species or their critical habitat (the informal consultation phase). DO NOT stand in the way of the response efforts.

If this initial review indicates the action may result in **jeopardy** or **adverse modification**, and no means of reducing or avoiding this effect are apparent, the agency should be so advised, and the Services' conclusions documented.

Project leaders should establish procedures (e.g., a calling tree) within their offices outlining who can be called to handle the emergency consultation. Once these procedures have been established, they should be provided to all Federal agencies in that operating area responsible for handling emergency situations (e.g., Coast Guard, Environmental Protection Agency, and Federal Emergency Management Agency) and any other Federal agencies with responsibilities in the operating area.

The FWS Field Office conducting the consultation should notify the FWS Assistant Regional Director responsible for endangered species and/or the ecosystem at risk, following timeframes established by FWS Regional guidance. The notification should be in memo form, following the format outlined in Exhibit 8-1. Early telephone notification may be required. For NMFS, the Regional Director should notify the Director, Office of Protected Resources.

(B) Initiating Formal Consultation

As soon as practicable after the emergency is under control, the action agency initiates formal consultation with the Services if listed species or critical habitat have been adversely affected. Although formal consultation occurs after the response to the emergency, procedurally it is treated like any other formal consultation. However, the action agency has to provide additional information to initiate a formal consultation following an emergency:

- a description of the emergency;
- a justification for the expedited consultation; and
- an evaluation of the response to and the impacts of the emergency on affected species and their habitats, including documentation of how the Services' recommendations were implemented, and the results of implementation in minimizing take.

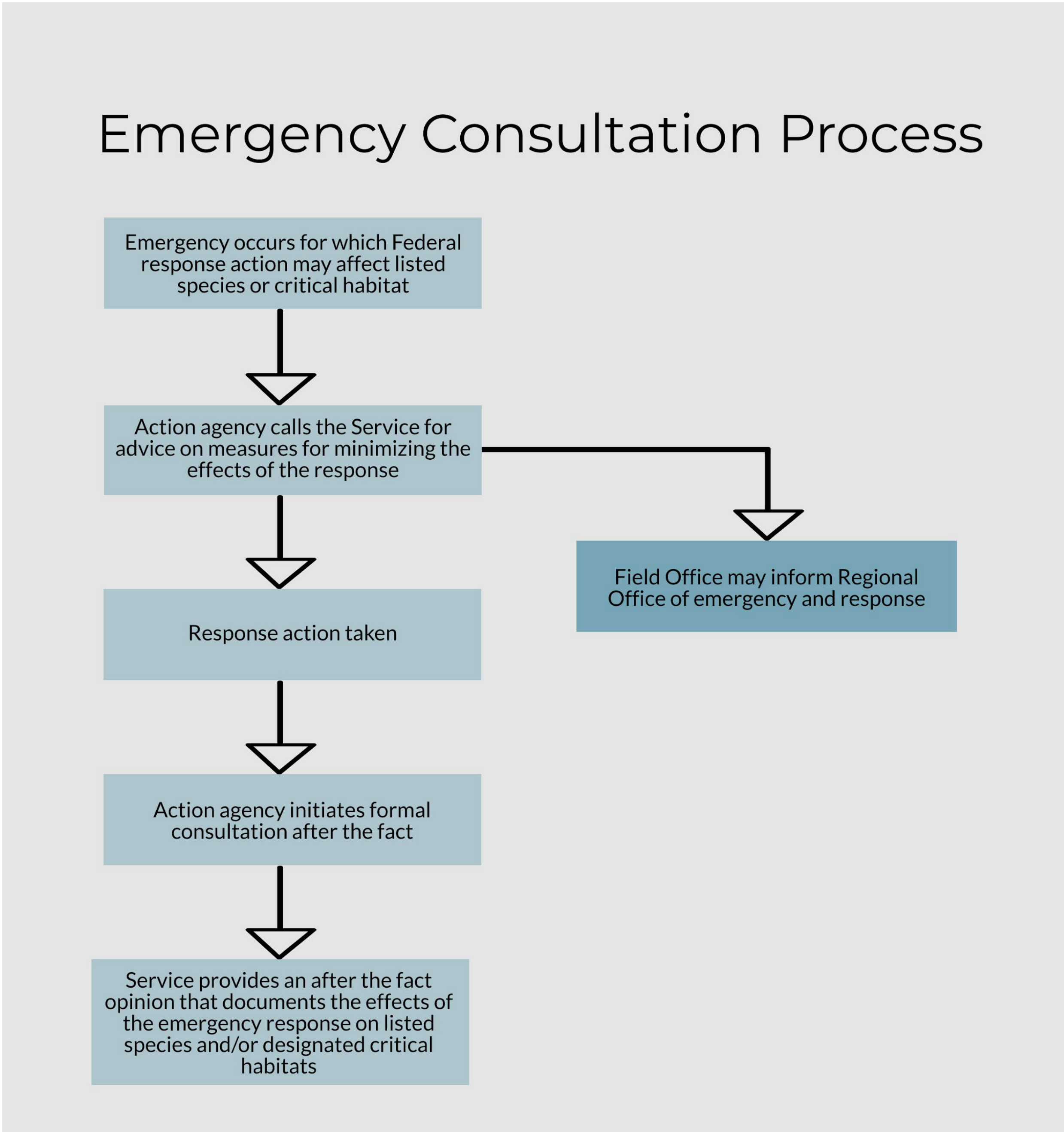


Figure 1. Emergency Consultation Process (excerpted from Figure 8-1 of the USFWS Endangered Species Consultation Handbook 1998).

(C) Emergency Biological Opinion

After concluding formal consultation on an emergency, the Services issue an emergency biological opinion. The "effects of the action" section, documents the recommendations provided by the Services to the action agency and the results of agency implementation of the recommendations on listed species. The timeframe, format and contents are the same as for formal consultation (see Chapter 4 of the ESA Consultation Handbook (USFWS and NMFS 1998)). A sample of standardized language for an emergency consultation document can be found in Appendix B in the ESA Consultation Handbook. The standardized statements for formal consultation have been modified to reflect that this is, in most cases, an after-the-fact consultation.

Documenting **jeopardy** and **adverse modification** biological opinions is particularly important to tracking the effect on species and habitat conditions. For FWS, emergency biological opinions with the conclusion of "not likely to jeopardize" the species or "not likely to result in destruction or **adverse modification** of critical habitat" are completed at the Field Office level. However, if the conclusion is likely **jeopardy** or **adverse modification**, the consultation is elevated to the Regional Office. Such a finding may not have a reasonable and prudent alternative available, unless some further action can restore or enhance the species to a level below the **jeopardy** threshold. For NMFS, emergency opinions are signed in Washington by the Director, Office of Protected Resources, except where a specific Region has been delegated signature authority (i.e., Northwest and Southwest Regions have been delegated signature authority for anadromous fish).

(D) Incidental Take Statement

If incidental take is anticipated during the emergency response, the Services can advise the action agency during the informal consultation phase of ways to minimize take. In some circumstances, the actual or estimated take occurring from the agency's emergency response actions can be determined, and should be documented in the biological opinion for future inclusion in the species' environmental baseline. The incidental take statement in an emergency consultation does not include reasonable and prudent measures or terms and conditions to minimize take, unless the agency has an ongoing action related to the emergency. Rather, an emergency consultation incidental take statement documents the recommendations given to minimize take during informal consultation, the success of the agency in carrying out these recommendations, and the ultimate effects on the species of concern through take.

(E) Conservation Recommendations
Emergency consultations may contain conservation recommendations to help protect listed species and their habitats in future emergency situations or initiate beneficial actions to conserve the species.

Note: While the timing of "emergencies" is unpredictable, the types of emergencies that may affect listed species or critical habitat can be determined in advance. Emergency response actions are routinely practiced by responsible Federal agencies. Advance coordination with responsible Federal agencies is encouraged so that endangered species components can be incorporated into the emergency response where appropriate.

Conferences

Section 7(a)(4) of the ESA requires Federal agencies to confer with the USFWS and NMFS (the Services), as appropriate, in cases where the agency, or the Services, have determined that a proposed or ongoing Federal action is likely to jeopardize the continued existence of species proposed to be listed under Section 4 of the ESA, or result in the destruction or adverse modification of critical habitat proposed to be designated for such species; see Chapter 6 (pp. 6-1 through 6-10) of the Services' Consultation Handbook (USFWS and NMFS 1998).

The Services encourage Federal agencies to conference on actions that may affect a proposed species, or proposed critical habitat. In such cases, conference concurrence determinations, or conference opinions, can be adopted as formal concurrences or biological opinions, respectively, after a proposed species is listed, or the critical habitat is designated. This approach can avoid disruption of project implementation due to the need to initiate and complete formal consultation at the time of listing or designation. It also facilitates, or promotes, action agency consideration of the conservation needs of proposed species and the recovery function of proposed critical habitat. Emergency consultation procedures can be adapted to accommodate the conference process if necessary.

Exhibit 8-1. FWS Emergency consultation notification memorandum to the Regional Office (optional).

(date)

Memorandum

To: Assistant Regional Director, Region __(number)___

From: Field Supervisor, ____(name of Field Office)____

Subject: Emergency Consultation on ____(name of Federal action)___.

This office has completed an informal emergency consultation. The following information summarizes the location of the emergency, nature of the emergency, listed species and critical habitat(s) involved, and how those species and habitats are likely to be affected by the emergency.

Date of Contact: Time:

Contact(s) Name:

Agency:

Contact(s) Title:

Nature of the Emergency:

Species/Critical Habitats in the Area:

Anticipated Effects:

Recommendations Given the Contact:

Alignment with Regional and State Plans

The use of emergency consultation procedures aligns with the CRB Plan. Use of emergency consultation procedures is consistent with the Department of the Interior's objectives to use efficient and effective processes that provide for a timely and rapid response to dreissenid introductions. Also, the states in the CRB (Washington, Oregon, Idaho, Montana, Wyoming, Nevada and Utah) have state-specific Aquatic Nuisance Species Management Plans approved by the Aquatic Nuisance Species Task Force (https://www.anstaskforce.gov/stateplans.php). In addition, Washington (DeBruyckere et al. 2014), Oregon (Draheim et al. updated 2017), Idaho (Idaho Department of Agriculture updated 2015) and Montana (Montana Fish, Wildlife, and Parks 2018) have specific dreissenid mussel rapid response plans that align with state AIS plans. The use of emergency consultation procedures aligns with these state plans.

EMERGENCY CONSULTATION PROCESS

START

A dreissenid species is detected in a Columbia River Basin waterbody, and eradication is deemed possible.

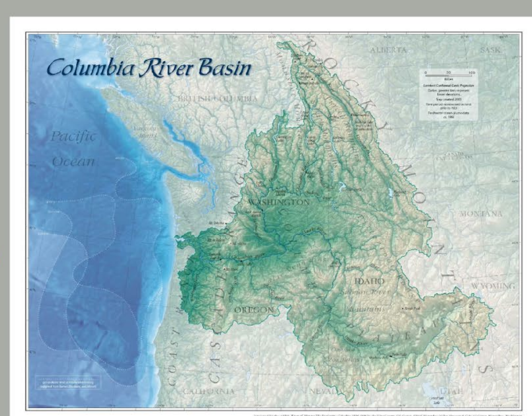
The action is deemed an emergency that warrants rapid response and may affect listed species or critical habitat. Photo credit: USFWS

The action agency calls the USFWS for advice on measures for minimizing effects during response.

The response action is taken in the waterbody. Graphic credit: Minehaha Creek Watershed District.

The action agency initiates formal consultation after the response action is taken.

The USFWS provides an after-the-fact opinion that documents the effects of the emergency response on listed species and/or designated critical habitats.



The Columbia River Basin waterbodies are protected for human health and welfare as well as listed species and critical habitats.

All appropriate measures were taken to avoid and minimize take for listed species and critical habitats.

Chapter Two References

DeBruyckere, L.A., W. Brown, and B. Tweit. 2014. Washington Dreissenid Mussel Rapid Response Plan. 63pp.

Draheim, R., R. Boatner, G. Dolphin, and L. DeBruyckere. 2017. Oregon Rapid Response Plan. 93pp.

Idaho Department of Agriculture. 2015. Idaho Rapid Response Plan for Early Detection of Dreissenid Mussels. 5pp.

Montana Fish, Wildlife & Parks. 2018. The State of Montana's Dreissenid Mussel Rapid Response Guidelines.

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Endangered Species Consultation Handbook – Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

CHAPTER 3. RESPONSE ACTIONS

A detection of dreissenids in a CRB water body in the United States would likely result in a rapid response action, with a Federal nexus (e.g., Federal funding), in the states of Washington, Oregon, Idaho, and/or Montana via implementation of the CRB plan, and therefore likely trigger the emergency consultation process (Chapter 2).

Any water body in the CRB could be a potential location for the proposed action, from free-flowing rivers and streams, to hydropower reservoirs, to isolated water bodies. Access to any water body is dependent on the road network to each water body, and the amount of development and access sites available. Areas close to public use access sites, such as boat launches and marinas, are the most likely locations where both dreissenid detections and response actions would occur as a result of dreissenid introduction through watercraft, or water-based, recreation activities.

Specific tasks associated with each response action may include detection area isolation, sample collection, site monitoring, site preparation, fish and wildlife salvage, mussel treatment, equipment decontamination, site restoration activities associated with the control action (if necessary), and implementation of conservation and minimization measures and best management practices to avoid and minimize adverse environmental effects.

This chapter describes the types of most likely treatments and activities that would occur in response to a detection of dreissenids in an open water system. The CRB plan outlines many different control options, including treatments that may not be appropriate, or feasible, for response in open-water systems (see Section D-1 of the CRB plan).

Defining the Affected Area

The potentially affected area (or action area as described in the ESA section 7 regulations) for any hypothetical rapid response action would include all areas affected directly or indirectly by the response, and not merely the immediate area involved in the response (e.g., upstream, downstream, hatcheries, infrastructure, etc.). Therefore, for the broad purposes of this manual, it could include any water body in the CRB, including all access sites into and out of the water body, staging areas, and other infrastructure adjacent to the water body, areas downstream of the site (if applicable), and any other areas affected by implementation of the response action.

Description of Possible Response Actions

Appendix D of the CRB Plan (Heimowitz and Phillips 2008) describes, in detail, the numerous methods available to control invasive dreissenids in a variety of situations, including hydropower facilities, closed water systems, and open water bodies.

Appendix D of the CRB plan summarizes the latest science associated with treatment types and efficacy for physical, biological, and chemical controls. Any rapid response action could include detection, isolation of the treatment area, fish and wildlife salvage, eradication tactics, and riparian restoration.

Treatment Steps

The following steps are applicable to all treatments and align with the *Columbia River Basin Interagency Invasive Species Response Plan* (Heimowitz and Phillips 2008).

1. Receive report or lab analysis of a **positive identification** of dreissenids and **make initial notifications** per Section IV-A, Appendix C of the *Columbia River Basin Interagency Invasive Species Response Plan*. Initiate USFWS emergency consultation and/or NMFS consultation.

2. **Activate appropriate organizational elements** of the CRB Interagency Response Plan per Section IV-A of the *Columbia River Basin Interagency Invasive Species Response Plan*.

3. **Verify the reported introduction** per the mutually agreed upon methods and protocols established by the western states.[1]

4. **Determine the extent of the colonization** per Section IV-A, Appendix B of the *Columbia River Basin Interagency Invasive Species Response Plan.*

5. **Establish an external communications system** per Section III, Section IV, and Appendix B of the *Columbia River Basin Interagency Invasive Species Response Plan.*

6. **Obtain and organize resources** needed for a control action per Section IV-A of the *Columbia River Basin Interagency Invasive Species Response Plan.*

7. **Prevent further spread via quarantine and pathway management** per Section IV-A, Appendix B of the *Columbia River Basin Interagency Invasive Species Response Plan.*

8. **Initiate available/relevant control actions** per Section IV-A, Appendices B and D of the *Columbia River Basin Interagency Invasive Species Response Plan.* Ensure conservation measures and best management practices are implemented to avoid and minimize any detrimental effects to native fish and wildlife and their habitats.

9. **Initiate post-response consultation requirements** with appropriate agencies per direction from those agencies (USFWS, NMFS, etc.).

[1] https://www.buildingconsensusinthewest.org/monitoring

Rapid Response Project Activities

This section lists the main steps for most rapid response actions, and identifies each step and associated activities. The purpose of this section is to outline the possible activities that could occur for a typical rapid response action that would need to be considered for inclusion in an Emergency Consultation for that action.

1. Site Mobilization

Equipment expected to be used in any control effort: vehicles, boats, trailers, generators, small fuel and oil containers for small engines, pumps, hose material, silt curtains, portable water tanks, other barrier material, and treatment chemicals.

Site mobilization includes access and vegetation and wildlife considerations. Best management practices for each are included in Chapter 5 in this document.

2. Area Isolation

The areas adjacent to public access site(s) where the detection of dreissenids is confirmed will be immediately closed to boat traffic, and any contaminated watercraft, including derelict vessels, will be removed. Isolation reduces the potential that dreissenid veligers or juveniles could escape the treatment area, which is important when the invasion is detected early and eradication is most likely. A barrier must significantly limit or eliminate water transfer from the treatment area to the main water body. Complete elimination of connectivity for the duration of treatment is preferred.

- Establish mandatory decontamination procedures for all existing watercraft.
- Collect samples inside and outside of the contaminated area for immediate analysis.

- Determine the feasibility of using silt curtains or barriers to close the bay or marina to open water.

Isolation of a portion of the water body is intended to eliminate water transfer from the treatment area to the main water body and prevent the transfer of aquatic life from the main water body into the treatment area. Two methods commonly used to create this isolation are silt curtains and bladder dams.

- Impervious silt curtains (Figure 3) would be deployed via boat (e.g., commercial silt curtain or HDPE material anchored in place), then secured to shore on the other end, or the boat can deploy the curtain in a circular fashion around the perimeter of a treatment area. Silt curtains can be up to 30.5 m in length, with a skirt of the same depth. Curtains can be fastened together to extend as far as necessary, whereas the skirts have a bottom chain for weight, and can be anchored to the substrate with sand bags.

The skirt is lowered, and sandbag anchors placed once the curtain has been appropriately stretched. This includes dropping the weighted skirt by untying or cutting, binding, and attaching and lowering sandbags into place.

Removal steps occur in the reverse order.

- Inflatable bladder dams [e.g., PLUG (Portable Lightweight Ubiquitous Gasket) and Tiger (PVC-coated fabric) dams, high density polyethylene (HDPE) liner material] would be deployed by humans on foot.

Inflatable bladder dams (Figure 4) can be positioned across the substrate and pumped with water to effectively block connectivity. This isolation method may be depth-limited.

Methods for bladder dam deployment may include:

- o Bladder dams are unrolled and waded into place on foot, and the bladders are then filled via water pumped into the bladder.
- o Any pump intake would be required to draw as specified by NMFS (2001) to protect juvenile fishes 20–30 mm.

Removal steps occur in the reverse order. If water is used from the water body being treated, the bladder water would receive treatment before being discharged.

Methods that could be used to isolate a portion of the water body, in addition to silt curtains and inflatable bladder dams, may include geotextile fabric filled with an appropriate material as well as a combination of sandbags, polyvinyl chloride (PVC)-coated fabric, and blocks.

Water tracer dyes
To evaluate the effectiveness of containment barriers (regardless of type) after installation but prior to treatment, tracer dyes may be used. Water tracing introduces xenobiotic substances[2] into waters and are a potential source of water contamination (Behrens et al. 2001). The selection of a tracer depends on the receiving system, cost,ease of analysis, toxicity, ambient background concentrations, and the degree to which the tracer behaves conservatively (Runkel 2015). Fluorescent dyes used as water tracers should be readily soluble in water, conservative, stable through time, measurable at large dilutions, simply and easily detectable, low in toxicity, readily available and inexpensive, and not deteriorate upon contact with water as well as pose no significant health or environmental threats (Field et al. 1995).

3. Rescue/Salvage

In cases in which listed aquatic species are present, attempts should be made to rescue/salvage listed species (that would not naturally move away from the action area). The guidelines and protocols identified in NMFS (2000 or most recent version) and Reynolds (1996) for electrofishing would be implemented during listed fish salvage. For all other listed species, such as mollusks, all attempts would be made to rescue/salvage any listed species and retain them offsite, or move them into another portion of the water body where it has been determined they will not be affected by the action.

Fish salvage methods may include:

- Boat or backpack electrofishing gear calibrated to the specific onsite water conditions (i.e., conductivity).

- At least one team of three people would wade, or operate a boat throughout the treatment area, netting fish and placing them in containers of fresh water with air supply until no fish are captured for a period of 5–10 minutes. Number of teams and total collection effort would depend on size of the treatment area.

- Fish would be transferred to a separate holding tank with uncontaminated water calibrated to the ambient treatment area water temperature with oxygen supply.

- A clean water flush calibrated to the ambient treatment area temperature would completely replace the tank volume prior to fish release outside of the treatment area.

- A separate crew with sanitary equipment would conduct the fish transfer via nets and smaller containers adjacent to the treatment area.

[2] Xenobiotic substances are synthetic chemicals generally not naturally produced.

- All equipment used during salvage would be treated onsite using the same methods as equipment sterilization (discussed below).

4. Response Method Options

A suite of chemical and non-chemical options exists for controlling invasive mussels in the CRB; some treatments are appropriate solely for hydropower facilities and water delivery systems, in which fish are not present and the water can be treated before being released into a sewage system. Other treatments, which may have lower toxicity to fish and living organisms, are more appropriate for open water situations. Although the CRB plan outlines numerous potential control options, many treatments may not be appropriate, or feasible, for response in open-water systems (see Section D-1 of the CRB plan (Heimowitz and Phillips 2008). The scope of this manual includes the treatment options most likely to be used in open-water systems. For example, oxidizing biocides (i.e., chlorine, bromine, hydrogen peroxide, ozone, and potassium permanganate) and non-oxidizing compounds (proprietary molluscicides; i.e. Clam-Trol, Bulab, and Bayluscide) are listed as chemical treatment options in the CRB plan. Although these treatments may be effective at controlling invasive dreissenid mussels, they are highly toxic to other aquatic species, including fishes, and are not included in this manual as likely treatment options in open-water situations (see Chapter 1 – Scope and Intent).

The most likely treatment options that would be implemented for any water body in the four CRB states would include both chemical and physical treatments:

A. Chemical Methods

The use of chemicals requires knowledge of permitting, labeling, and chemical-specific application regulations (BOR 2015).

1. **Muriate of Potash**—used as a biocide; requires a Section 18 Pesticide Emergency Exemption from the US Environmental Protection Agency (USEPA).
2. **EarthTec QZ™**—used as a biocide; (only in water bodies with non-salmonid/trout species).
3. **Zequanox®**—the only EPA-registered biocide for mussels.
4. **Rhodamine dye**—used to evaluate water flow and containment effectiveness (not used as a biocide).

B. Mechanical and Other Methods

1. **Intense Ultraviolet-B and Ultraviolet-C Radiation**
2. **Water level management**
3. **Physical removal**
4. **Benthic mats**

Combinations of treatments may be used, and retreatments may be necessary. Treatment areas would be isolated up to 45 days during treatment to maximize dreissenid mussel exposure time, incorporate variables, such as temperature variations (which affects efficacy of potash), and provide for re-treatment, if needed. The 45-day isolation period would incorporate two full treatments if a second treatment was necessary to achieve 100% mortality.

Bioassays

Several bioassays could be employed to determine the effectiveness of each treatment.

If adult dreissenid mussels are present in a water body, mussel mortality could be assessed via in-situ cage bioassays (Lund et al. 2017). Source bioassay specimens from the waterbody where proposed treatment(s) will occur. If possible, four cages of ~50–100 mussels per cage could be placed within the treatment area. Cages could be constructed of plastic canvas mesh sheets (1–2 mm openings), anchored to the lake bottom. If the water body is stratified (having distinct epilimnion, metalimnion, and hypolimnion), additional bioassays representative of the different layers may be appropriate. Live, gaping, and dead mussels could be recorded daily until all mussels are dead or until no additional mussels die over three consecutive days.

A. Chemical Methods

This paper describes three of the most commonly used chemicals to control dreissenids, including Muriate of Potash, EarthTec QZ™, and Zequanox®. In locations in which salmonids and bull trout occur, products containing copper should not be used because of the toxicity of copper to salmonids.

A1. Chemical Method – Muriate of Potash

In basin locations in which ESA-listed salmonids and their critical habitat exist, the most likely product to be used, based on least toxicity to aquatic life as well as cost, is potash.

Potash is a common plant fertilizer which is largely comprised of potassium salts. Forms used to treat dreissenids include potassium chloride (KCl), potassium hydroxide (KOH), and potassium sulfide (K_2SO_4).

Potassium fertilizers used in agriculture have been shown to precipitate salts when applied in large quantities and/or through time, which can cause salinity problems in spoils (Magen 1996). There is either a paucity of information on the effects of potassium applied directly to water, or the only actual outcome is increased nutrient loading. Irrigation systems cause compound leaching over time and allow precipitates to accumulate in soils (Burt and Isbell 2005).

Toxicity

Potassium ions interfere with the respiration of dreissenids at the gill surface (Fisher et al. 1991, Aquatic Sciences Inc. 1997). Acute lethal effects of potash on juvenile brook trout (*Salvelinus fontinalis*) and juvenile Chinook salmon (*Oncorhynchus tshawytscha*) are not expected at concentrations used to control dreissenids (Densmore et al. 2018). In fact, exposure concentrations of eight times greater than the dose of KCl used as a molluscide (800 mg/L) in a static system during a 96-hour period resulted in no mortality, and no behavioral, histological, or gross morphological effects on fish of either species (Densmore et al. 2018). Significant mortality among sensitive aquatic invertebrates, such as water fleas (Daphniidae), is not unexpected (Densmore et al. 2018). Other invertebrates, such as crayfish (*Procambarus* spp.), demonstrate some degree of sensitivity to KCl (Densmore et al. 2018). For example, crayfish exposed to KCl at higher concentrations (e.g., 800 mg/L–1,600 mg/L) for at least 24 hours experienced immobilization, but half were able to fully recover in fresh water within 24 hours (Densmore et al. 2018). Further analysis is needed to fully realize the threats to crayfish and other invertebrate species from KCl.

Liquid potash was successfully used, with 100% effectiveness, to eradicate zebra mussels from the Millbrook Quarry in Virginia, USA (Fernald and Watson 2014).

Potash Application

Potash consists primarily of potassium chloride (KCl). Potash is not a registered pesticide in the United States and requires a Section 18 Pesticide Emergency Exemption from the U.S. Environmental Protection Agency (USEPA) to allow its use in the four CRB states.

Target application rates are 95–115 mg/L (KCl), ≤ 10 mg/L (KOH), and 160–640 mg/L (K_2SO_4). Applications may be made at the surface, mid-depth, or deep waters to ensure appropriate mixing and to maintain the desired concentration throughout the treatment area. Potash can be applied up to 21 days after mixing to achieve desired effectiveness.

Equipment includes High Density Polyethylene storage tanks with spill containment to protect against spills and ensure a constant supply of stock solution. A stock solution of about 12% potassium is mixed by a chemical supplier and delivered to the site on an as required basis where it is transferred to the storage tanks and kept in solution by an electric tank mixer. The quantity of metric tons of KCl required to treat the site is estimated in advance based on the size of the contained portion of the water body.

Water-based operations use a work boat outfitted with a specially designed diffuser assembly. Stock solution from the shore-based storage tanks continuously feed the diffuser through a floating 3.8 cm (1.5 in.) diameter supply line and shore-based centrifugal pump transfer system. Proper diffusion of potassium is a critical element of the treatment method.

Treatment proceeds on a systematic basis by separating the cordoned off areas into segments or treatment zones delineated by water depth. The work platform-based retractable diffuser assembly consists of perforated vertical flexible hoses having capped and weighted ends attached to the horizontal section. This allows for an enlarged mixing zone to be achieved while the flexible hose reduces damage due to submerged obstacles. An echo sounder is used to monitor water depth and the depth of the submerged diffuser assembly to maintain an optimum height above the bottom of the water body. This system also reduces the risk of entangling the diffuser assembly on bottom features.

To ensure the potassium diffusion system is operating efficiently and is attaining target potassium concentrations throughout the treatment zone, potassium spot monitoring is completed during each charge operation. This provides personnel with information on how quickly and how well the potassium is dispersing through the treatment zone. This information can be used to modify the treatment protocol, either by increasing or decreasing the dosing rate to achieve target concentrations. Following the “charge” activities, a final sampling exercise is conducted throughout each cordoned off area to characterize potassium concentrations at various depth profiles. Monitoring points at each enclosed area are spaced depending on the width of the enclosed area at each transect location. Sites are monitored along each transect to ensure feasible and maximum monitoring coverage of the treated transect area. Duplicate samples are collected and analyzed for every tenth sample for quality assurance and quality assurance/quality control (QA/QC) purposes.

To determine the potassium concentrations, water samples are obtained by two different methods. Surface grabs are conducted where water depths are less than 2 m and are collected at least 0.15 m below the surface. A peristaltic pump, or Kemmerer bottle, is used to collect samples from each thermocline present in the sectioned off area and at depths greater than 2 m. Samples are analyzed with a concentration meter, in combination with a potassium probe. Sample identification, location, depth, date, GPS coordinates for each monitoring point, and other pertinent information is recorded in a field logbook and on reporting log sheets. The field instruments are calibrated prior to use every day with standards of known value. Monitoring is conducted daily throughout a 12-hour shift.

A2. Chemical Method – EarthTec QZ™

EarthTec QZ™ is a copper-based algaecide/bactericide (a formulation of copper sulfate pentahydrate) labeled to control zebra and quagga mussels. EarthTec QZ™ is registered in all 50 states as an algaecide/bactericide and in Montana and Washington as a molluscide. EarthTec QZ™ is documented as achieving 100% mortality of mussels when exposed to the product for 96 hours (Watters et al. 2013). The product can be spread on the surface of a water body or pumped into a water body, and disperses rapidly.

EarthTec QZ™ is a liquid formulation that is miscible in water and has ionic diffusion properties that cause it to readily disperse throughout the water column. The product’s active ingredient is delivered in the cupric ion form—a biologically active form of copper (Watters et al. 2013). EarthTec QZ™ does not have any degradation byproducts, and no adjuvants or surfactants are used in the application.

Toxicity

Lethal dose and exposure time of zebra mussels to EarthTecQZ™ had been identified under laboratory conditions (Watters et al. 2013, Claudi et al. 2014).

The cupric ion (Cu^{2+}) form of copper is considered the most toxic form of copper to aquatic life because it is the most bioavailable (Eisler 2000, Solomon 2009). In addition, the cupric ion form of copper is more lethal in soft water compared to hard waters rich in cations because cations reduce its bioavailability (Pagenkopf 1983, Paquin et al. 2002). The toxicity of copper to fish and other aquatic life depends on its bioavailability, which is strongly dependent on pH, the presence of dissolved organic carbon (DOC), and water chemistry, such as the presence of calcium ions.

- Juvenile rainbow trout (*Oncorhynchus mykiss*) were exposed to either hard water or soft water spiked with copper for 30 days (Taylor et al. 2000). Fish in the hard-water, high dose (60 µg/L) treatment groups showed an increased sensitivity to copper.

- The mean 96-hour LC_{50} (with 95% confidence limits) for copper exposure in alevin, swim-up, parr and smolt steelhead (*Salmo gairdneri*) is 28 (27–30), 17 (15–19), 18 (15–22), and 29 (>20) µg/L of copper, respectively (Chen and Lin 2001). The mean 96-hour LC_{50} for copper exposure in alevin, swim-up, parr, and smolt Chinook salmon (*Oncorhynchus tshawytscha*) is 26 (24–33), 19 (18–21), 38 (35–44), and 26 (23–35) µg/L of copper, respectively. The experiments were done by adding copper as copper sulfate.

- Aquatic snails (*Biomphalaria glabrata*) had a 24-hour and 48-hour LC_{50} (with 95% confidence intervals) of 1.868 (1.196–3.068) and 0.477 (0.297–0.706) mg/L Cu, respectively (de Oliveira-Filho et al. 2004).

- 1-day-old freshwater snail eggs (*Lymnaea luteda*) were exposed to copper at concentrations from 1 to 320 µg/L of copper for 14 days at 21 °C in a semi-static embryo toxicity test (Khangarot and Das 2010). Embryos exposed to copper at 100 to 320 µg/L died within 168 hours. At lower doses from 3.2–10 µg/L, significant delays in hatching and increased mortality were noted.

EarthTec QZ™ Application

Application methods vary depending on the scale of project. It is applied at a rate of up to 2 mg/L, not to exceed 0.1 mg/L total copper. Concentrations may be held constant up to 30 days (depending on dose) to achieve effective treatment for all dreissenid life stages. EarthTec QZ™ copper is highly water soluble and does not precipitate. The product remains suspended until uptake by bacteria and algae occurs (Master Label for EarthTec QZ™, EPA Reg. No. 64962-1). Dispersion into the water body quickly reduces concentrations to below effective levels outside of the isolated treatment area.

EarthTec QZ™ is applied near the water surface and allowed to disperse, or is delivered via hose and pump to the depths, sites, and surfaces of the area of infestation. When applying to large areas, it is dispensed along a route with gaps no greater than 200 feet. Generally, when fish are present, no more than one-half of the body of water is treated at a time, starting near one shore and moving outward in bands to allow fish to move away. When treating half of a body of water, the second half must not be treated within 14 days from the last treatment. For effective control of adult and juvenile mussels, it is applied at the recommended rate of 2–16 parts per million (i.e., 2–16 gallons of EarthTec QZ™ per million gallons of water) to yield a rate of 0.120–0.960 mg/L (ppm) metallic copper. A total of at least four days is required for mortality of dreissenids to occur. Colder water temperatures may require longer exposures and doses closer to the high end of the allowable range. Within the half of the water body being treated, repeat applications may be needed to maintain lethal concentrations of copper for a sufficient time period. The second half of the water body is not treated within 14 days of the last treatment of the first half. Effective control can also be achieved by longer exposures (e.g., 5–30 days) at lower doses (1–5 parts per million EarthTec QZ™, to yield a rate of 0.06–0.30 mg/L (ppm) metallic copper.) When reapplying, a concentration of 1.0 mg/L (ppm) metallic copper in the treated water is not exceeded.

A3. Chemical Method – Zequanox®

Zequanox® is a biopesticide consisting of the dead bacterial cells of *Pseudomonas fluorescens* strain CL145 A that, when ingested by zebra and quagga mussels, destroy the digestive lining (https://marronebioinnovations.com/molluscicide/zequanox/). All treatments are undertaken by state-licensed applicators. Prior to beginning chemical treatment, the area to be treated is sealed off using non-permeable geotextile membranes, creating a contained open water body.

Zequanox® is maintained at a rate of 100 mg/L for up to eight hours; treatments are often repeated, although the label recommends no more than four Zequanox® applications annually.

Toxicity

Zequanox® is a potential tool for controlling dreissenids in shallow water habitats in lakes, hydrologically connected wetlands, or portions of flowing water that can be cordoned off with barriers, without significant long-term effects on water quality (Whitledge et al. 2014). However, this biopesticide does cause temporary, but substantial, reductions in dissolved oxygen because of the barriers that prevent well-oxygenated water from circulating into treatment zones (Whitledge et al. 2014).

Exposure to Zequanox® caused no mortality to blue mussels (*Mytilus edulis*) or any of six native North American unionid clam species (*Pyganodon grandis*, *Lasmigona compressa*, *Strophitus undulatus*, *Lampsilis radiata*, *Pyganodon cataracta*, and *Elliptio complanata*) (Bureau of Reclamation 2011). Exposure of duck mussel (*Anodonta* spp.), non-biting midge (*Chironomus plumosus*), and white-clawed crayfish (*Austropotamobius pallipes*) to Zequanox® in a 72-hour static renewal toxicity test at concentrations of 100–750mg active ingredient/liter resulted in LC_{50} values for *Anodonta*: ≥500mg active ingredient/liter, *C. plumosus*: 1075mg active ingredient/liter, and *A. pallipes*: ≥750mg active ingredient/liter, demonstrating that Zequanox ® does not negatively affect these species at concentrations required for greater than 80% zebra mussel mortality (i.e., 150mg active ingredient/liter) (Meehan et al. 2014).

Nicholson (2018) conducted a replicated aquatic mesocosm experiment using open-water applications of Zequanox® (100 mg/L of the active ingredient) to determine the responses of primary producers, zooplankton, and macroinvertebrates to Zequanox® exposure in a complex aquatic environment. Short-term increases occurred in phytoplankton and periphyton biomass (250–350% of controls), abundance of large cladoceran grazers (700% of controls), and insect emergence (490% of controls). Large declines initially occurred among small cladoceran zooplankton (88–94% reductions in *Chydorus sphaericus*, *Ceriodaphnia lacustris*, and *Scapheloberis mucronata*), but abundances generally rebounded within three weeks. Declines also occurred in amphipods (*Hyalella azteca* - mean abundance 77% less than controls) and gastropods (*Viviparus georgianus* - survival 73 ±16%), which did not recover during the experiment. Short-term impacts to water quality included a decrease in dissolved oxygen (minimum 1.2 mg/L), despite aeration of the mesocosms.

Zequanox® Application

Products are mixed in tanks and injected at the water surface. Following treatment, monitoring occurs every 1–2 days for 14 days post-treatment. Monitoring consists of collecting surface water samples at various locations inside the treatment area. Samples are submitted for analysis by mass spectroscopy, with results reported within 1–2 days. Portable meters are used to inform bump applications in the field.

During the Zequanox® application, concentrations are estimated using turbidity measurements, on the first and last day of treatment application. Monitoring of concentrations is of limited utility because the active agent in Zequanox® is degraded within 24 hours after it is added to water (Molloy et al. 2013).

A4. Chemical Method – Rhodamine Dye

There are water tracers that are carcinogenic, genotoxic, or ectoxic[3]. Fluorescent dyes that demonstrate no effect on genotoxicity or ecotoxicity are classified as safe for use in water tracing (Behrens et al. 2001). Rhodamine dyes (aminoxanthenes) are used as hydrologic tracers in surface water systems (Runkel 2015). Rhodamine dyes are synthesized by reacting 3-dialkylaminophenols with phthalic anhydride (Ismael et al. 2013). Rhodamine WT is water soluble, highly detectable, and fluorescent in a part of the spectrum not common to materials commonly found in water, harmless in low

[3] Carcinogenic substances have the potential to cause cancer. Genotoxic substances have the potential to damage genetic information within a cell, causing mutations, which may lead to cancer. Ectoxic substances have the potential to place biological, chemical, or physical stressors on an ecosystem.

concentrations, and reasonably stable in aquatic environments (USGS 1986). Domenico and Schwartz (1990) described rhodamine WT as a conservative, ideal tracer because it does not react with other ions or the geologic medium to any appreciable extent.

Toxicity

Molinari and Rochat (1978) concluded there is relatively low ecotoxicological risk from rhodamine WT. Smart (1984) concluded rhodamine WT is a severe irritant to the eye and moderately irritating to the skin. Nestmann and Kowbel (1979) documented rhodamine WT was mutagenic in the *Salmonella typhum*/mammalian microsome Ames test. Douglas et al. (1983) concluded rhodamine WT does not represent a major genotoxic hazard because it was weak in vitro mutagenicity using very high dye concentrations.

In aquatic ecosystems, larval stages of shellfish and algae are most sensitive to fluorescent dyes (Smart 1984). However, Rhodamine WT does not affect development nor cause mortality in shellfish eggs and larvae after 48 hours exposure, and dye concentrations as high as 1 mg/l can be tolerated for two days without damage to aquatic organisms (Smart 1984). Fairy shrimp, *Thamnocephalus platyurus*, had a toxicity of EC_{50} 24 hours: 1,698 mg/L-1. A total of 48-hour exposures at 24° C of 11,000 Pacific oyster (*Crassostrea gigas*) eggs per liter and 6,000 12-day-old larvae per liter, in sea water with concentrations of rhodamine WT ranging from 1 µg/l to 10 mg/l, resulted in development of the eggs to normal straight-hinge larvae and no abnormalities in the larvae development (Parker 1973). Coho salmon (*Oncorhynchus kisutch*) and Donaldson rainbow trout (*Oncorhynchus* mykiss) held for 17.5 hours in a tankfull of sea water with a dye concentration of 10 mg/l at 22°C showed no mortalities or respiratory problems (Parker 1973). A concentration of 375 mg/l, and extended time of an additional 3.2 hours resulted in no mortalities or abnormalities (Parker 1973). The fish remained healthy in dye-free water when last checked one month after the test. J.S. Worttley and T.C. Atkinson (reported as personal commun., 1975, in Smart and Laidlaw 1977) exposed a number of freshwater and brackish water invertebrates, including water flea (*Daphnia magna*), shrimp (*Gammarus zadllachl*), log louse (*Asellus aquaticus*), may fly (*Cloeon dipterum*), and pea mussel (*Visidium spp.*), to water containing up to 2,000,000 µg/L of rhodamine WT for periods of up to 1 week. No significant differences in mortality between the test and control animals were observed.

Dye concentrations for water tracing purposes are low enough to exert almost no toxic impacts on water fauna, including fairy shrimp, water fleas (*Daphnia magna*), horned planorbis snail (*Planorbis corneus*), and guppy fish (*Poecilla reticulata*) (Rowinski and Chrzanowski 2011).

The lethal dose of rhodamine WT in rats is 25,000 mg kg-1 (Field et al. 1995). The oral lethal dose for humans is estimated to be 25,000 mg kg -1 d-1, which would require an adult to ingest 875,000 mg l-1 of rhodamine WT for a dose of 25,000 mg kg-1 d-1 to be achieved (Field et al. 1995). Field et al. (1995) tested the possible ecotoxicity effects of 12 water tracer dyes, including rhodamine WT, on human health. They concluded rhodamine WT has no skin absorption, has limited oral uptake, has inadequate data on carcinogenicity, and poses little concern for both oncogenic and mutagenic effects as well as little concern for chronic toxicity, including liver and kidney effects.

Ecological toxicity structure-activity relationship (SAR) concerns for rhodamine WT are as follows:
Fish (96 hours LC50) > 320 mg 1-1a
Cladocera (48 hours LC50) 170 mg l-1a
Green algae (96 hours EC50) 20 mg l -1
The high LC_{50} demonstrated for aquatic organisms indicate unlikely serious effects on groundwater fauna from 1-2 mg 1-1 dye concentrations in the water (Field et al. 1995).

When used at recommended dosages, rhodamine WT does not constitute an environmental hazard associated with manmade nitrosamines in the environment (Steinheimer and Johnson 1986). However, it should be noted that Field et al. (1995) emphasized their focus on acute toxicity relative to lethal doses, noting that other toxicological effects, such as developmental toxicity, were not calculated.

Rhodamine WT Application and Best Management Practices (from Field et al. 1995)
The maximum recommended concentration of rhodamine WT is 2 mg 1-1. Individuals using tracers should be experienced or well trained in their use, and tracer concentrations should not exceed 1–2 mg 1-1 persisting for a period in excess of 24 hours in groundwater at the point of groundwater withdrawal, or discharge. Such concentrations are well below toxicity levels and allows for easy recognition by the naked eye.

B1. Mechanical and Other Methods – Intense Ultraviolet-B and Ultraviolet-C Radiation

Ultraviolet (UV) radiation is an effective method for controlling zebra mussels in all life stages, although veligers are more sensitive than adults. Complete veliger mortality can be obtained within four hours of exposure to UV-B radiation, and adult mortalities can also be obtained if constant radiation is applied. UV radiation can be harmful to other aquatic species, and its effectiveness may be decreased by turbidity and high suspended solids loads (Wright et al. 1997). Doses as low as 26.2 mJ/cm^2 and 79.6 mJ/cm^2 can decrease survival of pre-settlement stage larvae by nearly 50% and 80%, respectively, within four days of exposure (Stewart-Malone et al. 2015).

The use of UV light to control larval dreissenids in industrial cooling water systems is well documented (Pucherelli and Claudi 2017). To reduce environmental effects, lower costs, and avoid the need for discharge permitting, UV light irradiation can be used to prevent or limit mussel colonization in industrial facilities, and can be used in water bodies in combination with treatments targeted at adult dreissenids. Site-specific characteristics, such as the ability of the water to transmit UV light, suspended solids, and flow conditions, affect the efficacy of this treatment (Pucherelli and Claudi 2017). This technique requires continuous UV light application for up to 120 hours, and is considered only partially effective in killing larval dreissenids.

The UV light is applied using watercraft and submerged UV light panels, which are raised and lowered in the water column to target larval dreissenids.

B2. Mechanical and Other Methods – Water Level Management

Sudden water-level drawdowns during several winter conditions can temporarily reduce dreissenids in impounded river sections, although this type of control is considered a method to temporarily reduce large numbers of adults (Leuven et al. 2014).[4] Freezing air temperatures are highly lethal to zebra mussels within a matter of hours (Grazio and Montz 2002). Water drawdowns occur when managers decrease the maximum depth in a body of water that has adequate water level control structures (Grazio and Montz 2002). Winter water drawdowns were used to treat Lake Zumbro, Minnesota, and Edinboro Lake, Pennsylvania, in 2000 and 2001. Although complete mortality of invasive mussels was observed in drawdown areas (1.5-meter drawdowns), mussels successfully overwintered in waters deeper than the maximum drawdown depth (Grazio and Montz 2002). A drawdown of Ed Zorinsky Reservoir (Zorinsky Lake), Nebraska, in the winter of 2010 resulted in the eradication of zebra mussels within the lake, and the lake was refilled and re-opened for recreation in 2012 (Hargrave and Jensen 2012). Zebra mussel veligers were detected in May 2016, however, adult mussels have not been observed. Total elimination of dreissenids with this management technique is unlikely, and the potential costs and benefits before attempting fall/winter lake drawdowns for zebra mussel control should be evaluated on a site-by-site basis.

B3. Mechanical and Other Methods – Physical Removal

Information in this section is from Culver et al. (2013).

Removal, either by hand or another mechanical method, can potentially eradicate dreissenid mussels when 1) the structure from which mussels are being removed lends itself to this technique, and 2) when mussels are concentrated within specific areas of a water body or on particular infrastructure within it. Mussel populations can successfully be eradicated using this strategy only if 1) no additional larval or juvenile/adult mussels are entering the water body from infested waters (aqueduct or reservoir) and/or boat traffic, and 2) if enough mussels are removed to reach the point where the population can no longer sustain itself. Achieving the latter can be difficult, due to the mussels' ability to inhabit inaccessible places, limiting removal efforts and increasing chances that individuals will survive. Where there are many inaccessible areas, a combination of tactics will likely be most effective.

Even when eradication is not possible, this strategy offers an effective method for controlling the population when applied appropriately, and when used in combination with other control tactics. Likewise, if the infested area is large (>20,000 square feet),[1] a combination of oxygen deprivation using tarps and manual/mechanical removal may be useful.

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[4] In a study in the Netherlands, the overall density of dreissenids decreased, but six months after the water level was increased, the mussel density slightly increased. Within 18 months, the mussel density had recovered to pre-drawdown levels.

The steps to be taken in manual removal include organizing divers, training divers, determining the distribution of mussels, conducting pre-implementation surveys, preparing the target site, manually removing the mussels using hand-held tools, collecting the mussels, disposing of the mussels, decontaminating persons and gear, and evaluating tactic success. For more information on the specific steps associated with manual and mechanical removal of aquatic invasive species, California Sea Grant has developed an information sheet (2013) for educational purposes (https://caseagrant.ucsd.edu/sites/default/files/3%20Manual%20Mechanical%20Individual_121418.pdf)

B4. Mechanical and Other Methods – Benthic Mats

Benthic mats are large, dark tarps anchored to the bottom of a water body to control invasive mussels by restricting water flow, oxygen and food from the mussels beneath the mats, and blocking light to prevent photosynthesis from producing oxygen beneath the mats.[5]

[5] https://invasivemusselcollaborative.net/management/

5. Summary of Application Rates and Contact Time for Dreissenid Treatment Methods

The *Columbia River Basin Interagency Invasive Species Response Plan: Zebra Mussels and Other Dreissenids* (Heimowitz and Phillips 2008) documents the chemical methods available for dreissenid control, including the ones documented in Table 1. Appendix D in the CRB Plan identifies the treatment, target age, efficiency, contact time/concentration, and comments relative to effects on the environment and other species. Information from that appendix is summarized here for the treatments included in this manual.

Table 1. Summary of application rates and contact time for dreissenid chemical treatments.

Treatment Method	Target Dreissenid Life Stage	Efficiency	Application Rate	Contact Time
Potash (KCl)	Juveniles and adults	Prevent larval settlement (50%) 95–100% mortality	95–115 mg/L	21 days
Potash (KH_2PO_4)	Juveniles and adults	100%	160–640 mg/L	21 days
Potash (KOH)	Juveniles and adults	95–100% mortality	≤ 10 mg/L	21 days
EarthTec QZ™	Juveniles and adults	100%	0.5–2 mg/L, not to exceed 0.1 mg/L total copper (Master Label for Earthtec™, EPA Reg. No. 64962-1)	30 days
Zequanox ®	Juveniles and adults	70–100%	150 mg/L (Zequanox Label – Open Water Systems[6])	1–2 weeks
UV-B Radiation	Juveniles and adults	50–80%	10–100 mJ/cm^2	5 days

[6] https://marronebio.com/download/zequanox-label/

Project Timeline

Rapid response actions are implemented immediately upon detection of dreissenids in a given area. Physical activity onsite occurs until the severity of the invasion is determined through initial treatment and extended treatment area isolation. Additional treatments may be required for 100% effectiveness. Isolation barriers remain in place until monitoring suggests 100% mussel mortality has occurred and water chemistry is acceptable for barrier removal.

It is likely that mussel detection and treatment would occur during warmer months of the year, when both mussel growth and activity is greatest (estimated April through September) and when water temperatures are conductive to the most likely chemical treatments. However, discussions should occur with State and Federal natural resource agencies to adhere to in-water work timing windows (see Best Management Practices). Restoration occurs only after the final treatment in the case of a site requiring riparian access. Plant restoration, if necessary, would likely occur during October–March.

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CHAPTER 4. LISTED SPECIES AND CRITICAL HABITAT IN THE FOUR CRB STATES

The purpose of this chapter is to provide information about the listed species and their critical habitats that are known to occur in Washington, Oregon, Idaho, and Montana (the four states that protect the majority of the Columbia River Basin). The intent is to provide easy access to key life history vulnerabilities associated with those species and critical habitat, with the likely effects of an action on species, and additional species-specific best management practices to inform any proposed action to control (or eradicate) dreissenids.

The information in this chapter was obtained from the U.S. Fish and Wildlife Service Environmental Conservation Online System (ECOS), and was supported by each state's heritage database system. This information is accurate as of the date of publication of this manual, and may change in the future. The material in this chapter does not substitute for the need to communicate with the local U.S. Fish and Wildlife Service Ecological Services Program to confirm the accuracy of this information as well as any new information and updates made since the development of this document.

The four CRB states have federally endangered and threatened listed species that occur in habitats conducive to dreissenids (Table 2). A detailed list of federally listed species by state, including a hyperlink to the ECOS profile, a link to the distribution map, and links to information about critical habitat and critical habitat maps (if appropriate) is provided in Table 3.

Table 2. Number of federally listed threatened and endangered species by CRB state.

	Oregon	Washington	Idaho	Montana
Mammals	3T	4T, 3E	3T, 1E	3T, 1E
Birds	5T, 1E	5T	1T	3T, 1E
Amphibians	1T	1T		
Fish	15T, 2E	12T, 1E	4T, 2E	1T, 2E
Invertebrates	2T, 5E	2E	1T, 3E	2T
Plants	8T,11E	8T, 4E	5T	2T
TOTALS	**34T, 19E**	**30T, 10E**	**14T, 6E**	**11T, 4E**

Table 3. Listed threatened (T), endangered (E), and experimental population (XN) species and critical habitat (CH) in the CRB states. Species highlighted in orange were included in this analysis; species with no highlight were excluded from this analysis because dreissenids would not be found in their habitat, or the species would not be directly or indirectly affected by rapid response actions for dreissenids.

	ECOS Profile	Oregon	Washington	Idaho	Montana
MAMMALS					
Black-footed ferret (*Mustela nigripes*)	Link				E, XN
Canada lynx (*Lynx canadensis*) CH Map (2014), 5-year review (2017)	Link	T	T	T	T
Columbian white-tailed deer (*Odocoileus virginianus leucurus*)[7]	Link	T	T		
Gray wolf (*Canis lupus*)[8]	Link		E[9]		
Grizzly bear (*Ursus arctos horribilis*) CH (1976)	Link		T	T	T
Mazama pocket gopher (*Thomomys azama pugetensis, glacialis, tumuli, and yelmensis*) CH (2014): Olympia CH Map, Roy Prairie CH Map, Tenino CH Map, Yelm CH Map	Link		T		
Northern Idaho ground squirrel (*Urocitellus endemicus*)	Link			T	
Northern long-eared bat (*Myotis septentrionalis*)	Link				T
Pacific Marten (*Martes caurina*)	Link	T			
Columbia Basin Pygmy rabbit (*Brachylagus idahoensis*) (Columbia Basin DPS)	Link		E		
Southern Selkirk Mountains woodland caribou (*Rangifer tarandus caribou*) CH Map, CH (2012)	Link		E	E	
BIRDS					
Least tern (*Sterna antillarum*)	Link	E			
Marbled murrelet (*Brachyramphus marmoratus*)[10] CH Map, CH (2016)	Link	T	T		
Northern spotted owl (*Strix occidentalis caurina*) CH Map, CH (2012)	Link	T	T		
Piping plover (*Charadrius melodus*) CH Map, CH (2002)	Link				T
Red knot (*Calidris canutus rufa*)	Link				T
Streaked horned lark (*Eremophila alpestris strigata*) CH Map, CH (2013)	Link	T	T		

[7] Columbia River population.

[8] Conterminous USA, lower 48 states, except where otherwise designated).

[9] Endangered in the western 2/3 of Washington, west of Hwy 97, State Route 17 and US 395. WDFW has primary management authority to the east of that line. Wolves that inhabit tribal lands east of highways 97, 17, and 395 are managed by those tribal entities.

[10] Washington, Oregon, and California population.

	ECOS Profile	Oregon	Washington	Idaho	Montana
Western snowy plover (*Charadrius alexandrines nivosus*)[11] CH Map, CH[12, 13] (2012)	Link	T	T		
Whooping crane (*Grus americana*)	Link				E, XN
Yellow-billed cuckoo (*Coccyzus americanus*)[14] , Proposed critical habitat - CH Map, CH (2014)	Link	T	T	T	T
AMPHIBIANS					
Oregon spotted frog (*Rana pretiosa*) CH Map, CH (2016)	Link	T	T		
FISH					
Bull trout (*Salvelinus confluentus*)[15] CH Map, CH (2010)	Link	T, XN	T	T	T
Chinook salmon (*Oncorhynchus tshawytscha*) CH (2000) Upper Columbia spring-run ESU Snake River spring/summer run ESU Snake River fall-run ESU Puget Sound ESU Lower Columbia River ESU Upper Willamette River ESU	Link	 E T T T T	 E T T T T 	 T T 	
Chum salmon (*Oncorhynchus keta*) CH (2000) Hood Canal summer-run ESU Columbia River ESU	Link	 T	 T 		
Coho Salmon (*Oncorhynchus kisutch*) CH (2000) Oregon Coast ESU Lower Columbia River ESU Southern Oregon/Northern California Coast Coho Salmon	Link	 T T T	 T 		
Sockeye salmon (*Oncorhynchus nerka*) Snake River ESU [CH (1993)] Ozette Lake ESU [CH (2000)]	Link	 E 	 T	 E 	
Steelhead (*Oncorhynchus mykiss*) CH (2005) Upper Columbia River DPS Upper Willamette River DPS	Link	 T T	 T 		

[11] Pacific coast population.

[12] Critical habitat was designated in 2005 for 32 areas along the coasts of California, Oregon, and Washington. A recovery plan was finalized in September 2007. On December 17, 2010, the USFWS, along with other federal agencies and the State of Oregon, signed off on a statewide Habitat Conservation Plan. On June 19, 2012, a final rule of critical habitat was published for the coasts of California, Oregon, and Washington.

[13] Ibid.

[14] Western population.

[15] Conterminous USA, lower 48 states.

	ECOS Profile	Oregon	Washington	Idaho	Montana
Middle Columbia River DPS		T			
Lower Columbia River DPS		T	T		
Snake River Basin DPS		T	T	T	
Puget Sound DPS			T		
Kootenai River white sturgeon (*Acipenser transmontanus*) CH Map, CH (2008)	Link			E	E
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)	Link	T			
Pallid sturgeon (*Scaphirhynchus albus*)	Link				E
INVERTEBRATES					
Banbury Springs limpet (*Lanx* spp.)	Link			E	
Bliss Rapids snail (*Taylorconcha serpenticola*)	Link			T	
Bruneau hot springsnail (*Pyrgulopsis bruneauensis*)	Link			E	
Snake River physa snail (*Physa natricina*)	Link	E		E	
Fender's blue butterfly (*Icaricia icarioides fender)* CH Map, CH (2006)	Link	E			
Franklin's Bumble Bee (*Bombus franklin*)	Link	E			
Island Marble Butterfly (*Euchloe ausonides insulanus*)	Link		E		
Meltwater Lednian Stonefly (*Lednia tumana*)	Link				T
Taylor's checkerspot butterfly (*Euphydryas editha taylori*) CH Map, CH (2013)	Link	E	E		
Oregon silverspot butterfly (*Zpeyeria zerene hippolyta*) CH Map, CH (1980)	Link	T, XN			
Vernal pool fairy shrimp (*Branchinecta lynchi*) CH Map, CH (2011)	Link	T			
Vernal pool tadpole shrimp (*Lepidurus packardi*)	Link	E			
Western Glacier Stonefly (*Zapada glacier*) (Glacier NP, Grand Teton NP, Absaroka/Beartooth Wilderness)	Link				T
PLANTS					
Applegate's milk-vetch (*Astragalus applegatei*)	Link	E			
Bradshaw's desert parsley (*Lomatium bradshawii*)	Link	E	E		
Cook's lomatium (*Lomatium cookii*) CH Map, CH (2010)	Link	E			
Gentner's fritillary (*Fritillaria gentneri*)	Link	E			
Golden paintbrush (*Castilleja levisecta*)	Link	T	T		
Greene's tuctoria (*Tuctoria greenei*)	Link	E			
Howell's spectacular thelypody (*Thelypodium howellii* spp. *spectabilis*)	Link	T			
Kincaid's lupine (*Lupinus sulphureus spp. kincaidii*) CH Map, CH (2006)	Link	T	T		
Large-flowered woolly meadowfoam (*Limnanthes pumila spp. grandiflora*) CH Map, CH (2010)	Link	E			
MacFarlane's four o'clock (*Mirabilis macfarlaneil*)	Link	T		T	
Malheur wire-lettuce (*Stephanomeria malheurensis*) CH Map, CH (1982)	Link	E			
Marsh sandwort (*Arenaria paludicola*)	Link		E		

	ECOS Profile	Oregon	Washington	Idaho	Montana
McDonald's rockcress (*Arabis macdonaldiana*)	Link	E			
Nelson's checker-mallow (*Sidalcea nelsoniana*)	Link	T	T		
Rough popcornflower (*Plagiobothrys hirtus*)	Link	E			
Showy stickweed (*Hackelia venusta*)	Link		E		
Slender Orcutt grass (*Orcuttia tenuis*) CH Map, CH (2006)	Link	T			
Slickspot peppergrass (*Lepidium papilliferum*) CH Map, CH (2014)	Link			T	
Spalding's catchfly (*Silene spaldingii*)	Link	T	T	T	T
Umtanum desert buckwheat (*Eriogonum codium*) CH Map, CH (2013)	Link		T		
Ute Ladies'-tresses (*Spiranthes diluvialis*)	Link		T	T	T
Water howellia (*Howellia aquatilis*)	Link	T	T	T	
Wenatchee Mountains checker-mallow (*Sidalcea oregana var. calva*) CH Map, CH (2001)	Link		E		
Western lily (*Lilium occidentale*)	Link	E			
White bluffs bladderpod (*Physaria douglasii spp. tuplashensis*) CH Map, CH (2013)	Link		T		
Willamette daisy (*Erigeron decumbens var. decumbens*) CH Map, CH (2006)	Link	E			
PROPOSED SPECIES					
North American wolverine (*Gulo gulo luscus*)					P

Endangered (E)—Any species that is in danger of extinction throughout all or a significant portion of its range.

Threatened (T)—Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed (P)—Any species of that is proposed in the Federal Register to be listed under section 4 of the Act.

Non-essential experimental population (XN)—A population of a listed species reintroduced into a specific area that receives more flexible management under the Act.

Critical Habitat/Proposed Critical Habitat (CH, PCH)—The specific areas (i) within the geographic area occupied by a species, at the time it is listed, on which are found those physical or biological features (I) essential to conserve the species and (II) that may require special management considerations or protection; and (ii) specific areas outside the geographic area occupied by the species at the time it is listed upon determination that such areas are essential to conserve the species.

Species Excluded from Further Analysis

The list of species in Table 3 was reviewed to determine if any could be eliminated from consideration because of known species distribution or its critical habitat (Appendix D). Because the habitat of the listed or proposed species is habitat in which dreissenids would not be found, or which would potentially be directly or indirectly affected by rapid response actions for dreissenids, these species are excluded from further analysis. However, it should be noted that if site preparation or staging areas are established in terrestrial habitats including shoreline or riparian habitats, some species could be impacted and may warrant consideration when planning staging areas for rapid response. The following species were excluded from further analysis:

MAMMALS

Black-footed ferret (*Mustela nigripes*)
Canada lynx (*Lynx canadensis*)
Gray wolf (*Canis lupus*)[16]
Grizzly bear (*Ursus arctos horribilis*)
Mazama pocket gopher (*Thomomys azama pugetensis, glacialis, tumul*i, and *yelmensis*)
Northern Idaho ground squirrel (*Urocitellus endemicus*)
Northern long-eared bat (*Myotis septentrionalis*)
Columbia Basin Pygmy rabbit (*Brachylagus idahoensis*) (Columbia Basin DPS)
Southern Selkirk Mountains woodland caribou (*Rangifer tarandus caribou*)
North American wolverine (*Gulo gulo luscus*)

BIRDS

Marbled murrelet (*Brachyramphus marmoratus*)[17]
Northern spotted owl (*Strix occidentalis caurina*)
Short-tailed albatross (*Phoebastria albatrus*)
Whooping crane (*Grus americana*)
Streaked horned lark (*Eremophila alpestris strigata*)

INVERTEBRATES

Fender's blue butterfly (*Icaricia icarioides fender*)
Taylor's checkerspot butterfly (*Euphydryas editha taylori*)
Oregon silverspot butterfly (*Zpeyeria zerene hippolyta*)
Vernal pool fairy shrimp (*Branchinecta lynchi*)
Vernal pool tadpole shrimp (*Lepidurus packardi*)

PLANTS

Applegate's milk-vetch (*Astragalus applegatei*)
Cook's lomatium (*Lomatium cookii*)
Gentner's fritillary (*Fritillaria gentneri*)

[16] Conterminous USA, lower 48 states, except where otherwise designated)
[17] Washington, Oregon, and California population

Golden paintbrush (*Castilleja levisecta*)
Greene's tuctoria (*Tuctoria greenei*)
Howell's spectacular thelypody (*Thelypodium howellii* spp. *spectabilis*)
Kincaid's lupine (*Lupinus sulphureus* spp. *kincaidii*)
Large-flowered woolly meadowfoam (*Limnanthes pumila spp. grandiflora*)
MacFarlane's four o'clock (*Mirabilis macfarlaneil*)
Malheur wire-lettuce (*Stephanomeria malheurensis*)
Marsh sandwort (*Arenaria paludicola*)
McDonald's rockcress (*Arabis macdonaldiana*)
Rough popcornflower (*Plagiobothrys hirtus*)
Showy stickweed (*Hackelia venusta*)
Slender Orcutt grass (*Orcuttia tenuis*)
Slickspot peppergrass (*Lepidium papilliferum*)
Spalding's catchfly (*Silene spaldingii*)
Umtanum desert buckwheat (*Eriogonum codium*)
Wenatchee Mountains checker-mallow (*Sidalcea oregana var. calva*)
Western lily (*Lilium occidentale*)
White bluffs bladderpod (*Physaria douglasii* spp. *tuplashensis*)

Potential Effects of Chemical Methods on Listed Species and Critical Habitats Associated with CRB Water Bodies

Table 4 (below) compiles information for each listed species and associated designated critical habitat(s) known to occur in the CRB. The table briefly summarizes key species life history attributes and vulnerabilities, the potential effects of an action on key life stages and critical habitats, and species-specific BMPs that can reduce detrimental effects. If no documented vulnerabilities are listed, it is unknown what, if any, impacts may occur to any life stages and critical habitats. Appendix E of this document includes important information about the threatened and endangered species in the CRB whose life history needs are met by CRB water bodies, and their associated critical habitats where designated.

Table 4. Potential estimated effects of chemical treatments on important life history needs and critical habitat (https://ecos.fws.gov) for listed species whose life history needs are partially, or entirely, met by CRB water bodies. This table also includes species-specific best management practices to avoid or lessen impacts from chemical treatment activities. The chemical methods considered below do not reflect the entirety of chemical method options, but are limited in scope to include the chemical methods most likely to be used in an open-water dreissenid rapid response scenario within the CRB.

Ungulates

Toxicity of potash to ungulates: There is no published information on the effects of potash on any life stage of ungulates, or this particular ungulate species.

Toxicity of EarthTec QZ™ to ungulates: There is no published information on the effects of EarthTec QZ™ on ungulates, however, sheep can be particularly sensitive to products containing copper sulfate, possible due to inefficient copper excretion (Oruc et al. 2009). The toxic doses of copper sulfate for cattle are 200–880 mg/kg. Sheep are ten times more sensitive; they have a toxic dose of 20–110 mg/kg of copper sulfate (Thompson 2007).

Toxicity of Zequanox® to ungulates: There is no published information on the effects of Zequanox® on any life stage of ungulates, or this particular ungulate species.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Columbian white-tailed deer (*Odocoileus virginianus leucurus*)	Riparian access development could fragment habitat. Restoration activities could introduce invasive species and cause fragmentation of habitats.	Columbian white-tailed deer are not found in CRB water bodies; they are found in riparian areas associated with the Lower Columbia River. Thus, no life stage of this species would be present in a water body where application of any of the proposed chemical treatments would occur. It is unlikely any potash treatment would occur within the Columbia River system unless the area was capable of being cordoned off prior to treatment (this would avoid/lessen any indirect impacts to ungulates).	No critical habitat designated.	Any activities in riparian areas within the geographic scope of this species should be minimized to avoid fragmenting riparian habitat, or introducing invasive species. Use existing access roads and entries. Avoid introducing invasive species (see BMPs section of manual). Avoid fragmentation of habitat via restoration activities.

Birds

Toxicity of potash to birds: There is no published information on the potential negative effects of potash on least terns, piping plovers, red knots, western snowy plovers, yellow-billed cuckoos, or other avian species. Potassium chloride (KCl) is used as a supplement (0.2 and 0.4% KCl) in diet or drinking water of poultry to reduce the effects of high environmental temperature by maintaining the water/electrolyte balance (Dai et al. 2009).

Toxicity of EarthTec QZ™ to birds: Limited information is available on the toxicity of copper sulfate to wild birds (Eisler 1998). A flock of captive 3-week-old Canada geese (*Branta canadensis*) used a pond treated with copper sulfate; Ten of the geese died nine hours after ingestion of roughly 600 mg/kg copper sulfate (Henderson and Winterfield 1995). Although copper is known to be moderately toxic to birds (Boone et al. 2012), copper sulfate poses less of a threat to birds than to other animals - The lowest lethal dose (LDLo) for this material in pigeons and ducks is 1,000 mg/kg and 600 mg/kg, respectively (TOXNET 1975-1986). The oral LD_{50} for Bordeaux mixture in young mallards is 2,000 mg/kg (Tucker and Crabtree 1970). The toxicity of copper to aquatic life depends on its bioavailability, which is strongly dependent on pH, the presence of dissolved organic carbon (DOC), and water chemistry, such as the presence of calcium ions (http://npic.orst.edu/factsheets/archive/cuso4tech.html).

Toxicity of Zequanox® to birds: Zequanox has a "practically non-toxic" designation for birds. No mortality was observed after feeding mallards a 2,000 mg/kg dose of live P. fluorescens strain CL145A (Bureau of Reclamation 2011). The no observable effect limit (NOEL) was set at >2,000 mg/kg and classified Zequanox® as "practically non-toxic to mallard."

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Least tern (*Sterna antillarum*)	Anthropogenic disturbance is a key factor affecting least terns at breeding colonies and foraging locations (Burton and Terrill 2012). Terns mid-May through August on river sandbars. Increased turbidity may negatively affect least tern foraging success (USFWS 1990).	Potash—Interior least terns forage on small fish. Numerous studies have demonstrated acute toxicity to fish from muriate of potash, however, mortality occurred at dosages that far exceed dosages that would be used to control dreissenids (e.g., bluegill, *Lepomis macrochirus*), 96 hours @ LC_{50} @ 2,010 mg/L (Mosaic 2004). It is unlikely that an application of muriate of potash would affect the food of interior least terns. Anthropogenic disturbance associated with a potash application could affect least tern nesting and foraging success. EarthTec QZ™—Interior least terns forage on small fish. EarthTec QZ™ is toxic to fish and other aquatic life (Master Label for EarthTec™, EPA Reg. No. 64962-1). Waters treated with this product may be hazardous to other aquatic organisms (Master Label for EarthTec QZ™, EPA Reg. No. 64962-1). It is estimated that EarthTec QZ™ could affect the foraging success of least terns if the product were applied in water bodies in which least terns feed. Zequanox®—Zequanox® would likely not affect least terns.	No critical habitat designated.	Survey action site in advance to determine presence. Avoid disturbance activities during nesting season, if possible. Minimize turbidity in the water column during control action, especially in sites near least tern nests, and in locations where least terns forage.
Piping plover (*Charadrius melodus*)	Disturbance to nesting plovers. Introduction of beachgrass. Invertebrate prey mortality.	Potash—Piping plovers consume invertebrates. Potash has the potential to affect the prey base of shorebirds in small, shallow water areas where potash is applied. Examples of ecotoxicity of muriate of potash on invertebrates is 48 hours @ EC_{50} @ 337–825 mg/L (*Daphnia magna*), and 96 hours @ LC_{50} @ 940 mg (*Physa heterostropha*) (Mosaic 2004). However, given the mobility of the bird, it is not expected that an action in a shallow portion of a CRB water body would affect the ability of the bird to feed in and around untreated areas of that same water body, and adjacent water bodies. Any effects on prey species (invertebrates) are expected to be minimal long-term because benthic communities typically recolonize quickly after disturbance (McCauley et al. 1977, Albright and Borithilette 1982, Romberg et al. 1995, Wilson and Romberg 1996).	Critical habitat in the Columbia River Basin is in Montana in Unit MT-2 (The Missouri River flowing through the Assiniboine and Sioux Tribes of Fort Peck reservation lands, state land, and private land) and Unit MT-3 (Fort Peck Reservoir – 77,370 acres within the Charles M. Russell National Wildlife Refuge). There is no other critical habitat for piping plovers in the CRB. The Missouri River and Fort Peck Reservoir are susceptible to the introduction and establishment of	Survey action site in advance to determine presence from early May-late August. Avoid disturbance activities during nesting season, if possible. Avoid activities that result in introduction of non-native vegetation. Assess impact of action on invertebrate food availability.

		EarthTec QZ™—Piping plovers consume invertebrates. EarthTec QZ™ has the potential to affect the prey base of shorebirds in small, shallow water areas where it is applied. Zequanox®—Piping plovers consume invertebrates. Zequanox® has the potential to affect the prey base of shorebirds in small, shallow water areas where it is applied.	dreissenids (Creative Resource Strategies, LLC 2017), and critical habitat for piping plovers can be affected by reductions in their prey base caused by all three potential chemicals—potash, EarthTec QZ™, and Zequanox®.	
Red knot (*Calidris canutus rufa*)	Disturbance to migratory birds. Introduction of invasive species. Invertebrate prey mortality. Red knots are rare from May through October in Montana wetlands. At other times of the year, they are found in marine coastal environments in North America including Washington and Oregon.	Potash—Potash has the potential to affect the prey base of shorebirds in small, shallow water areas where potash is applied. EarthTec QZ™—EarthTec QZ™ has the potential to affect the prey base of shorebirds in small, shallow water areas where it is applied. Zequanox®—Red knots consume invertebrates. Zequanox® has the potential to affect the prey base of shorebirds in small, shallow water areas where it is applied. However, given the mobility of the bird, it is not expected that an action in a shallow portion of a CRB water body, using any potash, EarthTec QZ™, or Zequanox®, would affect the ability of the bird to feed in and around untreated areas of that same, and adjacent water bodies. Red knots are migratory; they are rarely observed in Montana wetlands.	No critical habitat designated.	Survey for presence May–October. Assess impact of action on invertebrate food availability.
Yellow-billed cuckoo (*Coccyzus americanus*)	Degradation of riparian habitat.	The primary diet of yellow-billed cuckoos is caterpillars, which would not be affected by an action involving potash, EarthTec QZ™, or Zequanox®. It is unlikely that chemical treatments would occur in rivers and streams and in broad floodplains. If a treatment were to occur in a large river system, it would likely occur in a small area that could be cordoned off for treatment. Construction equipment and treatment crews could disturb nests during breeding season, if emergency action occurs in breeding habitat during breeding/fledging seasons.	Critical habitat includes riparian habitat along low-gradient (surface slope less than 3 percent) rivers and streams, and in open riverine valleys that provide wide floodplain conditions (greater than 325 ft (100 m). Rivers and streams of lower gradient and more open valleys with a broad floodplain are essential physical or biological features for this species (Federal Register 79(158)). Riparian habitats would likely not be affected by any chemical treatment, particularly if BMPs are followed that avoid disturbance to these areas.	Avoid activities that result in loss or degradation of riparian habitat. Avoid introducing invasive species (see BMPs section of manual). Avoid disturbance activities during breeding and nesting season, if possible.

Amphibians

Toxicity of potash to amphibians: Pollution is the 2nd major threat to amphibian populations (IUCN 2008). Agricultural chemicals are a potential cause of amphibian declines (Relyea and Mills 2001), and malformed amphibians have been reported to occur in agricultural areas where pesticides and fertilizers are applied extensively (Ouellet et al. 1997, Taylor et al. 2005). Agricultural pesticides can affect amphibian growth, development, reproduction, and behavior (Carey and Bryant 1995). There is no published information on the potential negative effects of potash on amphibian populations, however, introduction of potash into a water body would alter the water chemistry, and in shallow portions sectioned off with barriers, would raise the water temperature, albeit temporarily (note: Potash itself would not alter the water temperature, but barricading a portion of the water body could increase the water temperature in the barricaded portion because of lack of mixing with deeper, colder water in the water body).

Toxicity of EarthTec QZ™ to amphibians: Larval ambystomatids were highly sensitive to Cu with 50% mortality at 18.7, 35.3, and 47.9 ppb for three species. Cu also caused reduced growth rates in *A. talpoideium* (Savannah River Ecological Laboratory 2016).

Concentrations of copper sulfate were found to be toxic to amphibians at or below those recommended for plant control – 0.31 mg/L was lethal to northern leopard frog tadpoles (Landé and Guttman 1973); Fort and Stover (1997) documented susceptibility to copper with increased age in African clawed frogs (*Xenopus* laevis) - LC_{50} values of 1.32 mg/L for embryos, and 0.20 mg/L for 12-16 day-old tadpoles. Growth of African clawed frogs was reduced at concentrations as low as 0.048 mg/L, and completely inhibited at 1.3 mg/L in embryos (Fort and Stover 1997). Distal hind limb aplasia, which is a sensitive indicator of copper toxicosis, occurred in 8.5% of larvae exposed to 0.05 mg/L copper (Fort and Stover 1997).

Toxicity of Zequanox® to amphibians: There is no published information on the toxicity of Zequanox® to amphibians at any key life stage.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Oregon spotted frog (*Rana pretiosa*)	Disturbance, including ground disturbance (e.g., road grading) during breeding and larval development. Alterations to existing habitats, including loss of connectivity, disturbance to riparian vegetation, sedimentation, vegetation clearing in and adjacent to breeding ponds and streams, fluctuating water levels, and temperature changes. The Oregon Spotted Frog is a wetland/marsh specialist that prefers floodplain wetlands, side channels, and sloughs associated with permanent waterbodies. Habitats have good solar exposure with low to moderate amounts of cover by emergent vegetation (25–50%; Watson et al. 2003), and silty, rather than gravelly substrate. Habitat requirements are divided into three life-seasons: breeding (oviposition) and early larval habitat, active summer habitat, and overwintering habitat. Dispersal/connective habitat is required to link the three main habitat types during late spring and fall: Breeding and early larval habitat: · areas that experience shallow inundation (3° C in March/April (Environment Canada 2014); and · contain indigenous aquatic vegetation (e.g., rushes, sedges, grasses, pondweeds, buttercups) or moderate amounts of Reed Canarygrass (*Phalaris* spp.). Active Season (summer) habitat: · wetlands that are >40 cm deep (Watson et al. 2003, Environment Canada 2014); and · contain moderately dense, structurally diverse submergent, emergent, and floating vegetation (Licht 1969, 1986a,b; McAllister and Leonard 1997, Popescu 2012). Over-winter habitat: · springs, seeps, or low-flow channels that do not freeze in the winter and have more stable levels of	Oregon spotted frog habitat is closely correlated with the type of habitat a dreissenid action would occur in (i.e., shallow water along a wetland edge). Potash—It is estimated that the addition of potash to a water body occupied by Oregon spotted frog could potentially affect the growth, development, reproduction, and behavior of individuals. EarthTec QZ™—It is estimated that the application of EarthTec QZ™ to a water body occupied by Oregon spotted frog would be toxic to various life stages of this species. EarthTec QZ™ could affect breeding, larval, and adult stages of Oregon spotted frogs. Zequanox® - There is no published information on the toxicity of Zequanox® to amphibians during key life stages.	65,038 acres and 20.3 river miles in Whatcom, Skagit, Thurston, Skamania, and Klickitat counties in Washington, and Wasco, Deschutes, Klamath, Lane, and Jackson counties in Oregon. See Vulnerabilities in this section for a description of breeding and early larval habitat, active season, over-winter habitat, and dispersal-connective habitat. Potash—Barricades used during a potash application could result in elevated water temperatures in areas barricaded for treatment, which could affect breeding and early larval habitat, active season habitat, and over-winter habitat. EarthTec QZ™—EarthTec QZ™ could affect submerged, emergent, and floating vegetation important to breeding and	Reduce and minimize the amount of disturbance or activities occurring in and around critical habitat. Avoid construction activities during the frog's active season (November to mid-August). Minimize the footprint of the action. Reduce ground disturbance to facilitate revegetation. Restore disturbed sites using a combination of strategies, such as natural regeneration, seeding with a native grass mix and short-lived cover crop, planting native vegetation, and using weed-free materials to reduce the need for weed management, such as hand-pulling weeds. Salvage species prior to action.

	dissolved oxygen than other areas (Pearl and Hayes 2004); or · in deeper water, beaver dams or areas of dense submerged vegetation (Hayes et al. 2001, Watson et al. 2003, Chelgren et al. 2006, Govindarajulu 2008, Pearson 2010, COSEWIC 2011). Dispersal/connective habitat: · any aquatic habitat that connects the three main habitat types during late spring and fall.		early larval habitats, active season habitats, and over-winter habitats. Zequanox® - There is no published information on the toxicity of Zequanox® to critical habitat for amphibians.	

Fish

Generally, younger fish in juvenile and fry stages are considered for more susceptible to most aquatic toxicants than adult fish (Weber 1993); in addition, there are species-specific differences in sensitivities to toxicants (Lazorchak 2007).

Toxicity of potash (KCl) to fish: The efficacy of potassium chloride treatment is inhibited in the presence of elevated dissolved solids, in particular the concentration of sodium (Moffitt et al. 2016, Stockton-Fiti and Moffitt 2017).

Based upon the acute toxicity testing of KCl using both juvenile Brook Trout (*Salvelinus fontinalis*) and juvenile Chinook Salmon (*Oncorhynchus tshawytscha*), acute lethal effects of potash on these salmonids at these life stages are not expected at concentrations commonly used to control invasive dreissenid mussels (100 mg/L) (Densmore et al. 2018). Exposure concentrations of as much as 800 mg/L KCl, eight times greater than the dose of KCl used as a molluscicide, were applied to these fish species in static systems for 96 hours; there was no evidence of mortality attributable to KCl exposure among either species (Densmore et al. 2018). Behavioral or gross morphological effects on these fish from KCl-based molluscicide applications at levels up to 800 mg/L were also not indicated (Densmore et al. 2018). Hillard et al. (2019) exposed Fall Chinook Salmon eggs within 24 hours of fertilization to 750 mg/L potassium chloride for one hour followed by 20 mg/L formalin for three hours to disinfect the eggs and kill any zebra mussel larvae. There was no effect on salmon egg viability.

Several listed fish species forage on invertebrates, particularly during juvenile life stages. The ecotoxicity of muriate of potash on invertebrates is 48 hours @ EC_{50} @ 337–825 mg/L (*Daphnia magna*), and 96 hours @ LC_{50} @ 940 mg *Physa heterostropha* (Mosaic 2004). Fathead minnow (*Pimephales* ***promelas***) trials - LC_{50} @ 880 mg/L KCl for 96 hours (Mount et al. 2007). Daphniid exposure trials – LC_{50} @ 196 mg/L for 48 hours; significant mortality of sensitive aquatic invertebrates is not expected at the KCl concentrations used to control dreissenids (Densmore et al. 2018). Crayfish (*Cambarus* spp.) exposure trials resulted in mortality and temporary paralysis at concentrations of 800 and 1,600 mg/L for at least 24 hours (Densmore et al. 2018). Other ecotoxicology studies: Bluegill sunfish (*Lepomis macrochirus*) – LC_{50} – 2010 mg/L (Mosaic 2014). Substantial differences exist in the accuracy of models to predict organism survival to introduced toxins, such as potassium, calcium, and magnesium (Pillard et al. 2000). Brook Trout are less sensitive to potassium chloride than Rainbow Trout (*Oncorhynchus mykiss*), and Fathead Minnows are two to three times more sensitive to KCl than Brook Trout or Rainbow Trout (Lazorchak 2007).

Potash solutions in water can have varied concentrations throughout the water column because of the density of potash relative to the density of water in cold-water conditions (Lund et al. 2017). Hotspots, or accumulations of potash in higher concentrations, can accumulate at deeper depths (Lund et al. 2017).

Toxicity of EarthTec QZ™ to fish: Copper is one of the most toxic heavy metals to fish (Nowak and Duda 1996), and is broadly toxic to the salmon olfactory system (Baldwin et al. 2003). According to the label for this product, "this pesticide is toxic to fish and aquatic invertebrates. Waters treated with this product may be hazardous to aquatic organisms. Treatment of aquatic weeds and algae can result in oxygen loss from decomposition of dead algae and weeds. This oxygen loss can cause fish and invertebrate suffocation. Do not use this product in waters with cyprinid and salmonid fish." EarthTec is produced in the cupric ion form, the most toxic form of copper (Ferguson and Sandoval 2020).

Copper impairs gill gas exchange, upsets salt balance, negatively affects reproductive output and the immune system, affects glucose metabolism and the cellular structure of fish, and negatively affects liver and kidney function (Ferguson and Sandoval 2020).

The proposed low and high application rates are well above the range of salmonids and their prey LC_{50} (96 hour), and the LC_{50} (96 hour) for pond snails falls at the lowest proposed application rate (TOXNET 1975–1986). For salmonids, the upper recommended limit is < 0.03 mg/l in hard water (>100 mg/l $CaCO_3$) whereas in soft water, it is <0.0006 mg/l (Ferguson and Sandoval 2020).

Direct bioassay of Rainbow Trout (assumed adult) subject to EarthTec QZ™ resulted in a NOEC of 0.240 mg/L copper, and LC_{50} of 0.294 mg/L copper (https://www.icais.org/pdf/2017presentations/Monday/PM/1B/230_Hammond.pdf), which are both above the proposed high copper application of 0.1 mg/L. Fish kills have been reported after copper sulfate applications for algae control in ponds and lakes, however, oxygen depletion and dead organisms clogging the gills have been cited as the cause of fish deaths, resulting from massive and sudden plant death and decomposition in the water body (Bartsch 1954, Hanson and Stefan 1984, Masser et al. 2006). Copper can either temporarily, or permanently, disrupt olfaction in fish (Solomon 2009, Ferguson and Sandoval 2020), possibly interfering with their ability to locate food, predators, and spawning streams (Chapman 1978, Jaensson and Olsen 2010).

It is unknown if there are any bioaccumulation effects of EarthTec QZ™; one recent study suggested the fate of copper in the environment is not fully known and should be considered (Lake-Thompson and Hofmann 2019).

Fish eggs are more resistant than young fish fry to the toxic effects of copper sulfate (Gangstad 1986).

Juvenile Rainbow Trout were exposed to either hard water, or soft water, spiked with copper for 30 days (Taylor et al. 2000). Fish in the hard-water, high dose (60 µg/L) treatment groups showed an increased sensitivity to copper.

The mean 96-hour LC_{50} (with 95% confidence limits) for copper exposure in alevin, swim-up, parr and smolt Steelhead (*Salmo gairdneri*) are 28 (27–30), 17 (15–19), 18 (15–22), and 29 (>20) µg/L of copper respectively (Chen and Lin 2001). The mean 96-hour LC_{50} for copper exposure in alevin, swim-up, parr and smolt Chinook salmon are 26 (24–33), 19 (18–21), 38 (35–44), and 26 (23–35) µg/L of copper respectively. The experiments were done by adding copper as $CuCl_2$.

The 48-hour LC_{50} for Fathead Minnow is 19.2 $\pm$ 3.1 (mean $\pm$ SD) mcg/L Cu (Mastin and Rodgers 2000).

Toxicity of Zequanox® to fish: Zequanox requires containment within a barrier system when applied to surface waters for the management of dreissenid mussels; without containment, effective treatment concentrations cannot be maintained (Luoma et al. 2019).

No mortality from Zequanox® has been observed in Fathead Minnows, young-of-the-year Brown Trout (*Salmo trutta*), and juvenile Bluegill Sunfish (Bureau of Reclamation 2011). Fish trials conducted with dead bacteria have indicated that applications of killed cells were harmless to fish, yet were still highly lethal to Dreissena spp. mussels (Bureau of Reclamation 2011). Temporary, but substantial, reductions in dissolved oxygen were observed in treatment locations during the morning following Zequanox® treatment in two trials, likely due to the presence of the barriers that prevented well-oxygenated water from circulating into treatment zones from adjacent areas in the lake (Whitledge et al. 2015). During one of the few open water treatments using Zequanox®, dissolved oxygen levels declined as a result of using containment barriers (DO values of 0.1ppm were reached within 24 hours, and these hypoxic conditions continued for 7 days) (Lund et al. 2017).

A 2018 study evaluated the effects of Zequanox® on juvenile Lake Sturgeon (*Acipenser fulvescens*) and Lake Trout (*Salvelinus namaycush*) (Luoma et al. 2018). No acute mortality was observed in either species; however, significant latent mortality was observed in Lake Trout that were exposed to the highest dose of Zequanox®. Statistically significant, but biologically minimal, differences were observed in the weight (range 20.17 to 21.49 g) of surviving Lake Sturgeon at the termination of the 33 d post-exposure observation period. Survival was not impacted in the Lake Trout in the 100 mg/L treated group for the first 3 weeks; however, impacts were readily detectable 4 weeks (28 d) after Zequanox® exposure. Poor food consumption, emaciation, and abdominal hemorrhaging were observed about 3 to 4 weeks after exposure in some of the Lake Trout exposed to 100 mg/L A.I. of Zequanox®.

Cold water, cool water, and warm water fish were tested for exposure-related effects to *Pseudomonas fluorescens*, Strain CL145A. (Luoma et al. 2015). Analyses of test animal condition factors and survival revealed that a 24-hour continuous dose of SDP affected all species. Calculated concentrations of SDP that would be lethal to 50 percent of the test animals (LC_{50}) for the cold water species were 19.2 and 104.6 mg/L for Rainbow Trout and Brook Trout, respectively. The LC_{50} for the cool water species were 185.4, 176.9 and 8.9 mg/L for Yellow Perch (*Perca flavescens*), Walleye (*Sander vitreus*), and Lake Sturgeon, respectively. The LC_{50} for the warm water species were 173.6, 139.4, and 63.1 for the Largemouth Bass (*Micropterus salmoides*), Smallmouth Bass (*Micropterus dolomieu*), and Channel Catfish (*Ictalurus punctatus*), respectively.

Barbour et al. (2021) assessed avoidance behavior of fish to Zequanox® exposure, and determined that Brook Trout, Lake Trout, and Bluegill Sunfish avoided Zequanox®-treated water, and Lake Sturgeon and Fathead Minnow were attracted to Zequanox®-treated water. In the Barbour et al. (2021) study, one species of fish, Yellow Perch, was indifferent to Zequanox® exposure, likely because of their ability to function in both clear and turbid water and their tolerance to Zequanox® compared to other fishes. Sensitive fish species may avoid Zequanox® treatments, which can reduce overall risk to a species (Barbour et al. 2021).

Crain et al. (2008) assessed the effects of multiple stressors on aquatic environments and concluded effects were additive, or synergistic. Therefore, any of the treatments described above are assumed to adversely affect aquatic species to some degree and for some duration.

Zequanox® greatly increases turbidity (Barbour et al. 2021). Turbidity was 13x higher than in control plots, but there was no difference between treatment and control plots after 8 hours (Luoma et al. 2019). Fish behavioral response to turbidity varies with species and life stage, but has been associated with mortality (Kemp et al. 2011). Although salmonids have the ability to cope with some levels of turbidity during certain life stages (Gregory and Northcote 1993), salmonid populations not normally exposed to high levels of natural turbidity, or anthropogenic sources, may be negatively affected by low levels, e.g., 18-70 NTU (Gregory 1992). Effects of turbidity on salmonids include physiological effects (e.g., gill trauma, osmoregulation challenges, blood chemistry changes, and effects on reproduction and growth), behavioral effects (e.g., avoidance, territoriality, foraging and predation, and homing and migration), and habitat effects (e.g., reduction in spawning habitat, effect on hyporheic upwelling, reduction in BI habitat, and damage to redds (Bash et al. 2001).

Spawning, foraging, and seasonal migrations should be considered when planning Zequanox® treatments (Barbour et al. 2021); altering treatment timing and limiting the treatment area to provide access to refugia may be helpful mitigation steps.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Bull trout (*Salvelinus confluentus*)	Threats to any of the nine Primary Constituent Elements[18]: 1. Springs, seeps, groundwater sources, and subsurface water connectivity 2. Migration habitats 3. Food base 4. Complex aquatic environments 5. Water temperature 6. Spawning and rearing habitat 7. A natural hydrograph 8. Sufficient water quality and quantity 9. Sufficient low levels of occurrence of non-native predatory fish, or competing fish species	Disturbance to any water body can increase sedimentation and suspended solids, which can be detrimental to fish, resulting in lethal effects, sublethal effects that alter the physiology of the fish, and behavioral effects that change the activity of the fish and could contribute to mortality through time (Newcombe and MacDonald 1991). Increased turbidity can cause behavioral changes to fish, including stress, reduced feeding, impacts to growth rates, interference with cues necessary in homing and migration, and death (Lloyd 1987). Bull trout are highly susceptible to sediment inputs (USFWS 1998, Bash et al. 2001). Young bull trout less than 200mm in length forage on invertebrates. Potash—Adult bull trout in the vicinity of the action area would have sufficient ability to avoid the area; any long-term effects on prey species are expected to be minimal because benthic communities typically recolonize quickly after disturbance (McCauley et al. 1977, Albright and Borithilette 1982, Romberg et al. 1995, Wilson and Romberg 1996). However, there may be short-term effects on invertebrate species, which may affect the foraging ability of juvenile bull trout. EarthTec QZ™—All life history stages of bull trout are expected to be negatively affected by the addition of EarthTec QZ™ to a water body. Zequanox®—Bull trout are expected to be negatively affected by Zequanox® based on the sensitivity of rainbow and brook trout to this chemical.	Potash—Of the nine PCEs, potash could potentially affect the migration habitats, water temperature, and spawning and rearing habitat of bull trout by altering the water chemistry during critical life stages/use of shallow portions of CRB water bodies. EarthTec QZ™—Of the nine PCEs, EarthTec QZ™ would detrimentally affect migration habitats, food base, complex aquatic environments, and spawning and rearing habitat. Zequanox—None of the nine PCEs would likely be affected by Zequanox®.	Salvage or move fish out of contained treatment sites. Implement BMPs to avoid introducing invasive species (see BMPs section of manual). Minimize disturbance at the shoreline and in benthic portions of the water body to minimize turbidity. Prior to an action in an area with a known bull trout population or critical habitat, determine total suspended solid concentrations, and gather information on the size, shape, and composition of sediment. Consider timing of treatment to prevent barriers for seasonal migrations. Alter treatment timing, and limit the treatment area to provide access to refugia.

[18] Primary constituent elements are physical and biological features that are essential to the conservation of the species. These include, but are not limited to: space for individual and population growth and for normal behavior; food, water, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing of offspring; and habitats that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

The next portion of the table includes salmon and Steelhead species. Primary constituent elements within critical habitat boundaries are essential for the conservation of these DPSs – these are sites and habitat components that support one or more life stages, and include:

(1) Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development;
(2) Freshwater rearing sites with:
(i) Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
(ii) Water quality and forage supporting juvenile development; and
(iii) Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
(3) Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions and natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival;
(4) Estuarine areas free of obstruction and excessive predation with:
(i) Water quality, water quantity, and salinity conditions supporting juvenile and adult physiological transitions between fresh- and saltwater;
(ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels; and
(iii) Juvenile and adult forage, including aquatic invertebrates and fishes, supporting growth and maturation.
(5) Nearshore marine areas free of obstruction and excessive predation with:
(i) Water quality and quantity conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation; and
(ii) Natural cover such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, and side channels.
(6) Offshore marine areas with water quality conditions and forage, including aquatic invertebrates and fishes, supporting growth and maturation.
(d) *Exclusion of Indian lands.* Critical habitat does not include habitat areas on Indian lands. The Indian lands specifically excluded from critical habitat are those defined in the Secretarial Order, including:
(1) Lands held in trust by the United States for the benefit of any Indian tribe;
(2) Land held in trust by the United States for any Indian Tribe or individual subject to restrictions by the United States against alienation;
(3) Fee lands, either within or outside the reservation boundaries, owned by the tribal government; and
(4) Fee lands within the reservation boundaries owned by individual Indians.
(e) *Land owned or controlled by the Department of Defense.* Critical habitat does not include any areas subject to an approved Integrated Natural Resource Management Plan or associated with Department of Defense easements or right-of-ways. In areas within Navy security zones identified at 33 CFR 334 that are outside the areas described above, critical habitat is only designated within a narrow nearshore zone from the line of extreme high tide down to the line of mean lower low water.
(f) *Land covered by an approved Habitat Conservation Plan.* Critical habitat does not include any areas subject to an approved incidental take permit issued by NMFS under section 10(a)(1)(B) of the ESA. The specific sites addressed include those associated with the following Habitat Conservation Plans:
(1) Washington Department of Natural Resources—West of Cascades
(2) Washington State Forest Practices, except those lands on the Kitsap Peninsula overlapping with areas occupied by Puget Sound steelhead and not classified as being in an approved or renewed status by the Washington Department of Natural Resources as of September 2015.
(3) Green Diamond Company.
(4) West Fork Timber Company.
(5) City of Kent.
(6) J.L. Storedahl and Sons.

Specific critical habitat designations for each species can be found in Appendix E.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
Chinook salmon (*Oncorhynchus tshawytscha*) Upper Columbia spring-run ESU Snake River spring/summer run ESU Snake River fall-run ESU Puget Sound ESU Lower Columbia River ESU Upper Willamette River ESU	**Upper Columbia Spring-run Chinook Salmon ESU**: Sedimentation from land and water management activities (MNFS 2007); Increasing fines in sediment caused by increased winter flooding (Honea et al. 2016); juvenile freshwater stage requires high spring flows; ranks high re: sensitivity to climate change (Crozier et al. 2019). The abundance and distribution of invasive species compete and interbreed with prey in spawning, rearing, and migration areas (NMFS 2007a).	Disturbance to any water body can increase sedimentation and suspended solids, which can be detrimental to fish, resulting in lethal effects, sublethal effects that alter the physiology of the fish, and behavioral effects that change the activity of the fish and could contribute to mortality through time (Newcombe and MacDonald 1991). Increased turbidity can cause behavioral changes to fish, including stress, reduced feeding, impacts to growth rates, interference with cues necessary in homing and migration, and death (Lloyd 1987). Despite the fact that most dreissenid applications will occur in water that is not flowing (i.e., lakes versus rivers and streams), there may be instances in which a portion of a river (e.g., a boat launch or marina) is sectioned off and chemicals are applied. Depending on the proximity of the sectioned off portion of water, fish passage to nearby tributaries, or within the river, or stream, may be impeded. **Potash**—Adult salmon in the vicinity of the action area would have sufficient ability to avoid the area; any long-term effects on prey species are expected to be minimal because benthic communities typically recolonize quickly after disturbance (McCauley et al. 1977, Albright and Borithilette 1982, Romberg et al. 1995, Wilson and Romberg 1996). However, there may be short-term effects on invertebrate species, which may	Critical habitat is found in Oregon in Clatsop, Columbia, Gilliam, Hood River, Morrow, Multnomah, Sherman, Umatilla, and Wasco counties, and in Washington in Benton, Chelan, Clark, Cowlitz, Douglas, Franklin, Grant, Kittitas, Klickitat, Okanagan, Pacific, Skamania, Wahkiakum, Walla Walla, and Yakima counties.	Implement avoidance, minimization, and restoration measures. Salvage, or move, fish out of contained treatment sites. Implement BMPs to avoid introducing, or spreading, invasive species (see BMPs section of manual). Minimize disturbance at the shoreline and in benthic portions of the water body to minimize turbidity. Prior to an action in an area with a known salmon population or critical habitat, determine total suspended solid concentrations, and gather information on the size, shape, and composition of sediment. Consider any impediments to fish passage. If sectioned off portions of rivers or streams impede fish passage, implement actions to facilitate fish passage upstream and downstream. Consider the life cycle of salmonids that will be present in, and moving through the stream, during action preparation and implementation, and take steps to ensure fish passage is not impeded (e.g., installing a pipe around the action area to allow fish passage around the cordoned area). Consider timing of treatment to: ▪ prevent barriers for seasonal migrations. ▪ avoid excessive concentrations of KCl in lower portions of the water body column.
	Snake River Spring/Summer run Chinook Salmon ESU: The adult freshwater stage is at risk for pre-spawn mortality while holding in tributary habitats during peak summer temperatures (Bowerman et al. 2016). Limiting factors include impaired water quality (abnormal temperature, dissolved oxygen, toxic pollutants), which affects egg-to-smolt survival, and smolt and adult migration; excess fine sediment (reduces spawning gravel or increases embeddedness), which affects egg-to-parr survival (NMFS 2017a).		Critical habitat is found in Oregon in Baker, Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, Wasco; and in Washington: Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Pacific, Skamania, Wahkiakum, Walla, Whitman; and in Idaho: Adams, Blaine, Custer, Idaho, Lemhi, Lewis, Nez Perce, Valley.	
	Snake River Fall-Run Chinook Salmon ESU: Threats include agricultural runoff, legacy mining contaminants, urban and industrial runoff, effluent, and wastes; accumulation of toxic pollutants in reservoirs. Limiting factors include contaminants, such as DDTs, PCBs, PBDEs, metals, mercury, methylmercury (MeHG), radionuclides, dioxin, etc.,		Critical habitat is found in Oregon in Baker, Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, and Wasco counties; and in Washington in Adams, Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Lincoln, Pacific, Skamania, Spokane, Wahkiakum, Walla Walla, and Whitman counties;	

[19] Critical habitat includes the stream channels within the designated stream reaches, and includes a lateral extent as defined by the ordinary high-water line (33 CFR 319.11). In areas where ordinary high-water line has not been defined, the lateral extent will be defined by the bankfull elevation. Bankfull elevation is the level at which water begins to leave the channel and move into the floodplain and is reached at a discharge which generally has a recurrence interval of 1 to 2 years on the annual flood series. Critical habitat in lake areas is defined by the perimeter of the water body as displayed on standard 1:24,000 scale topographic maps or the elevation of ordinary high water, whichever is greater. In estuarine and nearshore marine areas critical habitat includes areas contiguous with the shoreline from the line of extreme high water out to a depth no greater than 30 meters relative to mean lower low water.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
	causing mortality, disease, reduced fitness (NMFS 2017b).	affect the foraging ability of salmon and Steelhead. **EarthTec QZ™**—All life history stages of salmon and Steelhead are expected to be negatively affected by the addition of EarthTec QZ™ to a water body. **Zequanox®**—Salmon and Steelhead are expected to be negatively affected by Zequanox® based on the sensitivity of Rainbow Trout and Brook Trout to this chemical. In addition, increased turbidity has been associated with the use of Zequanox®.	and in Idaho in Adams, Benewah, Blaine, Clearwater, Custer, Idaho, Latah, Lemhi, Lewis, Nez Perce, Shoshone, and Valley counties.	▪ avoid impacting salmon and Steelhead species during key sensitive life stages. Alter treatment timing, and limit the treatment area to provide access to refugia.
	Puget Sound Chinook Salmon ESU: Limiting factors include reduced water quality (dissolved oxygen, temperature, chemical contaminants and nutrients, and suspended sediment/turbidity) and invasive species (NMFS 2007b).		Critical habitat is found in Clallam, Jefferson, King, Mason, Pierce, Skagit, Snohomish, Thurston, and Whatcom counties.	
	Lower Columbia River Chinook Salmon ESU: Limiting factors include tributary habitat degradation from past and/or current land and water use; anthropogenic activities have reduced water quality, diminished habitat quantity, quality, and complexity, adversely affected stream and side channel structure, riparian conditions, floodplain function, sediment conditions, water quality and quantity, and ecological function of watersheds (NFMS 2013). Note: Turbidity is a common limiting factor (within the water quality limiting factor).		Critical habitat is found in Oregon in Clackamas, Clatsop, Columbia, Hood River, and Multnomah counties, and in Washington in Clark, Cowlitz, Klickitat, Lewis, Pacific, Skamania, and Wahkiakum counties.	
	Upper Willamette River Chinook Salmon ESU: Limiting factors include access to spawning and/or rearing habitat, including those habitats in degraded conditions (ODFW and NMFS 2011). Examples include sediment, connectivity of side channels and water quality. Reservoirs where production occurs support numerous life stages, including egg/alevin (hatching, early life development); fry, summer and winter parr (rearing), smolt (migration, some rearing), adult (migration, staging), spawner (spawning), and kelt (downstream migration).		Critical habitat is found in Oregon in Benton, Clackamas, Clatsop, Columbia, Lane, Linn, Marion, Multnomah, Polk, and Yamhill counties and in Washington in Clark, Cowlitz, Pacific, and Wahkiakum counties.	
Chum salmon (*Oncorhynchus keta*) Hood Canal summer-run ESU (ESA threatened)	**Hood Canal Summer-run Chum Salmon ESU:** Spawn from late August through late October (peak spawning in winter when river flows are high) in tributaries to Hood Canal and Discovery, Sequim, and Dungeness Bays, WA. Do not reside in fresh water for an extended period –		Critical habitat is found in Washington in Clallam, Jefferson, Kitsap, and Mason counties.	

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
Columbia River ESU (ESA threatened)	migrate directly to estuaries and ocean soon after being born			
	Columbia River Chum Salmon ESU: Spawn in tributaries to lower Columbia River in WA and OR.		Critical habitat is found in Oregon in Clatsop, Columbia, Hood River, and Multnomah counties, and in Washington in Clark, Cowlitz, Klickitat, Lewis, Pacific, Skamania, and Wahkiakum counties.	
Coho Salmon (*Oncorhynchus kisutch*) Oregon Coast ESU Lower Columbia River ESU	**Oregon Coast Coho Salmon ESU:** Limiting factors include reduced stream complexity and degraded water quality (in particular, increased water temperature) (NMFS 2016).		Critical habitat is found in Oregon in Benton, Clatsop, Columbia, Coos, Curry, Douglas, Lane, Lincoln, Polk, Tillamook, Washington, and Yamhill counties.	
	Lower Columbia River Coho Salmon ESU: Limiting factors include tributary habitat degradation from past and/or current land and water use; anthropogenic activities have reduced water quality, diminished habitat quantity, quality, and complexity, adversely affected stream and side channel structure, riparian conditions, floodplain function, sediment conditions, water quality and quantity, and ecological function of watersheds (NFMS 2013). Note: Turbidity is a common limiting factor (within the water quality limiting factor).		Critical habitat is found in Oregon in Clackamas, Clatsop, Columbia, Hood River, Marion, and Multnomah counties, and in Washington in Clark, Cowlitz, Klickitat, Lewis, Pacific, Skamania, and Wahkiakum counties.	
Sockeye salmon (*Oncorhynchus nerka*) Snake River ESU Ozette Lake ESU	**Snake River Sockeye Salmon ESU:** Essential habitat consists of spawning and juvenile rearing areas, juvenile migration corridors, areas for growth and development to adulthood, and adult migration corridors.		Critical habitat is found in Oregon in Clatsop, Columbia, Gillium, Hood River, Morrow, Multnomah, Sherman, Umatilla, Wallowa, and Wasco counties; and in Washington in Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Pacific, Skamania, Wahkiakum, Walla Walla, and Whitman counties; and in Idaho in Blaine, Custer, Idaho, Lemhi, Lewis and Nez Perce counties.	
	Ozette Lake Sockeye Salmon ESU: Habitat concerns include a reduction in beach spawning habitat as Ozette Lake beaches are narrowed by vegetation recruitment; water quality is impaired as a result of mercury and PCB levels; water quantity and hydrologic patterns		Critical habitat is found in Clallam county in Washington.	

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
	are a concern; predation is a significant factor (NMFS 2016).			
Steelhead (*Oncorhynchus mykiss*) Upper Columbia River DPS Upper Willamette River DPS Middle Columbia River DPS Lower Columbia River DPS Snake River Basin DPS Puget Sound DPS	**Upper Columbia River Steelhead DPS:** Sedimentation from land and water management activities (NMFS 2007). The abundance and distribution of invasive species compete and interbreed with prey in spawning, rearing, and migration areas (NMFS 2007a).		Critical habitat is found in Oregon in Columbia, Gilliam, Hood River, Morrow, Multnomah, Umatilla, and Wasco counties, and in Washington in Adams, Benton, Chelan, Clark, Cowlitz, Douglas, Franklin, Grant, Kittitas, Klickitat, Okanagan, Pacific, Skamania, Wahkiakum, Walla Walla, and Yakima counties.	
	Upper Willamette River Steelhead DPS: Limiting factors include access to spawning and/or rearing habitat, including those habitats in degraded conditions (ODFW and NMFS 2011). Examples include sediment, connectivity of side channels and water quality. Reservoirs where production occurs support numerous life stages, including egg/alevin (hatching, early life development); fry, summer and winter parr (rearing), smolt (migration, some rearing), adult (migration, staging), spawner (spawning), and kelt (downstream migration).		Critical habitat is found in Oregon in Benton, Clackamas, Clatsop, Columbia, Linn, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill counties and in Washington in Clark, Cowlitz, Pacific, and Wahkiakum counties.	
	Middle Columbia River Steelhead DPS: There are numerous limiting factors relating to land use, including impaired physical habitat quality and impaired water quality; secondary concerns for all populations are the impacts of fine sediment on steelhead eggs and alevins (NMFS 2009).		Critical habitat is found in Oregon in Clatsop, Columbia, Crook, Gilliam, Grant, Hood River, Jefferson, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, Wasco, and Wheeler counties, and in Washington in Benton, Clark, Cowlitz, Columbia, Frankling, King, Kittitas, Klickitat, Lewis, Pacific, Pierce, Skamania, Wahkiakum, Walla Walla, and Yakima counties.	
	Lower Columbia River Steelhead DPS: Limiting factors include tributary habitat degradation from past and/or current land and water use; anthropogenic activities have reduced water quality, diminished habitat quantity, quality, and complexity, adversely affected stream and side channel structure, riparian conditions, floodplain function, sediment conditions, water quality and quantity, and ecological function of watersheds		Critical habitat is found in Oregon in Clackamas, Clatsop, Columbia, Hood River, Marion, and Multnomah counties, and in Washington in Clark, Cowlitz, Klickitat, Lewis, Pacific, Skamania, and Wahkiakum counties.	

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
	(NFMS 2013). Note: Turbidity is a common limiting factor (within the water quality limiting factor).			
	Snake River Basin Steelhead DPS: Limiting factors include impaired water quality (abnormal temperature, dissolved oxygen, toxic pollutants), which affects egg-to-smolt survival, and smolt and adult migration; excess fine sediment (reduces spawning gravel or increases embeddedness), which affects egg-to-parr survival (NMFS 2017a).		Critical habitat is found in Idaho in Adams, Blaine, Clearwater, Custer, Idaho, Latah, Lemhi, Lewis, Nez Perce, and Valley counties, in Oregon in Clatsop, Columbia, Gilliam, Hood River, Morrow, Multnomah, Sherman, Umatilla, Union, Wallowa, and Wasco counties, and in Washington in Asotin, Benton, Clark, Columbia, Cowlitz, Franklin, Garfield, Klickitat, Pacific, Skamania, Walla Walla, Wahkiakum, and Whitman counties.	
	Puget Sound Steelhead DPS: Puget Sound Steelhead migrate directly from natal freshwater streams and rivers to the ocean rapidly, spending only a few days to a few weeks in Puget Sound.		Critical habitat is found in Clallam, Jefferson, King, Kitsap, Mason, Pierce, Skagit, Snohomish, Thurston, and Whatcom counties.	Salvage or move fish out of contained treatment sites. Consider timing of treatment to prevent barriers for seasonal migrations. Avoid treatments in Puget Sound during key migration periods.
Kootenai River white sturgeon (*Acipenser transmontanus*)	Spawning and rearing habitat are the key limiting factors for Kootenai River White Sturgeon. Spawning and incubation occur from mid-May to August (Duke et al. 1999, Kootenai Tribe of Idaho 2005). Recruitment failure is caused by egg or larval suffocation, predation, and/or other mortality factors associated with early life stages (Anders 1991, Anders and Richards 1996, Duke et al. 1999, USFWS 1999, Paragamian et al. 2001, Anders 2002). Low turbidity increases predation (Kootenai Tribe of Idaho 2005).	**Potash**—Based on recent studies with salmonids (Densmore et al. 2018), the introduction of potash to Kootenai River white sturgeon habitat, at the levels sufficient to cause dreissenid mortality, would likely not affect this species. **EarthTec QZ™**—All stages of white sturgeon are expected to be negatively affected by the addition of EarthTec QZ™ to a water body from direct application of the product. There is an expected reduction in oxygen in areas isolated by barriers after the product has been applied. **Zequanox®**—Zequanox® applications (in small areas - less than 1 acre) are not likely to have long-term water quality impacts, such as ammonia toxicity (Meehan et al. 2014; Whitledge et al. 2015). However, the impacts of largescale, open-water applications of Zequanox® on water	Kootenai River white sturgeon critical habitat includes 18.3 river miles of the Kootenai River. Critical habitat is designated in the braided reach, which begins at river mile 159.7, below the confluence with the Moyie River, and extends downstream within the Kootenai River, into the meander reach, to river mile 141.4 below Shortys Island. Spawning habitats (cobble and gravel substrates) and rearing habitats are key components of critical habitat. Disruption to spawning and rearing habitats could occur during potash applications.	Salvage or move fish out of contained treatment sites. Consider timing of treatment (if possible) to prevent exposure to sensitive life stages including eggs and larvae. Consider timing of treatment to prevent barriers for seasonal migrations.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
		quality remain largely unknown (Luoma et al. 2018). The LC_{50} for lake sturgeon was 8.9mg/L (Luomo et al. 2015).		
Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*)	Major impacts to habitat and abundance include: 1) reduction and alteration of stream discharge; 2) alteration of stream channels and morphology; 3) degradation of water quality; 4) reduction of lake levels and concentrated chemical components in natural lakes; and 5) introductions of non-native fish species (Coffin and Cowan 1995). LCT spawn in cold, flowing streams.	**Potash**—Based on recent studies with salmonids (Densmore et al. 2018), the introduction of potash to LCT, at the levels sufficient to cause dreissenid mortality, would likely not affect adults. Degradation of water quality and chemical composition of lake water are two key impacts that affect habitat and species abundance of Lahontan cutthroat trout (Coffin and Cowan 1995); therefore, introduction of potash to LCT habitat/water bodies could temporarily affect this species. **EarthTec QZ™**—All stages of Lahontan cutthroat trout are expected to be negatively affected by the addition of EarthTec QZ™ to a water body from direct application of the copper-based product as well as an expected reduction in oxygen after the product has been applied. **Zequanox®**—Zequanox® could temporarily reduce the dissolved oxygen in the treatment area of the water body, thus it has the potential to affect this species. Also, applications of this product has increased turbidity, which could detrimentally affect Lahontan cutthroat trout.	No critical habitat designated.	Salvage or move fish out of treatment sites. Consider timing of treatment (if possible) to prevent exposure to sensitive life stages including eggs and larvae. Consider timing of treatment to prevent barriers for seasonal migrations.
Shortnose sucker (*Chasmistes brevirostris*)	Life history information from USFWS (1993): Shortnose suckers have complex life histories that include stream/river, lake, marsh, and shoreline habitats. They spawn during the spring over gravel substrates in habitats less than 4.3 ft (1.3 m) deep in tributary streams and rivers.	Adults generally occupy deep water habitats, and could move to other habitats within a larger water body during a chemical application. Potash—Based on recent studies with salmonids (Densmore et al. 2018), the introduction of potash to LCT, at the levels sufficient to cause dreissenid mortality, would likely not affect adults. Juveniles would use locations where a potash application would likely occur, i.e., shallow water areas.	About 136 miles of streams and 123,590 acres of lakes and reservoirs for shortnose sucker in Klamath and Lake Counties in Oregon have been designated critical habitat. Potash would likely have no effects on critical habitat. Both EarthTec QZ™ and Zequanox® would likely affect oxygen levels in critical habitat.	Salvage or move fish out of treatment sites. Consider timing of treatment to prevent barriers for seasonally migrating fishes.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats[19]	Species-specific BMPs
		The invertebrate prey base would likely be affected by a potash application, which could affect the survivability of larval and juvenile suckers. Any long-term effects on prey species are expected to be minimal because benthic communities typically recolonize quickly after disturbance (McCauley et al. 1977, Albright and Borithilette 1982, Romberg et al. 1995, Wilson and Romberg 1996). EarthTec QZ™—All stages of Shortnose Sucker are expected to be negatively affected by the addition of EarthTec QZ™ to a water body from direct application of the copper-based product as well as an expected reduction in oxygen after the product has been applied. Zequanox®—It is unknown what effect Zequanox® may have on sucker populations as no specific studies have been conducted. Zequanox® could temporarily reduce the dissolved oxygen in the treatment area of the water body, thus it has the potential to affect this species.		

Aquatic invertebrates

Toxicity of potash to mollusks: Freshwater mollusks are particularly sensitive to environmental change, which has made them the most threatened fauna in North America (Johnson et al. 2013, Williams et al. 2008). Naturally high potassium concentrations decreased the diversity of mussel populations in the Missouri River Basin (Imlay 1973). Any river or stream with a potassium concentration of equal to or greater than 7 mg/L lacked mussels whereas mussels could be found in rivers with concentrations of less than 4 mg/L (Imlay 1973). Toxicity studies using two bivalves (Alabama Rainbow (*Villosa nebulosa*) and Orangenacre Mucket (*Hamiota perovalis*)), and two gastropods (Round Rocksnail (*Leptoxis ampla*), and Pebblesnail (*Somatogyrus* spp.)) concluded that native mussels may be more sensitive to potassium than zebra mussels (48-h LC_{50} value for 24,000µg/L for juvenile Southern Rainbow (*Villosa vibex*) mussels—the authors suggested potassium should not be used as a molluscicide (Gibson et al. 2018). Alabama Rainbow had an EC_{50} value of 15,966 µg/L (95% CI = 12,450–20,476µg/L), whereas Orangenacre Mucket had an EC_{50} value of 11,938µg/L (95% CI = 10,089–14,134 µg/L). An EC_{50} value could not be calculated for Round Rocksnail, however it is expected to be much more sensitive than most other species tested (Gibson et al. 2018). At 100µg/L, 50% of the test organisms were classified as dead at the end of the trial but only a third of the test organisms died at the highest concentration (1000µg/L), thus the EC_{50} value for Round Rocksnail was more than 1000 µg/L. Partial kills (≤33%) were observed at all five concentrations. The pebblesnails had an EC_{50} value of 7285 µg/L (95% CI = 5739–9245µg/L), which is lower than either mussel species tested in the study (Gibson et al. 2018).

Significant mortality among sensitive aquatic invertebrates, such as daphniids, is not unexpected (Densmore et al. 2018). Other invertebrates, such as crayfish, demonstrate some degree of sensitivity to KCl (Densmore et al. 2018). Crayfish exposed to KCl at higher concentrations (e.g., 800 mg/L–1,600 mg/L) for at least 24 hours experienced immobilization, but half were able to fully recover in fresh water within 24 hours (Densmore et al. 2018).

Toxicity of EarthTec QZ™ to invertebrates and mollusks: EarthTec QZ™ is toxic to invertebrates. The 48-hour LC_{50} for the non-biting midge (*Chironomus tentans*) is 1,136.5 ± 138.6 (mean ± SD) µg/L Cu (Mastin and Rodgers 2000). Reported 48-hour LC_{50} concentrations for *Daphnia magna* include 0.00115 mmol CuSO4/L85 and 18.9 ± 2.3 (mean ± SD) µg/L Cu (Mastin and Rodgers 2000). The LC_{50} for *Daphnia pulex* was relatively constant at 24, 48, and 72 hours. Reported values were 21–31 µg/L, 20–31 µg/L, and 20–29 µg/L, respectively (Ingersoll and Winner 1982). The 24- and 48-hour EC50(with 95% confidence intervals) for *Daphnia similis* was 0.035 (0.030–0.042) and 0.032 (0.026–0.039) mg/L Cu, respectively (de Oliveira-Filho et al. 2004).

Copper disrupts surface epithelia function and peroxidase enzymes in mollusks (USEPA 2009). Aquatic snails (*Biomphalaria glabrata*) had a 24-hour and 48-hour LC_{50} (with 95% confidence intervals) of 1.868 (1.196–3.068) and 0.477 (0.297–0.706) mg/L Cu, respectively (de Oliveira-Filho et al. 2004). 1-day-old freshwater snail eggs (*Lymnaea luteda*) were exposed to copper at concentrations from 1 to 320 µg/L of copper for 14 days at 21 °C in a semi-static embryo toxicity test (Khangarot and Das 2010). Embryos exposed to copper at 100 to 320 µg/L died within 168 hours. At lower doses from 3.2–10 µg/L, significant delays in hatching and increased mortality were noted.

Toxicity of Zequanox® to mollusks/mussels/invertebrates: Exposure to Zequanox® caused no mortality to blue mussels (*Mytilus edulis*) or any of six native North American unionid clam species (*Pyganodon grandis, Lasmigona compressa, Strophitus undulatus, Lampsilis radiata, Pyganodon cataracta*, and *Elliptio complanata*) (Bureau of Reclamation 2011). Exposure of duck mussel (*Anodonta* spp.), non-biting midge (*Chironomus plumosus*), and white-clawed crayfish (*Austropotamobius pallipes*) to Zequanox® in a 72-hour static renewal toxicity test at concentrations of 100–750mg active ingredient/liter resulted in LC_{50} values for Anodonta: ≥500mg active ingredient/liter, C. plumosus: 1075mg active ingredient/liter, and A. pallipes: ≥750mg active ingredient/liter, demonstrating that Zequanox® does not negatively affect these species at concentrations required for greater than 80% zebra mussel mortality (i.e., 150mg active ingredient/liter) (Meehan et al. 2014).

Nicholson (2018) conducted a replicated aquatic mesocosm experiment using open-water applications of Zequanox® (100 mg/L of the active ingredient) to determine the responses of primary producers, zooplankton, and macroinvertebrates to Zequanox® exposure in a complex aquatic environment. Short-term increases occurred in phytoplankton and periphyton biomass (250–350% of controls), abundance of large cladoceran grazers (700% of controls), and insect emergence (490% of controls). Large declines initially occurred among small cladoceran zooplankton (88–94% reductions in *Chydorus sphaericus*, *Ceriodaphnia lacustris*, and *Scapheloberis mucronata*), but abundances generally rebounded within three weeks. Declines also occurred in amphipods *Hyalella azteca* (mean abundance 77% less than controls) and gastropods *Viviparus georgianus* (survival 73 ±16%), which did not recover during the experiment. Short-term impacts to water quality included a decrease in dissolved oxygen (minimum 1.2 mg/L), despite aeration of the mesocosms.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Banbury Springs limpet (*Lanx* spp.)	Potash is lethal to mollusks. EarthTech QZ™ is toxic to mollusks and invertebrates.	Potash—At the concentrations used to cause 100% mortality to dreissenids, potash would likely cause 100% mortality to mollusks, which demonstrate higher sensitivities to potash than dreissenids (Gibson et al. 2018). EarthTech QZ™—At the concentrations used to cause 100% mortality to dreissenids, EarthTech QZ™ would likely cause a range of effects, from significant delays in hatching to mortality (de Oliveira-Filho et al. 2004).	No critical habitat designated.	Depending on seasonality, salvage prior to action. 1) Use double barrier systems (multiple curtain or bladder dams) to reduce risk of molluscicide leakage to downstream area; 2) Use neutralizing agents (if available) for proposed molluscicides - possibly introduce between double

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
		Zequanox®—AT the concentrations used to cause 100% mortality to dreissenids, Zequanox® would likely have a negative effect, including mortality, on gastropods, either through direct toxicity, or indirect effects (Nicholson 2018).		barrier system (assumes not toxicity from neutralizing agent); 3) Predeploy barrier systems to those reservoirs immediately upstream of the at-risk river reaches.
Bliss Rapids snail (*Taylorconcha serpenticola*)	Potash is lethal to mollusks. EarthTech QZ™ is toxic to mollusks and invertebrates.	Potash—At the concentrations used to cause 100% mortality to dreissenids, potash would likely cause 100% mortality to mollusks, which demonstrate higher sensitivities to potash than dreissenids (Gibson et al. 2018). EarthTech QZ™—At the concentrations used to cause 100% mortality to dreissenids, EarthTech QZ™ would likely cause a range of effects, from significant delays in hatching to mortality (de Oliveira-Filho et al. 2004). Zequanox®—AT the concentrations used to cause 100% mortality to dreissenids, Zequanox® would likely have a negative effect, including mortality, on gastropods, either through direct toxicity, or indirect effects (Nicholson 2018).	No critical habitat designated.	Species would need to be collected and removed from any treatment sites prior to treatment. 1) Use double barrier systems (multiple curtain or bladder dams) to reduce risk of molluscicide leakage to downstream area; 2) Use neutralizing agents (if available) for proposed molluscicides - possibly introduce between double barrier system (assumes not toxicity from neutralizing agent); 3) Predeploy barrier systems to those reservoirs immediately upstream of the at-risk river reaches.
Bruneau hot springsnail (*Pyrgulopsis bruneauensis*)	This species is not restricted to hot springs but is commonly found in the Bruneau River where there are influences (sometimes weak) of geo/hydrothermal discharge. While the introduction of Dreissenids upstream is unlikely, the Bruneau is a short-season whitewater run and hence it is plausible, though less likely, these mussels could be introduced upstream. Hot Creek, a short geothermal spring on private land also contains an isolated and vulnerable population of the springsnail. The Hot Creek area has been used as an access point for the purpose of herbicide application for an invasive aquatic plant (Hydrilla verticillata). Access to the river upstream of this location is not feasible given the deep canyon. Damaging access through Hot Creek and or treatment of waters of the Bruneau River for dreissenid control would have adverse impacts to the springsnail.	Potash—At the concentrations used to cause 100% mortality to dreissenids, potash would likely cause 100% mortality to mollusks, which demonstrate higher sensitivities to potash than dreissenids (Gibson et al. 2018). EarthTech QZ™—At the concentrations used to cause 100% mortality to dreissenids, EarthTech QZ™ would likely cause a range of effects, from significant delays in hatching to mortality (de Oliveira-Filho et al. 2004). Zequanox®—AT the concentrations used to cause 100% mortality to dreissenids, Zequanox® would likely have a negative effect, including mortality, on gastropods, either through direct toxicity, or indirect effects (Nicholson 2018).	No critical habitat designated.	Species would need to be collected and removed from any treatment sites prior to treatment. 1) Use double barrier systems (multiple curtain or bladder dams) to reduce risk of molluscicide leakage to downstream area; 2) Use neutralizing agents (if available) for proposed molluscicides - possibly introduce between double barrier system (assumes not toxicity from neutralizing agent); 3) Predeploy barrier systems to those reservoirs immediately upstream of the at-risk river reaches.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Snake River physa snail (*Physa natricina*)	Potash is lethal to mollusks. EarthTech QZ™ is toxic to mollusks and invertebrates.	Potash—At the concentrations used to cause 100% mortality to dreissenids, potash would likely cause 100% mortality to mollusks, which demonstrate higher sensitivities to potash than dreissenids (Gibson et al. 2018). EarthTech QZ™—At the concentrations used to cause 100% mortality to dreissenids, EarthTech QZ™ would likely cause a range of effects, from significant delays in hatching to mortality (de Oliveira-Filho et al. 2004). Zequanox®—AT the concentrations used to cause 100% mortality to dreissenids, Zequanox® would likely have a negative effect, including mortality, on gastropods, either through direct toxicity, or indirect effects (Nicholson 2018).	No critical habitat designated.	Species would need to be collected and removed from any treatment sites prior to treatment. 1) Use double barrier systems (multiple curtain or bladder dams) to reduce risk of molluscicide leakage to downstream area; 2) Use neutralizing agents (if available) for proposed molluscicides - possibly introduce between double barrier system (assumes not toxicity from neutralizing agent); 3) Predeploy barrier systems to those reservoirs immediately upstream of the at-risk river reaches.

Plants

Toxicity of potash to plants: Potassium plays a critical role in plant growth and metabolism, and contributes to the survival of plants under abiotic or biotic stress (Wang et al. 2013). Potassium can often be deficient in the environment (Truong 2017). At the concentrations used to kill dreissenids, potash would not negatively affect these plant species because of the demonstrated role that potassium plays in plant growth and metabolism (Wang et al. 2013).

Toxicity of EarthTec QZ™ to plants: One of the limiting factors in the use of copper compounds is their serious potential for phytotoxicity, or poisonous activity in plants (USEPA 1986). Copper sulfate can kill plants by disrupting photosynthesis. 200 ppm of copper was found in grass five months after it was sprayed with copper sulfate to control liver fluke (TOXNET 1975–1986). Blue-green algae in some copper sulfate-treated Minnesota lakes appeared to become increasingly resistant to the algaecide after 26 years of use (Pimental 1971).

Toxicity of Zequanox® to plants: Phytotoxicity (degree of toxic effects to plants) of microbial suspensions of Zequanox® were tested on some of the most common aquatic and non-aquatic weed species, including common water plantain (*Alisma plantago-aquatica*), small-flower umbrella sedge (*Cyperus difformis*), nightshade, bindweed, mallow, and curly dock (*Rumex crispis*; MBI 2009). Suspensions at 100 and 200 mg/L were prepared in distilled water and sprayed on the plant species. No phytotoxic symptoms were observed at either test concentration in any of the tested plants.

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
Bradshaw's desert parsley (*Lomatium bradshawii*)	Saturated, or flooded prairies adjacent to creeks and small rivers in the Willamette Valley are a habitat type that is declining because of agriculture and development. Restoration activities could introduce invasive species and cause fragmentation of habitats	The majority of Bradshaw's lomatium populations occur on seasonally saturated or flooded prairies, adjacent to creeks and small rivers in the southern Willamette Valley. Any chemical application would not occur in this specific habitat type, but could occur along a small river adjacent to this habitat type. Disturbance to the site and damage to any existing plants as a result of equipment use and access to the water body could detrimentally affect individual plants.	No critical habitat designated.	The presence of this species should be assessed prior to any actions along creeks and small rivers in the southern Willamette Valley to determine the potential to affect this species as a result of any disturbance activities associated an action as well as take action to minimize impacts.
Nelson's checker-mallow (*Sidalcea nelsoniana*)	Nelson's checker-mallow most frequently occurs in Oregon ash (*Fraxinus latifolia*) swales and meadows with wet depressions, or along streams. The species also grows in wetlands within remnant prairie grasslands. Some populations occur along roadsides at stream crossings where non-native plants, such as reed canarygrass (*Phalaris arundinacea*), blackberry (*Rubus* spp.), and Queen Anne's lace (*Daucus carota*), are also present. Nelson's checkermallow primarily occurs in open areas with little or no shade and will not tolerate encroachment of woody species. Restoration activities could introduce invasive species and cause fragmentation of habitats.	Any chemical application would not occur in the habitat type for Nelson's checker-mallow, however, an application could occur in streams adjacent to this habitat type. Disturbance to the site and damage to any existing plants as a result of equipment use and access to the water body could detrimentally affect individual plants.	No critical habitat designated.	The presence of this species should be assessed prior to any actions along streams/stream crossings to determine the potential to affect this species as a result of any disturbance activities associated an action as well as take action to minimize impacts.
Ute Ladies'-tresses (*Spiranthes diluvialis*)	The orchid occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs	Any chemical application would not occur in the habitat type for Ute Ladies'-tresses, however, an	No critical habitat designated.	The presence of this species should be assessed prior to any actions in these water bodies/wetlands to determine the

Species	Vulnerabilities	Potential Effects on Key Life Stages	Potential Effects on Critical Habitats	Species-specific BMPs
	in stable wetland and seepy areas associated with old landscape features within historical floodplains of major rivers. It also is found in wetland and seepy areas near freshwater lakes or springs. Restoration activities could introduce invasive species and cause fragmentation of habitats	application could occur in an adjacent freshwater lake, perennial stream, oxbow, or river. Disturbance to the site and damage to any existing plants as a result of equipment use and access to the water body could detrimentally affect individual plants.		potential to affect this species as a result of any disturbance activities associated an action as well as take action to minimize impacts. The BLM and USFWS have developed avoidance and minimization measures for Ute ladies'-tresses in Appendix 14 of Proposed Richfield RMP/Final EIS (Bureau of Land Management 2008).
Water howellia (*Howellia aquatilis*)	This species is restricted to small, vernal, freshwater wetlands, glacial pothole ponds, or former river oxbows that have an annual cycle of filling with water over the fall, winter and early spring, followed by drying during the summer months (USFWS ECOS database). These habitats are generally small [< 2.47 ac] and shallow [< 3.3 ft]. Water howellia was found in shallow water or around the edges of deep ponds. Restoration activities could introduce invasive species and cause fragmentation of habitats.	Chemical application, disturbance to the site and damage to any existing plants as a result of equipment use and access to the water body could detrimentally affect individual plants.	No critical habitat designated.	The presence of this species should be assessed prior to any actions in these water bodies/wetlands to determine the potential to affect this species as a result of any disturbance activities associated an action as well as take action to minimize impacts.
Willamette daisy (*Erigeron decumbens* var. *decumbens*)	Willamette daisy populations are known mainly from bottomland habitats, but one population is found in an upland prairie remnant. Restoration activities could introduce invasive species and cause fragmentation of habitats.	None of the proposed three chemicals (potash, EarthTec QZ™, Zequanox®) would negatively affect Willamette daisy at the concentrations used to kill dreissenids. Disturbance to the site and damage to any existing plants as a result of equipment use and access to the water body could detrimentally affect individual plants.	Critical habitat for the Willamette daisy is located in Polk, Benton, Yamhill, Lane, Marion, Linn, and Douglas Counties in Oregon as well as Lewis County in Washington. Critical habitat includes wet prairies, which is not suitable habitat for dreissenids.	The presence of this species should be assessed prior to any actions in these water bodies/wetlands to determine the potential to affect this species as a result of any disturbance activities associated an action as well as take action to minimize impacts.

Chapter 4: Table 4 References

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Effects of Non-Chemical Methods on Listed Species and Critical Habitats of Species Associated with CRB Water Bodies

Table 5 (below) summarizes information for each listed species and associated designated critical habitat(s) known to occur in the CRB. The table compiles key species life history attributes and vulnerabilities, the potential effects of an action on key life stages and critical habitats, and species-specific BMPs that can reduce those detrimental effects. Very few studies have been conducted on the effects of non-chemical treatments on species and critical habitats in the CRB, or in other locations (Table 5). Appendix E of this document includes important information about threatened and endangered species in the CRB whose life history needs are met by CRB water bodies, and their associated critical habitats where designated.

Table 5. Potential estimated effects of non-chemical treatments on listed species and critical habitats of species associated with CRB water bodies. This table also includes species-specific BMPs to avoid or lessen impacts from non-chemical treatment activities. The non-chemical methods considered below do not reflect the entirety of options, but are limited in scope to include the non-chemical methods most likely to be used in an open-water rapid response scenario within the CRB.

Intense Ultraviolet-B and Ultraviolet-C Radiation

Increases in ambient levels of UV-B radiation have significantly contributed to amphibian population declines (Blaustein and Wake 1995). Researchers have found that UV-B radiation can kill amphibians directly, cause sublethal effects, such as slowed growth rates and immune dysfunction, and work synergistically with contaminants, pathogens, and climate change (Kiesecker and Blaustein 1995, Long et al. 1995, Anzalone et al. 1998, Blaustein et al. 1998, Belden and Blaustein 2002, Blaustein et al. 2003).

Species	Potential Effects on Key Life Stages and Critical Habitats	Species-specific BMPs
Oregon spotted frog (*Rana pretiosa*)	Embryo mortality and/or deformities, reducing larval survival, and affecting swimming activity. Based on the effects of UV-B light on other amphibian species, Oregon spotted frogs and their critical habitat would likely be negatively affected by the use of UV-B light, causing embryo mortality and/or deformities, reducing larval survival, and affecting swimming activity.	Capture and remove Oregon spotted frogs (all life stages present) prior to use of this control. Any activities in riparian areas within the geographic scope of this species should be minimized to avoid fragmenting riparian habitat, or introducing invasive species. Use existing access roads and entries. Implement BMPs to avoid introducing invasive species (see BMPs section of manual). Avoid fragmentation of habitat via restoration activities.

Species	Potential Effects on Key Life Stages and Critical Habitats	Species-specific BMPs
Other frog and toad species	Western Toad (*Bufo boreas*)—Exposure to UV-B increases embryo mortality, causes developmental abnormalities, and hampers antipredator behavior. Exposure to high levels of UV-B increases susceptibility of embryos to infection by a parasitic fungus *Saprolignia ferix* (Worrest and Kimeldorf 1976, Blaustein et al. 1994, Kats et al. 2000, Kiesecker and Blaustein 1995, Kiesecker et al. 2001). Common Toad (*Bufo bufo*)—Exposure to UV-B increases embryo mortality and reduces larval survival (Lizana and Pedraza 1998, Häkkinen et al. 2010). Common Froglet (*Crinia signifera*)—Exposure to UV-B increases embryo mortality (Broomhall et al. 2000). Common Tree Frog (*Hyla arborea*)—Exposure to UV-B causes skin darkening (Langhelle et al. 1999). California treefrog (*Hyla cadaverina*)—Exposure to UV-B increases embryo mortality (Anzalone et al. 1998). Gray Treefrog (*Hyla chrysoscelis*)—Exposure to UV-B causes embryonic deformities (Starnes et al. 2000). Gray Treefrog (*Hyla versicolor*)—Exposure to UV-B causes skin darkening and decreased swimming activity. Exposure to UV-B and carbaryl decreases swimming activity of larvae (Zaga et al. 1998). Green and Golden Bell Frog (*Litoria aurea*)—Adult and larval frogs show behavioral avoidance of high levels of UV-B (van de Mortel and Buttemer 1998). Peron's Tree Frog (*Litoria peronii*)—Adult and larval frogs show behavioral avoidance of high levels of UV-B (van de Mortel and Buttemer 1998).	Capture and remove all life stages of frogs and toads prior to use of this control. Any activities in riparian areas within the geographic scope of this species should be minimized to avoid fragmenting riparian habitat, or introducing invasive species. Use existing access roads and entries. Avoid introducing invasive species. Avoid fragmentation of habitat via restoration activities.

Species	Potential Effects on Key Life Stages and Critical Habitats	Species-specific BMPs
	Verreaux's Tree Frog (*Litoria verreauxii*)—Exposure to UV-B increases embryo mortality (Broomhall et al. 2000). Pacific Treefrog (*Pseudacris regilla*)—Exposure to UV-B causes developmental and physiological abnormalities and reduces larval survival. Exposure to UV-B in combination with high levels of nitrates reduces larval survival (Hays et al. 1996, Ovaska et al. 1997, Hatch and Blaustein 2003). Western Chorus Frog (*Pseudacris triseriata*)—Exposure to UV-B causes embryonic deformaties (Starnes et al. 2000).	

Drawdowns/dewatering

Winter drawdowns can decrease taxonomic richness of macrophytes and benthic invertebrates and shift assemblage composition to favor taxa with r-selected life history strategies and with functional traits resistant to direct and indirect drawdown effects (Carmignani and Roy 2017). Fish assemblages, though less directly affected by winter drawdowns (except where there is critically low dissolved oxygen), can be indirectly negatively affected via decreased food resources and changes in spawning habitat (Carmignani and Roy 2017).

Drawdowns modify abiotic conditions, cause sediment dessication and freezing, place stress on vegetative root structures (Siver et al. 1986), displace plants as a result of erosion of frozen sediment during spring refills (Beard 1973, Mattson et al. 2004), and stifle species growth by increasing acidity and cations to toxic concentrations (Peverly and Kopka 1991). Annual winter drawdowns can, through time, coarsen sediment texture and remove nutrients in the exposure zone, making these sites unsuitable for macrophyte colonization and growth, particularly in steep-sided basins (Hellsten 1997).

Other adverse impacts of drawdowns (New Hampshire Department of Environmental Services 2019) may include:

- Large amounts of aquatic plants and organisms that succumb to the drawdown begin to decay shortly after drawdown, but nutrient release to the water body may not occur until full-pond level is achieved. Nutrients released from decayed material will quickly be used by algae and cyanobacteria, leading to increased cell production. Shallow lakes have shown shifts from clear, plant-dominated conditions to turbid, algal dominated systems.
- Algal or cyanobacteria blooms may follow.
- Aquatic food web changes may result in shifts in plant and animal structure.
- Oxygen concentrations throughout the water column may be impacted.
- Changes in the bottom sediment may also occur. Softer sediments may become compacted, or frozen segments that are lighter than water could loosen and float around in large masses, or as floating islands in the water body, only to settle once again in a new location.
- Impacts to aquatic animal species can be significant. These impacts range from stranding animals to food chain modifications, or stressors associated with the drawdown. Fish, frogs, salamanders, turtles, aquatic insect larvae, mussels, and others can be affected by a drawdown. Agile and faster moving organisms may be able to move upstream or downstream to other unimpacted habitats, however, these fish may be confined to smaller, shallower areas where they become easy prey to consumers, or suffer from oxygen deprivation. Slower moving, more sedentary organisms have a greater risk to negative impacts. Freshwater mussels, snails, insects, and crayfish may not be able to find suitable habitat, and may succumb to the drawdown.

Species	Potential Effects on Key Life Stages and Critical Habitats	Species-specific BMPs
Macroinvertebrates	Macroinvertebrates that are semivoltine (have more than one generation or brood/year), have long life cycles, have low to moderate mobility (e.g., clams and crawlers), or are fine-sediment burrowers) can be sensitive to drawdowns and dewatering (Carmignani and Roy 2017). Taxon richness decreases with intensity of water level regulation; freezing and flushing of sediments in late winter can result in impoverished macroinvertebrate fauna; invertebrates with long life cycles seem especially vulnerable to unnatural water level fluctuations (Aroviita and Hämäläiien 2008). Low mobility organisms and filter feeders decrease with increasing drawdown (White et al. 2011). Benthic organisms increase more than threefold after drawdowns are reduced (Benson and Hudson 1975). Drawdowns can strand benthic invertebrates, resulting in mortality; diversity is reduced in drawdown zones (Kraft 1988). Benthic invertebrates may be susceptible to water-level changes that alter sediment exposure, temperature regime, wave-induced sediment distribution, and basal productivity (McEwan and Butler 2010). Haxton and Findlay 2011: ▪ Macroinvertebrate abundance is lower in zones or areas that have been dewatered as a result of water fluctuations, or low flows. ▪ Hypolimnetic draws are associated with reduced abundance of aquatic invertebrate communities and macroinvertebrates downstream of a dam ▪ Altered flows are associated with reduced abundance of fluvial specialists, but not habitat generalists	Incorporate hydropower ramping rates that result in lengthier reduction times for drawdowns, which allow macroinvertebrates to remain, or have access to, water as levels recede. Consider current flows, season, and air and water temperatures such that a rapid change in river height is avoided, adequate water is maintained in the river channel to prevent mortality, or exposure to extreme air and water fluctuations.

Species	Potential Effects on Key Life Stages and Critical Habitats	Species-specific BMPs
Fish	Fall and spring spawners, juvenile life stages in littoral zones, and insectivorous fish can be sensitive to drawdowns. Littoral spawning in the fall—Low water levels in spring can prevent fish access to spawning areas; the amount of fall to late spring drawdown is inversely correlated to year-class strengths of coregonid fishes (Gaboury and Patalas 1984). Fish that spawn on reservoir bottoms with winter drawdowns can experience dissolved oxygen deficiency in late winter, which affects survival of eggs and year-class strength (Sutela et al. 2002). Late winter drawdowns reduced lake whitefish abundance by more than 80% during three years of drawdowns because of reduced recruitment and decreased survival (Mills et al. 2002). Littoral spawning in the spring—Dewatered areas in early spring can limit the recruitment of spring spawners, such as northern pike (Kallemeyn 1987). Spring spawning could be negatively impacted by the effects of drawdowns that occur during years when winter and spring droughts occur (McDowell 2012). Littoral juvenile life stage—Different species of fish use differing behavioral strategies to address water fluctuations in natural and man-made lakes. One study tested fish behavior when lake level was decreased in the fall; larger burbot were more successful competing for suitable shelter than smaller burbot until a certain level, at which the largest fish abandoned shelter use while smaller fish persisted in sheltering behavior (Fischer and Öhl 2005). In contrast, stone loach showed no hierarchical order, or size-related shelter use (Fischer and Öhl 2005). Insectivorous fish—Hypolimnetic draws are associated with reduced abundance of aquatic fish and invertebrate communities and macroinvertebrates downstream of a dam (Haxton and Findlay 2008).	Consider life history needs of native fish to avoid drawdown times that could affect spawning, or juvenile life stages.

Manual and Mechanical Dreissenid Removal

Physical harvesting of dreissenids can reduce the diversity and abundance of soft-sediment benthic community taxa (Wittman et al. 2012). Following best management practices for manual removal minimizes any effects on non-target organisms (Culver et al. 2013). Steps involved in manual removal (Culver et al. 2013) include: organize divers, train divers, conduct pre-implementation surveys, prepare target site, manually remove mussels using hand-held tools, collect removed mussels, dispose of removed mussels, decontaminate persons and gear, and evaluate efficacy of effort.

Effort to remove mussels manually can be minimized by using a suction pump made from PVC and a SCUBA tank to vacuum the mussels into collection bags, however, use of this technique can significantly disrupt benthic macroinvertebrate community structure (Wittman et al. 2012).

Suction harvesting side effects can include high turbidity, reduced clarity, and algae blooms from nutrient release caused by disturbance of bottom sediment, which can reduce oxygen conditions and ultimately affect ecosystem communities (New York State Department of Environmental Conservation 2005). Suction harvesting also has the potential to release sediment-bound heavy metals into the water column, which can affect the food chain in the water body (New York State Department of Environmental Conservation 2005).

Oxygen Deprivation

Bottom/benthic barriers or mats can be installed on portions of lake bottoms and weighted, resulting in oxygen deprivation. This tactic is used for low to moderate mussel infestations in difficult to access locations, and can be enhanced by combining it with tactics that target larval stages (Culver et al. 2013). This method is not as effective in locations with large infestations.

Steps involved in oxygen deprivation (Culver et al. 2013) include: organize divers and boat operators, locate needed supplies, review the need for area closures, determine mussel distribution, conduct pre-implementation survey, conduct a pilot study, install tarps, add chemicals/biocides if needed, monitor during installation, remove tarp, decontaminate persons and gear, and evaluate efficacy of effort.

Benthic barriers interfere with respiration in fish and macroinvertebrates. Benthic barriers comprised of anchored textile/plastic are generally placed over vegetation to prevent the growth and establishment of plants whereas benthic barriers can be created by depositing silt to smother bottom-dwelling organisms (US Army Corps of Engineers 2012). Response to silt barriers can include feeding inhibition, reduced metabolism, avoidance, or mortality (Collins et al. 2011).

Although studies have shown that benthic barriers may impact non-target organisms, especially benthic dwellers, and will affect chemistry at the sediment-water interface, impacts are limited to the area of installation, and because only a small percentage of lake bottoms are typically exposed to benthic barriers, lake-wide impacts are not expected and have not been observed (Mattson et al. 2004).

Table 6. Examples of results of sediment dose-response experiments for fish and macroinvertebrates.

Organism	Suspended sediment concentration (mg 1-1)	Duration (h)	Impact	Reference
Fish - Chinook salmon	207 000	1	100% mortality of juveniles	Newcomb and Flagg 1983
Fish - Cyprinids	100 000	168	Some survival	Wallen 1951
Copepod – Cladocera	25 000	Unknown	Feeding inhibition	Alabaster and Lloyd 1982
Mollusk – Bivalvia	600	Unknown	Feeding inhibition and reduced metabolism	Aldridge et al. 1987
Benthic invertebrates	743	Unknown	Reduce population (85%)	Wagener and LaPerriere 1985

Chapter 4: Tables 5 and 6 References

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CHAPTER 5. BEST MANAGEMENT PRACTICES

Practices that avoid or minimize impacts to listed species and critical habitats

Federal agencies must ensure actions are not likely to jeopardize the survival of listed species nor adversely modify critical habitats. Best management practices (BMPs) are intended to reduce adverse effects to wildlife, plants, and their habitats. The following list of BMPs includes general measures from the Environmental Protection Agency (EPA 1993) as well as nationwide standard conservation measures[20] intended to reduce impacts to listed species and associated critical habitats.

All BMPs should be reviewed before any rapid response action to identify those BMPs that would avoid and minimize take. All BMPs pertinent to a specific control action should be reviewed during discussions initiating the emergency consultation process with the USFWS and in advance of the action to ensure optimal protections for listed species.

General Best Management Practices

1. Properly Handle and Remove Hazardous and Solid Waste

a. Provide enclosed solid waste receptacles at all project areas. Non-hazardous solid waste (trash) would be collected and deposited in the on-site receptacles. For more information about solid waste and how to properly dispose of it, see the EPA Non-Hazardous Waste website.

b. Develop a written contingency plan for all project sites where hazardous materials (e.g., pesticides, herbicides, petroleum products) will be used or stored. To clean up small-scale accidental hazardous spills, ensure appropriate materials/supplies (e.g., shovel, disposal containers, absorbent materials, first aid supplies, clean water) are available on site. Report all hazardous spills. Emergency response, removal, transport, and disposal of hazardous materials shall be done in accordance with the U.S. Environmental Protection Agency. Store at least 150 feet from surface water and in areas protected from runoff hazardous materials and petroleum products in approved containers, or chemical sheds.

c. All chemicals shall be handled in strict accordance with label specifications. Proper personal protection (e.g., gloves, masks, protective clothing) shall be used by all applicators. The safety data sheet (SDS) from the chemical manufacturer shall be readily available to the project coordinators for detailed

20 https://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

information on each chemical to be used, in accordance with applicable Federal and State regulations concerning the use of chemicals.

d. To protect the health of workers, pesticide applicators shall wear appropriate personal protective gear (e.g., clothing, gloves, and masks) in accordance with state applicators' licensing requirements when applying, mixing, or otherwise handling pesticides.

e. Avoid chemical contamination of the project area by implementing a spill prevention, control, and countermeasures (SPCC) plan. A copy of the plan will be maintained at the work site.

    i. Outline BMPs, responsive actions in the event of a spill or release, and notification and reporting procedures. Take corrective actions in the event of any discharge of oil, fuel, or chemicals into the water, including:

        a. Containment and cleanup efforts will begin immediately upon discovery of the spill and will be completed in an expeditious manner, in accordance with all local, state, and federal regulations. Cleanup will include proper disposal of any spilled material and used cleanup material.

        b. The cause of the spill will be determined, and appropriate actions taken, to prevent further incidents or environmental damage.

        c. Spills will be reported to the appropriate state and/or federal agency.

        d. Work barges will not be allowed to ground out.

        e. Excess or waste materials will not be disposed of or abandoned waterward of ordinary high water or allowed to enter waters of the state. Waste materials will be disposed of in an appropriate manner consistent with applicable local, state, and federal regulations.

        f. Materials will not be stored where wave action or upland runoff can cause materials to enter surface waters.

    ii. Outline the measures to prevent the release or spread of hazardous materials found on site and encountered during construction but not identified in contract documents, including any hazardous materials that are stored, used, or generated on the construction site during construction activities. These items include, but are not limited to, gasoline, diesel fuel, oils, and chemicals.

iii. Maintain at the site applicable spill response equipment and material.

2. Minimize Disturbance and Restore Disturbed Areas

a. Minimize construction impacts on fish and wildlife, including avoiding unnecessary disturbance to habitats by driving on existing roads, working only in the required area, and minimizing direct disturbance to streams and open water sources. Maximize use of disturbed land for all project activities (i.e., siting, lay-down areas, and construction).

b. Complete restoration activities at individual project sites in a timely manner to reduce disturbance and/or displacement of wildlife in the immediate project area. Minimize project creep by clearly delineating and maintaining project boundaries (including staging areas).

c. Use existing roadways or travel paths for access to project sites.

d. Avoid the use of heavy equipment and techniques that will result in excessive soil disturbances or compaction of soils, especially on steep or unstable slopes.

e. To avoid direct and indirect adverse effects to listed plants and habitats, delineate and cordone off the areas, and clearly communicate to equipment operators and project participants/volunteers.

f. Replant bank stabilizing vegetation that is removed or altered because of restoration activities with native vegetation and protect it from further disturbance until new growth is well established.

g. Source seedlings, cuttings, and other plant propagules for restoration from local ecotypes.

h. Implement pre-watering, and other preparations at project site and staging areas, prior to ground-disturbing activities, to maintain surface soils in stabilized conditions where support vehicles and equipment will operate.

i. Apply water, or an approved dust palliative during ground-disturbing activities including clearing, grubbing and earth moving activities, to keep soils moist throughout the process and immediately after completion.

j. Incorporate the use of sediment barriers, or other erosion control devices, downstream of ground-disturbing activities.

k. Limit stream crossings to designated and existing locations.

l. Obliterate all temporary roads and paths upon project completion

3. Comply with all Terms, Conditions, and Stipulations in Permits and Project Authorizations—Eliminate or reduce adverse effects to endangered, threatened, and sensitive species and their critical habitats.

4. Protect Wetland Areas

a. Avoid contaminating natural aquatic and wetland systems with runoff by limiting all equipment maintenance, staging laydown, and dispensing of fuel, oil, etc., to designated upland areas, i.e., equipment shall be stored, serviced, and fueled a minimum of 150 feet from aquatic habitats and other sensitive areas.

b. Implement sedimentation and erosion controls, when and where appropriate, during wetland restoration or creation activities to maintain the water quality of adjacent water sources.

c. Avoid removal of riparian vegetation.

d. Complete any construction associated with the project onsite in compliance with each state's water quality standards, including:
    i. Petroleum products, fresh cement, lime, concrete, chemicals, or other toxic or deleterious materials will not be allowed to enter surface waters or onto land where there is a potential for reentry into surface waters.

    ii. Fuel hoses, oil drums, oil or fuel transfer valves, fittings, etc., will be checked regularly for leaks, and materials will be maintained and stored properly to prevent spills.

    iii. When fill (e.g., gravel) is required in the staging area and water access location, only clean rock is permitted, and all fill will be removed post-action. Fill would not be permitted to enter the water. During construction activities, the minimum amount of vegetation will be removed to gain access. Wetland sites will be avoided to the extent possible.

5. Monitor Post-Action—Monitoring is required during restoration project implementation and for at least one year following the action to ensure that restoration activities implemented at individual project sites are functioning as intended and do not create unintended consequences to fish, wildlife, and plant species and their critical habitats or adversely impact human health and safety. Corrective actions, as appropriate, shall be taken to address potential and existing adverse effects to fish, wildlife, and plants.

6. Train Personnel—Provide environmental awareness training program to all personnel to brief them on the status of the special status species and the required avoidance measures.

7. Notify the Public and Post Action Areas

a. Temporarily close staging and action areas to public use for public safety. Make information available to the public on the purpose and timing of the closure.
b. Flag and identify sensitive resource areas, equipment entry and exit points, road and stream crossings, staging, storage and stockpile areas, and no-spray/application areas and buffers.

8. Ensure Responsible Use of Clean Equipment

a. Provide vehicle wash stations prior to entering sensitive habitat areas to prevent accidental transport of non-native and invasive species.
b. Avoid soil contamination by using drip pans underneath equipment and containment zones at construction sites and when refueling vehicles or equipment.
c. Consistently check equipment for leaks and other problems that could result in the discharge of petroleum-based products or other material into the water or riparian area.

9. Protect the Integrity of the Water Body

a. Contain the in-water treatment area by installing a vertical floating curtain barrier that extends from the surface of the water to the bottom of the water body, restricting flow and open water exchange. The barrier outlining the treatment area should contact the shoreline and encompass any existing public boat ramps, docks, or other infrastructure.

10. Protect Disturbance/Effects to Listed Species During Key Vulnerable Life History Stages—In-water work treatment windows are designated for each state by state and federal agencies. The treatment window guidelines restrict in-water work during certain periods to protect fish and wildlife resources during vulnerable and critical life stages. In-water work should be conducted only during the approved in-water work window, as described by each of the four CRB states or federal agencies (listed below). **If an action is proposed outside of the recommended windows, the action entity should receive approval for all appropriate variances to these windows to avoid any potential effects on listed species and their habitats. Also note that each state has designated state-listed species in addition to federal listed species and critical habitats. Contact your state fish and wildlife agency to ensure protections for state-listed species are implemented.**

Washington

The Washington Department of Fish and Wildlife (WDFW) provides recommended treatment windows for aquatic herbicide treatment. WDFW recognizes that aggressive treatment of emerging invasive species may sometimes be advisable during these treatment windows. In these situations, the Washington Department of Ecology and the permittee must consult WDFW to determine ways to minimize or mitigate treatment impacts to fish and wildlife. Contact the local WDFW regional office. **The annual treatment window is July 15–October 31, unless the specific water body is listed in the treatment window table.** If an action is proposed outside of this window, the Department of Ecology and the permittee must consult WDFW to determine an alternate timing window or if priority species are present, potential species impacts and appropriate mitigation.

Oregon

The Oregon Department of Fish and Wildlife (ODFW), under its authority to manage Oregon's fish and wildlife resources, developed the Oregon Guidelines for Timing of In-Water Work to assist the public in minimizing potential impacts to important fish, wildlife, and habitat resources. The guidelines are based on ODFW district fish biologists' recommendations. Primary considerations are given to important fish species including anadromous and other game fish and threatened, endangered, or sensitive species. Time periods are established for in-water work to avoid the vulnerable life stages of these fish including migration, spawning, and rearing.

ODFW, on a project-by-project basis, may consider variations in climate, location, and category of work that would allow more specific in-water work timing recommendations. The appropriate ODFW district office will make these more specific timing recommendations through the applicable planning or permitting process. ODFW in-water timing guidelines are typically applied to activities that are proposed in streams, rivers, upstream tributaries, and associated reservoirs and lakes. The timing guidelines are not typically applied in ocean waters or wetlands.

Montana

The US Fish and Wildlife Service has established in-water timing work with the US Army Corps of Engineers. **In bull trout feeding, migrating, overwintering habitat:** In-channel work can only occur from July 1 to September 30.

In bull trout spawning and rearing habitat: In-channel work can only occur from May 1 to August 31.

Idaho

National Marine Fisheries Service (NMFS) staff provide guidelines for in-water work in Idaho.

Instream work windows for all other streams in the project area (Lower Salmon River, Lower Snake River, and Clearwater River Basins).

Stream type	Instream work window
Perennial, no listed fish	Base the timing on the nearest listed fish found downstream from the project area
Perennial, listed steelhead only	Preferred window is August 1 through October 30; exceptions may be made on a project-specific basis to begin work as early as July 15.
Perennial, listed steelhead and salmon	August 1 through October 30 when unlisted Chinook and coho spawning habitats

	are not present in the action area; July 15 through August 15 when Chinook spawning habitat is present in action area; August 1 through September 15 when coho spawning habitat is present in the action area.
Perennial, listed steelhead as well as listed salmon or bull trout	July 15 through August 15 Intermittent August 1 to October 30, or any time work can be completed while the stream is not flowing

11. Mitigation—Any native fish and wildlife habitat destroyed in the development of an access corridor would be restored with appropriate, native species once the final treatment is completed. Replacement plant species will be recommended by a local state botanist. Mitigation methods may include:

- Mowing the site for ease of planting and to reduce initial plant competition during establishment.
- Removal of any fill using proper equipment.
- Planting to include hand tools, a power auger, hydraulic auger operated by equipment, or stinger operated by equipment. A 1 m buffer of herbaceous vegetation will be left between the shoreline and upland plantings to prevent potential sediment runoff.
- Installing weed matting or plant protection material to keep competition down while plants establish, and keep any loose sediment in place.
- Seeding, either via top seeding or seed drill depending upon herbaceous species and site characteristics.
- Seed native grasses, forbs, and pollinator species as available.
- Silt fence or weed-free straw will be used to contain runoff, if necessary.
- Monitoring plant establishment with adaptive management to ensure appropriate plant survival of 80% at 24 months.

Best Management Practices to Avoid the Spread of Invasive Species

Agencies throughout North America should institute best management practices to reduce the likelihood of introducing invasive species, particularly via plant seed or propagules, during maintenance, construction and vegetation management activities. The following general best management practices, adapted from a variety of sources (British Columbia Ministry of the Environment 2011; US Forest Service 2012; Halloran et al. 2013; Elwell and Phillips 2016; New York State Department of Environmental Conservation 2018; Creative Resource Strategies, LLC 2019), can help prevent the spread of invasive species.

A. Education and Support

Knowledge of invasive species and techniques to avoid their spread is critical to the implementation of all BMPs.

A.1 Provide trainings and educational materials for staff and contractors.

- Conduct training sessions on sanitation procedures for other equipment.
- Provide brochures and other materials on weed identification.
- Provide checklists and instructions for execution of BMPs in the field.
- Communicate the impact of invasive species and the importance of prevention.

B. Planning and Records

B.1 Include an invasive species risk evaluation as a component of initial project planning.

Evaluate the risk of:

- Spreading invasive seeds and other propagules from the project site to new areas. Identify invasive species in and surrounding the site. Identify control and sanitation measures that would reduce risk.
- Bringing invasive propagules into the site during project activities. Consider any use and transportation of project vehicles outside of the project area. Identify sanitation measures that would reduce this risk.

B.2 Incorporate design components that minimize the movement of invasive propagules into or out of the site.

B.3 Incorporate sanitation and invasive control measures into plans, budgets, and contracts.

- Consider the use of specialized gear and clothing, tools for sanitation, and any staff training.

- Allocate time for prevention and sanitation activities.

B.4 Schedule activities to minimize the potential for spread of invasive propagules into or out of the site.

- Consider life stages of invasive plants. Avoid activities that may spread propagules when plants are fruiting.

- Consider the toxicity, ecological fate, persistence, and unintended consequences of pesticides. Consider timing to avoid impacts to listed or at-risk species, pollinators, nesting birds and mammals, and to trail users, medicine and food harvesters, and other public use.

B.5. Record observations of all suspected priority invasive species and others of concern. Note the date, location in as much detail as possible, approximate size of the patch, species identity if known, and stage of the plant (flowering, fruiting, etc.).

C. Soil Disturbance

Disturbing soil creates opportunities for the establishment of weed species.

C.1 Minimize soil disturbance—Whenever possible, activities should be avoided in areas containing fruiting, or rhizomatous invasive plants.

When soil must be disturbed, use proper erosion control practices—Minimize soil disturbance in areas containing invasive plants. Should invasive plants be detected early, use a certified pesticide applicator and spray within limits of pesticide permit, and/or take other actions as may be deemed appropriate.

Stabilize disturbed soils as soon as possible by seeding, mulching or using stone or other materials that are free of invasive plant materials. Site-specific revegetation efforts should address site preparation, species selection, and overall maintenance of the area. The activities to reduce invasive plants are intended to complement other practices addressing erosion control, proper drainage, and protecting infrastructure. Materials, such as fill, loam, gravel, mulch or hay should not be brought into project areas from sites where invasive plants are known to exist or have existed.

C.2 Manage and contain any water runoff, which can carry weed propagules.

C.3 Plan for cleaning time.

D. Project Materials

Project materials are common dispersal vectors for weed propagules to new locations. Soils, erosion control materials (especially if reused), landscape materials, water, and other materials can all contain propagules. Use of these BMPs can prevent the introduction of weed species to a project site through contaminated materials.

D.1 Use project materials that are known to be weed free.

Whenever possible, re-use weed-free materials from onsite rather than importing new materials. When re-using materials is not possible, obtain materials from local vendors, ideally those offering weed-free materials. Inspect materials for weed propagules. Use certified weed-free seed. Monitor for weeds after the installation of new materials. Treat any state/local-listed priority weeds found at early stages to maximize effectiveness of control.

D.2 Prevent contamination and germination of weed propagules in unused stockpiles of materials.

Cover exposed materials to protect from wind and rain. Inspect stockpiles prior to use. Treat any weeds found before the material is used.

D.3 Prevent contamination when transporting project materials.

Never move materials from a weed-infested to an un-infested location.
Cover materials during travel to prevent either contamination of clean materials, or spread of propagules from infested materials.

E. Travel and Maintenance of Equipment—Disinfection Protocols

Workers can spread invasive species as they travel from site to site. These BMPs should be implemented at all visits to sites known to, or suspected to, contain invasive species. All vehicles should be examined for potential weed propagules: mud, soil, vegetation on vehicle undercarriages, wheel wells, bumpers and grills. Wearing appropriate clothing, boots, and other gear, and cleaning them before leaving a site can prevent them from transporting weeds to new sites. Following these BMPs will minimize introduction of invasive species by equipment, vehicles, and people traveling among project sites.

E.1 Locate and use a staging area that is free of invasive plants.

E.2. Avoid driving off-road, or parking in areas infested with invasive species.
Arrange routes to travel to uninfested sites first, when the vehicle is clean. Visit weedy/infested sites last.

E.3. Inspect and Clean

Designate cleaning areas for tools, equipment and vehicles—Ideal locations include paved or sealed surfaces. Avoid waterways and sensitive habitat areas. If equipment must be used or staged in areas where invasive plants occur, all equipment, gear (i.e., boots), machinery, and hand tools should be cleaned of all viable soil, plant, and animal material before leaving the project. Acceptable methods of cleaning include but are not limited to:

- Portable wash station that contains runoff from washing equipment (containments must be in compliance with wastewater discharge regulations). If on-site cleaning is not an option, clean equipment at a commercial car wash facility. For vehicles and other large equipment, pay particular attention to the undercarriage and treads of tracks and tires.

- High pressure air.

- Brush, broom or other tool (used without water) – this is likely to be the BMP most practiced to avoid unintentional transport of invasive species as equipment moves from site to site.

Aquatic sites— Before leaving any aquatic site or any site in wet condition, thoroughly remove all organic matter (e.g., mud, plants, algae) from nets, sampling devices, boots (especially the tread), and any other equipment or clothing that has come into contact with water or aquatic sediments.

- Watercraft—Inspection and decontamination procedures for watercraft entering and leaving waterbodies should follow the Uniform Minimum Standards and Protocols for Watercraft Inspection and Decontamination Programs for Dreissenid Mussels in the Western United States (Elwell and Phillips 2016).

- Firefighting activities—US Forest Service and Bureau of Land Management prevention activities associated with the transport of water during firefighting activities should be used to prevent the spread of invasive species, sanitize equipment, and address disposal and safety concerns.

- Working in water bodies:

    - Sample from least to most invasive species-contaminated areas within the water body, for example, sample upstream to downstream or from areas of less weed growth to dense weed growth.

    - Minimize wading and avoid running boats onto sediment. For example, use bank sampling poles instead of wading.

    - Avoid getting plants and sediment inside boats or other sampling gear.

    - Use a catch pan underneath dredges, etc., to keep potential invasive species off boat decks and out of bilges.

    - Clean, Drain, Dry

        - CLEAN – Remove any visible vertebrates, invertebrates, plants, plant fragments, seeds, algae, and dirt. If necessary, use a scrub brush and rinse with clean water either from the site or brought for that purpose. Continue this process until the equipment is clean.

  - DRAIN – Drain all water in bilges, samplers, and other equipment that could hold water before leaving the site.

  - DRY – Fully wipe down all equipment until dry.

- Decontaminate, if possible—Decontaminate using options for aquatic invasive species (Elwell and Phillips 2016).

F. Transport & Disposal of Plants

After invasive plant removal, plant parts must be properly disposed of to prevent establishment in other locations.

F.1 When disposing on site, minimize the chance of viable material spreading by choosing a location where viable plant material will be contained, buried, or destroyed. Conduct monitoring at and near debris piles to treat any weeds that may have spread during the disposal and degradation process.

Drying/Liquefying: For large amounts of plant material, or for plants with rigid stems, place the material on asphalt, and under tarps, or heavy plastic to prevent the material from blowing away. For smaller amounts of plant material, or for plants with pliable stems, bag the material in heavy- duty (3 mil or thicker) garbage bags. Keep the plant material covered or bagged for at least one month and up to 3 months. Material is nonviable when it is partially decomposed, very slimy, or brittle. Once material is nonviable, it can be disposed of in an approved landfill or brush pile.

Brush Piles: Plant materials from most invasive plants can be piled on site to dry. However, for some species, care must be taken to pile stems so that the cut surfaces are not in contact with soil. This method is not recommended for any invasive plant with seeds or fruit attached, unless plants can be left within the limits of the infestation.

Burying: Plant material from most invasive plants can be buried a minimum of three feet below grade. This method is best used on a job site that is already has disturbed soils.

Burning: Plant material should be taken to a designated burn pile. (All necessary permits must be obtained before burning).

F.2 Herbicides—If herbicides are applied at the disposal sites, only licensed applicators are allowed to apply herbicide treatments. Ensure herbicides are contained such that they do not come into contact with native plants and wildlife.

F.3 When disposing off site, select appropriate disposal locations and transport properly. Invasive plant material must be covered during transport and transport vehicles swept clean at the transported location.

G. Revegetation and Landscaping

Proper revegetation and landscaping work can create weed-resistant plant communities. Without proper care, however, landscaping activities and materials can serve as vectors for invasive species.

G.1 Select vegetation appropriate to the site to maximize weed resistance.

G.2 Use plants from a local source.

Use local ecotypes whenever possible for best plant establishment. Verify the taxonomy of species to be planted. Ensure all species to be used are approved.

G.3 Mitigate the risks of unintentional invasive species introductions during site preparation activities.

Whenever possible, time site preparation activities when invasive species are not producing seed.

Treat any invasive species found during the site preparation process.

Minimize soil disturbance to the amount necessary for planting.

Chapter 5 References

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Environmental Protection Agency. 1993. Guidance Manual for Developing Best Management Practices. IPA 833-B-93-004.

Halloran, J., H. Anderson, and D. Tassie. 2013. Clean equipment protocol for industry. Peterborough Stewardship Council and Ontario Invasive Plan Council. Peterborough, ON.

National Marine Fisheries Service (NMFS). 2000. Guidelines for electrofishing waters containing salmonids listed under the Endangered Species Act. National Marine Fisheries Service, Portland, Oregon, and Santa Rosa, California.

New York State Department of Environmental Conservation. 2018. Inter-agency Guidelines for Implementing Best Management Practices to Control Invasive Species on DEC Administered Lands of the Adirondack Park.

Reynolds, J.B. 1996. Electrofishing. Pages 221–253 *in* B. R. Murphy and D. W. Willis, eds. Fisheries techniques, 2nd edition. American Fisheries Society, Bethesda, Maryland.

US Forest Service. 2012. Non-native Invasive Species Best Management Practices. 282pp.

CHAPTER 6. POST-EMERGENCY CONSULTATION

As soon as practical after the emergency event is under control, the action agency initiates consultation if the emergency response may affect listed species and/or critical habitat. If adverse effects to a listed species are necessary to respond to the emergency, consultation should begin as soon as possible after the emergency to discuss effects to any listed species that may have occurred.

The action agency drafts a biological assessment that includes a justification for expedited consultation, a description of activities that occurred during the emergency, documentation of how the USFWS recommendations were implements, and resulting effects to listed species and their habitats.

Because emergency consultations are "after the fact" consultations, they do not strictly follow the standard Biological Opinion format. Rather, they focus on assessing the effects, identifying restoration opportunities, and re-evaluating environmental baselines.

An emergency consultation includes an estimate of the amount of take that occurred during the emergency, documentation of USFWS recommendations to minimize effects, an evaluation of the action agency's success in implementing the recommendations, and a determination of the ultimate effect of the take of listed species.

Take or other adverse effects resulting from the emergency are not attributable to the Federal action agency. Rather, incidental take by the Federal agency could only occur because of the response to the emergency. Because the incidental take statement is issued after-the-fact, reasonable and prudent measures are not included in the biological opinion for the emergency actions unless ongoing actions will result in incidental take.

APPENDIX A. 50 CFR §17.21 - PROHIBITIONS

Section (c) (5):

(5) Notwithstanding paragraph (c)(1) of this section, any qualified employee or agent of a State Conservation Agency which is a party to a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by his agency for such purposes, may, when acting in the course of his official duties take those endangered species which are covered by an approved cooperative agreement for conservation programs in accordance with the Cooperative Agreement, provided that such taking is not reasonably anticipated to result in:

(i) The death or permanent disabling of the specimen;
(ii) The removal of the specimen from the State where the taking occurred;
(iii) The introduction of the specimen so taken, or of any progeny derived from such a specimen, into an area beyond the historical range of the species; or
(iv) The holding of the specimen in captivity for a period of more than 45 consecutive days.

APPENDIX B. U.S. FISH AND WILDLIFE SERVICE REGIONAL OFFICE CONTACTS

The contact list below is for USFWS staff within the Ecological Services (ES) Program that coordinate on activities within the CRB. The Ecological Services Program administers the ESA inclusive of the section 7 consultation program. Consultation on emergency response actions for dreissenid mussels would be administered through the ES Program.

The CRB Plan (Heimowitz and Stephens 2008) provides contacts for the USFWS Fish and Aquatic Conservation (FAC) Program. In the event of a rapid response, we anticipate that both the FAC and ES Programs would be closely involved and part of internal coordination as well as participation with procedures outlined in the CRB Plan (e.g., MAC calls).

Region 1 - Pacific U.S. Fish and Wildlife Service Ecological Services Eastside Federal Complex 911 N.E. 11th Avenue Portland, OR 97232-4181 www.fws.gov/pacific/ecoservices/ *Assistant Regional Director - Ecological Services:* (503) 231-6151	**Region 6 - Mountain Prairie** U.S. Fish and Wildlife Service Ecological Services 134 Union Boulevard, Suite 650 Lakewood, CO 80228 www.fws.gov/mountain-prairie/es *Assistant Regional Director - Ecological Services:* (303) 236-7400

APPENDIX C. LISTED SPECIES AND CRITICAL HABITAT EXCLUDED FROM FURTHER ANALYSIS

Mammals

Black-footed Ferret (*Mustela nigripes*) (MT)

The historic range of this species aligned with the colonies of three species of prairie dogs—black-tailed, white-tailed, and Gunnison's (*Cynomys* spp.) (Anderson et al. 1986). Their habitat, and the associated habitat of prairie dogs, is primarily open mixed grass, or short grass prairie, and is classified as "black-tailed prairie dog town grassland complex." The most recent distribution of black-footed ferrets in Montana can be accessed at http://fieldguide.mt.gov/speciesDetail.aspx?elcode=AMAJF02040.

Canada Lynx (*Lynx canadensis*) (OR, WA, ID, MT)

The Canada lynx is a boreal forest carnivore, and occurs across most of North America. Its habitat is moist, cool, boreal spruce-fir forests in northwestern Montana/northern Idaho and north-central Washington.[21] The distribution of Canada lynx can be accessed at https://wildcatconservation.org/wild-cats/north-america/canada-lynx/.

Gray wolf (*Canis lupus*) (OR, WA)

The gray wolf (*Canis lupus*) was once found throughout much of the continental United States and are listed as endangered in the western 2/3 of Oregon and Washington. Gray wolves are one of the most wide-ranging land animals. They occupy a wide variety of habitats, from arctic tundra to forest, prairie, and arid landscapes. Click on the following links for additional information on wolves in Oregon and Washington.

Grizzly bear (*Ursus arctos horribilis*) (WA, ID, MT)

There are five areas where grizzlies remain today—Yellowstone ecosystem, Northern Continental Divide ecosystem, Cabinet-Yaak ecosystem, Selkirk ecosystem, and Northern Cascades ecosystem.[22] Grizzly bears are found many different habitats, from dense forests to subalpine meadows, open plains and arctic tundra.

Mazama pocket gopher (*Thomomys azama pugetensis, glacialis, tumuli, and yelmensis*) (WA)

The Olympia, Roy Prairie, Tenino, and Yelm pocket gophers are regionally endemic subspecies of the Mazama pocket gopher found only in Washington. The Olympia, Tenino, and Yelm pocket gophers are only found in Thurston County whereas the Roy Prairie pocket gopher is only found in Pierce County. Preferred habitat is prairies, grasslands, and meadows. The Joint Base Lewis-McChord and Olympia airport contain the largest areas occupied by any of the four listed species.

[21] https://www.fws.gov/mountain-prairie/es/canadaLynx.php

[22] https://www.fws.gov/mountain-prairie/es/grizzlyBear.php

Northern Idaho ground squirrel (*Urocitellus endemicus*) (ID)

Populations of the northern Idaho ground squirrel have been found in Adams and Valley Counties of western Idaho, though the species historic range extends into neighboring Washington County.[23] It occurs in dry meadows surrounded by ponderosa pine and Douglas-fir forests, including lands managed by the U.S. Forest Service—Payette National Forest (1,500 to 7,500-foot elevations).

Northern long-eared bat (*Myotis septentrionalis*) (MT)[24]

Northern long-eared bats spend winter hibernating in caves and mines, called hibernacula. They use areas in various sized caves or mines with constant temperatures, high humidity, and no air currents. Within hibernacula, surveyors find them hibernating most often in small crevices or cracks, often with only the nose and ears visible. During the summer, northern long-eared bats roost singly or in colonies underneath bark, in cavities or in crevices of both live trees and snags (dead trees). Males and non-reproductive females may also roost in cooler places, like caves and mines. Northern long-eared bats seem to be flexible in selecting roosts, choosing roost trees based on suitability to retain bark or provide cavities or crevices. This bat has also been found rarely roosting in structures, like barns and sheds.

Columbia Basin Pygmy rabbit (*Brachylagus idahoensis*) (Columbia Basin Distinct Population Segment (DPS)) (WA)

Pygmy rabbits are typically found in areas that include tall, dense stands of sagebrush (*Artemisia* spp.), which provide food and shelter year-round. Pygmy rabbits dig their own burrows in deep, loose soils, but occasionally make use of burrows abandoned by other species (USFWS 2012).

Southern Selkirk Mountains woodland caribou (*Rangifer tarandus caribou*) (WA, ID)

The southern Selkirk Mountains population of woodland caribou occupies high-elevation habitat in the Selkirk Mountains of northern Idaho and northeastern Washington.[25] In 2018, three male animals were documented in the herd.[26]

Wolverine (*Gulo gulo luscus*) (WA, ID, MT, OR)

In North America, wolverines occur within a wide variety of habitats, primarily boreal forests, tundra, and western mountains throughout Alaska and Canada; however, the southern portion of the range extends into the contiguous United States. Currently, wolverines are found in the North Cascades in Washington and the Northern Rocky Mountains in Idaho, Montana, Oregon (Wallowa Range), and Wyoming.

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[23] https://ecos.fws.gov/ecp0/profile/speciesProfile?spcode=A0EK

[24] https://www.fws.gov/midwest/Endangered/mammals/nleb/nlebFactSheet.html

[25] https://www.fws.gov/idaho/promo.cfm?id=177175825

[26] https://www.opb.org/news/article/caribou-continental-united-states-south-selkirk-extinct/

Birds

Marbled murrelet (*Brachyramphus marmoratus*) (OR, WA)[27]

Marbled murrelets use forests that primarily include old-growth (characterized by large trees, a multi-storied stand, and moderate to high canopy closure), but also use mature forests with an old-growth component. Trees must have large branches or deformities for nest platforms, with the occurrence of suitable platforms being more important than tree size alone. Because marbled murrelets feed primarily on fish and invertebrates in nearshore marine waters, they require nearshore marine habitats with sufficient prey resources. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Northern spotted owl (*Strix occidentalis caurina*) (OR, WA)[28]

Northern spotted owls live in forests characterized by dense canopy closure of mature and old-growth trees, abundant logs, standing snags, and live trees with broken tops. They prefer older forest stands with multi-layered canopies of several tree species of varying size and age, both standing and fallen dead trees, and open space among the lower branches to allow flight under the canopy. Typically, forests do not attain these characteristics until they are at least 150 to 200 years old. Although the breeding season varies with geographic location and elevation, spotted owls generally nest from February to June. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Short-tailed albatross (*Phoebastria albatrus*) (OR, WA)

The short-tailed albatross is a pelagic bird that nests on islands in Japan and moves to feeding areas in the North Pacific after they breed and their chicks fledge in June. Because their habitat is marine, this species is excluded from further analysis.

Whooping crane (*Grus americana*) (MT)[29]

About 145 whooping cranes migrate across Montana from Wood Buffalo National Park to the Aransas National Wildlife Refuge. The spring migration occurs from late April to mid-June. Whooping cranes are occasionally sighted in southwestern Montana's Centennial Valley. The Whooping Crane has been observed in the marsh habitat present at Medicine Lake National Wildlife Refuge and Red Rock Lakes National Wildlife Refuge. Observations of individual birds in other areas of the state include grain and stubble fields as well as wet meadows, wet prairie habitat, and freshwater marshes that are usually shallow and broad with safe roosting sites and nearby foraging opportunities (Montana Bird Distribution Committee 2012). The Whooping Crane generally probes in the mud or sand in or near shallow water, but may also take prey from the water column, or pick items from the substrate (Ehrlich et al. 1992).

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[27] USFWS (1997)

[28] https://www.fws.gov/oregonfwo/articles.cfm?id=149489595

[29] http://FieldGuide.mt.gov/speciesDetail.aspx?elcode=ABNMK01030

Streaked horned lark (*Eremophila alpestris strigata*) (OR, WA)[30]

The streaked horned lark was listed as a threatened species on October 3, 2013. Habitat used by streaked horned larks is generally flat with substantial areas of bare ground and sparse low-stature vegetation primarily composed of grasses and forbs. Suitable habitat is generally 16-17% bare ground and may be even more open at sites selected for nesting. A key attribute of habitat used by larks is open landscape context. Critical habitat was designated for the streaked horned lark October 3, 2013, for 16 sites; in the Willamette Valley, designated critical habitat is located on the Service's Willamette Valley National Wildlife Refuge Complex at the William R. Finley, Ankeny and Baskett Slough units. The current range and distribution of the streaked horned lark can be divided into three regions: 1) the south Puget Lowlands in Washington; 2) the Washington coast and lower Columbia River islands (including dredge spoil deposition and industrial sites near the Columbia River in Portland, Oregon); and 3) the Willamette Valley in Oregon. The largest known populations of streaked horned larks breed in the southern Willamette Valley at the Corvallis Municipal Airport and on the Fish and Wildlife Service's Willamette Valley National Wildlife Refuge Complex. **Avoid disruption during the breeding season (late March into June).**

Invertebrates

Fender's blue butterfly (*Icaricia icarioides fender)* (OR)

Fender's blue butterfly occurs in native prairie habitats. Most Willamette Valley prairies are early seral (one stage in a sequential progression) habitats, requiring natural or human-induced disturbance for their maintenance. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Taylor's checkerspot butterfly (*Euphydryas editha taylori*) (OR, WA)

Habitat requirements for the Taylor's checkerspot consist of open grasslands and grass/oak woodland sites where food plants for larvae and nectar sources for adults are available. These sites include coastal and inland prairies on post-glacial, gravelly outwash and balds. Taylor's checkerspot larvae have been documented feeding on members of the figwort or snapdragon family (Scrophulariaceae), including paintbrush (*Castilleja hispida*) as well as native and non-native *Plantago* spp. in the plantain family (Plantaginacea). The last remaining population in Oregon also depends upon *P. lanceolate*. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Oregon silverspot butterfly (*Zpeyeria zerene hippolyta*) (OR, WA)

The Oregon silverspot occupies three types of grassland habitat. One type consists of marine terrace and coastal headland salt-spray meadows (e.g., Cascade Head, Bray Point Rock Creek-Big Creek and portions of Del Norte sites). The second consists of stabilized dunes as found at the Long Beach Peninsula, Clatsop Plains, and the remainder of Del Norte. Both of these habitats are strongly influenced by proximity to

[30] https://www.fws.gov/oregonfwo/articles.cfm?id=149489450

the ocean, mild temperatures, high rainfall, and persistent fog. The third habitat type consists of montane grasslands found on Mount Hebo and Fairview Mountains. Conditions at these sites include colder temperatures, significant snow accumulations, less coastal fog, and no salt spray. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Vernal pool fairy shrimp (*Branchinecta lynchi*) (OR)

Vernal pool fairy shrimp occur primarily in vernal pools, seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer. Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time. Different pools within or between complexes may provide habitat for the fairy shrimp in alternative years, as climatic conditions vary. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Vernal pool tadpole shrimp (*Lepidurus packardi*) (OR)

Vernal pool tadpole shrimp occur primarily in vernal pools (seasonal wetlands that fill with water during fall and winter rains and dry up in spring and summer). Typically, the majority of pools in any vernal pool complex are not inhabited by the species at any one time. Different pools within or between complexes may provide habitat for the tadpole shrimp in alternative years, as climatic conditions vary. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Western glacier stonefly (*Zapada glacier*) (MT)

Western glacier stoneflies are known to occur in 16 streams; 6 in Glacier National Park, Montana, 4 in Grand Teton National Park, Wyoming and 6 in the Absaroka/Beartooth Wilderness, Montana. All occupied streams are high-elevation, alpine streams originating from cold water sources, including glaciers and small icefields, permanent and seasonal snowpack, alpine springs, and glacial lake outlets. Recent collections of the western glacier stonefly were in habitats with daily maximum water temperatures less than 6.3°C (43°F). Western glacier stoneflies occupy the most upstream reaches of alpine streams, typically occurring within the first one half mile of stream, starting at the meltwater source. Therefore, they are sensitive to temperature changes and are considered to be a barometer for the effects of climate change in the alpine environment. Dreissenids would not occupy habitat occupied by the western glacier stonefly.

Meltwater lednian stonefly (*Lednia tumana*) (MT)

This species is listed as proposed threatened. Its habitat is alpine snow-melt streams at the base of glaciers in Glacier National Park. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Bruneau hot springsnail (*Pyrgulopsis bruneauensis*) (ID)

It is only found in 89 of the 155 small geothermal springs and seeps along an 8-kilometer length of the Bruneau River, extending about 2.5 miles above and below the confluence of Hot Spring, in Owyhee, County, Idaho (USFWS 2007). It prefers wetted rock faces of springs and flowing water, with large cobbles and boulders. The principal threat to the Bruneau hot springsnail is the reduction and/or elimination of its geothermal habitats as a result of groundwater withdrawal, primarily for agriculture. Spring temperatures are the predominant factor that determines the springsnail's distribution and abundance; the springsnail requires constant springwater temperatures to survive. Dreissenids would not occupy habitat occupied by the Bruneau hot springsnail.

Plants

Applegate's milk-vetch (*Astragalus applegatei*) (OR)

Applegate's milk-vetch occurs in flat-lying, seasonally moist, strongly alkaline soils dominated by greasewood (*Sarcobatus vermiculatus*) with sparse, native bunch grasses and patches of bare soil. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Cook's lomatium (*Lomatium cookii*) (OR)

This plant occurs only where soil types have a hard pan or clay pan layer close to the soil surface, creating seasonally wet soils and vernal pools. This species is known from the Agate Desert near Medford, Jackson County, Oregon and French Flat in the Illinois Valley in Josephine County, Oregon on land owned by The Nature Conservancy (Agate Desert Preserve), Jackson County, Oregon Department of Fish and Wildlife, City of Medford, Oregon Department of Transportation, Bureau of Land Management (French Flat), and private landowners. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Gentner's fritillary (*Fritillaria gentneri*) (OR)

Gentner's fritillary occurs within a broad array of plant associations but often occupies grassland and chaparral habitats within, or on the edges of, dry, open, mixed-species woodlands at elevations below 1,544 meters (5,064 feet). Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Golden paintbrush (*Castilleja levisecta*) (OR, WA)

Golden paintbrush occurs in upland prairies, on generally flat grasslands, including some that are characterized by mounded topography. Low deciduous shrubs are commonly present as small to large thickets. In the absence of fire, some of the sites have been colonized by trees, primarily Douglas-fir, and shrubs, including wild rose and Scotch broom, an aggressive non-native shrub. The mainland population in Washington occurs in a gravelly, glacial outwash prairie. Other populations occur on clayey soils derived from either glacial drift or glacio-lacustrine sediments (in the northern end of the species' historic range). All of the extant populations are on soils derived from glacial origins. At the southern end of its historic range, populations occurred on clayey alluvial soils, in association with Oregon white oak woodlands. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Greene's tuctoria (*Tuctoria greenei*) (OR)
This grass typically occurs in vernal pools in open grassland and is threatened by the destruction of rare vernal pool habitat. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Howell's spectacular thelypody (*Thelypodium howellii* spp. *spectabilis*) (OR)
Howell's spectacular thelypody occurs in moist, moderately well-drained, somewhat alkaline meadow habitats, typically growing with salt tolerant species. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Kincaid's lupine (*Lupinus sulphureus* spp. *kincaidii*) (OR, WA)
Kincaid's lupine is found mainly in the Willamette Valley, Oregon where it occupies native grassland habitats. Kincaid's lupine is typically found in native upland prairie. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Large-flowered woolly meadowfoam (*Limnanthes pumila* spp. *grandiflora*) (OR)
Woolly meadowfoam occurs at the edge of vernal pools at elevations of 375 to 400 meters (1,230 to 1,310 feet). Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

MacFarlane's four o'clock (*Mirabilis macfarlaneil*) (OR, WA)
Macfarlane's four-o-clock grows on rockslides, canyon walls, and sandy to gravelly talus slopes. Elevation ranges from 300 to 900 m (980 to 2050 feet). Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Malheur wire-lettuce (*Stephanomeria malheurensis*) (OR)
Malheur wirelettuce occurs in the high desert of the northern portion of the Great Basin and is located in an area south of Burns, Oregon. It occurs on top of a dry, broad hill on volcanic soil intermixed with layers of limestone. Dominant plants at the site are big sagebrush (*Artemisia tridentata*), gray rabbitbrush (*Chrysothamnus nauseosus*), green rabbitbrush (*Chrysothamnus viscidiflorus*), and, more recently, invasive cheatgrass (*Bromus tectorum*). Malheur wirelettuce may be one of the few species able to survive on and around the otherwise barren harvester ant hills at the site. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Marsh sandwort (*Arenaria paludicola*) (WA)
Marsh sandwort is a coastal species that was historically known to occur in wetlands, and in freshwater marshes. Plants have been documented in areas with or without standing water and in acidic, organic bog soils and sandy substrates with high organic content. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

McDonald's rockcress (*Arabis macdonaldiana*) (OR)
This species is restricted to soils derived from ultramafic rocks, chiefly peridotite. Soils may range from recently exposed serpentine to very old weathered lateritic soils. A pronounced red color is often evident in the lateritic soils because of the abundance of

iron. These soils are also high in heavy metals such as copper, chromium and nickel. The habitat is often very steep and unstable, with an open tree canopy of generally less than 5 percent cover. Elevation ranges up to about 4,900 feet on the slopes of Preston Peak and Sanger Peak in the Siskiyou Mountains. Vegetation association ranges from dry Jeffrey Pine, knobcone pine, or incense cedar woodlands to brushy or very open, rocky scree slopes. In addition to scattered trees, associated vegetation includes a diverse array of herbs and shrubs, such as montane penny-cress, Bolander's lily, and multiple species of buckbrush, fescue grass, iris, snakeroot, lomatium, stonecrop, violet, phlox, onion, and others. Serpentine barren habitats in general often support a great variety of endemic plants, many of which are sensitive or rare. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Rough popcornflower (*Plagiobothrys hirtus*) (OR)
Rough popcornflower grows in open, seasonal wetlands in poorly- drained clay or silty clay loam soils at elevations ranging from 30 to 270 m (100 to 900 ft). The taxon depends on seasonal flooding and/or fire to maintain open habitat and to limit competition with invasive native and non-native plant species. This plant occurs in open microsites within the one-sided sedge (*Carex unilateralis*)-meadow barley (*Hordeum brachyantherum*) community type within interior valley grasslands. The plant occurs on soils in the Conser Silty Clay Loam Series (NRCS mapped soil unit SSURGO 44A). Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Showy stickweed (*Hackelia venusta*) (WA)
Showy stickseed grows on sparsely vegetated, granitic scree on unstable, steep slopes on the east slope of the central Cascade Mountains of Washington. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Slender Orcutt grass (*Orcuttia tenuis*) (OR)
O. tenuis is dependent on vernal pools; however, it has been reported from other natural and artificial wetlands such as stock ponds, and borrow pits. The plants tolerate inundation and therefore live in deeper pools or in deeper areas of pools than Green's tuctoria. Primary habitat requirement appears to be inundation of sufficient duration and quantity to eliminate most competition and to meet the plant's physiological requirements for prolonged inundation, followed by gradual desiccation. Occupied pools are or were underlain by iron-silica cemented hardpan, tuffaceous alluvium, or claypan. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Slickspot peppergrass (*Lepidium papilliferum*) (ID)
The native plant occurs in specialized habitats known as slickspots, which are mini-playas or natric (high sodium soil) sites with distinct clay layers. Slickspots tend to be highly reflective, are usually relatively light in color and occur dispersed throughout the sagebrush-steppe ecosystem in southwest Idaho. More than 90 percent of the occupied slickspot peppergrass habitat occurs on federal lands with the remaining occupied habitat owned by the state of Idaho private land owners. Because the

habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Spalding's catchfly (*Silene spaldingii*) (OR, WA, ID, MT)

This species grows on mesic grassland prairies at low- to mid- elevations. Associated species include Idaho fescue (*Festuca idahoensis*), bluebunch wheatgrass (*Agropyron spicatum*), Nutka rose (*Rosa nutkana*), purple avens (*Geum triflorum*), sticky geranium (*Geranium viscosis*sum), balsamroot (*Balsamorhiza sagittata*), and scattered Ponderosa pine (*Pinus ponderosa*). Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Umtanum desert buckwheat (*Eriogonum codium*) (WA)

The solitary population occurs between 340–400 m (1,120–1,300 ft) on flat to gently sloping microsites near the top of a steep, north-facing basalt ridge overlooking the Columbia River. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Wenatchee Mountains checker-mallow (*Sidalcea oregana var. calva*) (WA)

The Wenatchee Mountains checker-mallow (*Sidalcea oregana* var. *calva*) is an endemic plant found only in mid-elevation wetlands and moist meadows within Chelan County in eastern Washington State. This plant is currently known from only five populations. The largest population has an estimated 11,000 plants and the remaining 4 populations range in size from 8 to 300 individuals. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

Western lily (*Lilium occidentale*) (OR)

This species has been reported from sites in a narrow band along the Pacific Coast no more than four miles inland from Coos County, Oregon about 200 miles south to Humboldt County, California. Western lily typically occurs within, or at the edges of fens and in poorly drained forest or thicket openings. It also grows in coastal prairie/scrub near the ocean. Fens are composed of highly organic soils with a fluctuating water table, and often situated above Blacklock or other soils that serve to perch a seasonal water table. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

White bluffs bladderpod (*Physaria douglasii* spp. *tuplashensis*) (WA)

The buckwheat is a woody plant that can live up to 150 years and is limited to a weathered basalt outcrop on the top edge of the Umtanum Ridge in Benton County, where it is threatened by fire, invasive species, off-road vehicle destruction and stray cattle. Because the habitat of this species is not habitat in which dreissenids would be found, this species is excluded from further analysis.

APPENDIX D. LIFE HISTORY INFORMATION FOR SPECIES AND CRITICAL HABITATS ASSOCIATED WITH COLUMBIA RIVER BASIN WATER BODIES

Mammals

Columbian white-tailed deer (*Odocoileus virginianus leucurus*) (OR, WA)

Information provided here is summarized in USFWS (1983) and from USACE and USFWS (2018).

Listing History

On March 11, 1967, the Secretary of the Interior identified the Columbian white-tailed deer (CWTD) as an endangered species under the authority of the Endangered Species Preservation Act of October 15, 1966. On March 8, 1969, the Secretary of the Interior again identified the CWTD as an endangered species. On August 25, 1970, the Acting Secretary of the Interior proposed to list the CWTD as an endangered subspecies under the authority of new regulations implementing the Endangered Species Conservation Act of 1969. The CWTD was automatically listed under the ESA when it was enacted in 1973.

On July 24, 2003, the Douglas County, Oregon, population was delisted due to recovery. October 17, 2016, the USFWS published a final rule to "downlist" the CWTD to threatened status.

Life History/Biological Requirements

Islands and bottomlands along the lower Columbia River around 9.8 ft (3 m) above sea level with vegetation over 2.3 ft (0.7 m) high in the vicinity of forage species are preferred. Native vegetation of the Columbia River tidal area includes dense, tall shrub and tree community including Sitka spruce, dogwood, cottonwood, red alder, and willow species. These and other species such as rose, sumac, and elderberry are common food and cover sources.

Breeding occurs from mid-September through late February, with a peak in November. Does reach sexual maturity by 6 months of age or when their weight reaches approximately 80 pounds [lbs (36 kilograms (kg))]. Maturation and fertility depends on the nutritional quality of available forage. Fawns are born in early summer after a 200-day gestation period.

Distribution and Critical Habitat

Columbian-white tailed deer are associated with riparian habitats in the Lower Columbia River and Douglas County, Oregon.[31] This species occupies tidal spruce habitats—densely forested swamps covered with tall shrubs and scattered spruce, alder, cottonwood, and willows—on islands along the Columbia River. Islands and bottomlands along the lower Columbia River around 9.8 ft (3 m) above sea level with vegetation over 2.3 ft (0.7 m) high near forage species are preferred. Native vegetation of the Columbia River tidal area includes dense, tall shrub and tree community including Sitka spruce, dogwood, cottonwood, red alder, and willow species. These and other species such as rose, sumac, and elderberry are common food and cover sources.

In Douglas County, Oregon, this species uses willow and cottonwood habitat along rivers and streams as well as oak-savannah habitats in upland areas.

Although habitat types and locations have been identified for the Columbian white-tailed deer, no critical habitat has been designated. Currently, the Columbia River DPS has a discontinuous range of approximately 149 mi^2 (240 km^2) or about 60,000 ac^2 (24,281 ha^2) in limited areas of Clatsop, Multnomah, and Columbia Counties in Oregon, and Cowlitz, Wahkiakum, Pacific, Skamania, and Clark Counties in Washington. Within that range, CWTD currently occupy an area of approximately 16,000 ac^2 [6,475 ha^2].

Threats

Conversion of brushy riparian land to agriculture, urbanization, uncontrolled sport, commercial hunting, and other factors caused the extirpation of CWTD over most of its range. A lack of dense woody cover between open pastures has been identified as a major limiting habitat factor. The population had also been severed into two small, spatially separated groups, historically, making genetic diversity another risk factor.

Other potential threats include catastrophic flood damaging suitable habitat, as well as hoof rot, which is a crippling hoof disease exacerbated by wet conditions that has plagued the Columbia River population.

[31] https://www.fws.gov/oregonfwo/articles.cfm?id=149489413

Birds

Least Tern (*Sterna antillarum*) (MT)

Information provided here is summarized in the USFWS Least Tern Recovery Plan (1990).

Listing History

The interior least tern was listed as an endangered species on June 27, 1985 in the States of Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana (Mississippi River and its tributaries north of Baton Rouge), Mississippi (Mississippi River), Missouri, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Tennessee, and Texas (except within 80 km of Gulf Coast).

Life History/Biological requirements

Interior least terns spend about 4-5 months at their breeding sites. They arrive at breeding areas from late April to early June. Courtship behavior of least terns is similar throughout North America. Courtship occurs at the nesting site or at some distance from the nest site. Breeding site fidelity is high.

From late April to August they occur primarily on barren to sparsely vegetated riverine sandbars, dike field sandbar islands, sand and gravel pits, and lake and reservoir shorelines. The nest is a shallow and inconspicuous depression in an open, sandy area, gravelly patch, or exposed flat. Small stones, twigs, pieces of wood and debris usually lie near the nest. Least terns nest in colonies or terneries, and nests can be as close as just a few meters apart or widely scattered up to hundreds of meters.

The birds usually lay two or three eggs. The average clutch size for interior least terns nesting on the Mississippi River during 1986–1989 was 2.4 eggs. Egg-laying begins by late May. Both sexes share incubation which generally lasts 20-25 days, but has ranged from 17 to 28 days.

The interior least tern's home range during the breeding season usually is limited to a reach of river near the sandbar nesting site where they feed primarily on fish.

Distribution and Critical Habitat

No critical habitat has been designated for the interior population of the least tern. The interior least tern is migratory and historically bred along the Mississippi, Red and Rio Grande River systems and rivers of central Texas. The breeding range extended from Texas to Montana and from eastern Colorado and New Mexico to southern Indiana. It included the Red, Missouri, Arkansas, Mississippi, Ohio and Rio Grande River systems. Incidental occurrences of least terns in Michigan, Minnesota, Wisconsin, Ohio and Arizona have been reported.

The interior least tern continues to breed in most of the aforementioned river systems, although its distribution generally is restricted to less altered river segments.

Least terns nest on barren to sparsely vegetated sandbars along rivers, sand and gravel pits, lake and reservoir shorelines, and occasionally gravel rooftops. Recreational activities on rivers and sandbars disturb nesting least terns, causing them to abandon their nests. The interior least tern breeding season is April through August – nesting season is mid-May through August. Nesting in small colonies, least tern nests are shallow depressions scraped in open sandy areas, gravelly patches, or exposed flats. Both parents incubate their eggs for about 24 days. Chicks leave the nest only a few days after hatching, but the adults continue to care for them, leading them to shelter in nearby grasses and bringing them food. The interior least tern's home range during the breeding season usually is limited to a reach of river near the sandbar nesting site where they feed primarily on fish.

Threats

Threats to the survival of the species include the actual and functional loss of riverine sandbar habitat. Channelization and impoundment of rivers have directly eliminated nesting habitat.

Piping plover (*Charadrius melodus*) (MT)

Information provided here is summarized in Atkinson and Dood (2006).

Breeding Season Habitat

In north-central North America, plovers typically nest on barren sand and gravel beaches along the Great Lakes, and on alkali flats, gravel shorelines and river sandbars in the Great Plains (USFWS 2002c). While data suggests that habitat use by plovers is dynamic (USFWS 2002c), alkali lakes and wetlands associated with the Missouri Coteau landform, located inside the Prairie Pothole Region, appear to support a significant portion (34 -75%) of the Great Plains population in any given year (Haig and Plissner 1993, Murphy et al. 2000, Plissner and Haig 2000, Haig et al. 2005, Skagen and Thompson 2005). Remaining nest sites occur primarily along rivers and reservoirs although fresh water lakes, dry alkali lakes, sandpits, industrial ponds and gravel mines may also be utilized (Haig et al. 2005).

Piping plovers are a migratory species. Piping Plovers primarily select unvegetated sand or pebble beaches on shorelines or islands in freshwater and saline wetlands. Vegetation, if present at all, consists of sparse, scattered clumps (Casey 2000). Open shorelines and sandbars of rivers and large reservoirs in the eastern and north-central portions of Montana provide prime breeding habitat. In Montana, and throughout the species' range, nesting may occur on a variety of habitat types. If conditions are right, alkali wetlands, lakes, reservoirs, and rivers can all provide the essential features required for nesting. The alkali wetlands and lakes found in the northeastern corner of the state generally contain wide, unvegetated, gravelly, salt-encrusted beaches. Rivers that flood adequately can supply open sandbars or gravelly beaches, as can large reservoirs, with their shoreline beaches, peninsulas, and islands of gravel or sand. Sites with gravel substrate provide the most suitable sites for nesting (Montana Piping Plover Recovery Committee 1994). One of the most limiting factors to nesting site selection is vegetational encroachment. Piping Plovers avoid areas where vegetation provides cover for potential predators. Fine-textured soils are easier to treat mechanically than rocky or gravelly soils when vegetation is determined as a limiting factor in an area's ability to provide suitable nesting habitat, but fine soils are not typically a preferred nesting substrate (Montana Piping Plover Recovery Committee 1994). Nests are simple scrapes dug into the nest substrate which may or may not be lined with pebbles (Montana Piping Plover Recovery Committee 1994, 1995, Haig 1992).

Migrants begin arriving at breeding areas in southern Washington in early March and in central California as early as January, although the main arrival is from early March to late April. Since some individuals nest at multiple locations during the same year, birds may continue arriving through June. Males make a nest scrape, which is a depression in the sand or substrate made by leaning forward on his breast and scratching his feet while rotating his body axis. The earliest nests on the California coast occur during the first week of March in some years and by the third week of March in most years. Peak initiation of nesting is from mid-April to mid-June. Hatching lasts from early April through mid-August, with chicks reaching fledging age approximately 1 month after hatching.

Riverine Habitat
Characteristic riverine nesting sites include reservoir beaches and large dry, barren sand or gravel bars within wide, unobstructed river channels (USFWS 1988). Nests are usually located after the spring and early summer flows recede and dry areas on sandbars are exposed. Along the Platte River, Nebraska, relatively large sandbars, averaging 286 m long and 55 m wide, appear to be selected when available (Faanes 1983). In addition, preferred vegetative cover at nest sites is generally low (Schwalbach 1988). Although Faanes (1983) reported vegetative cover of 25% on nesting sandbar habitat along the Platte River, other research suggests that the optimum range is much lower: estimates range from 0-10% (Armbruster 1986). Likewise, along the Missouri River in South Dakota, plover colony sites were characteristically barren or with short (<10cm) sparse (<10%) vegetative cover (Schwalbach 1988).

Foraging Habitat
Plovers feed by pecking at or just below the substrate surface (Cairns 1977, USFWS 2002c, Haig and Elliot-Smith 2004) and require feeding grounds that are rich in surface invertebrates (Shaffer and Laporte 1994). While adults typically concentrate feeding efforts within 5 m of the water's edge (Whyte 1985), chicks tend to feed on firmer ground at greater distances from the shoreline (Cairns 1977).

Critical Habitat
In 2002, the USFWS officially designated critical habitat for the Northern Great Plains breeding population (USFWS 2002c). Under the Endangered Species Act, critical habitat refers to specific geographic locations that contain features essential for conserving a species and may require special management considerations. While critical habitat can be, and is, designated on private lands, it only relates to those activities on private lands that require federal permits or funding that are required to be reviewed under the Act. For piping plovers, primary constituent elements include components essential for courtship, breeding, sheltering, brood-rearing, foraging, roosting, intraspecific communication and migration. Furthermore, it stated that the one overriding primary biological element that must be present at all sites is the

maintenance of the dynamic ecological processes that create and maintain piping plover habitat.

On prairie alkali lakes and wetlands the physical primary constituent elements include shallow, seasonally to permanently flooded, wetlands with sandy to gravelly, sparsely vegetated beaches as well as springs and fens along the edges of alkali lakes and wetlands. Along rivers, sparsely vegetated channel sandbars, sand and gravel beaches on islands and temporary pools on sandbars are considered primary. At reservoirs and inland lakes such elements include sparsely vegetated shoreline beaches, peninsulas, islands composed of sand and gravel or shale and their interface with the water bodies.
In its final ruling, the USFWS identified a total of 19 habitat units in the states of Minnesota, Montana, Nebraska, North Dakota, and South Dakota as critical to aiding piping plover recovery (USFWS 2002c).

Within Montana, 40,423.1 hectares (99,887.5 acres) including four separate units comprised of various ownership patterns are designated as critical habitat (Table 7).

Table 7. Land ownership within unit boundaries for critical piping plover habitat in Montana. Source: USFWS (2002).

Critical Habitat Unit	Ownership (in hectares)				
	Federal	State	Tribal	Private	Total
MT-1 Sheridan County	5,405	119		2,254	7,779
MT-2 Missouri River					202
MT-3 Fort Peck Reservoir	31,311				31,311
MT-4 Bowdoin NWR	38,049	119		2,254	40,423

Sheridan County (Unit MT-1), in the extreme northeastern corner of the state, includes 20 alkali lakes and wetlands. Essential nesting habitat is dispersed throughout this unit. The Missouri River units (MT-2 and MT-3) consist of both reservoir and river reaches: Fort Peck Reservoir is located entirely within the Charles M. Russel NWR, while unit MT-2 encompasses approximately 201.8 km of the Missouri River just west of Wolf Point to the Montana-North Dakota border.

The river reach below Fort Peck Reservoir to the confluence of the Milk River is not included as it is highly degraded and contains few sandbars. Bowdoin NWR is the site of the fourth critical habitat unit (MT-4). Despite sporadic breeding records at Alkali Lake in Pondera County, Bowdoin NWR, located in east-central Phillips County, represents the typical western edge of the Northern Great Plains breeding population of piping plovers.

In Phillips County, three historic lake beds at Nelson Reservoir most likely provided essential habitat to breeding piping plovers however this area was flooded when the reservoir was created for irrigation purposes. While Nelson Reservoir was originally proposed for critical habitat inclusion, it was excluded from the final listing as a Memorandum of Understanding (MOU) between the Bureau of Reclamation (BOR), the USFWS, and local Irrigation Districts was in place that would minimize the threat of flooding to active piping plover nest sites. Additionally, as part of the terms and conditions of a 1990 biological opinion on the operation of Nelson Reservoir by the BOR, conservation measures had been employed to minimize take, and would continue.

Occupied nesting habitat on North Alkali Lake in Pondera County occurs on Blackfeet tribal land and was not designated critical habitat at the request of the tribal government. Habitat on tribal lands determined essential to conserve the species may be designated. This was the case for sand bars along the Missouri River along the Fort Peck Reservation. The USFWS believes this designation is consistent with the special trust responsibility the Federal government has to Indian people to preserve and protect their lands and resources.

In Montana, spring arrival of the species most often occurs from late April through early May with departure occurring by late August (Montana Piping Plover Recovery Committee 1997). Recent analysis of migration data from banded Great Lakes birds suggests that critical habitat units are used heavily during migration (Stucker and Cuthbert 2006). Further, while stopover length could not be quantified in this study the authors speculate that it may be variable in length for the Great Lakes population, ranging from several days to one month based on anecdotal reports (Stucker and Cuthbert 2006).

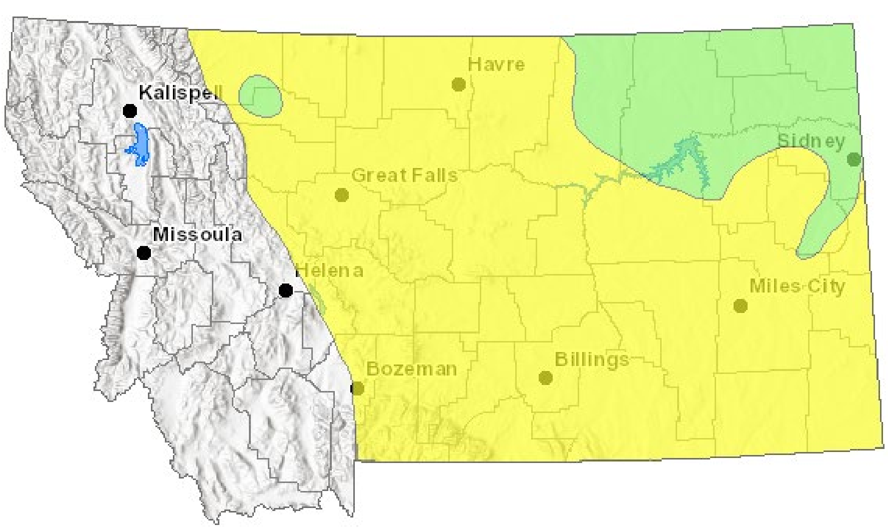

Figure 5. Summer range (green) and migratory range (yellow) of piping plovers in Montana. Source. Montana Natural Heritage Program.

Red knot (Calidris canutus rufa)[32] (MT)

Information from this section is excerpted from Montana Field Guide (http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNNF11020).

Red knots are a migratory species. Migratory stopovers in Montana are rare, but are most common at larger wetlands. A total of 60 percent of documented migratory stopovers in Montana have been at Freezeout Lake, Benton Lake National Wildlife Refuge, and Lake Bowdoin National Wildlife Refuge (Montana Natural Heritage Program Point Observation Database 2016). Red knots are rarely observed at Montana wetlands during migration in May or July through October (Montana Natural Heritage Program Point Observation Database 2016). There are only about 50 observations documented for individuals stopping at Montana wetlands, with only 0–4 for any given year since the 1970s; 60 percent of observations have been in May associated with northward migration (Montana Natural Heritage Program Point Observation Database 2016).

Western snowy plover (*Charadrius alexandrines nivosus*)[33] (OR, WA)

Information included here is from USFWS (2007) and USACE and USFWS (2018).

Listing History

On March 5, 1993, the Pacific coast population of the western snowy plover was listed as threatened. The Pacific coast population is defined as those individuals that nest within 50 mi (80.5 km) of the Pacific Ocean on the mainland coast, peninsulas, offshore islands, bays, estuaries, or rivers of the United States and Baja California, Mexico.

Life History/Biological requirements

The Pacific coast population of the western snowy plover breeds primarily above the high tide line on coastal beaches, sand spits, dune-backed beaches, sparsely-vegetated dunes, beaches at creek and river mouths, and salt pans at lagoons and estuaries. Less common nesting habitats include bluff-backed beaches, dredged material disposal sites, salt pond levees, dry salt ponds, and river bars.

Migrants begin arriving at breeding areas in southern Washington in early March and in central California as early as January, although the main arrival is from early March to late April. Since some individuals nest at multiple locations during the same year, birds may continue arriving through June. Males make a nest scrape, which is a depression in the sand or substrate made by leaning forward on his breast and scratching his feet while rotating his body axis.

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32 http://fieldguide.mt.gov/speciesDetail.aspx?elcode=ABNNF11020

33 Pacific coast population

The earliest nests on the California coast occur during the first week of March in some years and by the third week of March in most years. Peak initiation of nesting is from mid-April to mid-June. Hatching lasts from early April through mid-August, with chicks reaching fledging age approximately 1 month after hatching.

In winter, western snowy plovers are found on many of the beaches used for nesting as well as on beaches where they do not nest, in man-made salt ponds, and on estuarine sand and mud flats.

Distribution and Critical Habitat
Critical habitat was designated for the western snowy plover December 7, 1999, again on September 29, 2005, and most recently on June 6, 2012. The current Pacific coast breeding population extends from Damon Point, Washington, south to Bahia Magdalena, Baja California, Mexico [including both Pacific and Gulf of California coasts)]. The western snowy plover winters mainly in coastal areas from southern Washington to Central America.

Threats
Habitat degradation caused by human disturbance, urban development, introduced beachgrass (*Ammophila* spp.), and expanding predator populations have resulted in a decline in active nesting areas and in the size of the breeding and wintering populations.

Yellow-billed cuckoo (*Coccyzus americanus*) (OR, WA, ID, MT)
Information in this section from USACE (2018).

Listing History
The western yellow-billed cuckoo was listed as threatened October 3, 2014, while critical habitat was proposed August 15, 2014, but a final designation has not been made. The western DPS includes Arizona, California (Baja California, Baja California Sur, Chihuahua, western Durango, Sinaloa, and Sonora), western Colorado, Idaho, western Montana, western New Mexico, Nevada, Oregon, western Texas, Utah, Washington, western Wyoming, and southwest British Columbia.

Life History/Biological requirements
As summarized by Cornell University (https://www.allaboutbirds.org/guide/Yellow-billed_Cuckoo/lifehistory): Yellow-billed cuckoos use wooded habitat with dense cover and water nearby, including woodlands with low, scrubby, vegetation, overgrown orchards, abandoned farmland, and dense thickets along streams and marshes. In the Midwest, look for cuckoos in shrublands of mixed willow and dogwood, and in dense stands of small trees such as American elm. In the Southwest, yellow-billed cuckoos are rare breeders in riparian woodlands of willows, cottonwoods and dense stands of mesquite to breed.

Yellow-billed cuckoo prey largely on caterpillars. On the east coast, periodic outbreaks of tent caterpillars draw cuckoos to the tent-like webs, where they may eat as many as 100 caterpillars at a sitting. Fall webworms and the larvae of gypsy, brown-tailed, and white-marked tussock moths are also part of the cuckoo’s lepidopteran diet, often supplemented with beetles, ants, and spiders. They also take advantage of the annual outbreaks of cicadas, katydids, and crickets, and will hop to the ground to chase frogs and lizards. In summer and fall, cuckoos forage on small wild fruits, including elderberries, blackberries and wild grapes. In winter, fruit and seeds become a larger part of the diet.

Pairs may visit prospective nest sites multiple times before building a nest together. Nest heights can range from 0.98 yds (0.9 m) to as much as 30 yds (27.5 m) off the ground, with the nest placed on a horizontal branch or in the fork of a tree or large shrub. In the West, nests are often placed in willows along streams and rivers, with nearby cottonwoods serving as foraging sites.

The male and female yellow-billed cuckoo build a loose stick nest together, using twigs collected from the ground or snapped from nearby trees and shrubs. The male sometimes continues bringing in nest materials after incubation has begun. Clutch size can range from 1-5 eggs with up to 2 clutches per year.

Distribution and Critical Habitat

Critical habitat is proposed, but not yet designated for yellow-billed cuckoo. Critical habitat was proposed in 2013. The breeding range of the yellow-billed cuckoo formerly included most of North America from southern Canada to the Greater Antilles and northern Mexico (AOU 1957, 1998).

In recent years, the species’ distribution in the west has contracted. The northern limit of breeding in the western coastal States is now in Sacramento Valley, California, and the northern limit of breeding in the western interior States is southern Idaho (AOU 1998, Hughes 1999). The species overwinters from Columbia and Venezuela, south to northern Argentina (Ehrlich et al. 1992; AOU 1998).

Threats

The greatest threat to the species has been reported to be loss of riparian habitat. It has been estimated that 90% of the cuckoo's stream-side habitat has been lost (USFWS 2018a). Habitat loss in the west is attributed to agriculture, dams, and river flow management, overgrazing and competition from exotic plants such as tamarisk.

Amphibians

Oregon spotted frog (*Rana pretiosa*) (OR, WA)

Information in this section from USACE (2018) and other sources.

Listing History

The Oregon spotted frog was listed as threatened August 29, 2014.

Life History/Biological requirements

Adult Oregon spotted frogs begin to breed by 1 to 3 years of age, depending on sex, elevation, and latitude. Males may breed at 1 year at lower elevations and latitudes, but generally breed at 2 years of age. Females breed by 2 or 3 years of age, depending on elevation and latitude. Breeding occurs in February or March at lower elevations and between early April and early June at higher elevations. Males and females separate soon after egg-laying, with females returning to fairly solitary lives. Males often stay at the breeding site, possibly for several weeks, until egg-laying is completed. Females may deposit their egg masses at the same locations in successive years.

The Oregon spotted frog life cycle requires shallow water areas for egg and tadpole survival; perennially deep, moderately vegetated pools for adult and juvenile survival in the dry season; and perennial water for protecting all age classes during cold wet weather. The Oregon spotted frog inhabits emergent wetland habitats in forested landscapes, although it is not typically found under forest canopy. Historically, this species was also associated with lakes in the prairie landscape of the Puget lowlands. This is the most aquatic native frog species in the Pacific Northwest, as all other species have a terrestrial life stage. Post-metamorphic Oregon spotted frogs are opportunistic predators that prey on live animals, primarily insects, found in or near the water.

Distribution and Critical Habitat

Critical habitat was designated for the Oregon spotted frog May 11, 2016. Historically, the Oregon spotted frog ranged from British Columbia to the Pit River basin in northeastern California. Currently, the Oregon spotted frog is found from extreme southwestern British Columbia south through the Puget Trough and in the Cascades Range from south-central Washington at least to the Klamath Basin in southern Oregon. Oregon spotted frogs occur in lower elevations in British Columbia and Washington and are restricted to high elevations in Oregon.

Oregon Spotted Frogs are highly aquatic and live in or near permanent bodies of water, including lakes, ponds, slow streams and marshes. They prefer areas with thick algae and vegetation for cover, but may also hide under decaying vegetation. They are most often found in non-woody wetland plant communities (species such as sedges, rushes and grasses). Most Oregon Spotted Frogs hibernate and aestivate. Oregon Spotted Frogs distribute through a wide range of altitudes and in Washington have been found from 40 to 620 meters above sea level (McAllister and Leonard 1997). Adults eat insects, mollusks, crustaceans and arachnids. Larvae eat algae and organic debris. The timing of breeding is related to ice melt on lakes, ponds and marshes. Breeding occurs from February to March in the lower elevations, and from March to April in the higher elevations in the Cascade Range. Oregon Spotted Frogs lay their eggs in the shallows of a permanent water source.

Oregon Spotted Frogs are generally associated with wetland complexes > 4 ha (10 acres) in size with extensive emergent marsh coverage that warms substantially from spring to fall (Pearl and Hayes 2004). Hayes (1994a, b) stressed the reliance of this species on warm-water habitats. Washington's remaining populations of Oregon Spotted Frogs occupy palustrine wetlands connected to riverine systems. The perennial creeks and associated network of intermittent tributaries provide aquatic connectivity between breeding sites, active season habitat and overwintering habitat. Additionally, perennially flowing waters may provide the only suitable habitat during extreme summer drought or during winter when still-waters become hypoxic (low dissolved oxygen levels that are detrimental to aerobic organisms). Associated wetlands have a mix of dominance types including aquatic bed, emergent, scrub-shrub, and forested wetlands. The seasonally inundated wetland margins are frequently hay fields and pasture. The less disturbed sites have wet meadows and prairie uplands. Some occupied sites are engineered by American Beaver (*Castor canadensis*, hereafter "beaver"). All the remaining Oregon Spotted Frog sites have moderate to severe habitat alteration including a history of cattle grazing and/or hay production as well as encroaching or established rural residential development. Hydrology has been altered to some extent at all sites with the most extensive changes at Conboy Lake National Wildlife Refuge and surrounding area.

Watson et al. (2000; Black River) found that different life stages of Oregon Spotted Frogs had different hydrological needs that varied by season. For development of eggs and larvae, relatively stable water levels were needed during the breeding season. For survival of transformed frogs, deeper water pools were critical during the summer dry season. Adequate water levels over emergent vegetation were important for survival of all age classes during the wet season and coldest time of the year. In general, frogs selected sedge-dominated and hardhack (*Spiraea douglasii*)–dominated types and avoided reed canarygrass types, alder/willow, and deep water. Uplands were not used. During the breeding season, frogs preferred sedge-dominated habitat particularly sedge/rush found in association with breeding sites. During the dry season, frogs preferred hardhack-dominated habitats. The hardhack was in the deepest waters and these retained water during dry periods. Also, the hardhack shaded out reed canarygrass preventing dense, impenetrable grass cover. Aquatic connectivity was essential; frogs did not move terrestrially to isolated ponds. The predominant use of shallow water habitat by Oregon Spotted Frogs was illustrated by Watson et al. (1998, 2003), who found Oregon Spotted Frogs (n = 295 radio-telemetry locations) selected water depths of 10–30 cm (~4–11.7 in.) with less emergent vegetation and more submergent vegetation than adjacent habitats.

Threats
Habitat alteration appears to be the primary threat to the Oregon spotted frog. Breeding locations makes Oregon spotted frogs acutely vulnerable to fluctuating water levels, disease, predation, poor water quality, and extirpation from stochastic events. Hydrologic changes, resulting from activities such as water diversions and removal of beavers, increase the likelihood of fluctuating water levels and temperatures, and may also facilitate predators.

Fish

Bull trout (*Salvelinus confluentus*) (OR, WA, ID, MT)

Please refer to the USFWS Final Critical Habitat Designation for Bull Trout in Idaho, Oregon, Washington, Montana, and Nevada (USFWS 2015) for the latest information on bull trout distribution and critical habitat.

Bull trout (*Salvelinus confluentus*) were listed under the Endangered Species Act (Act) in 1999 as threatened throughout their range in Washington, Oregon, Idaho, Montana and Nevada. Bull trout are a cold-water fish of relatively pristine streams and lakes in northwestern North America. They are grouped with the char, within the salmonid family of fishes. They have more specific habitat requirements than most salmonids, including the "Four C's": Cold, Clean, Complex and Connected habitat. Bull trout require the coldest water temperatures; they require among the cleanest stream substrates for spawning and rearing; they require complex habitats, including streams with riffles and deep pools, undercut banks and lots of large logs; and they need connection from river, lake and ocean habitats to headwater streams for annual spawning and feeding migrations. Bull trout can be found throughout the Columbia and Snake river basins, extending east to headwater streams in Montana and Idaho, into Canada and in the Klamath River Basin of southcentral Oregon. However, the distribution of populations is scattered and patchy, primarily due to habitat degradation and fragmentation. They are excellent indicators of water quality; protecting and enhancing their habitat can improve the water quality of rivers and lakes throughout their range.

Listing History

The USFWS issued a final rule listing the Columbia River population of bull trout as threatened on June 10, 1998, while critical habitat for this species was listed on October 18, 2010. Bull trout are currently listed throughout their range in the United States as a threatened species.

Life History/Biological requirements

Most bull trout populations are migratory, spending portions of their life cycle in larger rivers or lakes before returning to smaller streams to spawn, while some populations complete their entire life cycle in the same stream. Some bull trout in the Coastal-Puget Sound population migrate between fresh water and the marine environment. Bull trout can grow to more than 20 pounds in lake environments and live up to 12 years. Under exceptional circumstances, they can live more than 20 years.

Of all the native salmonids in the Pacific Northwest of the United States, bull trout generally have the most specific habitat requirements (Rieman and McIntryre 1993), which are often referred to as "the four Cs": Cold, Clean, Complex, and Connected habitat. This includes cold water temperatures (often less than 12 degrees Celsius [54 degrees Fahrenheit]), complex stream habitat including deep pools, overhanging banks and large woody debris, and connectivity between spawning and rearing (SR) areas and downstream foraging, migration, and overwintering (FMO) habitats. Within the coterminous United States, bull trout currently occur in the Columbia River and Snake River basins in Washington, Oregon, Montana, Idaho, and Nevada; Puget Sound and Olympic Peninsula watersheds in Washington; the Saint Mary basin in Montana; and the Klamath River basin of south-central Oregon.

Distribution and Critical Habitat
Bull trout critical habitat was designated on October 18, 2010. In the Columbia River Basin, bull trout historically were found in about 60% of the basin. They now occur in less than half of their historic range. Populations remain in portions of Oregon, Washington, Idaho, Montana, and Nevada (Table 8).

Table 8. Acres and miles of Bull trout critical habitat in Idaho, Montana, Oregon and Washington.

	Stream Miles	Acres of Lakes or Reservoirs
Idaho	8,771.6	170,217.5
Montana	3,056.5	221,470.7
Oregon	2,835.9	30,255.5
Washington	3793.3	66,308.1

The USFWS designated about 18,975 miles of streams and 488,252 acres of lakes and reservoirs in Idaho, Oregon, Washington, Montana and Nevada as critical habitat for bull trout. In Washington, 754 miles of marine shoreline are included in the final designation. The designation identifies 32 critical habitat units and 99 sub-units on 3,500 water body segments across the five states. These areas are clustered into six recovery units where recovery efforts will be focused. By state, the designation covers approximately:

- Idaho: 8,772 stream miles and 170,218 acres of lakes or reservoirs
- Oregon: 2,836 stream miles and 30,256 acres of lakes or reservoirs
- Washington: 3,793 stream miles, 66,308 acres of lakes or reservoirs and 754 miles of marine shoreline
- Montana: 3,056 stream miles and 221,471 acres of lakes or reservoirs
- Nevada: 72 stream miles.

In some areas, the critical habitat designation shares Columbia or Snake river borders, including:

- Oregon/Idaho (Snake River): 108 stream miles
- Washington/Idaho (Snake River): 37 stream miles
- Washington/Oregon (Columbia River): 301 stream miles

Table 9. Stream/shoreline distance (miles/kilometers) designated as bull trout critical habitat by critical habitat unit.

Critical Habitat Unit	Stream/Shoreline Kilometers	Stream/Shoreline Miles
Olympic Peninsula	748.7	465.2
Olympic Peninsula (Marine)	592.2	328.8
Puget Sound	1,840.20	1,143.50

Puget Sound (Marine)	684	425
Lower Columbia River Basins	119.3	74.2
Upper Willamette River	312.4	194.1
Hood River	128.1	79.6
Lower Deschutes River	232.8	144.7
Odell Lake	27.4	17
Mainstem Lower Columbia River	340.4	211.5
Klamath River Basin	445.2	276.6
Upper Columbia River Basins	931.8	579
Yakima River	896.9	557.3
John Day River	1,089.60	677
Umatilla River	163	101.3
Walla Walla River Basin	383.7	238.4
Lower Snake River Basins	270.8	168.3
Grande Ronde River	1,057.90	657.4
Imnaha River	285.7	177.5
Sheep and Granite Creeks	47.9	29.7
Hells Canyon Complex	377.5	234.6
Powder River Basin	296.5	184.2
Clearwater River	2,702.10	1,679.00
Mainstem Upper Columbia River	520.1	323.2
Mainstem Snake River	451.7	280.6
Malheur River Basin	272.3	169.2
Jarbidge River	245.2	152.4
Southwest Idaho River Basins	2,150.00	1,335.90
Salmon River Basin	7,376.50	4,583.50
Little Lost River	89.2	55.4
Coeur d'Alene River Basin	821.5	510.5

Kootenai River Basin	522.5	324.7
Clark Fork River Basin	5,356.00	3,328.10
Saint Mary River Basin	34.7	21.6

Kootenai River white sturgeon (*Acipenser transmontanus*) (ID, MT)

Information in this section from USFWS (1999) and USACE (2018).

Listing History

The Kootenai River population of white sturgeon was listed as endangered on September 6, 1994.

Life History/Biological requirements

The Kootenai River White Sturgeon is a land-locked species found along 167.7 miles of the Kootenai River extending from Kootenai Falls, Montana, located 31 river miles below Libby Dam, Montana, downstream through Kootenay Lake to Corra Linn Dam at the outflow from Kootenay Lake in British Columbia. The Kootenai River population of white sturgeon became isolated from other white sturgeon in the Columbia River basin during the last glacial age (approximately 10,000 years ago). Once isolated, the population adapted to the predevelopment habitat conditions in the Kootenai River drainage.

The species has been declining since the mid-1960, and its population has experienced almost no reproduction since 1974 because of habitat fragmentation—construction of the Libby Dam in Montana altered river flow patterns and reduced river productivity, human development (which has contributed to loss of ecological functions), dikes constructed along the river channel (which reduced riparian function and floodplain interaction), and pollution.

Historically, spring runoff events re-sorted river sediments providing a clean cobble substrate conducive to insect production and sturgeon egg incubation. Side channels and low-lying deltaic marsh lands were un-diked at this time, providing productive, low velocity backwater areas. Nutrient delivery in the system was unimpeded by dams and occurred primarily during spring runoff. Floodplain ecosystems like the predevelopment Kootenai River are characterized by seasonal floods that promote the exchange of nutrients and organisms in a mosaic of habitats and thus enhance biological productivity.

Distribution and Critical Habitat

Critical habitat was initially designated for white sturgeon September 6, 2001, with a revised designation July 9, 2008. The Kootenai River population is one of several land-locked populations of white sturgeon found in the Pacific Northwest. Although officially termed and listed as the "Kootenai River population of white sturgeon", this white sturgeon population inhabits and migrates freely in the Kootenai River from Kootenai Falls in Montana downstream into Kootenay Lake, British Columbia, Canada. A total of 18 miles of the Kootenai River in Idaho is designated critical habitat. Specific actions needed for recovery include spring flow augmentation during the reproduction period; a conservation aquaculture program to prevent near-term extinction; habitat restoration, and research and monitoring programs to evaluate recovery progress (Duke et al. 1999).

Threats

Modification of the Kootenai River white sturgeon's habitat by human activities has changed the natural hydrograph of the Kootenai River, altering white sturgeon spawning, egg incubation, and rearing habitats; and reducing overall biological productivity. These factors have contributed to a general lack of recruitment in the white sturgeon population since the mid-1960's.

Spawning and rearing habitat are the key limiting factors for Kootenai River White Sturgeon. Spawning and incubation occur from mid-May to August (Duke et al. 1999). Depths for spawning white surgeon in the Lower Columbia River range from 3.5 to 25m—habitat suitability is poor for depths less than 2m, and moderate for depths of 2 to 4m (Parsley and Beckman 1994). Higher velocities are associated with more suitable substrate for white sturgeon egg incubation, greater egg dispersal, and reduction of egg predation (Barton et al. 2006). The greatest occurrence of white sturgeon spawning occurs in the area downstream of the mouth of Deep Creek at river kilometer mile 237.5 and 228.4 (Barton et al. 2006). Generally, habitat suitability is better in the straight reaches compared to meandering reaches because of coarser substrates and higher velocities (Barton et al. 2006). White sturgeon seldom spawn in the straight reach.

Lahontan cutthroat trout (*Oncorhynchus clarki henshawi)* (OR)

Information in this section from USFWS (1995) and USACE (2018).

Listing History

The Lahontan cutthroat (LCT) was listed as endangered October 13, 1970 and downlisted to threatened status on July 16, 1975 to facilitate management and allow regulated angling.

Life History/Biological requirements

Historically, LCT were found in a wide variety of cold-water habitats: Large terminal alkaline lakes (e.g., Pyramid Lakes); oligotrophic alpine lakes (e.g., Lake Tahoe); slow meandering low-gradient rivers (e.g., Humboldt River); moderate gradient montane rivers (e.g., Carson, Truckee, Walker, and Marys Rivers); and small headwater tributary streams. Habitat preferences are similar to other salmonids. Lahontan cutthroat inhabit small streams characterized by cool water, pools in close proximity to cover and velocity breaks, well vegetated and stable stream banks, and relatively silt free, rocky substrate in riffle-run areas. Fluvial LCT generally prefer rocky areas, riffles, deep pools, and habitats near overhanging logs, shrubs, or banks.

Typical of cutthroat trout subspecies, Lahontans are an obligatory stream spawner. Spawning occurs from April through July, depending on stream flow, elevation, and water temperature. Females mature at 3 to 4 years of age, and males at 2 to 3 years of age. Consecutive year spawning by individuals is uncommon. Lake residents migrate up tributaries to spawn in riffles or tail ends of pools. Distance traveled varies with stream size and race of cutthroat trout. Populations in Pyramid and Winnemucca Lakes reportedly migrated over 100 mi (160.9 km) up the Truckee River into Lake Tahoe. Lahontan cutthroat trout spawning migrations have been observed in water temperature ranging from 41–60.8 °F (5–16 °C).

Stream resident LCT are opportunistic feeders, with diets consisting of drift organisms, typically terrestrial and aquatic insects. In lakes, small LCT feed largely on insects and zooplankton, and larger LCT feed on fish.

Distribution and Critical Habitat
No critical habitat has been designated for Lahontan cutthroat trout. The Lahontan cutthroat is an inland subspecies of cutthroat trout endemic to the physiographic Lahontan basin of northern Nevada, eastern California, and the Coyote Lake basin in southeast Oregon. Lahontan cutthroat trout currently occupy between 155 and 160 streams; 123 to 129 streams within the Lahontan basin and 32 to 34 streams outside the basin, with approximately 482 mi (775.7 km) of occupied habitat.

Major impacts to LCT habitat and abundance include: 1) reduction and alteration of stream discharge; 2) alteration of stream channels and morphology; 3) degradation of water quality; 4) reduction of lake levels and concentrated chemical components in natural lakes; and 5) introductions of non-native fish species. These alterations are typically associated with agricultural use, livestock and feral horse grazing, mining, and urban development. Alteration and degradation of LCT habitat have also resulted from logging, highway and road construction, dam building, and the discharge of effluent from wastewater treatment facilities.

Lahontan cutthroat trout are native to the following southeastern Oregon streams: Willow Creek, Whitehorse Creek, Little Whitehorse Creek, Doolitle Creek, Fifteen Mile Creek in the Coyote Lake Basin; and Indian Creek, Sage Creek, and Line Canyon Creek, tributaries of McDermitt Creek in the Quinn River basin (which flows into Nevada).

Lahontan cutthroat trout are obligate but opportunistic stream spawners. Typically, they spawn from April through July, depending on water temperature and flow characteristics. Autumn spawning runs have been reported from some populations. The fish may reproduce more than once, though post-spawning mortality is high (60 to 90 percent). Lake residents migrate into streams to spawn, typically in riffles on well washed gravels. The behavior of this subspecies is typical of stream spawning trout; adults court, pair, and deposit and fertilize eggs in a redd dug by the female. Although the Lahontan cutthroat in Oregon were originally classified as Willow-Whitehorse cutthroat trout, genetic and taxonomic investigations led to the re-classification in 1991 (Williams 1991).

Lahontan trout are stocked in Mann Lake, the only place in Oregon stocked with this desert race of cutthroat trout.[34]

The Quinn River Lahontan Cutthroat Trout SMU is comprised of four populations, three of which are now extinct due to hybridization with non-native rainbow trout. Sage Creek is

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[34] ODFW: https://myodfw.com/fishing/southeast-zone

the only population to persist in the SMU, has an extremely limited distribution and abundance, and is vulnerable to hybridization. [35] Distribution of Lahontan cutthroat trout in the Oregon portion of the Quinn River Basin is limited to 15 km in Sage and Line Canyon creeks.[36]

The Coyote Lake SMU is comprised of five native cutthroat trout populations. Distribution is naturally fragmented, restricted by barrier falls and a discontinuous stream network. Three populations have low abundance and limited productivity. Lahontan cutthroat trout are the only fish species present in Willow, Whitehorse, and Antelope basins.[37]

Pallid sturgeon (*Scaphirhynchus albus*) (MT)

Information in this section from listed sources and USACE (2018).

Listing History

The Pallid sturgeon was listed as endangered under the Endangered Species Act on September 6, 1990. Since listing, the status of the species has improved and is currently stable.

Life History/Biological requirements

The Pallid sturgeon is native to the Missouri and Mississippi rivers and adapted to the pre-development habitat conditions that historically existed in these rivers. These conditions generally can be described as large, free-flowing, warm-water, and turbid rivers with a diverse assemblage of dynamic physical habitats. Floodplains, backwaters, chutes, sloughs, islands, sandbars, and a dynamic main channel formed the large-river ecosystem that met the habitat and life history requirements of Pallid Sturgeon and other native large-river fishes.

Historic data on preferred or occupied habitat is lacking. Recent data suggests Pallid sturgeon primarily utilize main channel, secondary channel, and channel border habitats throughout their range. Juvenile and adult Pallid sturgeon are rarely observed in habitats lacking flowing water which are removed from the main channel (i.e., backwaters and sloughs). Specific patterns of habitat use and the range of habitat parameters used may vary with availability and by life stage, size, age, and geographic location.

Habitat requirements of larval and young-of-year Pallid sturgeon remain largely undescribed across the species' range, primarily as a result of low populations of spawning adults and poor recruitment.

Distribution and Critical Habitat

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[35] https://www.dfw.state.or.us/fish/ONFSR/docs/final/09-cutthroat-trout/ct-summary-quinn-river.pdf

[36] Ibid.

[37] https://www.dfw.state.or.us/fish/ONFSR/docs/final/09-cutthroat-trout/ct-summary-coyote-lake.pdf

No critical habitat has been designated for the Pallid sturgeon. Since listing in 1990, wild and hatchery Pallid sturgeon have been documented in the Mississippi and Missouri Rivers.

Pallid Sturgeon are a migratory species that use the lower Yellowstone River primarily during spring and summer, but during fall and winter use the Missouri River below the confluence with the Yellowstone (Tews 1994, Bramblett 1996). Some Pallid Sturgeon use the Fort Peck tailrace yearlong, but others move downstream in spring (in one case more than 300 kilometers) (Tews 1994).

Pallid Sturgeon use large, turbid rivers over sand and gravel bottoms, usually in strong current; also impoundments of these rivers (FWP). In Montana, Pallid Sturgeon use large turbid streams including the Missouri and Yellowstone rivers (Brown 1971, Flath 1981) (Figure 6). They use all channel types, primarily straight reaches with islands (Bramblett 1996). They primarily use areas with substrates containing sand (especially bottom sand dune formations) and fines (93% of observations) (Bramblett 1996). Stream bottom velocities ranged between 0.0 and 1.37 meters per second, with an average of 0.65 meter per second (Bramblett 1996). Depths used were 0.6 to 14.5 meters and averaged 3.30 meters, and they seem to move deeper during the day (Bramblett 1996). Channel widths from 110 to 1100 meters are used and average 324 meters (Bramblett 1996). Water temperatures used ranged from 2.8 to 20 degrees C (Tews 1994, Bramblett 1996). Water turbidity ranged from 12 to 6400 NTU (Turbidity Units) (Tews 1994). Once Pallid Sturgeon spawn, the resulting larvae have a strong tendency to drift great distances downstream over a long period of time (Kynard 1998).

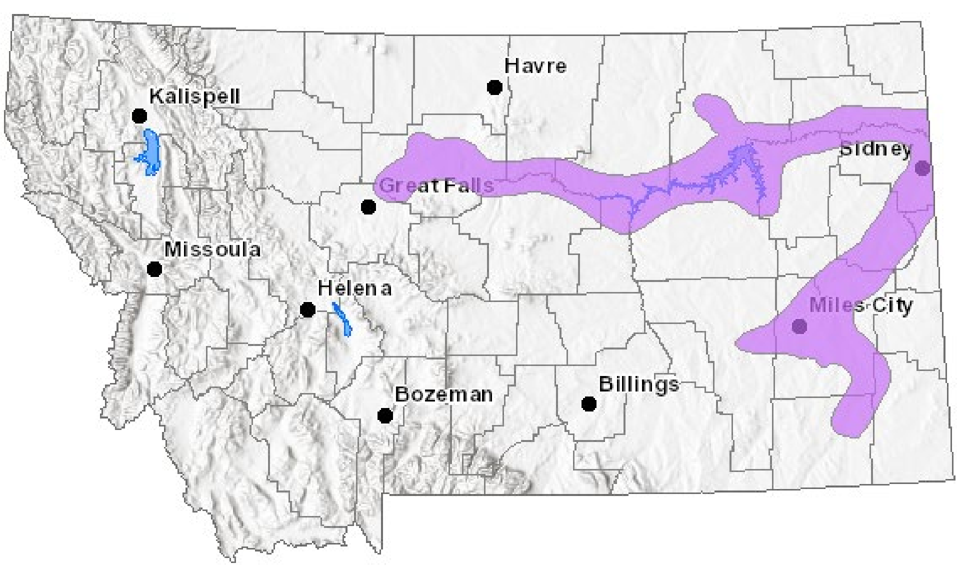

Figure 6. Pallid sturgeon use of the Missouri and Yellowstone Rivers.

Threats
Limiting factors include: 1) activities which affect in-river connectivity and the natural form, function, and hydrologic processes of rivers; 2) illegal harvest; 3) impaired water quality and quantity; 4) entrainment; and 5) life history attributes of the species (i.e., delayed sexual maturity, females not spawning every year, and larval drift requirements). The degree to which these factors affect the species varies among river reaches.

Invertebrates

Banbury Springs limpet (*Lanx spp.*) (ID)
Currently this species only exists at four cold-spring locations along the Snake River in Idaho that are isolated from each other: Thousand Springs, Box Canyon Springs, Briggs Springs and Banbury Springs. Primary factors affecting the Banbury Sprigs limpet in its four remaining coldwater spring complexes and tributaries are habitat modification, spring flow reduction, groundwater quality, the invasive New Zealand mudsnail and inadequate regulatory mechanisms.

Bliss Rapids snail (*Taylorconcha serpenticola*) (ID)
ECOS—The Bliss Rapids snail occurs in cold water springs and spring-fed tributaries to the Snake River, and in some reaches of the Snake River. The Bliss Rapids snail is primarily found on cobble boulder substrate, and in water temperatures between 59–61 degrees Fahrenheit. Recent surveys indicate the species is distributed discontinuously over 22 miles, from River Mile (RM) 547-560, RM 566-572, and at RM 580 on the Snake River. The species is also known to occur in 14 springs or tributaries to the Snake River. The species does not occur in reservoirs, although both Bliss Rapids snail and Snake River physa occur in river reaches immediately downstream of reservoirs.

It lives on stable rocks in flowing waters in the free-flowing reaches of the Snake River and in several cold-water springs in the Hagerman Valley (Bogan 2000). During the daytime, the snail resides on the sides and undersides of rocks.

Historically, this species occurred from Indian Cove Bridge to Twin Falls (Hershler et al. 1994). Populations occur in the lower reaches of the Malad River and in the Snake River between the springs above Hagerman and King Hill[38].

Bruneau hot springsnail (*Pyrgulopsis bruneauensis*) (ID)
This species is not restricted to hot springs but is commonly found in the Bruneau River where there are influences (sometimes weak) of geo/hydrothermal discharge. While the introduction of Dreissenids upstream is unlikely, the Bruneau is a short-season whitewater run and hence it is plausible, though less likely, these mussels could be introduced upstream. Hot Creek, a short geothermal spring on private land also contains an isolated and vulnerable population of the springsnail. The Hot Creek area has been used as an access point for the purpose of herbicide application for an

[38] http://fishandgame.idaho.gov/ifwis/cwcs/pdf/Bliss%20Rapids%20Snail.pdf

invasive aquatic plant (Hydrilla verticillata). Access to the river upstream of this location is not feasible given the deep canyon. Damaging access through Hot Creek and or treatment of waters of the Bruneau River for dreissenid control would have adverse impacts to the springsnail.

Snake River physa snail (*Physa natricina*) (ID)

The Snake River physa snail is a freshwater mollusk found in the middle Snake River of southern Idaho. It has an ovoid shell that is amber to brown in color, and has 3 to 3.5 whorls (curls or turns in the shell). The physa can reach a maximum length of about 6.5 millimeters. The Snake River physa is believed to have evolved in the Pliocene to Pleistocene lakes and rivers of northern Utah and southeastern Idaho. While much information exists on the family Physidae, very little is known about the biology or ecology of this species. It is believed to be confined to the Snake River, inhabiting areas of swift current on sand to boulder-sized substrate. In 1995, the Service reported the known modern range of the species to be from Grandview, Idaho (RM 487) to the Hagerman Reach of the Snake River (RM 573). More recent investigations have shown this species to occur outside of this historic range to as far downstream as Ontario, Oregon (RM 368), with another population known to occur downstream of Minidoka Dam (RM 675). While the species' current range is estimated to be over 300 river miles, the snail has been recorded in only 5% of over 1,000 samples collected within this area, and it has never been found in high densities. The species' status is uncertain within the current known range, but portions of the middle Snake River (e.g., Milner Reservoir, RM 663 to Lower Salmon Falls Reservoir, RM 572) are of questionable habitat value given current water quality and water use issues. In addition, the sampling in this reach has been limited. Very few live specimens have been recovered from reservoirs which have been extensively sampled. Both Bliss Rapids snail and Snake River physa occur in river reaches immediately downstream of reservoirs. Leakage of molluscicides from treated reservoir areas to downstream areas could result in adverse effects and could plausibly jeopardize Snake River physa (restricted to a single 11-mile reach).

The recovery area for the species extends from Snake River mile 553 to Snake River mile 675. It is currently listed as an Endangered species.

The species historical range included Idaho.

Plants

Bradshaw's desert parsley (*Lomatium bradshawii*) (OR, WA)

The majority of Bradshaw's desert parsley populations occur on seasonally saturated or flooded prairies, adjacent to creeks and small rivers in the southern Willamette Valley. Soils at these sites are dense, heavy clays, with a slowly permeable clay layer located 15-30 cm (6-12 in) below the surface. This clay layer results in a perched water table during winter and spring, and is critical to the wetland character of these grasslands, known as tufted hair-grass (*Deschampsia cespitosa*) prairies. Bradshaw's desert parsley occurs on alluvial (deposited by flowing water) soils. The species occurs on soils in the

Wapto, Bashaw and Mcalpin Series (NRCS mapped soil unit STATSGO 81). Note: The distribution of this species should be reviewed prior to any actions along creeks and small rivers in the southern Willamette Valley to determine presence and the potential to affect this species as a result of any activities associated with an action.

Nelson's checker-mallow (*Sidalcea nelsoniana*) (OR, WA)

Within the Willamette Valley, Nelson's checkermallow most frequently occurs in Oregon ash (*Fraxinus latifolia*) swales and meadows with wet depressions, or along streams. The species also grows in wetlands within remnant prairie grasslands. Some populations occur along roadsides at stream crossings where non-native plants, such as reed canarygrass (*Phalaris arundinacea*), blackberry (*Rubus* spp.), and Queen Anne's lace (*Daucus carota*), are also present. Nelson's checkermallow primarily occurs in open areas with little or no shade and will not tolerate encroachment of woody species. Note: The distribution of this species should be reviewed prior to any actions streams in its distribution in Oregon and Washington to determine presence and the potential to affect this species as a result of any activities associated with an action.

Ute Ladies'-tresses (*Spiranthes diluvialis*) (WA, ID, MT)

Information in this section from the USFWS ECOS database and USACE (2018).

Listing History

Ute ladies'-tresses was listed as threatened on January 17, 1992. On October 12, 2004 there was a petition filed to delist Ute ladies'-tresses. The petition states that there is substantial new information indicating that the population size and distribution are much larger than known at the time of listing; there is more information on life history and habitat needs, allowing for better management, and threats are not as great in magnitude or imminence as understood at the time of listing. This plant remains listed as threatened.

Ute ladies'-tresses is a perennial herb with erect, glandular-pubescent stems 5-24 in (12.7 to 61 cm) tall arising from tuberous-thickened roots. It reproduces exclusively by seed. The plant's life cycle consists of four main stages: seedling, dormant, vegetative, and reproductive. Fruits are produced in late August or September with seeds shed shortly thereafter. Seeds are microscopic, dust-like, and readily dispersed by wind or water. This plant may remain dormant for eight to eleven years and may revert to below ground existence for one to four or more growing seasons before re-emerging with new above-ground shoots.

The vegetative shoots are produced in October and persist through the winter as small rosettes. These resume growth in the spring and develop into short-stemmed, leafy plants. It blooms from early July to late October. Flowering typically occurs earlier in sites that have an open canopy and later in well-shaded sites. Bees are the primary pollinators of Ute ladies'-tresses, particularly solitary bees.

In perennial streamside populations, Ute ladies'-tresses typically occur on shallow sandy loam, silty-loam, or clayey-silt alluvial soils overlying more permeable cobbles, gravels, and sediments. It is dominated by perennial graminoids and forbs, particularly *Agrostis stolonifea, Elymus repens, Juncus balticus, and Equisetum laeigatum*. Ute ladies'-tresses populations may persist for a short time in the grassy understory of woody riparian shrublands, but do not appear to thrive under these conditions (Ward and Naumann 1998).

Distribution and Critical Habitat

No critical habitat has been designated for this species. Populations of Ute ladies'-tresses orchids are known from three broad general areas of the interior western United States—near the base of the eastern slope of the Rocky Mountains in southeastern Wyoming and adjacent Nebraska and north-central and central Colorado; in the upper Colorado River basin, particularly in the Uinta Basin; and in the Bonneville Basin along the Wasatch Front and westward in the eastern Great Basin, north-central and western Utah, extreme eastern Nevada, and southeastern Idaho. The species is also known to occur in Bonneville, Fremont, Jefferson, and Madison counties along the Snake River, has been discovered in southwestern Montana, and in the Okanogan area and along the Columbia River in North Central Washington.

The orchid occurs along riparian edges, gravel bars, old oxbows, high flow channels, and moist to wet meadows along perennial streams. It typically occurs in stable wetland and seepy areas associated with old landscape features within historical floodplains of major rivers. It also is found in wetland and seepy areas near freshwater lakes or springs. Note: The distribution of this species should be reviewed prior to any actions along riparian areas, rivers, and streams in its known distribution to determine potential to affect this species as a result of any activities associated with an action.

Water howellia (*Howellia aquatilis*) (OR, WA, ID, MT)

Information in this section from USFWS ECOS database and USACE (2018).

Listing History

Water howellia was listed as threatened on July 14, 1994.

Life History/Biological requirements

Water howellia is an annual aquatic species in the bellflower family (Campanulaceae). Individuals are mostly submerged and rooted in bottom sediments. Stems branch near the soil surface and are 1.5-2.8 in (4-7 cm) long. The leaves are numerous and linear to linear-filiform, measuring 0.4-0.6 in (1-5 cm) long, with an entire margin or with a few teeth. The flowers are axillary, 0.08-0.11 in (2-2.7 mm) long, and a corolla is present (in emergent flowers) or lacking (in underwater flowers). The corolla is white to pale lavender and is deeply cleft on one side. The fruit is 0.3-0.4 in (8-10 mm) long. The seeds number 1-5 and are 0.08-0.2 in (2-4 mm) long. This species typically blooms May through August.

Information on herbarium labels or Oregon collections describe the habitat as "ponds in woods", "pond in shaded woods", and "stagnant ponds in the timber". Information from other locales indicate that this species is restricted to small, vernal, freshwater wetlands, glacial pothole ponds, or former river oxbows that have an annual cycle of filling with water over the fall, winter and early spring, followed by drying during the summer months. These habitats are generally small [< 2.47 ac (1 ha)] and shallow [< 3.3 ft (1 m deep)]. Bottom surfaces are reported as firm, consolidated clay, and organic sediments. Most locations were surrounded by deciduous trees and howellia was found in shallow water or around the edges of deep ponds. Associated species include duckweed (*Lemna* spp.), water starworts (*Callitriche* spp.), water buttercup (*Ranunculus aquaticus*), yellow water-lily (*Nuphar polysepalum*), bladderwort (*Utricularia vulgaris*), and pondweeds (*Potamogeton* spp.).

Distribution and Critical Habitat
No critical habitat has been designated for this species. Historically, water howellia was known to occur in one location in Mendocino County, California, four locations in northwest Oregon, two additional locations in Washington, and one location in northern Idaho.

As of drafting the recovery plan for this species in 1995, water howellia was known to occur in six locations; one in Idaho, three in Washington, and one in Montana, and one in California.

Threats
Habitat destruction appears to be the main threat and cause for decline of water howellia. Road and pasture development, grazing and trampling, timber harvest, invasive species, and wetland succession have been documented as potential factors.

Willamette daisy (*Erigeron decumbens* var. *decumbens*) (OR)
This species occurs on alluvial soils (deposited by flowing waters). The Willamette daisy occurs on soils in the Wapto, Bashaw and Mcalpin Series (NRCS mapped soil unit STATSGO 81). The species is known to have been extirpated (destroyed or no longer surviving) from an additional 19 historic locations. Willamette daisy populations are known mainly from bottomland, but one population is found in an upland prairie remnant. Currently, 18 sites are known, distributed over an area of 700,000 hectares (1.7 million acres), between Grand Ronde and Goshen, Oregon. Note: The distribution of this species should be reviewed prior to any actions along riparian areas, rivers, and streams in its known distribution to determine potential to affect this species as a result of any activities associated with an action.

APPENDIX E. CRITICAL HABITAT FOR LISTED SALMONID SPECIES IN THE COLUMBIA RIVER BASIN.

(g) ***Puget Sound Chinook Salmon*** *(Oncorhynchus tshawytscha)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Nooksack Subbasin 17110004

(i) *Upper North Fork Nooksack River Watershed 1711000401*. Outlet(s) = North Fork Nooksack River (Lat 48.9055, Long −121.9886) upstream to endpoint(s) in: Boyd Creek (48.8998, −121.8640); Canyon Creek (48.9366, −121.9451); Cascade Creek (48.8996, −121.8621); Cornell Creek (48.8882, −121.9594); Deadhorse Creek (48.9024, −121.8359); Gallop Creek (48.8849, −121.9447); Glacier Creek (48.8197, −121.8931); Hedrick Creek (48.8953, −121.9705); Thompson Creek (48.8837, −121.9028); Wells Creek (48.8940, −121.7976).

(ii) *Middle Fork Nooksack River Watershed 1711000402*. Outlet(s) = Middle Fork Nooksack River (Lat 48.8342, Long −122.1540) upstream to endpoint(s) in: Canyon Creek (48.8374, −122.1198); Clearwater Creek (48.7841, −122.0293); Middle Fork Nooksack River (48.7249, −121.8999); Porter Creek (48.7951, −122.1098); Sister Creek (48.7492, −121.9736); Unnamed (48.7809, −122.1157); Unnamed (48.7860, −122.1214); Warm Creek (48.7559, −121.9741).

(iii) *South Fork Nooksack River Watershed 1711000403*. Outlet(s) = South Fork Nooksack River (Lat 48.8095, Long −122.2026) upstream to endpoint(s) in: Black Slough (48.7715, −122.1931); Cavanaugh Creek (48.6446, −122.1094); Deer Creek (48.6041, −122.0912); Edfro Creek (48.6607, −122.1206); Fobes Creek (48.6230, −122.1139); Hard Scrabble Falls Creek (48.7601, −122.2273); Howard Creek (48.6118, −121.9639); Hutchinson Creek (48.7056, −122.1663); Jones Creek (48.7186, −122.2130); McCarty Creek (48.7275, −122.2188); Plumbago Creek (48.6088, −122.0949); Pond Creek (48.6958, −122.1651); Skookum Creek (48.6871, −122.1029); South Fork Nooksack River (48.6133, −121.9000); Standard Creek (48.7444, −122.2191); Sygitowicz Creek (48.7722, −122.2269); Unnamed (48.6048, −121.9143); Unnamed (48.6213, −122.1039); Unnamed (48.7174, −122.1815); Unnamed (48.7231, −122.1968); Unnamed (48.7843, −122.2188).

(iv) *Lower North Fork Nooksack River Watershed 1711000404*. Outlet(s) = Nooksack River (Lat 48.8711, Long −122.3227) upstream to endpoint(s) in: Anderson Creek (48.8088, −122.3410); Boulder Creek (48.9314, −122.0258); Coal Creek (48.8889, −122.1506); Kendall Creek (48.9251, −122.1455); Kenney Creek (48.8510, −122.1368); Macaulay Creek (48.8353, −122.2345); Maple Creek (48.9262, −122.0751); Mitchell Creek (48.8313,

−122.2174); North Fork Nooksack River (48.9055, −121.9886); Racehorse Creek (48.8819, −122.1272); Smith Creek (48.8439, −122.2544); Unnamed (48.8103, −122.1855); Unnamed (48.9002, −122.1205); Unnamed (48.9040, −122.0875); Unnamed (48.9131, −122.0127); Unnamed (48.9158, −122.0091); Unnamed (48.9162, −122.0615); Unnamed (48.9200, −122.0463); Wildcat Creek (48.9058, −121.9995); Deer Creek (48.8439, −122.4839).

(v) *Nooksack River Watershed 1711000405*. Outlet(s) = Lummi River (Lat 48.8010, Long −122.6582); Nooksack River (48.7737, −122.5986); Silver Creek (48.7786, −122.5635); Slater Slough (48.7759, −122.6029); Unnamed (48.7776, −122.5708); Unnamed (48.7786, −122.5677); Unnamed (48.7973, −122.6717); Unnamed (48.8033, −122.6771) upstream to endpoint(s) in: Fishtrap Creek (49.0025, −122.4053); Fourmile Creek (48.8890, −122.4213); Lummi River (48.8198, −122.6049); Nooksack River (48.8711, −122.3227); Pepin Creek (49.0024, −122.4724); Slater Slough (48.7778, −122.6041); Tenmile Creek (48.8457, −122.3661); Unnamed (48.8191, −122.5705); Unnamed (48.8453, −122.6071); Unnamed (48.8548, −122.4749); Unnamed (48.9609, −122.5312); Unnamed (48.9634, −122.3928); Unnamed (49.0024, −122.4730); Unnamed (49.0025, −122.5218).

(2) Upper Skagit Subbasin 17110005

(i) *Skagit River/Gorge Lake Watershed 1711000504*. Outlet(s) = Skagit River (Lat 48.6725, Long −121.2633) upstream to endpoint(s) in: Goodell Creek (48.6890, −121.2718); Skagit River (48.6763, −121.2404).

(ii) *Skagit River/Diobsud Creek Watershed 1711000505*. Outlet(s) = Skagit River (Lat 48.5218, Long −121.4315) upstream to endpoint(s) in: Bacon Creek (48.6456, −121.4244); Diobsud Creek (48.5761, −121.4309); Falls Creek (48.6334, −121.4258); Skagit River (48.6725, −121.2633).

(iii) *Cascade River Watershed 1711000506*. Outlet(s) = Cascade River (Lat 48.5218, Long −121.4315) upstream to endpoint(s) in: Found Creek (48.4816, −121.2437); Kindy Creek (48.4613, −121.2094); Marble Creek (48.5398, −121.2612); North Fork Cascade River (48.4660, −121.1641); South Fork Cascade River (48.4592, −121.1494).

(iv) *Skagit River/Illabot Creek Watershed 1711000507*. Outlet(s) = Skagit River (Lat 48.5333, Long −121.7370) upstream to endpoint(s) in: Illabot Creek (48.4498, −121.4551); Jackman Creek (48.5294, −121.6957); Skagit River (48.5218, −121.4315); Unnamed (48.5013, −121.6598).

(3) Sauk Subbasin 17110006

(i) *Upper Sauk River Watershed 1711000601*. Outlet(s) = Sauk River (Lat 48.1731, Long −121.4714) upstream to endpoint(s) in: Camp Creek (48.1559, −121.2909); North Fork Sauk River (48.0962, −121.3710); Owl Creek (48.1623, −121.2948); South Fork Sauk River

(48.0670, −121.4088); Swift Creek (48.1011, −121.3975); Unnamed (48.1653, −121.3288); White Chuck River (48.1528, −121.2645).

(ii) *Upper Suiattle River Watershed 1711000602*. Outlet(s) = Suiattle River (Lat 48.2586, Long −121.2237) upstream to endpoint(s) in: Downey Creek (48.2828, −121.2083); Milk Creek (48.2207, −121.1634); Suiattle River (48.2211, −121.1609); Sulphur Creek (48.2560, −121.1773); Unnamed (48.2338, −121.1792).

(iii) *Lower Suiattle River Watershed 1711000603*. Outlet(s) = Suiattle River (Lat 48.3384, Long −121.5482) upstream to endpoint(s) in: Big Creek (48.3435, −121.4416); Buck Creek (48.2753, −121.3268); Circle Creek (48.2555, −121.3395); Lime Creek (48.2445, −121.2933); Straight Creek (48.2594;-121.4009); Suiattle River (48.2586, −121.2237); Tenas Creek (48.3371, −121.4304).

(iv) *Lower Sauk River Watershed 1711000604*. Outlet(s) = Sauk River (Lat 48.4821, Long −121.6060) upstream to endpoint(s) in: Dan Creek (48.2702, −121.5473); Sauk River (48.1731, −121.4714); Unnamed (48.2247, −121.5826); Unnamed (48.3187, −121.5480).

(4) Lower Skagit Subbasin 17110007

(i) *Middle Skagit River/Finney Creek Watershed 1711000701*. Outlet(s) = Skagit River (Lat 48.4891, Long −122.2178) upstream to endpoint(s) in: Alder Creek (48.5280, −121.9498); Day Creek (48.4689, −122.0216); Finney Creek (48.4655, −121.6858); Grandy Creek (48.5510, −121.8621); Hansen Creek (48.5600, −122.2069); Jims Slough (48.5274, −122.0227); Jones Creek (48.5418, −122.0494); Mannser Creek (48.5260, −122.0430); Muddy Creek (48.5278, −122.0007); Pressentin Creek (48.5099, −121.8449); Skagit River (48.5333, −121.7370); Sorenson Creek (48.4875, −122.1029); Unnamed (48.4887, −122.0747); Unnamed (48.5312, −122.0149); Wiseman Creek (48.5160, −122.1286).

(ii) *Lower Skagit River/Nookachamps Creek Watershed 1711000702*. Outlet(s) = Browns Slough (Lat 48.3305, Long −122.4194); Freshwater Slough (48.3109, −122.3883); Hall Slough (48.3394, −122.4426); Isohis Slough (48.2975, −122.3711); North Fork Skagit River (48.3625, −122.4689); South Fork Skagit River (48.2920, −122.3670); Unnamed (48.3085, −122.3868); Unnamed (48.3831, −122.4842) upstream to endpoint(s) in: Britt Slough (48.3935, −122.3571); Browns Slough (48.3411, −122.4127); East Fork Nookachamps Creek (48.4044, −122.1790); Hall Slough (48.3437, −122.4376); Mundt Creek (48.4249, −122.2007); Skagit River (48.4891, −122.2178); Unnamed (48.3703, −122.3081); Unnamed (48.3827, −122.1893); Unnamed (48.3924, −122.4822); Walker Creek (48.3778, −122.1899).

(5) Stillaguamish Subbasin 17110008

(i) *North Fork Stillaguamish River Watershed 1711000801*. Outlet(s) = North Fork Stillaguamish River (Lat 48.2037, Long −122.1256) upstream to endpoint(s) in: Ashton Creek (48.2545, −121.6708);

Boulder River (48.2624, −121.8090); Deer Creek (48.2835, −121.9255); French Creek (48.2534, −121.7856); Furland Creek (48.2624, −121.6749); Grant Creek (48.2873, −122.0118); North Fork Stillaguamish River (48.3041, −121.6360); Rollins Creek (48.2908, −121.8441); Squire Creek (48.2389, −121.6374); Unnamed (48.2393, −121.6285); Unnamed (48.2739, −121.9948).

(ii) *South Fork Stillaguamish River Watershed 1711000802*. Outlet(s) = South Fork Stillaguamish River (Lat 48.2037, Long −122.1256) upstream to endpoint(s) in: Jim Creek (48.2230, −121.9483); North Fork Canyon Creek (48.1697, −121.8194); Siberia Creek (48.1731, −122.0377); South Fork Canyon Creek (48.1540, −121.7840); South Fork Stillaguamish River (48.0454, −121.4819); Unnamed (48.1463, −122.0162).

(iii) *Lower Stillaguamish River Waterhed 1711000803*. Outlet(s) = Stillaguamish River (Lat 48.2385, Long −122.3749); Unnamed (48.1983, −122.3579) upstream to endpoint(s) in: Armstrong Creek (48.2189, −122.1347); Pilchuck Creek (48.2983, −122.1672); Stillaguamish River (48.2037, −122.1256).

(6) Skykomish Subbasin 17110009

(i) *Tye and Beckler River Watershed 1711000901*. Outlet(s) = South Fork Skykomish River (Lat 47.7147, Long −121.3393) upstream to endpoint(s) in: East Fork Foss River (47.6522, −121.2792); Rapid River (47.8131, −121.2470) Tye River (47.7172, −121.2254) Unnamed (47.8241, −121.2979); West Fork Foss River (47.6444, −121.2972).

(ii) *Skykomish River Forks Watershed 1711000902*. Outlet(s) = North Fork Skykomish River (Lat 47.8133, Long −121.5782) upstream to endpoint(s) in: Bridal Veil Creek (47.7987, −121.5597); Lewis Creek (47.8223, −121.5160); Miller River (47.7018, −121.3950); Money Creek (47.7208, −121.4062); North Fork Skykomish River (47.9183, −121.3073); South Fork Skykomish River (47.7147, −121.3393); Unnamed (47.7321, −121.4176); Unnamed (47.8002, −121.5548).

(iii) *Skykomish River/Wallace River Watershed 1711000903*. Outlet(s) = Skykomish River (Lat 47.8602, Long-121.8190) upstream to endpoint(s) in: Deer Creek (47.8191, −121.5805); Olney Creek (47.8796, −121.7163); Proctor Creek (47.8216, −121.6460); Skykomish River (47.8133, −121.5782); Unnamed (47.8507, −121.8010); Wagleys Creek (47.8674, −121.7972); Wallace River (47.8736, −121.6491).

(iv) *Sultan River Watershed 1711000904*. Outlet(s) = Sultan River (Lat 47.8602, Long −121.8190) upstream to endpoint(s) in: Sultan River (47.9598, −121.7951).

(v) *Skykomish River/Woods Creek Watershed 1711000905*. Outlet(s) = Skykomish River (Lat 47.8303, Long −122.0451) upstream to endpoint(s) in: Elwell Creek (47.8038, −121.8524); Skykomish River (47.8602, −121.8190); Unnamed (47.8890, −121.8637); West Fork Woods Creek (47.9627, −121.9707); Woods Creek (47.8953, −121.8742); Youngs Creek (47.8081, −121.8332).

(7) Snoqualmie Subbasin 17110010

(i) *Middle Fork Snoqualmie River Watershed 1711001003*. Outlet(s) = Snoqualmie River (Lat 47.6407, Long −121.9261) upstream to endpoint(s) in: Canyon Creek (47.5837, −121.9623); Deep Creek (47.4764, −121.8905); Griffin Creek (47.6164, −121.9014); Lake Creek (47.5036, −121.9035); Patterson Creek (47.6276, −121.9855); Raging River (47.4795, −121.8691); Snoqualmie River (47.5415, −121.8362); Tokul Creek (47.5563, −121.8285).

(ii) *Lower Snoqualmie River Watershed 1711001004*. Outlet(s) = Snoqualmie River (Lat 47.8303, Long −122.0451) upstream to endpoint(s) in: Cherry Creek (47.7465, −121.8953); Margaret Creek (47.7547, −121.8933); North Fork Tolt River (47.7060, −121.7957); Snoqualmie River (47.6407, −121.9261); South Fork Tolt River (47.6969, −121.7861); Tuck Creek (47.7442, −122.0032); Unnamed (47.6806, −121.9730); Unnamed (47.6822, −121.9770); Unnamed (47.7420, −122.0084); Unnamed (47.7522, −121.9745); Unnamed (47.7581, −121.9586).

(8) Snohomish Subbasin 17110011

(i) *Pilchuck River Watershed 1711001101*. Outlet(s) = Pilchuck River (Lat 47.9013, Long −122.0917) upstream to endpoint(s) in: Pilchuck River (48.0052, −121.7718).

(ii) *Snohomish River Watershed 1711001102*. Outlet(s) = Quilceda Creek (Lat 48.0556, Long −122.1908); Skykomish River (48.0173, −122.1877); Steamboat Slough (48.0365, −122.1814); Union Slough (48.0299, −122.1794); Unnamed (48.0412, −122.1723) upstream to endpoint(s) in: Allen Creek (48.0767, −122.1404); Quilceda Creek (48.1124, −122.1540); Skykomish River (47.8303, −122.0451); Unnamed (47.9545, −122.1969); Unnamed (47.9777, −122.1632); Unnamed (48.0019, −122.1283); Unnamed (48.0055, −122.1303); Unnamed (48.1330, −122.1472).

(9) Lake Washington Subbasin 17110012

(i) *Cedar River Watershed 1711001201*. Outlet(s) = Cedar River (Lat 47.5003, Long −122.2146) upstream to endpoint(s) in: Cedar River (47.4192, −121.7805); Rock Creek (47.3673, −122.0132); Unnamed (47.4092, −122.0358); Webster Creek (47.3857, −121.9845).

(ii) *Lake Washington Watershed 1711001203*. Outlet(s) = Lake Washington (Lat 47.6654, Long −122.3960) upstream to endpoint(s) in: Cedar River (47.5003, −122.2146); Sammamish River (47.7543, −122.2465).

(10) Duwamish Subbasin 17110013

(i) *Upper Green River Watershed 1711001301*. Outlet(s) = Green River (Lat 47.2234, Long −121.6081) upstream to endpoint(s) in: Friday Creek (47.2204, −121.4559); Intake Creek (47.2058, −121.4049); McCain Creek (47.2093, −121.5292); Sawmill Creek (47.2086, −121.4675); Smay Creek (47.2508, −121.5872); Snow Creek

(47.2607, −121.4046); Sunday Creek (47.2587, −121.3659); Tacoma Creek (47.1875, −121.3630); Unnamed (47.2129, −121.4579).

(ii) *Middle Green River Watershed 1711001302*. Outlet(s) = Green River (Lat 47.2911, Long −121.9714) upstream to endpoint(s) in: Bear Creek (47.2774, −121.7990); Cougar Creek (47.2439, −121.6442); Eagle Creek (47.3051, −121.7219); Gale Creek (47.2644, −121.7085); Green River (47.2234, −121.6081); Piling Creek (47.2820, −121.7553); Sylvester Creek (47.2457, −121.6537); Unnamed (47.2360, −121.6333).

(iii) *Lower Green River Watershed 1711001303*. Outlet(s) = Duwamish River (Lat 47.5113, Long −122.2951) upstream to endpoint(s) in: Big Soos Creek (47.4191, −122.1599); Burns Creek (47.2779, −122.1087); Covington Creek (47.3341, −122.0399); Crisp Creek (47.2897, −122.0590); Green River (47.2911, −121.9714); Jenkins Creek (47.3791, −122.0899); Little Soos Creek (47.4031, −122.1235); Mill Creek (47.3263, −122.2455); Newaukum Creek (47.2303, −121.9518); Unnamed (47.2765, −121.9730); Unnamed (47.2891, −122.1557); Unnamed (47.3007, −122.1774); Unnamed (47.3250, −122.1961); Unnamed (47.3464, −122.2397); Unnamed (47.3751, −122.2648); Unnamed (47.4046, −122.2134); Unnamed (47.4525, −122.2354); Unnamed (47.4618, −122.2315); Unnamed (47.4619, −122.2554); Unnamed (47.4876, −122.2781).

(11) Puyallup Subbasin 17110014

(i) *Upper White River Watershed 1711001401*. Outlet(s) = White River (Lat 47.1588, Long −121.6587) upstream to endpoint(s) in: Greenwater River (47.1204, −121.5055); Huckleberry Creek (47.0612, −121.6033); Pinochle Creek (47.0478, −121.7043); Unnamed (46.9935, −121.5295); West Fork White River (47.0483, −121.6916); Wrong Creek (47.0403, −121.6999).

(ii) *Lower White River Watershed 1711001402*. Outlet(s) = White River (Lat 47.2001, Long −122.2579) upstream to endpoint(s) in: Boise Creek (47.1958, −121.9467); Camp Creek (47.1430, −121.7012); Clearwater River (47.0852, −121.7823); Unnamed (47.1509, −121.7236); Unnamed (47.2247, −122.1072); Unnamed (47.2307, −122.1079); Unnamed (47.2383, −122.2234); Unnamed (47.2498, −122.2346); White River (47.1588, −121.6587).

(iii) *Carbon River Watershed 1711001403*. Outlet(s) = Carbon River (Lat 47.1308, Long −122.2315) upstream to endpoint(s) in: Carbon River (46.9965, −121.9198); South Fork South Prairie Creek (47.1203, −121.9963); Voight Creek (47.0751, −122.1285); Wilkeson Creek (47.0972, −122.0245).

(iv) *Upper Puyallup River Watershed 1711001404*. Outlet(s) = Puyallup River (Lat 47.1308, Long −122.2315) upstream to endpoint(s) in: Deer Creek (46.8547, −121.9680); Kapowsin Creek (46.9854, −122.2008); Kellog Creek (46.9164, −122.0652); Mowich

River (46.9209, −121.9739); Rushingwater Creek (46.8971, −121.9439); Unnamed (46.8867, −122.0194); Unnamed (46.8899, −121.9657).

(v) *Lower Puyallup River Watershed 1711001405*. Outlet(s) = Hylebos Creek (Lat 47.2611, Long −122.3591); Puyallup River (47.2501, −122.4131) upstream to endpoint(s) in: Canyonfalls Creek (47.1421, −122.2186); Clarks Creek (47.1757.-122.3168); Clear Creek (47.2187, −122.3727); Fennel Creek (47.1495, −122.1849); Puyallup River (47.1308, −122.2315); Unnamed (47.1779, −122.1992); Unnamed (47.1799, −122.3066); Unnamed (47.1928, −122.3371); Unnamed (47.2723, −122.3216); West Hylebos Creek (47.2736, −122.3289).

(12) Nisqually Subbasin 17110015

(i) *Mashel/Ohop Watershed 1711001502*. Outlet(s) = Nisqually River (Lat 46.8646, Long −122.4776) upstream to endpoint(s) in: Little Mashel River (46.8504, −122.2724); Lynch Creek (46.8760, −122.2625); Mashel River (46.8431, −122.1205); Nisqually River (46.8303, −122.3225); Ohop Creek (46.9264, −122.2603); Powell Creek (46.8528, −122.4505); Tanwax Creek (46.8630, −122.4549); Twentyfive Mile Creek (46.9274, −122.2558).

(ii) *Lowland Watershed 1711001503*. Outlet(s) = McAllister Creek (Lat 47.1120, Long −122.7215); Nisqually River (47.1110, −122.7026); Unnamed (47.0071, −122.6556); Yelm Creek (46.9712, −122.6263) upstream to endpoint(s) in: Horn Creek (46.9042, −122.4776); McAllister Creek (47.0299, −122.7236); Nisqually River (46.8646, −122.4776); Unnamed (46.9108, −122.5032); Unnamed (47.0001, −122.6510); Unnamed (47.0055, −122.6520); Yelm Creek (46.9629, −122.6194). Excluded is that segment of the Nisqually River from Lat 47.0703, Long −122.7017, to Lat 46.9668, Long −122.5640.

(13) Skokomish Subbasin 17110017—*Skokomish River Watershed 1711001701*. Outlet(s) = Skokomish River (Lat 47.3543, Long −123.1122); Unnamed (47.3420, −123.1092); Unnamed (47.3471, −123.1275); Unnamed (47.3509, −123.1101) upstream to endpoint(s) in: Brown Creek (47.4238, −123.3052); Fir Creek (47.3363, −123.3016); McTaggert Creek (47.3749, −123.2318); North Fork Skokomish River (47.5197, −123.3329); Purdy Canyon (47.3021, −123.1803); Unnamed (47.3048, −123.1528); Unnamed (47.3077, −123.2012); Unnamed (47.3146, −123.1353); Unnamed (47.3209, −123.2212); Unnamed (47.3222, −123.3060); Unnamed (47.3237, −123.1467); Unnamed (47.3250, −123.1250); Vance Creek (47.3300, −123.3137); Weaver Creek (47.3097, −123.2384).

(14) Hood Canal Subbasin 17110018—(i) *Hamma Hamma River Watershed 1711001803*. Outlet(s) = Hamma Hamma River (Lat 47.5471, Long −123.0440) upstream to endpoint(s) in: Hamma Hamma River (47.5590, −123.0632); North Fork John Creek (47.5442, −123.0696)

(ii) *Duckabush River Watershed 1711001804*. Outlet(s) = Duckabush River (Lat 47.6502, Long −122.9348) upstream to endpoint(s) in: Duckabush River (47.6825, −123.0675).

(iii) *Dosewallips River Watershed 1711001805.* Outlet(s) = Dosewallips River (Lat 47.6881, Long −122.8945); Unnamed (47.6857, −122.8967) upstream to endpoint(s) in: Dosewallips River (47.7289, −123.1111); Rocky Brook (47.7212, −122.9405); Unnamed (47.6886, −122.8977).

(15) Dungeness/Elwha 17110020

(i) *Dungeness River Watershed 1711002003.* Outlet(s) = Dungeness River (Lat 48.1506, Long −123.1311); Unnamed (48.1537, −123.1267) upstream to endpoint(s) in: Dungeness River (47.9386, −123.0885); Gray Wolf River (47.9168, −123.2409); Matriotti Creek (48.1368, −123.1428); Unnamed (48.1514, −123.1216).

(ii) *Elwha River Watershed 1711002007.* Outlet(s) = Elwha River (Lat 48.1466, Long −123.5671); Unnamed (48.1483, −123.5599) upstream to endpoint(s) in: Elwha River (48.0927, −123.5614).

(16) Nearshore Marine Areas—Except as provided in paragraph (e) of this section, critical habitat includes all nearshore marine areas (including areas adjacent to islands) of the Strait of Georgia (south of the international border), Puget Sound, Hood Canal, and the Strait of Juan de Fuca (to the western end of the Elwha River delta) from the line of extreme high tide out to a depth of 30 meters.

(h) ***Lower Columbia River Chinook Salmon*** *(Oncorhynchus tshawytscha).* Critical habitat is designated to include the areas defined in the following subbasins:

(1) Middle Columbia/Hood Subbasin 17070105

(i) *East Fork Hood River Watershed 1707010506.* Outlet(s) = Hood River (Lat 45.6050, Long −121.6323) upstream to endpoint(s) in: Dog River (45.4655, −121.5656); East Fork Hood River (45.4665, −121.5669); Pinnacle Creek (45.4595, −121.6568); Tony Creek (45.5435, −121.6411).

(ii) *West Fork Hood River Watershed 1707010507.* Outlet(s) = West Fork Hood River (Lat 45.6050, Long −121.6323) upstream to endpoint(s) in: Divers Creek (45.5457, −121.7447); Elk Creek (45.4277, −121.7889); Indian Creek (45.5375, −121.7857); Jones Creek (45.4629, −121.7942); Lake Branch (45.5083, −121.8485); McGee Creek (45.4179, −121.7675); No Name Creek (45.5347, −121.7929); Red Hill Creek (45.4720, −121.7705), Unnamed (45.5502, −121.7014).

(iii) *Hood River Watershed 1707010508.* Outlet(s) = Hood River (Lat 45.7205, Long −121.5055) upstream to endpoint(s) in: Hood River (45.6050, −121.6323).

(iv) *White Salmon River Watershed 1707010509.* Outlet(s) = White Salmon River (Lat 45.7226, Long −121.5214) upstream to endpoint(s) in: White Salmon River (45.7677, −121.5374).

(v) *Wind River Watershed 1707010511.* Outlet(s) = Wind River (Lat 45.7037, Long −121.7946) upstream to endpoint(s) in: Bear Creek (45.7620, −121.8293); Big Hollow Creek (45.9399, −121.9996); Dry Creek (45.9296, −121.9721); Falls Creek (45.9105, −121.9222); Little Wind River (45.7392, −121.7772); Ninemile Creek (45.8929,

−121.9526); Paradise Creek (45.9527, −121.9408); Trapper Creek (45.8887, −122.0065); Trout Creek (45.8021, −121.9313); Wind River (45.9732, −121.9031).

(vi) *Middle Columbia/Grays Creek Watershed 1707010512*. Outlet(s) = Columbia River (Lat 45.7044, Long −121.7980) upstream to endpoint(s) in: Columbia River (45.7205, −121.5056).

(vii) *Middle Columbia/Eagle Creek Watershed 1707010513*. Outlet(s) = Columbia River (Lat 45.6447, Long −121.9395) upstream to endpoint(s) in: Camp Creek (45.6676, −121.8167); Carson Creek (45.7206, −121.8184); Columbia River (45.7044, −121.7980); Dry Creek (45.6717, −121.8732); Eagle Creek (45.6365, −121.9171); East Fork Herman Creek (45.6538, −121.8122); Herman Creek (45.6749, −121.8477); Rock Creek (45.6958, −121.8915); Unnamed (45.6654, −121.8164); Unnamed (45.6674, −121.8487); Unnamed (45.6689, −121.8444); Unnamed (45.6762, −121.9350); Unnamed (45.6902, −121.9034); Unnamed (45.6948, −121.9424).

(2) Lower Columbia/Sandy Subbasin 17080001

(i) *Salmon River Watershed 1708000101*. Outlet(s) = Salmon River (Lat 45.3768, Long −122.0293) upstream to endpoint(s) in: Cheeney Creek (45.3104, −121.9561); Copper Creek (45.2508, −121.9053); Salmon River (45.2511, −121.9025); South Fork Salmon River (45.2606, −121.9474); Unnamed (45.3434, −121.9920).

(ii) *Zigzag River Watershed 1708000102*. Outlet(s) = Zigzag River (Lat 45.3489, Long −121.9442) upstream to endpoint(s) in: Henry Creek (45.3328, −121.9110); Still Creek (45.2755, −121.8413); Unnamed (45.3019, −121.8202); Zigzag River (45.3092, −121.8642).

(iii) *Upper Sandy River Watershed 1708000103*. Outlet(s) = Sandy River (Lat 45.3489, Long −121.9442) upstream to endpoint(s) in: Clear Creek (45.3712, −121.9246); Clear Fork Sandy River (45.3994, −121.8525); Horseshoe Creek (45.3707, −121.8936); Lost Creek (45.3709, −121.8150); Sandy River (45.3899, −121.8620).

(iv) *Middle Sandy River Watershed 1708000104*. Outlet(s) = Sandy River (Lat 45.4464, Long −122.2459) upstream to endpoint(s) in: Alder Creek (45.3776, −122.0994); Bear Creek (45.3368, −121.9265); Cedar Creek (45.4087, −122.2617); North Boulder Creek (45.3822, −122.0168); Sandy River (45.3489, −121.9442).

(v) *Bull Run River Watershed 1708000105*. Outlet(s) = Bull Run River (Lat 45.4464, Long −122.2459) upstream to endpoint(s) in: Bull Run River (45.4455, −122.1561); Little Sandy Creek (45.4235, −122.1975).

(vi) *Washougal River (1708000106)*. Outlet(s) = Washougal River (Lat 45.5795, Long −122.4022) upstream(s) to endpoint(s) in: Cougar Creek (45.6265, −122.2987); Dougan Creek (45.6770, −122.1522); Lacamas Creek (45.5972, −122.3933); Little Washougal River (45.6315, −122.3767); Washougal River (45.6729, −122.1524); West Fork Washougal River (45.6205, −122.2149).

(vii) *Columbia Gorge Tributaries Watershed 1708000107*. Outlet(s) = Columbia River (Lat 45.5735, Long −122.3945) upstream to endpoint(s) in: Bridal Veil Creek (45.5542, −122.1793); Columbia River (45.6447, −121.9395); Coopey Creek (45.5656, −122.1671); Government Cove (45.5948, −122.0630); Hamilton Creek (45.6414, −121.9764); Hardy Creek (45.6354, −121.9987); Horsetail Creek (45.5883, −122.0675); Latourell Creek (45.5388, −122.2173); McCord Creek (45.6115, −121.9929); Moffett Creek (45.6185, −121.9662); Multnomah Creek (45.5761, −122.1143), Oneonta Creek (45.5821, −122.0718); Tanner Creek (45.6264, −121.9522); Turnaft Creek (45.6101, −122.0284); Unnamed (45.5421, −122.2624); Unnamed (45.5488, −122.3504); Unnamed (45.6025, −122.0443); Unnamed (45.6055, −122.0392); Unnamed (45.6083, −122.0329); Unnamed (45.6118, −122.0216); Unnamed (45.6124, −122.0172); Unnamed (45.6133, −122.0055); Wahkeena Creek (45.5755, −122.1266); Young Creek (45.5480, −122.1997).

(viii) *Lower Sandy River Watershed 1708000108*. Outlet(s) = Sandy River (Lat 45.5680, Long −122.4023) upstream to endpoint(s) in: Beaver Creek (45.5258, −122.3822); Gordon Creek (45.4915, −122.2423); Sandy River (45.4464, −122.2459); Trout Creek (45.4844, −122.2785); Unnamed (45.5542, −122.3768); Unnamed (45.5600, −122.3650).

(3) Lewis Subbasin 17080002

(i) *East Fork Lewis River Watershed 1708000205*. Outlet(s) = East Fork Lewis River (Lat 45.8664, Long −122.7189) upstream to endpoint(s) in: East Fork Lewis River (45.8395, −122.4463).

(ii) *Lower Lewis River Watershed 1708000206*. Outlet(s) = Lewis River (Lat 45.8519, Long −122.7806) upstream to endpoint(s) in: Cedar Creek (45.9049, −122.3684); Chelatchie Creek (45.9169, −122.4130); Johnson Creek (45.9385, −122.6261); Lewis River (45.9570, −122.5550); Pup Creek (45.9391, −122.5440); Unnamed (45.8882, −122.7412); Unnamed (45.9153, −122.4362).

(4) Lower Columbia/Clatskanie Subbasin 17080003

(i) *Kalama River Watershed 1708000301*. Outlet(s) = Burris Creek (45.8926, −122.7892); Kalama River (46.0340, −122.8695) upstream to endpoint(s) in: Arnold Creek (46.0463, −122.5938); Burris Creek (45.9391, −122.7780); Elk Creek (46.0891, −122.5117); Gobar Creek (46.0963, −122.6042); Hatchery Creek (46.0459, −122.8027); Kalama River (46.1109, −122.3579); Little Kalama River (45.9970, −122.6939); North Fork Kalama River (46.1328, −122.4118); Wild Horse Creek (46.0626, −122.6367).

(ii) *Clatskanie River Watershed 1708000303*. Outlet(s) = Clatskanie River (Lat 46.1398, Long −123.2303) upstream to endpoint(s) in: Clatskanie River (46.0435, −123.0829); Merrill Creek (46.0916, −123.1727); Perkins Creek (46.0826, −123.1678).

(iii) *Skamokawa/Elochoman Watershed 1708000305*. Outlet(s) = Elochoman River (Lat 46.2269, Long −123.4040); Skamokawa Creek (46.2677, −123.4562); Unnamed (46.2243, −123.3975) upstream to endpoint(s) in: Beaver Creek (46.2256, −123.3071); Elochoman River (46.3503, −123.2428); Falk Creek (46.2954, −123.4413); Left Fork Skamokawa Creek (46.3249, −123.4538); McDonald Creek (46.3398, −123.4116); Standard Creek (46.3292, −123.3999); West Fork Elochoman River (46.3211, −123.2605); West Fork Skamokawa Creek (46.2871, −123.4654); Wilson Creek (46.2970, −123.3434).
(iv) *Plympton Creek Watershed 1708000306*. Outlet(s) = Westport Slough (Lat 46.1434, Long −123.3816) upstream to endpoint(s) in: Plympton Creek (46.1261, −123.3842); Westport Slough (46.1195, −123.2797).

(5) Upper Cowlitz Subbasin 17080004

(i) *Headwaters Cowlitz River 1708000401*. Outlet(s) = Cowlitz River (Lat 46.6580, Lat −121.6032) upstream to endpoint(s) in: Clear Fork Cowlitz River (46.6858, −121.5668); Muddy Fork Cowlitz River (46.6994, −121.6169); Ohanapecosh River (46.6883, −121.5809).
(ii) *Upper Cowlitz River Watershed 1708000402*. Outlet(s) = Cowlitz River (Lat 46.5763, Long −121.7051) upstream to endpoint(s) in: Cowlitz River (46.6580, −121.6032).
(iii) *Cowlitz Valley Frontal Watershed 1708000403*. Outlet(s) = Cowlitz River (Lat 46.4765, Long −122.0952) upstream to endpoint(s) in: Cowlitz River (46.5763, −121.7051); Silver Creek (46.5576, −121.9178).
(iv) *Upper Cispus River Watershed 1708000404*. Outlet(s) = Cispus River (Lat 46.4449, Long −121.7954) upstream to endpoint(s) in: Cispus River (46.3410, −121.6709); East Canyon Creek (46.3454, −121.7031); North Fork Cispus River (46.4355, −121.654).
(v) *Lower Cispus River Watershed 1708000405*. Outlet(s) = Cispus River (Lat 46.4765, Long −122.0952) upstream to endpoint(s) in: Cispus River (46.4449, −121.7954); McCoy Creek (46.3892, −121.8190); Yellowjacket Creek (46.3871, −121.8335).

(6) Cowlitz Subbasin 17080005

(i) *Riffe Reservoir Watershed 1708000502*. Outlet(s) = Cowlitz River (Lat 46.5033, Long −122.5870) upstream to endpoint(s) in: Cowlitz River (46.4765, −122.0952).
(ii) *Jackson Prairie Watershed 1708000503*. Outlet(s) = Cowlitz River (Lat 46.3678, Long −122.9337) upstream to endpoint(s) in: Bear Creek (46.4215, −122.9224); Blue Creek (46.4885, −122.7253); Cowlitz River (46.5033, −122.5870); Lacamas Creek (46.5118, −122.8113); Mill Creek (46.4701, −122.8557); Mill Creek (46.5176;-122.6209); Otter Creek (46.4800, −122.6996); Salmon Creek (46.4237, −122.8400); Skook Creek (46.5035, −122.7556).
(iii) *North Fork Toutle River Watershed 1708000504*. Outlet(s) = North Fork Toutle River (Lat 46.3669, Long −122.5859) upstream to endpoint(s) in: North Fork Toutle River (46.3718, −122.5847).

(iv) *Green River Watershed 1708000505*. Outlet(s) = Green River (Lat 46.3718, Long −122.5847) upstream to endpoint(s) in: Cascade Creek (46.3924, −122.3530); Devils Creek (46.3875, −122.5113); Elk Creek (46.3929, −122.3224); Green River (46.3857, −122.1815); Miners Creek (46.3871, −122.2091); Shultz Creek (46.3744, −122.2987); Unnamed (46.3796, −122.3632).

(v) *South Fork Toutle River Watershed 1708000506*. Outlet(s) = South Fork Toutle River (Lat 46.3282, Long −122.7215) upstream to endpoint(s) in: Johnson Creek (46.3100, −122.6338); South Fork Toutle River (46.2306, −122.4439); Studebaker Creek (46.3044, −122.6777).

(vi) *East Willapa Watershed 1708000507*. Outlet(s) = Cowlitz River (Lat 46.2660, Long −122.9154) upstream to endpoint(s) in: Arkansas Creek (46.3275, −123.0123); Baxter Creek (46.3034, −122.9709); Brim Creek (46.4263, −123.0139); Campbell Creek (46.3756, −123.0401); Cowlitz River (46.3678, −122.9337); Delameter Creek (46.2495, −122.9916); Hemlock Creek (46.2585, −122.7269); Hill Creek (46.3724, −122.9211); King Creek (46.5076, −122.9885); Monahan Creek (46.2954, −123.0286); North Fork Toutle River (46.3669, −122.5859); Olequa Creek (46.5174, −122.9042); Stillwater Creek (46.3851, −123.0478); Sucker Creek (46.2628, −122.8116); Unnamed (46.5074, −122.9585); Unnamed (46.5405, −122.9090); Wyant Creek (46.3424, −122.6302).

(vii) *Coweeman Watershed 1708000508*. Outlet(s) = Cowlitz River (Lat 46.0977, Long −122.9141); Owl Creek (46.0771, −122.8676) upstream to endpoint(s) in: Baird Creek (46.1704, −122.6119); Coweeman River (46.1505, −122.5792); Cowlitz River (46.2660, −122.9154); Leckler Creek (46.2092, −122.9206); Mulholland Creek (46.1932, −122.6992); North Fork Goble Creek (46.1209, −122.7689); Ostrander Creek (46.2095, −122.8623); Owl Creek (46.0914, −122.8692); Salmon Creek (46.2547, −122.8839); South Fork Ostrander Creek (46.1910, −122.8600); Unnamed (46.0838, −122.7264).

(7) Lower Columbia Subbasin 17080006

(i) *Big Creek Watershed 1708000602*. Outlet(s) = Bear Creek (Lat 46.1719; Long −123.6642); Big Creek (46.1847, −123.5943); Blind Slough (46.2011, −123.5822); John Day River (46.1820, −123.7392) upstream to endpoint(s) in: Bear Creek (46.1181, −123.6388); Big Creek (46.1475, −123.5819); Gnat Creek (46.1614, −123.4813); John Day River (46.1763, −123.7474).

(ii) *Grays Bay Watershed 1708000603*. Outlet(s) = Crooked Creek (Lat 46.2962, Long −123.6795); Deep River (46.3035, −123.7092); Grays River (46.3035, −123.6867); Sisson Creek (46.3011, −123.7237); Unnamed (46.3042, −123.6870) upstream to endpoint(s) in: Crooked Creek (46.3033, −123.6222); East Fork Grays River (46.4425, −123.4081); Fossil Creek (46.3628, −123.5530); Grays River (46.4910,

−123.4334); Hull Creek (46.3725, −123.5866); Johnson Canyon (46.3699, −123.6659); Klints Creek (46.3562, −123.5675); Malone Creek (46.3280, −123.6545); Mitchell Creek (46.4512, −123.4371) South Fork Grays River (46.3813, −123.4581); Sweigiler Creek (46.4195, −123.5375); Unnamed (46.3283, −123.7376); Unnamed (46.3651, −123.6839); Unnamed (46.4701, −123.4515); West Fork Grays River (46.4195, −123.5530).

(8) Clackamas Subbasin 17090011

(i) *Lower Clackamas River Watershed 1709001106*. Outlet(s) = Clackamas River (Lat 45.3719, Long −122.6071) upstream to endpoint(s) in: Clackamas River (45.2440, −122.2798); Clear Creek (45.3568, −122.4781); Deep Creek (45.3916, −122.4028); Richardson Creek (45.3971, −122.4712); Rock Creek (45.4128, −122.5043).

(ii) [Reserved]

(9) Lower Willamette Subbasin 17090012

(i) *Johnson Creek Watershed 1709001201*. Outlet(s) = Willamette River (Lat 45.4423, Long −122.6453) upstream to endpoint(s) in: Crystal Springs Creek (45.4770, −122.6403); Kellogg Creek (45.4344, −122.6314); Tryon Creek (45.4239, −122.6595); Unnamed (45.4002, −122.6423); Willamette River (45.3719, −122.6071).

(ii) *Scappoose Creek Watershed 1709001202*. Outlet(s) = Multnomah Channel (Lat 45.8577, Long −122.7919) upstream to endpoint(s) in: Cunningham Slough (45.8250, −122.8069); Multnomah Channel (45.6188, −122.7921); North Scappoose Creek (45.8014, −122.9340).

(iii) *Columbia Slough/Willamette River Watershed 1709001203*. Outlet(s) = Willamette River (Lat 45.6530, Long −122.7646) upstream to endpoint(s) in: Bybee/Smith Lakes (45.6189, −122.7333); Columbia Slough (45.5979, −122.7137); Willamette River (45.4423, −122.6453).

(10) Lower Columbia River Corridor—Lower Columbia River Corridor. Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (45.5709, −122.4021).

(i) ***Upper Willamette River Chinook Salmon*** *(Oncorhynchus tshawytscha)*. Critical habitat is to include the areas defined in the following subbasins:

(1) Middle Fork Willamette Subbasin 17090001

(i) *Upper Middle Fork Willamette River Watershed 1709000101*. Outlet(s) = Middle Fork Willamette River (Lat 43.4961, Long −122.3989) upstream to endpoint(s) in: Echo Creek (43.4670, −122.3172); Found Creek (43.5048, −122.2831); Middle Fork Willamette River (43.4801, −122.2534); Noisy Creek (43.5083, −122.3016); Simpson Creek (43.5031, −122.3801); Skunk Creek (43.5069, −122.2866); Staley Creek (43.4527, −122.3650); Swift Creek (43.5438, −122.2431); Tumblebug Creek (43.4740, −122.2549);

Unnamed (43.4967, −122.2645); Unnamed (43.4986, −122.2686); Unnamed (43.5020, −122.2764).

(ii) *Hills Creek Watershed 1709000102.* Outlet(s) = Hills Creek (Lat 43.7071, Long −122.4195) upstream to endpoint(s) in: Hills Creek (43.6718, −122.3502).

(iii) *Salt Creek/Willamette River Watershed 1709000103.* Outlet(s) = Salt Creek (Lat 43.7261, Long −122.4381) upstream to endpoint(s) in: Coyote Creek (43.6682, −122.2378); Eagle Creek (43.6795, −122.2293); Salt Creek (43.6204, −122.1413); South Fork Salt Creek (43.6518, −122.2261).

(iv) *Hills Creek Reservoir Watershed 1709000105.* Outlet(s) = Middle Fork Willamette River (Lat 43.7589, Long −122.5242) upstream to endpoint(s) in: Big Willow Creek (43.6341, −122.4139); Buck Creek (43.5945, −122.4272); Bull Creek (43.6598, −122.4014); Coal Creek (43.4882, −122.4246); Coffeepot Creek (43.6182, −122.4160); Gold Creek (43.5860, −122.4768); Indian Creek (43.5034, −122.4638); Larison Creek (43.6851, −122.4760); Middle Fork Willamette River (43.4961, −122.3989); Packard Creek (43.6516, −122.4904); Snake Creek (43.5388, −122.4554) Snow Creek (43.6061, −122.4585); Windfall Creek (43.5984, −122.4638).

(v) *North Fork of Middle Fork Willamette River Watershed 1709000106.* Outlet(s) = North Fork Middle Fork Willamette River (Lat 43.7589, Long −122.5242) upstream to endpoint(s) in: Cayuse Creek (43.8651, −122.1856); Chalk Creek (43.8750, −122.4044); Christy Creek (43.9079, −122.3796); Fisher Creek (43.8699, −122.1551); North Fork Middle Fork Willamette River (43.8671, −122.0711).

(vi) *Middle Fork Willamette/Lookout Point Watershed 1709000107.* Outlet(s) = Middle Fork Willamette River (Lat 43.9495, Long −122.8471) upstream to endpoint(s) in: Anthony Creek (43.8799, −122.8498); Bannister Creek (43.8743, −122.6538); Buckhead Creek (43.7753, −122.5253); Burnt Bridge Creek (43.7900, −122.5334); Carr Creek (43.8558, −122.8177); Deception Creek (43.7551, −122.5541); East Fork Minnow Creek (43.8902, −122.7342); Goodman Creek (43.8309, −122.6940); Gosage Creek (43.8446, −122.8129); Guiley Creek (43.8419, −122.7962); Hazel Creek (43.8637, −122.6891); Lost Creek (43.8427, −122.7781); Middle Creek (43.8624, −122.8323); Middle Fork Willamette River (43.7589, −122.5242); Minnow Creek (43.8872, −122.7458); North Creek (43.8247, −122.6236); Rolling Riffle Creek (43.8750, −122.7052); School Creek (43.8604, −122.6099); South Creek (43.8230, −122.6216); Unnamed (43.8329, −122.6775); Unnamed (43.8427, −122.6643); Unnamed (43.8433, −122.6950).

(vii) *Little Fall Creek Watershed 1709000108.* Outlet(s) = Little Fall Creek (Lat 43.9577, Long −122.8166) upstream to endpoint(s) in: Little Fall Creek (44.0579, −122.5440); Norton Creek (44.0006, −122.7044); Sturdy Creek (44.0196, −122.6475).

(viii) *Fall Creek Watershed 1709000109*. Outlet(s) = Fall Creek (Lat 43.9707, Long −122.8677) upstream to endpoint(s) in: Alder Creek (44.0000, −122.4993); Fall Creek (43.9922, −122.3758); Gold Creek (43.9772, −122.4051); Logan Creek (43.9447, −122.4504); Nelson Creek (43.9285, −122.6850); Portland Creek (43.9331, −122.4655); Sunshine Creek (43.9943, −122.4672); Winberry Creek (43.9142, −122.6890).

(ix) *Lower Middle Fork Willamette River Wateshed 1709000110*. Outlet(s) = Middle Fork Willamette River (Lat 44.0226, Long −123.0169) upstream to endpoint(s) in: Hills Creek (43.9945, −122.8651); Middle Fork Willamette River (43.9495, −122.8471); Mill Race (44.0407, −123.0004); Pudding Creek (44.0173, −122.9501); Rattlesnake Creek (43.9352, −122.8608); Wallace Creek (44.0074, −122.8984).

(2) Upper Willamette Subbasin 17090003

(i) *Muddy Creek Watershed 1709000302*. Outlet(s) = Willamette River (Lat 44.6400, Long −123.1096) upstream to endpoint(s) in: Willamette River (44.0226, −123.0169).

(ii) *Calapooia River Watershed 1709000303*. Outlet(s) = Calapooia River (Lat 44.5088, Long −123.1101) upstream to endpoint(s) in: Calapooia River (44.2354, −122.4128).

(iii) *Oak Creek Watershed 1709000304*. Outlet(s) = Willamette River (Lat 44.7504, Long −123.1421) upstream to endpoint(s) in: Calapooia River (44.5088, −123.1101); Willamette River (44.6400, −123.1096).

(iv) *Marys River Watershed 1709000305*. Outlet(s) = Marys River (Lat 44.5566, Long −123.2597) upstream to endpoint(s) in: Beaver Creek (44.4554, −123.3748); Marys River (44.5373, −123.3762); Oak Creek (44.5636, −123.2932).

(v) *Luckiamute River Watershed 1709000306*. Outlet(s) = Luckiamute River (Lat 44.7561, Long −123.1468) upstream to endpoint(s) in: Soap Creek (44.7317, −123.2151); Unnamed (44.7661, −123.2011).

(3) McKenzie Subbasin 17090004

(i) *Upper McKenzie River Watershed 1709000401*. Outlet(s) = McKenzie River (Lat 44.1721, Long −122.2058) upstream to endpoint(s) in: Deer Creek (44.2677, −122.0712); Frissell Creek (44.2288, −122.0699); Lost Creek (44.1729, −122.0401); McKenzie River (44.3109, −122.0199); Scott Creek (44.1981, −122.0195); Smith River (44.2824, −122.0506).

(ii) *Horse Creek Watershed 1709000402*. Outlet(s) = West Fork Horse Creek (Lat 44.1721, Long −122.2058) upstream to endpoint(s) in: Cedar Swamp Creek (44.1563, −122.1132); Horse Creek (44.0602, −122.0087); King Creek (44.1635, −122.1693); Separation Creek (44.1274, −122.0077).

(iii) *South Fork McKenzie River Watershed 1709000403*. Outlet(s) = South Fork McKenzie River (Lat 44.1595, Long −122.2946) upstream to endpoint(s) in: Augusta Creek (43.9562, −122.1632); Cougar Creek (44.1397, −122.2437); East Fork South Fork McKenzie (44.0850, −122.0997); Elk Creek (43.9455, −122.0384); French Pete Creek (44.0402, −122.1854); Hardy Creek (44.0345, −122.2047); Rebel Creek (44.0167, −122.1505); Roaring River (43.9479, −122.0811); South Fork McKenzie River (43.9533, −121.9995).

(iv) *McKenzie River/Quartz Creek Watershed 1709000405.* Outlet(s) = McKenzie River (Lat 44.1112, Long −122.4209) upstream to endpoint(s) in: Cone Creek (44.1528, −122.3649); McKenzie River (44.1721, −122.2058); Quartz Creek (44.0188, −122.3015); Wycoff Creek (44.0846, −122.3143).

(v) *Lower McKenzie River Watershed 1709000407*. Outlet(s) = McKenzie River (Lat 44.1255, Long −123.1059) upstream to endpoint(s) in: Boulder Creek (44.0601, −122.7825); Camp Creek (44.0896, −122.8544); Deer Creek (44.0895, −122.4234); Ennis Creek (44.0804, −122.3754); Finn Creek (44.1471, −122.5972); Forest Creek (44.0861, −122.7153); Haagen Creek (44.0880, −122.7126); Hatchery Creek (44.1449, −122.6056); Holden Creek (44.1056, −122.7061); Indian Creek (44.1526, −122.5816); Lane Creek (44.0928, −122.7323); Marten Creek (44.1075, −122.5046); McKenzie River (44.1112, −122.4209); North Fork Gate Creek (44.1718, −122.5248); Osborn Creek (44.0565, −122.7880); Ritchie Creek (44.1028, −122.6567); South Fork Gate Creek (44.1667, −122.4980); Taylor Creek (44.0783, −122.7481); Toms Creek (44.1316, −122.5586); Unnamed (44.0646, −122.9399); Walterville Canal (44.0765, −122.7537).

(4) North Santiam Subbasin 17090005

(i) *Middle North Santiam River Watershed 1709000504*. Outlet(s) = North Santiam River (Lat 44.7852, Long −122.6079) upstream to endpoint(s) in: Mad Creek (44.7453, −122.3898); North Santiam River (44.7510, −122.2821); Rock Creek (44.7077, −122.4171); Snake Creek (44.7477, −122.4905).

(ii) *Little North Santiam River Watershed 1709000505*. Outlet(s) = Little North Santiam River (Lat 44.7852, Long −122.6079) upstream to endpoint(s) in: Elkhorn Creek (44.8134, −122.3561); Little North Santiam River (44.8390, −122.3364); Little Sinker Creek (44.8191, −122.4111); Sinker Creek (44.8166, −122.4174).

(iii) *Lower North Santiam River Watershed 1709000506*. Outlet(s) = Santiam River (Lat 44.7504, Long −123.1421) upstream to endpoint(s) in: Bear Branch (44.7559, −122.7974); Cold Creek (44.7522, −122.8848); Morgan Creek (44.7500, −123.0376); North Santiam River (44.7852, −122.6079); Salem Ditch (44.8000, −122.8120); Smallman Creek (44.7300, −122.9098); Stout Creek (44.7930, −122.6177); Trask Creek (44.7725, −122.6152); Unnamed (44.7672, −123.0517); Valentine Creek (44.8013, −122.7176).

(5) South Santiam Subbasin 17090006

(i) *Hamilton Creek/South Santiam River Watershed 1709000601*. Outlet(s) = South Santiam River (Lat 44.6869, Long −123.0052) upstream to endpoint(s) in: Hamilton Creek (44.5037, −122.7667); McDowell Creek (44.4580, −122.7128); Mill Creek (44.6750, −122.9721); Noble Creek (44.4519, −122.7976); South Santiam River (44.4163, −122.6693); Spring Branch (44.6821, −122.9811); Unnamed (44.6703, −122.9870); Unnamed (44.6801, −122.9786).

(ii) *Crabtree Creek Watershed 1709000602*. Outlet(s) = Crabtree Creek (Lat 44.6756, Long −122.9557) upstream to endpoint(s) in: Bald Peter Creek (44.5682, −122.5825); Beaver Creek (44.6271, −122.8504); Crabtree Creek (44.6058, −122.5405); Roaring River (44.6251, −122.7283); South Fork Crabtree Creek (44.5741, −122.5744).

(iii) *Thomas Creek Watershed 1709000603*. Outlet(s) = Thomas Creek (Lat 44.6778, Long −122.9654) upstream to endpoint(s) in: Jordan Creek (44.7531, −122.6595); Mill Creek (44.7055, −122.7842); Neal Creek (44.7101, −122.6912); South Fork Neal Creek (44.7033, −122.7078); Thomas Creek (44.6776, −122.4650).

(iv) *South Santiam River Watershed 1709000606*. Outlet(s) = South Santiam River (Lat 44.3977, Long −122.4491) upstream to endpoint(s) in: Falls Creek (44.4007, −122.3828); South Santiam River (44.3980, −122.2610).

(v) *South Santiam River/Foster Reservoir Watershed 1709000607*. Outlet(s) = South Santiam River (Lat 44.4163, Long −122.6693) upstream to endpoint(s) in: Middle Santiam River (44.4498, −122.5479); South Santiam River (44.3977, −122.4491).

(vi) *Wiley Creek Watershed 1709000608*. Outlet(s) = Wiley Creek (Lat 44.4140, Long −122.6752) upstream to endpoint(s) in: Little Wiley Creek (44.3673, −122.5916); Wiley Creek (44.3488, −122.5900).

(6) Middle Willamette Subbasin 17090007

(i) *Mill Creek/Willamette River Watershed 1709000701*. Outlet(s) = Mill Creek (Lat 44.9520, Long −123.0381) upstream to endpoint(s) in: Mill Creek (44.8255, −122.8226).

(ii) *Rickreall Creek Watershed 1709000702*. Outlet(s) = Willamette River (Lat 44.9288, Long −123.1124) upstream to endpoint(s) in: Willamette River (44.7504, −123.1421).

(iii) *Willamette River/Chehalem Creek Watershed 1709000703*. Outlet(s) = Willamette River (Lat 45.2552, Long −122.8806) upstream to endpoint(s) in: Willamette River (44.9288, −123.1124).

(iv) *Abernethy Creek Watershed 1709000704*. Outlet(s) = Willamette River (Lat 45.3719, Long −122.6071) upstream to endpoint(s) in: Willamette River (45.2552, −122.8806).

(7) Molalla/Pudding Subbasin 17090009

(i) *Butte Creek/Pudding River Watershed 1709000902*. Outlet(s) = Pudding River (Lat 45.1907, Long −122.7527) upstream to endpoint(s) in: Pudding River (45.0740, −122.8525).

(ii) *Senecal Creek/Mill Creek Watershed 1709000904*. Outlet(s) = Pudding River (Lat 45.2843, Long −122.7149) upstream to endpoint(s) in: Pudding River (45.1907, −122.7527).

(iii) *Upper Molalla River Watershed 1709000905*. Outlet(s) = Molalla River (Lat 45.1196, Long −122.5342) upstream to endpoint(s) in: Molalla River (44.9124, −122.3228); North Fork Molalla River (45.0872, −122.3849); Table Rock Fork Molalla River (44.9876, −122.2741).

(iv) *Lower Molalla River Watershed 1709000906*. Outlet(s) = Molalla River (Lat 45.2979, Long −122.7141) upstream to endpoint(s) in: Gribble Creek (45. 2146, −122.6988); Milk Creek (45.2278, −122.5670); Molalla River (45.1196, −122.5342).

(8) Clackamas Subbasin 17090011

(i) *Collawash River Watershed 1709001101*. Outlet(s) = Collawash River (Lat 45.0321, Long −122.0600) upstream to endpoint(s) in: Blister Creek (44.9594, −122.1590); Collawash River (44.9507, −122.0350); Hot Springs Fk Collawash River (44.9385, −122.1721); Nohorn Creek (44.9442, −122.1957).

(ii) *Upper Clackamas River 1709001102*. Outlet(s) = Clackamas River (Lat 45.0321, Long −122.0600) upstream to endpoint(s) in: Cabin Creek (45.0087, −121.8958); Clackamas River (44.8966, −121.8800); Cub Creek (44.8969, −121.8876); Granite Creek (45.0184, −121.9885); Hunter Creek (44.9086, −121.8929); Last Creek (44.9715, −121.8547); Lowe Creek (44.9487, −121.8983); Pot Creek (45.0149, −121.9084); Unnamed (44.9469, −121.8691); Wall Creek (44.9555, −121.8843).

(iii) *Oak Grove Fork Clackamas River Watershed 1709001103*. Outlet(s) = Oak Grove Fork Clackamas River (Lat 45.0746, Long −122.0520) upstream to endpoint(s) in: Oak Grove Fork Clackamas River (45.0822, −121.9859).

(iv) *Middle Clackamas River Watershed 1709001104*. Outlet(s) = Clackamas River (Lat 45.2440, Long −122.2798) upstream to endpoint(s) in: Clackamas River (45.0321, −122.0600); Fish Creek (45.0962, −122.1683); North Fork Clackamas River (45.2361, −122.2186); Roaring River (45.1773, −122.0650); South Fork Clackamas River (45.1939, −122.2257); Tag Creek (45.0607, −122.0512); Tar Creek (45.0494, −122.0570).

(v) *Lower Clackamas River Watershed 1709001106*. Outlet(s) = Clackamas River (Lat 45.3719, Long −122.6071) upstream to endpoint(s) in: Clackamas River (45.2440, −122.2798); Clear Creek (45.3568, −122.4781); Deep Creek (45.3937, −122.4095); Richardson Creek (45.3971, −122.4712).

(9) Lower Willamette/Columbia River Corridor—*Lower Willamette/Columbia River Corridor*. Outlet(s) = Columbia River (Lat

46.2485, Long −124.0782) upstream to endpoint(s) in: Willamette River (45.3719, −122.6071).

(j) ***Upper Columbia River Spring Chinook Salmon*** *(Oncorhynchus tshawytscha)*. Critical habitat is to include the areas defined in the following subbasins:

(1) Chief Joseph Subbasin 17020005—*Upper Columbia/Swamp Creek Watershed 1702000505*. Outlet(s) = Columbia River (Lat 47.8077, Long −119.9754) upstream to endpoint(s) in: Columbia River (48.0502, −119.8942).

(2) Methow Subbasin 17020008

(i) *Lost River Watershed 1702000801* Outlet(s) = Lost River Gorge (Lat 48.6501, Long −120.5103) upstream to endpoint(s) in: Eureka Creek (48.7020, −120.4986); Lost River Gorge (48.7324, −120.4475).

(ii) *Upper Methow River Watershed 1702000802*. Outlet(s) = Methow River (Lat 48.6015, Long −120.4376) upstream to endpoint(s) in: Early Winters Creek (48.5999, −120.5840); Methow River (48.6417, −120.6150); Rattlesnake Creek (48.6523, −120.5733); Robinson Creek (48.6680, −120.5394); South Fork Trout Creek (48.6448, −120.6030).

(iii) *Upper Chewuch River Watershed 1702000803*. Outlet(s) = Chewuch River (Lat 48.7501, Long −120.1356) upstream to endpoint(s) in: Andrews Creek (48.7855, −120.1087); Chewuch River (48.8614, −120.0288); Dog Creek (48.8218, −120.0151); Lake Creek (48.8258, −120.1996); Thirtymile Creek (48.8109, −120.0199).

(iv) *Lower Chewuch River Watershed 1702000804*. Outlet(s) = Chewuch River (Lat 48.4751, Lat −120.1790) upstream to endpoint(s) in: Boulder Creek (48.5797, −120.1538); Chewuch River (48.7501, −120.1356); Cub Creek (48.5513, −120.1899); Eightmile Creek (48.6071, −120.1775); Lake Creek (48.4926, −120.1629); Twentymile Creek (48.7029, −120.1117).

(v) *Twisp River Watershed 1702000805*. Outlet(s) = Twisp River (Lat 48.3682, Long −120.1176) upstream to endpoint(s) in: Buttermilk Creek (48.3528, −120.3239); Eagle Creek (48.3584, −120.3914); North Creek (48.4587, −120.5595); Poorman Creek (48.3674, −120.1997); South Creek (48.4330, −120.5431); Twisp River (48.4615, −120.5764); War Creek (48.3649, −120.4030).

(vi) *Middle Methow River Watershed 1702000806*. Outlet(s) = Methow River (Lat 48.2495, Long −120.1156) upstream to endpoint(s) in: Bear Creek (48.4527, −120.1423); Goat Creek (48.5888, −120.3705); Little Boulder Creek (48.5700, −120.3797); Methow River (48.6015, −120.4376); Wolf Creek (48.4776, −120.2840) Unnamed (48.4896, −120.2116).

(vii) *Lower Methow River Watershed 1702000807*. Outlet(s) = Methow River (Lat 48.0502, Long −119.8942) upstream to endpoint(s) in: Methow River (48.2495, −120.1156).

(3) Upper Columbia/Entiat Subbasin 17020010

(i) *Entiat River Watershed 1702001001*. Outlet(s) = Entiat River (Lat 47.6585, Long −120.2194) upstream to endpoint(s) in: Entiat River (47.9855, −120.5749); Hornet Creek (47.7714, −120.4403); Mad River (47.7804, −120.4403); Tillicum Creek (47.7295, −120.4304).
(ii) *Lake Entiat Watershed 1702001002*. Outlet(s) = Columbia River (Lat 47.3438, Long −120.0929) upstream to endpoint(s) in: Columbia River (47.8077, −119.9754).

(4) Wenatchee Subbasin 17020011

(i) *White River Watershed 1702001101*. Outlet(s) = White River (Lat 47.8088, Long −120.7159) upstream to endpoint(s) in: Little Wenatchee River (47.8526, −120.9541); Napeequa River (47.9285, −120.8829); Panther Creek (47.9355, −120.9482); White River (47.9535, −120.9380).
(ii) *Chiwawa River Watershed 1702001102*. Outlet(s) = Chiwawa River (Lat 47.7880, Long −120.6589) upstream to endpoint(s) in: Alder Creek (47.8483, −120.6587); Chikamin Creek (47.9785, −120.7194); Chiwawa River (48.1048, −120.8773); Goose Creek (47.8392, −120.6461); Minnow Creek (47.9137, −120.7182); Phelps Creek (48.0794, −120.8400); Unnamed (48.0366, −120.7615).
(iii) *Nason/Tumwater Watershed 1702001103*. Outlet(s) = Wenatchee River (Lat 47.5801, Long −120.6660) upstream to endpoint(s) in: Chiwaukum Creek (47.7039, −120.7791); Nason Creek (47.7769, −120.9103); Skinney Creek (47.6894, −120.7351).
(iv) *Icicle/Chumstick Watershed 1702001104*. Outlet(s) = Wenatchee River (Lat 47.5575, Long −120.5729) upstream to endpoint(s) in: Wenatchee River (47.5801, −120.6660).
(v) *Lower Wenatchee River Watershed 1702001105*. Outlet(s) = Wenatchee River (Lat 47.4553, Long −120.3185) upstream to endpoint(s) in: Wenatchee River (47.5575, −120.5729).

(5) Columbia River Corridor—*Columbia River Corridor* Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (47.3438, −120.0929).

(k) ***Hood Canal Summer-run Chum Salmon*** *(Oncorhynchus keta)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Skokomoish Subbasin 17110017—*Skokomish River 1711001701*. Outlet(s) = Skokomish River (Lat 47.3543, Long −123.1122), Unnamed (47.3420, −123.1092), Unnamed (47.3471, −123.1275), Unnamed (47.3509. −123.1101) upstream to endpoint(s) in: Mussel Sheel Creek (47.3039, −123.1590); Skokomish (47.3199, −123.2198); Unnamed (47.3209, −123.2211).

(2) Hood Canal Subbasin 17110018

(i) *Lower West Hood Canal Frontal Watershed 1711001802*. Outlet(s)= Eagle Creek (Lat 47.4849, Long −123.0766); Finch Creek (47.4067, −123.1377); Fulton Creek (47.6183, −122.9736); Jorsted Creek (47.5263, −123.0489); Lilliwaup Creek (47.4689, −123.1136); Unnamed (47.4576, −123.1117) upstream to endpoint(s) in: Eagle Creek (47.4905, −123.0830); Finch Creek (47.4076, −123.1586); Fulton Creek (47.6275, −122.9805); Jorsted Creek (47.5246, −123.0649); Lilliwaup Creek (47.4704, −123.1166); Unnamed (47.4585, −123.1186).

(ii) *Hamma Hamma River Watershed 1711001803*. Outlet(s) = Hamma Hamma River (Lat 47.5471, Long −123.0440) upstream to endpoint(s) in: Hamma Hamma River (47.5547, −123.0623); John Creek (47.5369, −123.0619).

(iii) *Duckabush River Watershed 1711001804*. Outlet(s) = Duckabush River (Lat 47.6502, Long −122.9348) upstream to endpoint(s) in: Duckabush River (47.6654, −122.9728).

(iv) *Dosewallips River Watershed 1711001805*. Outlet(s) = Dosewallips River (Lat 47.6880, Long −122.8949) upstream to endpoint(s) in: Dosewallips River (47.7157, −122.9396).

(v) *Big Quilcene River Watershed 1711001806*. Outlet(s) = Big Quilcene River (Lat 47.8188, Long −122.8605) upstream to endpoint(s) in: Big Quilcene River (47.8102, −122.9119).

(vi) *Upper West Hood Canal Frontal Watershed 1711001807*. Outlet(s) = Little Quilcene River (Lat 47.8266; Long −122.8608) upstream to endpoint(s) in: Little Quilcene River (47.8374, −122.8854).

(vii) *West Kitsap Watershed 1711001808*. Outlet(s) = Anderson Creek (Lat 47.5670, Long −122.9664); Big Beef Creek (47.6521, −122.7823); Dewatto River (47.4538, −123.0474); Little Anderson Creek (47.6653, −122.7554); Tahuya River (47.3767, −123.0355); Union River (47.4484, −122.8368); Unnamed (47.3767, −123.0372); Unnamed (47.4537, −123.0474) upstream to endpoint(s) in: Anderson Creek (47.5596, −122.9354); Bear Creek (47.4980, −122.8074); Big Beef Creek (47.6385, −122.7868); Dewatto River (47.4937, −122.9914); East Fork Union River (47.5056, −122.7897); Hazel Creek (47.5170, −122.7945); Little Anderson Creek (47.6606, −122.7543); North East Fork Union River (47.4954, −122.7819); Tahuya River (47.4510, −122.9597); Union River (47.5273, −122.7846); Unnamed (47.4492, −122.9229); Unnamed (47.4527, −122.8294); Unnamed (47.4553, −122.8301); Unnamed (47.4594, −122.8396); Unnamed (47.4700, −122.8300); Unnamed (47.4852, −122.8313); Unnamed (47.4966, −122.8393); Unnamed (47.4971, −122.8315); Unnamed (47.6600, −122.7559); Unnamed (47.6642, −122.7534).

(3) Puget Sound Subbasin 17110019—*Port Ludlow/Chimacum Creek Watershed 1711001908*. Outlet(s) = Chimacum Creek (Lat 48.0507, Long −122.7832) upstream to endpoint(s) in: Chimacum Creek (47.9743, −122.7764).

(4) Dungeness/Elwha Subbasin 17110020

(i) *Discovery Bay Watershed 1711002001*. Outlet(s) = Salmon Creek (Lat 47.9895, Long −122.8879); Snow Creek (47.9900, −122.8834) upstream to endpoint(s) in: Salmon Creek (47.9775, −122.9191); Snow Creek (47.9638, −122.8827).

(ii) *Sequim Bay Watershed 1711002002*. Outlet(s) = Jimmycomelately Creek (Lat 48.0235, Long −123.0039) upstream to endpoint(s) in: Jimmycomelately Creek (48.0125, −123.0026).

(iii) *Dungeness River Watershed 1711002003.* Outlet(s) = Dungeness River (Lat 48.1506, Long −123.1311); Unnamed (48.1537, −123.1267) upstream to endpoint(s) in: Dungeness River (48.0258, −123.1358); Matriotti Creek (48.1369, −123.1488); Unnamed (48.1167, −123.1403); Unnamed (48.1514, −123.1216).

(5) Nearshore Marine Areas—Except as provided in paragraph (e) of this section, critical habitat includes all nearshore marine areas (including areas adjacent to islands) of Hood Canal and the Strait of Juan de Fuca (to Dungeness Bay) from the line of extreme high tide out to a depth of 30 meters.

(l) ***Columbia River Chum Salmon*** *(Oncorhynchus keta)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Middle Columbia/Hood Subbasin 17070105

(i) *White Salmon River Watershed 1707010509*. Outlet(s) = White Salmon River (Lat 45.7267, Long −121.5209) upstream to endpoint(s) in: White Salmon River (45.7677, −121.5374).

(ii) *Middle Columbia/Grays Creek Watershed 1707010512*. Outlet(s) = Columbia River (Lat 45.7074, Long −121.7965) upstream to endpoint(s) in: Columbia River (45.7267, −121.5209).

(iii) *Middle Columbia/Eagle Creek 1707010513*. Outlet(s) = Columbia River (Lat 45.6453, Long −121.9395) upstream to endpoint(s) in: Columbia River (45.7074, −121.7965).

(2) Lower Columbia/Sandy Subbasin 17080001

(i) *Washougal River Watershed 1708000106*. Outlet(s) = Unnamed (Lat 45.5812, Long −122.4077); Washougal River (45.5795, −122.4023) upstream to endpoint(s) in: Lacamas Creek (45.5972, −122.3933); Little Washougal River (45.6210, −122.3750); Unnamed (45.5861, −122.4083); Washougal River (45.6232, −122.2738).

(ii) *Columbia Gorge Tributaries Watershed 1708000107*. Outlet(s) = Columbia River (Lat 45.5709, Long −122.4020) upstream to endpoint(s) in: Columbia River (45.6453, −121.9395); Duncan Creek (45.6136, −122.0539); Gibbons Creek (45.5710, −122.3147); Greenleaf Creek (45.6548, −121.9569); Hamilton Creek (45.6535, −121.9879); Hardy Creek (45.6354, −121.9987); Indian Mary Creek (45.6066, −122.0716); Lawton Creek (45.5746, −122.2501); Unnamed (45.5673, −122.3033); Unnamed (45.6017, −122.1106); Unnamed (45.6017, −122.1087); Unnamed (45.6483, −121.9725); Unnamed (45.6509, −121.9502); Walton Creek (45.5757, −122.2618).

(iii) *Salmon Creek Watershed 1708000109*. Outlet(s) = Lake River (Lat 45.8437, Long −122.7800); Love Creek (45.5976, −122.5443); Unnamed (45.5867, −122.5015); Unnamed (45.5919, −122.5241); Unnamed (45.5952, −122.5366) upstream to endpoint(s) in: Love Creek (45.5981, −122.5444); Salmon Creek (45.7089, −122.6480);

Unnamed (45.5873, −122.5015); Unnamed (45.5924, −122.5242); Unnamed (45.5955, −122.5360).

(3) Lewis Subbasin 17080002

(i) *East Fork Lewis River Watershed 1708000205.* Outlet(s) = East Fork Lewis River (Lat 45.8664, Long −122.7189); Gee Creek (45.8462, −122.7803) upstream to endpoint(s) in: Brezee Creek (45.8622, −122.6667); East Fork Lewis River (45.8395, −122.4463); Gee Creek (45.8264, −122.7458); Lockwood Creek (45.8578, −122.6259); Mason Creek (45.8410, −122.5919); McCormick Creek (45.8521, −122.6907); Riley Creek (45.8663, −122.6349); Unnamed (45.8076, −122.5878); Unnamed (45.8076, −122.6286); Unnamed (45.8090, −122.6089); Unnamed (45.8111, −122.5860); Unnamed (45.8149, −122.5654); Unnamed (45.8201, −122.5991); Unnamed (45.8241, −122.6380); Unnamed (45.8280, −122.6431); Unnamed (45.8292, −122.6040); Unnamed (45.8389, −122.6456); Unnamed (45.8439, −122.6478); Unnamed (45.8439, −122.6605).

(ii) *Lower Lewis River Watershed 1708000206.* Outlet(s) = Lewis River (Lat 45.8519, Long −122.7806) upstream to endpoint(s) in: Cedar Creek (45.9383, −122.5818); Colvin Creek (45.9400, −122.6081); Houghton Creek (45.9395, −122.6478); Johnson Creek (45.9385, −122.6261); Lewis River (45.9570, −122.5550); Ross Creek (45.9340, −122.7076).

(4) Lower Columbia/Clatskanie Subbasin 17080003

(i) *Kalama River Watershed 1708000301.* Outlet(s) = Kalama River (Lat 46.0340, Long −122.8696) upstream to endpoint(s) in: Kalama River (46.0449, −122.8034).

(ii) *Germany/Abernathy Watershed 1708000304.* Outlet(s) = Abernethy Creek (Lat 46.1908, Long −123.1661); Germany Creek (46.1895, −123.1244); Mill Creek (46.1888, −123.1745) upstream to endpoint(s) in: Abernethy Creek (46.2263, −123.1467); Germany Creek (46.2221, −123.1353); Mill Creek (46.1932, −123.1834).

(iii) *Skamokawa/Elochoman Watershed 1708000305.* Outlet(s) = Elochoman River (Lat 46.2269, Long −123.4039); Jim Crow Creek (46.2662, −123.5511); Skamokawa Creek (46.2677, −123.4562); Unnamed (46.2243, −123.3975) upstream to endpoint(s) in: Beaver Creek (46.2262, −123.3239); Brooks Slough (46.2502, −123.4094); Clear Creek (46.2611, −123.2996); Duck Creek (46.2517, −123.3159); Eggman Creek (46.3248, −123.4951); Elochoman River (46.2615, −123.2965); Indian Jack Slough (46.2371, −123.3955); Jim Crow Creek (46.2891, −123.5553); Kelly Creek (46.3109, −123.4797); Left Fork Skamokawa Creek (46.3331, −123.4610); Quarry Creek (46.3292, −123.4241); Skamokawa Creek (46.3277, −123.4236); Unnamed (46.2338, −123.3282); Unnamed (46.3293, −123.4534); West Fork Skamokawa Creek (46.3119, −123.4889); West Valley Creek (46.2981, −123.4698); Wilson Creek (46.3006, −123.3787).

(5) Lower Cowlitz Subbasin 17080005

(i) *Jackson Prairie Watershed 1708000503*. Outlet(s) = Cowlitz River (Lat 46.3678, Long −122.9337) upstream to endpoint(s) in: Bear Creek (46.4544, −122.9187); Blue Creek (46.4885, −122.7253); Coon Creek (46.4272, −122.9109); Cowlitz River (46.5033, −122.5871); Lacamas Creek (46.5564, −122.6878); Mill Creek (46.5025, −122.8017); Salmon Creek (46.4130, −122.8165); Skook Creek (46.4708, −122.7594); Unnamed (46.4191, −122.8205); Unnamed (46.4205, −122.8662); Unnamed (46.4280, −122.8380); Unnamed (46.4707, −122.7713); Unnamed (46.4885, −122.8068); Unnamed (46.5076, −122.6675); Unnamed (46.5311, −122.8194); Unnamed (46.5432, −122.7466).

(ii) *South Fork Toutle River Watershed 1708000506*. Outlet(s) = South Fork Toutle River (Lat 46.3282, Long −122.7215) upstream to endpoint(s) in: Johnson Creek (46.3102, −122.6444); South Fork Toutle River (46.2817, −122.6420).

(iii) *East Willapa Watershed 1708000507*. Outlet(s) = Cowlitz River (Lat 46.2660, Long −122.9154) upstream to endpoint(s) in: Arkansas Creek (46.3032, −122.9801); Cowlitz River (46.3678, −122.9337); Delameter Creek (46.2598, −122.9679); Hill Creek (46.3704, −122.9267); McMurphy Creek (46.4082, −122.9520); Monahan Creek (46.2636, −122.9727); North Fork Toutle River (46.3669, −122.5859); Olequa Creek (46.4324, −122.9688); Unnamed (46.2606, −122.9551); Unnamed (46.2642, −122.9291); Unnamed (46.2689, −122.9589); Unnamed (46.2880, −122.9051); Unnamed (46.2892, −122.9626); Unnamed (46.3294, −122.9085); Unnamed (46.3371, −122.8922); Unnamed (46.3491, −122.7052); Unnamed (46.3571, −122.7684); Unnamed (46.3587, −122.7478); Unnamed (46.3683, −122.7503); Unnamed (46.3814, −122.6091); Wyant Creek (46.3314, −122.6768).

(iv) *Coweeman Watershed 1708000508*. Outlet(s) = Cowlitz River (Lat 46.0977, Long −122.9141); Owl Creek (46.0768, −122.8679) upstream to endpoint(s) in: Baird Creek (46.1789, −122.5822); Butler Creek (46.1491, −122.5170); Cowlitz River (46.2660, −122.9154); Goble Creek (46.1074, −122.7068);Leckler Creek (46.2164, −122.9325); Mulholland Creek (46.2004, −122.6484); Nineteen Creek (46.1593, −122.6095); North Fork Goble Creek (46.1208, −122.7691); Owl Creek (46.0914, −122.8692); Salmon Creek (46.2547, −122.8839); Sandy Bend Creek (46.2318, −122.9143); Skipper Creek (46.1625, −122.5915); Turner Creek (46.1167, −122.8150); Unnamed (46.0719, −122.8607); Unnamed (46.0767, −122.8604); Unnamed (46.0897, −122.7355); Unnamed (46.1295, −122.8993); Unnamed (46.1369, −122.8034); Unnamed (46.1441, −122.5816); Unnamed (46.1478, −122.8649); Unnamed (46.1516, −122.8749); Unnamed (46.1558, −122.7803); Unnamed (46.1727, −122.7716); Unnamed (46.1753, −122.7657); Unnamed (46.1940, −122.7068); Unnamed (46.2021, −122.6941); Unnamed (46.2416, −122.8869).

(6) Lower Columbia Subbasin 17080006

(i) *Big Creek Watershed 1708000602*. Outlet(s) = Big Creek (Lat 46.1848, Long −123.5943) upstream to endpoint(s) in: Big Creek (46.1476, −123.5820); Little Creek (46.1510, −123.6007).

(ii) *Grays Bay Watershed 1708000603.* Outlet(s) = Deep River (Lat 46.3035, Long −123.7092); Grays River (46.3035, −123.6867); Unnamed (46.2419, −123.8842); Unnamed (46.3026, −123.9702) upstream to endpoint(s) in: Alder Creek (46.4279, −123.4621); Blaney Creek (46.3957, −123.4607); Campbell Creek (46.3435, −123.7087); Chinook River (46.2685, −123.9233); Deep River (46.3480, −123.6865); East Fork Grays River (46.4424, −123.4120); Fossil Creek (46.3612, −123.5217); Grays River (46.4628, −123.4602); Johnson Creek (46.4544, −123.4732); Kessel Creek (46.3336, −123.5850); King Creek (46.3444, −123.5774); Lassila Creek (46.3343, −123.7108); Mitchell Creek (46.4512, −123.4269); South Fork Grays River (46.3836, −123.4592); Thadbar Creek (46.3331, −123.6092); Unnamed (46.2502, −123.8833); Unnamed (46.2847, −123.9402); Unnamed (46.2901, −123.9368); Unnamed (46.3605, −123.5228); Unnamed (46.3838, −123.5454); Unnamed (46.4328, −123.4444); West Fork Grays River (46.3942, −123.5611).

(7) Lower Columbia River Corridor—*Lower Columbia River Corridor* Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (45.5709, −122.4020).

(m) **Ozette Lake Sockeye Salmon** (*Oncorhynchus nerka*). Critical habitat is designated to include the areas defined in the following subbasin:

(1) Hoh/Quillayute Subbasin 17100101

(i) Ozette Lake Watershed 1710010102. Outlet(s) = Ozette River (Lat 48.1818, Long −124.7076) upstream to endpoints in: Big River (48.1844, −124.4987); Coal Creek (48.1631, −124.6612); East Branch Umbrella Creek (48.1835, −124.5659); North Fork Crooked Creek (48.1020, −124.5507); Ozette River (48.0370, −124.6218); South Fork Crooked Creek (48.0897, −124.5597); Umbrella Creek (48.2127, −124.5787); Unnamed (48.1771, −124.5967); Unnamed (48.1740, −124.6005); Unnamed (48.1649, −124.5208).

(n) ***Upper Columbia River Steelhead*** *(Oncorhynchus mykiss)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Chief Joseph Subbasin 17020005—*Upper Columbia/Swamp Creek Watershed 1702000505.* Outlet(s) = Columbia River (Lat 47.8077, Long −119.9754) upstream to endpoint(s) in: Columbia River (48.0828, −119.7062).

(2) Okanogan Subbasin 17020006

(i) *Upper Okanogan River Watershed 1702000601*. Outlet(s) = Okanogan River (Lat 48.7350, Long −119.4280) upstream to endpoint(s) in: Antoine Creek (48.7474, −119.3655); Ninemile Creek (48.9755, −119.3834); Okanogan River (49.0002, −119.4409);

Similkameen River (48.9345, −119.4411); Tomasket Creek (48.9502, −119.3618); Whitestone Creek (48.7773, −119.4170).

(ii) *Okanogan River/Bonaparte Creek Watershed 1702000602*. Outlet(s) = Okanogan River (Lat 48.5612, Long −119.4863) upstream to endpoint(s) in: Aeneas Creek (48.6629, −119.4953); Bonaparte Creek (48.6824, −119.3947); Okanogan River (48.7350, −119.4280); Tunk Creek (48.5644, −119.4718).

(iii) *Salmon Creek Watershed 1702000603*. Outlet(s) = Salmon Creek (Lat 48.3593, Long −119.5805) upstream to endpoint(s) in: Salmon Creek (48.5374, −119.7465).

(iv) *Okanogan River/Omak Creek Watershed 1702000604*. Outlet(s) = Okanogan River (Lat 48.3593, Long −119.5805) upstream to endpoint(s) in: Okanogan River (48.5612, −119.4863); Omak Creek (48.3698, −119.4365); Unnamed (48.3802, −119.4915).

(v) *Lower Okanogan River Watershed 1702000605*. Outlet(s) = Okanogan River (Lat 48.0976, Long −119.7352) upstream to endpoint(s) in: Chiliwist Creek (48.2643, −119.7304); Loup Loup Creek (48.3080, −119.7128); Okanogan River (48.3593, −119.5805).

(3) Similkameen Subbasin 17020007—*Lower Similkameen River Watershed 1702000704*. Outlet(s) = Similkameen River (Lat 48.9345, Long −119.4411) upstream to endpoint(s) in: Similkameen River (48.9657, −119.5009).

(4) Methow Subbasin 17020008

(i) *Lost River Watershed 1702000801*. Outlet(s) = Lost River Gorge (Lat 48.6501, Long −120.5103) upstream to endpoint(s) in: Lost River Gorge (48.7324, −120.4475).

(ii) *Upper Methow River Watershed 1702000802*. Outlet(s) = Methow River (Lat 48.6015, Long −120.4376) upstream to endpoint(s) in: Early Winters Creek (48.5889, −120.4711); Methow River (48.6597, −120.5368).

(iii) *Upper Chewuch River Watershed 1702000803*. Outlet(s) = Chewuch River (Lat 48.7501, Long −120.1356) upstream to endpoint(s) in: Andrews Creek (48.7855, −120.1087); Chewuch River (48.8614, −120.0288); Lake Creek (48.8258, −120.1996).

(iv) *Lower Chewuch River Watershed 1702000804*. Outlet(s) = Chewuch River (Lat 48.4751, Long −120.1790) upstream to endpoint(s) in: Boulder Creek (48.5804, −120.1521); Chewuch River (48.7501, −120.1356); Eightmile Creek (48.6167, −120.1975); Twentymile Creek (48.7025, −120.1087).

(v) *Twisp River Watershed 1702000805*. Outlet(s) = Twisp River (Lat 48.3682, Long −120.1176) upstream to endpoint(s) in: Buttermilk Creek 48.3414, −120.3034); Eagle Creek (48.3579, −120.3953); Little Bridge Creek (48.4289, −120.3552); South Creek (48.4329, −120.5434); Twisp River (48.4545, −120.5621); War Creek (48.3626, −120.4106).

(vi) *Middle Methow River Watershed 1702000806*. Outlet(s) = Methow River (Lat 48.2495, Long −120.1156) upstream to endpoint(s) in: Goat Creek (48.6101, −120.3692); Hancock Creek (48.5338, −120.3310); Little Boulder Creek (48.5569, −120.3847); Methow River (48.6015, −120.4376); North Fork Beaver Creek (48.4340, −120.0228); Wolf Creek (48.4777, −120.2844).

(vii) *Lower Methow River Watershed 1702000807*. Outlet(s) = Methow River (Lat 48.0502, Long −119.8942) upstream to endpoint(s) in: Black Canyon Creek (48.0721, −120.0168); Foggy Dew Creek (48.1869, −120.2344); Gold Creek (48.2113, −120.2021); Libby Creek (48.2548, −120.1653); Methow River (48.2495, −120.1156); South Fork Gold Creek (48.1468, −120.1650).

(5) Upper Columbia/Entiat Subbasin 17020010

(i) *Entiat River Watershed 1702001001*. Outlet(s) = Entiat River (Lat 47.6585, Long −120.2194) upstream to endpoint(s) in: Entiat River (47.9855, −120.5749); Mad River (47.8254, −120.5301); Potato Creek (47.7944, −120.3889); Roaring Creek (47.6795, −120.4163); Stormy Creek (47.8246, −120.4125); Tamarack Creek (47.6699, −120.4041); Tillicum Creek (47.7295, −120.4303).

(ii) *Lake Entiat Watershed 1702001002*. Outlet(s) = Columbia River (Lat 47.3539, Long −120.1105) upstream to endpoint(s) in: Columbia River (47.8077, −119.9754).

(iii) *Columbia River/Lynch Coulee Watershed 1702001003*. Outlet(s) = Columbia River (Lat 47.0494, Long −120.0241) upstream to endpoint(s) in: Brushy Creek (47.1316, −120.1493); Colockum Creek (47.2919, −120.1592); Columbia River (47.3539, −120.1105); Lynch Coulee (47.2320, −119.9943); Quilomene Creek (47.1105, −120.0379); Tarpiscan Creek (47.2264, −120.0922); Tekison Creek (47.1816, −120.0206).

(iv) *Columbia River/Sand Hollow Watershed 1702001004*. Outlet(s) = Columbia River (Lat 46.8159, Long −119.9255) upstream to endpoint(s) in: Columbia River (47.0494, −120.0241); Sand Hollow (46.9296, −119.9365); Whiskey Dick Creek (47.0302, −120.0331).

(6) Wenatchee Subbasin 17020011

(i) *White River Watershed 1702001101*. Outlet(s) = White River (Lat 47.8088, Long −120.7159) upstream to endpoint(s) in: Little Wenatchee River (47.8526, −120.9541); Napeequa River (47.9359, −120.8712); Panther Creek (47.9375, −120.9408); White River (47.9535, −120.9380).

(ii) *Chiwawa River Watershed 1702001102*. Outlet(s) = Chiwawa River (Lat 47.7880, Long −120.6589) upstream to endpoint(s) in: Alder Creek (47.8565, −120.6564); Alpine Creek (48.0823, −120.8683); Buck Creek (48.1045, −120.8815); Chikamin Creek (47.9111, −120.7165); Chiwawa River (48.1140, −120.8775); Clear Creek (47.8016, −120.6210); James Creek (48.0748, −120.8598); Phelps Creek (48.0743, −120.8484); Unnamed (47.9727, −120.7878).

(iii) *Nason/Tumwater Watershed 1702001103*. Outlet(s) = Wenatchee River (Lat 47.5801, Long −120.6660) upstream to endpoint(s) in: Beaver Creek (47.7649, −120.6553); Chiwaukum Creek (47.7038, −120.7788); Coulter Creek (47.7594, −120.7969); Gill Creek (47.7716, −120.8237); Kahler Creek (47.7691, −120.7558); Mill Creek (47.7744, −121.0117); Nason Creek (47.7825, −121.0464); Roaring Creek (47.7572, −120.8203); Skinney Creek (47.7247, −120.7370).

(iv) *Icicle/Chumstick Watershed 1702001104*. Outlet(s) = Wenatchee River (Lat 47.5575, Long −120.5729) upstream to endpoint(s) in: Chumstick Creek (47.6785, −120.6385); Derby Canyon (47.6036, −120.5623); Eagle Creek (47.6342, −120.6261); Icicle Creek (47.6460, −120.9833); Wenatchee River (47.5801, −120.6660).

(v) *Lower Wenatchee River Watershed 1702001105*. Outlet(s) = Wenatchee River (Lat 47.4553, Long −120.3185) upstream to endpoint(s) in: Brender Creek (47.5214, −120.4844); Ingalls Creek (47.4612, −120.6776); King Canyon (47.3522, −120.4423); Mill Creek (47.5139, −120.6724); Mission Creek (47.3289, −120.4771); Peshastin Creek (47.4380, −120.6590); Sand Creek (47.4321, −120.5307); Wenatchee River (47.5575, −120.5729).

(7) Lower Crab Subbasin 17020015—*Lower Crab Creek Watershed 1702001509*. Outlet(s) = Lower Crab Creek (Lat 46.8159, Long −119.9255) upstream to endpoint(s) in: Hayes Creek (46.8821, −119.2703); Lower Crab Creek (46.9028, −119.2785); Unnamed (46.8157, −119.4326); Unnamed (46.8243, −119.4429); Unnamed (46.8353, −119.3750); Unnamed (46.8658, −119.3757); Unnamed (46.8770, −119.5863).

(8) Upper Columbia/Priest Rapids Subbasin 17020016

(i) *Yakima River/Hanson Creek Watershed 1702001604*. Outlet(s) = Columbia River (Lat 46.7159, Long −119.5294) upstream to endpoint(s) in: Columbia River (46.8159, −119.9255).

(ii) *Middle Columbia/Priest Rapids Watershed 1702001605*. Outlet(s) = Columbia River (Lat 46.5091, Long −119.2661) upstream to endpoint(s) in: Columbia River (46.7159, −119.5294).

(iii) *Columbia River/Zintel Canyon Watershed 1702001606*. Outlet(s) = Columbia River (Lat 46.2534, Long −119.2268) upstream to endpoint(s) in: Columbia River (46.5091, −119.2661).

(9) Columbia River Corridor—*Columbia River Corridor*. Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (46.2534, −119.2268).

(o) ***Snake River Basin Steelhead*** *(Oncorhynchus mykiss)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Hells Canyon Subbasin 17060101

(i) *Snake River/Granite Creek Watershed 1706010101*. Outlet(s) = Snake River (Lat 45.467, Long −116.554) upstream to endpoint(s) in: Battle Creek (45.307, −116.697); Bernard Creek (45.387, −116.569); Brush Creek (45.275, −116.657); Bull Creek (45.329, −116.673); Deep

Creek (45.237, −116.674); Devils Farm Creek (45.301, −116.611); Granite Creek (45.277, −116.630); Hells Canyon (45.254, −116.698); Lightning Creek (45.440, −116.500); Little Granite Creek (45.335, −116.636); North Fork Battle Creek (45.316, −116.687); Rattlesnake Creek (45.457, −116.610); Rough Creek (45.397, −116.638); Rush Creek (45.468, −116.596); Saddle Creek (45.375, −116.721); Sheep Creek (45.406, −116.523); Sluice Creek (45.445, −116.622); Snake River (45.243, −116.700); Stud Creek (45.267, −116.693); Three Creek (45.353, −116.610); Unnamed (45.468, −116.610); Unnamed (45.4787, −116.4799); Wild Sheep Creek (45.326, −116.676).

(ii) *Snake River/Getta Creek Watershed 1706010102*. Outlet(s) = Snake River (Lat 45.747, Long −116.543) upstream to endpoint(s) in: Big Canyon Creek (45.689, −116.467); Corral Creek (45.588, −116.433); Cove Creek (45.553, −116.574); Durham Creek (45.595, −116.472); Getta Creek (45.736, −116.421); Highrange Creek (45.738, −116.518); Indian Creek (45.744, −116.449); Jones Creek (45.703, −116.526); Kirby Creek (45.575, −116.454); Kirkwood Creek (45.548, −116.457); Klopton Creek (45.627, −116.434); Kurry Creek (45.656, −116.426); Lookout Creek (45.713, −116.542); Lost Valley Creek (45.550, −116.482); Pleasant Valley Creek (45.647, −116.492); Salt Creek (45.576, −116.554); SCreek (45.491, −116.574); Snake River (45.468, −116.554); Somers Creek (45.645, −116.553); Temperance Creek (45.537, −116.571); Tryon Creek (45.694, −116.540); Two Corral Creek (45.561, −116.526); Unnamed (45.5817, −116.5098); West Creek (45.664, −116.453); West Fork West Creek (45.669, −116.463).

(iii) *Snake River/Divide Creek Watershed 1706010104*. Outlet(s) = Snake River (Lat 45.857 Long −116.794) upstream to endpoint(s) in: Divide Creek (45.859, −116.741); Dry Creek (45.842, −116.598); Snake River (45.747, −116.543); Unnamed (45.7599, −116.6456); Wolf Creek (45.776, −116.567).

(2) Imnaha River Subbasin 17060102

(i) *Upper Imnaha River Watershed 1706010201*. Outlet(s) = Imnaha River (Lat 45.232, Long −116.844) upstream to endpoint(s) in: Crazyman Creek (45.190, −116.811); Dry Creek (45.123, −116.867); Gumboot Creek (45.147, −116.968); Mahogany Creek (45.201, −116.905); North Fork Dry Creek (45.143, −116.850); North Fork Gumboot Creek (45.184, −116.928); North Fork Imnaha River (45.118, −117.129); Skookum Creek (45.117, −116.938); South Fork Imnaha River (45.111, −117.230); Unnamed (45.188, −116.923); Unnamed (45.208, −116.890).

(ii) *Middle Imnaha River Watershed 1706010202*. Outlet(s) = Imnaha River (Lat 45.557, Long −116.834) upstream to endpoint(s) in: Freezeout Creek (45.352, −116.761); Grouse Creek (45.179, −116.976); Imnaha River (45.232, −116.844); Morgan Creek (45.261, −116.948); Rich Creek (45.243, −116.869); Road Creek (45.279, −116.932); Shadow Canyon (45.295, −116.860); Summit Creek

(45.228, −116.793); Unnamed (45.203, −116.978); Unnamed (45.203, −116.943); Unnamed (45.250, −116.923).

(iii) *Big Sheep Creek Watershed 1706010203*. Outlet(s) = Big Sheep Creek (Lat 45.520, Long −116.859) upstream to endpoint(s) in: Big Sheep Creek (45.171, −117.086); Carrol Creek (45.240, −117.063); Griffith Creek (45.273, −117.061); Lick Creek (45.133, −117.056); Marr Creek (45.299, −116.949); North Fork Carrol Creek (45.295, −116.993); South Fork Squaw Creek (45.354, −116.872); Tyee Creek (45.188, −116.991); Unnamed (45.164, −117.023); Unnamed (45.239, −117.045); Unnamed (45.297, −116.940).

(iv) *Little Sheep Creek Watershed 1706010204*. Outlet(s) = Big Sheep Creek (Lat 45.557, Long −116.834) upstream to endpoint(s) in: Bear Gulch (45.379, −116.955); Big Sheep Creek (45.520, −116.859); Camp Creek (45.544, −116.959); Canal Creek (45.256, −117.103); Devils Gulch (45.428, −116.962); Downey Gulch (45.405, −116.958); Ferguson Creek (45.267, −117.106); Lightning Creek (45.475, −117.020); Little Sheep Creek (45.236, −117.083); McCully Creek (45.295, −117.107); Redmont Creek (45.250, −117.099); South Fork Lightning Creek (45.473, −117.019); Summit Creek (45.390, −116.930); Threebuck Creek (45.395, −117.012); Trail Creek (45.563, −116.898).

(v) *Lower Imnaha River Watershed 1706010205*. Outlet(s) = Imnaha River (Lat 45.817, Long −116.764) upstream to endpoint(s) in: Corral Creek (45.708, −116.815); Cottonwood Creek (45.659, −116.865); Cow Creek (45.573, −116.628); Dodson Fork (45.725, −116.821); East Fork Fence Creek (45.652, −116.855); Fence Creek (45.655, −116.875); Horse Creek (45.421, −116.725); Imnaha River (45.557, −116.834); Lightning Creek (45.447, −116.682); Prong (45.589, −116.592); Pumpkin Creek (45.517, −116.758); Sleepy Creek (45.604, −116.666); Stubblefield Fork (45.711, −116.815); Tulley Creek (45.743, −116.766).

(3) Lower Snake/Asotin Subbasin 17060103

(i) *Snake River/Rogersburg Watershed 1706010301*. Outlet(s) = Snake River (Lat 46.080, Long −116.978) upstream to endpoint(s) in: Cache Creek (45.976, −116.928); Cave Gulch (46.023, −116.840); Cook Creek (45.901, −116.865); Corral Creek (46.055, −116.875); Cottonwood Creek (45.944, −116.860); Garden Creek (45.972, −116.903); Snake River (45.857, −116.794).

(ii) *Asotin River Watershed 1706010302*. Outlet(s) = Asotin Creek (Lat 46.345, Long −117.053) upstream to endpoint(s) in: Ayers Gulch (46.278, −117.094); Charley Creek (46.271, −117.460); Coombs Canyon (46.128, −117.276); George Creek (46.144, −117.303); Hefflefinger Gulch (46.151, −117.231); Huber Gulch (46.155, −117.188); Kelly Creek (46.251, −117.114); Lick Creek (46.260, −117.358); Middle Branch North Fork Asotin Creek (46.195, −117.439); Nims Gulch (46.178, −117.121); North Fork Asotin Creek

(46.207, −117.478); Pintler Creek (46.194, −117.153); South Fork Asotin Creek (46.174, −117.341); South Fork North Fork Asotin Creek (46.192, −117.425).

(iii) *Snake River/Captain John Creek Watershed 1706010303.* Outlet(s) = Snake River (Lat 46.428, Long −117.038) upstream to endpoint(s) in: Captain John Creek (46.145, −116.821); Couse Creek (46.157, −117.032); Edeburn Gulch (46.142, −117.008); Mill Creek (46.157, −117.078); Redbird Creek (46.220, −116.898); Snake River (46.080, −116.978); South Fork Captain John Creek (46.123, −116.864); Tammany Creek (46.362, −117.052); Tenmile Canyon (46.284, −116.976); Tenmile Creek (46.123, −117.086); Unnamed (46.119, −117.100); Unnamed (46.124, −117.111).

(4) Upper Grande Ronde River Subbasin 17060104

(i) *Upper Grande Ronde River Watershed 1706010401.* Outlet(s) = Grande Ronde River (Lat 45.264, Long −118.376) upstream to endpoint(s) in: Chicken Creek (44.987, −118.378); Clear Creek (45.014, −118.329); Dry Creek (45.052, −118.380); East Fork Grande Ronde River (45.060, −118.237); East Sheep Creek (44.987, −118.425); Fly Creek (45.125, −118.596); Grande Ronde River (44.998, −118.273); Limber Jim Creek (45.107, −118.270); Little Clear Creek (45.038, −118.300); Little Fly Creek (45.062, −118.504); Lookout Creek (45.065, −118.543); Muir Creek (45.066, −118.297); North Fork Limber Jim Creek (45.125, −118.308); Sheep Creek (45.016, −118.507); South Fork Limber Jim Creek (45.088, −118.304); Squaw Creek (45.103, −118.554); Umapine Creek (45.116, −118.571); Unnamed (45.042, −118.269); Unnamed (45.045, −118.417); West Chicken Creek (45.025, −118.404); Winter Canyon (45.215, −118.361).

(ii) *Meadow Creek Watershed 1706010402.* Outlet(s) = Meadow Creek (Lat 45.264, Long −118.376) upstream to endpoint(s) in: Battle Creek (45.216, −118.507); Bear Creek (45.210, −118.577); Burnt Corral Creek (45.159, −118.524); Dark Canyon (45.382, −118.394); East Burnt Corral Creek (45.173, −118.498); Ensign Creek (45.361, −118.554); Little Dark Canyon (45.322, −118.418); Marley Creek (45.177, −118.476); McCoy Creek (45.322, −118.628); McIntyre Creek (45.345, −118.459); Meadow Creek (45.286, −118.716); Peet Creek (45.233, −118.611); Smith Creek (45.295, −118.594); Sullivan Gulch (45.200, −118.515); Syrup Creek (45.296, −118.543); Tybow Canyon (45.214, −118.467); Unnamed (45.206, −118.552); Unnamed (45.275, −118.695); Unnamed (45.295, −118.718); Unnamed (45.330, −118.551); Waucup Creek (45.243, −118.660).

(iii) *Grande Ronde River/Beaver Creek Watershed 1706010403.* Outlet(s) = Grande Ronde River (Lat 45.347, Long −118.221) upstream to endpoint(s) in: Bear Creek (45.283, −118.270); Beaver Creek (45.146, −118.206); Dry Beaver Creek (45.168, −118.316); East Fork Rock Creek (45.166, −118.111); Grande Ronde

River (45.264, −118.376); Graves Creek (45.245, −118.161); Hoodoo Creek (45.154, −118.259); Jordan Creek (45.162, −118.187); Little Beaver Creek (45.185, −118.333); Little Whiskey Creek (45.209, −118.178); Rock Creek (45.172, −118.139); Sheep Creek (45.281, −118.130); South Fork Spring Creek (45.346, −118.363); Spring Creek (45.396, −118.372); Unnamed (45.167, −118.144); Unnamed (45.227, −118.262); Unnamed (45.231, −118.279); Unnamed (45.232, −118.091); Unnamed (45.240, −118.257); Watermelon Creek (45.195, −118.277); Whiskey Creek (45.198, −118.181).

(iv) *Grande Ronde River/Five Points Creek Watershed 1706010404*. Outlet(s) = Grande Ronde River (Lat 45.408, Long −117.930) upstream to endpoint(s) in: California Gulch (45.406, −118.335); Conley Creek (45.406, −118.084); Dobbin Ditch (45.377, −118.017); Dry Creek (45.426, −118.379); Fiddlers Hell (45.443, −118.145); Five Points Creek (45.482, −118.143); Grande Ronde River (45.347, −118.221); Little John Day Creek (45.430, −118.192); Middle Fork Five Points Creek (45.485, −118.129); Mt Emily Creek (45.465, −118.125); Pelican Creek (45.438, −118.318); Tie Creek (45.420, −118.129); Unnamed (45.385, −118.043); Unnamed (45.423, −118.243).

(v) *Catherine Creek Watershed 1706010405*. Outlet(s) = Catherine Creek (Lat 45.219, Long −117.915) upstream to endpoint(s) in: Buck Creek (45.132, −117.606); Camp Creek (45.100, −117.596); Collins Creek (45.100, −117.531); Corral Creek (45.113, −117.575); Little Catherine Creek (45.148, −117.716); Middle Fork Catherine Creek (45.155, −117.567); Milk Creek (45.092, −117.717); North Fork Catherine Creek (45.221, −117.610); Pole Creek (45.123, −117.544); Prong Creek (45.096, −117.565); SPass Creek (45.115, −117.528); Scout Creek (45.105, −117.644); South Fork Catherine Creek (45.116, −117.503); Unnamed (45.104, −117.685).

(vi) *Ladd Creek Watershed 1706010406*. Outlet(s) = Ladd Creek (Lat 45.282, Long −117.936) upstream to endpoint(s) in: Catherine Creek (45.219, −117.915); Ladd Creek (45.215, −118.024); Little Creek (45.210, −117.784); Mill Creek (45.263, −118.083); Unnamed (45.259, −118.039).

(vii) *Grande Ronde River/Mill Creek Watershed 1706010407*. Outlet(s) = Grande Ronde River (Lat 45.408, Long −117.930) upstream to endpoint(s) in: Catherine Creek (45.282, −117.936); McAlister Slough (45.315, −117.973); Mill Creek (45.278, −117.728); Unnamed (45.297, −117.806).

(viii) *Phillips Creek/Willow Creek Watershed 1706010408*. Outlet(s) = Willow Creek (Lat 45.492, Long −117.931) upstream to endpoint(s) in: Dry Creek (45.640, −118.114); End Creek (45.4622, −118.0316); Finley Creek (45.625, −118.099); Fir Creek (45.5171, −118.0568); Little Dry Creek (45.5348, −118.0393); McDonald Creek (45.5348, −118.0393); Mill Creek (45.568, −118.025); Slide Creek (45.422,

−118.028); Smith Creek (45.5256, −118.0537); Unnamed (45.525, −118.014).

(ix) *Grande Ronde River/Indian Creek Watershed 1706010409*. Outlet(s) = Grande Ronde River (Lat 45.560, Long −117.910) upstream to endpoint(s) in: Camp Creek (45.386, −117.720); Clark Creek (45.409, −117.728); East Fork Indian Creek (45.363, −117.737); Grande Ronde River (45.408, −117.930); Indian Creek (45.332, −117.717); Little Indian Creek (45.375, −117.785); Middle Fork Clark Creek (45.462, −117.764); North Fork Clark Creek (45.502, −117.733); North Fork Indian Creek (45.419, −117.787); Unnamed (45.375, −117.739); Unnamed (45.476, −117.757).

(x) *Lookingglass Creek Watershed 1706010410*. Outlet(s) = Lookingglass Creek (Lat 45.707, Long −117.841) upstream to endpoint(s) in: Buzzard Creek (45.845, −117.939); Eagle Creek (45.723, −118.005); Jarboe Creek (45.776, −117.855); Little Lookingglass Creek (45.848, −117.901); Lookingglass Creek (45.777, −118.070); Mottet Creek (45.827, −117.958); Unnamed (45.835, −117.869); Unnamed (45.844, −117.893).

(xi) *Grande Ronde River/Cabin Creek Watershed 1706010411*. Outlet(s) = Grande Ronde River (Lat 45.726, Long −117.784) upstream to endpoint(s) in: Buck Creek (45.662, −117.919); Duncan Canyon (45.654, −117.776); East Phillips Creek (45.669, −118.066); Gordon Creek (45.665, −118.001); Grande Ronde River (45.560, −117.910); Little Phillips Creek (45.668, −118.036); North Fork Cabin Creek (45.721, −117.929); Pedro Creek (45.676, −118.051); Phillips Creek (45.666, −118.089); Rysdam Canyon (45.633, −117.812); South Fork Cabin Creek (45.698, −117.963); Unnamed (45.661, −117.930); Unnamed (45.672, −117.941); Unnamed (45.682, −117.974); Unnamed (45.695, −117.927); Unnamed (45.707, −117.916).

(5) Wallowa River Subbasin 17060105

(i) *Upper Wallowa River Watershed 1706010501*. Outlet(s) = Wallowa River (Lat 45.427, Long −117.310) upstream to endpoint(s) in: Hurricane Creek (45.337, −117.291); Little Hurricane Creek (45.407, −117.276); Prairie Creek (45.394, −117.189); Spring Creek (45.406, −117.287); Trout Creek (45.455, −117.281); Unnamed (45.387, −117.215); Unnamed (45.392, −117.214); Unnamed (45.411, −117.264); Unnamed (45.412, −117.156); Unnamed (45.424, −117.313); Wallowa River (45.335, −117.222).

(ii) *Lostine River Watershed 1706010502*. Outlet(s) = Lostine River (Lat 45.552, Long −117.489) upstream to endpoint(s) in: Lostine River (45.245, −117.375); Silver Creek (45.394, −117.420).

(iii) *Middle Wallowa River Watershed 1706010503*. Outlet(s) = Wallowa River (Lat 45.584, Long −117.540) upstream to endpoint(s) in: Middle Fork Whisky Creek (45.590, −117.342); North Fork Whisky Creek (45.614, −117.331); Parsnip Creek (45.533, −117.419); South

Fork Whisky Creek (45.590, −117.413); Straight Whisky Creek (45.622, −117.396); Wallowa River (45.427, −117.310); Whisky Creek (45.608, −117.397).

(iv) *Bear Creek Watershed 1706010504.* Outlet(s) = Bear Creek (Lat 45.584, Long −117.540) upstream to endpoint(s) in: Bear Creek (45.347, −117.500); Doc Creek (45.449, −117.572); Fox Creek (45.447, −117.562); Goat Creek (45.413, −117.519); Little Bear Creek (45.456, −117.500).

(v) *Minam River Watershed 1706010505.* Outlet(s) = Minam River (Lat 45.621, Long −117.720) upstream to endpoint(s) in: Cougar Creek (45.517, −117.672); Elk Creek (45.157, −117.480); Little Minam River (45.338, −117.643); Minam River (45.149, −117.392); Murphy Creek (45.414, −117.644); North Minam River (45.275, −117.520); Patrick Creek (45.426, −117.645); Squaw Creek (45.576, −117.706); Trout Creek (45.471, −117.652).

(vi) *Lower Wallowa River Watershed 1706010506.* Outlet(s) = Wallowa River (Lat 45.726, Long −117.784) upstream to endpoint(s) in: Deer Creek (45.452, −117.606); Dry Creek (45.650, −117.439); Fisher Creek (45.666, −117.750); Howard Creek (45.735, −117.695); Reagin Gulch (45.670, −117.559); Rock Creek (45.679, −117.620); Sage Creek (45.486, −117.590); Tamarack Canyon (45.656, −117.518); Unnamed (45.618, −117.629); Unnamed (45.654, −117.442); Unnamed (45.678, −117.556); Wallowa River (45.584, −117.540); Water Canyon (45.589, −117.614); Wise Creek (45.671, −117.705).

(6) Lower Grande Ronde Subbasin 17060106

(i) *Grande Ronde River/Rondowa Watershed 1706010601.* Outlet(s) = Grande Ronde River (Lat 45.896, Long −117.493) upstream to endpoint(s) in: Alder Creek (45.844, −117.750); Bear Creek (45.885, −117.752); Clear Creek (45.775, −117.714); Deep Creek (45.817, −117.651); East Grossman Creek (45.819, −117.625); Elbow Creek (45.927, −117.630); Grande Ronde River (45.726, −117.784); Grossman Creek (45.732, −117.614); Meadow Creek (45.825, −117.760); Sheep Creek (45.756, −117.797); Sickfoot Creek (45.842, −117.567); Unnamed (45.746, −117.656).

(ii) *Grande Ronde River/Mud Creek Watershed 1706010602.* Outlet(s) = Grande Ronde River (Lat 45.946, Long −117.450) upstream to endpoint(s) in: Bishop Creek (45.747, −117.555); Bobcat Creek (45.853, −117.370); Buck Creek (45.758, −117.298); Burnt Creek (45.769, −117.283); Courtney Creek (45.857, −117.314); Grande Ronde River (45.896, −117.493); Little Courtney Canyon (45.903, −117.385); McAllister Creek (45.683, −117.361); McCubbin Creek (45.700, −117.294); Mud Creek (45.633, −117.291); Unnamed (45.867, −117.329); Shamrock Creek (45.828, −117.335); Simmons Draw (45.730, −117.514); Sled Creek (45.730, −117.278); Teepee Creek (45.694, −117.349); Tope Creek (45.634, −117.330);

Unnamed (45.710, −117.283); Unnamed (45.856, −117.312); Wallupa Creek (45.765, −117.528); Wildcat Creek (45.732, −117.489).

(iii) *Wenaha River Watershed 1706010603*. Outlet(s) = Wenaha River (Lat 45.946, Long −117.450) upstream to endpoint(s) in: Beaver Creek (46.002, −117.815); Crooked Creek (46.046, −117.624); First Creek (46.071, −117.519); Melton Creek (46.060, −117.566); Milk Creek (45.973, −117.902); North Fork Wenaha River (46.064, −117.912); Rock Creek (45.999, −117.766); Second Creek (46.065, −117.595); Slick Ear Creek (45.983, −117.784); South Fork Wenaha River (45.872, −117.897); Third Creek (46.089, −117.627); Weller Creek (45.989, −117.648); West Fork Butte Creek (46.064, −117.759).

(iv) *Chesnimnus Creek Watershed 1706010604*. Outlet(s) = Chesnimnus Creek (Lat 45.715, Long −117.155) upstream to endpoint(s) in: Alder Creek (45.702, −116.997); Billy Creek (45.815, −117.032); Butte Creek (45.641, −117.096); Chesnimnus Creek (45.718, −116.906); Deadman Gulch (45.659, −117.049); Devils Run Creek (45.775, −116.882); Doe Creek (45.751, −117.029); Dry Salmon Creek (45.663, −117.051); East Fork Peavine Creek (45.830, −117.061); Gooseberry Creek (45.681, −117.110); McCarty Gulch (45.749, −117.064); Peavine Creek (45.795, −117.084); Pine Creek (45.673, −117.029); Poison Creek (45.791, −116.979); Salmon Creek (45.662, −117.038); South Fork Chesnimnus Creek (45.743, −116.861); Sterling Gulch (45.712, −117.000); Summit Creek (45.794, −116.947); Telephone Gulch (45.767, −117.076); TNT Gulch (45.754, −116.919); Unnamed (45.694, −117.013); Unnamed (45.709, −116.878); Unnamed (45.724, −116.867); Unnamed (45.742, −117.090); Unnamed (45.825, −117.004); Unnamed (45.838, −117.009); Unnamed (45.846, −117.029); West Fork Peavine Creek (45.805, −117.100).

(v) *Upper Joseph Creek Watershed 1706010605*. Outlet(s) = Joseph Creek (Lat 45.823, Long −117.231) upstream to endpoint(s) in: Alford Gulch (45.729, −117.165); Cougar Creek (45.806, −117.150); Crow Creek (45.536, −117.115); Davis Creek (45.658, −117.257); Elk Creek (45.598, −117.167); Gould Gulch (45.657, −117.181); Little Elk Creek (45.694, −117.199); Sumac Creek (45.753, −117.148); Swamp Creek (45.543, −117.218); Unnamed (45.597, −117.141).

(vi) *Lower Joseph Creek Watershed 1706010606*. Outlet(s) = Joseph Creek (Lat 46.053, Long −117.005) upstream to endpoint(s) in: Basin Creek (45.910, −117.057); Broady Creek (45.882, −117.076); Cottonwood Creek (45.832, −116.950); Horse Creek (45.945, −116.962); Joseph Creek (45.823, −117.231); Peavine Creek (45.879, −117.162); Rush Creek (45.899, −117.150); Tamarack Creek (45.964, −117.127); Unnamed (45.826, −116.957); West Fork Broady Creek (45.862, −117.102).

(vii) *Lower Grande Ronde River/Menatchee Creek Watershed 1706010607*. Outlet(s) = Grande Ronde River (Lat 46.080, Long

−116.978) upstream to endpoint(s) in: Bear Creek (45.973, −117.455); Buford Creek (45.975, −117.276); Cottonwood Creek (46.071, −117.301); Cougar Creek (46.049, −117.327); Deer Creek (45.992, −117.191); East Bear Creek (45.960, −117.307); Grande Ronde River (45.946, −117.450); Grouse Creek (46.031, −117.460); Menatchee Creek (46.018, −117.371); Rattlesnake Creek (46.079, −117.204); Shumaker Creek (46.049, −117.117); West Bear Creek (45.951, −117.337); West Branch Rattlesnake Creek (46.086, −117.258).

(7) Lower Snake/Tucannon Subbasin 17060107

(i) *Alpowa Creek Watershed 1706010701*. Outlet(s) = Alpowa Creek (Lat 46.422, Long −117.203) upstream to endpoint(s) in: Kidwell Gulch (46.338, −117.480); Page Creek (46.402, −117.210); Pow Wah Kee Creek (46.389, −117.288).

(ii) *Snake River/Steptoe Canyon Watershed 1706010702*. Outlet(s) = Snake River (Lat 46.660, Long −117.433) upstream to endpoint(s) in: Offield Canyon (46.648, −117.420); Snake River (46.428, −117.038); Steptoe Canyon (46.455, −117.192); Truax Canyon (46.565, −117.348); Wawawai Canyon (46.636, −117.375).

(iii) *Deadman Creek Watershed 1706010703*. Outlet(s) = Deadman Creek (Lat 46.626, Long −117.799) upstream to endpoint(s) in: Deadman Gulch (46.574, −117.565); Lynn Gulch (46.628, −117.597); North Deadman Creek (46.578, −117.457); North Meadow Creek (46.517, −117.489); South Meadow Creek (46.507, −117.508).

(iv) *Upper Tucannon River Watershed 1706010706*. Outlet(s) = Tucannon River (Lat 46.509, Long −117.995) upstream to endpoint(s) in: Cummings Creek (46.235, −117.610); Little Tucannon River (46.221, −117.758); Meadow Creek (46.163, −117.728); Panjab Creek (46.171, −117.709); Sheep Creek (46.196, −117.623); Tucannon River (46.168, −117.559); Tumalum Creek (46.315, −117.585).

(v) *Lower Tucannon River Watershed 1706010707*. Outlet(s) = Tucannon River (Lat 46.558, Long −118.174) upstream to endpoint(s) in: Kellogg Creek (46.430, −118.067); Smith Hollow (46.463, −118.017); Tucannon River (46.509, −117.995).

(vi) *Snake River/Penawawa Creek Watershed 1706010708*. Outlet(s) = Snake River (Lat 46.589, Long −118.215) upstream to endpoint(s) in: Almota Creek (46.706, −117.363); Little Almota Creek (46.715, −117.465); Penawawa Creek (46.728, −117.625); Snake River (46.660, −117.433); Unnamed (46.698, −117.381).

(8) Upper Salmon Subbasin 17060201

(i) *Salmon River/Challis Watershed 1706020101*. Outlet(s) = Salmon River (Lat 44.692, Long −114.049) upstream to endpoint(s) in: Challis Creek (44.563, −114.246); Salmon River (44.470, −114.192).

(ii) *Salmon River/Bayhorse Creek Watershed 1706020104*. Outlet(s) = Salmon River (Lat 44.470, Long −114.192) upstream to endpoint(s) in: Bayhorse Creek (44.395, −114.308); Salmon River (44.268, −114.326).

(iii) *East Fork Salmon River/McDonald Creek Watershed 1706020105.* Outlet(s) = East Fork Salmon River (Lat 44.268, Long −114.326) upstream to endpoint(s) in: Big Lake Creek (44.165, −114.394); East Fork Salmon River (44.147, −114.378); McDonald Creek (44.091, −114.318); Pine Creek (44.136, −114.367).

(iv) *Herd Creek Watershed 1706020108.* Outlet(s) = Herd Creek (Lat 44.154, Long −114.300) upstream to endpoint(s) in: East Fork Herd Creek (44.037, −114.203); East Pass Creek (44.009, −114.369); Lake Creek (44.103, −114.194); Taylor Creek (44.067, −114.317); West Fork Herd Creek (44.032, −114.248).

(v) *East Fork Salmon River/Big Boulder Creek Watershed 1706020109.* Outlet(s) = East Fork Salmon River (Lat 44.147, Long −114.378) upstream to endpoint(s) in: Big Boulder Creek (44.131, −114.518); East Fork Salmon River (44.039, −114.461); Little Boulder Creek (44.065, −114.542).

(vi) *Upper East Fork Salmon River Watershed 1706020110.* Outlet(s) = East Fork Salmon River (Lat 44.039, Long −114.461) upstream to endpoint(s) in: Bowery Creek (44.0316, −114.4587); South Fork East Fork Salmon River (43.902, −114.562); West Fork East Fork Salmon River (43.929, −114.575); West Pass Creek (43.922, −114.446).

(vii) *Germania Creek Watershed 1706020111.* Outlet(s) = Germania Creek (Lat 44.039, Long −114.461) upstream to endpoint(s) in: Germania Creek (44.003, −114.532).

(viii) *Salmon River/Kinnikinic Creek Watershed 1706020112.* Outlet(s) = Salmon River (Lat 44.268, Long −114.326) upstream to endpoint(s) in: Kinnikinic Creek (44.2667, −144.4026); Salmon River (44.249, −114.454).

(ix) *Salmon River/Slate Creek Watershed 1706020113.* Outlet(s) = Salmon River (Lat 44.249, Long −114.454) upstream to endpoint(s) in: Holman Creek (44.250, −114.529); Salmon River (44.254, −114.675); Silver Rule Creek (44.198, −114.588); Slate Creek (44.168, −114.626); Thompson Creek (44.318, −114.588).

(x) *Warm Springs Creek Watershed 1706020114.* Outlet(s) = Warm Springs Creek (Lat 44.254, Long −114.675) upstream to endpoint(s) in: Warm Springs Creek (44.151, −114.718).

(xi) *Salmon River/Big Casino Creek Watershed 1706020115.* Outlet(s) = Salmon River (Lat 44.254, Long −114.675) upstream to endpoint(s) in: Big Casino Creek (44.216, −114.830); Little Casino Creek (44.224, −114.861); Lower Harden Creek (44.274, −114.778); Nip Tuck Creek (44.234, −114.929); Salmon River (44.169, −114.898); Upper Harden Creek (44.272, −114.791).

(xii) *Salmon River/Fisher Creek Watershed 1706020117.* Outlet(s) = Salmon River (Lat 44.169, Long −114.898) upstream to endpoint(s) in: Decker Creek (44.072, −114.879); Gold Creek (44.114, −114.846);

Huckleberry Creek (44.061, −114.875); Salmon River (44.032, −114.836); Williams Creek (44.096, −114.852).

(xiii) *Salmon River/Fourth of July Creek Watershed 1706020118.* Outlet(s) = Salmon River (Lat 44.032, Long −114.836) upstream to endpoint(s) in: Champion Creek (44.019, −114.825); Fourth of July Creek (44.035, −114.784); Hell Roaring Creek (44.0268, −114.9252); Salmon River (44.004, −114.836); Unnamed (44.017, −114.879).

(xiv) *Upper Salmon River Watershed 1706020119.* Outlet(s) = Salmon River (Lat 44.004, Long −114.836) upstream to endpoint(s) in: Beaver Creek (43.919, −114.813); Camp Creek (43.876, −114.738); Frenchman Creek (43.822, −114.792); Pole Creek (43.940, −114.686); Salmon River (43.837, −114.759); Smiley Creek (43.829, −114.823); Twin Creek (43.935, −114.723); Unnamed (43.843, −114.742); Unnamed (43.990, −114.803).

(xv) *Alturas Lake Creek Watershed 1706020120.* Outlet(s) = Alturas Lake Creek (Lat 44.004, Long −114.836) upstream to endpoint(s) in: Alpine Creek (43.905, −114.923); Alturas Lake Creek (43.895, −114.910); Cabin Creek (43.937, −114.856); Pettit Lake Creek (43.961, −114.916); Unnamed (43.952, −114.858); Vat Creek (43.967, −114.871); Yellowbelly Creek (43.995, −114.847).

(xvi) *Redfish Lake Creek Watershed 1706020121.* Outlet(s) = Redfish Lake Creek (Lat 44.169, Long −114.898) upstream to endpoint(s) in: Fishhook Creek (44.137, −114.966); Redfish Lake Creek (44.097, −114.959).

(xvii) *Valley Creek/Iron Creek Watershed 1706020122.* Outlet(s) = Valley Creek (Lat 44.225, Long −114.927) upstream to endpoint(s) in: Crooked Creek (44.214, −115.034); Goat Creek (44.179, −115.008); Iron Creek (44.191, −115.025); Job Creek (44.242, −115.027); Meadow Creek (44.190, −114.961); Park Creek (44.281, −115.036); Stanley Creek (44.276, −114.938); Valley Creek (44.291, −115.018).

(xviii) *Upper Valley Creek Watershed 1706020123.* Outlet(s) = Valley Creek (Lat 44.291, Long −115.018); Stanley Lake Creek (44.2535, −115.0040) upstream to endpoint(s) in: East Fork Valley Creek (44.347, −114.999); Elk Creek (44.227, −115.145); Hanna Creek (44.314, −115.041); Meadow Creek (44.291, −115.119); Stanley Lake Creek (44.248, −115.045); Trap Creek (44.311, −115.121); Valley Creek (44.392, −114.980).

(xix) *Basin Creek Watershed 1706020124.* Outlet(s) = Basin Creek (Lat 44.264, Long −114.817) upstream to endpoint(s) in: Basin Creek (44.361, −114.902); East Basin Creek (44.314, −114.823).

(xx) *Yankee Fork/Jordan Creek Watershed 1706020125.* Outlet(s) = Yankee Fork (Lat 44.270, Long −114.734) upstream to endpoint(s) in: Eightmile Creek (44.448, −114.639); Fivemile Creek (44.355, −114.615); Jordan Creek (44.457, −114.752); Ramey Creek (44.355,

−114.641); Sevenmile Creek (44.423, −114.608); Sixmile Creek (44.394, −114.585); Yankee Fork (44.426, −114.619).

(xxi) *West Fork Yankee Fork Watershed 1706020126.* Outlet(s) = West Fork Yankee Fork (Lat 44.351, Long −114.727) upstream to endpoint(s) in: Cabin Creek (44.428, −114.881); Deadwood Creek (44.356, −114.834); Lightning Creek (44.466, −114.787); Sawmill Creek (44.341, −114.765); West Fork Yankee Fork (44.386, −114.919).

(xxii) *Upper Yankee Fork Watershed 1706020127.* Outlet(s) = Yankee Fork (Lat 44.426, Long −114.619) upstream to endpoint(s) in: Elevenmile Creek (44.436, −114.544); McKay Creek (44.475, −114.491); Ninemile Creek (44.439, −114.590); Tenmile Creek (44.484, −114.646); Twelvemile Creek (44.497, −114.614); Yankee Fork (44.510, −114.588).

(xxiii) *Squaw Creek Watershed 1706020128.* Outlet(s) = Squaw Creek (Lat 44.249, Long −114.454) upstream to endpoint(s) in: Cash Creek (44.353, −114.473); Cinnabar Creek (44.359, −114.503); Squaw Creek (44.420, −114.489).

(xxiv) *Garden Creek Watershed 1706020129.* Outlet(s) = Garden Creek (Lat 44.511, Long −114.203) upstream to endpoint(s) in: Garden Creek (44.468, −114.325).

(xxv) *Challis Creek/Mill Creek Watershed 1706020130.* Outlet(s) = Challis Creek (Lat 44.563, Long −114.246) upstream to endpoint(s) in: Challis Creek (44.573, −114.309); Darling Creek (44.572, −114.252).

(xxvi) *Morgan Creek Watershed 1706020132.* Outlet(s) = Morgan Creek (Lat 44.612, Long −114.168) upstream to endpoint(s) in: Blowfly Creek (44.714, −114.326); Corral Creek (44.8045, −114.2239); Lick Creek (44.7371, −114.2948); Morgan Creek (44.8029, −114.2561); Van Horn Creek (44.7614, −114.2680); West Fork Morgan Creek (44.710, −114.335).

(9) Pahsimeroi Subbasin 17060202

(i) *Lower Pahsimeroi River Watershed 1706020201.* Outlet(s) = Pahsimeroi River (Lat 44.692, Long −114.049) upstream to endpoint(s) in: Pahsimeroi River (44.559, −113.900); Patterson Creek (44.561, −113.897).

(ii) *Paterson Creek Watershed 1706020203.* Outlet(s) = Patterson Creek (Lat 44.534, Long −113.837) upstream to endpoint(s) in: Patterson Creek (44.566, −113.670).

(10) Middle Salmon-Panther Subbasin 17060203

(i) *Salmon River/Colson Creek Watershed 1706020301.* Outlet(s) = Salmon River (Lat 45.297, Long −114.591) upstream to endpoint(s) in: Colson Creek (45.307, −114.531); Owl Creek (45.340, −114.462); Salmon River (45.316, −114.405).

(ii) *Owl Creek Watershed 1706020302.* Outlet(s) = Owl Creek (Lat 45.340, Long −114.462) upstream to endpoint(s) in: East Fork Owl Creek (45.367, −114.430); Owl Creek (45.382, −114.469).

(iii) *Salmon River/Pine Creek Watershed 1706020303*. Outlet(s) = Salmon River (Lat 45.316, Long −114.405) upstream to endpoint(s) in: Boulder Creek (45.385, −114.297); Pine Creek (45.307, −114.186); Salmon River (45.399, −114.168); Spring Creek (45.421, −114.278); Squaw Creek (45.449, −114.215).
(iv) *Indian Creek Watershed 1706020304*. Outlet(s) = Indian Creek (Lat 45.400, Long −114.167) upstream to endpoint(s) in: Indian Creek (45.523, −114.151); McConn Creek (45.519, −114.185); West Fork Indian Creek (45.481, −114.168).
(v) *Salmon River/Moose Creek Watershed 1706020305*. Outlet(s) = Salmon River (Lat 45.399, Long −114.168) upstream to endpoint(s) in: Dump Creek (45.369, −114.035); Fourth of July Creek (45.417, −113.857); Little Fourth of July Creek (45.396, −113.912); Moose Creek (45.346, −114.080); Salmon River (45.320, −113.909); Wagonhammer Creek (45.395, −113.945).
(vi) *North Fork Salmon River Watershed 1706020306*. Outlet(s) = North Fork Salmon River (Lat 45.405, Long −113.994) upstream to endpoint(s) in: Anderson Creek (45.577, −113.918); Dahlonega Creek (45.559, −113.845); Ditch Creek (45.534, −113.994); Hughes Creek (45.541, −114.069); Hull Creek (45.471, −114.016); Moose Creek (45.674, −113.951); Pierce Creek (45.640, −113.937); Sheep Creek (45.502, −113.889); Smithy Creek (45.575, −113.889); Threemile Creek (45.577, −113.866); Twin Creek (45.591, −114.081).
(vii) *Salmon River/Tower Creek Watershed 1706020307*. Outlet(s) = Salmon River (Lat 45.320, Long −113.909) upstream to endpoint(s) in: Salmon River (45.250, −113.899); Tower Creek (45.367, −113.857); Wallace Creek (45.2645, −113.9035).
(viii) *Carmen Creek Watershed 1706020308*. Outlet(s) = Carmen Creek (Lat 45.250, Long −113.899) upstream to endpoint(s) in: Carmen Creek (45.316, −113.800); Freeman Creek (45.269, −113.752).
(ix) *Salmon River/Jesse Creek Watershed 1706020309*. Outlet(s) = Salmon River (Lat 45.250, Long −113.899) upstream to endpoint(s) in: Salmon River (45.109, −113.901); Unnamed (45.180, −113.930).
(x) *Salmon River/Williams Creek Watershed 1706020310*. Outlet(s) = Salmon River (Lat 45.109, Long −113.901) upstream to endpoint(s) in: Salmon River (45.011, −113.932); Williams Creek (45.081, −113.935).
(xi) *Salmon River/Twelvemile Creek Watershed 1706020311*. Outlet(s) = Salmon River (Lat 45.011, Long −113.932) upstream to endpoint(s) in: Lake Creek (45.015, −113.959); Salmon River (44.896, −113.963); Twelvemile Creek (45.011, −113.927).
(xii) *Salmon River/Cow Creek Watershed 1706020312*. Outlet(s) = Salmon River (Lat 44.896, Long −113.963) upstream to endpoint(s) in: Cow Creek (44.730, −113.940); McKim Creek (44.810, −114.008);

Poison Creek (44.876, −113.934); Salmon River (44.692, −114.049); Warm Spring Creek (44.913, −113.914).

(xiii) *Hat Creek Watershed 1706020313*. Outlet(s) = Hat Creek (Lat 44.795, Long −114.001) upstream to endpoint(s) in: Hat Creek (44.785, −114.040).

(xiv) *Iron Creek Watershed 1706020314*. Outlet(s) = Iron Creek (Lat 44.887, Long −113.968) upstream to endpoint(s) in: Iron Creek (44.921, −114.124).

(xv) *Upper Panther Creek Watershed 1706020315*. Outlet(s) = Panther Creek (Lat 45.022, Long −114.313) upstream to endpoint(s) in: Cabin Creek (44.957, −114.365); Opal Creek (44.901, −114.307); Panther Creek (44.887, −114.305); Porphyry Creek (45.034, −114.388).

(xvi) *Moyer Creek Watershed 1706020316*. Outlet(s) = Moyer Creek (Lat 45.024, Long −114.311) upstream to endpoint(s) in: Moyer Creek (44.949, −114.265); South Fork Moyer Creek (44.944, −114.305).

(xvii) *Panther Creek/Woodtick Creek Watershed 1706020317*. Outlet(s) = Panther Creek (Lat 45.079, Long −114.251) upstream to endpoint(s) in: Copper Creek (45.060, −114.258); Fawn Creek (45.073, −114.247); Musgrove Creek (45.054, −114.368); Panther Creek (45.022, −114.313); Woodtick Creek (45.008, −114.235).

(xviii) *Deep Creek Watershed 1706020318*. Outlet(s) = Deep Creek (Lat 45.126, Long −114.215) upstream to endpoint(s) in: Deep Creek (45.108, −114.179).

(xix) *Panther Creek/Spring Creek Watershed 1706020320*. Outlet(s) = Panther Creek (45.176, Long −114.314) upstream to endpoint(s) in: Little Deer Creek (45.156, −114.298); Panther Creek (45.079, −114.251); Spring Creek (45.088, −114.223).

(xx) *Big Deer Creek Watershed 1706020321*. Outlet(s) = Big Deer Creek (Lat 45.1763, Long −114.3138) upstream to endpoint(s) in: Big Deer Creek (45.1695, −114.3256).

(xxi) *Panther Creek/Trail Creek Watershed 1706020322*. Outlet(s) = Panther Creek (Lat 45.316, Long −114.405) upstream to endpoint(s) in: Beaver Creek (45.2816, −114.2744); Garden Creek (45.2959, −114.4293); Trail Creek (45.2318, −114.2663); Panther Creek (45.176, −114.314).

(xxii) *Clear Creek Watershed 1706020323*. Outlet(s) = Clear Creek (Lat 45.295, Long −114.351) upstream to endpoint(s) in: Clear Creek (45.210, −114.485).

(11) Lemhi Subbasin 17060204

(i) *Lemhi River/Bohannon Creek Watershed 1706020401*. Outlet(s) = Lemhi River (Lat 45.188, Long −113.889) upstream to endpoint(s) in: Bohannon Creek (45.189, −113.692); Lemhi River (45.098, −113.720).

(ii) *Lemhi River/Whimpey Creek Watershed 1706020402*. Outlet(s) = Lemhi River (Lat 45.098, Long −113.720) upstream to endpoint(s) in: Lemhi River (45.032, −113.662); Wimpey Creek (45.131, −113.678); Withington Creek (45.058, −113.750).
(iii) *Lemhi River/Kenney Creek Watershed 1706020403*. Outlet(s) = Lemhi River (Lat 45.032, Long −113.662) upstream to endpoint(s) in: Kenney Creek (45.087, −113.551); Lemhi River (44.940, −113.639).
(iv) *Lemhi River/McDevitt Creek Watershed 1706020405*. Outlet(s) = Lemhi River (Lat 44.940, Long −113.639) upstream to endpoint(s) in: Lemhi River (44.870, −113.626).
(v) *Lemhi River/Yearian Creek Watershed 1706020406*. Outlet(s) = Lemhi River (Lat 44.867, Long −113.626) upstream to endpoint(s) in: Lemhi River (44.778, −113.535).
(vi) *Peterson Creek Watershed 1706020407*. Outlet(s) = Lemhi River (Lat 44.778, Long −113.535) upstream to endpoint(s) in: Lemhi River (44.739, −113.459).
(vii) *Big Eight Mile Creek Watershed 1706020408*. Outlet(s) = Lemhi River (Lat 44.739, Long −113.459) upstream to endpoint(s) in: Lemhi River (44.692, −113.366).
(viii) *Canyon Creek Watershed 1706020409*. Outlet(s) = Lemhi River (Lat 44.692, Long −113.366) upstream to endpoint(s) in: Lemhi River (44.682, −113.355).
(ix) *Texas Creek Watershed 1706020412*. Outlet(s) = Texas Creek (Lat 44.6822, Long −113.3545) upstream to endpoint(s) in: Purcell Creek (44.5726, −113.3459), Texas Creek (44.5348, −113.3018).
(x) *Hayden Creek Watershed 1706020414*. Outlet(s) = Hayden Creek (Lat 44.870, Long −113.626) upstream to endpoint(s) in: Bear Valley Creek (44.796, −113.790); East Fork Hayden Creek (44.708, −113.661); Hayden Creek (44.726, −113.769); Kadletz Creek (44.761, −113.767); West Fork Hayden Creek (44.706, −113.768); Wright Creek (44.759, −113.794).

(12) Upper Middle Fork Salmon Subbasin 17060205

(i) *Lower Loon Creek Watershed 1706020501*. Outlet(s) = Loon Creek (Lat 44.808, Long −114.811) upstream to endpoint(s) in: Cabin Creek (44.742, −114.708); Loon Creek (44.552, −114.849).
(ii) *Warm Springs Watershed 1706020502*. Outlet(s) = Warm Spring Creek (Lat 44.653, Long −114.736) upstream to endpoint(s) in: Trapper Creek (44.504, −114.617); Warm Spring Creek (44.609, −114.481).
(iii) *Upper Loon Creek Watershed 1706020503*. Outlet(s) = Loon Creek (Lat 44.552, Long −114.849) upstream to endpoint(s) in: Cottonwood Creek (44.593, −114.679); East Fork Mayfield Creek (44.494, −114.700); Loon Creek (44.469, −114.923); Pioneer Creek (44.466, −114.873); South Fork Cottonwood Creek (44.563, −114.780); Trail Creek (44.506, −114.959); West Fork Mayfield Creek (44.473, −114.730).

(iv) *Little Loon Creek Watershed 1706020504*. Outlet(s) = Little Loon Creek (Lat 44.731, Long −114.940) upstream to endpoint(s) in: Little Loon Creek (44.615, −114.963).
(v) *Rapid River Watershed 1706020505*. Outlet(s) = Rapid River (Lat 44.680, Long −115.152) upstream to endpoint(s) in: Float Creek (44.546, −115.148); North Fork Sheep Creek (44.656, −114.997); Rapid River (44.551, −115.007); South Fork Sheep Creek (44.628, −114.988); Vanity Creek (44.500, −115.072).
(vi) *Marsh Creek Watershed 1706020506*. Outlet(s) = Marsh Creek (Lat 44.449, Long −115.230) upstream to endpoint(s) in: Asher Creek (44.374, −115.126); Banner Creek (44.291, −115.187); Bear Creek (44.490, −115.098); Beaver Creek (44.494, −114.964); Camp Creek (44.384, −115.144); Cape Horn Creek (44.333, −115.287); Knapp Creek (44.424, −114.915); Marsh Creek (44.329, −115.091); Swamp Creek (44.300, −115.175); Winnemucca Creek (44.479, −114.972).
(vii) *Middle Fork Salmon River/Soldier Creek Watershed 1706020507*. Outlet(s) = Middle Fork Salmon River (Lat 44.680, Long −115.152) upstream to endpoint(s) in: Boundary Creek (44.507, −115.328); Dagger Creek (44.498, −115.307); Elkhorn Creek (44.582, −115.369); Greyhound Creek (44.626, −115.158); Middle Fork Salmon River (44.449, −115.230); Soldier Creek (44.528, −115.201).
(viii) *Bear Valley Creek Watershed 1706020508*. Outlet(s) = Bear Valley Creek (Lat 44.449, Long −115.230) upstream to endpoint(s) in: Ayers Creek (44.454, −115.330); Bear Valley Creek (44.236, −115.499); Bearskin Creek (44.331, −115.528); Cache Creek (44.286, −115.409); Cold Creek (44.371, −115.317); Cook Creek (44.389, −115.438); East Fork Elk Creek (44.481, −115.359); Fir Creek (44.354, −115.296); Little Beaver Creek (44.415, −115.504); Little East Fork Elk Creek (44.479, −115.407); Mace Creek (44.289, −115.443); North Fork Elk Creek (44.527, −115.458); Poker Creek (44.444, −115.345); Pole Creek (44.361, −115.366); Porter Creek (44.466, −115.529); Sack Creek (44.320, −115.351); Sheep Trail Creek (44.360, −115.451); West Fork Elk Creek (44.485, −115.499); Wyoming Creek (44.362, −115.335).
(ix) *Sulphur Creek Watershed 1706020509*. Outlet(s) = Sulphur Creek (Lat 44.555, Long −115.297) upstream to endpoint(s) in: Blue Moon Creek (44.572, −115.364); Full Moon Creek (44.535, −115.400); Honeymoon Creek (44.605, −115.399); North Fork Sulphur Creek (44.583, −115.467); Sulphur Creek (44.510, −115.518).
(x) *Pistol Creek Watershed 1706020510*. Outlet(s) = Pistol Creek (Lat 44.724, Long −115.149) upstream to endpoint(s) in: Little Pistol Creek (44.721, −115.404); Luger Creek (44.636, −115.386); Pistol Creek (44.644, −115.442).
(xi) *Indian Creek Watershed 1706020511*. Outlet(s) = Indian Creek (Lat 44.770, Long −115.089) upstream to endpoint(s) in: Big Chief

Creek (44.817, −115.368); Indian Creek (44.803, −115.383); Little Indian Creek (44.879, −115.226).

(xii) *Upper Marble Creek Watershed 1706020512*. Outlet(s) = Marble Creek (Lat 44.797, Long −114.971) upstream to endpoint(s) in: Big Cottonwood Creek (44.879, −115.206); Canyon Creek (44.822, −114.943); Cornish Creek (44.933, −115.127); Dynamite Creek (44.871, −115.207); Marble Creek (44.983, −115.079); Trail Creek (44.917, −114.930).

(xiii) *Middle Fork Salmon River/Lower Marble Creek Watershed 1706020513*. Outlet(s) = Middle Fork Salmon River (Lat 44.808, Long −114.811) upstream to endpoint(s) in: Marble Creek (44.797, −114.971); Middle Fork Salmon River (44.680, −115.152).

(13) Lower Middle Fork Salmon Subbasin 17060206

(i) *Lower Middle Fork Salmon River Watershed 1706020601*. Outlet(s) = Middle Fork Salmon River (Lat 45.297, Long −114.591) upstream to endpoint(s) in: Middle Fork Salmon River (45.095, −114.732); Roaring Creek (45.186, −114.574); Stoddard Creek (45.244, −114.702).

(ii) *Wilson Creek Watershed 1706020602*. Outlet(s) = Wilson Creek (Lat 45.033, Long −114.723) upstream to endpoint(s) in: Wilson Creek (45.032, −114.659).

(iii) *Middle Fork Salmon River/Brush Creek Watershed 1706020603*. Outlet(s) = Middle Fork Salmon River (Lat 45.095, Long −114.732) upstream to endpoint(s) in: Brush Creek (44.955, −114.733); Middle Fork Salmon River (44.958, −114.747).

(iv) *Yellow Jacket Creek Watershed 1706020604*. Outlet(s) = Yellowjacket Creek (Lat 44.892, Long −114.644) upstream to endpoint(s) in: Beagle Creek (44.993, −114.466); Hoodoo Creek (44.993, −114.568); Lake Creek (44.967, −114.603); Little Jacket Creek (44.931, −114.505); Meadow Creek (44.984, −114.481); Shovel Creek (45.006, −114.463); Trail Creek (44.939, −114.461); Yellowjacket Creek (45.050, −114.480).

(v) *Silver Creek Watershed 1706020605*. Outlet(s) = Silver Creek (Lat 44.830, Long −114.501) upstream to endpoint(s) in: Silver Creek (44.856, −114.458).

(vi) *Upper Camas Creek Watershed 1706020606*. Outlet(s) = Camas Creek (Lat 44.830, Long −114.501) upstream to endpoint(s) in: Castle Creek (44.825, −114.415); Fly Creek (44.703, −114.509); Furnace Creek (44.767, −114.421); J Fell Creek (44.669, −114.459); South Fork Camas Creek (44.731, −114.553); Spider Creek (44.688, −114.495); White Goat Creek (44.731, −114.460).

(vii) *West Fork Camas Creek Watershed 1706020607*. Outlet(s) = West Fork Camas Creek (Lat 44.831, Long −114.504) upstream to endpoint(s) in: Flume Creek (44.806, −114.526); Martindale Creek (44.822, −114.560); West Fork Camas Creek (44.795, −114.595).

(viii) *Lower Camas Creek Watershed 1706020608*. Outlet(s) = Camas Creek (Lat 44.892, Long −114.722) upstream to endpoint(s) in: Camas Creek (44.830, −114.501); Duck Creek (44.852, −114.521); Woodtick Creek (44.870, −114.636).

(ix) *Middle Fork Salmon River/Sheep Creek Watershed 1706020609.* Outlet(s) = Middle Fork Salmon River (Lat 44.955, Long −114.733) upstream to endpoint(s) in: Middle Fork Salmon River (44.808, −114.811); Sheep Creek (44.923, −114.873).

(x) *Rush Creek Watershed 1706020610.* Outlet(s) = Rush Creek (Lat 45.105, Long −114.861) upstream to endpoint(s) in: Rush Creek (44.958, −114.992); South Fork Rush Creek (45.013, −114.972); Two Point Creek (45.027, −114.947).

(xi) *Monumental Creek Watershed 1706020611.* Outlet(s) = Monumental Creek (Lat 45.160, Long −115.129) upstream to endpoint(s) in: Monumental Creek (44.952, −115.179); Snowslide Creek (45.055, −115.266); West Fork Monumental Creek (45.011, −115.244).

(xii) *Big Creek/Little Marble Creek Watershed 1706020612.* Outlet(s) = Big Creek (Lat 45.163, Long −115.128) upstream to endpoint(s) in: Big Creek (45.153, −115.297); Little Marble Creek (45.062, −115.276).

(xiii) *Upper Big Creek Watershed 1706020613.* Outlet(s) = Big Creek (Lat 45.153, Long −115.297) upstream to endpoint(s) in: Big Creek (45.075, −115.342); Jacobs Ladder Creek (45.063, −115.322); Middle Fork Smith Creek (45.166, −115.411); Smith Creek (45.170, −115.380); Unnamed (45.129, −115.422).

(xiv) *Beaver Creek Watershed 1706020614.* Outlet(s) = Beaver Creek (Lat 45.163, Long −115.242) upstream to endpoint(s) in: Beaver Creek (45.242, −115.314); Coin Creek (45.218, −115.328); HCreek (45.266, −115.270).

(xv) *Big Ramey Creek Watershed 1706020615.* Outlet(s) = Big Ramey Creek (Lat 45.177, Long −115.159) upstream to endpoint(s) in: Big Ramey Creek (45.279, −115.243).

(xvi) *Big Creek/Crooked Creek Watershed 1706020616.* Outlet(s) = Big Creek (Lat 45.127, Long −114.935) upstream to endpoint(s) in: Big Creek (45.163, −115.128); Cave Creek (45.219, −114.916); Coxey Creek (45.181, −115.022); East Fork Crooked Creek (45.250, −114.975); Fawn Creek (45.125, −115.032); West Fork Crooked Creek (45.251, −115.117).

(xvii) *Lower Big Creek Watershed 1706020617.* Outlet(s) = Big Creek (Lat 45.095, Long −114.732) upstream to endpoint(s) in: Big Creek (45.127, −114.935); Cabin Creek (45.195, −114.837); Canyon Creek (45.087, −114.997); Cliff Creek (45.127, −114.857); Cougar Creek (45.138, −114.813); Pioneer Creek (45.066, −114.842).

(14) Middle Salmon-Chamberlain Subbasin 17060207

(i) *Salmon River/Fall Creek Watershed 1706020701.* Outlet(s) = Salmon River (Lat 45.426, Long −116.025) upstream to endpoint(s) in: Carey Creek (45.4242, −115.9343); Fall Creek (45.4153, −115.9755); Salmon River (45.455, −115.941).

(ii) *Wind River Watershed 1706020702*. Outlet(s) = Wind River (Lat 45.4553, Long −115.9411) upstream to endpoint(s) in: Wind River (45.4657, −115.9394).

(iii) *Salmon River/California Creek Watershed 1706020703*. Outlet(s) = Salmon River (Lat 45.455, Long −115.941) upstream to endpoint(s) in: Bear Creek (45.435, −115.852); Bull Creek (45.482, −115.716); California Creek (45.341, −115.850); Cottontail Creek (45.388, −115.752); Maxwell Creek (45.392, −115.841); Salmon River (45.434, −115.666).

(iv) *Sheep Creek Watershed 1706020704*. Outlet(s) = Sheep Creek (Lat 45.468, Long −115.810) upstream to endpoint(s) in: East Fork Sheep Creek (45.546, −115.769); Meadow Creek (45.544, −115.792); Plummer Creek (45.531, −115.807); Porcupine Creek (45.506, −115.817); Sheep Creek (45.591, −115.705).

(v) *Crooked Creek Watershed 1706020705*. Outlet(s) = Crooked Creek (Lat 45.434, Long −115.666) upstream to endpoint(s) in: Arlington Creek (45.491, −115.678); Crooked Creek (45.515, −115.554); Lake Creek (45.616, −115.686).

(vi) *Salmon River/Rabbit Creek Watershed 1706020706*. Outlet(s) = Salmon River (Lat 45.434, Long −115.666) upstream to endpoint(s) in: Indian Creek (45.409, −115.608); Rabbit Creek (45.416, −115.667); Salmon River (45.378, −115.512).

(vii) *Salmon River/Trout Creek Watershed 1706020708*. Outlet(s) = Salmon River (Lat 45.378, Long −115.512) upstream to endpoint(s) in: Big Blowout Creek (45.468, −115.432); Big Elkhorn Creek (45.521, −115.331); Fivemile Creek (45.391, −115.452); Jersey Creek (45.494, −115.531); Little Fivemile Creek (45.416, −115.425); Little Mallard Creek (45.538, −115.317); Rhett Creek (45.483, −115.410); Richardson Creek (45.499, −115.265); Salmon River (45.567, −115.191); Trout Creek (45.396, −115.315).

(viii) *Bargamin Creek Watershed 1706020709*. Outlet(s) = Bargamin Creek (Lat 45.567, Long −115.191) upstream to endpoint(s) in: Bargamin Creek (45.706, −115.046); Cache Creek (45.691, −115.180); Porcupine Creek (45.725, −115.128); Prospector Creek (45.688, −115.153); Rainey Creek (45.617, −115.210); Salt Creek (45.643, −115.189).

(ix) *Salmon River/Rattlesnake Creek Watershed 1706020710*. Outlet(s) = Salmon River (Lat 45.567, Long −115.191) upstream to endpoint(s) in: Rattlesnake Creek (45.560, −115.143); Salmon River (45.511, −115.041).

(x) *Sabe Creek Watershed 1706020711*. Outlet(s) = Sabe Creek (Lat 45.507, Long −115.024) upstream to endpoint(s) in: Center Creek (45.573, −115.040); Hamilton Creek (45.544, −114.826).

(xi) *Salmon River/Hot Springs Creek Watershed 1706020712*. Outlet(s) = Salmon River (Lat 45.511, Long −115.041) upstream to endpoint(s) in: Big Harrington Creek (45.498, −114.895);

Hot Springs Creek (45.465, −115.135); Salmon River (45.454, −114.931).

(xii) *Salmon River/Disappointment Creek Watershed 1706020713.* Outlet(s) = Salmon River (Lat 45.454, Long −114.931) upstream to endpoint(s) in: Salmon River (45.395, −114.732).

(xiii) *Horse Creek Watershed 1706020714.* Outlet(s) = Horse Creek (Lat 45.395, Long −114.732) upstream to endpoint(s) in: East Fork Reynolds Creek (45.541, −114.493); Horse Creek (45.498, −114.421); Reynolds Creek (45.555, −114.558); West Horse Creek (45.494, −114.754).

(xiv) *Salmon River/Kitchen Creek Watershed 1706020715.* Outlet(s) = Salmon River (Lat 45.395, Long −114.732) upstream to endpoint(s) in: Corn Creek (45.370, −114.681); Kitchen Creek (45.295, −114.752); Salmon River (45.297, −114.591).

(xv) *Cottonwood Creek Watershed 1706020716.* Outlet(s) = Cottonwood Creek (Lat 45.394, Long −114.802) upstream to endpoint(s) in: Cottonwood Creek (45.354, −114.823).

(xvi) *Lower Chamberlain/McCalla Creek Watershed 1706020717.* Outlet(s) = Chamberlain Creek (Lat 45.454, Long −114.931) upstream to endpoint(s) in: McCalla Creek (45.321, −115.115); Unnamed (45.433, −114.935); Whimstick Creek (45.241, −115.053).

(xvii) *Upper Chamberlain Creek Watershed 1706020718.* Outlet(s) = Chamberlain Creek (Lat 45.414, Long −114.981) upstream to endpoint(s) in: Flossie Creek (45.384, −115.248); Lodgepole Creek (45.305, −115.254); Moose Creek (45.283, −115.292); South Fork Chamberlain Creek (45.288, −115.342).

(xviii) *Warren Creek Watershed 1706020719.* Outlet(s) = Warren Creek (Lat 45.397, Long −115.592) upstream to endpoint(s) in: Richardson Creek (45.372, −115.625); Slaughter Creek (45.269, −115.648); Steamboat Creek (45.259, −115.722); Warren Creek (45.248, −115.653).

(15) South Fork Salmon Subbasin 17060208

(i) *Lower South Fork Salmon River Watershed 1706020801.* Outlet(s) = South Fork Salmon River (Lat 45.378, Long −115.512) upstream to endpoint(s) in: Big Buck Creek (45.253, −115.554); Pony Creek (45.209, −115.663); Porphyry Creek (45.255, −115.462); Smith Creek (45.265, −115.550); South Fork Salmon River (45.156, −115.585).

(ii) *South Fork Salmon River/Sheep Creek Watershed 1706020802.* Outlet(s) = South Fork Salmon River (Lat 45.156, Long −115.585) upstream to endpoint(s) in: Bear Creek (45.124, −115.643); Contux Creek (45.155, −115.620); Deer Creek (45.162, −115.606); Elk Creek (45.149, −115.506); Sheep Creek (45.039, −115.583); South Fork Salmon River (45.025, −115.706).

(iii) *Lower East Fork South Fork Salmon River Watershed 1706020803.* Outlet(s) = East Fork South Fork Salmon River (Lat

45.015, Long −115.713) upstream to endpoint(s) in: Caton Creek (44.900, −115.584); East Fork South Fork Salmon River (44.963, −115.501); Loosum Creek (44.918, −115.529); Parks Creek (44.969, −115.530).

(iv) *Upper East Fork South Fork Salmon River Watershed 1706020804.* Outlet(s) = East Fork South Fork Salmon River (Lat 44.963, Long −115.501) upstream to endpoint(s) in: East Fork South Fork Salmon River (44.934, −115.336); Profile Creek (45.035, −115.409); Quartz Creek (45.048, −115.496); Salt Creek (44.962, −115.329); Sugar Creek (44.975, −115.245); Tamarack Creek (44.995, −115.318).

(v) *Lower Johnson Creek Watershed 1706020805.* Outlet(s) = Johnson Creek (Lat 44.963, Long −115.501) upstream to endpoint(s) in: Johnson Creek (44.803, −115.518); Riordan Creek (44.898, −115.472); Trapper Creek (44.829, −115.508).

(vi) *Burntlog Creek Watershed 1706020806.* Outlet(s) = Burntlog Creek (Lat 44.803, Long −115.518) upstream to endpoint(s) in: Burntlog Creek (44.718, −115.419).

(vii) *Upper Johnson Creek Watershed 1706020807.* Outlet(s) = Johnson Creek (Lat 44.803, Long −115.518) upstream to endpoint(s) in: Boulder Creek (44.565, −115.595); Johnson Creek (44.550, −115.590); Landmark Creek (44.630, −115.574); Rock Creek (44.600, −115.592); SCreek (44.609, −115.413); Whiskey Creek (44.563, −115.486).

(viii) *Upper South Fork Salmon River Watershed 1706020808.* Outlet(s) = South Fork Salmon River (Lat 44.652, Long −115.703) upstream to endpoint(s) in: Bear Creek (44.607, −115.600); Camp Creek (44.605, −115.633); Curtis Creek (44.593, −115.752); Lodgepole Creek (44.576, −115.610); Mormon Creek (44.499, −115.654); Rice Creek (44.510, −115.644); South Fork Salmon River (44.480, −115.688); Tyndall Creek (44.568, −115.736).

(ix) *South Fork Salmon River/Cabin Creek Watershed 1706020809.* Outlet(s) = South Fork Salmon River (Lat 44.759, Long −115.684) upstream to endpoint(s) in: Cabin Creek (44.713, −115.638); Dollar Creek (44.759, −115.751); North Fork Dollar Creek (44.755, −115.745); Six-Bit Creek (44.684, −115.724); South Fork Salmon River (44.652, −115.703); Two-bit Creek (44.655, −115.747); Warm Lake Creek (44.653, −115.662).

(x) *South Fork Salmon River/Blackmare Creek Watershed 1706020810.* Outlet(s) = South Fork Salmon River (Lat 44.898, Long −115.715) upstream to endpoint(s) in: Blackmare Creek (44.809, −115.795); Camp Creek (44.889, −115.691); Cougar Creek (44.823, −115.804); Phoebe Creek (44.910, −115.705); South Fork Salmon River (44.759, −115.684).

(xi) [Reserved]

(xii) *Buckhorn Creek Watershed 1706020811*. Outlet(s) = Buckhorn Creek (Lat 44.922, Long −115.736) upstream to endpoint(s) in: Buckhorn Creek (44.881, −115.856); Little Buckhorn Creek (44.902, −115.756); West Fork Buckhorn Creek (44.909, −115.832).

(xiii) *South Fork Salmon River/Fitsum Creek Watershed 1706020812*. Outlet(s) = South Fork Salmon River (Lat 45.025, Long −115.706) upstream to endpoint(s) in: Fitsum Creek (44.996, −115.784); North Fork Fitsum Creek (44.992, −115.870); South Fork Fitsum Creek (44.981, −115.768); South Fork Salmon River (44.898, −115.715).

(xiv) *Lower Secesh River Watershed 1706020813*. Outlet(s) = Secesh River (Lat 45.025, Long −115.706) upstream to endpoint(s) in: Cly Creek (45.031, −115.911); Hum Creek (45.070, −115.903); Lick Creek (45.049, −115.906); Secesh River (45.183, −115.821); Split Creek (45.109, −115.805); Zena Creek (45.057, −115.732).

(xv) *Middle Secesh River Watershed 1706020814*. Outlet(s) = Secesh River (Lat 45.183, Long −115.821) upstream to endpoint(s) in: Grouse Creek (45.289, −115.835); Secesh River (45.257, −115.895); Victor Creek (45.186, −115.831).

(xiv) *Upper Secesh River Watershed 1706020815*. Outlet(s) = Secesh River (Lat 45.257, Long −115.895) upstream to endpoint(s) in: Lake Creek (45.374, −115.867); Threemile Creek (45.334, −115.891).

(16) Lower Salmon Subbasin 17060209

(i) *Salmon River/China Creek Watershed 1706020901*. Outlet(s) = Salmon River (Lat 45.857, Long −116.794) upstream to endpoint(s) in: China Creek (46.004, −116.817); Flynn Creek (45.911, −116.714); Salmon River (45.999, −116.695); Wapshilla Creek (45.945, −116.766).

(ii) *Eagle Creek Watershed 1706020902*. Outlet(s) = Eagle Creek (Lat 45.997, Long −116.700) upstream to endpoint(s) in: Eagle Creek (46.057, −116.814).

(iii) *Deer Creek Watershed 1706020903*. Outlet(s) = Deer Creek (Lat 45.999, Long −116.695) upstream to endpoint(s) in: Deer Creek (46.051, −116.702).

(iv) *Salmon River/Cottonwood Creek Watershed 1706020904*. Outlet(s) = Salmon River (Lat 45.999, Long −116.695) upstream to endpoint(s) in: Billy Creek (45.990, −116.643); Cottonwood Creek (45.932, −116.598); Maloney Creek (46.068, −116.625); Salmon River (46.038, −116.625); West Fork Maloney Creek (46.061, −116.632).

(v) *Salmon River/Deep Creek Watershed 1706020905*. Outlet(s) = Salmon River (Lat 46.038, Long −116.625) upstream to endpoint(s) in: Burnt Creek (45.966, −116.548); Deep Creek (46.005, −116.547); Round Spring Creek (45.972, −116.501); Salmon River (45.911, −116.410); Telcher Creek (45.978, −116.443).

(vi) *Rock Creek Watershed 1706020906*. Outlet(s) = Rock Creek (Lat 45.905, Long −116.396) upstream to endpoint(s) in: Grave Creek

(45.978, −116.359); Johns Creek (45.930, −116.245); Rock Creek (45.919, −116.245).
(vii) *Salmon River/Hammer Creek Watershed 1706020907.* Outlet(s) = Salmon River (Lat 45.911, Long −116.410) upstream to endpoint(s) in: Salmon River (45.752, −116.322).
(viii) *White Bird Creek Watershed 1706020908.* White Bird Creek (Lat 45.752, Long −116.322) upstream to endpoint(s) in: Asbestos Creek (45.722, −116.050); Cabin Creek (45.842, −116.110); Chapman Creek (45.841, −116.216); Cold Springs Creek (45.716, −116.037); Fish Creek (45.865, −116.084); Jungle Creek (45.739, −116.063); Little White Bird Creek (45.740, −116.087); North Fork White Bird Creek (45.797, −116.089); Pinnacle Creek (45.779, −116.086); South Fork White Bird Creek (45.772, −116.028); Twin Cabins Creek (45.782, −116.048); Unnamed (45.809, −116.086); Unnamed (45.841, −116.114); Unnamed (45.858, −116.105).
(ix) *Salmon River/McKinzie Creek Watershed 1706020909.* Outlet(s) = Salmon River (Lat 45.752, Long −116.322) upstream to endpoint(s) in: Deer Creek (45.706, −116.332); McKinzie Creek (45.676, −116.260); Salmon River (45.640, −116.284); Sotin Creek (45.725, −116.341).
(x) *Skookumchuck Creek Watershed 1706020910.* Outlet(s) = Skookumchuck Creek (Lat 45.700, Long −116.317) upstream to endpoint(s) in: North Fork Skookumchuck Creek (45.728, −116.114); South Fork Skookumchuck Creek (45.711, −116.197).
(xi) *Slate Creek Watershed 1706020911.* Outlet(s) = Slate Creek (Lat 45.640, Long −116.284) upstream to endpoint(s) in: Deadhorse Creek (45.603, −116.093); Little Slate Creek (45.587, −116.075); North Fork Slate Creek (45.671, −116.095); Slate Creek (45.634, −116.000); Slide Creek (45.662, −116.146); Unnamed (45.5959, −116.1061); Waterspout Creek (45.631, −116.115).
(xii) *Salmon River/John Day Creek Watershed 1706020912.* Outlet(s) = Salmon River (Lat 45.640, Long −116.284) upstream to endpoint(s) in: China Creek (45.547, −116.310); Cow Creek (45.539, −116.330); East Fork John Day Creek (45.575, −116.221); Fiddle Creek (45.495, −116.269); John Day Creek (45.564, −116.220); Race Creek (45.437, −116.316); South Fork Race Creek (45.440, −116.403); West Fork Race Creek (45.464, −116.352).
(xiii) *Salmon River/Lake Creek Watershed 1706020913.* Outlet(s) = Salmon River (Lat 45.437, Long −116.316) upstream to endpoint(s) in: Allison Creek (45.507, −116.156); Berg Creek (45.426, −116.244); Lake Creek (45.294, −116.219); Salmon River (45.418, −116.162); West Fork Allison Creek (45.457, −116.184); West Fork Lake Creek (45.370, −116.241).
(xiv) *Salmon River/Van Creek Watershed 1706020914.* Outlet(s) = Salmon River (Lat 45.418, Long −116.162) upstream to endpoint(s)

in: Robbins Creek (45.430, −116.026); Salmon River (45.426, −116.025); Van Creek (45.431, −116.138).

(xv) *French Creek Watershed 1706020915*. Outlet(s) = French Creek (Lat 45.425, Long −116.030) upstream to endpoint(s) in: French Creek (45.375, −116.040).

(xvi) *Partridge Creek Watershed 1706020916*. Outlet(s) = Elkhorn Creek (Lat 45.4043, Long −116.0941); Partridge Creek (45.408, −116.126) upstream to endpoint(s) in: Elkhorn Creek (45.369, −116.092); Partridge Creek (45.369, −116.146).

(17) Little Salmon Subbasin 17060210

(i) *Lower Little Salmon River Watershed 1706021001*. Outlet(s) = Little Salmon River (Lat 45.417, Long −116.313) upstream to endpoint(s) in: Denny Creek (45.306, −116.359); Elk Creek (45.218, −116.311); Hat Creek (45.313, −116.354); Little Salmon River (45.204, −116.310); Lockwood Creek (45.254, −116.366); North Fork Squaw Creek (45.4234, −116.4320); Papoose Creek (45.4078, −116.3920); Rattlesnake Creek (45.268, −116.339); Sheep Creek (45.344, −116.336); South Fork Squaw Creek (45.4093, −116.4356).

(ii) *Little Salmon River/Hard Creek Watershed 1706021002*. Outlet(s) = Little Salmon River (Lat 45.204, Long −116.310) upstream to endpoint(s) in: Bascum Canyon (45.145, −116.248); Hard Creek (45.125, −116.239); Little Salmon River (45.123, −116.298); Trail Creek (45.164, −116.338).

(iii) *Hazard Creek Watershed 1706021003*. Outlet(s) = Hazard Creek (Lat 45.183, Long −116.283) upstream to endpoint(s) in: Hazard Creek (45.201, −116.248).

(iv) *Boulder Creek Watershed 1706021006*. Outlet(s) = Boulder Creek (Lat 45.204, Long −116.310) upstream to endpoint(s) in: Ant Basin Creek (45.128, −116.447); Boulder Creek (45.103, −116.479); Bull Horn Creek (45.159, −116.407); Pollock Creek (45.168, −116.395); Pony Creek (45.190, −116.374); Squirrel Creek (45.198, −116.368); Star Creek (45.152, −116.418); Unnamed (45.095, −116.461); Unnamed (45.116, −116.455); Yellow Jacket Creek (45.141, −116.426).

(v) *Rapid River Watershed 1706021007*. Outlet(s) = Rapid River (Lat 45.375, Long −116.355) upstream to endpoint(s) in: Granite Fork Lake Fork Rapid River (45.179, −116.526); Paradise Creek (45.223, −116.550); Rapid River (45.157, −116.489); Shingle Creek (45.369, −116.409); West Fork Rapid River (45.306, −116.425).

(18) Upper Selway Subbasin 17060301

(i) *Selway River/Pettibone Creek Watershed 1706030101*. Outlet(s) = Selway River (Lat 46.122, Long −114.935) upstream to endpoint(s) in: Ditch Creek (46.022, −114.900); Elk Creek (45.987, −114.872); Pettibone Creek (46.105, −114.745); Selway River (45.962, −114.828).

(ii) *Bear Creek Watershed 1706030102*. Outlet(s) = Bear Creek (Lat 46.019, Long −114.844) upstream to endpoint(s) in: Bear Creek (46.104, −114.588); Brushy Fork Creek (45.978, −114.602); Cub Creek

(46.021, −114.662); Granite Creek (46.102, −114.619); Paradise Creek (46.036, −114.710); Wahoo Creek (46.104, −114.633).
(iii) *Selway River/Gardner Creek Watershed 1706030103*. Outlet(s) = Selway River (Lat 45.962, Long −114.828) upstream to endpoint(s) in: Bad Luck Creek (45.899, −114.752); Crooked Creek (45.865, −114.764); Gardner Creek (45.937, −114.772); Magruder Creek (45.702, −114.795); North Star Creek (45.950, −114.806); Selway River (45.707, −114.719); Sheep Creek (45.821, −114.741); Snake Creek (45.855, −114.728).
(iv) *White Cap Creek Watershed 1706030104*. Outlet(s) = White Cap Creek (Lat 45.860, Long −114.744) upstream to endpoint(s) in: Barefoot Creek (45.886, −114.639); Canyon Creek (45.878, −114.422); Cedar Creek (45.895, −114.668); Cooper Creek (45.861, −114.557); Elk Creek (45.928, −114.574); Fox Creek (45.898, −114.597); Granite Creek (45.931, −114.506); Lookout Creek (45.959, −114.626); Paloma Creek (45.918, −114.592); Peach Creek (45.868, −114.607); South Fork Lookout Creek (45.929, −114.649); Unnamed (45.855, −114.557); White Cap Creek (45.947, −114.534).
(v) *Indian Creek Watershed 1706030105*. Outlet(s) = Indian Creek (Lat 45.792, Long −114.764) upstream to endpoint(s) in: Indian Creek (45.786, −114.581); Jack Creek (45.789, −114.681); Saddle Gulch (45.766, −114.641); Schofield Creek (45.818, −114.586).
(vi) *Upper Selway River Watershed 1706030106*. Outlet(s) = Selway River (Lat 45.707, Long −114.719) upstream to endpoint(s) in: Cayuse Creek (45.752, −114.572); Deep Creek (45.703, −114.517); French Creek (45.609, −114.561); Gabe Creek (45.714, −114.666); Hells Half Acre Creek (45.689, −114.708); Lazy Creek (45.670, −114.553); Line Creek (45.590, −114.585); Mist Creek (45.561, −114.629); Pete Creek (45.720, −114.557); Selway River (45.502, −114.702); Slow Gulch Creek (45.678, −114.520); Storm Creek (45.641, −114.596); Surprise Creek (45.533, −114.672); Swet Creek (45.516, −114.804); Three Lakes Creek (45.620, −114.803); Unnamed (45.569, −114.642); Vance Creek (45.681, −114.594); Wilkerson Creek (45.561, −114.601).
(vii) *Little Clearwater River Watershed 1706030107*. Outlet(s) = Little Clearwater River (Lat 45.754, Long −114.775) upstream to endpoint(s) in: Burnt Knob Creek (45.697, −114.950); FCreek (45.644, −114.847); Little Clearwater River (45.740, −114.949); Lonely Creek (45.727, −114.865); Salamander Creek (45.655, −114.883); Short Creek (45.759, −114.859); Throng Creek (45.736, −114.904).
(viii) *Running Creek Watershed 1706030108*. Outlet(s) = Running Creek (Lat 45.919, Long −114.832) upstream to endpoint(s) in: Eagle Creek (45.844, −114.886); Lynx Creek (45.794, −114.993); Running Creek (45.910, −115.027); South Fork Running Creek (45.820, −115.024).

(ix) *Goat Creek Watershed 1706030109*. Outlet(s) = Goat Creek (Lat 45.962, Long −114.828) upstream to endpoint(s) in: Goat Creek (45.940, −115.038).

(19) Lower Selway Subbasin 17060302

(i) *Selway River/Goddard Creek Watershed 1706030201*. Outlet(s) = Selway River (Lat 46.140, Long −115.599) upstream to endpoint(s) in: Boyd Creek (46.092, −115.431); Glover Creek (46.082, −115.361); Goddard Creek (46.059, −115.610); Johnson Creek (46.139, −115.514); Rackliff Creek (46.110, −115.494); Selway River (46.046, −115.295).

(ii) *Gedney Creek Watershed 1706030202*. Outlet(s) = Gedney Creek (Lat 46.056, Long −115.313) upstream to endpoint(s) in: Gedney Creek (46.111, −115.268).

(iii) *Selway River/Three Links Creek Watershed 1706030203*. Outlet(s) = Selway River (Lat 46.046, Long −115.295) upstream to endpoint(s) in: Mink Creek (46.041, −115.087); Otter Creek (46.042, −115.216); Pinchot Creek (46.120, −115.108); Selway River (46.098, −115.071); Three Links Creek (46.143, −115.093).

(iv) *Upper Three Links Creek Watershed 1706030204*. Outlet(s) = Three Links Creek (Lat 46.143, Long −115.093) upstream to endpoint(s) in: Three Links Creek (46.155, −115.100).

(v) *Rhoda Creek Watershed 1706030205*. Outlet(s) = Rhoda Creek (Lat 46.234, Long −114.960) upstream to endpoint(s) in: Lizard Creek (46.220, −115.136); Rhoda Creek (46.252, −115.164); Wounded Doe Creek (46.299, −115.078).

(vi) *North Fork Moose Creek Watershed 1706030207*. Outlet(s) = North Fork Moose Creek (Lat 46.165, Long −114.897) upstream to endpoint(s) in: North Fork Moose Creek (46.305, −114.853); West Moose Creek (46.322, −114.970).

(vii) *East Fork Moose Creek/Trout Creek Watershed 1706030208*. Outlet(s) = Selway River (Lat 46.098, Long −115.071) upstream to endpoint(s) in: Double Creek (46.230, −114.837); East Fork Moose Creek (46.204, −114.722); Elbow Creek (46.200, −114.716); Fitting Creek (46.231, −114.861); Maple Creek (46.218, −114.785); Monument Creek (46.189, −114.728); Selway River (46.122, −114.935); Trout Creek (46.141, −114.861).

(viii) *Upper East Fork Moose Creek Watershed 1706030209*. Outlet(s) = East Fork Moose Creek (Lat 46.204, Long −114.722) upstream to endpoint(s) in: Cedar Creek (46.291, −114.708); East Fork Moose Creek (46.253, −114.700).

(ix) *Marten Creek Watershed 1706030210*. Outlet(s) = Marten Creek (Lat 46.099, Long −115.052) upstream to endpoint(s) in: Marten Creek (45.988, −115.029).

(x) *Upper Meadow Creek Watershed 1706030211*. Outlet(s) = Meadow Creek (Lat 45.88043738, Long −115.1034371) upstream to endpoint(s) in: Butter Creek (45.804, −115.149); Meadow Creek (45.698, −115.217); Three Prong Creek (45.790, −115.062).

(xi) *Middle Meadow Creek Watershed 1706030212*. Outlet(s) = Meadow Creek (Lat 45.88157325, Long −115.2178401) upstream to endpoint(s) in: East Fork Meadow Creek (45.868, −115.067); Meadow Creek (45.880, −115.103); Sable Creek (45.853, −115.219); Schwar Creek (45.905, −115.108); Simmons Creek (45.856, −115.247).

(xii) *Lower Meadow Creek Watershed 1706030213*. Outlet(s) = Meadow Creek (Lat 46.04563958, Long −115.2953459) upstream to endpoint(s) in: Buck Lake Creek (45.992, −115.084); Butte Creek (45.878, −115.248); Fivemile Creek (45.953, −115.310); Little Boulder Creek (45.935, −115.293); Meadow Creek (45.882, −115.218).

(xiii) *O'Hara Creek Watershed 1706030214*. Outlet(s) = OHara Creek (Lat 46.08603027, Long −115.5170987) upstream to endpoint(s) in: East Fork OHara Creek (45.995, −115.521); West Fork O'Hara Creek (45.995, −115.543).

(20) Lochsa Subbasin 17060303

(i) *Lower Lochsa River Watershed 1706030301*. Outlet(s) = Lochsa River (Lat 46.14004554, Long −115.5986467) upstream to endpoint(s) in: Canyon Creek (46.227, −115.580); Coolwater Creek (46.215, −115.464); Deadman Creek (46.262, −115.517); East Fork Deadman Creek (46.275, −115.505); Fire Creek (46.203, −115.411); Kerr Creek (46.162, −115.579); Lochsa River (46.338, −115.314); Nut Creek (46.180, −115.601); Pete King Creek (46.182, −115.697); Placer Creek (46.196, −115.631); South Fork Canyon Creek (46.211, −115.556); Split Creek (46.207, −115.364); Walde Creek (46.193, −115.662).

(ii) *Fish Creek Watershed 1706030302*. Outlet(s) = Fish Creek (Lat 46.33337703, Long −115.3449332) upstream to endpoint(s) in: Alder Creek (46.319, −115.460); Ceanothus Creek (46.341, −115.470); Fish Creek (46.341, −115.575); Frenchman Creek (46.330, −115.544); Gass Creek (46.390, −115.511); Ham Creek (46.391, −115.365); Hungery Creek (46.377, −115.542); Myrtle Creek (46.343, −115.569); Poker Creek (46.346, −115.447); Willow Creek (46.396, −115.369).

(iii) *Lochsa River/Stanley Creek Watershed 1706030303*. Outlet(s) = Lochsa River (Lat 46.33815653, Long −115.3141495) upstream to endpoint(s) in: Bald Mountain Creek (46.406, −115.254); Dutch Creek (46.377, −115.211); Eagle Mountain Creek (46.428, −115.130); Indian Grave Creek (46.472, −115.103); Indian Meadow Creek (46.450, −115.060); Lochsa River (46.466, −114.985); Lost Creek (46.432, −115.116); Sherman Creek (46.352, −115.320); Stanley Creek (46.387, −115.144); Unnamed (46.453, −115.028); Unnamed (46.460, −115.006); Unnamed (46.502, −115.050); Weir Creek (46.490, −115.035).

(iv) *Lochsa River/Squaw Creek Watershed 1706030304*. Outlet(s) = Lochsa River (Lat 46.4656626, Long −114.9848623) upstream to endpoint(s) in: Badger Creek (46.535, −114.833); Bear Mtn. Creek

(46.471, −114.962); Cliff Creek (46.482, −114.708); Colgate Creek (46.455, −114.914); Doe Creek (46.534, −114.914); East Fork Papoose Creek (46.555, −114.743); Jay Creek (46.513, −114.739); Lochsa River (46.508, −114.681); Postoffice Creek (46.529, −114.948); Squaw Creek (46.567, −114.859); Unnamed (46.463, −114.923); Wendover Creek (46.521, −114.788); West Fork Papoose Creek (46.576, −114.758); West Fork Postoffice Creek (46.493, −114.985); West Fork Squaw Creek (46.545, −114.884).

(v) *Lower Crooked Fork Watershed 1706030305*. Outlet(s) = Crooked Fork Lochsa River (Lat 46.50828495, Long −114.680785) upstream to endpoint(s) in: Crooked Fork Lochsa River (46.578, −114.612).

(vi) *Upper Crooked Fork Watershed 1706030306*. Outlet(s) = Crooked Fork Lochsa River (Lat 46.57831788, Long −114.6115072) upstream to endpoint(s) in: Boulder Creek (46.636, −114.703); Crooked Fork Lochsa River (46.653, −114.670); Haskell Creek (46.605, −114.596); Shotgun Creek (46.601, −114.667).

(vii) *Brushy Fork Watershed 1706030307*. Outlet(s) = Brushy Fork (Lat 46.57831788, Long −114.6115072) upstream to endpoint(s) in: Brushy Fork (46.619, −114.450); Pack Creek (46.580, −114.588); Spruce Creek (46.609, −114.433).

(viii) *Lower White Sands Creek Watershed 1706030308*. Outlet(s) = White Sands Creek (Lat 46.50828495, Long −114.680785) upstream to endpoint(s) in: Beaver Creek (46.509, −114.619); Cabin Creek (46.518, −114.641); Walton Creek (46.500, −114.673); White Sands Creek (46.433, −114.540).

(ix) *Storm Creek Watershed 1706030309*. Outlet(s) = Storm Creek (Lat 46.46307502, Long −114.5482819) upstream to endpoint(s) in: Maud Creek (46.495, −114.511); Storm Creek (46.540, −114.424).

(x) *Upper White Sands Creek Watershed 1706030310*. Outlet(s) = White Sands Creek (Lat 46.4330966, Long −114.5395027) upstream to endpoint(s) in: Big FCreek (46.401, −114.475); Big SCreek (46.407, −114.534); Colt Creek (46.403, −114.726); White Sands Creek (46.422, −114.462).

(xi) *Warm Springs Creek Watershed 1706030311*. Outlet(s) = Warm Springs Creek (Lat 46.4733796, Long −114.8872254) upstream to endpoint(s) in: Cooperation Creek (46.453, −114.866); Warm Springs Creek (46.426, −114.868).

(xii) *Fish Lake Creek Watershed 1706030312*. Outlet(s) = Fish Lake Creek (Lat 46.46336343, Long −114.9957028) upstream to endpoint(s) in: Fish Lake Creek (46.405, −115.000); Heslip Creek (46.393, −115.027); Sponge Creek (46.384, −115.048).

(xiii) *Boulder Creek Watershed 1706030313*. Outlet(s) = Boulder Creek (Lat 46.33815653, Long −115.3141495) upstream to endpoint(s) in: Boulder Creek (46.320, −115.199).

(xiv) *Old Man Creek Watershed 1706030314*. Outlet(s) = Old Man Creek (Lat 46.2524595, Long −115.3988563) upstream to endpoint(s) in: Old Man Creek (46.256, −115.343).

(21) Middle Fork Clearwater Subbasin 17060304

(i) *Middle Fork Clearwater River/Maggie Creek Watershed 1706030401*. Outlet(s) = Middle Fork Clearwater River (Lat 46.1459, Long −115.9797) upstream to endpoint(s) in: Maggie Creek (46.195, −115.801); Middle Fork Clearwater River (46.140, −115.599).

(ii) *Clear Creek Watershed 1706030402*. Outlet(s) = Clear Creek (Lat 46.1349, Long −115.9515) upstream to endpoint(s) in: Browns Spring Creek (46.067, −115.658); Clear Creek (46.056, −115.659); Kay Creek (46.005, −115.725); Middle Fork Clear Creek (46.030, −115.739); Pine Knob Creek (46.093, −115.702); South Fork Clear Creek (45.941, −115.769); West Fork Clear Creek (46.013, −115.821).

(22) South Fork Clearwater Subbasin 17060305

(i) *Lower South Fork Clearwater River Watershed 1706030501*. Outlet(s) = South Fork Clearwater River (Lat 46.1459, Long −115.9797) upstream to endpoint(s) in: Butcher Creek (45.945, −116.064); Castle Creek (45.834, −115.966); Earthquake Creek (45.853, −116.005); Green Creek (45.957, −115.937); Lightning Creek (45.936, −115.946); Mill Creek (45.934, −116.010); Rabbit Creek (46.028, −115.877); Sally Ann Creek (46.019, −115.893); Schwartz Creek (45.914, −116.000); South Fork Clearwater River (45.830, −115.931); Wall Creek (45.998, −115.926).

(ii) *South Fork Clearwater River/Meadow Creek Watershed 1706030502*. Outlet(s) = South Fork Clearwater River (Lat 45.8299, Long −115.9312) upstream to endpoint(s) in: Covert Creek (45.890, −115.933); North Meadow Creek (45.923, −115.890); South Fork Clearwater River (45.824, −115.889); Storm Creek (45.952, −115.848); Whitman Creek (45.914, −115.919).

(iii) *South Fork Clearwater River/Peasley Creek Watershed 1706030503*. Outlet(s) = South Fork Clearwater River (Lat 45.8239, Long −115.8892) upstream to endpoint(s) in: South Fork Clearwater River (45.795, −115.763).

(iv) *South Fork Clearwater River/Leggett Creek Watershed 1706030504*. Outlet(s) = South Fork Clearwater River (Lat 45.7952, Long −115.7628) upstream to endpoint(s) in: Allison Creek (45.832, −115.588); Buckhorn Creek (45.807, −115.658); Fall Creek (45.833, −115.696); Leggett Creek (45.862, −115.685); Maurice Creek (45.856, −115.514); Moose Creek (45.835, −115.578); Rabbit Creek (45.822, −115.603); Santiam Creek (45.811, −115.624); South Fork Clearwater River (45.808, −115.474); Twentymile Creek (45.791, −115.765); Whiskey Creek (45.869, −115.544).

(v) *Newsome Creek Watershed 1706030505*. Outlet(s) = Newsome Creek (Lat 45.8284, Long −115.6147) upstream to endpoint(s) in:

Baldy Creek (45.944, −115.681); Bear Creek (45.887, −115.580); Beaver Creek (45.943, −115.568); Haysfork Creek (45.953, −115.678); Mule Creek (45.985, −115.606); Newsome Creek (45.972, −115.654); Nuggett Creek (45.897, −115.600); Pilot Creek (45.939, −115.716); Sawmill Creek (45.904, −115.701); Sing Lee Creek (45.898, −115.677); West Fork Newsome Creek (45.880, −115.661).
(vi) *American River Watershed 1706030506.* Outlet(s) = American River (Lat 45.8082, Long −115.4740) upstream to endpoint(s) in: American River (45.996, −115.445); Big Elk Creek (45.902, −115.513); Box Sing Creek (45.850, −115.386); Buffalo Gulch (45.873, −115.522); East Fork American River (45.905, −115.381); Flint Creek (45.913, −115.423); Kirks Fork American River (45.842, −115.385); Lick Creek (45.945, −115.477); Little Elk Creek (45.894, −115.476); Monroe Creek (45.871, −115.495); Unnamed (45.884, −115.510); West Fork American River (45.934, −115.510); West Fork Big Elk Creek (45.883, −115.515).
(vii) *Red River Watershed 1706030507.* Outlet(s) = Red River (Lat 45.8082, Long −115.4740) upstream to endpoint(s) in: Bridge Creek (45.814, −115.163); Campbell Creek (45.792, −115.486); Dawson Creek (45.728, −115.393); Deadwood Creek (45.794, −115.471); Ditch Creek (45.7941, −115.2923); Jungle Creek (45.710, −115.286); Little Campbell Creek (45.801, −115.478); Little Moose Creek (45.710, −115.399); Moose Butte Creek (45.695, −115.365); Otterson Creek (45.803, −115.222); Red Horse Creek (45.822, −115.355); Red River (45.788, −115.174); Siegel Creek (45.800, −115.323); Soda Creek (45.741, −115.257); South Fork Red River (45.646, −115.407); Trail Creek (45.784, −115.265); Trapper Creek (45.672, −115.311); Unnamed (45.788, −115.199); West Fork Red River (45.662, −115.447).
(viii) *Crooked River Watershed 1706030508.* Outlet(s) = Crooked River (Lat 45.8241, Long −115.5291) upstream to endpoint(s) in: American Creek (45.7159, −115.9679); East Fork Crooked River (45.655, −115.562); East Fork Relief Creek (45.7363, −115.4511); Fivemile Creek (45.721, −115.568); Quartz Creek (45.702, −115.536); Relief Creek (45.712, −115.472); Silver Creek (45.713, −115.535); Trout Creek (45.6876, −115.9463); West Fork Crooked River (45.666, −115.596).
(ix) *Ten Mile Creek Watershed 1706030509.* Outlet(s) = Tenmile Creek (Lat 45.8064, Long −115.6833) upstream to endpoint(s) in: Mackey Creek (45.754, −115.683); Morgan Creek (45.731, −115.672); Sixmile Creek (45.762, −115.641); Tenmile Creek (45.694, −115.694); Williams Creek (45.703, −115.636).
(x) *John's Creek Watershed 1706030510.* Outlet(s) = Johns Creek (Lat 45.8239, Long −115.8892) upstream to endpoint(s) in: American Creek (45.750, −115.961); Frank Brown Creek (45.708, −115.785); Gospel Creek (45.637, −115.915); Johns Creek (45.665, −115.827);

Trout Creek (45.750, −115.909); West Fork Gospel Creek (45.657, −115.949).

(xi) *Mill Creek Watershed 1706030511*. Outlet(s) = Mill Creek (Lat 45.8299, Long −115.9312) upstream to endpoint(s) in: Adams Creek (45.6556, −116.0408); Camp Creek (45.6613, −115.9820); Corral Creek (45.6719, −115.9779); Hunt Creek (45.6768, −115.9640); Mill Creek (45.641, −116.008); Unnamed (45.6964, −115.9641).

(xii) *Cottonwood Creek Watershed 1706030513*. Outlet(s) = Cottonwood Creek (Lat 46.0810, Long −115.9764) upstream to endpoint(s) in: Cottonwood Creek (46.0503, −116.1109); Red Rock Creek (46.0807, −116.1579).

(23) Clearwater Subbasin 17060306

(i) *Lower Clearwater River Watershed 1706030601*. Outlet(s) = Clearwater River (Lat 46.4281, Long −117.0380) upstream to endpoint(s) in: Clearwater River (46.447, −116.837).

(ii) *Clearwater River/Lower Potlatch River Watershed 1706030602*. Outlet(s) = Clearwater River (Lat 46.4467, Long −116.8366) upstream to endpoint(s) in: Catholic Creek (46.489, −116.841); Clearwater River (46.474, −116.765); Howard Gulch (46.4976, −116.7791); Little Potlatch Creek (46.6322, −116.8320); Potlatch River (46.523, −116.728).

(iii) *Potlatch River/Middle Potlatch Creek Watershed 1706030603*. Outlet(s) = Potlatch River (Lat 46.5231, Long −116.7284) upstream to endpoint(s) in: Middle Potlatch Creek (46.669, −116.796); Potlatch River (46.583, −116.700).

(iv) *Lower Big Bear Creek Watershed 1706030604*. Outlet(s) = Big Bear Creek (Lat 46.6180, Long −116.6439) upstream to endpoint(s) in: Big Bear Creek (46.7145, −116.6632); Little Bear Creek (46.7360, −116.7010), West Fork Little Bear Creek (46.7413, −116.7789).

(v) *Upper Big Bear Creek 1706030605*. Outlet(s) = Big Bear Creek (Lat 46.7145, Long −116.6632) upstream to endpoint(s) in: East Fork Big Bear Creek (46.8141, −116.5984).

(vi) *Potlatch River/Pine Creek Watershed 1706030606*. Outlet(s) = Potlatch River (Lat 46.5830, Long −116.6998) upstream to endpoint(s) in: Boulder Creek (46.711, −116.450); Leopold Creek (46.6547, −116.4407); Pine Creek (46.706, −116.554); Potlatch River (46.699, −116.504).

(vii) *Upper Potlatch River Watershed 1706030607*. Outlet(s) = Potlatch River (Lat 46.6987, Long −116.5036) upstream to endpoint(s) in: Corral Creek (46.8012, −116.4746); East Fork Potlatch River (46.876, −116.247); Feather Creek (46.938, −116.411); Head Creek (46.942, −116.366); Little Boulder Creek (46.768, −116.414); Nat Brown Creek (46.911, −116.375); Pasture Creek (46.940, −116.371); Porcupine Creek (46.937, −116.379); Potlatch River (46.941, −116.359); Ruby Creek (46.7992, −116.3037); Unnamed

(46.8938, −116.3617); Unnamed (46.922, −116.449); West Fork Potlatch River (46.931, −116.458).

(viii) *Clearwater River/Bedrock Creek Watershed 1706030608.* Outlet(s) = Clearwater River (Lat 46.4741, Long −116.7652) upstream to endpoint(s) in: Bedrock Creek (46.5738, −116.5000); Clearwater River (46.516, −116.590); Louse Creek (46.5380, −116.4411); Pine Creek (46.579, −116.615).

(ix) *Clearwater River/Jack's Creek Watershed 1706030609.* Outlet(s) = Clearwater River (Lat 46.5159, Long −116.5903) upstream to endpoint(s) in: Clearwater River (46.498, −116.433); Jacks Creek (46.435, −116.462).

(x) *Big Canyon Creek Watershed 1706030610.* Outlet(s) = Big Canyon Creek (Lat 46.4984, Long −116.4326) upstream to endpoint(s) in: Big Canyon Creek (46.2680, −116.5396); Cold Springs Creek (46.2500, −116.5210); Posthole Canyon (46.318, −116.450); Sixmile Canyon (46.372, −116.441); Unnamed (46.3801, −116.3750).

(xi) *Little Canyon Creek Watershed 1706030611.* Outlet(s) = Little Canyon Creek (Lat 46.4681, Long −116.4172) upstream to endpoint(s) in: Little Canyon Creek (46.295, −116.279).

(xii) *Clearwater River/Lower Orofino Creek Watershed 1706030612.* Outlet(s) = Clearwater River (Lat 46.4984, Long −116.4326) upstream to endpoint(s) in: Clearwater River (46.476, −116.254); Orofino Creek (46.485, −116.196); Whiskey Creek (46.5214, −116.1753).

(xiii) *Jim Ford Creek Watershed 1706030614.* Outlet(s) = Jim Ford Creek (Lat 46.4394, Long −116.2115) upstream to endpoint(s) in: Jim Ford Creek (46.3957, −115.9570).

(xiv) *Lower Lolo Creek Watershed 1706030615.* Outlet(s) = Lolo Creek (Lat 46.3718, Long −116.1697) upstream to endpoint(s) in: Big Creek (46.392, −116.118); Lolo Creek (46.284, −115.882), Schmidt Creek (46.3617, −116.0426).

(xv) *Middle Lolo Creek Watershed 1706030616.* Outlet(s) = Lolo Creek (Lat 46.2844, Long −115.8818) upstream to endpoint(s) in: Crocker Creek (46.254, −115.859); Lolo Creek (46.381, −115.708); Mud Creek (46.274, −115.759); Nevada Creek (46.322, −115.735); Pete Charlie Creek (46.289, −115.823); Yakus Creek (46.238, −115.763).

(xvi) *Musselshell Creek Watershed 1706030617.* Outlet(s) = Jim Brown Creek (Lat 46.3098, Long −115.7531) upstream to endpoint(s) in: Gold Creek (46.376, −115.735); Jim Brown Creek (46.357, −115.790); Musselshell Creek (46.394, −115.744).

(xvii) *Upper Lolo Creek Watershed 1706030618.* Outlet(s) = Lolo Creek (Lat 46.3815, Long −115.7078) upstream to endpoint(s) in: Camp Creek (46.416, −115.624); Lolo Creek (46.425, −115.648); Max Creek (46.384, −115.679); Relaskon Creek (46.394, −115.647); Siberia Creek (46.384, −115.707); Yoosa Creek (46.408, −115.589).

(xviii) *Eldorado Creek Watershed 1706030619*. Outlet(s) = Eldorado Creek (Lat 46.2947, Long −115.7500) upstream to endpoint(s) in: Cedar Creek (46.298, −115.711); Dollar Creek (46.301, −115.640); Eldorado Creek (46.300, −115.645); Four Bit Creek (46.294, −115.644).

(xix) *Clearwater River/Fivemile Creek Watershed 1706030620*. Outlet(s) = Clearwater River (Lat 46.4759, Long −116.2543) upstream to endpoint(s) in: Clearwater River (46.350, −116.154); Fivemile Creek (46.3473, −116.1859).

(xx) *Clearwater River/Sixmile Creek Watershed 1706030621*. Outlet(s) = Clearwater River (Lat 46.3500, Long −116.1541) upstream to endpoint(s) in: Clearwater River (46.257, −116.067); Sixmile Creek (46.269, −116.213).

(xxi) *Clearwater River/Tom Taha Creek Watershed 1706030622*. Outlet(s) = Clearwater River (Lat 46.2565, Long −116.067) upstream to endpoint(s) in: Clearwater River (46.146, −115.980); Tom Taha Creek (46.244, −115.993).

(xxii) *Lower Lawyer Creek Watershed 1706030623*. Outlet(s) = Lawyer Creek (Lat 46.2257, Long −116.0116) upstream to endpoint(s) in: Lawyer Creek (46.155, −116.190), Sevenmile Creek (46.1498, −116.0838).

(xxiii) *Middle Lawyer Creek Watershed 1706030624*. Outlet(s) = Lawyer Creek (Lat 46.1546, Long −116.1899) upstream to endpoint(s) in: Lawyer Creek (46.188, −116.380).

(xxiv) *Cottonwood Creek Watershed 1706030627*. Outlet(s) = Cottonwood Creek (Lat 46.5023, Long −116.7127) upstream to endpoint(s) in: Cottonwood Creek (46.387, −116.622), Coyote Creek (46.4622, −116.6377), Magpie Creek (46.4814, −116.6643).

(xxv) *Upper Lapwai Creek Watershed 1706030628*. Outlet(s) = Lapwai Creek (Lat 46.3674, Long −116.7352) upstream to endpoint(s) in: Lapwai Creek (46.2961, −116.5955); Unnamed (46.3346, −116.5794).

(xxvi) *Mission Creek Watershed 1706030629*. Outlet(s) = Mission Creek (Lat 46.3674, Long −116.73525) upstream to endpoint(s) in: Mission Creek (46.2724, −116.6949); Rock Creek (46.3048, −116.6250).

(xxvii) *Upper Sweetwater Creek Watershed 1706030630*. Outlet(s) = Webb Creek (Lat 46.3310, Long −116.8369) upstream to endpoint(s) in: Sweetwater Creek (46.2751, −116.8513); Webb Creek (46.2338, −116.7500).

(xxviii) *Lower Sweetwater Creek Watershed 1706030631*. Outlet(s) = Lapwai Creek (Lat 46.4512, Long −116.8182) upstream to endpoint(s) in: Lapwai Creek (46.364, −116.750); Sweetwater Creek (46.331, −116.837); Tom Beall Creek (46.4240, −116.7822).

(24) Lower Snake/Columbia River Corridor—*Lower Snake/Columbia River Corridor*. Outlet(s) = Columbia River mouth (Lat 46.2485, Long −124.0782)

upstream to endpoint at the confluence of the Palouse River (46.589, −117.215).

(p) ***Middle Columbia River Steelhead*** *(Oncorhynchus mykiss)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Upper Yakima Subbasin 17030001

(i) *Upper Yakima River Watershed 1703000101*. Outlet(s) = Yakima River (Lat 47.1770, Long −120.9964) upstream to endpoint(s) in: Big Creek (47.1951, −121.1181); Cabin Creek (47.2140, −121.2400); Cle Elum River (47.2457, −121.0729); Kachess River (47.2645, −121.2062); Little Creek (47.2002, −121.0842); Peterson Creek (47.1765, −121.0592); Tucker Creek (47.2202, −121.1639); Yakima River (47.3219, −121.3371).

(ii) *Teanaway River Watershed 1703000102*. Outlet(s) = Yakima River (Lat 47.1673, Long −120.8338) upstream to endpoint(s) in: Bear Creek (47.3684, −120.7902); DeRoux Creek (47.4202, −120.9477); Dickey Creek (47.2880, −120.8322); Indian Creek (47.3216, −120.8145); Jack Creek (47.3414, −120.8130); Jungle Creek (47.3453, −120.8951); Mason Creek (47.2528, −120.7889); Middle Creek (47.2973, −120.8204); Middle Fork Teanaway River (47.3750, −120.9800); Standup Creek (47.3764, −120.8362); Tillman Creek (47.1698, −120.9798); Unnamed (47.2809, −120.8995); West Fork Teanaway River (47.3040, −121.0179); Yakima River (47.1770, −120.9964).

(iii) *Middle Upper Yakima River Watershed 1703000103*. Outlet(s) = Yakima River (Lat 46.8987, Long −120.5035) upstream to endpoint(s) in: Badger Creek (46.9305, −120.4805); Coleman Creek (46.9636, −120.4764); Cooke Creek (46.9738, −120.4381); Dry Creek (47.0366, −120.6122); First Creek (47.2082, −120.6732); Iron Creek (47.3495, −120.7032); Manastash Creek (46.9657, −120.7347); Naneum Creek (46.9561, −120.4987); North Fork Taneum Creek (47.1224, −121.0396); Reecer Creek (47.0066, −120.5817); South Fork Taneum Creek (47.0962, −120.9713); Swauk Creek (47.3274, −120.6586); Unnamed (46.9799, −120.5407); Unnamed (47.0000, −120.5524); Unnamed (47.0193, −120.5676); Williams Creek (47.2638, −120.6513); Wilson Creek (46.9931, −120.5497); Yakima River (47.1673, −120.8338).

(iv) *Umtanum/Wenas Watershed 1703000104*. Outlet(s) = Yakima River (Lat 46.6309, Long −120.5130) upstream to endpoint(s) in: Burbank Creek (46.7663, −120.4238); Lmuma Creek (46.8224, −120.4510); Umtanum Creek (46.8928, −120.6130); Wenas Creek (46.7087, −120.5179); Yakima River (46.8987, −120.5035).

(2) Naches Subbasin 17030002

(i) *Little Naches River Watershed 1703000201*. Outlet(s) = Little Naches River (Lat 46.9854, Long −121.0915) upstream to endpoint(s) in: American River (46.9008, −121.4194); Barton Creek (46.8645, −121.2869); Bear Creek (47.0793, −121.2415); Blowout Creek

(47.0946, −121.3046); Crow Creek (47.0147, −121.3241); Goat Creek (46.9193, −121.2269); Kettle Creek (46.9360, −121.3262); Mathew Creek (47.0829, −121.1944); Miner Creek (46.9542, −121.3074); Morse Creek (46.9053, −121.4131); North Fork Little Naches River (47.0958, −121.3141); Parker Creek (46.9589, −121.2900); Pinus Creek (46.9682, −121.2766); Quartz Creek (47.0382, −121.1128); Scab Creek (46.8969, −121.2459); South Fork Little Naches River (47.0574, −121.2760); Sunrise Creek (46.9041, −121.2448); Survey Creek (46.9435, −121.3296); Timber Creek (46.9113, −121.3822); Union Creek (46.9366, −121.3596); Unnamed (46.8705, −121.2809); Unnamed (46.8741, −121.2956); Unnamed (46.8872, −121.2811); Unnamed (46.8911, −121.2816); Unnamed (46.9033, −121.4162); Unnamed (46.9128, −121.2286); Unnamed (46.9132, −121.4058); Unnamed (46.9158, −121.3710); Unnamed (46.9224, −121.2200); Unnamed (46.9283, −121.3484); Unnamed (46.9302, −121.2103); Unnamed (46.9339, −121.1970); Unnamed (46.9360, −121.3482); Unnamed (46.9384, −121.3200); Unnamed (46.9390, −121.1898); Unnamed (46.9396, −121.3404); Unnamed (46.9431, −121.3088); Unnamed (46.9507, −121.2894); Unnamed (47.0774, −121.3092); Wash Creek (46.9639, −121.2810).

(ii) *Naches River/Rattlesnake Creek Watershed 1703000202.* Outlet(s) = Naches River (Lat 46.7467, Long −120.7858) upstream to endpoint(s) in: Glass Creek (46.8697, −121.0974); Gold Creek (46.9219, −121.0464); Hindoo Creek (46.7862, −121.1689); Little Rattlesnake Creek (46.7550, −121.0543); Lost Creek (46.9200, −121.0568); Naches River (46.9854, −121.0915); North Fork Rattlesnake Creek (46.8340, −121.1439); Rattlesnake Creek (46.7316, −121.2339); Rock Creek (46.8847, −120.9718).

(iii) *Naches River/Tieton River Watershed 1703000203.* Outlet(s) = Naches River (Lat 46.6309, Long −120.5130) upstream to endpoint(s) in: Naches River (46.7467, −120.7858); Oak Creek (46.7295, −120.9348); South Fork Cowiche Creek (46.6595, −120.7601); Tieton River (46.6567, −121.1287); Unnamed (46.6446, −120.5923); Wildcat Creek (46.6715, −121.1520).

(3) Lower Yakima Subbasin 17030003

(i) *Ahtanum Creek Watershed 1703000301.* Outlet(s) = Ahtanum Creek (Lat 46.5283, Long −120.4732) upstream to endpoint(s) in: Foundation Creek (46.5349, −121.0134); Middle Fork Ahtanum Creek (46.5075, −121.0225); Nasty Creek (46.5718, −120.9721); North Fork Ahtanum Creek (46.5217, −121.0917); South Fork Ahtanum Creek (46.4917, −120.9590); Unnamed (46.5811, −120.6390).

(ii) *Upper Lower Yakima River Watershed 1703000302.* Outlet(s) = Yakima River (Lat 46.5283, Long −120.4732) upstream to endpoint(s) in: Unnamed (46.5460, −120.4383); Yakima River (46.6309, −120.5130).

(iii) *Upper Toppenish Creek Watershed 1703000303*. Outlet(s) = Toppenish Creek (Lat 46.3767, Long −120.6172) upstream to endpoint(s) in: Agency Creek (46.3619, −120.9646); Branch Creek (46.2958, −120.9969); North Fork Simcoe Creek (46.4548, −120.9307); North Fork Toppenish Creek (46.3217, −120.9985); Old Maid Canyon (46.4210, −120.9349); South Fork Toppenish Creek (46.2422, −121.0885); Toppenish Creek (46.3180, −121.1387); Unnamed (46.3758, −120.9336); Unnamed (46.4555, −120.8436); Wahtum Creek (46.3942, −120.9146); Willy Dick Canyon (46.2952, −120.9021).
(iv) *Lower Toppenish Creek Watershed 1703000304*. Outlet(s) = Yakima River (Lat 46.3246, Long −120.1671) upstream to endpoint(s) in: Toppenish Creek (46.3767, −120.6172); Unnamed (46.3224, −120.4464); Unnamed (46.3363, −120.5891); Unnamed (46.3364, −120.2288); Unnamed (46.3679, −120.2801); Unnamed (46.4107, −120.5582); Unnamed (46.4379, −120.4258); Yakima River (46.5283, −120.4732).
(v) *Satus Creek Watershed 1703000305*. Outlet(s) = Satus Creek (Lat 46.2893, Long −120.1972) upstream to endpoint(s) in: Bull Creek (46.0314, −120.5147); Kusshi Creek (46.0994, −120.6094); Logy Creek (46.1357, −120.6389); Mule Dry Creek (46.0959, −120.3186); North Fork Dry Creek (46.1779, −120.7669); Satus Creek (46.0185, −120.7268); Unnamed (46.0883, −120.5278); Wilson Charley Canyon (46.0419, −120.6479).
(vi) *Yakima River/Spring Creek Watershed 1703000306*. Outlet(s) = Yakima River (Lat 46.3361, Long −119.4817) upstream to endpoint(s) in: Corral Creek (46.2971, −119.5302); Satus Creek (46.2893, −120.1972); Snipes Creek (46.2419, −119.6802); Spring Creek (46.2359, −119.6952); Unnamed (46.2169, −120.0189); Unnamed (46.2426, −120.0993); Unnamed (46.2598, −120.1322); Unnamed (46.2514, −120.0190); Yakima River (46.3246, −120.1671).
(vii) *Yakima River/Cold Creek Watershed 1703000307*. Outlet(s) = Yakima River (Lat 46.2534, Long −119.2268) upstream to endpoint(s) in: Yakima River (46.3361, −119.4817).

(4) Middle Columbia/Lake Wallula Subbasin 17070101
(i) *Upper Lake Wallula Watershed 1707010101*. Outlet(s) = Columbia River (Lat 46.0594, Long −118.9445) upstream to endpoint(s) in: Columbia River (46.1776, −119.0183).
(ii) *Lower Lake Wallula Watershed 1707010102*. Outlet(s) = Columbia River (Lat 45.9376, Long −119.2969) upstream to endpoint(s) in: Columbia River (46.0594, −118.9445).
(iii) *Glade Creek Watershed 1707010105*. Outlet(s) = Glade Creek (Lat 45.8895, Long −119.6809) upstream to endpoint(s) in: Glade Creek (45.8978, −119.6962).
(iv) *Upper Lake Umatilla Watershed 1707010106*. Outlet(s) = Columbia River (Lat 45.8895, Long −119.6809) upstream to endpoint(s) in: Columbia River (45.9376, −119.2969).

(v) *Middle Lake Umatilla Watershed 1707010109*. Outlet(s) = Columbia River (Lat 45.8318, Long −119.9069) upstream to endpoint(s) in: Columbia River (45.8895, −119.6809).
(vi) *Alder Creek Watershed 1707010110*. Outlet(s) = Alder Creek (Lat 45.8298, Long −119.9277) upstream to endpoint(s) in: Alder Creek (45.8668, −119.9224).
(vii) *Pine Creek Watershed 1707010111*. Outlet(s) = Pine Creek (Lat 45.7843, Long −120.0823) upstream to endpoint(s) in: Pine Creek (45.8234, −120.1396).
(viii) *Wood Gulch Watershed 1707010112*. Outlet(s) = Wood Creek (Lat 45.7443, Long −120.1930) upstream to endpoint(s) in: Big Horn Canyon (45.8322, −120.2467); Wood Gulch (45.8386, −120.3006).
(ix) *Rock Creek Watershed 1707010113*. Outlet(s) = Rock Creek (Lat 45.6995, Long −120.4597) upstream to endpoint(s) in: Rock Creek (45.8835, −120.5557); Squaw Creek (45.8399, −120.4935).
(x) *Lower Lake Umatilla Watershed 1707010114*. Outlet(s) = Columbia River (Lat 45.7168, Long −120.6927) upstream to endpoint(s) in: Chapman Creek (45.7293, −120.3148); Columbia River (45.8318, −119.9069).

(5) Walla Walla Subbasin 17070102

(i) *Upper Walla Walla River Watershed 1707010201*. Outlet(s) = Walla Walla River (Lat 45.9104, Long −118.3696) upstream to endpoint(s) in: Bear Creek (45.8528, −118.0991); Big Meadow Canyon (45.900, −118.1116); Burnt Cabin Gulch (45.8056, −118.0593); Couse Creek (45.8035, −118.2032); Elbow Creek (45.7999, −118.1462); Kees Canyon (45.8262, −118.0927); Little Meadow Canyon (45.9094, −118.1333); North Fork Walla Walla River (45.9342, −118.0169); Reser Creek (45.8840, −117.9950); Rodgers Gulch (45.8513, −118.0839); Skiphorton Creek (45.8892, −118.0255); South Fork Walla Walla River (45.9512, −117.9647); Swede Canyon (45.8506, −118.0640); Table Creek (45.8540, −118.0546); Unnamed (45.8026, −118.1412); Unnamed (45.8547, −117.9915); Unnamed (45.8787-118.0387); Unnamed (45.8868, −117.9629); Unnamed (45.9095, −117.9621).
(ii) *Mill Creek Watershed 1707010202*. Outlet(s) = Mill Creek (Lat 46.0391, Long −118.4779) upstream to endpoint(s) in: Blue Creek (46.0188, −118.0519); Broken Creek (45.9745, −117.9899); Cold Creek (46.0540, −118.4097); Deadman Creek (46.0421, −117.9503); Doan Creek (46.0437, −118.4353); Green Fork (46.0298, −117.9389); Henry Canyon (45.9554, −118.1104); Low Creek (45.9649, −117.9980); Mill Creek (46.0112, −117.9406); North Fork Mill Creek (46.0322, −117.9937); Paradise Creek (46.0005, −117.9900); Tiger Creek (45.9588, −118.0253); Unnamed (46.0253, −117.9320); Unnamed (46.0383, −117.9463); Webb Creek (45.9800, −118.0875).
(iii) *Upper Touchet River Watershed 1707010203*. Outlet(s) = Touchet River (Lat 46.3196, Long −117.9841) upstream to endpoint(s) in: Burnt Fork (46.0838, −117.9311); Coates Creek (46.1585, −117.8431); Green

Fork (46.0737, −117.9712); Griffin Fork (46.1100, −117.9336); Ireland Gulch (46.1894, −117.8070); Jim Creek (46.2156, −117.7959); Lewis Creek (46.1855, −117.7791); North Fork Touchet River (46.0938, −117.8460); North Patit Creek (46.3418, −117.7538); Robinson Fork (46.1200, −117.9006); Rodgers Gulch (46.2813, −117.8411); Spangler Creek (46.1156, −117.7934); Unnamed (46.1049, −117.9351); Unnamed (46.1061, −117.9544); Unnamed (46.1206, −117.9386); Unnamed (46.1334, −117.9512); Unnamed (46.1604, −117.9018); Unnamed (46.2900, −117.7339); Weidman Gulch (46.2359, −117.8067); West Patit Creek (46.2940, −117.7164); Whitney Creek (46.1348, −117.8491); Wolf Fork (46.1035, −117.8797).

(iv) *Middle Touchet River Watershed 1707010204*. Outlet(s) = Touchet River (Lat 46.2952, Long −118.3320) upstream to endpoint(s) in: North Fork Coppei Creek (46.1384, −118.0181); South Fork Coppei Creek (46.1302, −118.0608); Touchet River (46.3196, −117.9841); Whisky Creek (46.2438, −118.0785).

(v) *Lower Touchet River Watershed 1707010207*. Outlet(s) = Touchet River (Lat 46.0340, Long −118.6828) upstream to endpoint(s) in: Touchet River (46.2952, −118.3320).

(vi) *Cottonwood Creek Watershed 1707010208*. Outlet(s) = Walla Walla River (Lat 46.0391, Long −118.4779) upstream to endpoint(s) in: Birch Creek (45.9489, −118.2541); Caldwell Creek (46.0493, −118.3022); East Little Walla Walla River (46.0009, −118.4069); Garrison Creek (46.0753, −118.2726); Middle Fork Cottonwood Creek (45.9566, −118.1776); North Fork Cottonwood Creek (45.9738, −118.1533); Reser Creek (46.0370, −118.3085); Russell Creek (46.0424, −118.2488); South Fork Cottonwood Creek (45.9252, −118.1798); Stone Creek (46.0618, −118.3081); Unnamed (45.9525, −118.2513); Unnamed (46.0022, −118.4070); Walla Walla River (45.9104, −118.3696); Yellowhawk Creek (46.0753, −118.2726).

(vii) *Dry Creek Watershed 1707010210*. Outlet(s) = Dry Creek (Lat 46.0507, Long −118.5932) upstream to endpoint(s) in: Dry Creek (46.0725, −118.0268); Mud Creek (46.1414, −118.1313); South Fork Dry Creek (46.0751, −118.0514); Unnamed (46.1122, −118.1141).

(viii) *Lower Walla Walla River Watershed 1707010211*. Outlet(s) = Walla Walla River (Lat 46.0594, Long −118.9445) upstream to endpoint(s) in: Walla Walla River (46.0391, −118.4779).

(6) Umatilla Subbasin 17070103

(i) *Upper Umatilla River Watershed 1707010301*. Outlet(s) = Umatilla River (Lat 45.7024, Long −118.3593) upstream to endpoint(s) in: Bear Creek (45.7595, −118.1942); Bobsled Creek (45.7268, −118.2503); Buck Creek (45.7081, −118.1059); East Fork Coyote Creek (45.7553, −118.1263); Johnson Creek #4 (45.7239, −118.0797); Lake Creek #2 (45.7040, −118.1297); Lick Creek (45.7400, −118.1880); North Fork Umatilla River (45.7193, −118.0244); Rock Creek (45.7629, −118.2377); Ryan Creek (45.6362, −118.2963); Shimmiehorn Creek

(45.6184, −118.1908); South Fork Umatilla River (45.6292, −118.2424); Spring Creek #2 (45.6288, −118.1525); Swamp Creek (45.6978, −118.1356); Thomas Creek (45.6546, −118.1435); Unnamed (45.6548, −118.1371); Unnamed (45.6737, −118.1616); Unnamed (45.6938, −118.3036); Unnamed (45.7060, −118.2123); Unnamed (45.7200, −118.3092); Unnamed (45.7241, −118.3197); Unnamed (45.7281, −118.1604); Unnamed (45.7282, −118.3372); Unnamed (45.7419, −118.1586); West Fork Coyote Creek (45.7713, −118.1513); Woodward Creek (45.7484, −118.0760).

(ii) *Meacham Creek Watershed 1707010302*. Outlet(s) = Meacham Creek (Lat 45.7024, Long −118.3593) upstream to endpoint(s) in: Bear Creek #3 (45.4882, −118.1993); Beaver Creek (45.4940, −118.4411); Boston Canyon (45.6594, −118.3344); Butcher Creek (45.4558, −118.3737); Camp Creek (45.5895, −118.2800); Duncan Canyon (45.5674, −118.3244); East Meacham Creek (45.4570, −118.2212); Hoskins Creek (45.5188, −118.2059); Line Creek (45.6303, −118.3291); Meacham Creek (45.4364, −118.3963); North Fork Meacham Creek (45.5767, −118.1721); Owsley Creek (45.4349, −118.2434); Pot Creek (45.5036, −118.1438); Sheep Creek (45.5121, −118.3945); Twomile Creek (45.5085, −118.4579); Unnamed (45.4540, −118.2192); Unnamed (45.5585, −118.2064); Unnamed (45.6019, −118.2971); Unnamed (45.6774, −118.3415).

(iii) *Umatilla River/Mission Creek Watershed 1707010303*. Outlet(s) = Umatilla River (Lat 45.6559, Long −118.8804) upstream to endpoint(s) in: Bachelor Canyon (45.6368, −118.3890); Buckaroo Creek (45.6062, −118.5000); Coonskin Creek (45.6556, −118.5239); Cottonwood Creek (45.6122, −118.5704); Little Squaw Creek (45.5969, −118.4095); Mission Creek (45.6256, −118.6133); Moonshine Creek (45.6166, −118.5392); Patawa Creek (45.6424, −118.7125); Red Elk Canyon (45.6773, −118.4431); Saddle Hollow (45.7067, −118.3968); South Patawa Creek (45.6250, −118.6919); Squaw Creek (45.5584, −118.4389); Stage Gulch (45.6533, −118.4481); Thorn Hollow Creek (45.6957, −118.4530); Umatilla River (45.7024, −118.3593); Unnamed (45.5649, −118.4221); Unnamed (45.6092, −118.7603); Unnamed (45.6100, −118.4046); Unnamed (45.6571, −118.7473); Unnamed (45.6599, −118.4641); Unnamed (45.6599, −118.4711); Unnamed (45.6676, −118.6176); Unnamed (45.6688, −118.5575); Unnamed (45.6745, −118.5859).

(iv) *McKay Creek Watershed 1707010305*. Outlet(s) = McKay Creek (Lat 45.6685, Long −118.8400) upstream to endpoint(s) in: McKay Creek (45.6077, −118.7917).

(v) *Birch Creek Watershed 1707010306*. Outlet(s) = Birch Creek (Lat 45.6559, Long −118.8804) upstream to endpoint(s) in: Bear Creek (45.2730, −118.8939); Bridge Creek (45.3603, −118.9039); California Gulch (45.3950, −118.8149); Dark Canyon (45.3119, −118.7572); East Birch Creek (45.3676, −118.6085); Johnson Creek #2 (45.3931,

−118.7518); Little Pearson Creek (45.3852, −118.7415); Merle Gulch (45.3450, −118.8136); Owings Creek (45.3864, −118.9600); Pearson Creek (45.2901, −118.7985); South Canyon #2 (45.3444, −118.6949); Unnamed (45.2703, −118.7624); Unnamed (45.3016, −118.7705); Unnamed (45.3232, −118.7264); Unnamed (45.3470, −118.7984); Unnamed (45.3476, −118.6703); Unnamed (45.3511, −118.6328); Unnamed (45.4628, −118.7491); West Birch Creek (45.2973, −118.8341); Willow Spring Canyon (45.3426, −118.9833).

(vi) *Umatilla River/Alkali Canyon Watershed 1707010307*. Outlet(s) = Umatilla River (Lat 45.7831, Long −119.2372) upstream to endpoint(s) in: Umatilla River (45.6559, −118.8804).

(vii) *Lower Umatilla River Watershed 1707010313*. Outlet(s) = Umatilla River (Lat 45.9247, Long −119.3575) upstream to endpoint(s) in: Umatilla River (45.7831, −119.2372); Unnamed (45.8202, −119.3305).

(7) Middle Columbia/Hood Subbasin 17070105—(i) *Upper Middle Columbia/Hood Watershed 1707010501*. Outlet(s) = Columbia River (Lat 45.6426, Long −120.9142) upstream to endpoint(s) in: Columbia River (45.7168, −120.6927); Frank Fulton Canyon (45.6244, −120.8258); Spanish Hollow Creek (45.6469, −120.8069); Unnamed (45.6404, −120.8654).

(ii) *Fifteenmile Creek Watershed 1707010502*. Outlet(s) = Fifteenmile Creek (Lat 45.6197, Long −121.1265) upstream to endpoint(s) in: Cedar Creek (45.3713, −121.4153); Dry Creek (45.4918, −121.0479); Fifteenmile Creek (45.3658, −121.4390); Ramsey Creek (45.3979, −121.4454); Unnamed (45.3768, −121.4410).

(iii) *Fivemile Creek Watershed 1707010503*. Outlet(s) = Eightmile Creek (Lat 45.6064, Long −121.0854) upstream to endpoint(s) in: Eightmile Creek (45.3944, −121.4983); Middle Fork Fivemile Creek (45.4502, −121.4324); South Fork Fivemile Creek (45.4622, −121.3641).

(iv) *Middle Columbia/Mill Creek Watershed 1707010504*. Outlet(s) = Columbia River (Lat 45.6920, Long −121.2937) upstream to endpoint(s) in: Brown Creek (45.5911, −121.2729); Chenoweth Creek (45.6119, −121.2658); Columbia River (45.6426, −120.9142); North Fork Mill Creek (45.4999, −121.4537); South Fork Mill Creek (45.5187, −121.3367); Threemile Creek (45.5598, −121.1747).

(v) *Mosier Creek Watershed 1707010505*. Outlet(s) = Mosier Creek (Lat 45.6950, Long −121.3996) upstream to endpoint(s) in: Mosier Creek (45.6826, −121.3896); Rock Creek (45.6649, −121.4352).

(vi) *White Salmon River Watershed 1707010509*. Outlet(s) = White Salmon River (Lat 45.7267, Long −121.5209) upstream to endpoint(s) in: Unnamed (45.7395, −121.5500); White Salmon River (45.7676, −121.5374).

(vii) *Middle Columbia/Grays Creek Watershed 1707010512*. Outlet(s) = Columbia River (Lat 45.7070, Long −121.7943) upstream to endpoint(s) in: Catherine Creek (45.7448, −121.4206); Columbia River (45.6920, −121.2937); Dog Creek

(45.7200, −121.6804); East Fork Major Creek (45.8005, −121.3449); Hanson Creek (45.7472, −121.3143); Jewett Creek (45.7524, −121.4704); Rowena Creek (45.6940, −121.3122); Unnamed (45.7238, −121.7227); Unnamed (45.7248, −121.7322); Unnamed (45.7303, −121.3095); Unnamed (45.7316, −121.3094); Unnamed (45.7445, −121.3309); Unnamed (45.7486, −121.3203); Unnamed (45.7530, −121.4697); Unnamed (45.7632, −121.4795); Unnamed (45.7954, −121.3863); Unnamed (45.8003, −121.4062); West Fork Major Creek (45.8117, −121.3929).

(8) Klickitat Subbasin 17070106

(i) *Upper Klickitat River Watershed 1707010601*. Outlet(s) = Klickitat River (Lat 46.1263, Long −121.2881) upstream to endpoint(s) in: Cedar Creek (46.2122, −121.2042); Coyote Creek (46.4640, −121.1839); Cuitin Creek (46.4602, −121.1662); Diamond Fork (46.4794, −121.2284); Huckleberry Creek (46.4273, −121.3720); Klickitat River (46.4439, −121.3756); McCreedy Creek (46.3319, −121.2529); Piscoe Creek (46.3708, −121.1436); Surveyors Creek (46.2181, −121.1838); Unnamed (46.4476, −121.2575); Unnamed (46.4585, −121.2565); West Fork Klickitat River (46.2757, −121.3267).

(ii) *Middle Klickitat River Watershed 1707010602*. Outlet(s) = Klickitat River (Lat 45.9858, Long −121.1233) upstream to endpoint(s) in: Bear Creek (46.0770, −121.2262); Klickitat River (46.1263, −121.2881); Outlet Creek (46.0178, −121.1740); Summit Creek (46.0035, −121.0918); Trout Creek (46.1166, −121.1968); White Creek (46.1084, −121.0730).

(iii) *Little Klickitat River Watershed 1707010603*. Outlet(s) = Little Klickitat River (Lat 45.8452, Long −121.0625) upstream to endpoint(s) in: Blockhouse Creek (45.8188, −120.9813); Butler Creek (45.9287, −120.7005); Canyon Creek (45.8833, −121.0504); East Prong Little Klickitat River (45.9279, −120.6832); Mill Creek (45.8374, −121.0001); Unnamed (45.8162, −120.9288); West Prong Little Klickitat River (45.9251, −120.7202).

(iv) *Lower Klickitat River Watershed 1707010604*. Outlet(s) = Klickitat River (Lat 45.6920, Long −121.2937) upstream to endpoint(s) in: Dead Canyon (45.9473, −121.1734); Dillacort Canyon (45.7349, −121.1904); Klickitat River (45.9858, −121.1233); Logging Camp Canyon (45.7872, −121.2260); Snyder Canyon (45.8431, −121.2152); Swale Creek (45.7218, −121.0475); Wheeler Canyon (45.7946, −121.1615).

(9) Upper John Day Subbasin 17070201

(i) *Middle South Fork John Day Watershed 1707020103*. Outlet(s) = South Fork John Day River (Lat 44.1918, Long −119.5261) upstream to endpoint(s) in: Blue Creek (44.2183, −119.3679); Corral Creek (44.1688, −119.3573); North Fork Deer Creek (44.2034, −119.3009); South Fork Deer Creek (44.1550, −119.3457); South Fork John Day

River (44.1822, −119.5243) Unnamed (44.1824, −119.4210); Vester Creek (44.1794, −1193872).
(ii) *Murderers Creek Watershed 1707020104*. Outlet(s) = Murderers Creek (Lat 44.3146, Long −119.5383) upstream to endpoint(s) in: Bark Cabin Creek (44.2481, −119.3967); Basin Creek (44.2700, −119.1711); Cabin Creek (44.3420, −119.4403); Charlie Mack Creek (44.2708, −119.2344); Crazy Creek (44.2421, −119.4282); Dans Creek (44.2500, −119.2774); Duncan Creek (44.3219, −119.3555); Lemon Creek (44.2528, −119.2500); Miner Creek (44.3237, −119.2416); Orange Creek (44.2524, −119.2613); Oregon Mine Creek (44.2816, −119.2945); South Fork Murderers Creek (44.2318, −119.3221); Sugar Creek (44.2914, −119.2326); Tennessee Creek (44.3041, −119.3029); Thorn Creek (44.3113, −119.3157); Todd Creek (44.3291, −119.3976); Unnamed (44.3133, −119.3533); Unnamed (44.3250, −119.3476); White Creek (44.2747, −119.1866).
(iii) *Lower South Fork John Day Watershed 1707020105*. Outlet(s) = South Fork John Day River (Lat 44.4740, Long −119.5344) upstream to endpoint(s) in: Cougar Gulch (44.2279, −119.4898); Frazier Creek (44.2200, −119.5745); Jackass Creek (44.3564, −119.4958); North Fork Wind Creek (44.3019, −119.6632); Payten Creek (44.3692, −119.6185); Smoky Creek (44.3893, −119.4791); South Fork Black Canyon Creek (44.3789, −119.7293); South Fork John Day River (44.1918, −119.5261); South Fork Wind Creek (44.2169, −119.6192); South Prong Creek (44.3093, −119.6558); Squaw Creek (44.3000, −119.6143); Unnamed (44.2306, −119.6095); Unnamed (44.2358, −119.6013); Unnamed (44.3052, −119.6332); Wind Creek (44.2793, −119.6515).
(iv) *Upper John Day River Watershed 1707020106*. Outlet(s) = John Day River (Lat 44.4534, Long −118.6711) upstream to endpoint(s) in: Bogue Gulch (44.3697, −118.5200); Call Creek (44.2973, −118.5169); Crescent Creek (44.2721, −118.5473); Dads Creek (44.5140, −118.6463); Dans Creek (44.4989, −118.5920); Deardorff Creek (44.3665, −118.4596); Eureka Gulch (44.4801, −118.5912); Graham Creek (44.3611, −118.6084); Isham Creek (44.4649, −118.5626); Jeff Davis Creek (44.4813, −118.6370); John Day River (44.2503, −118.5256); Mossy Gulch (44.4641, −118.5211); North Reynolds Creek (44.4525, −118.4886); Rail Creek #2 (44.3413, −118.5017); Reynolds Creek (44.4185, −118.4507); Roberts Creek (44.3060, −118.5815); Thompson Creek (44.3581, −118.5395); Unnamed (44.2710, −118.5412).
(v) *Canyon Creek Watershed 1707020107*. Outlet(s) = Canyon Creek (Lat 44.4225, Long −118.9584) upstream to endpoint(s) in: Berry Creek (44.3084, −118.8791); Brookling Creek (44.3042, −118.8363); Canyon Creek (44.2368, −118.7775); Crazy Creek #2 (44.2165, −118.7751); East Brookling Creek (44.3029, −118.8082); East Fork Canyon Creek (44.2865, −118.7939); Middle Fork Canyon

Creek (44.2885, −118.7500); Skin Shin Creek (44.3036, −118.8488); Tamarack Creek #2 (44.2965, −118.8611); Unnamed (44.2500, −118.8298); Unnamed (44.2717, −118.7500); Unnamed (44.2814, −118.7620); Vance Creek (44.2929, −118.9989); Wall Creek (44.2543, −118.8308).

(vi) *Strawberry Creek Watershed 1707020108*. Outlet(s) = John Day River (Lat 44.4225, Long −118.9584) upstream to endpoint(s) in: Bear Creek (44.5434, −118.7508); Dixie Creek (44.5814, −118.7257); Dog Creek (44.3635, −118.8890); Grub Creek (44.5189, −118.8050); Hall Creek (44.5479, −118.7894); Indian Creek #3 (44.3092, −118.7438); John Day River (44.4534, −118.6711); Little Pine Creek (44.3771, −118.9103); Onion Creek (44.3151, −118.6972); Overholt Creek (44.3385, −118.7196); Pine Creek (44.3468, −118.8345); Slide Creek (44.2988, −118.6583); Standard Creek (44.5648, −118.6468); Strawberry Creek (44.3128, −118.6772); West Fork Little Indian Creek (44.3632, −118.7918).

(vii) *Beech Creek Watershed 1707020109*. Outlet(s) = Beech Creek (Lat 44.4116, Long −119.1151) upstream to endpoint(s) in: Bear Creek (44.5268, −119.1002); Beech Creek (44.5682, −119.1170); Clear Creek (44.5522, −118.9942); Cottonwood Creek (44.5758, −119.0694); East Fork Beech Creek (44.5248, −118.9023); Ennis Creek (44.5409, −119.0207); Hog Creek (44.5484, −119.0379); Little Beech Creek (44.4676, −118.9733); McClellan Creek #2 (44.5570, −118.9490); Tinker Creek (44.5550, −118.8892); Unnamed (44.5349, −119.0827).

(viii) *Laycock Creek Watershed 1707020110*. Outlet(s) = John Day River (Lat 44.4155, Long −119.2230) upstream to endpoint(s) in: Birch Creek #2 (44.4353, −119.2148); East Fork Dry Creek (44.4896, −119.1817); Fall Creek #2 (44.3551, −119.0420); Hanscombe Creek (44.3040, −119.0513); Harper Creek (44.3485, −119.1259); Ingle Creek (44.3154, −119.1153); John Day River (44.4225, −118.9584); Laycock Creek (44.3118, −119.0842); McClellan Creek (44.3510, −119.2004); Moon Creek (44.3483, −119.2389); Riley Creek (44.3450, −119.1664).

(ix) *Fields Creek Watershed 1707020111*. Outlet(s) = John Day River (Lat 44.4740, Long −119.5344) upstream to endpoint(s) in: Belshaw Creek (44.5460, −119.2025); Bridge Creek (44.4062, −119.4180); Buck Cabin Creek (44.3412, −119.3313); Cummings Creek (44.5043, −119.3250); Fields Creek (44.3260, −119.2828); Flat Creek (44.3930, −119.4386); John Day River (44.4155, −119.2230); Marks Creek (44.5162, −119.3886); Wickiup Creek (44.3713, −119.3239); Widows Creek (44.3752, −119.3819); Wiley Creek (44.4752, −119.3784).

(x) *Upper Middle John Day Watershed 1707020112*. Outlet(s) = John Day River (Lat 44.5289, Long −119.6320) upstream to endpoint(s) in: Back Creek (44.4164, −119.6858); Battle Creek (44.4658, −119.5863); Cottonwood Creek (44.3863, −119.7376); Cougar Creek (44.4031,

−119.7056); East Fork Cottonwood Creek (44.3846, −119.6177); Ferris Creek (44.5446, −119.5250); Franks Creek (44.5067, −119.4903); John Day River (44.4740, −119.5344); Rattlesnake Creek (44.4673, −119.6953); Unnamed (44.3827, −119.6479); Unnamed (44.3961, −119.7403); Unnamed (44.4082, −119.6916).

(xi) *Mountain Creek Watershed 1707020113.* Outlet(s) = Mountain Creek (Lat 44.5214, Long −119.7138) upstream to endpoint(s) in: Badger Creek (44.4491, −120.1186); Fopiano Creek (44.5899, −119.9429); Fort Creek (44.4656, −119.9253); Fry Creek (44.4647, −119.9940); Keeton Creek (44.4632, −120.0195); Mac Creek (44.4739, −119.9359); Milk Creek (44.4649, −120.1526); Unnamed (44.4700, −119.9427); Unnamed (44.4703, −120.0328); Unnamed (44.4703, −120.0597); Unnamed (44.4827, −119.8970); Willow Creek (44.6027, −119.8746).

(xii) *Rock Creek Watershed 1707020114.* Outlet(s) = Rock Creek (Lat 44.5289, Long −119.6320) upstream to endpoint(s) in: Baldy Creek (44.3906, −119.7651); Bear Creek (44.3676, −119.8401); Fir Tree Creek (44.3902, −119.7893); First Creek (44.4086, −119.8120); Fred Creek (44.4602, −119.8549); Little Windy Creek (44.3751, −119.7595); Pine Hollow #2 (44.5007, −119.8559); Rock Creek (44.3509, −119.7636); Second Creek (44.3984, −119.8075); Unnamed (44.4000, −119.8501); Unnamed (44.4232, −119.7271); West Fork Birch Creek (44.4365, −119.7500).

(xiii) *John Day River/Johnson Creek Watershed 1707020115.* Outlet(s) = John Day River (Lat 44.7554, Long −119.6382) upstream to endpoint(s) in: Buckhorn Creek (44.6137, −119.7382); Burnt Corral Creek (44.6987, −119.5733); Frank Creek (44.6262, −119.7177); Indian Creek (44.5925, −119.7636); John Day River (44.5289, −119.6320); Johnny Creek (44.6126, −119.5534); Johnson Creek (44.6766, −119.7363).

(10) North Fork John Day Subbasin 17070202

(i) *Upper North Fork John Day River Watershed 1707020201.* Outlet(s) = North Fork John Day River (Lat 44.8661, Long −118.5605) upstream to endpoint(s) in: Baldy Creek (44.8687, −118.3172); Bear Gulch (44.8978, −118.5400); Bull Creek (44.8790, −118.2753); Crane Creek (44.8715, −118.3539); Crawfish Creek (44.9424, −118.2608); Cunningham Creek (44.9172, −118.2478); Davis Creek (44.9645, −118.4156); First Gulch (44.8831, −118.5588); Hoodoo Creek (44.9763, −118.3673); Long Meadow Creek (44.9490, −118.2932); McCarty Gulch (44.9131, −118.5114); Middle Trail Creek (44.9513, −118.3185); North Fork John Day River (44.8691, −118.2392); North Trail Creek (44.9675, −118.3219); South Trail Creek (44.9434, −118.2930); Trout Creek (44.9666, −118.4656); Unnamed (44.8576, −118.3169); Unnamed (44.8845, −118.3421); Unnamed (44.9221, −118.5000); Unnamed (44.9405, −118.4093); Unnamed (44.9471, −118.4797); Wagner Gulch (44.9390, −118.5148).

(ii) *Granite Creek Watershed 1707020202*. Outlet(s) = Granite Creek (Lat 44.8661, Long −118.5605) upstream to endpoint(s) in: Beaver Creek (44.7425, −118.3940); Boulder Creek (44.8368, −118.3631); Boundary Creek (44.8106, −118.3420); Bull Run Creek (44.7534, −118.3154); Corral Creek #2 (44.8186, −118.3565); Deep Creek #2 (44.8017, −118.3200); East Ten Cent Creek (44.8584, −118.4253); Granite Creek (44.8578, −118.3736); Lake Creek (44.7875, −118.5929); Lick Creek (44.8503, −118.5065); Lightning Creek (44.7256, −118.5011); Lost Creek (44.7620, −118.5822); North Fork Ruby Creek (44.7898, −118.5073); Olive Creek (44.7191, −118.4677); Rabbit Creek (44.7819, −118.5616); Ruby Creek (44.7797, −118.5237); South Fork Beaver Creek (44.7432, −118.4272); Squaw Creek #5 (44.8552, −118.4705); Unnamed (44.8427, −118.4233); West Fork Clear Creek (44.7490, −118.5440); West Ten Cent Creek (44.8709, −118.4377); Wolesy Creek (44.7687, −118.5540).
(iii) *North Fork John Day River/Big Creek Watershed 1707020203.* Outlet(s) = North Fork John Day River (Lat 44.9976, Long −118.9444) upstream to endpoint(s) in: Backout Creek (44.8560, −118.6289); Basin Creek (44.9081, −118.6671); Big Creek (45.0115, −118.6041); Bismark Creek (44.9548, −118.7020); Corral Creek (44.9592, −118.6368); Cougar Creek (44.9288, −118.6653); Meadow Creek (44.9856, −118.4664); North Fork John Day River (44.8661, −118.5605); Oregon Gulch (44.8694, −118.6119); Oriental Creek (45.0000, −118.7255); Otter Creek (44.9634, −118.7567); Paradise Creek (44.9168, −118.5850); Raspberry Creek (44.9638, −118.7356); Ryder Creek (44.9341, −118.5943); Silver Creek (44.9077, −118.5580); Simpson Creek (44.9383, −118.6794); South Fork Meadow Creek (44.9303, −118.5481); South Martin Creek (44.9479, −118.5281); Trough Creek (44.9960, −118.8499); Unnamed (44.8594, −118.6432); Unnamed (44.9073, −118.5690); Unnamed (45.0031, −118.7060); Unnamed (45.0267, −118.7635); Unnamed (45.0413, −118.8089); White Creek (45.0000, −118.5617); Winom Creek (44.9822, −118.6766).
(iv) *Desolation Creek Watershed 1707020204.* Outlet(s) = Desolation Creek (Lat 44.9977, Long −118.9352) upstream to endpoint(s) in: Battle Creek (44.8895, −118.7010); Beeman Creek (44.8230, −118.7498); Bruin Creek (44.8936, −118.7600); Howard Creek (44.8513, −118.7004); Junkens Creek (44.8482, −118.7994); Kelsay Creek (44.9203, −118.6899); Little Kelsay Creek (44.9127, −118.7124); North Fork Desolation Creek (44.7791, −118.6231); Park Creek (44.9109, −118.7839); Peep Creek (44.9488, −118.8069); South Fork Desolation Creek (44.7890, −118.6732); Sponge Creek (44.8577, −118.7165); Starveout Creek (44.8994, −118.8220); Unnamed (44.8709, −118.7130); Unnamed (44.9058, −118.7689); Unnamed (44.9163, −118.8384); Unnamed (44.9203, −118.8315); Unnamed (44.9521, −118.8141); Unnamed (44.9735, −118.8707).

(v) *Upper Camas Creek Watershed 1707020205*. Outlet(s) = Camas Creek (Lat 45.1576, Long −118.8411) upstream to endpoint(s) in: Bear Wallow Creek (45.2501, −118.7502); Bowman Creek (45.2281, −118.7028); Butcherknife Creek (45.1495, −118.6913); Camas Creek (45.1751, −118.5548); Dry Camas Creek (45.1582, −118.5846); Frazier Creek (45.1196, −118.6152); Hidaway Creek (45.0807, −118.5788); Lane Creek (45.2429, −118.7749); Line Creek (45.1067, −118.6562); North Fork Cable Creek (45.0535, −118.6569); Rancheria Creek (45.2144, −118.6552); Salsbury Creek (45.2022, −118.6206); South Fork Cable Creek (45.0077, −118.6942); Unnamed (45.0508, −118.6536); Unnamed (45.0579, −118.6705); Unnamed (45.0636, −118.6198); Unnamed (45.0638, −118.5908); Unnamed (45.0823, −118.6579); Unnamed (45.1369, −118.6771); Unnamed (45.1513, −118.5966); Unnamed (45.1854, −118.6842); Unnamed (45.1891, −118.6110); Unnamed (45.2429, −118.7575); Warm Spring Creek (45.1386, −118.6561).

(vi) *Lower Camas Creek Watershed 1707020206*. Outlet(s) = Camas Creek (Lat 45.0101, Long −118.9950) upstream to endpoint(s) in: Bridge Creek (45.0395, −118.8633); Camas Creek (45.1576, −118.8411); Cooper Creek (45.2133, −118.9881); Deerlick Creek (45.1489, −119.0229); Dry Fivemile Creek (45.1313, −119.0898); Fivemile Creek (45.1804, −119.2259); Middle Fork Wilkins Creek (45.1193, −119.0439); North Fork Owens Creek (45.1872, −118.9705); Owens Creek (45.2562, −118.8305); Silver Creek (45.1066, −119.1268); Snipe Creek (45.2502, −118.9707); South Fork Wilkins Creek (45.1078, −119.0312); Sugarbowl Creek (45.1986, −119.0999); Taylor Creek (45.1482, −119.1820); Tribble Creek (45.1713, −119.1617); Unnamed (45.0797, −118.7878); Unnamed (45.1198, −118.8514); Unnamed (45.1993, −118.9062); Unnamed (45.2000, −118.8236); Unnamed (45.2141, −118.8079); Unnamed (45.1773, −119.0753); Unnamed (45.2062, −119.0717); Wilkins Creek (45.1239, −119.0094).

(vii) *North Fork John Day River/Potamus Creek Watershed 1707020207*. Outlet(s) = North Fork John Day River (Lat 44.8832. Long −119.4090) upstream to endpoint(s) in: Buckaroo Creek (45.0245, −119.1187); Butcher Bill Creek (45.1290, −119.3197); Cabin Creek (44.9650, −119.3628); Deep Creek (45.0977, −119.2021); Deerhorn Creek (45.0513, −119.0542); Ditch Creek (45.1584, −119.3153); East Fork Meadow Brook Creek (44.9634, −118.9575); Ellis Creek (45.1197, −119.2167); Graves Creek (44.9927, −119.3171); Hinton Creek (44.9650, −119.0025); Hunter Creek (45.0114, −119.0896); Jericho Creek (45.0361, −119.0829); Little Potamus Creek (45.0462, −119.2579); Mallory Creek (45.1030, −119.3112); Martin Creek (45.1217, −119.3538); Matlock Creek (45.0762, −119.1837); No Name Creek (45.0730, −119.1459); North Fork John Day River (44.9976, −118.9444); Pole Creek (45.1666, −119.2533); Rush Creek (45.0498,

−119.1219); Skull Creek (44.9726, −119.2035); Smith Creek (44.9443, −118.9687); Stalder Creek (45.0655, −119.2844); Stony Creek (45.0424, −119.1489); West Fork Meadow Brook (44.9428, −119.0319); Wickiup Creek (45.0256, −119.2776); Wilson Creek (45.1372, −119.2673).

(viii) *Wall Creek Watershed 1707020208*. Outlet(s) = Big Wall Creek (Lat 44.8832, Long −119.4090) upstream to endpoint(s) in: Alder Creek (45.1049, −119.4170); Bacon Creek (45.0137, −119.4800); Bear Creek (45.0551, −119.4170); Big Wall Creek (44.9369, −119.6055); Bull Prairie Creek (44.9753, −119.6604); Colvin Creek (44.9835, −119.6911); East Fork Alder Creek (45.1028, −119.3929); East Fork Indian Creek (44.9009, −119.4918); Happy Jack Creek (44.8997, −119.5730); Hog Creek (45.0507, −119.4821); Indian Creek (44.8810, −119.5260); Johnson Creek (45.0097, −119.6282); Little Bear Creek (45.0433, −119.4084); Little Wall Creek (45.0271, −119.5235); Little Wilson Creek (44.8979, −119.5531); Lovlett Creek (44.9675, −119.5105); Skookum Creek (45.0894, −119.4725); South Fork Big Wall Creek (44.9315, −119.6167); Swale Creek (45.1162, −119.3836); Three Trough Creek (44.9927, −119.5318); Two Spring Creek (45.0251, −119.3938); Unnamed (44.9000, −119.6213); Unnamed (44.9830, −119.7364); Unnamed (44.9883, −119.7248); Unnamed (45.0922, −119.4374); Unnamed (45.1079, −119.4359); Willow Spring Creek (44.9467, −119.5921); Wilson Creek (44.9861, −119.6623).

(ix) *Cottonwood Creek Watershed 1707020209*. Outlet(s) = Cottonwood Creek (Lat 44.8141, Long −119.4183) upstream to endpoint(s) in: BecK Creek (44.5795, −119.2664); Board Creek (44.5841, −119.3763); Boulder Creek (44.5876, −119.3006); Camp Creek #3 (44.6606, −119.3283); Cougar Creek #2 (44.6230, −119.4133); Day Creek (44.5946, −119.0235); Donaldson Creek (44.5919, −119.3480); Dunning Creek (44.6416, −119.0628); Fox Creek (44.6163, −119.0078); Indian Creek #3 (44.6794, −119.2196); McHaley Creek (44.5845, −119.2234); Mill Creek (44.6080, −119.0878); Mine Creek (44.5938, −119.1756); Murphy Creek (44.6062, −119.1114); Smith Creek (44.6627, −119.0808); Squaw Creek #3 (44.5715, −119.4069); Unnamed (44.6176, −119.0806).

(x) *Lower North Fork John Day River Watershed 1707020210*. Outlet(s) = North Fork John Day River (Lat 44.7554, Long −119.6382) upstream to endpoint(s) in: East Fork Deer Creek (44.7033, −119.2753); Gilmore Creek (44.6744, −119.4875); North Fork John Day River (44.8832, −119.4090); Rudio Creek (44.6254, −119.5026); Straight Creek (44.6759, −119.4687); West Fork Deer Creek (44.6985, −119.3372).

(11) Middle Fork John Day Subbasin 17070203

(i) *Upper Middle Fork John Day River Watershed 1707020301*. Outlet(s) = Middle Fork John Day River (Lat 44.5946, Long −118.5163) upstream to endpoint(s) in: Bridge Creek (44.5326,

−118.5746); Clear Creek (44.4692, −118.4615); Crawford Creek (44.6381, −118.3887); Dry Fork Clear Creek (44.5339, −118.4484); Fly Creek (44.6108, −118.3810); Idaho Creek (44.6113, −118.3856); Middle Fork John Day River (44.5847, −118.4286); Mill Creek (44.6106, −118.4809); North Fork Bridge Creek (44.5479, −118.5663); North Fork Summit Creek (44.5878, −118.3560); Squaw Creek (44.5303, −118.4089); Summit Creek (44.5831, −118.3585).
(ii) *Camp Creek Watershed 1707020302*. Outlet(s) = Middle Fork John Day River (Lat 44.6934, Long −118.7947) upstream to endpoint(s) in: Badger Creek (44.7102, −118.6738); Balance Creek (44.6756, −118.7661); Beaver Creek (44.6918, −118.6467); Bennett Creek (44.6095, −118.6432); Big Boulder Creek (44.7332, −118.6889); Blue Gulch (44.6952, −118.5220); Butte Creek (44.5913, −118.6481); Camp Creek (44.5692, −118.8041); Caribou Creek (44.6581, −118.5543); Charlie Creek (44.5829, −118.8277); Cottonwood Creek (44.6616, −118.8919); Cougar Creek (44.6014, −118.8261); Coxie Creek (44.5596, −118.8457); Coyote Creek (44.7040, −118.7436); Davis Creek (44.5720, −118.6026); Deerhorn Creek (44.5984, −118.5879); Dry Creek (44.6722, −118.6962); Eagle Creek (44.5715, −118.8269); Granite Boulder Creek (44.6860, −118.6039); Lemon Creek (44.6933, −118.6169); Lick Creek (44.6102, −118.7504); Little Boulder Creek (44.6661, −118.5807); Little Butte Creek (44.6093, −118.6188); Middle Fork John Day River (44.5946, −118.5163); Myrtle Creek (44.7336, −118.7187); Placer Gulch (44.5670, −118.5593); Ragged Creek (44.6366, −118.7048); Ruby Creek (44.6050, −118.6897); Sulphur Creek (44.6119, −118.6672); Sunshine Creek (44.6424, −118.7437); Tincup Creek (44.6489, −118.6320); Trail Creek (44.6249, −118.8469); Unnamed (44.5535, −118.8139); Unnamed (44.5697, −118.5975); Unnamed (44.6041, −118.6051); Unnamed (44.6471, −118.6869); Unnamed (44.6559, −118.5777); Vincent Creek (44.6663, −118.5345); Vinegar Creek (44.6861, −118.5378); West Fork Lick Creek (44.6021, −118.7891); Whiskey Creek (44.6776, −118.8659); Windlass Creek (44.6653, −118.6030); Wray Creek (44.6978, −118.6588).
(iii) *Big Creek Watershed 1707020303*. Outlet(s) = Middle Fork John Day River (Lat 44.8363, Long −119.0306) upstream to endpoint(s) in: Barnes Creek (44.8911, −118.9974); Bear Creek (44.7068, −118.8742); Big Creek (44.7726, −118.6831); Deadwood Creek (44.7645, −118.7499); Deep Creek (44.7448, −118.7591); East Fork Big Creek (44.7923, −118.7783); Elk Creek (44.7167, −118.7721); Granite Creek (44.8893, −119.0103); Huckleberry Creek (44.8045, −118.8605); Indian Creek (44.8037, −118.7498); Lick Creek (44.8302, −118.9613); Little Indian Creek (44.8743, −118.8862); Lost Creek (44.7906, −118.7970); Middle Fork John Day River (44.6934, −118.7947); Mosquito Creek (44.7504, −118.8021); North Fork Elk Creek (44.7281, −118.7624); Onion Gulch (44.7622, −118.7846); Pizer Creek (44.7805, −118.8102);

Slide Creek (44.6950, −118.9124); Swamp Gulch (44.7606, −118.7641); Unnamed (44.8249, −118.8718); Unnamed (44.8594, −118.9018).

(iv) *Long Creek Watershed 1707020304.* Outlet(s) = Long Creek (Lat 44.8878, Long −119.2338) upstream to endpoint(s) in: Basin Creek (44.7458, −119.2452); Everett Creek (44.7106, −119.1063); Jonas Creek (44.6307, −118.9118); Long Creek (44.6076, −118.9402); Pass Creek (44.7681, −119.0414); Paul Creek (44.7243, −119.1304); Pine Creek (44.8125, −119.0859); South Fork Long Creek (44.6360, −118.9756).

(v) *Lower Middle Fork John Day River Watershed 1707020305.* Outlet(s) = Middle Fork John Day River (Lat 44.9168, Long −119.3004) upstream to endpoint(s) in: Middle Fork John Day River (44.8363, −119.0306).

(12) Lower John Day Subbasin 17070204

(i) *Lower John Day River/Kahler Creek 1707020401.* Outlet(s) = John Day River (Lat 44.8080, Long −119.9585) upstream to endpoint(s) in: Alder Creek (44.9575, −119.8621); Camp Creek (44.9005, −119.9505); East Bologna Canyon (44.8484, −119.5842); Henry Creek (44.9609, −119.7683); Horseshoe Creek (44.7076, −119.9465); John Day River (44.7554, −119.6382); Kahler Creek (44.9109, −119.7030); Lake Creek (44.9012, −119.9806); Left Hand Creek (44.7693, −119.7613); Parrish Creek (44.7207, −119.8369); Tamarack Butte #2 (44.6867, −119.7898); Tamarack Creek (44.9107, −119.7026); Unnamed (44.9334, −119.9164); Unnamed (44.9385, −119.9088); Unnamed (44.9451, −119.8932); Unnamed (44.9491, −119.8696); Unnamed (44.9546, −119.8739); Unnamed (44.9557, −119.7561); West Bologna Canyon (44.8338, −119.6422); Wheeler Creek (44.9483, −119.8447); William Creek (44.7458, −119.9027).

(ii) *Lower John Day River/Service Creek Watershed 1707020402.* Outlet(s) = John Day River (Lat 44.7368, Long −120.3054) upstream to endpoint(s) in: Big Service Creek (44.9286, −120.0428); Girds Creek (44.6681, −120.1234); John Day River (44.8080, −119.9585); Rowe Creek (44.8043, −120.1751); Service Creek (44.8951, −120.0892); Shoofly Creek (44.6510, −120.0207).

(iii) *Bridge Creek Watershed 1707020403.* Outlet(s) = Bridge Creek (Lat 44.7368, Long −120.3054) upstream to endpoint(s) in: Bear Creek (44.5585, −120.4198); Bridge Creek (44.4721, −120.2009); Carroll Creek (44.5460, −120.3322); Dodds Creek (44.5329, −120.3867); Gable Creek (44.5186, −120.2384); Johnson Creek #2 (44.5193, −120.0949); Slide Creek (44.4956, −120.3023); Thompson Creek (44.5270, −120.2489); West Branch Bridge Creek (44.4911, −120.3098).

(iv) *Lower John Day River/Muddy Creek Watershed 1707020404.* Outlet(s) = John Day River (Lat 44.9062, Long −120.4460) upstream to endpoint(s) in: Cherry Creek (44.6344,

−120.4543); Clubfoot Hollow (44.8865, −120.1929); Cove Creek (44.9299, −120.3791); Dry Creek (44.6771, −120.5367); John Day River (44.7368, −120.3054); Little Muddy Creek (44.7371, −120.5575); Muddy Creek (44.7491, −120.5071); Pine Creek (44.8931, −120.1797); Robinson Canyon (44.8807, −120.2678); Steers Canyon (44.9247, −120.2013).

(v) *Lower John Day River/Clarno Watershed 1707020405*. Outlet(s) = John Day River (Lat 45.1626, Long −120.4681) upstream to endpoint(s) in: Pine Creek (44.9062, −120.4460); Sorefoot Creek (44.9428, −120.5481).

(vi) *Butte Creek Watershed 1707020406*. Outlet(s) = Butte Creek (Lat 45.0574, Long −120.4831) upstream to endpoint(s) in: Butte Creek (44.9266, −120.1142); Cottonwood Creek (44.9816, −120.2136); Deep Creek (45.0166, −120.4165); Hunt Canyon (45.1050, −120.2838); Straw Fork (44.9536, −120.1024); Unnamed (45.0952, −120.2928); West Fork Butte Creek (44.9883, −120.3332).

(vii) *Pine Hollow Watershed 1707020407*. Outlet(s) = Pine Hollow (Lat 45.1531, Long −120.4757) upstream to endpoint(s) in: Big Pine Hollow (44.9968, −120.7342); Brush Canyon (45.0255, −120.6329); Eakin Canyon (45.1608, −120.5863); Hannafin Canyon (45.1522, −120.6158); Long Hollow Creek (44.9922, −120.5565); West Little Pine Hollow (44.9921, −120.7324).

(viii) *Thirtymile Creek Watershed 1707020408*. Outlet(s) = Thirtymile Creek (Lat 45.1626, Long −120.4681) upstream to endpoint(s) in: Condon Canyon (45.1870, −120.1829); Dry Fork Thirtymile Creek (45.1858, −120.1338); East Fork Thirtymile Creek (45.1575, −120.0556); Lost Valley Creek (45.1062, −119.9916); Patill Canyon (45.1252, −120.1870); Thirtymile Creek (44.9852, −120.0375); Unnamed (44.9753, −120.0469); Wehrli Canyon (45.1539, −120.2137).

(ix) *Lower John Day River/Ferry Canyon Watershed 1707020409*. Outlet(s) = John Day River (Lat 45.3801, Long −120.5117) upstream to endpoint(s) in: Ferry Canyon (45.3424, −120.4388); Jackknife Creek (45.2490, −120.6106); John Day River (45.1626, −120.4681); Lamberson Canyon (45.3099, −120.4147); Little Ferry Canyon (45.3827, −120.5913).

(x) *Lower John Day River/Scott Canyon Watershed 1707020410*. Outlet(s) = John Day River (Lat 45.5769, Long −120.4041) upstream to endpoint(s) in: Cottonwood Canyon (45.4143, −120.4490); Cottonwood Canyon (45.4898, −120.5118); Dry Fork Hay Creek (45.3093, −120.1612); John Day River (45.3801, −120.5117); Scott Canyon (45.4124, −120.1957); Unnamed (45.3407, −120.2299).

(xi) *Upper Rock Creek Watershed 1707020411*. Outlet(s) = Rock Creek (Lat 45.2190, Long −119.9597) upstream to endpoint(s) in: Allen Canyon (45.1092, −119.5976); Allen Spring Canyon (45.0471, −119.6468); Board Creek (45.1120, −119.5390); Brown Creek

(45.0365, −119.8296); Buckhorn Creek (45.0272, −119.9186); Chapin Creek (45.0538, −119.6727); Davidson Canyon (45.0515, −119.5952); Hahn Canyon (45.1491, −119.8320); Harris Canyon (45.0762, −119.5856); Hollywood Creek (45.0964, −119.5174); Indian Creek (45.0481, −119.6476); John Z Canyon (45.0829, −119.6058); Juniper Creek (45.0504, −119.7730); Middle Fork Rock Creek (45.0818, −119.7404); Rock Creek (45.0361, −119.5989); Stahl Canyon (45.0071, −119.8683); Tree Root Canyon (45.0626, −119.6314); Tupper Creek (45.0903, −119.4999); Unnamed (45.0293, −119.5907); Unnamed (45.0698, −119.5329); Unnamed (45.0714, −119.5227); West Fork Juniper Creek (45.0192, −119.7786).

(xii) *Lower Rock Creek Watershed 1707020412*. Outlet(s) = Rock Creek (Lat 45.5769, Long −120.4041) upstream to endpoint(s) in: Dry Creek (45.3238, −119.9709); Rock Creek (45.2190, −119.9597); Sixmile Canyon (45.2448, −120.0283); South Fork Rock Creek (45.2770, −120.1232).

(xiii) *Grass Valley Canyon Watershed 1707020413*. Outlet(s) = Grass Valley Canyon (Lat 45.5974, Long −120.4232) upstream to endpoint(s) in: Grass Valley Canyon (45.4071, −120.7226); Hay Canyon (45.5104, −120.6085); Rosebush Creek (45.3395, −120.7159).

(xiv) *Lower John Day River/McDonald Ferry Watershed 1707020414*. Outlet(s) = John Day River (Lat 45.7389, Long −120.6520) upstream to endpoint(s) in: John Day River (45.5769, −120.4041).

(13) Lower Deschutes Subbasin 17070306

(i) *Upper Deschutes River Watershed 1707030603*. Outlet(s) = Deschutes River (Lat 44.8579, Long −121.0668) upstream to endpoint(s) in: Deschutes River (44.7243, −121.2465); Shitike Creek (44.7655, −121.5835); Unnamed (44.7934, −121.3715).

(ii) *Mill Creek Watershed 1707030604*. Outlet(s) = Mill Creek (Lat 44.8792, Long −121.3711) upstream to endpoint(s) in: Boulder Creek (44.8261, −121.4924); Mill Creek (44.8343, −121.6737); Unnamed (44.8330, −121.6756).

(iii) *Beaver Creek Watershed 1707030605*. Outlet(s) = Beaver Creek (Lat 44.8730, Long −121.3405) upstream to endpoint(s) in: Beaver Butte Creek (45.0786, −121.5746); Beaver Creek (45.1306, −121.6468); Indian Creek (45.0835, −121.5113).

(iv) *Warm Springs River Watershed 1707030606*. Outlet(s) = Warm Springs River (Lat 44.8579, Long −121.0668) upstream to endpoint(s) in: Badger Creek #2 (44.9352, −121.5569); South Fork Warm Springs River (44.9268, −121.6995); Warm Springs River (44.9812, −121.7976).

(v) *Middle Deschutes River Watershed 1707030607*. Outlet(s) = Deschutes River (Lat 45.2642, Long −121.0232) upstream to endpoint(s) in: Cove Creek (44.9673, −121.0430); Deschutes River (44.8579, −121.0668); Eagle Creek (44.9999, −121.1688); Nena Creek (45.1030, −121.1653); Oak Creek (44.9336, −121.0981); Paquet Gulch

(45.0676, −121.2911); Skookum Creek (44.9171, −121.1251); Stag Canyon (45.1249, −121.0563); Unnamed (45.0186, −121.0464); Unnamed (45.0930, −121.1511); Wapinitia Creek (45.1177, −121.3025).

(vi) *Bakeoven Creek Watershed 1707030608*. Outlet(s) = Bakeoven Creek (Lat 45.1748, Long −121.0728) upstream to endpoint(s) in: Bakeoven Creek (45.1261, −120.9398); Booten Creek (45.1434, −121.0131); Cottonwood Creek (45.0036, −120.8720); Deep Creek (44.9723, −120.9480); Robin Creek (45.1209, −120.9652); Trail Hollow Creek (45.1481, −121.0423).

(vii) *Buck Hollow Creek Watershed 1707030611*. Outlet(s) = Buck Hollow Creek (Lat 45.2642, Long −121.0232) upstream to endpoint(s) in: Buck Hollow Creek (45.0663, −120.7095); Finnegan Creek (45.2231, −120.8472); Macken Canyon (45.1093, −120.7011); Thorn Hollow (45.0450, −120.7386).

(viii) *Lower Deschutes River Watershed 1707030612*. Outlet(s) = Deschutes River (Lat 45.6426, Long −120.9142) upstream to endpoint(s) in: Bull Run Canyon (45.4480, −120.8655); Deschutes River (45.2642, −121.0232); Fall Canyon (45.5222, −120.8538); Ferry Canyon (45.3854, −120.9373); Jones Canyon (45.3011, −120.9404); Macks Canyon (45.3659, −120.8524); Oak Canyon (45.3460, −120.9960); Sixteen Canyon (45.4050, −120.8529).

(14) Trout Subbasin 17070307

(i) *Upper Trout Creek Watershed 1707030701*. Outlet(s) = Trout Creek (Lat 44.8229, Long −120.9193) upstream to endpoint(s) in: Amity Creek (44.6447, −120.5854); Auger Creek (44.5539, −120.5381); Beaver Creek (44.6390, −120.7034); Big Log Creek (44.5436, −120.6997); Big Whetstone Creek (44.6761, −120.7645); Board Hollow (44.6064, −120.7405); Cartwright Creek (44.5404, −120.6535); Clover Creek (44.6523, −120.7358); Dutchman Creek (44.5320, −120.6704); Foley Creek (44.5861, −120.6801); Little Trout Creek (44.7816, −120.7237); Opal Creek (44.5792, −120.5446); Potlid Creek (44.5366, −120.6207); Trout Creek (44.5286, −120.5805); Tub Springs Canyon (44.8155, −120.7888); Unnamed (44.5428, −120.5848); Unnamed (44.6043, −120.7403); Unnamed (44.6510, −120.7337).

(ii) *Antelope Creek Watershed 1707030702*. Antelope Creek (Lat 44.8229, Long −120.9193) upstream to endpoint(s) in: Antelope Creek (44.8564, −120.8574); Boot Creek (44.9086, −120.8864); Pole Creek (44.9023, −120.9108); Ward Creek (44.9513, −120.8341).

(iii) *Lower Trout Creek Watershed 1707030705*. Outlet(s) = Trout Creek (Lat 44.8214, Long −121.0876) upstream to endpoint(s) in: Brocher Creek (44.8357, −121.0330); Hay Creek (44.7824, −120.9652); Trout Creek (44.8229, −120.9193).

(15) Upper Columbia/Priest Rapids Subbasin 17020016—*Columbia River/Zintel Canyon Watershed 1702001606*. Outlet(s) = Columbia River

(Lat 46.1776, Long −119.0183) upstream to endpoint(s) in: Columbia River (46.2534, −119.2268).
(16) Columbia River Corridor—*Columbia River Corridor* Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (45.7070, −121.7943).

(q) ***Lower Columbia River Steelhead*** *(Oncorhynchus mykiss)*. Critical habitat is designated to include the areas defined in the following subbasins:
(1) Middle Columbia/Hood Subbasin 17070105
(i) *East Fork Hood River Watershed 1707010506*. Outlet(s) = Hood River (Lat 45.6050, Long −121.6323) upstream to endpoint(s) in: Baldwin Creek (45.5618, −121.5585); Bear Creek (45.4894, −121.6516); Cat Creek (45.4708, −121.5591); Clark Creek (45.3335, −121.6420); Coe Branch (45.4342, −121.6673); Cold Spring Creek (45.4020, −121.5873);Culvert Creek (45.3770, −121.5660); Dog River (45.4404, −121.5623); East Fork Hood River (45.3172, −121.6390); Eliot Branch, Middle Fork Hood River (45.4534, −121.6362); Emil Creek (45.5223, −121.5886); Evans Creek (45.4872, −121.5894); Graham Creek (45.5463, −121.5639); Meadows Creek (45.3195, −121.6279); Newton Creek (45.3370, −121.6261); Pinnacle Creek (45.4595, −121.6568); Pocket Creek (45.3025, −121.5969); Polallie Creek (45.4132, −121.5826); Tony Creek (45.5254, −121.6584); Unnamed (45.3470, −121.5843); Unnamed (45.4661, −121.5627); Unnamed (45.5208, −121.6198); Unnamed (45.5445, −121.5738).
(ii) *West Fork Hood River Watershed 1707010507*. Outlet(s) = West Fork Hood River (Lat 45.6050, Long −121.6323) upstream to endpoint(s) in: Divers Creek (45.5457, −121.7447); Elk Creek (45.4294, −121.7884); Green Point Creek (45.5915, −121.6981); Indian Creek (45.5375, −121.7857); Jones Creek (45.4673, −121.8020); Lake Branch (45.5083, −121.8485); McGee Creek (45.4120, −121.7598); No Name Creek (45.5347, −121.7929); Red Hill Creek (45.4720, −121.7705); Unnamed (45.5502, −121.7014).
(iii) *Hood River Watershed 1707010508*. Outlet(s) = Hood River (Lat 45.7237, Long −121.5049) upstream to endpoint(s) in: Hood River (45.6050, −121.6323); Lenz Creek (45.6291, −121.5220); Neal Creek (45.5787, −121.4875); West Fork Neal Creek (45.5751, −121.5215); Whiskey Creek (45.6827, −121.5064).
(iv) *Wind River Watershed 1707010511*. Outlet(s) = Wind River (Lat 45.7067, Long −121.7929) upstream to endpoint(s) in: Bear Creek (45.7619, −121.8295); Big Hollow Creek (45.9408, −122.0075); Bourbon Creek (45.9246, −121.9982); Brush Creek (45.7720, −121.7528); Cedar Creek (45.8388, −121.7956); Compass Creek (45.8372, −122.0633); Crater Creek (45.8637, −122.0639); Dry Creek (45.9551, −121.9924); East Fork Trout Creek (45.8503, −122.0096); Eightmile Creek (45.8616, −121.8966); Falls Creek (45.9107, −121.9151); Hollis Creek (45.8524, −121.9304); Jimmy Creek (45.7886,

−121.8409); Layout Creek (45.8096, −122.0475); Little Wind River (45.7763, −121.7222); Martha Creek (45.7846, −121.9482); Mouse Creek (45.8415, −121.8428); Ninemile Creek (45.8942, −121.9023); Oldman Creek (45.9856, −121.9369); Panther Creek (45.8605, −121.8422); Pass Creek (45.8555, −122.0133); Planting Creek (45.8071, −122.0010); Proverbial Creek (45.9816, −121.9654); Tenmile Creek (45.8760, −121.8694); Trapper Creek (45.9113, −122.0470); Trout Creek (45.8679, −122.0477); Unnamed (45.7862, −121.9097); Unnamed (45.8008, −121.9881); Unnamed (45.8025, −121.9678); Unnamed (45.8142, −122.0204); Unnamed (45.8149, −122.0532); Unnamed (45.8161, −121.8437); Unnamed (45.8206, −121.8111); Unnamed (45.8218, −121.9470); Unnamed (45.8242, −122.0295); Unnamed (45.8427, −121.9180); Unnamed (45.8509, −121.9190); Unnamed (45.8529, −122.0406); Unnamed (45.8551, −122.0638); Unnamed (45.8610, −121.9635); Unnamed (45.8637, −122.0625); Unnamed (45.8640, −121.9764); Unnamed (45.8682, −121.9714); Unnamed (45.8940, −122.0348); Unnamed (45.8965, −122.0035); Unnamed (45.9652, −121.9517); Unnamed (45.9798, −121.8873); Unnamed (45.9844, −121.9171); Wind River (45.9964, −121.9000).

(v) *Middle Columbia/Grays Creek Watershed 1707010512*. Outlet(s) = Columbia River (Lat 45.7070, Long −121.7943) upstream to endpoint(s) in: Columbia River (45.7237, −121.5049).

(vi) *Middle Columbia/Eagle Creek Watershed 1707010513*. Outlet(s) = Columbia River (Lat 45.6453, Long −121.9395) upstream to endpoint(s) in: Columbia River (45.7070, −121.7943).

(2) Lower Columbia/Sandy Subbasin 17080001

(i) *Salmon River Watershed 17080001*. Outlet(s) = Salmon River (Lat 45.3768, Long −122.0293) upstream to endpoint(s) in: Bighorn Creek (45.2582, −121.9204); Boulder Creek (45.3027, −122.0209); Cheeney Creek (45.2919, −121.9710); Copper Creek (45.2454, −121.9051); Mack Hall Creek (45.2391, −121.9508); Salmon River (45.2511, −121.9025); South Fork Salmon River (45.2500, −121.9770); Unnamed (45.2576, −121.9068); Unnamed (45.2600, −121.9093); Unnamed (45.2633, −121.9153); Unnamed (45.2646, −121.9175); Unnamed (45.2708, −121.9246); Unnamed (45.2946, −121.9388); Unnamed (45.3161, −121.9565); Unnamed (45.3225, −121.9609); Unnamed (45.3254, −121.9582); Unnamed (45.3277, −121.9635); Unnamed (45.3336, −121.9538); Unnamed (45.3383, −121.9768); Unnamed (45.3398, −121.9954).

(ii) *Zigzag River Watershed 1708000102*. Outlet(s) = Zigzag River (Lat 45.3489, Long −121.9442) upstream to endpoint(s) in: Camp Creek (45.3070, −121.7921); Cool Creek (45.2867, −121.8849); Devil Canyon (45.3186, −121.8587); Henry Creek (45.3241, −121.8869); Lady Creek (45.3199, −121.8225); Little Zigzag Canyon (45.3138, −121.8035); Still Creek (45.3167, −121.7228); Unnamed (45.2647, −121.8342); Unnamed (45.2706, −121.8194); Unnamed (45.2793,

−121.8529); Unnamed (45.2801, −121.8537); Wind Creek (45.2961, −121.8515); Zigzag River (45.3270, −121.7786).
(iii) *Upper Sandy River Watershed 1708000103.* Outlet(s) = Sandy River (Lat 45.3489, Long −121.9442) upstream to endpoint(s) in: Cast Creek (45.3794, −121.8538); Clear Creek (45.3998, −121.8936); Clear Fork (45.4256, −121.8006); Horseshoe Creek (45.3664, −121.8680); Little Clear Creek (45.3854, −121.9190); Lost Creek (45.3670, −121.8091); Muddy Fork (45.3920, −121.7577); Sandy River (45.3719, −121.7560); Unnamed (45.3813, −121.8954); Unnamed (45.3904, −121.7979); Unnamed (45.4090, −121.8056); Unnamed (45.4164, −121.8342).
(iv) *Middle Sandy River Watershed 1708000104.* Outlet(s) = Sandy River (Lat 45.4464, Long −122.2459) upstream to endpoint(s) in: Alder Creek (45.3459, −122.0875); Bear Creek #2 (45.3368, −121.9265); Cedar Creek (45.4046, −122.2513); Hackett Creek (45.3525, −121.9504); North Boulder Creek (45.3900, −122.0037); Sandy River (45.3489, −121.9442); Unnamed (45.3469, −122.0673); Unnamed (45.3699, −122.0764); Unnamed (45.3808, −122.0325); Unnamed (45.3864, −122.0355); Whisky Creek (45.3744, −122.1202).
(v) *Washougal River Watershed 1708000106.* Outlet(s) = Unnamed (Lat 45.5812, Long −122.4077); Washougal River (45.5795, −122.4023) upstream to endpoint(s) in: Bear Creek (45.7732, −122.1468); Bluebird Creek (45.7486, −122.1717); Cougar Creek (45.6514, −122.2677); Dougan Creek (45.7080, −122.1817); East Fork Little Washougal River (45.6722, −122.2827); Grouse Creek (45.7574, −122.1352); Hagen Creek (45.7154, −122.2518); Jackson Creek (45.6755, −122.2530); Jones Creek (45.6913, −122.2870); Lacamas Creek (45.5972, −122.3933); Little Washougal River (45.7006, −122.3212); Lookout Creek (45.7806, −122.1006); Meander Creek (45.7708, −122.0848); Prospector Creek (45.7590, −122.0890); Silver Creek (45.7343, −122.1694); Stebbins Creek (45.7285, −122.0683); Texas Creek (45.6946, −122.1873); Timber Creek (45.7236, −122.1001); Unnamed (45.5873, −122.4121); Unnamed (45.6002, −122.3312); Unnamed (45.6132, −122.3238); Unnamed (45.6177, −122.2425); Unnamed (45.6206, −122.3449); Unnamed (45.6213, −122.2807); Unnamed (45.6243, −122.2283); Unnamed (45.6251, −122.3419); Unnamed (45.6279, −122.2549); Unnamed (45.6297, −122.2463); Unnamed (45.6321, −122.2753); Unnamed (45.6328, −122.2574); Unnamed (45.6382, −122.2915); Unnamed (45.6477, −122.3665); Unnamed (45.6487, −122.3336); Unnamed (45.6507, −122.1562); Unnamed (45.6531, −122.2739); Unnamed (45.6594, −122.2062); Unnamed (45.6622, −122.3015); Unnamed (45.6625, −122.3446); Unnamed (45.6675, −122.3415); Unnamed (45.6694, −122.1553); Unnamed (45.6703, −122.3399); Unnamed (45.6721, −122.1725); Unnamed (45.6749, −122.3370); Unnamed (45.6798, −122.2905); Unnamed (45.6835, −122.3336); Unnamed (45.6836,

−122.1146); Unnamed (45.6871, −122.2996); Unnamed (45.6934, −122.1063); Unnamed (45.6949, −122.3305); Unnamed (45.6959, −122.3149); Unnamed (45.6965, −122.0837); Unnamed (45.7074, −122.1566); Unnamed (45.7080, −122.2600); Unnamed (45.7092, −122.2510); Unnamed (45.7179, −122.0744); Unnamed (45.7201, −122.1360); Unnamed (45.7249, −122.1067); Unnamed (45.7285, −122.1965); Unnamed (45.7303, −122.1126); Unnamed (45.7458, −122.1328); Unnamed (45.7476, −122.0518); Unnamed (45.7482, −122.1594); Unnamed (45.7624, −122.1308); Unnamed (45.7841, −122.1211); Washougal River (45.7798, −122.1403); West Fork Washougal River (45.7382, −122.2173); Wildboy Creek (45.6712, −122.2172); Winkler Creek (45.6377, −122.2588).

(vi) *Columbia Gorge Tributaries Watershed 1708000107.* Outlet(s) = Columbia River (Lat 45.5710, Long −122.4021) upstream to endpoint(s) in: Columbia River (45.6453, −121.9395).

(vii) *Lower Sandy River Watershed 1708000108.* Outlet(s) = Sandy River (Lat 45.5679, Long −122.4023) upstream to endpoint(s) in: Beaver Creek (45.4959, −122.3643); Big Creek (45.5068, −122.2966); Buck Creek (45.4985, −122.2671); Gordon Creek (45.5021, −122.1805); Kelly Creek (45.5134, −122.3953); Sandy River (45.4464, −122.2459); Smith Creek (45.5136, −122.3339); Trout Creek (45.4819, −122.2769); Unnamed (45.4889, −122.3513); Unnamed (45.5557, −122.3715); Unnamed (45.5600, −122.3650).

(3) Lewis Subbasin 17080002

(i) *East Fork Lewis River Watershed 1708000205.* Outlet(s) = Allen Creek (Lat 45.8641, Long −122.7499); East Fork Lewis River (45.8664, −122.7189); Gee Creek (45.8462, −122.7803) upstream to endpoint(s) in: Allen Creek (45.8279, −122.6968); Anaconda Creek (45.8208, −122.2652); Basket Creek (45.8327, −122.4579); Big Tree Creek (45.8572, −122.3728); Brezee Creek (45.8625, −122.6637); Cedar Creek (45.7226, −122.3290); Cold Creek (45.7493, −122.3252); Copper Creek (45.8177, −122.2637); Coyote Creek (45.7554, −122.2641); East Fork Lewis River (45.8380, −122.0948); Gee Creek (45.7920, −122.6679); Green Fork (45.8462, −122.1274); Grouse Creek (45.7214, −122.2709); King Creek (45.7802, −122.2552); Little Creek (45.8417, −122.1779); Lockwood Creek (45.8986, −122.5953); Mason Creek (45.8661, −122.5430); McCormick Creek (45.8521, −122.6907); McKinley Creek (45.8026, −122.1797); Niccolls Creek (45.8148, −122.3093); Poison Gulch (45.7898, −122.1617); Riley Creek (45.8936, −122.6175); Rock Creek (45.7375, −122.2571); Roger Creek (45.8183, −122.3426); Slide Creek (45.8477, −122.2090); Unnamed (45.7212, −122.3389); Unnamed (45.7623, −122.2727); Unnamed (45.7697, −122.3157); Unnamed (45.7726, −122.6651); Unnamed (45.7770, −122.3539); Unnamed (45.7802, −122.6068); Unnamed (45.7858, −122.3283); Unnamed (45.7916, −122.3780); Unnamed (45.7919, −122.2780); Unnamed (45.7961, −122.1312); Unnamed (45.7980,

−122.5650); Unnamed (45.8033, −122.6667); Unnamed (45.8038, −122.3545); Unnamed (45.8075, −122.1120); Unnamed (45.8076, −122.6285); Unnamed (45.8079, −122.2942); Unnamed (45.8146, −122.4818); Unnamed (45.8147, −122.3144); Unnamed (45.8149, −122.5653); Unnamed (45.8172, −122.5742); Unnamed (45.8207, −122.4916); Unnamed (45.8230, −122.7069); Unnamed (45.8242, −122.6390); Unnamed (45.8292, −122.6040); Unnamed (45.8306, −122.3769); Unnamed (45.8353, −122.4842); Unnamed (45.8363, −122.1252); Unnamed (45.8368, −122.6498); Unnamed (45.8381, −122.4685); Unnamed (45.8427, −122.3708); Unnamed (45.8432, −122.1480); Unnamed (45.8434, −122.2292); Unnamed (45.8439, −122.6478); Unnamed (45.8471, −122.7486); Unnamed (45.8475, −122.6486); Unnamed (45.8484, −122.4401); Unnamed (45.8498, −122.7300); Unnamed (45.8502, −122.5228); Unnamed (45.8513, −122.1323); Unnamed (45.8537, −122.5973); Unnamed (45.8600, −122.6112); Unnamed (45.8604, −122.3831); Unnamed (45.8606, −122.3981); Unnamed (45.8662, −122.5772); Unnamed (45.8667, −122.5744); Unnamed (45.8689, −122.4227); Unnamed (45.8698, −122.6777); Unnamed (45.8756, −122.4795); Unnamed (45.8813, −122.4772); Unnamed (45.8899, −122.6256); Unnamed (45.8986, −122.5742); Unnamed (45.8988, −122.6123); Unnamed (45.9055, −122.5187); Yacolt Creek (45.8761, −122.4220).

(ii) *Lower Lewis River Watershed 1708000206*. Outlet(s) = Lewis River (Lat 45.8519, Long −122.7806) upstream to endpoint(s) in: Bitter Creek (45.9133, −122.4593); Brush Creek (45.9280, −122.4674); Cedar Creek (45.9019, −122.3655); Chelatchie Creek (45.9357, −122.3784); Colvin Creek (45.9400, −122.6081); Houghton Creek (45.9559, −122.6348); John Creek (45.9291, −122.4964); Johnson Creek (45.9536, −122.6183); Lewis River (45.9570, −122.5550); Pup Creek (45.9486, −122.5245); Robinson Creek (45.9362, −122.7243); Ross Creek (45.9536, −122.7043); Staples Creek (45.9423, −122.6665); Unnamed (45.8696, −122.7658); Unnamed (45.8878, −122.3688); Unnamed (45.8928, −122.4209); Unnamed (45.8940, −122.4371); Unnamed (45.9001, −122.7226); Unnamed (45.9136, −122.6836); Unnamed (45.9141, −122.5565); Unnamed (45.9172, −122.3591); Unnamed (45.9202, −122.5339); Unnamed (45.9203, −122.4557); Unnamed (45.9245, −122.3731); Unnamed (45.9258, −122.5964); Unnamed (45.9294, −122.6225); Unnamed (45.9396, −122.4097); Unnamed (45.9417, −122.7035); Unnamed (45.9436, −122.6417); Unnamed (45.9438, −122.6190); Unnamed (45.9446, −122.6437); Unnamed (45.9457, −122.3926); Unnamed (45.9474, −122.6695); Unnamed (45.9549, −122.6967).

(4) Lower Columbia/Clatskanie Subbasin 17080003—

(i) *Kalama River Watershed 1708000301*. Outlet(s) = Burris Creek (Lat 45.8926, Long −122.7892); Bybee Creek (45.9667, −122.8150); Kalama River (46.0340, −122.8695); Mill Creek (45.9579, −122.8030);

Schoolhouse Creek (45.9785, −122.8282); Unnamed (46.0001, −122.8438); Unnamed (46.0075, −122.8455) upstream to endpoint(s) in: Arnold Creek (46.0206, −122.5638); Bear Creek (46.0951, −122.5772); Burris Creek (45.9506, −122.7428); Bush Creek (46.0828, −122.4611); Bybee Creek (45.9695, −122.8135); Canyon Creek (45.9540, −122.7925); Cedar Creek (46.0333, −122.8110); Dee Creek (45.9953, −122.6525); Elk Creek (46.1154, −122.4796); Hatchery Creek (46.0673, −122.7548); Indian Creek (46.0516, −122.7502); Jacks Creek (46.0400, −122.5014); Kalama River (46.1109, −122.3579); Knowlton Creek (46.0245, −122.6454); Langdon Creek (46.1137, −122.4364); Little Kalama River (45.9745, −122.6604); Lost Creek (46.0692, −122.5292); Mill Creek (45.9741, −122.7756); North Fork Elk Creek (46.1086, −122.5284); North Fork Kalama River (46.1550, −122.4007); Schoolhouse Creek (45.9810, −122.8217); Spencer Creek (46.0253, −122.8285); Summers Creek (46.0357, −122.6529); Unnamed (45.9034, −122.7792); Unnamed (45.9423, −122.7761); Unnamed (45.9683, −122.7751); Unnamed (45.9772, −122.6534); Unnamed (45.9820, −122.7123); Unnamed (45.9830, −122.8249); Unnamed (45.9957, −122.6742); Unnamed (46.0023, −122.8001); Unnamed (46.0034, −122.8330); Unnamed (46.0059, −122.7350); Unnamed (46.0064, −122.7377); Unnamed (46.0238, −122.5834); Unnamed (46.0257, −122.5913); Unnamed (46.0389, −122.6305); Unnamed (46.0437, −122.5713); Unnamed (46.0440, −122.8548); Unnamed (46.0462, −122.5097); Unnamed (46.0473, −122.7668); Unnamed (46.0611, −122.5514); Unnamed (46.0618, −122.4290); Unnamed (46.0634, −122.5630); Unnamed (46.0645, −122.3953); Unnamed (46.0861, −122.6708); Unnamed (46.0882, −122.5729); Unnamed (46.0982, −122.4887); Unnamed (46.0986, −122.6384); Unnamed (46.0998, −122.6089); Unnamed (46.1031, −122.3851); Unnamed (46.1076, −122.5965); Unnamed (46.1086, −122.4399); Unnamed (46.1088, −122.3440); Unnamed (46.1124, −122.6411); Unnamed (46.1153, −122.5646); Unnamed (46.1159, −122.5728); Unnamed (46.1169, −122.3397); Unnamed (46.1242, −122.5932); Unnamed (46.1244, −122.4255); Unnamed (46.1355, −122.4413); Unnamed (46.1451, −122.4279); Unnamed (46.1543, −122.4131); Unnamed (46.1559, −122.4254); Wild Horse Creek (46.1018, −122.6755); Wolf Creek (46.0523, −122.4334).

(5) Upper Cowlitz Subbasin 17080004

(i) *Headwaters Cowlitz River Watershed 1708000401.* Outlet(s) = Cowlitz River (Lat 46.6580, Long −121.6032) upstream to endpoint(s) in: Clear Fork Cowlitz River (46.6846, −121.5668); Muddy Fork Cowlitz River (46.6973, −121.6177); Ohanapecosh River (46.6909, −121.5809); Purcell Creek (46.6722, −121.5877).

(ii) *Upper Cowlitz River Watershed 1708000402.* Outlet(s) = Cowlitz River (Lat 46.5742, Long −121.7059) upstream to endpoint(s) in: Butter Creek (46.6451, −121.6749); Coal Creek (46.6438, −121.6108);

Cowlitz River (46.6580, −121.6032); Hall Creek (46.6044, −121.6609); Johnson Creek (46.5546, −121.6373); Lake Creek (46.6227, −121.6093); Skate Creek (46.6850, −121.8052); Unnamed (46.6930, −121.8024).

(iii) *Cowlitz Valley Frontal Watershed 1708000403*. Outlet(s) = Cowlitz River (Lat 46.4765, Long −122.0952) upstream to endpoint(s) in: Burton Creek (46.5423, −121.7505); Cowlitz River (46.5742, −121.7059); Davis Creek (46.5410, −121.8084); Kilborn Creek (46.5081, −121.8007); Oliver Creek (46.5450, −121.9928); Peters Creek (46.5386, −121.9830); Siler Creek (46.4931, −121.9085); Silver Creek (46.5909, −121.9253); Smith Creek (46.5620, −121.6923); Unnamed (46.4913, −122.0820); Unnamed (46.5657, −122.0489); Willame Creek (46.5805, −121.7319).

(iv) *Upper Cispus River Watershed 1708000404*. Outlet(s) = Cispus River (Lat 46.4449, Long −121.7954) upstream to endpoint(s) in: Cispus River (46.3450, −121.6833); East Canyon Creek (46.3472, −121.7028); North Fork Cispus River (46.4362, −121.6479); Timonium Creek (46.4318, −121.6548); Twin Creek (46.3748, −121.7297); Yozoo Creek (46.4363, −121.6637).

(v) *Lower Cispus River Watershed 1708000405*. Outlet(s) = Cispus River (Lat 46.4765, Long −122.0952) upstream to endpoint(s) in: Ames Creek (46.4654, −121.9233); Camp Creek (46.4513, −121.8301); Cispus River (46.4449, −121.7954); Covell Creek (46.4331, −121.8516); Crystal Creek (46.4454, −122.0234); Greenhorn Creek (46.4217, −121.9042); Iron Creek (46.3887, −121.9702); McCoy Creek (46.3891, −121.8190); Quartz Creek (46.4250, −122.0519); Unnamed (46.4633, −121.9548); Woods Creek (46.4741, −121.9473); Yellowjacket Creek (46.3869, −121.8342).

(6) Cowlitz Subbasin 17080005

(i) *Riffe Reservoir Watershed 1708000502*. Outlet(s) = Cowlitz River (Lat 46.5033, Long −122.5870) upstream to endpoint(s) in: Cowlitz River (46.4765, −122.0952).

(ii) *Jackson Prairie Watershed 1708000503*. Outlet(s) = Cowlitz River (Lat 46.3678, Long −122.9337) upstream to endpoint(s) in: Bear Creek (46.4538, −122.9192); Blue Creek (46.4885, −122.7253); Brights Creek (46.5015, −122.6247); Cedar Creek (46.4110, −122.7316); Coon Creek (46.4371, −122.9065); Cougar Creek (46.3937, −122.7945); Cowlitz River (46.5033, −122.5870); Foster Creek (46.4073, −122.8897); Hopkey Creek (46.4587, −122.5533); Jones Creek (46.5125, −122.6825); Lacamas Creek (46.5246, −122.7923); Little Salmon Creek (46.4402, −122.7458); Mill Creek (46.5024, −122.8013); Mill Creek (46.5175, −122.6209); Otter Creek (46.4801, −122.7000); Pin Creek (46.4133, −122.8321); Rapid Creek (46.4320, −122.5465); Skook Creek (46.5031, −122.7561); Unnamed (46.3838, −122.7243); Unnamed (46.3841, −122.6789); Unnamed (46.3849, −122.7043); Unnamed (46.3857, −122.9224); Unnamed (46.3881,

−122.6949); Unnamed (46.3900, −122.7368); Unnamed (46.3998, −122.8974); Unnamed (46.4001, −122.7437); Unnamed (46.4015, −122.7327); Unnamed (46.4097, −122.5887); Unnamed (46.4102, −122.6787); Unnamed (46.4106, −122.7075); Unnamed (46.4115, −122.9091); Unnamed (46.4117, −122.7554); Unnamed (46.4143, −122.7823); Unnamed (46.4174, −122.6365); Unnamed (46.4241, −122.8170); Unnamed (46.4269, −122.6124); Unnamed (46.4291, −122.6418); Unnamed (46.4293, −122.8354); Unnamed (46.4412, −122.5192); Unnamed (46.4454, −122.8662); Unnamed (46.4496, −122.5281); Unnamed (46.4514, −122.8699); Unnamed (46.4703, −122.7959); Unnamed (46.4708, −122.7713); Unnamed (46.4729, −122.6850); Unnamed (46.4886, −122.8067); Unnamed (46.5172, −122.6534); Unnamed (46.5312, −122.8196).

(iii) *North Fork Toutle River Watershed 1708000504*. Outlet(s) = North Fork Toutle River (Lat 46.3669, Long −122.5859) upstream to endpoint(s) in: Alder Creek (46.2813, −122.4964); Bear Creek (46.3085, −122.3504); Coldwater Creek (46.2884, −122.2675); Cow Creek (46.3287, −122.4616); Hoffstadt Creek (46.3211, −122.3324); Maratta Creek (46.2925, −122.2845); Unnamed (46.3050, −122.5416); Unnamed (46.3346, −122.5460); Unnamed (46.3394, −122.3314).

(iv) *Green River Watershed 1708000505*. Outlet(s) = Green River (Lat 46.3718, Long −122.5847) upstream to endpoint(s) in: Beaver Creek (46.4056, −122.5671); Cascade Creek (46.3924, −122.3529); Devils Creek (46.4017, −122.4089); Elk Creek (46.4178, −122.2477); Green River (46.3857, −122.1815); Jim Creek (46.3885, −122.5256); Miners Creek (46.3483, −122.1932); Shultz Creek (46.3684, −122.2848); Tradedollar Creek (46.3769, −122.2411); Unnamed (46.3271, −122.2978); Unnamed (46.3467, −122.2092); Unnamed (46.3602, −122.3257); Unnamed (46.3655, −122.4774); Unnamed (46.3683, −122.3454); Unnamed (46.3695, −122.4132); Unnamed (46.3697, −122.4705); Unnamed (46.3707, −122.5175); Unnamed (46.3734, −122.3883); Unnamed (46.3817, −122.2348); Unnamed (46.3844, −122.4335); Unnamed (46.3876, −122.4870); Unnamed (46.3931, −122.3726); Unnamed (46.4023, −122.5543); Unnamed (46.4060, −122.5415); Unnamed (46.4087, −122.5061); Unnamed (46.4106, −122.4300); Unnamed (46.4143, −122.4463); Unnamed (46.4173, −122.2910); Unnamed (46.4196, −122.2850); Unnamed (46.4226, −122.3029); Unnamed (46.4285, −122.2662).

(v) *South Fork Toutle River Watershed 1708000506*. Outlet(s) = South Fork Toutle River (Lat 46.3282, Long −122.7215) upstream to endpoint(s) in: Bear Creek (46.2219, −122.4620); Big Wolf Creek (46.2259, −122.5662); Disappointment Creek (46.2138, −122.3080); Eighteen Creek (46.2453, −122.5989); Harrington Creek (46.2508, −122.4126); Johnson Creek (46.3047, −122.5923); Sheep Canyon (46.2066, −122.2672); South Fork Toutle River (46.2137, −122.2347); Studebaker Creek (46.2825, −122.6805); Thirteen Creek (46.2374,

−122.6230); Trouble Creek (46.1999, −122.3774); Twenty Creek (46.2508, −122.5738); Unnamed (46.1858, −122.2983); Unnamed (46.1953, −122.2881); Unnamed (46.2068, −122.3301); Unnamed (46.2075, −122.3267); Unnamed (46.2082, −122.2591); Unnamed (46.2107, −122.4301); Unnamed (46.2115, −122.2786); Unnamed (46.2117, −122.2378); Unnamed (46.2121, −122.5188); Unnamed (46.2157, −122.3467); Unnamed (46.2215, −122.5318); Unnamed (46.2234, −122.3265); Unnamed (46.2265, −122.3906); Unnamed (46.2271, −122.3367); Unnamed (46.2277, −122.3719); Unnamed (46.2309, −122.3828); Unnamed (46.2357, −122.4802); Unnamed (46.2365, −122.4402); Unnamed (46.2424, −122.4860); Unnamed (46.2444, −122.5427); Unnamed (46.2457, −122.6283); Unnamed (46.2523, −122.5147); Unnamed (46.2587, −122.5333); Unnamed (46.2591, −122.5240); Unnamed (46.2608, −122.5493); Unnamed (46.2618, −122.5705); Unnamed (46.2693, −122.5763); Unnamed (46.2707, −122.6094); Unnamed (46.2932, −122.5890); Unnamed (46.2969, −122.6718); Unnamed (46.2976, −122.6129); Unnamed (46.3035, −122.5952); Unnamed (46.3128, −122.7032); Unnamed (46.3217, −122.6473); Whitten Creek (46.2328, −122.4944).

(vi) *East Willapa Watershed 1708000507*. Outlet(s) = Cowlitz River (Lat 46.2660, Long −122.9154) upstream to endpoint(s) in: Arkansas Creek (46.3345, −123.0567); Baxter Creek (46.3367, −122.9841); Brim Creek (46.4446, −123.0395); Campbell Creek (46.3436, −123.0700); Cline Creek (46.3397, −122.8550); Cowlitz River (46.3678, −122.9337); Delameter Creek (46.2705, −123.0143); Ferrier Creek (46.4646, −122.9374); Hemlock Creek (46.2586.-122.7270); Hill Creek (46.3861, −122.8864); King Creek (46.5304, −123.0203); McMurphy Creek (46.4113, −122.9469); Monahan Creek (46.3041, −123.0614); North Fork Brim Creek (46.4627, −123.0222); North Fork Toutle River (46.3669, −122.5859); Owens Creek (46.3994, −123.0457); Rock Creek (46.3479, −122.8144); Rock Creek (46.3531, −122.9368); Snow Creek (46.4486, −122.9805); Stankey Creek (46.3259, −122.8266); Stillwater Creek (46.3583, −123.1144); Sucker Creek (46.2600, −122.7684); Tucker Creek (46.2565, −123.0162); Unnamed (46.2413, −122.9887); Unnamed (46.2480, −123.0169); Unnamed (46.2480, −122.7759); Unnamed (46.2517, −123.0173); Unnamed (46.2606, −122.9549); Unnamed (46.2629, −123.0188); Unnamed (46.2663, −122.9804); Unnamed (46.2709, −122.7687); Unnamed (46.2711, −122.8159); Unnamed (46.2840, −122.8128); Unnamed (46.2878, −123.0286); Unnamed (46.2883, −122.9051); Unnamed (46.2892, −122.9625); Unnamed (46.2900, −122.8124); Unnamed (46.3030, −123.0645); Unnamed (46.3092, −122.9826); Unnamed (46.3160, −122.7783); Unnamed (46.3161, −123.0123); Unnamed (46.3173, −122.8950); Unnamed (46.3229, −122.8152); Unnamed (46.3245, −122.8609); Unnamed (46.3248, −123.0292); Unnamed (46.3252, −122.9238); Unnamed (46.3294, −122.9084); Unnamed (46.3309,

−123.0046); Unnamed (46.3316, −122.8257); Unnamed (46.3346, −123.0167); Unnamed (46.3378, −122.9398); Unnamed (46.3393, −122.9402); Unnamed (46.3415, −122.9208); Unnamed (46.3456, −122.6405); Unnamed (46.3472, −122.9457); Unnamed (46.3488, −123.0519); Unnamed (46.3510, −123.0079); Unnamed (46.3511, −122.7678); Unnamed (46.3584, −122.7902); Unnamed (46.3585, −123.0369); Unnamed (46.3586, −122.7477); Unnamed (46.3599, −123.0992); Unnamed (46.3623, −122.6910); Unnamed (46.3665, −122.6334); Unnamed (46.3667, −122.8953); Unnamed (46.3683, −122.8930); Unnamed (46.3683, −122.7502); Unnamed (46.3718, −122.6202); Unnamed (46.3720, −123.0933); Unnamed (46.3748, −122.6167); Unnamed (46.3818, −122.8822); Unnamed (46.3824, −122.6090); Unnamed (46.3942, −122.9794); Unnamed (46.4015, −123.0272); Unnamed (46.4045, −123.0194); Unnamed (46.4177, −122.9611); Unnamed (46.4200, −123.0403); Unnamed (46.4286, −123.0467); Unnamed (46.4362, −123.0451); Unnamed (46.4379, −122.9985); Unnamed (46.4571, −122.9604); Unnamed (46.4606, −123.0166); Unnamed (46.4724, −122.9989); Unnamed (46.4907, −122.9352); Unnamed (46.5074, −122.8877); Unnamed (46.5089, −122.9291); Unnamed (46.5228, −122.8539); Unnamed (46.5336, −122.9793); Unnamed (46.5371, −122.8214); Unnamed (46.5439, −122.8538); Whittle Creek (46.3122, −122.9501); Wyant Creek (46.3381, −122.6117).

(vii) *Coweeman River Watershed 1708000508.* Outlet(s) = Cowlitz River (Lat 46.0977, Long −122.9141); Owl Creek (46.0771, −122.8676) upstream to endpoint(s) in: Baird Creek (46.1942, −122.5483); Coweeman River (46.1505, −122.5172); Cowlitz River (46.2660, −122.9154); Goble Creek (46.1103, −122.6789); Hill Creek (46.1784, −122.5990); Leckler Creek (46.2317, −122.9470); Little Baird Creek (46.1905, −122.5709); Martin Creek (46.1394, −122.5519); Mulholland Creek (46.2013, −122.6450); Nineteen Creek (46.1437, −122.6146); North Fork Goble Creek (46.1363, −122.6769); Nye Creek (46.1219, −122.8040); O'Neil Creek (46.1760, −122.5422); Ostrander Creek (46.2103, −122.7623); Owl Creek (46.0913, −122.8644); Salmon Creek (46.2547, −122.8839); Sandy Bend Creek (46.2319, −122.9140); Skipper Creek (46.1639, −122.5887); South Fork Ostrander Creek (46.1875, −122.8240); Turner Creek (46.1167, −122.8149); Unnamed (46.0719, −122.8607); Unnamed (46.0767, −122.8605); Unnamed (46.0824, −122.7200); Unnamed (46.0843, −122.7195); Unnamed (46.1185, −122.7253); Unnamed (46.1289, −122.8968); Unnamed (46.1390, −122.5709); Unnamed (46.1430, −122.8125); Unnamed (46.1433, −122.8084); Unnamed (46.1478, −122.8649); Unnamed (46.1546, −122.6376); Unnamed (46.1562, −122.7808); Unnamed (46.1579, −122.6476); Unnamed (46.1582, −122.5332); Unnamed (46.1605, −122.6681); Unnamed (46.1620, −122.5885); Unnamed (46.1671, −122.6284); Unnamed (46.1688, −122.9215); Unnamed

(46.1724, −122.6118); Unnamed (46.1735, −122.8282); Unnamed (46.1750, −122.8428); Unnamed (46.1750, −122.7557); Unnamed (46.1797, −122.7746); Unnamed (46.1803, −122.7801); Unnamed (46.1811, −122.7631); Unnamed (46.1814, −122.7656); Unnamed (46.1840, −122.8191); Unnamed (46.1955, −122.9082); Unnamed (46.1966, −122.5542); Unnamed (46.1971, −122.7118); Unnamed (46.2014, −122.8241); Unnamed (46.2021, −122.6941); Unnamed (46.2027, −122.5593); Unnamed (46.2172, −122.9516); Unnamed (46.2192, −122.6663); Unnamed (46.2199, −122.8375); Unnamed (46.2208, −122.8887); Unnamed (46.2231, −122.9509); Unnamed (46.2257, −122.7667); Unnamed (46.2261, −122.8023); Unnamed (46.2379, −122.8859); Unnamed (46.2430, −122.8842).

(7) Clackamas Subbasin 17090011

(i) *Collawash River Watershed 1709001101*. Outlet(s) = Collawash River (Lat 45.0321, Long −122.0600) upstream to endpoint(s) in: Blister Creek (44.9594, −122.1590); Dickey Creek (44.9335, −122.0469); East Fork Collawash River (44.8789, −121.9850); Elk Lake Creek (44.8886, −122.0128); Fan Creek (44.9926, −122.0735); Farm Creek (44.9620, −122.0604); Hot Springs Fork Collawash River (44.9005, −122.1616); Hugh Creek (44.9226, −122.1978); Pansy Creek (44.9463, −122.1420); Skin Creek (44.9477, −122.2015); Thunder Creek (44.9740, −122.1230).

(ii) *Upper Clackamas River Watershed 1709001102*. Outlet(s) = Clackamas River (Lat 45.0321, Long −122.0600) upstream to endpoint(s) in: Berry Creek (44.8291, −121.9176); Cabin Creek (45.0087, −121.8958); Clackamas River (44.8723, −121.8470); Cub Creek (44.8288, −121.8863); Fawn Creek (44.9089, −121.9226); Hunter Creek (44.8926, −121.9285); Kansas Creek (44.9820, −121.8999); Last Creek (44.9759, −121.8424); Lost Creek (45.0180, −121.9070); Lowe Creek (44.9636, −121.9457); Pinhead Creek (44.9421, −121.8359); Pot Creek (45.0201, −121.9014); Rhododendron Creek (44.9358, −121.9154); Sisi Creek (44.9110, −121.8875); Unnamed (44.8286, −121.9225); Unnamed (44.8343, −121.8778); Unnamed (44.8944, −121.9028); Unnamed (44.9355, −121.8735); Unnamed (44.9661, −121.8894); Unnamed (44.9687, −121.8920); Unnamed (45.0000, −121.8910).

(iii) *Oak Grove Fork Clackamas River Watershed 1709001103*. Outlet(s) = Oak Grove Fork Clackamas River (Lat 45.0746, Long −122.0520) upstream to endpoint(s) in: Oak Grove Fork Clackamas River (45.0823, −121.9861); Pint Creek (45.0834, −122.0355).

(iv) *Middle Clackamas River Watershed 1709001104*. Outlet(s) = Clackamas River (Lat 45.2440, Long −122.2798) upstream to endpoint(s) in: Big Creek (45.0694, −122.0848); Calico Creek (45.0682, −122.1627); Clackamas River (45.0321, −122.0600); Cripple Creek (45.1149, −122.0618); Fish Creek (45.0634, −122.1597); Mag

Creek (45.0587, −122.0488); North Fork Clackamas River (45.2371, −122.2181); Pick Creek (45.0738, −122.1994); Pup Creek (45.1451, −122.1055); Roaring River (45.1773, −122.0650); Sandstone Creek (45.0862, −122.0845); Second Creek (45.1081, −122.1601); South Fork Clackamas River (45.1912, −122.2261); Tag Creek (45.0605, −122.0475); Tar Creek (45.0494, −122.0569); Third Creek (45.0977, −122.1649); Trout Creek (45.0379, −122.0720); Wash Creek (45.0473, −122.1893); Whale Creek (45.1102, −122.0849).

(v) *Eagle Creek Watershed 1709001105*. Outlet(s) = Eagle Creek (Lat 45.3535, Long −122.3823) upstream to endpoint(s) in: Bear Creek (45.3369, −122.2331); Currin Creek (45.3369, −122.3555); Delph Creek (45.2587, −122.2098); Eagle Creek (45.2766, −122.1998); Little Eagle Creek (45.3003, −122.1682); North Fork Eagle Creek (45.3142, −122.1135); Trout Creek (45.3305, −122.1187).

(vi) *Lower Clackamas River 1709001106*. Outlet(s) = Clackamas River (Lat 45.3719, Long −122.6071) upstream to endpoint(s) in: Bargfeld Creek (45.3195, −122.4398); Clackamas River (45.2440, −122.2798); Clear Creek (45.2022, −122.3121); Deep Creek (45.3421, −122.2799); Foster Creek (45.3512, −122.4082); Goose Creek (45.3621, −122.3549); Little Clear Creek (45.2803, −122.4055); Mosier Creek (45.2683, −122.4516); North Fork Deep Creek (45.4271, −122.3094); Richardson Creek (45.4097, −122.4484); Rock Creek (45.4157, −122.5013); Tickle Creek (45.3932, −122.2775); Unnamed (45.3502, −122.4861); Unnamed (45.3626, −122.2858); Unnamed (45.3816, −122.3721); Unnamed (45.4057, −122.3223); Unnamed (45.4102, −122.2987); Wade Creek (45.2922, −122.3237).

(8) Lower Willamette Subbasin 17090012

(i) *Johnson Creek Watershed 1709001201*. Outlet(s) = Willamette River (Lat 45.4423, Long −122.6453) upstream to endpoint(s) in: Crystal Springs Creek (45.4811, −122.6381); Crystal Springs Lake (45.4799, −122.6361); Johnson Creek (45.4610, −122.3432); Kellogg Creek (45.4083, −122.5925); Kelly Creek (45.4661, −122.4655); Mount Scott Creek (45.4306, −122.5556); Oswego Creek (45.4105, −122.6666); Phillips Creek (45.4328, −122.5763); Tryon Creek (45.4472, −122.6863); Unnamed (45.4793, −122.4165); Willamette River (45.3719, −122.6071).

(ii) *Scappoose Creek Watershed 1709001202*. Outlet(s) = Multnomah Channel (Lat 45.8577, Long −122.7919) upstream to endpoint(s) in: Multnomah Channel (45.6188, −122.7921).

(iii) *Columbia Slough/Willamette River Watershed 1709001203*. Outlet(s) = Willamette River (Lat 45.6530, Long −122.7646) upstream to endpoint(s) in: Bybee Lake (45.6266, −122.7523); Bybee/Smith Lakes (45.6105, −122.7285); Columbia Slough #1 (45.6078, −122.7447); Swan Island Basin (45.5652, −122.7120); Unnamed (45.6253, −122.7568); Willamette River (45.4423, −122.6453).

(9) Lower Columbia River Corridor—*Lower Columbia River Corridor* Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (45.5710, −122.4021).

(r) ***Upper Willamette River Steelhead*** *(Oncorhynchus mykiss)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Upper Willamette Subbasin 17090003

(i) *Calapooia River Watershed 1709000303.* Outlet(s) = Calapooia River (Lat 44.5088, Long −123.1101) upstream to endpoint(s) in: Bigs Creek (44.2883, −122.6133); Butte Creek (44.4684, −123.0488); Calapooia River (44.2361, −122.3664); Hands Creek (44.2559, −122.5127); King Creek (44.2458, −122.4452); McKinley Creek (44.2569, −122.5621); North Fork Calapooia River (44.2497, −122.4094); Potts Creek (44.2581, −122.4756); Spoon Creek (44.4379, −123.0877); United States Creek (44.2244, −122.3825).

(ii) *Oak Creek Watershed 1709000304.* Outlet(s) = Willamette River (Lat 44.7504, Long −123.1421) upstream to endpoint(s) in: Calapooia River (44.5088, −123.1101); Cox Creek (44.6417, −123.0680); Periwinkle Creek (44.6250, −123.0814); Truax Creek (44.6560, −123.0598).

(iii) *Luckiamute River Watershed 1709000306.* Outlet(s) = Luckiamute River (Lat 44.7561, Long −123.1468) upstream to endpoint(s) in: Bonner Creek (44.6735, −123.4849); Burgett Creek (44.6367, −123.4574); Clayton Creek (44.7749, −123.4870); Cooper Creek (44.8417, −123.3246); Grant Creek (44.8389, −123.4098); Little Luckiamute River (44.8673, −123.4375); Luckiamute River (44.7970, −123.5270); Maxfield Creek (44.6849, −123.3427); McTimmonds Creek (44.7622, −123.4125); North Fork Pedee Creek (44.7866, −123.4511); Plunkett Creek (44.6522, −123.4241); Price Creek (44.6677, −123.3732); Sheythe Creek (44.7683, −123.5027); Soap Creek (44.6943, −123.2488); South Fork Pedee Creek (44.7798, −123.4667); Teal Creek (44.8329, −123.4582); Unnamed (44.7562, −123.5293); Unnamed (44.7734, −123.2027); Unnamed (44.7902, −123.6211); Vincent Creek (44.6380, −123.4327); Waymire Creek (44.8725, −123.4128); Woods Creek (44.6564, −123.3905).

(2) North Santiam Subbasin 17090005

(i) *Middle North Santiam River Watershed 1709000504.* Outlet(s) = North Santiam River (Lat 44.7852, Long −122.6079) upstream to endpoint(s) in: Little Rock Creek (44.7330, −122.3927); Mad Creek (44.7373, −122.3735); North Santiam River (44.7512, −122.2825); Rock Creek (44.7011, −122.4080); Snake Creek (44.7365, −122.4870).

(ii) *Little North Santiam River Watershed 1709000505.* Outlet(s) = Little North Santiam River (Lat 44.7852, Long −122.6079) upstream to endpoint(s) in: Cedar Creek (44.8439, −122.2682); Elkhorn Creek (44.8139, −122.3451); Evans Creek (44.8412, −122.3601); Fish Creek (44.8282, −122.3915); Little North Santiam River (44.8534, −122.2887);

Little Sinker Creek (44.8235, −122.4163); Sinker Creek (44.8211, −122.4210).

(iii) *Lower North Santiam River Watershed 1709000506.* Outlet(s) = Santiam River (Lat 44.7504, Long −123.1421) upstream to endpoint(s) in: Bear Branch (44.7602, −122.7942); Chehulpum Creek (44.7554, −122.9898); Cold Creek (44.7537, −122.8812); Morgan Creek (44.7495, −123.0443); North Santiam River (44.7852, −122.6079); Salem Ditch (44.8000, −122.8120); Santiam River (44.6869, −123.0052); Smallman Creek (44.7293, −122.9139); Stout Creek (44.8089, −122.5994); Trask Creek (44.7725, −122.6152); Unnamed (44.7972, −122.7328); Valentine Creek (44.7999, −122.7311).

(3) South Santiam Subbasin 17090006

(i) *Hamilton Creek/South Santiam River Watershed 1709000601.* Outlet(s) = South Santiam River (Lat 44.6869, Long −123.0052) upstream to endpoint(s) in: Albany—Santiam Canal (44.5512, −122.9032); Hamilton Creek (44.5392, −122.7018); Johnson Creek (44.4548, −122.7080); McDowell Creek (44.4640, −122.6803); Mill Creek (44.6628, −122.9575); Morgan Creek (44.4557, −122.7058); Noble Creek (44.4513, −122.7974); South Santiam River (44.4163, −122.6693).

(ii) *Crabtree Creek Watershed 1709000602.* Outlet(s) = Crabtree Creek (Lat 44.6756, Long −122.9557) upstream to endpoint(s) in: Bald Barney Creek (44.5469, −122.5959); Bald Peter Creek (44.5325, −122.6024); Beaver Creek (44.6337, −122.8537); Camp Creek (44.5628, −122.5768); Crabtree Creek (44.6208, −122.5055); Cruiser Creek (44.5543, −122.5831); Green Mountain Creek (44.5777, −122.6258); Roaring River (44.6281, −122.7148); Rock Creek (44.5883, −122.6000); South Fork Crabtree Creek (44.5648, −122.5441); White Rock Creek (44.6050, −122.5209).

(iii) *Thomas Creek Watershed 1709000603.* Outlet(s) = Thomas Creek (Lat 44.6778, Long −122.9654) upstream to endpoint(s) in: Criminal Creek (44.7122, −122.5709); Ella Creek (44.6815, −122.5228); Hortense Creek (44.6756, −122.5017); Jordan Creek (44.7527, −122.6519); Mill Creek (44.7060, −122.7849); Neal Creek (44.6923, −122.6484); South Fork Neal Creek (44.7016, −122.7049); Thomas Creek (44.6776, −122.4650); West Fork Ella Creek (44.6805, −122.5288).

(iv) *South Santiam River Watershed 1709000606.* Outlet(s) = South Santiam River (Lat 44.3977, Long −122.4473) upstream to endpoint(s) in: Canyon Creek (44.3074, −122.3300); Falls Creek (44.4007, −122.3828); Harter Creek (44.4166, −122.2605); Keith Creek (44.4093, −122.2847); Moose Creek (44.4388, −122.3671), Owl Creek (44.2999, −122.3686); Shuttle Camp Creek (44.4336, −122.2597); Soda Fork South Santiam River (44.4410, −122.2466); South Santiam

River (44.3980, −122.2610); Trout Creek (44.3993, −122.3464); Two Girls Creek (44.3248, −122.3346).

(v) *South Santiam River/Foster Reservoir Watershed 1709000607*. Outlet(s) = South Santiam River (Lat 44.4163, Long −122.6693) upstream to endpoint(s) in: Lewis Creek (44.4387, −122.6223); Middle Santiam River (44.4498, −122.5479); South Santiam River (44.3977, −122.4473).

(vi) *Wiley Creek Watershed 1709000608*. Outlet(s) = Wiley Creek (Lat 44.4140, Long −122.6752) upstream to endpoint(s) in: Farmers Creek (44.3383, −122.5812); Jackson Creek (44.3669, −122.6344); Little Wiley Creek (44.3633, −122.5228); Unnamed (44.3001, −122.4579); Unnamed (44.3121, −122.5197); Unnamed (44.3455, −122.5934); Unnamed (44.3565, −122.6051); Wiley Creek (44.2981, −122.4318).

(4) Middle Willamette Subbasin 17090007

(i) *Mill Creek/Willamette River Watershed 1709000701*. Outlet(s) = Mill Creek (Lat 44.9520, Long −123.0381) upstream to endpoint(s) in: Mill Creek (44.8268, −122.8249).

(ii) *Rickreall Creek Watershed 1709000702*. Outlet(s) = Willamette River (Lat 44.9288, Long −123.1124) upstream to endpoint(s) in: Willamette River (44.7504, −123.1421).

(iii) *Willamette River/Chehalem Creek Watershed 1709000703*. Outlet(s) = Willamette River (Lat 45.2552, Long −122.8806) upstream to endpoint(s) in: Willamette River (44.9288, −123.1124).

(iv) *Abernethy Creek Watershed 1709000704*. Outlet(s) = Willamette River (Lat 45.3540, Long −122.6186) upstream to endpoint(s) in: Willamette River (45.2552, −122.8806).

(5) Yamhill Subbasin 17090008

(i) *Upper South Yamhill River Watershed 1709000801*. Outlet(s) = South Yamhill River (Lat 45.0784, Long −123.4753) upstream to endpoint(s) in: Agency Creek (45.1799, −123.6976); Cedar Creek (45.0892, −123.6969); Cockerham Creek (45.0584, −123.5077); Cosper Creek (45.1497, −123.6178); Cow Creek (45.0410, −123.6165); Crooked Creek (45.0964, −123.6611); Doane Creek (45.0449, −123.4929); Ead Creek (45.1214, −123.6969); Elmer Creek (45.0794, −123.6714); Gold Creek (45.0108, −123.5496); Jackass Creek (45.0589, −123.6495); Joe Creek (45.1216, −123.6216); Joe Day Creek (45.0285, −123.6660); Kitten Creek (45.1110, −123.7266); Klees Creek (45.0784, −123.5496); Lady Creek (45.0404, −123.5269); Little Rowell Creek (45.0235, −123.5792); Mule Tail Creek (45.0190, −123.5547); Pierce Creek (45.1152, −123.7203); Rock Creek (45.0130, −123.6344); Rogue River (45.0613, −123.6550); Rowell Creek (45.0187, −123.5699); Unnamed (45.0318, −123.5421); Unnamed (45.0390, −123.4620); Unnamed (45.0431, −123.5541); Unnamed (45.0438, −123.4721); Unnamed (45.0493, −123.6044); Unnamed (45.0599, −123.4661); Unnamed (45.0945, −123.6110); Unnamed

(45.0994, −123.6276); Unnamed (45.1151, −123.6566); Unnamed (45.1164, −123.6717); Unnamed (45.1412, −123.6705); West Fork Agency Creek (45.1575, −123.7032); Wind River (45.1367, −123.6392); Yoncalla Creek (45.1345, −123.6614).

(ii) *Mill Creek/South Yamhill River Watershed 1709000803*. Outlet(s) = Mill Creek (Lat 45.0908, Long −123.4434) upstream to endpoint(s) in: Mill Creek (45.0048, −123.4184).

(iii) *Lower South Yamhill River Watershed 1709000804*. Outlet(s) = South Yamhill River (Lat 45.1616, Long −123.2190) upstream to endpoint(s) in: South Yamhill River (45.0784, −123.4753).

(iv) *Yamhill River Watershed 1709000807*. Outlet(s) = Yamhill River (Lat 45.2301, Long −122.9950) upstream to endpoint(s) in: South Yamhill River (45.1616, −123.2190).

(6) Molalla/Pudding Subbasin 17090009

(i) *Abiqua Creek/Pudding River Watershed 1709000901*. Outlet(s) = Pudding River (Lat 45.0740, Long −122.8525) upstream to endpoint(s) in : Abiqua Creek (44.9264, −122.5666); Little Abiqua Creek (44.9252, −122.6204); Little Pudding River (45.0435, −122.8965); Powers Creek (44.9552, −122.6796); Pudding (44.9998, −122.8412); Silver Creek (44.8981, −122.6799).

(ii) *Butte Creek/Pudding River Watershed 1709000902*. Outlet(s) = Pudding River (Lat 45.1907, Long −122.7527) upstream to endpoint(s) in: Pudding River (45.0740, −122.8525).

(iii) *Rock Creek/Pudding River Watershed 1709000903*. Outlet(s) = Rock Creek (Lat 45.1907, Long −122.7527) upstream to endpoint(s) in: Rock Creek (45.0876, −122.5916).

(iv) *Senecal Creek/Mill Creek Watershed 1709000904*. Outlet(s) = Pudding River (Lat 45.2843, Long −122.7149) upstream to endpoint(s) in: Pudding River (45.1907, −122.7527).

(v) *Upper Molalla River Watershed 1709000905*. Outlet(s) = Molalla River (Lat 45.1196, Long −122.5342) upstream to endpoint(s) in: Camp Creek (44.9630, −122.2928); Cedar Creek (45.0957, −122.5257); Copper Creek (44.8877, −122.3704); Cougar Creek (45.0421, −122.3145); Dead Horse Canyon Creek (45.0852, −122.3146); Gawley Creek (44.9320, −122.4304); Lost Creek (44.9913, −122.2444); Lukens Creek (45.0498, −122.2421); Molalla River (44.9124, −122.3228); North Fork Molalla River (45.0131, −122.2986); Pine Creek (45.0153, −122.4560); Table Rock Fork Molalla River (44.9731, −122.2629); Trout Creek (45.0577, −122.4657).

(vi) *Lower Molalla River Watershed 1709000906*. Outlet(s) = Molalla River (Lat 45.2979, Long −122.7141) upstream to endpoint(s) in: Buckner Creek (45.2382, −122.5399); Canyon Creek (45.1317, −122.3858); Cedar Creek (45.2037, −122.5327); Gribble Creek (45.2004, −122.6867); Jackson Creek (45.1822, −122.3898); Milk Creek (45.2036, −122.3761); Molalla River (45.1196, −122.5342); Woodcock Creek (45.1508, −122.5075).

(7) Tualatin Subbasin 17090010—*Gales Creek Watershed 1709001002*. Outlet(s) = Tualatin River (Lat 45.5019, Long −122.9946) upstream to endpoint(s) in: Bateman Creek (45.6350, −123.2966); Beaver Creek (45.6902, −123.2889); Clear Creek (45.5705, −123.2567); Gales Creek (45.6428, −123.3576); Iler Creek (45.5900, −123.2582); North Fork Gales Creek (45.6680, −123.3394); Roaring Creek (45.5620, −123.2574); Roderick Creek (45.5382, −123.2013); South Fork Gales Creek (45.6059, −123.2978); Tualatin River (45.4917, −123.1012).

(8) Lower Willamette/Columbia River Corridor—*Lower Willamette/Columbia River Corridor*. Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Willamette River (45.3540, −122.6186).

(s) **Oregon Coast Coho Salmon** (*Oncorhynchus kisutch*). Critical habitat is designated to include the areas defined in the following subbasins:

(1) Necanicum Subbasin 17100201—*Necanicum River Watershed 1710020101*. Outlet(s) = Arch Cape Creek (Lat 45.8035, Long−123.9656); Asbury Creek (45.815,−123.9624); Ecola Creek (45.8959,−123.9649); Necanicum River (46.0113,−123.9264); Short Sand Creek (45.7595,−123.9641) upstream to endpoint(s) in: Arch Cape Creek (45.8044,−123.9404); Asbury Creek (45.8150,−123.9584); Beerman Creek (45.9557,−123.8749); Bergsvik Creek (45.8704,−123.7650); Brandis Creek (45.8894,−123.8529); Charlie Creek (45.9164,−123.7606); Circle Creek (45.9248,−123.9436); Circle Creek Trib A (45.9335,−123.9457); North Fork Ecola Creek (45.8705,−123.9070); West Fork Ecola Creek (45.8565,−123.9424); Grindy Creek (45.9179,−123.7390); Hawley Creek (45.9259,−123.8864); Joe Creek (45.8747,−123.7503); Johnson Creek (45.8885,−123.8816); Klootchie Creek (45.9450,−123.8413); Klootchie Creek Trib A (45.9250,−123.8447); Lindsley Creek (45.9198,−123.8339); Little Humbug Creek (45.9235,−123.7653); Little Joe Creek (45.8781,−123.7852); Little Muddy Creek (45.9551,−123.9559); Mail Creek (45.8887,−123.8655); Meyer Creek (45.9279,−123.9135); Mill Creek (46.0245,−123.8905); Mill Creek Trib 1 (46.0142,−123.8967); Neacoxie Creek (46.0245,−123.9157); Neawanna Creek (45.9810,−123.8809); Necanicum River (45.9197,−123.7106); North Fork Necanicum River (45.9308,−123.7986); North Fork Necanicum River Trib A (45.9398,−123.8109); South Fork Necanicum River (45.8760,−123.8122); Shangrila Creek (45.9706,−123.8778); Short Sand Creek (45.7763,−123.9406); Thompson Creek (46.0108,−123.8951); Tolovana Creek (45.8581,−123.9370); Unnamed (45.8648,−123.9371); Unnamed (45.8821,−123.9318); Unnamed (45.8881,−123.7436); Unnamed (45.8883,−123.9366); Unnamed (45.8906,−123.7460); Unnamed (45.8912,−123.9433); Unnamed (45.8950,−123.8715); Unnamed (45.9026,−123.9540); Unnamed (45.9046,−123.9578); Unnamed (45.9050,−123.9585); Unnamed (45.9143,−123.8656); Unnamed (45.9161,−123.9000); Unnamed (45.9210,−123.8668); Unnamed (45.9273,−123.8499); Unnamed

(45.9292,−123.8900); Unnamed (45.9443,−123.9038); Unnamed (45.9850,−123.8999); Unnamed (46.0018,−123.8998); Volmer Creek (45.9049,−123.9139); Warner Creek (45.8887,−123.7801); Williamson Creek (45.9522,−123.9060).

(2) Nehalem Subbasin 17100202

(i) *Upper Nehalem River Watershed 1710020201*. Outlet(s) = Nehalem River (Lat 45.9019, Long −123.1442) upstream to endpoint(s) in: Bear Creek (45.7781,−123.4252); Bear Creek (45.8556,−123.2205); Beaver Creek (45.7624,−123.2073); Beaver Creek Trib A (45.8071,−123.2143); Beaver Creek Trib B (45.7711,−123.2318); Carlson Creek (45.7173,−123.3425); Castor Creek (45.7103,−123.2698); Cedar Creek (45.8528,−123.2928); Clear Creek, Lower North Fork (45.8229,−123.3111); Clear Creek (45.8239,−123.3531); Coal Creek Trib B (45.8149,−123.1174); Coal Creek (45.7978,−123.1293); Coon Creek (45.8211,−123.1446); Dell Creek (45.7919,−123.1559); Derby Creek (45.7225,−123.3857); Dog Creek (45.8957,−123.0741); Elk Creek (45.8256,−123.1290); Fall Creek (45.8626,−123.3247); Ginger Creek (45.8520,−123.3511); Ivy Creek (45.8938,−123.3160); Jim George Creek (45.8009,−123.1041); Kenusky Creek (45.8859,−123.0422); Kist Creek (45.7826,−123.2507); Lousignont Creek (45.7424,−123.3722); Lousignont Creek, North Fork (45.7463,−123.3576); Martin Creek (45.8474,−123.4025); Maynard Creek (45.8556,−123.3038); Military Creek (45.8233,−123.4812); Nehalem River (45.7269,−123.4159); Nehalem River, East Fork (45.8324,−123.0502); Olson Creek (45.8129,−123.3853); Pebble Creek (45.7661,−123.1357); Pebble Creek, West Fork (45.7664,−123.1899); Robinson Creek (45.7363,−123.2512); Rock Creek (45.8135,−123.5201); Rock Creek, North Fork (45.8616,−123.4560); Rock Creek, South Fork (45.7598,−123.4249); Rock Creek Trib C (45.7957,−123.4882); South Fork Rock Creek Trib A (45.7753,−123.4586); South Fork Nehalem River (45.7073,−123.4017); Selder Creek (45.8975,−123.3806); South Fork Clear Creek (45.8141,−123.3484); South Prong Clear Creek (45.7832,−123.2975); Step Creek (45.6824,−123.3348); Swamp Creek (45.8217,−123.2004); Unnamed (45.7270,−123.3419); Unnamed (45.8095,−123.0908); Unnamed (45.7558,−123.2630); Unnamed (45.7938,−123.3847); Unnamed (45.7943,−123.4059); Unnamed (45.8197,−123.0679); Unnamed (45.8477,−123.0734); Unnamed (45.8817,−123.1266); Unnamed (45.8890,−123.3817); Unnamed (45.9019,−123.1346); Weed Creek (45.8707,−123.4049); Wolf Creek, South Fork (45.7989,−123.4028); Wolf Creek (45.7768,−123.3556).

(ii) *Middle Nehalem River Watershed 1710020202*. Outlet(s) = Nehalem River (Lat 45.9838, Long −123.4214) upstream to endpoint(s) in: Adams Creek (46.0263,−123.2869); Archibald Creek (45.9218,−123.0829); Beaver Creek (46.0554,−123.2985); Boxler Creek (46.0486,−123.3521); Calvin Creek (45.9514,−123.2976); Cedar

Creek (45.9752,−123.1143); Cook Creek (45.9212,−123.1087); Cow Creek (46.0500,−123.4326); Crooked Creek (45.9043,−123.2689); Deep Creek (45.9461,−123.3719); Deep Creek Trib A (45.9127,−123.3794); Deep Creek Trib B (45.9314,−123.3809); Deer Creek (45.9033,−123.3142); Eastman Creek (46.0100,−123.2262); Fall Creek (45.9438,−123.2012); Fishhawk Creek (46.0596,−123.3857); Fishhawk Creek, North Fork (46.0907,−123.3675); Fishhawk Creek, Trib C (46.0808,−123.3692); Ford Creek (46.0570,−123.2872); Gus Creek (45.9828,−123.1453); Johnson Creek (46.0021,−123.2133); Lane Creek (45.9448,−123.3253); Little Deer Creek (45.9378,−123.2780); Lousignont Creek (46.0342,−123.4186); Lundgren Creek (46.0240,−123.2092); McCoon Creek (46.0665,−123.3043); Messing Creek (46.0339,−123.2260); Nehalem River (45.9019,−123.1442); Northrup Creek (46.0672,−123.4377); Oak Ranch Creek (45.9085,−123.0834); Sager Creek (45.9388,−123.4020); Unnamed (45.9039,−123.2044); Unnamed (45.9067,−123.0595); Unnamed (45.9488,−123.2220); Unnamed (45.9629,−123.3845); Unnamed (45.9999,−123.1732); Unnamed (46.0088,−123.4508); Unnamed (46.0208,−123.4588); Unnamed (46.0236,−123.2381); Unnamed (46.0308,−123.3135); Unnamed (46.0325,−123.4650); Unnamed (46.0390,−123.3648); Unnamed (46.0776,−123.3274); Unnamed (46.0792,−123.3409); Unnamed (46.0345,−123.2956); Warner Creek (46.0312,−123.3817); Wrong Way Creek (46.0789,−123.3142).

(iii) *Lower Nehalem River Watershed 1710020203.* Outlet(s) = Nehalem River (Lat 45.7507, Long −123.6530) upstream to endpoint(s) in: Alder Creek (45.9069,−123.5907); Beaver Creek (45.8949,−123.6764); Big Creek (45.8655,−123.6476); Bull Heifer Creek (45.9908,−123.5322); Buster Creek (45.9306,−123.4165); Cedar Creek (45.8931,−123.6029); Cow Creek (45.8587,−123.5206); Crawford Creek (45.9699,−123.4725); Cronin Creek, Middle Fork (45.7719,−123.5747); Cronin Creek, North Fork (45.7795,−123.6064); Cronin Creek, South Fork (45.7456,−123.5596); Destruction Creek (45.8750,−123.6571); East Humbug Creek (45.9454,−123.6358); Fishhawk Creek (45.9666,−123.5895); Fishhawk Creek (46.0224,−123.5374); George Creek (45.8461,−123.6226); George Creek (45.9118,−123.5766); Gilmore Creek (45.9609,−123.5372); Hamilton Creek (46.0034,−123.5881); Klines Creek (45.8703,−123.4908); Larsen Creek (45.8757,−123.5847); Little Fishhawk Creek (45.9256,−123.5501); Little Rock Creek (45.8886,−123.4558); McClure Creek (45.8560,−123.6227); Moores Creek (45.8801,−123.5178); Nehalem River (45.9838,−123.4214); Quartz Creek (45.8414,−123.5184); Spruce Run Creek (45.8103,−123.6028); Squaw Creek (45.9814,−123.4529); Stanley Creek (45.8861,−123.4352); Strum Creek (45.9321,−123.4275); Trailover Creek (46.0129,−123.4976); Unnamed (45.8083,−123.6280);

Unnamed (45.8682,−123.6168); Unnamed (45.9078,−123.6630); Unnamed (45.9207,−123.4534); Unnamed (45.9405,−123.6338); Unnamed (45.9725,−123.5544); West Humbug Creek (45.9402,−123.6726); Walker Creek (45.9266,−123.4423); Walker Creek (46.0391,−123.5142); West Brook (45.9757,−123.4638).
(iv) *Salmonberry River Watershed 1710020204*. Outlet(s) = Salmonberry River (Lat 45.7507, Long −123.6530) upstream to endpoint(s) in: Pennoyer Creek (45.7190,−123.4366); Salmonberry River (45.7248,−123.4436); Salmonberry River, North Fork (45.7181,−123.5204); Wolf Creek (45.6956,−123.4485).
(v) *North Fork of Nehalem River Watershed 1710020205*. Outlet(s) = Nehalem River, North Fork (Lat 45.7317, Long −123.8765) upstream to endpoint(s) in: Acey Creek (45.7823,−123.8292); Anderson Creek (45.7643,−123.9073); Big Rackheap Creek (45.7546,−123.8145); Boykin Creek (45.8030,−123.8595); Buchanan Creek (45.8270,−123.7901); Coal Creek (45.7897,−123.8676); Coal Creek, West Fork (45.7753,−123.8871); Cougar Creek (45.8064,−123.8090); Fall Creek (45.7842,−123.8547); Fall Creek (45.8226,−123.7054); Gods Valley Creek (45.7689,−123.7793); Grassy Lake Creek (45.7988,−123.8193); Gravel Creek (45.7361,−123.8126); Henderson Creek (45.7932,−123.8548); Jack Horner Creek (45.8531,−123.7837); Lost Creek (45.7909,−123.7195); Nehalem River, Little North Fork (45.9101,−123.6972); Nehalem River, North Fork (45.8623,−123.7463); Nehalem River, North Fork, Trib R (45.8287,−123.6625); Nehalem River, North Fork, Trib T (45.8492,−123.6796); Rackheap Creek (45.7677,−123.8008); Sally Creek (45.8294,−123.7468); Soapstone Creek (45.8498,−123.7469); Soapstone Creek, Trib A (45.8591,−123.7616); Sweethome Creek (45.7699,−123.6616); Unnamed (45.7457,−123.8490); Unnamed (45.7716,−123.7691); Unnamed (45.7730,−123.7789); Unnamed (45.7736,−123.7607); Unnamed (45.7738,−123.7534); Unnamed (45.7780,−123.7434); Unnamed (45.7784,−123.7742); Unnamed (45.7794,−123.7315); Unnamed (45.7824,−123.7396); Unnamed (45.7833,−123.7680); Unnamed (45.7841,−123.7299); Unnamed (45.7858,−123.7660); Unnamed (45.7898,−123.7424); Unnamed (45.7946,−123.7365); Unnamed (45.7966,−123.7953); Unnamed (45.8008,−123.7349); Unnamed (45.8193,−123.7436); Unnamed (45.8322,−123.7789); Unnamed (45.8359,−123.7766); Unnamed (45.8569,−123.7235); Unnamed (45.8629,−123.7347); Unnamed (45.8662,−123.7444); Unnamed (45.8962,−123.7189).
(vi) *Lower Nehalem River/Cook Creek Watershed 1710020206.* Outlet(s) = Nehalem River (Lat 45.6577, Long −123.9355) upstream to endpoint(s) in: Alder Creek (45.7286,−123.9091); Anderson Creek (45.6711,−123.7470); Bastard Creek (45.7667,−123.6943); Bob's Creek (45.7444,−123.9038); Cook Creek (45.6939,−123.6146); Cook Creek, East Fork

(45.6705,−123.6440); Daniels Creek (45.6716,−123.8606); Dry Creek (45.6449,−123.8507); Dry Creek (45.6985,−123.7422); East Foley Creek (45.6621,−123.8068); Fall Creek (45.7489,−123.7778); Foley Creek (45.6436,−123.8933); Gallagher Slough (45.7140,−123.8657); Hanson Creek (45.6611,−123.7179); Harliss Creek (45.6851,−123.7249); Helloff Creek (45.7545,−123.7603); Hoevett Creek (45.6894,−123.6276); Jetty Creek (45.6615,−123.9103); Lost Creek (45.7216,−123.7164); Neahkahnie Creek (45.7197,−123.9247); Nehalem River (45.7507,−123.6530); Peterson Creek (45.6975,−123.8098); Piatt Canyon (45.6844,−123.6983); Roy Creek (45.7174,−123.8038); Snark Creek (45.7559,−123.6713); Unnamed (45.6336,−123.8549); Unnamed (45.6454,−123.8663); Unnamed (45.6483,−123.8605); Unnamed (45.6814,−123.8786); Unnamed (45.7231,−123.9016).

(3) Wilson/Trask/Nestucca Subbasin 17100203

(i) *Little Nestucca River Watershed 1710020301*. Outlet(s) = Little Nestucca River (Lat 45.1827, Long −123.9543) upstream to endpoint(s) in: Austin Creek (45.1080,−123.8748); Austin Creek, West Fork (45.1074,−123.8894); Baxter Creek (45.1149,−123.7705); Bear Creek (45.1310,−123.8500); Bowers Creek (45.1393,−123.9198); Cedar Creek (45.0971,−123.8094); Fall Creek (45.1474,−123.8767); Hiack Creek (45.0759,−123.8042); Kautz Creek (45.0776,−123.8317); Kellow Creek (45.1271,−123.9072); Little Nestucca River (45.0730,−123.7825); Little Nestucca River, South Fork (45.0754,−123.8393); Louie Creek (45.1277,−123.7869); McKnight Creek (45.1124,−123.8363); Small Creek (45.1151,−123.8227); Sourgrass Creek (45.0917,−123.7623); Sourgrass Creek, Trib A (45.1109,−123.7664); Squaw Creek (45.1169,−123.8938); Stillwell Creek (45.0919,−123.8141); Unnamed (45.1169,−123.7974).

(ii) *Nestucca River Watershed 1710020302*. Outlet(s) = Nestucca Bay (Lat 45.1607, Long −123.9678) upstream to endpoint(s) in: Alder Creek (45.1436,−123.7998); Alder Creek (45.2436,−123.7364); Bays Creek (45.3197,−123.7240); Bear Creek (45.3188,−123.6022); Bear Creek (45.3345,−123.7898); Beulah Creek (45.2074,−123.6747); Bible Creek (45.2331,−123.5868); Boulder Creek (45.2530,−123.7525); Buck Creek (45.1455,−123.7734); Cedar Creek (45.3288,−123.4531); Clarence Creek (45.2649,−123.6395); Clear Creek (45.1725,−123.8660); Crazy Creek (45.1636,−123.7595); Dahl Fork (45.2306,−123.7076); East Beaver Creek (45.3579,−123.6877); East Creek (45.3134,−123.6348); Elk Creek (45.3134,−123.5645); Elk Creek, Trib A (45.2926,−123.5381); Elk Creek, Trib B (45.2981,−123.5471); Fan Creek (45.2975,−123.4994); Farmer Creek (45.2593,−123.9074); Foland Creek (45.2508,−123.7890); Foland Creek, West Fork (45.2519,−123.8025); George Creek (45.2329,−123.8291); Ginger Creek (45.3283,−123.4680); Hartney Creek (45.2192,−123.8632); Horn Creek (45.2556,−123.9212); Lawrence Creek (45.1861,−123.7852);

Limestone Creek (45.2472,–123.7169); Mina Creek (45.2444,–123.6197); Moon Creek (45.3293,–123.6762); North Beaver Creek (45.3497,–123.8961); Nestucca River (45.3093,–123.4077); Niagara Creek (45.1898,–123.6637); Pheasant Creek (45.2121,–123.6366); Pollard Creek (45.1951,–123.7958); Powder Creek (45.2305,–123.6974); Saling Creek (45.2691,–123.8474); Sanders Creek (45.2254,–123.8959); Slick Rock Creek (45.2683,–123.6106); Swab Creek (45.2889,–123.7656); Testament Creek (45.2513,–123.5488); Three Rivers (45.1785,–123.7557); Tiger Creek (45.3405,–123.8029); Tiger Creek, Trib A (45.3346,–123.8547); Tony Creek (45.2575,–123.7735); Turpy Creek (45.2537,–123.7620); Unnamed (45.1924,–123.8202); Unnamed (45.2290,–123.9398); Unnamed (45.3018,–123.4636); Unnamed (45.3102,–123.6628); Unnamed (45.3148,–123.6616); Unnamed (45.3158,–123.8679); Unnamed (45.3292,–123.8872); Walker Creek (45.2914,–123.4207); West Beaver Creek (45.3109,–123.8840); West Creek (45.2899,–123.8514); Wildcat Creek (45.3164,–123.8187); Wolfe Creek (45.3113,–123.7658); Woods Creek (45.1691,–123.8070).

(iii) *Tillamook River Watershed 1710020303.* Outlet(s) = Tillamook River (Lat 45.4682, Long –123.8802) upstream to endpoint(s) in: Bear Creek (45.4213,–123.8885); Beaver Creek (45.4032,–123.8861); Bewley Creek (45.3637,–123.8965); Esther Creek (45.4464,–123.9017); Fawcett Creek (45.3824,–123.7210); Joe Creek (45.3754,–123.8257); Killam Creek (45.4087,–123.7276); Mills Creek (45.3461,–123.7915); Munson Creek (45.3626,–123.7681); Simmons Creek (45.3605,–123.7364); Sutton Creek (45.4049,–123.8568); Tillamook River (45.3595,–123.9115); Tomlinson Creek (45.4587,–123.8868); Unnamed (45.3660,–123.8313); Unnamed (45.3602,–123.8466); Unnamed (45.3654,–123.9050); Unnamed (45.3987,–123.7105); Unnamed (45.4083,–123.8160); Unnamed (45.4478,–123.8670); Unnamed (45.3950,–123.7348).

(iv) *Trask River Watershed 1710020304.* Outlet(s) = Trask River (Lat 45.4682, Long –123.8802) upstream to endpoint(s) in: Bales Creek (45.3712,–123.5786); Bark Shanty Creek (45.4232,–123.5550); Bear Creek (45.4192,–123.7408); Bill Creek (45.3713,–123.6386); Blue Bus Creek (45.4148,–123.5949); Boundry Creek (45.3493,–123.5470); Clear Creek #1 (45.4638,–123.5571); Clear Creek #2 (45.5025,–123.4683); Cruiser Creek (45.4201,–123.4753); Dougherty Slough (45.4684,–123.7888); East Fork of South Fork Trask River (45.3563,–123.4752); Edwards Creek (45.3832,–123.6676); Elkhorn Creek, Trib C (45.4080,–123.4440); Elkhorn Creek (45.3928,–123.4709); Gold Creek (45.4326,–123.7218); Green Creek (45.4510,–123.7361); Hatchery Creek (45.4485,–123.6623); Headquarters Camp Creek (45.3317,–123.5072); Hoquarten Slough (45.4597,–123.8480); Joyce Creek (45.3881,–123.6386); Michael Creek (45.4799,–123.5119); Mill Creek (45.4100,–123.7450); Miller

Creek (45.3582,−123.5666); Pigeon Creek (45.3910,−123.5656); Rawe Creek (45.4395,−123.6351); Rock Creek (45.3515,−123.5074); Samson Creek (45.4662,−123.6439); Scotch Creek (45.4015,−123.5873); Steampot Creek (45.3875,−123.5425); Stretch Creek (45.3483,−123.5382); Summit Creek (45.3481,−123.6054); Summit Creek, South Fork (45.3473,−123.6145); Trask River, North Fork, Middle Fork (45.4472,−123.3945); Trask River, North Fork, North Fork (45.5275,−123.4177); Trask River, South Fork (45.3538,−123.6445); Trib A (45.3766,−123.5191); Trib B (45.3776,−123.4988); Unnamed (45.3639,−123.6054); Unnamed (45.4105,−123.7741); Unnamed (45.4201,−123.6320); Unnamed (45.4220,−123.7654).

(v) *Wilson River Watershed 1710020305*. Outlet(s) = Wilson River (Lat 45.4816, Long −123.8708) upstream to endpoint(s) in: Beaver Creek (45.4894,−123.7933); Ben Smith Creek (45.5772,−123.5072); Cedar Creek (45.5869,−123.6228); Cedar Creek, North Fork (45.6066,−123.6151); Deo Creek (45.6000,−123.3716); Drift Creek (45.6466,−123.3944); Elk Creek (45.6550,−123.4620); Elk Creek, West Fork (45.6208,−123.4717); Elliott Creek (45.5997,−123.3925); Fall Creek (45.4936,−123.5616); Fox Creek (45.5102,−123.5869); Hatchery Creek (45.4835,−123.7074); Hughey Creek (45.4540,−123.7526); Idiot Creek (45.6252,−123.4296); Jones Creek (45.6028,−123.5702); Jordan Creek (45.5610,−123.4557); Jordan Creek, South Fork (45.5099,−123.5279); Kansas Creek (45.4861,−123.6434); Morris Creek (45.6457,−123.5409); Tuffy Creek (45.5787,−123.4702); Unnamed (45.4809,−123.8362); Unnamed (45.5758,−123.5226); Unnamed (45.5942,−123.4259); Unnamed (45.6002,−123.5939); Unnamed (45.6151,−123.4385); White Creek (45.5181,−123.7223); Wilson River, Devil's Lake Fork (45.6008,−123.3301); Wilson River, North Fork (45.6679,−123.5138); Wilson River, North Fork, Little (45.5283,−123.6771); Wilson River, North Fork, West Fork (45.6330,−123.5879); Wilson River, North Fork, West Fork, North Fork (45.6495,−123.5779); Wilson River, South Fork (45.5567,−123.3965); Wolf Creek (45.5683,−123.6129).

(vi) *Kilchis River Watershed 1710020306*. Outlet(s) = Kilchis River (Lat 45.4927, Long −123.8615) upstream to endpoint(s) in: Clear Creek (45.5000,−123.7647); Coal Creek (45.5004,−123.8085); Company Creek (45.5892,−123.7370); French Creek (45.6318,−123.6926); Kilchis River, Little South Fork (45.5668,−123.7178); Kilchis River, North Fork (45.6044,−123.6504); Kilchis River, South Fork (45.5875,−123.6944); Mapes Creek (45.5229,−123.8382); Murphy Creek (45.5320,−123.8341); Myrtle Creek (45.5296,−123.8156); Sam Downs Creek (45.5533,−123.7144); Schroeder Creek (45.6469,−123.7064); Unnamed (45.5625,−123.7593).

(vii) *Miami River Watershed 1710020307*. Outlet(s) = Miami River (Lat 45.5597, Long −123.8904) upstream to endpoint(s) in: Diamond Creek (45.6158,−123.8184); Hobson Creek (45.5738,−123.8970);

Illingsworth Creek (45.5547,−123.8693); Miami River (45.6362,−123.7533); Miami River, Trib S (45.6182,−123.8004); Miami River, Trib T (45.6546,−123.7463); Minich Creek (45.5869,−123.8936); Moss Creek (45.5628,−123.8319); Peterson Creek (45.6123,−123.8996); Prouty Creek (45.6304,−123.8435); Stuart Creek (45.6042,−123.8442); Unnamed (45.6317,−123.7906); Unnamed (45.6341,−123.7900); Waldron Creek (45.5856,−123.8483).

(viii) *Tillamook Bay Watershed 1710020308*. Outlet(s) = Tillamook Bay (Lat 45.5600, Long −123.9366) upstream to endpoint(s) in: Douthy Creek (45.5277,−123.8570); Electric Creek (45.5579,−123.8925); Hall Slough (45.4736,−123.8637); Jacoby Creek (45.5297,−123.8665); Kilchis River (45.4927,−123.8615); Larson Creek (45.5366,−123.8849); Miami River (45.5597,−123.8904); Patterson Creek (45.5359,−123.8732); Tillamook Bay (45.4682,−123.8802); Vaughn Creek (45.5170,−123.8516); Wilson River (45.4816,−123.8708).

(ix) *Spring Creek/Sand Lake/Neskowin Creek Frontal Watershed 1710020309*. Outlet(s) = Crescent Lake (45.6360,−123.9405); Neskowin Creek (45.1001,−123.9859); Netarts Bay (45.4339,−123.9512); Rover Creek (45.3290,−123.9670); Sand Creek (45.2748,−123.9589); Watesco Creek (45.5892,−123.9477) upstream to endpoint(s) in: Andy Creek (45.2905,−123.8744); Butte Creek (45.1159,−123.9360); Crescent Lake (45.6320,−123.9376); Davis Creek (45.3220,−123.9254); Fall Creek (45.0669,−123.9679); Hawk Creek (45.1104,−123.9436); Jackson Creek (45.3568,−123.9611); Jewel Creek (45.2865,−123.8905); Jim Creek (45.0896,−123.9224); Lewis Creek (45.0835,−123.8979); Meadow Creek (45.0823,−123.9824); Neskowin Creek (45.0574,−123.8812); Prospect Creek (45.0858,−123.9321); Reneke Creek (45.2594,−123.9434); Rover Creek (45.3284,−123.9438); Sand Creek (45.3448,−123.9156); Sloan Creek (45.0718,−123.8998); Watesco Creek (45.5909,−123.9353); Whiskey Creek (45.3839,−123.9193).

(4) Siletz/Yaquina Subbasin 17100204

(i) *Upper Yaquina River Watershed 1710020401*. Outlet(s) = Yaquina River (Lat 44.6219, Long −123.8741) upstream to endpoint(s) in: Bales Creek (44.6893,−123.7503); Bales Creek, East Fork (44.6927,−123.7363); Bales Creek, East Fork, Trib A (44.6827,−123.7257); Bales Creek (44.6610,−123.8749); Bones Creek (44.6647,−123.6762); Bryant Creek (44.6746,−123.7139); Buckhorn Creek (44.6676,−123.6677); Buttermilk Creek (44.6338,−123.6827); Buttermilk Creek, Trib A (44.6518,−123.7173); Carlisle Creek (44.6451,−123.8847); Cline Creek (44.6084,−123.6844); Cook Creek (44.6909,−123.8583); Crystal Creek (44.6500,−123.8132); Davis Creek (44.6500,−123.6587); Eddy Creek (44.6388,−123.7951); Felton Creek (44.6626,−123.6502); Haxel Creek (44.6781,−123.8046); Hayes Creek (44.6749,−123.7749); Humphrey Creek (44.6697,−123.6329); Klamath Creek (44.6927,−123.8431); Little Elk Creek (44.6234,−123.6628); Little

Elk Creek,Trib A (44.6196,−123.7583); Little Yaquina River (44.6822,−123.6123); Lytle Creek (44.6440,−123.5979); Miller Creek (44.6055,−123.7030); Oglesby Creek (44.6421,−123.7271); Oglesby Creek, Trib A (44.6368,−123.7100); Peterson Creek (44.6559,−123.7868); Randall Creek (44.6721,−123.6570); Salmon Creek (44.6087,−123.7379); Simpson Creek (44.6775,−123.8780); Sloop Creek (44.6654,−123.8595); Spilde Creek (44.6636,−123.5856); Stony Creek (44.6753,−123.7020); Thornton Creek (44.6923,−123.8208); Trapp Creek (44.6455,−123.8307); Twentythree Creek (44.6887,−123.8751); Unnamed (44.6074,−123.6738); Unnamed (44.6076,−123.7067); Unnamed (44.6077,−123.6633); Unnamed (44.6123,−123.6646); Unnamed (44.6188,−123.7237); Unnamed (44.6202,−123.7201); Unnamed (44.6367,−123.7444); Unnamed (44.6415,−123.6237); Unnamed (44.6472,−123.7793); Unnamed (44.6493,−123.6789); Unnamed (44.6707,−123.7908); Unnamed (44.6715,−123.6907); Unnamed (44.6881,−123.6089); Unnamed (44.6908,−123.7298); Wakefield Creek (44.6336,−123.6963); Yaquina River (44.6894,−123.5907); Young Creek (44.6372,−123.6027).

(ii) *Big Elk Creek Watershed 1710020402*. Outlet(s) = Elk Creek (Lat 44.6219, Long −123.8741) upstream to endpoint(s) in: Adams Creek (44.5206,−123.6349); Baker Creek (44.5230,−123.6346); Bear Creek (44.5966,−123.8299); Beaver Creek (44.6040,−123.7999); Beaverdam Creek (44.5083,−123.6337); Bevens Creek (44.5635,−123.7371); Bull Creek (44.5408,−123.8162); Bull Creek (44.5431,−123.8142); Bull Creek, Trib A (44.5359,−123.8276); Cougar Creek (44.5070,−123.6482); Cougar Creek (44.5861,−123.7563); Deer Creek (44.6020,−123.7667); Devils Well Creek (44.6324,−123.8438); Dixon Creek (44.6041,−123.8659); Elk Creek (44.5075,−123.6022); Feagles Creek (44.4880,−123.7180); Feagles Creek, Trib B (44.5079,−123.6909); Feagles Creek, West Fork (44.5083,−123.7117); Grant Creek (44.5010,−123.7363); Harve Creek (44.5725,−123.8025); Jackass Creek (44.5443,−123.7790); Johnson Creek (44.5466,−123.6336); Lake Creek (44.5587,−123.6826); Leverage Creek (44.5536,−123.6343); Little Creek (44.5548,−123.6980); Little Wolf Creek (44.5590,−123.7165); Peterson Creek (44.5576,−123.6450); Rail Creek (44.5135,−123.6639); Spout Creek (44.5824,−123.6561); Sugarbowl Creek (44.5301,−123.5995); Unnamed (44.5048,−123.7566); Unnamed (44.5085,−123.6309); Unnamed (44.5108,−123.6249); Unnamed (44.5144,−123.6554); Unnamed (44.5204,−123.6148); Unnamed (44.5231,−123.6714); Unnamed (44.5256,−123.6804); Unnamed (44.5325,−123.7244); Unnamed (44.5332,−123.7211); Unnamed (44.5361,−123.7139); Unnamed (44.5370,−123.7643); Unnamed (44.5376,−123.6176); Unnamed (44.5410,−123.8213); Unnamed (44.5504,−123.8290); Unnamed (44.5530,−123.8282); Unnamed (44.5618,−123.8431);

Unnamed (44.5687,−123.8563); Unnamed (44.5718,−123.7256); Unnamed (44.5734,−123.6696); Unnamed (44.5737,−123.6566); Unnamed (44.5771,−123.7027); Unnamed (44.5821,−123.8123); Unnamed (44.5840,−123.6678); Unnamed (44.5906,−123.7871); Unnamed (44.5990,−123.7808); Unnamed (44.5865,−123.8521); Wolf Creek (44.5873,−123.6939); Wolf Creek, Trib A (44.5862,−123.7188); Wolf Creek, Trib B (44.5847,−123.7062).
(iii) *Lower Yaquina River Watershed 1710020403.* Outlet(s) = Yaquina River (Lat 44.6098, Long −124.0818) upstream to endpoint(s) in: Abbey Creek (44.6330,−123.8881); Babcock Creek (44.5873,−123.9221); Beaver Creek (44.6717,−123.9799); Blue Creek (44.6141,−123.9936); Boone Slough, Trib A (44.6134,−123.9769); Depot Creek, Little (44.6935,−123.9482); Depot Creek, Trib A (44.6837,−123.9420); Drake Creek (44.6974,−123.9690); East Fork Mill Creek (44.5691,−123.8834); Flesher Slough (44.5668,−123.9803); King Slough (44.5944,−124.0323); Little Beaver Creek (44.6531,−123.9728); McCaffery Slough (44.5659,−124.0180); Mill Creek (44.5550,−123.9064); Mill Creek, Trib A (44.5828,−123.8750); Montgomery Creek (44.5796,−123.9286); Nute Slough (44.6075,−123.9660); Olalla Creek (44.6810,−123.8972); Olalla Creek, Trib A (44.6511,−123.9034); Parker Slough (44.5889,−124.0119); Unnamed (44.5471,−123.9557); Unnamed (44.5485,−123.9308); Unnamed (44.5520,−123.9433); Unnamed (44.5528,−123.9695); Unnamed (44.5552,−123.9294); Unnamed (44.5619,−123.9348); Unnamed (44.5662,−123.8905); Unnamed (44.5827,−123.9456); Unnamed (44.5877,−123.8850); Unnamed (44.6444,−123.9059); Unnamed (44.6457,−123.9996); Unnamed (44.6530,−123.9914); Unnamed (44.6581,−123.8947); Unnamed (44.6727−123.8942); Unnamed (44.6831,−123.9940); West Olalla Creek (44.6812,−123.9299); West Olalla Creek, Trib A (44.6649,−123.9204); Wessel Creek (44.6988,−123.9863); Wright Creek (44.5506,−123.9250); Wright Creek, Trib A (44.5658,−123.9422); Yaquina River (44.6219,−123.8741).
(iv) *Middle Siletz River Watershed 1710020405.* Outlet(s) = Siletz River (Lat 44.7375, Long −123.7917) upstream to endpoint(s) in: Buck Creek, East Fork (44.8410,−123.7970); Buck Creek, South Fork (44.8233,−123.8095); Buck Creek, West Fork (44.8352,−123.8084); Cerine Creek (44.7478,−123.7198); Deer Creek (44.8245,−123.7268); Deer Creek, Trib A (44.8178,−123.7397); Elk Creek (44.8704,−123.7668); Fourth of July Creek (44.8203,−123.6810); Gunn Creek (44.7816,−123.7679); Holman River (44.8412,−123.7707); Mill Creek, North Fork (44.7769,−123.7361); Mill Creek, South Fork (44.7554,−123.7276); Palmer Creek (44.7936,−123.8344); Siletz River (44.8629,−123.7323); Sunshine Creek (44.7977,−123.6963); Unnamed (44.7691,−123.7851); Unnamed (44.7747,−123.7740); Unnamed (44.7749,−123.7662); Unnamed (44.8118,−123.6926); Unnamed

(44.8188,−123.6995); Unnamed (44.8312,−123.6983); Unnamed (44.8583,−123.7573); Whiskey Creek (44.8123,−123.6937).
(v) *Rock Creek/Siletz River Watershed 1710020406*. Outlet(s) = Rock Creek (Lat 44.7375, Long −123.7917) upstream to endpoint(s) in: Beaver Creek (44.7288,−123.6773); Big Rock Creek (44.7636,−123.6969); Brush Creek (44.6829,−123.6582); Cedar Creek (44.7366,−123.6586); Fisher Creek (44.7149,−123.6359); Little Rock Creek (44.7164,−123.6155); Little Steere Creek (44.7219,−123.6368); Rock Creek, Trib A (44.7414,−123.7508); Steere Creek (44.7336,−123.6313); Unnamed (44.7175,−123.6496); William Creek (44.7391,−123.7277).
(vi) *Lower Siletz River Watershed 1710020407*. Outlet(s) = Siletz Bay (Lat 44.9269, Long −124.0218) upstream to endpoint(s) in: Anderson Creek (44.9311,−123.9508); Bear Creek (44.8682,−123.8891); Bentilla Creek (44.7745,−123.8555); Butterfield Creek (44.8587,−123.9993); Cedar Creek (44.8653,−123.8488); Cedar Creek, Trib D (44.8606,−123.8696); Coon Creek (44.7959,−123.8468); Dewey Creek (44.7255,−123.9724); Drift Creek (44.9385,−123.8211); Erickson Creek (44.9629,−123.9490); Euchre Creek (44.8023,−123.8687); Fowler Creek (44.9271,−123.8440); Gordey Creek (44.9114,−123.9724); Hough Creek (44.8052,−123.8991); Jaybird Creek (44.7640,−123.9733); Long Prairie Creek (44.6970,−123.7499); Long Tom Creek (44.7037,−123.8533); Mann Creek (44.6987,−123.8025); Mill Creek (44.6949,−123.8967); Miller Creek (44.7487,−123.9733); North Creek (44.9279,−123.8908); North Roy Creek (44.7916,−123.9897); Ojalla Creek (44.7489,−123.9427); Quarry Creek (44.8989,−123.9360); Reed Creek (44.8020,−123.8835); Reed Creek (44.8475,−123.9267); Roots Creek (44.8300,−123.9351); South Roy Creek (44.7773,−123.9847); Sam Creek (44.7086,−123.7312); Sampson Creek (44.9089,−123.8173); Savage Creek (44.8021,−123.8608); Scare Creek (44.8246,−123.9954); Schooner Creek, North Fork (44.9661,−123.8793); Schooner Creek, South Fork (44.9401,−123.8689); Scott Creek (44.7414,−123.8268); Sijota Creek (44.8883,−124.0257); Siletz River (44.7375,−123.7917); Skunk Creek (44.8780,−123.9073); Smith Creek (44.9294,−123.8056); Stemple Creek (44.8405,−123.9492); Tangerman Creek (44.7278,−123.8944); Thayer Creek (44.7023,−123.8256); Thompson Creek (44.7520,−123.8893); Unnamed (44.7003,−123.7669); Unnamed (44.8904,−123.8034); Unnamed (44.8927,−123.8400); Unnamed (44.7034,−123.7754); Unnamed (44.7145,−123.8423); Unnamed (44.7410,−123.8800); Unnamed (44.7925,−123.9212); Unnamed (44.8396,−123.8896); Unnamed (44.9035,−123.8635); Unnamed (44.9240,−123.7913); West Fork Mill Creek (44.7119,−123.9703); Wildcat Creek (44.8915,−123.8842).
(vii) *Salmon River/Siletz/Yaquina Bay Watershed 1710020408*. Outlet(s) = Salmon River (Lat 45.0474, Long −124.0031)

upstream to endpoint(s) in: Alder Brook (45.0318,−123.8428); Bear Creek (44.9785,−123.8580); Boulder Creek (45.0428,−123.7817); Calkins Creek (45.0508,−123.9615); Crowley Creek (45.0540,−123.9819); Curl Creek (45.0150,−123.9198); Deer Creek (45.0196,−123.8091); Frazer Creek (45.0096,−123.9576); Gardner Creek (45.0352,−123.9024); Indian Creek (45.0495,−123.8010); Little Salmon River (45.0546,−123.7473); McMullen Creek (44.9829,−123.8682); Panther Creek (45.0208,−123.8878); Panther Creek, North Fork (45.0305,−123.8910); Prairie Creek (45.0535,−123.8129); Rowdy Creek (45.0182,−123.9751); Salmon River (45.0269,−123.7224); Slick Rock Creek (44.9903,−123.8158); Sulphur Creek (45.0403,−123.8216); Telephone Creek (45.0467,−123.9348); Toketa Creek (45.0482,−123.9088); Trout Creek (44.9693,−123.8337); Unnamed (44.9912,−123.8789); Unnamed (45.0370,−123.7333); Unnamed (45.0433,−123.7650); Widow Creek (45.0373,−123.8530); Widow Creek, West Fork (45.0320,−123.8643); Willis Creek (45.0059,−123.9391).

(viii) *Devils Lake/Moolack Frontal Watershed 1710020409*. Outlet(s) = Big Creek (Lat 44.6590, Long −124.0571); Coal Creek (44.7074,−124.0615); D River (44.9684,−124.0172); Fogarty Creek (44.8395,−124.0520); Moolack Creek (44.7033,−124.0622); North Depoe Bay Creek (44.8098,−124.0617); Schoolhouse Creek (44.8734,−124.0401); Spencer Creek (44.7292,−124.0582); Wade Creek (44.7159,−124.0600) upstream to endpoint(s) in: Big Creek (44.6558,−124.0427); Coal Creek (44.7047,−124.0099); Devils Lake (44.9997,−123.9773); Fogarty Creek (44.8563,−124.0153); Jeffries Creek (44.6425,−124.0315); Moolack Creek (44.6931,−124.0150); North Depoe Bay Creek (44.8157,−124.0510); Rock Creek (44.9869,−123.9317); South Depoe Bay Creek (44.7939,−124.0126); Salmon Creek (44.8460,−124.0164); Schoolhouse Creek (44.8634,−124.0151); South Fork Spencer Creek (44.7323,−123.9974); Spencer Creek, North Fork (44.7453,−124.0276); Unnamed (44.8290,−124.0318); Unnamed (44.9544,−123.9867); Unnamed (44.9666,−123.9731); Unnamed (44.9774,−123.9706); Wade Creek (44.7166,−124.0057).

(5) Alsea Subbasin 17100205

(i) *Upper Alsea River Watershed 1710020501*. Outlet(s) = Alsea River, South Fork (Lat 44.3767, Long −123.6024) upstream to endpoint(s) in: Alder Creek (44.4573,−123.5188); Alsea River, South Fork (44.3261,−123.4891); Baker Creek (44.4329,−123.5522); Banton Creek (44.3317,−123.6020); Brown Creek (44.3151,−123.6250); Bummer Creek (44.3020,−123.5765); Cabin Creek (44.4431,−123.5328); Crooked Creek (44.4579,−123.5099); Dubuque Creek (44.3436,−123.5527); Ernest Creek (44.4234,−123.5275); Hayden Creek (44.4062,−123.5815); Honey Grove Creek (44.3874,−123.5078); North Fork Alsea River (44.4527,−123.6102); Parker Creek

(44.4702,−123.5978); Peak Creek (44.3358,−123.4933); Record Creek (44.3254,−123.6331); Seeley Creek (44.4051,−123.5177); Swamp Creek (44.3007,−123.6108); Tobe Creek (44.3273,−123.5719); Trout Creek (44.3684,−123.5163); Unnamed (44.3108,−123.6225); Unnamed (44.3698,−123.5670); Unnamed (44.4574,−123.5001); Unnamed (44.3708,−123.5740); Unnamed (44.3713,−123.5656); Unnamed (44.3788,−123.5528); Unnamed (44.4270,−123.5492); Unnamed (44.4518,−123.6236); Yew Creek (44.4581,−123.5373); Zahn Creek (44.4381,−123.5425).
(ii) *Five Rivers/Lobster Creek Watershed 1710020502.* Outlet(s) = Five Rivers (Lat 44.3584, Long −123.8279) upstream to endpoint(s) in: Alder Creek (44.2947,−123.8105); Bear Creek (44.2824,−123.9123); Bear Creek (44.3588,−123.7930); Bear Creek (44.2589,−123.6647); Briar Creek (44.3184,−123.6602); Buck Creek (44.2428,−123.8989); Camp Creek (44.2685,−123.7552); Cascade Creek (44.3193,−123.9073); Cascade Creek, North Fork (44.3299,−123.8932); Cedar Creek (44.2732,−123.7753); Cherry Creek (44.3061,−123.8140); Coal Creek (44.2881,−123.6484); Cook Creek (44.2777,−123.6445); Cougar Creek (44.2723,−123.8678); Crab Creek (44.2458,−123.8750); Crazy Creek (44.2955,−123.7927); Crooked Creek (44.3154,−123.7986); Elk Creek (44.3432,−123.7969); Fendall Creek (44.2764,−123.7890); Five Rivers (44.2080,−123.8025); Green River (44.2286,−123.8751); Green River, East Fork (44.2255,−123.8143); Jasper Creek (44.2777,−123.7326); Little Lobster Creek (44.2961,−123.6266); Lobster Creek, East Fork (44.2552,−123.5897); Lobster Creek, South Fork (44.2326,−123.6060); Lobster Creek (44.2237,−123.6195); Lord Creek (44.2411,−123.7631); Martha Creek (44.2822,−123.6781); Meadow Creek (44.2925,−123.6591); Phillips Creek (44.3398,−123.7613); Preacher Creek (44.2482,−123.7440); Prindel Creek (44.2346,−123.7849); Ryan Creek (44.2576,−123.7971); Summers Creek (44.2589,−123.7627); Swamp Creek (44.3274,−123.8407); Unnamed (44.2845,−123.7007); Unnamed (44.2129,−123.7919); Unnamed (44.2262,−123.7982); Unnamed (44.2290,−123.8559); Unnamed (44.2327,−123.8344); Unnamed (44.2356,−123.8178); Unnamed (44.2447,−123.6460); Unnamed (44.2500,−123.8074); Unnamed (44.2511,−123.9011); Unnamed (44.2551,−123.8733); Unnamed (44.2614,−123.8652); Unnamed (44.2625,−123.8635); Unnamed (44.2694,−123.8180); Unnamed (44.2695,−123.7429); Unnamed (44.2696,−123.8497); Unnamed (44.2752,−123.7616); Unnamed (44.2760,−123.7121); Unnamed (44.2775,−123.8895); Unnamed (44.2802,−123.7097); Unnamed (44.2802,−123.8608); Unnamed (44.2823,−123.7900); Unnamed (44.2853,−123.7537); Unnamed (44.2895,−123.9083); Unnamed (44.2940,−123.7358); Unnamed (44.2954,−123.7602); Unnamed (44.2995,−123.7760); Unnamed (44.3024,−123.9064); Unnamed (44.3066,−123.8838); Unnamed (44.3070,−123.8280);

Unnamed (44.3129,−123.7763); Unnamed (44.3214,−123.8161); Unnamed (44.3237,−123.9020); Unnamed (44.3252,−123.7382); Unnamed (44.3289,−123.8354); Unnamed (44.3336,−123.7431); Unnamed (44.3346,−123.7721); Wilkinson Creek (44.3296,−123.7249); Wilson Creek (44.3085,−123.8990).

(iii) *Drift Creek Watershed 1710020503*. Outlet(s) = Drift Creek (Lat 44.4157, Long −124.0043) upstream to endpoint(s) in: Boulder Creek (44.4434,−123.8705); Bush Creek (44.5315,−123.8631); Cape Horn Creek (44.5153,−123.7844); Cedar Creek (44.4742,−123.9699); Cougar Creek (44.4405,−123.9144); Deer Creek (44.5514,−123.8778); Drift Creek (44.4688,−123.7859); Ellen Creek (44.4415,−123.9413); Flynn Creek (44.5498,−123.8520); Gold Creek (44.4778,−123.8802); Gopher Creek (44.5217,−123.7787); Horse Creek (44.5347,−123.9072); Lyndon Creek (44.4395,−123.9801); Needle Branch (44.5154,−123.8537); Nettle Creek (44.4940,−123.7845); Slickrock Creek (44.4757,−123.9007); Trout Creek (44.4965,−123.9113); Trout Creek, East Fork (44.4705,−123.9290); Unnamed (44.4995,−123.8488); Unnamed (44.4386,−123.9200); Unnamed (44.4409,−123.8738); Unnamed (44.4832,−123.9570); Unnamed (44.4868,−123.9340); Unnamed (44.4872,−123.9518); Unnamed (44.4875,−123.9460); Unnamed (44.4911,−123.9227); Unnamed (44.5187,−123.7996); Unnamed (44.5260,−123.7848); Unnamed (44.5263,−123.8868); Unnamed (44.5326,−123.8453); Unnamed (44.5387,−123.8440); Unnamed (44.5488,−123.8694); Unnamed (44.4624,−123.8216).

(iv) *Lower Alsea River Watershed 1710020504*. Outlet(s) = Alsea River (Lat 44.4165, Long −124.0829) upstream to endpoint(s) in: Alsea River (44.3767,−123.6024); Arnold Creek (44.3922,−123.9503); Barclay Creek (44.4055,−123.8659); Bear Creek (44.3729,−123.9623); Bear Creek (44.3843,−123.7704); Beaty Creek (44.4044,−123.6043); Benner Creek (44.3543,−123.7447); Brush Creek (44.3826,−123.8537); Bull Run Creek (44.4745,−123.7439); Canal Creek (44.3322,−123.9460); Canal Creek, East Fork (44.3454,−123.9161); Carns Canyon (44.4027,−123.7550); Cedar Creek (44.3875,−123.7946); Cove Creek (44.4403,−123.7107); Cow Creek (44.3620,−123.7510); Darkey Creek (44.3910,−123.9927; Digger Creek (44.3906,−123.6890); Fall Creek (44.4527,−123.6864); Fall Creek (44.4661,−123.6933); George Creek (44.3556,−123.8603); Grass Creek (44.3577,−123.8798); Hatchery Creek (44.3952,−123.7269); Hatchery Creek (44.4121,−123.8734); Hoover Creek (44.3618,−123.8583); Lake Creek (44.3345,−123.8725); Lint Creek (44.3850,−124.0490); Maltby Creek (44.3833,−123.6770); Meadow Fork (44.3764,−123.8879); Mill Creek (44.4046,−123.6436); Minotti Creek (44.3750,−123.7718); Nye Creek (44.4326,−123.7648); Oxstable Creek (44.3912,−123.9603); Phillips Creek (44.3803,−123.7780); Red Creek (44.3722,−123.9162); Risley Creek

(44.4097,−123.9380); Schoolhouse Creek (44.3897,−123.6545); Scott Creek, East Fork (44.4252,−123.7897); Scott Creek, West Fork (44.4212,−123.8225); Skinner Creek (44.3585,−123.9374); Skunk Creek (44.3998,−123.6912); Slide Creek (44.3986,−123.8419); Starr Creek (44.4477,−124.0130); Sudan Creek (44.3817,−123.9717); Sulmon Creek (44.3285,−123.7008); Sulmon Creek, North Fork (44.3421,−123.6374); Sulmon Creek, South Fork (44.3339,−123.6709); Swede Fork (44.3852,−124.0295); Unnamed (44.3319,−123.9318); Unnamed (44.3356,−123.9464); Unnamed (44.3393,−123.9360); Unnamed (44.3413,−123.9294); Unnamed (44.3490,−123.9058); Unnamed (44.3548,−123.6574); Unnamed (44.3592,−123.6363); Unnamed (44.3597,−123.9042); Unnamed (44.3598,−123.6563); Unnamed (44.3598,−123.6562); Unnamed (44.3600,−123.6514); Unnamed (44.3656,−123.9085); Unnamed (44.3680,−123.9629); Unnamed (44.3794,−123.8268); Unnamed (44.3800,−123.9134); Unnamed (44.3814,−123.7650); Unnamed (44.3822,−124.0555); Unnamed (44.3823,−124.0451); Unnamed (44.3989,−123.6050); Unnamed (44.4051,−124.0527); Unnamed (44.4166,−123.8149); Unnamed (44.4537,−123.7247); Walker Creek (44.4583,−124.0271); Weist Creek (44.3967,−124.0256); West Creek (44.3588,−123.9493).

(v) *Beaver Creek/Waldport Bay Watershed 1710020505*. Outlet(s) = Beaver Creek (Lat 44.5233, Long −124.0734); Deer Creek (44.5076,−124.0807); Thiel Creek (44.5646,−124.0709) upstream to endpoint(s) in: Beaver Creek, North Fork, Trib G (44.5369,−123.9195); Beaver Creek, South Fork (44.4816,−123.9853); Beaver Creek, South Fork, Trib A (44.4644,−124.0332); Bowers Creek (44.5312,−124.0117); Bunnel Creek (44.5178,−124.0265); Deer Creek (44.5057,−124.0721); Elkhorn Creek (44.5013,−123.9572); Elkhorn Creek (44.4976,−123.9685); Lewis Creek (44.5326,−123.9532); North Fork Beaver Creek (44.5149,−123.8988); Oliver Creek (44.4660,−124.0471); Peterson Creek (44.5419,−123.9738); Pumphouse Creek (44.5278,−124.0569); Simpson Creek (44.5255,−124.0390); Thiel Creek (44.5408,−124.0254); Tracy Creek (44.5411,−124.0500); Unnamed (44.4956,−123.9751); Unnamed (44.5189,−124.0638); Unnamed (44.5225,−123.9313); Unnamed (44.5256,−123.9399); Unnamed (44.5435,−124.0221); Unnamed (44.5461,−124.0311); Unnamed (44.5472,−124.0591); Unnamed (44.5482,−124.0249); Unnamed (44.5519,−124.0279); Unnamed (44.5592,−124.0531); Worth Creek (44.5013,−124.0207).

(vi) *Yachats River Watershed 1710020506*. Outlet(s) = Yachats River (Lat 44.3081, Long −124.1070) upstream to endpoint(s) in: Axtell Creek (44.3084,−123.9915); Beamer Creek (44.3142,−124.0124); Bend Creek (44.2826,−124.0077); Carson Creek (44.3160,−124.0030); Dawson Creek (44.2892,−124.0133); Depew Creek (44.3395,−123.9631); Earley Creek (44.3510,−123.9885); Fish Creek (44.3259,−123.9592); Glines Creek (44.3436,−123.9756); Grass Creek

(44.2673,–123.9109); Helms Creek (44.2777,–123.9954); Keller Creek (44.2601,–123.9485); Little Beamer Creek (44.2993,–124.0213); Reedy Creek (44.3083,–124.0460); South Beamer Creek (44.2852,–124.0325); Stump Creek (44.2566,–123.9624); Unnamed (44.2596,–123.9279); Unnamed (44.2657,–123.9585); Unnamed (44.2660,–123.9183); Unnamed (44.2684,–123.9711); Unnamed (44.2837,–123.9268); Unnamed (44.2956,–123.9316); Unnamed (44.3005,–123.9324); Unnamed (44.3163,–123.9428); Unnamed (44.3186,–123.9568); Unnamed (44.3259,–123.9578); Unnamed (44.3431,–123.9711); West Fork Williamson Creek (44.3230,–124.0008); Williamson Creek (44.3300,–124.0026); Yachats River (44.2468,–123.9329); Yachats River, North Fork (44.3467,–123.9972); Yachats River, School Fork (44.3145,–123.9341).

(vii) *Cummins Creek/Tenmile Creek/Mercer Lake Frontal Watershed 1710020507*. Outlet(s) = Berry Creek (Lat 44.0949, Long –124.1221); Big Creek (44.1767,–124.1148); Bob Creek (44.2448,–124.1118); Cape Creek (44.1336,–124.1211); Cummins Creek (44.2660,–124.1075); Rock Creek (44.1833,–124.1149); Sutton Creek (44.0605,–124.1269); Tenmile Creek (44.2245,–124.1083) upstream to endpoint(s) in: Bailey Creek (44.1037,–124.0530); Berry Creek (44.0998,–124.0885); Big Creek (44.1866,–123.9781); Big Creek, South Fork (44.1692,–123.9688); Big Creek, Trib A (44.1601,–124.0231); Bob Creek (44.2346,–124.0235); Cape Creek (44.1351,–124.0174); Cape Creek, North Fork (44.1458,–124.0489); Cummins Creek (44.2557,–124.0104); Fryingpan Creek (44.1723,–124.0401); Levage Creek (44.0745,–124.0588); Little Cummins Creek (44.2614,–124.0851); McKinney Creek (44.2187,–123.9985); Mercer Creek (44.0712,–124.0796); Mill Creek (44.2106,–124.0747); Quarry Creek (44.0881,–124.1124); Rath Creek (44.0747,–124.0901); Rock Creek (44.1882,–124.0310); Tenmile Creek (44.2143,–123.9351); Tenmile Creek, South Fork (44.2095,–123.9607); Unnamed (44.1771,–124.0908); Unnamed (44.0606,–124.0805); Unnamed (44.0624,–124.0552); Unnamed (44.0658,–124.0802); Unnamed (44.0690,–124.0490); Unnamed (44.0748,–124.0478); Unnamed (44.0814,–124.0464); Unnamed (44.0958,–124.0559); Unnamed (44.1283,–124.0242); Unnamed (44.1352,–124.0941); Unnamed (44.1712,–124.0558); Unnamed (44.1715,–124.0636); Unnamed (44.2011,–123.9634); Unnamed (44.2048,–123.9971); Unnamed (44.2146,–124.0358); Unnamed (44.2185,–124.0270); Unnamed (44.2209,–123.9368); Wapiti Creek (44.1216,–124.0448); Wildcat Creek (44.2339,–123.9632).

(viii) *Big Creek/Vingie Creek Watershed 1710020508*. Outlet(s) = Big Creek (Lat 44.3742, Long –124.0896) upstream to endpoint(s) in: Big Creek (44.3564,–124.0613); Dicks Fork Big Creek (44.3627,–124.0389); Reynolds Creek (44.3768,–124.0740); South Fork Big Creek

(44.3388,−124.0597); Unnamed (44.3643,−124.0355); Unnamed (44.3662,−124.0573); Unnamed (44.3686,−124.0683).

(6) Siuslaw Subbasin 17100206

(i) *Upper Siuslaw River Watershed 1710020601.* Outlet(s) = Siuslaw River (Lat 44.0033, Long −123.6545) upstream to endpoint(s) in: Bear Creek (43.8482,−123.5172); Bear Creek, Trib A (43.8496,−123.5059); Bierce Creek (43.8750,−123.5559); Big Canyon Creek (43.9474,−123.6582); Bottle Creek (43.8791,−123.3871); Bounds Creek (43.9733,−123.7108); Buck Creek, Trib B (43.8198,−123.3913); Buck Creek, Trib E (43.8152,−123.4248); Burntwood Creek (43.9230,−123.5342); Cabin Creek (43.8970,−123.6754); Camp Creek (43.9154,−123.4904); Canyon Creek (43.9780,−123.6096); Clay Creek (43.8766,−123.5721); Collins Creek (43.8913,−123.6047); Conger Creek (43.8968,−123.4524); Doe Creek (43.8957,−123.3558); Doe Hollow Creek (43.8487,−123.4603); Dogwood Creek (43.8958,−123.3811); Douglas Creek (43.8705,−123.2836); Edris Creek (43.9224,−123.5531); Esmond Creek (43.8618,−123.5772); Esmond Creek, Trib 1 (43.9303,−123.6518); Esmond Creek, Trib A (43.8815,−123.6646); Farman Creek (43.8761,−123.2562); Fawn Creek (43.8743,−123.2992); Fawn Creek (43.9436,−123.6088); Fryingpan Creek (43.8329,−123.4241); Fryingpan Creek (43.8422,−123.4318); Gardner Creek (43.8024,−123.2582); Haight Creek (43.8406,−123.4862); Haskins Creek (43.8785,−123.5851); Hawley Creek (43.8599,−123.1558); Hawley Creek, North Fork (43.8717,−123.1751); Holland Creek (43.8775,−123.4156); Jeans Creek (43.8616,−123.4714); Johnson Creek (43.8822,−123.5332); Kelly Creek (43.8338,−123.1739); Kline Creek (43.9034,−123.6635); Leopold Creek (43.9199,−123.6890); Leopold Creek, Trib A (43.9283,−123.6630); Letz Creek, Trib B (43.7900,−123.3248); Lick Creek (43.8366,−123.2695); Little Siuslaw Creek (43.8048,−123.3412); Lucas Creek (43.8202,−123.2233); Luyne Creek (43.9155,−123.5068); Luyne Creek, Trib A (43.9179,−123.5208); Michaels Creek (43.8624,−123.5417); Mill Creek (43.9028,−123.6228); Norris Creek (43.8434,−123.2006); North Creek (43.9223,−123.5752); North Fork Siuslaw River (43.8513,−123.2302); Oxbow Creek (43.8384,−123.5433); Oxbow Creek, Trib C (43.8492,−123.5465); Pheasant Creek (43.9120,−123.4247); Pheasant Creek, Trib 2 (43.9115,−123.4411); Pugh Creek (43.9480,−123.5940); Russell Creek (43.8813,−123.3425); Russell Creek, Trib A (43.8619,−123.3498); Sandy Creek (43.7684,−123.2441); Sandy Creek, Trib B (43.7826,−123.2538); Shaw Creek (43.8817,−123.3289); Siuslaw River, East Trib (43.8723,−123.5378); Siuslaw River, North Fork, Upper Trib (43.8483,−123.2275); Smith Creek (43.8045,−123.3665); South Fork Siuslaw River (43.7831,−123.1569); Trail Creek (43.9142,−123.6241); Tucker Creek (43.8159,−123.1604); Unnamed (43.7796,−123.2019); Unnamed (43.7810,−123.2818); Unnamed (43.8278,−123.2610);

Unnamed (43.8519,–123.2773); Unnamed (43.8559,–123.5520); Unnamed (43.8670,–123.6022); Unnamed (43.8876,–123.5194); Unnamed (43.8902,–123.5609); Unnamed (43.8963,–123.4171); Unnamed (43.8968,–123.4731); Unnamed (43.8992,–123.4033); Unnamed (43.9006,–123.4637); Unnamed (43.9030,–123.6434); Unnamed (43.9492,–123.6924); Unnamed (43.9519,–123.6886); Unnamed (43.9784,–123.6815); Unnamed (43.9656,–123.7145); Whittaker Creek (43.9490,–123.7004); Whittaker Creek, Trib B (43.9545,–123.7121).

(ii) *Wolf Creek Watershed 1710020602*. Outlet(s) = Wolf Creek (Lat 43.9548, Long –123.6205) upstream to endpoint(s) in: Bill Lewis Creek (43.9357,–123.5708); Cabin Creek (43.9226,–123.4081); Eames Creek (43.9790,–123.4352); Eames Creek, Trib C (43.9506,–123.4371); Elkhorn Creek (43.9513,–123.3934); Fish Creek (43.9238,–123.3872); Gall Creek (43.9865,–123.5187); Gall Creek, Trib 1 (43.9850,–123.5285); Grenshaw Creek (43.9676,–123.4645); Lick Creek (43.9407,–123.5796); Oat Creek, Trib A (43.9566,–123.5052); Oat Creek, Trib C (43.9618,–123.4902); Oat Creek (43.9780,–123.4761); Panther Creek (43.9529,–123.3744); Pittenger Creek (43.9713,–123.5434); Saleratus Creek (43.9796,–123.5675); Saleratus Creek, Trib A (43.9776,–123.5797); Swamp Creek (43.9777,–123.4197); Swing Log Creek (43.9351,–123.3339); Unnamed (43.9035,–123.3358); Unnamed (43.9343,–123.3648); Unnamed (43.9617,–123.4507); Unnamed (43.9668,–123.6041); Unnamed (43.9693,–123.4846); Van Curen Creek (43.9364,–123.5520); Wolf Creek (43.9101,–123.3234).

(iii) *Wildcat Creek Watershed 1710020603*. Outlet(s) = Wildcat Creek (Lat 44.0033, Long –123.6545) upstream to endpoint(s) in: Bulmer Creek (44.0099,–123.5206); Cattle Creek (44.0099,–123.5475); Fish Creek (44.0470,–123.5383); Fowler Creek (43.9877,–123.5918); Haynes Creek (44.1000,–123.5578); Kirk Creek (44.0282,–123.6270); Knapp Creek (44.1006,–123.5801); Miller Creek (44.0767,–123.6034); Pataha Creek (43.9914,–123.5361); Potato Patch Creek (43.9936,–123.5812); Salt Creek (44.0386,–123.5021); Shady Creek (44.0647,–123.5838); Shultz Creek (44.0220,–123.6320); Unnamed (43.9890,–123.5468); Unnamed (44.0210,–123.4805); Unnamed (44.0233,–123.4996); Unnamed (44.0242,–123.4796); Unnamed (44.0253,–123.4963); Unnamed (44.0283,–123.5311); Unnamed (44.0305,–123.5275); Unnamed (44.0479,–123.6199); Unnamed (44.0604,–123.5624); Unnamed (44.0674,–123.6075); Unnamed (44.0720,–123.5590); Unnamed (44.0839,–123.5777); Unnamed (44.0858,–123.5787); Unnamed (44.0860,–123.5741); Unnamed (44.0865,–123.5935); Unnamed (44.0945,–123.5838); Unnamed (44.0959,–123.5902); Walker Creek (44.0469,–123.6312); Walker Creek, Trib C (44.0418,–123.6048); Wildcat Creek

(43.9892,−123.4308); Wildcat Creek, Trib ZH (43.9924,−123.4975); Wildcat Creek, Trib ZI (44.0055,−123.4681).

(iv) *Lake Creek Watershed 1710020604*. Outlet(s) = Lake Creek (Lat 44.0556, Long −123.7968) upstream to endpoint(s) in: Chappell Creek (44.1158,−123.6921); Conrad Creek (44.1883,−123.4918); Druggs Creek (44.1996,−123.5926); Fish Creek (44.1679,−123.5149); Green Creek (44.1389,−123.7930); Greenleaf Creek (44.1766,−123.6391); Hula Creek (44.1202,−123.7087); Johnson Creek (44.1037,−123.7327); Lake Creek (44.2618,−123.5148); Lamb Creek (44.1401,−123.5991); Leaver Creek (44.0754,−123.6285); Leibo Canyon (44.2439,−123.4648); Little Lake Creek (44.1655,−123.6004); McVey Creek (44.0889,−123.6875); Nelson Creek (44.1229,−123.5558); North Fork Fish Creek (44.1535,−123.5437); Pontius Creek (44.1911,−123.5909); Pope Creek (44.2118,−123.5319); Post Creek (44.1828,−123.5259); Stakely Canyon (44.2153,−123.4690); Steinhauer Creek (44.1276,−123.6594); Swamp Creek (44.2150,−123.5687); Swartz Creek (44.2304,−123.4461); Target Canyon (44.2318,−123.4557); Unnamed (44.1048,−123.6540); Unnamed (44.1176,−123.5846); Unnamed (44.1355,−123.5473); Unnamed (44.1355,−123.6125); Unnamed (44.1382,−123.5539); Unnamed (44.1464,−123.5843); Unnamed (44.1659,−123.5658); Unnamed (44.1725,−123.5981); Unnamed (44.1750,−123.5914); Unnamed (44.1770,−123.5697); Unnamed (44.1782,−123.5419); Unnamed (44.1798,−123.5834); Unnamed (44.1847,−123.5862); Unnamed (44.2042,−123.5700); Unnamed (44.2143,−123.5873); Unnamed (44.2258,−123.4493); Unnamed (44.2269,−123.5478); Unnamed (44.2328,−123.5285); Unnamed (44.2403,−123.5358); Unnamed (44.2431,−123.5105); Unnamed (44.2437,−123.5739); Unnamed (44.2461,−123.5180); Unnamed (44.2484,−123.5501); Unnamed (44.2500,−123.5691); Unnamed (44.2573,−123.4736); Unnamed (44.2670,−123.4840); Wheeler Creek (44.1232,−123.6778).

(v) *Deadwood Creek Watershed 1710020605*. Outlet(s) = Deadwood Creek (Lat 44.0949, Long −123.7594) upstream to endpoint(s) in: Alpha Creek (44.1679,−123.6951); Bear Creek (44.1685,−123.6627); Bear Creek, South Fork (44.1467,−123.6743); Buck Creek (44.2003,−123.6683); Deadwood Creek (44.2580,−123.6885); Deadwood Creek, West Fork (44.1946,−123.8023); Deer Creek (44.1655,−123.7229); Failor Creek (44.1597,−123.8003); Fawn Creek (44.2356,−123.7244); Karlstrom Creek (44.1776,−123.7133); Misery Creek (44.1758,−123.7950); North Fork Panther Creek (44.2346,−123.7362); Panther Creek (44.2273,−123.7558); Raleigh Creek (44.1354,−123.6926); Rock Creek (44.1812,−123.6683); Schwartz Creek (44.1306,−123.7258); Unnamed (44.2011,−123.7273); Unnamed (44.1806,−123.7693); Unnamed (44.1845,−123.6824); Unnamed (44.1918,−123.7521); Unnamed (44.1968,−123.7664); Unnamed (44.2094,−123.6674); Unnamed

(44.2149,–123.7639); Unnamed (44.2451,–123.6705); Unnamed (44.2487,–123.7137); Unnamed (44.2500,–123.6933).

(vi) *Indian Creek/Lake Creek Watershed 1710020606*. Outlet(s) = Indian Creek (Lat 44.0808, Long –123.7891) upstream to endpoint(s) in: Cremo Creek (44.1424,–123.8144); Elk Creek (44.1253,–123.8821); Gibson Creek (44.1548,–123.8132); Herman Creek (44.2089,–123.8220); Indian Creek (44.2086,–123.9171); Indian Creek, North Fork (44.2204,–123.9016); Indian Creek, West Fork (44.2014,–123.9075); Long Creek (44.1395,–123.8800); Maria Creek (44.1954,–123.9219); Pyle Creek (44.1792,–123.8623); Rogers Creek (44.1851,–123.9397); Smoot Creek (44.1562,–123.8449); Taylor Creek (44.1864,–123.8115); Unnamed (44.1643,–123.8993); Unnamed (44.1727,–123.8154); Unnamed (44.1795,–123.9180); Unnamed (44.1868,–123.9002); Unnamed (44.1905,–123.8633); Unnamed (44.1967,–123.8872); Unnamed (44.2088,–123.8381); Unnamed (44.2146,–123.8528); Unnamed (44.2176,–123.8462); Unnamed (44.2267,–123.8912); Velvet Creek (44.1295,–123.8087).

(vii) *North Fork Siuslaw River Watershed 1710020607*. Outlet(s) = North Fork Siuslaw River (Lat 43.9719, Long –124.0783) upstream to endpoint(s) in: Billie Creek (44.0971,–124.0362); Cataract Creek (44.0854,–123.9497); Cedar Creek (44.1534,–123.9045); Condon Creek (44.1138,–123.9984); Coon Creek (44.0864,–124.0318); Deer Creek (44.1297,–123.9475); Drew Creek (44.1239,–123.9801); Drew Creek (44.1113,–123.9854); Elma Creek (44.1803,–123.9434); Hanson Creek (44.0776,–123.9328); Haring Creek (44.0307,–124.0462); Lawrence Creek (44.1710,–123.9504); Lindsley Creek (44.0389,–124.0591); McLeod Creek (44.1050,–123.8805); Morris Creek (44.0711,–124.0308); Porter Creek (44.1490,–123.9641); Russell Creek (44.0680,–123.9848); Sam Creek (44.1751,–123.9527); Slover Creek (44.0213,–124.0531); South Russell Creek (44.0515,–123.9840); Taylor Creek (44.1279,–123.9052); Uncle Creek (44.1080,–124.0174); Unnamed (43.9900,–124.0784); Unnamed (43.9907,–124.0759); Unnamed (43.9953,–124.0514); Unnamed (43.9958,–124.0623); Unnamed (43.9999,–124.0694); Unnamed (44.0018,–124.0596); Unnamed (44.0050,–124.0556); Unnamed (44.0106,–124.0650); Unnamed (44.0135,–124.0609); Unnamed (44.0166,–124.0371); Unnamed (44.0194,–124.0631); Unnamed (44.0211,–124.0663); Unnamed (44.0258,–124.0594); Unnamed (44.0304,–124.0129); Unnamed (44.0327,–124.0670); Unnamed (44.0337,–124.0070); Unnamed (44.0342,–124.0056); Unnamed (44.0370,–124.0391); Unnamed (44.0419,–124.0013); Unnamed (44.0441,–124.0321); Unnamed (44.0579,–124.0077); Unnamed (44.0886,–124.0192); Unnamed (44.0892,–123.9925); Unnamed (44.0941,–123.9131); Unnamed (44.0976,–124.0033); Unnamed (44.1046,–123.9032); Unnamed (44.1476,–123.8959); Unnamed (44.1586,–123.9150); West

Branch North Fork Siuslaw River (44.1616,–123.9616); Wilhelm Creek (44.1408,–123.9774).

(viii) *Lower Siuslaw River Watershed 1710020608*. Outlet(s) = Siuslaw River (Lat 44.0160, Long –124.1327) upstream to endpoint(s) in: Barber Creek (44.0294,–123.7598); Beech Creek (44.0588,–123.6980); Berkshire Creek (44.0508,–123.8890); Bernhardt Creek (43.9655,–123.9532); Brush Creek (44.0432,–123.7798); Brush Creek, East Fork (44.0414,–123.7782); Cedar Creek (43.9696,–123.9304); Cleveland Creek (44.0773,–123.8343); Demming Creek (43.9643,–124.0313); Dinner Creek (44.0108,–123.8069); Divide Creek (44.0516,–123.9421); Duncan Inlet (44.0081,–123.9921); Hadsall Creek (43.9846,–123.8221); Hadsall Creek, Trib D (43.9868,–123.8500); Hadsall Creek, Trib E (43.9812,–123.8359); Hanson Creek (44.0364,–123.9628); Hoffman Creek (43.9808,–123.9412); Hollenbeck Creek (44.0321,–123.8672); Hood Creek (43.9996,–123.7995); Karnowsky Creek (43.9847,–123.9658); Knowles Creek (43.9492,–123.7315); Knowles Creek, Trib L (43.9717,–123.7830); Lawson Creek, Trib B (43.9612,–123.9659); Meadow Creek (44.0311,–123.6490); Munsel Creek (44.0277,–124.0788); Old Man Creek (44.0543,–123.8022); Pat Creek (44.0659,–123.7245); Patterson Creek (43.9984,–124.0234); Rice Creek (44.0075,–123.8519); Rock Creek (44.0169,–123.6512); South Fork Waite Creek (43.9929,–123.7105); San Antone Creek (44.0564,–123.6515); Shoemaker Creek (44.0669,–123.8977); Shutte Creek (43.9939,–124.0339); Siuslaw River (44.0033,–123.6545); Skunk Hollow (43.9830,–124.0626); Smith Creek (44.0393,–123.6674); Spencer Creek (44.0676,–123.8809); Sulphur Creek (43.9822,–123.8015); Sweet Creek (43.9463,–123.9016); Sweet Creek, Trib A (44.0047,–123.8907); Sweet Creek, Trib D (43.9860,–123.8811); Thompson Creek (44.0974,–123.8615); Turner Creek (44.0096,–123.7607); Unnamed (43.9301,–124.0434); Unnamed (43.9596,–124.0337); Unnamed (43.9303,–124.0487); Unnamed (43.9340,–124.0529); Unnamed (43.9367,–124.0632); Unnamed (43.9374,–124.0442); Unnamed (43.9481,–124.0530); Unnamed (43.9501,–124.0622); Unnamed (43.9507,–124.0533); Unnamed (43.9571,–124.0658); Unnamed (43.9576,–124.0491); Unnamed (43.9587,–124.0988); Unnamed (43.9601,–124.0927); Unnamed (43.9615,–124.0527); Unnamed (43.9618,–124.0875); Unnamed (43.9624,–123.7499); Unnamed (43.9662,–123.7639); Unnamed (43.9664,–123.9252); Unnamed (43.9718,–124.0389; Unnamed (43.9720,–124.0075); Unnamed (43.9751,–124.0090); Unnamed (43.9784,–124.0191); Unnamed (43.9796,–123.9150); Unnamed (43.9852,–123.9802); Unnamed (43.9878,–123.9845); Unnamed (43.9915,–123.9732); Unnamed (43.9938,–123.9930); Unnamed (43.9942,–123.8547); Unnamed (43.9943,–123.9891); Unnamed (43.9954,–124.1185); Unnamed (43.9956,–123.7074);

Unnamed (43.9995,−123.9825); Unnamed (44.0023,−123.7317); Unnamed (44.0210,−123.7874); Unnamed (44.0240,−123.8989); Unnamed (44.0366,−123.7363); Unnamed (44.0506,−123.9068); Waite Creek (43.9886,−123.7220); Walker Creek (44.0566,−123.9129); Wilson Creek (44.0716,−123.8792).

(7) Siltcoos Subbasin 17100207

(i) *Waohink River/Siltcoos River/Tahkenitch Lake Frontal Watershed 1710020701.* Outlet(s) = Siltcoos River (Lat 43.8766, Long −124.1548); Tahkenitch Creek (43.8013,−124.1689) upstream to endpoint(s) in: Alder Creek (43.8967,−124.0114); Bear Creek (43.9198,−123.9293); Bear Creek Trib (43.9030,−123.9881); Bear Creek, South Fork (43.9017,−123.9555); Bell Creek (43.8541,−123.9718); Billy Moore Creek (43.8876,−123.9604); Carle Creek (43.9015,−124.0210); Carter Creek (43.9457,−124.0123); Dismal Swamp (43.8098,−124.0871); Elbow Lake Creek (43.7886,−124.1490); Fiddle Creek (43.9132,−123.9164); Fivemile Creek (43.8297,−123.9776); Grant Creek (43.9373,−124.0278); Harry Creek (43.8544,−124.0220); Henderson Canyon (43.8648,−123.9654); Henderson Creek (43.9427,−123.9704); John Sims Creek (43.8262,−124.0792); King Creek (43.8804,−124.0300); Lane Creek (43.8437,−124.0765); Leitel Creek (43.8181,−124.0200); Mallard Creek (43.7775,−124.0852); Maple Creek (43.9314,−123.9316); Maple Creek, North Prong (43.9483,−123.9510); Miles Canyon (43.8643,−124.0097); Miller Creek (43.9265,−124.0663); Mills Creek (43.8966,−124.0397); Morris Creek (43.8625,−123.9541); Perkins Creek (43.8257,−124.0448); Rider Creek (43.9210,−123.9700); Roache Creek (43.9087,−124.0049); Schrum Creek (43.9194,−124.0492); Schultz Creek (43.9245,−123.9371); Stokes Creek (43.9161,−123.9984); Tenmile Creek (43.9419,−123.9447); Unnamed (43.8928,−124.0461); Unnamed (43.7726,−124.1021); Unnamed (43.7741,−124.1313); Unnamed (43.7756,−124.1363); Unnamed (43.7824,−124.1342); Unnamed (43.7829,−124.0852); Unnamed (43.7837,−124.0812); Unnamed (43.7849,−124.0734); Unnamed (43.7862,−124.0711); Unnamed (43.7865,−124.1107); Unnamed (43.7892,−124.1163); Unnamed (43.7897,−124.0608); Unnamed (43.7946,−124.0477); Unnamed (43.7964,−124.0643); Unnamed (43.8015,−124.0450); Unnamed (43.8078,−124.0340); Unnamed (43.8095,−124.1362); Unnamed (43.8112,−124.0608); Unnamed (43.8152,−124.0981); Unnamed (43.8153,−124.1314); Unnamed (43.8172,−124.0752); Unnamed (43.8231,−124.0853); Unnamed (43.8321,−124.0128); Unnamed (43.8322,−124.0069); Unnamed (43.8323,−124.1016); Unnamed (43.8330,−124.0217); Unnamed (43.8361,−124.1209); Unnamed (43.8400,−123.9802); Unnamed (43.8407,−124.1051); Unnamed (43.8489,−124.0634); Unnamed (43.8500,−123.9852); Unnamed (43.8504,−124.1248); Unnamed (43.8504,−124.0024); Unnamed (43.8507,−124.0511); Unnamed (43.8589,−124.1231); Unnamed

(43.8596,−124.0438); Unnamed (43.8605,−124.1211); Unnamed (43.8669,−124.0717); Unnamed (43.8670,−124.0327); Unnamed (43.8707,−124.0689); Unnamed (43.8802,−124.0605); Unnamed (43.8862,−124.0570); Unnamed (43.8913,−123.9380); Unnamed (43.8919,−124.0771); Unnamed (43.8976,−124.0725); Unnamed (43.9032,−124.0651); Unnamed (43.9045,−124.0548); Unnamed (43.9057,−124.0606); Unnamed (43.9065,−124.0656); Unnamed (43.9105,−124.0453); Unnamed (43.9106,−124.0203); Unnamed (43.9202,−124.0786); Unnamed (43.9209,−124.0734); Unnamed (43.9237,−124.0155); Unnamed (43.9249,−124.0074); Unnamed (43.9274,−124.0759); Unnamed (43.9275,−124.0308); Unnamed (43.9360,−124.0892); Unnamed (43.9365,−124.0297); Unnamed (43.9424,−124.0981); Unnamed (43.9438,−124.0929); Unnamed (43.9453,−124.0752); Unnamed (43.9518,−123.9953).

(8) North Fork Umpqua Subbasin 17100301—(i) *Boulder Creek Watershed 1710030106.* Outlet(s) = Boulder Creek (Lat 43.3036, Long −122.5272) upstream to endpoint(s) in: Boulder Creek (Lat 43.3138, Long −122.5247)

(ii) *Middle North Umpqua Watershed 1710030107.* Outlet(s) = North Umpqua River (Lat 43.3322, Long −123.0025) upstream to endpoint(s) in: Calf Creek (43.2852,−122.6229); Copeland Creek (43.2853,−122.5325); Deception Creek (43.2766,−122.5850); Dry Creek (43.2967,−122.6016); Honey Creek (43.3181,−122.9414); Limpy Creek (43.3020,−122.6795); North Umpqua River (43.3027,−122.4938); Panther Creek (43.3019,−122.6801); Steamboat Creek (43.3491,−122.7281); Susan Creek (43.3044,−122.9058); Williams Creek (43.3431,−122.7724).

(iii) *Rock Creek/North Umpqua River Watershed 1710030110.* Outlet(s) = Rock Creek (Lat 43.3322, Long −123.0025) upstream to endpoint(s) in: Conley Creek (43.3594,−122.9663); Harrington Creek (43.4151,−122.9550); Kelly Creek (43.3592,−122.9912); McComas Creek (43.3536,−122.9923); Miller Creek (43.3864,−122.9371); Rock Creek (43.4247,−122.9055); Rock Creek, East Fork (43.3807,−122.8270); Rock Creek, East Fork, North Fork (43.4147,−122.8512); Shoup Creek (43.3882,−122.9674); Unnamed (43.3507,−122.9741); Woodstock Creek (43.3905,−122.9258).

(iv) *Little River Watershed 1710030111.* Outlet(s) = Little River (Lat 43.2978, Long −123.1012) upstream to endpoint(s) in: Buck Peak Creek (43.1762,−123.0479); Buckhorn Creek (43.2592,−123.1072); Cavitt Creek (43.1464,−122.9758); Copperhead Creek (43.1626,−123.0595); Emile Creek (43.2544,−122.8849); Evarts Creek (43.2087,−123.0133); Jim Creek (43.2257,−123.0592); Little River (43.2065,−122.8231); McKay Creek (43.2092,−123.0356); Tuttle Creek (43.1440,−122.9813); White Rock Creek (43.1540,−123.0379); Wolf Creek (43.2179,−122.9461).

(v) *Lower North Umpqua River Watershed 1710030112*. Outlet(s) = North Umpqua River (Lat 43.2682, Long −123.4448) upstream to endpoint(s) in: Bradley Creek (43.3350,−123.1025); Clover Creek (43.2490,−123.2604); Cooper Creek (43.3420,−123.1650); Cooper Creek (43.3797,−123.2807); Dixon Creek (43.2770,−123.2911); French Creek (43.3349,−123.0801); Huntley Creek (43.3363,−123.1340); North Umpqua River (43.3322,−123.0025); Oak Creek (43.2839,−123.2063); Short Creek (43.3204,−123.3315); Sutherlin Creek (43.3677,−123.2114); Unnamed (43.3285,−123.2016).
(9) South Fork Umpqua Subbasin 17100302—(i) *Jackson Creek Watershed 1710030202*. Outlet(s) = Jackson Creek (Lat 42.9695, Long −122.8795) upstream to endpoint(s) in: Beaver Creek (Lat 42.9084, Long −122.7924); Jackson Creek (Lat 42.9965, Long −122.6459); Ralph Creek (Lat 42.9744, Long −122.6976); Squaw Creek (Lat 42.9684, Long −122.6913);Tallow Creek (Lat 42.98814, Long −122.6965); Whiskey Creek (Lat 42.9593, Long −122.7262); Winters Creek (Lat 42.9380, Long −122.8271).
(ii) *Middle South Umpqua River Watershed 1710030203*. Outlet(s) = South Umpqua River (Lat 42.9272, Long −122.9504) upstream to endpoint(s) in: Boulder Creek (43.1056,−122.7379); Budd Creek (43.0506,−122.8185); Deadman Creek (43.0049,−122.8967); Dompier Creek (42.9553,−122.9166); Dumont Creek (43.0719,−122.8224); Francis Creek (43.0202,−122.8231); South Umpqua River (43.0481,−122.6998); Sam Creek (43.0037,−122.8412); Slick Creek (43.0986,−122.7867).
(iii) Elk Creek/South Umpqua Watershed 1710030204. Outlet(s) = Elk Creek (Lat 42.9272, Long −122.9504) upstream to endpoint(s) in: Brownie Creek (Lat 42.8304, Long −122.8746); Callahan Creek (Lat 42.8778, Long −122.9609); Camp Creek (Lat 42.8667, Long −122.8958); Dixon Creek (Lat 42.8931, Long −122.9152); Drew Creek (Lat 42.8682, Long −122.9358); Flat Creek (Lat 42.8294, Long −122.8250); Joe Hall Creek (Lat 42.8756, Long −122.8202); Tom Creek (Lat 42.8389, Long −122.8959).
(iv) *South Umpqua River Watershed 1710030205*. Outlet(s) = South Umpqua River (Lat 42.9476, Long −123.3368) upstream to endpoint(s) in: Alder Creek (42.9109,−123.2991); Canyon Creek (42.8798,−123.2410); Canyon Creek, West Fork (42.8757,−123.2734); Canyon Creek, West Fork, Trib A (42.8834,−123.2947); Coffee Creek (42.9416,−122.9993); Comer Brook (42.9082,−123.2908); Days Creek (43.0539,−123.0012); Days Creek, Trib 1 (43.0351,−123.0532); Doe Hollow (42.9805,−123.0812); Fate Creek (42.9943,−123.1028); Green Gulch (43.0040,−123.1276); Hatchet Creek (42.9251,−122.9757); Jordan Creek (42.9224,−123.3086); Lavadoure Creek (42.9545,−123.1049); Lick Creek (42.9213,−123.0261); May Creek (43.0153,−123.0725); Morgan Creek (42.9635,−123.2409); O'Shea Creek (42.9256,−123.2486); Perdue Creek (43.0038,−123.1192);

Poole Creek (42.9321,−123.1106); Poole Creek, East Fork (42.9147,−123.0956); South Umpqua River (42.9272,−122.9504); Shively Creek (42.8888,−123.1635); Shively Creek, East Fork (42.8793,−123.1194); Small Creek (42.9631,−123.2519); St. John Creek (42.9598,−123.0514); Stinger Gulch Creek (42.9950,−123.1851); Stouts Creek, East Fork (42.9090,−123.0424); Stouts Creek, West Fork (42.8531,−123.0167); Sweat Creek (42.9293,−123.1899); Wood Creek (43.0048,−123.1486).

(v) *Middle Cow Creek Watershed 1710030207*. Outlet(s) = Cow Creek (Lat 42.8114, Long −123.5947) upstream to endpoint(s) in: Bear Creek (42.8045,−123.3635); Booth Gulch (42.7804,−123.2282); Bull Run Creek (42.7555,−123.2366); Clear Creek (42.8218,−123.2610); Cow Creek (42.8487,−123.1780); Dads Creek (42.7650,−123.5401); East Fork Whitehorse Creek (42.7925,−123.1448); Fortune Branch (42.8051,−123.2971); Hogum Creek (42.7574,−123.1853); Lawson Creek (42.7896,−123.3752); Little Bull Run Creek (42.7532,−123.2479); McCullough Creek (42.7951,−123.4421); Mynatt Creek (42.8034,−123.2828); Panther Creek (42.7409,−123.4990); Perkins Creek (42.7331,−123.4997); Quines Creek (42.7278,−123.2396); Rattlesnake Creek (42.7106,−123.4774); Riffle Creek (42.7575,−123.6260); Section Creek (42.7300,−123.4373); Skull Creek (42.7527,−123.5779); Starveout Creek (42.7541,−123.1953); Stevens Creek (42.7255,−123.4835); Susan Creek (42.8035,−123.5762); Swamp Creek (42.7616,−123.3518); Tennessee Gulch (42.7265,−123.2591); Totten Creek (42.7448,−123.4610); Unnamed (42.7964,−123.4200); Unnamed (42.8101,−123.3150); Whitehorse Creek (42.7772,−123.1532); Wildcat Creek (42.7738,−123.2378); Windy Creek (42.8221,−123.3296); Wood Creek (42.8141,−123.4111); Woodford Creek (42.7458,−123.3180).

(vi) *West Fork Cow Creek Watershed 1710030208*. Outlet(s) = West Fork Cow Creek (Lat 42.8118, Long −123.6006) upstream to endpoint(s) in: Bear Creek (42.7662,−123.6741); Bobby Creek (42.8199,−123.7196); Elk Valley Creek (42.8681,−123.7133); Elk Valley Creek, East Fork (42.8698,−123.6812); Goat Trail Creek (42.8002,−123.6828); Gold Mountain Creek (42.8639,−123.7787); No Sweat Creek (42.8024,−123.7081); Panther Creek (42.8596,−123.7506); Slaughter Pen Creek (42.8224,−123.6565); Sweat Creek (42.8018,−123.6995); Walker Creek (42.8228,−123.7614); Wallace Creek (42.8311,−123.7696); West Fork Cow Creek (42.8329,−123.7733).

(vii) *Lower Cow Creek Watershed 1710030209*. Outlet(s) = Cow Creek (Lat 42.9476, Long −123.3368) upstream to endpoint(s) in: Ash Creek (42.9052,−123.3385); Boulder Creek (42.8607,−123.5494); Brush Creek (42.8526,−123.4369); Buck Creek (42.8093,−123.4979); Buck Creek (42.9347,−123.5163); Cattle Creek (42.8751,−123.5374); Cedar

Gulch (42.8457,–123.5038); Council Creek (42.8929,–123.4366); Cow Creek (42.8114,–123.5947); Darby Creek (42.8553,–123.6123); Doe Creek (42.9333,–123.5057); Gravel Creek (42.8596,–123.4598); Iron Mountain Creek (42.9035,–123.5175); Island Creek (42.8957,–123.4749); Jerry Creek (42.9517,–123.4009); Little Dads Creek (42.8902,–123.5655); Martin Creek (42.8080,–123.4763); Middle Creek, South Fork (42.8298,–123.3870); Panther Creek (42.8417,–123.4492); Peavine Creek (42.8275,–123.4610); Russell Creek (42.9094,–123.3797); Salt Creek (42.9462,–123.4830); Shoestring Creek (42.9221,–123.3613); Smith Creek (42.8489,–123.4765); Smith Creek (42.9236,–123.5482); Table Creek (42.9114,–123.5695); Union Creek (42.8769,–123.5853); Unnamed (42.8891,–123.4080).

(viii) *Middle South Umpqua River Watershed 1710030210*. Outlet(s) = South Umpqua River (Lat 43.1172, Long –123.4273) upstream to endpoint(s) in: Adams Creek (43.0724,–123.4776); Barrett Creek (43.0145,–123.4451); Clark Brook (43.0980,–123.2897); East Willis Creek (43.0151,–123.3845); Judd Creek (42.9852,–123.4060); Kent Creek (43.0490,–123.4792); Lane Creek (42.9704,–123.4001); Porter Creek (43.0444,–123.4597); Rice Creek (43.0181,–123.4779); Richardson Creek (43.0766,–123.2881); South Umpqua River (42.9476,–123.3368); Squaw Creek (43.0815,–123.4688); Van Dine Creek (43.0326,–123.3473); West Willis Creek (43.0172,–123.4355).

(ix) *Myrtle Creek Watershed 1710030211*. Outlet(s) = North Myrtle Creek (Lat 43.0231, Long –123.2951) upstream to endpoint(s) in: Ben Branch Creek (43.0544,–123.1618); Big Lick (43.0778,–123.2175); Bilger Creek (43.1118,–123.2372); Buck Fork Creek (43.1415,–123.0831); Cedar Hollow (43.0096,–123.2297); Frozen Creek (43.1089,–123.1929); Frozen Creek, Left Fork (43.1157,–123.2306); Harrison Young Brook (43.0610,–123.2850); Lally Creek (43.0890,–123.0597); Lee Creek (43.1333,–123.1477); Letitia Creek (43.0710,–123.0907); Little Lick (43.0492,–123.2234); Long Wiley Creek (43.0584,–123.1067); Louis Creek (43.1165,–123.0783); North Myrtle Creek (43.1486,–123.1219); Riser Creek (43.1276,–123.0703); Rock Creek (43.0729,–123.2620); South Myrtle Creek (43.0850,–123.0103); School Hollow (43.0563,–123.1753); Short Wiley Creek (43.0589,–123.1158); Slide Creek (43.1110,–123.1078); Unnamed (43.1138,–123.1721); Weaver Creek (43.1102,–123.0576).

(x) *Ollala Creek/Lookingglass Watershed 1710030212*. Outlet(s) = Lookingglass Creek (Lat 43.1172, Long –123.4273) upstream to endpoint(s) in: Archambeau Creek (43.2070,–123.5329); Bear Creek (43.1233,–123.6382); Berry Creek (43.0404,–123.5543); Bushnell Creek (43.0183,–123.5289); Byron Creek, East Fork (43.0192,–123.4939); Byron Creek, North Fork (43.0326,–123.4792); Coarse Gold Creek (43.0291,–123.5742); Flournoy Creek (43.2227,–123.5560); Little Muley Creek (43.0950,–123.6247);

Lookingglass Creek (43.1597,−123.6015); McNabb Creek (43.0545,−123.4984); Muns Creek (43.0880,−123.6333); Olalla Creek (42.9695,−123.5914); Perron Creek (43.0960,−123.4904); Porter Creek (43.1381,−123.5569); Sheilds Creek (43.0640,−123.6189); Tenmile Creek (43.1482,−123.6537); Tenmile Creek, North Fork (43.1260,−123.6069); Thompson Creek (42.9860,−123.5140); Willingham Creek (42.9600,−123.5814).

(xi) *Lower South Umpqua River Watershed 1710030213.* Outlet(s) = South Umpqua River (Lat 43.2682, Long −123.4448) upstream to endpoint(s) in: Callahan Creek (43.2291,−123.5355); Damotta Brook (43.2030,−123.2987); Deer Creek, North Fork (43.2166,−123.1437); Deer Creek, South Fork (43.1875,−123.1722); Deer Creek, South Fork, Trib 1 (43.1576,−123.2393); Deer Creek, South Fork, Middle Fork (43.1625,−123.1413); Doerner Creek (43.2370,−123.5153); Elgarose Creek (43.2747,−123.5105); Marsters Creek (43.1584,−123.4489); Melton Creek (43.1294,−123.2173); Roberts Creek (43.1124,−123.2831); South Umpqua River (43.1172,−123.4273); Stockel Creek (43.2205,−123.4392); Tucker Creek (43.1238,−123.2378); Unnamed (43.2184,−123.1709); Willow Creek (43.2543,−123.5143).

(10) Umpqua Subbasin 17100303

(i) *Upper Umpqua River Watershed 1710030301.* Outlet(s) = Umpqua River (Lat 43.6329, Long −123.5662) upstream to endpoint(s) in: Bear Creek (43.3202,−123.6118); Bear Creek (43.5436,−123.4481); Bottle Creek (43.4060,−123.5043); Brads Creek (43.5852,−123.4651); Camp Creek (43.2969,−123.5361); Case Knife Creek (43.4288,−123.6665); Cedar Creek (43.5360,−123.5969); Cougar Creek (43.3524,−123.6166); Doe Creek (43.5311,−123.4259); Fitzpatrick Creek (43.5819,−123.6308); Galagher Canyon (43.4708,−123.4394); Heddin Creek (43.5909,−123.6466); Hubbard Creek (43.2526,−123.5544); Leonard Creek (43.4448,−123.5402); Little Canyon Creek (43.4554,−123.4560); Little Wolf Creek (43.4232,−123.6633); Little Wolf Creek, Trib D (43.4052,−123.6477); Lost Creek (43.4355,−123.4902); Martin Creek (43.5539,−123.4633); McGee Creek (43.5125,−123.5632); Mehl Creek (43.5491,−123.6541); Mill Creek (43.3178,−123.5095); Miner Creek (43.4518,−123.6764); Panther Canyon (43.5541,−123.3484); Porter Creek (43.4348,−123.5530); Rader Creek (43.5203,−123.6517); Rader Creek, Trib A (43.4912,−123.5726); Umpqua River (43.2682,−123.4448); Unnamed (43.5781,−123.6170); Unnamed (43.5630,−123.6080); Unnamed (43.4011,−123.6474); Unnamed (43.4119,−123.6172); Unnamed (43.4212,−123.6398); Unnamed (43.4640,−123.6734); Unnamed (43.4940,−123.6166); Unnamed (43.5765,−123.4710); Waggoner Creek (43.5282,−123.6072); Whiskey Camp Creek (43.4587,−123.6755); Williams Creek (43.5952,−123.5222); Wolf Creek (43.4707,−123.6655).

(ii) *Calapooya Creek Watershed 1710030302*. Outlet(s) = Calapooya Creek (Lat 43.3658, Long −123.4674) upstream to endpoint(s) in: Bachelor Creek (43.5480,−123.2062); Banks Creek (43.3631,−123.1755); Beaty Creek (43.4406,−123.0392); Boyd Creek (43.4957,−123.1573); Brome Creek (43.4016,−123.0490); Burke Creek (43.3987,−123.4463); Buzzard Roost Creek (43.4584,−123.0990); Cabin Creek (43.5421,−123.3294); Calapooya Creek, North Fork (43.4867,−123.0280); Coon Creek (43.4218,−123.4349); Coon Creek (43.5245,−123.0429); Dodge Canyon Creek (43.4362,−123.4420); Driver Valley Creek (43.4327,−123.1960); Field Creek (43.4043,−123.0917); Gassy Creek (43.3862,−123.1133); Gilbreath Creek (43.4218,−123.0931); Gossett Creek (43.4970,−123.1045); Haney Creek (43.4763,−123.1086); Hinkle Creek (43.4230,−123.0382); Hog Creek (43.4767,−123.2516); Jeffers Creek (43.4522,−123.1047); Long Valley Creek (43.4474,−123.1460); Middle Fork South Fork Calapooya Creek (43.4772,−122.9952); Markam Creek (43.3751,−123.1479); Marsh Creek (43.5223,−123.3348); Mill Creek (43.4927,−123.1315); Norton Creek (43.5046,−123.3736); Pine Tree Creek (43.4179,−123.0688); Pollock Creek (43.5326,−123.2685); Salt Creek (43.5161,−123.2504); Salt Lick Creek (43.4510,−123.1168); Slide Creek (43.3926,−123.0919); Timothy Creek (43.4862,−123.0896); Unnamed (43.4469,−123.4268); Unnamed (43.4481,−123.4283); Unnamed (43.4483,−123.4134); Unnamed (43.4658,−122.9899); Unnamed (43.4707,−122.9896); Unnamed (43.4908,−123.0703); Unnamed (43.5173,−123.0564); Wheeler Canyon (43.4840,−123.3631); White Creek (43.4637,−123.0451); Williams Creek (43.4703,−123.4096).

(iii) *Elk Creek Watershed 1710030303*. Outlet(s) = Elk Creek (Lat 43.6329, Long −123.5662) upstream to endpoint(s) in: Adams Creek (43.5860,−123.2202); Allen Creek (43.6375,−123.3731); Andrews Creek (43.5837,−123.3920); Asker Creek (43.6290,−123.2668); Bear Creek (43.6195,−123.3703); Bear Creek (43.7119,−123.1757); Bennet Creek (43.6158,−123.1558); Big Tom Folley Creek (43.7293,−123.4053); Big Tom Folley Creek, North Fork (43.7393,−123.4917); Big Tom Folley Creek, Trib A (43.7231,−123.4465); Billy Creek, East Fork (43.5880,−123.3263); Billy Creek, South Fork (43.5725,−123.3603); Blue Hole Creek (43.5677,−123.4405); Brush Creek (43.5662,−123.4140); Buck Creek (43.6981,−123.1818); Cowan Creek (43.5915,−123.2615); Cox Creek (43.6356,−123.1794); Curtis Creek (43.6839,−123.1734); Dodge Canyon (43.6225,−123.2509); Elk Creek (43.5097,−123.1620); Ellenburg Creek (43.7378,−123.3296); Fitch Creek (43.6986,−123.3152); Five Point Canyon (43.5707,−123.3526); Flagler Creek (43.5729,−123.3382); Green Creek (43.6851,−123.4688); Green Ridge Creek (43.5920,−123.3958); Halo Creek (43.5990,−123.2658); Hancock Creek (43.6314,−123.5188); Hanlon Creek

(43.6190,−123.2785); Hardscrabble Creek (43.7111,−123.3517); Huntington Creek (43.5882,−123.2808); Jack Creek (43.7071,−123.3819); Johnny Creek (43.7083,−123.3972); Johnson Creek (43.6830,−123.2715); Lancaster Creek (43.6442,−123.4361); Lane Creek (43.5483,−123.1221); Lees Creek (43.6610,−123.1888); Little Sand Creek (43.7655,−123.2778); Little Tom Folley Creek (43.6959,−123.5393); McClintock Creek (43.6664,−123.2703); Parker Creek (43.6823,−123.4178); Pass Creek (43.7527,−123.1528); Pheasant Creek (43.7758,−123.2099); Rock Creek (43.7759,−123.2730); Saddle Butte Creek (43.7214,−123.5219); Salt Creek (43.6796,−123.2213); Sand Creek (43.7709,−123.2912); Shingle Mill Creek (43.5314,−123.1308); Simpson Creek (43.6629,−123.2553); Smith Creek (43.6851,−123.3179); Squaw Creek (43.6010,−123.4284); Taylor Creek (43.7642,−123.2712); Thief Creek (43.6527,−123.1459); Thistleburn Creek (43.6313,−123.4332); Unnamed (43.5851,−123.3101); Walker Creek (43.5922,−123.1707); Ward Creek (43.7486,−123.2023); Wehmeyer Creek (43.6823,−123.2404); Wilson Creek (43.5699,−123.2681); Wise Creek (43.6679,−123.2772); Yoncalla Creek (43.5563,−123.2833).

(iv) *Middle Umpqua River Watershed 1710030304*. Outlet(s) = Umpqua River (Lat 43.6556, Long −123.8752) upstream to endpoint(s) in: Burchard Creek (43.6680,−123.7520); Butler Creek (43.6325,−123.6867); Cedar Creek (43.7027,−123.6451); House Creek (43.7107,−123.6378); Little Mill Creek (43.6729,−123.8252); Little Paradise Creek (43.6981,−123.5630); Paradise Creek (43.7301,−123.5738); Patterson Creek (43.7076,−123.6977); Purdy Creek (43.6895,−123.7712); Sawyer Creek (43.6027,−123.6717); Scott Creek (43.6885,−123.6966); Umpqua River (43.6329,−123.5662); Unnamed (43.6011,−123.7084); Unnamed (43.5998,−123.6803); Unnamed (43.6143,−123.6674); Unnamed (43.6453,−123.7619); Unnamed (43.6461,−123.8064); Unnamed (43.6923,−123.7534); Unnamed (43.7068,−123.6109); Unnamed (43.7084,−123.7156); Unnamed (43.7098,−123.6300); Unnamed (43.7274,−123.6026); Weatherly Creek (43.7205,−123.6680); Wells Creek (43.6859,−123.7946).

(v) *Upper Smith River Watershed 1710030306.* Outlet(s) = Smith River (Lat 43.7968, Long −123.7565) upstream to endpoint(s) in: Amberson Creek (43.7787,−123.4944); Argue Creek (43.7656,−123.6959); Beaver Creek (43.7865,−123.6949); Beaver Creek (43.8081,−123.4041); Big Creek (43.7372,−123.7112); Blackwell Creek (43.8145,−123.7460); Blind Creek (43.7518,−123.6551); Bum Creek (43.8044,−123.5802); Carpenter Creek (43.7947,−123.7258); Clabber Creek (43.7919,−123.5878); Clearwater Creek (43.8138,−123.7375); Cleghorn Creek (43.7508,−123.4997); Clevenger Creek (43.7826,−123.4087); Coldwater Creek (43.8316,−123.7232); Deer Creek (43.8109,−123.5362); Devils Club Creek (43.7916,−123.6148);

Elk Creek (43.8004,−123.4347); Halfway Creek (43.7412,−123.5112); Hall Creek (43.7732,−123.3836); Haney Creek (43.8355,−123.5006); Hardenbrook Creek (43.7943,−123.5660); Hefty Creek (43.7881,−123.3954); Herb Creek (43.8661,−123.6782); Jeff Creek (43.8079,−123.6033); Marsh Creek (43.7831,−123.6185); Mosetown Creek (43.7326,−123.6613); Mosetown Creek, East Fork (43.7185,−123.6433); North Sister Creek (43.8492,−123.5771); Panther Creek (43.8295,−123.4464); Pearl Creek (43.8263,−123.5350); Peterson Creek (43.7575,−123.3947); Plank Creek (43.7635,−123.3980); Redford Creek (43.7878,−123.3520); Rock Creek (43.7733,−123.6222); Russell Creek (43.8538,−123.6971); South Sister Creek (43.8366,−123.5611); Salmonberry Creek (43.8085,−123.4482); Scare Creek (43.7631,−123.7260); Sleezer Creek (43.7535,−123.3711); Slideout Creek (43.7831,−123.5685); Smith River, Little South Fork (43.7392,−123.4583); Smith River, South Fork (43.7345,−123.3843); Smith River (43.7529,−123.3310); Spring Creek (43.7570,−123.3276); Summit Creek (43.7985,−123.3487); Sweden Creek (43.8618,−123.6468); Tip Davis Creek (43.7739,−123.3301); Twin Sister Creek (43.8348,−123.7168); Unnamed (43.7234,−123.6308); Unnamed (43.7397,−123.6984); Unnamed (43.7433,−123.4673); Unnamed (43.7492,−123.6911); Unnamed (43.7495,−123.5832); Unnamed (43.7527,−123.5210); Unnamed (43.7533,−123.7046); Unnamed (43.7541,−123.4805); Unnamed (43.7708,−123.4819); Unnamed (43.7726,−123.5039); Unnamed (43.7748,−123.6044); Unnamed (43.7775,−123.6927); Unnamed (43.7830,−123.5900); Unnamed (43.7921,−123.6335); Unnamed (43.7955,−123.7013); Unnamed (43.7993,−123.6171); Unnamed (43.8020,−123.6739); Unnamed (43.8034,−123.6959); Unnamed (43.8133,−123.5893); Unnamed (43.8197,−123.4827); Unnamed (43.8263,−123.5810); Unnamed (43.8360,−123.6951); Unnamed (43.8519,−123.5910); Unnamed (43.8535,−123.6357); Unnamed (43.8541,−123.6155); Unnamed (43.8585,−123.6867); Upper Johnson Creek (43.7509,−123.5426); West Fork Halfway Creek (43.7421,−123.6119); Yellow Creek (43.8193,−123.5545).

(vi) *Lower Smith River Watershed 1710030307.* Outlet(s) = Smith River (Lat 43.7115, Long −124.0807) upstream to endpoint(s) in: Bear Creek (43.8087,−123.8202); Beaver Creek (43.8983,−123.7559); Black Creek (43.7544,−123.9967); Brainard Creek (43.7448,−124.0105); Buck Creek (43.7719,−123.7823); Cassady Creek (43.7578,−123.9744); Cedar Creek (43.8541,−123.8562); Chapman Creek (43.8181,−123.9380); Coon Creek (43.8495,−123.7857); Crane Creek (43.8592,−123.7739); Edmonds Creek (43.8257,−123.9000); Eslick Creek (43.8153,−123.9894); Eslick Creek, East Fork (43.8082,−123.9583); Franz Creek (43.7542,−124.1006); Frarey Creek (43.7683,−124.0615); Georgia Creek (43.8373,−123.8911); Gold Creek (43.9002,−123.7470); Harlan Creek (43.8635,−123.9319);

Holden Creek (43.7901,−124.0178); Hudson Slough (43.7725,−124.0736); Johnson Creek (43.8291,−123.9582); Johnson Creek (43.8480,−123.8209); Joyce Creek (43.7892,−124.0356); Joyce Creek, West Fork (43.7708,−124.0457); Kentucky Creek (43.9313,−123.8153); Middle Fork of North Fork Smith River (43.8780,−123.7687); Moore Creek (43.8523,−123.8931); Moore Creek (43.8661,−123.7558); Murphy Creek (43.7449,−123.9527); Noel Creek (43.7989,−124.0109); Otter Creek (43.7216,−123.9626); Otter Creek, North Fork (43.7348,−123.9597); Paxton Creek (43.8847,−123.9004); Peach Creek (43.8963,−123.8599); Perkins Creek (43.7362,−123.9151); Railroad Creek (43.8086,−123.8998); Smith River, West Fork (43.9102,−123.7073); Smith River (43.7968,−123.7565); Spencer Creek (43.8429,−123.8321); Spencer Creek, West Fork (43.8321,−123.8685); Sulphur Creek (43.8512,−123.9422); Unnamed (43.7031,−123.7463); Unnamed (43.7106,−123.7666); Unnamed (43.7203,−123.7601); Unnamed (43.7267,−123.7396); Unnamed (43.7286,−123.7798); Unnamed (43.7322,−124.0585); Unnamed (43.7325,−123.7337); Unnamed (43.7470,−123.7416); Unnamed (43.7470,−123.7711); Unnamed (43.7569,−124.0844); Unnamed (43.7606,−124.0853); Unnamed (43.7623,−124.0753); Unnamed (43.7669,−124.0766); Unnamed (43.7734,−124.0674); Unnamed (43.7855,−124.0076); Unnamed (43.7877,−123.9936); Unnamed (43.8129,−123.9743); Unnamed (43.8212,−123.8777); Unnamed (43.8258,−123.8192); Unnamed (43.8375,−123.9631); Unnamed (43.8424,−123.7925); Unnamed (43.8437,−123.7989); Unnamed (43.8601,−123.7630); Unnamed (43.8603,−123.8155); Unnamed (43.8655,−123.8489); Unnamed (43.8661,−123.9136); Unnamed (43.8688,−123.7994); Unnamed (43.8831,−123.8534); Unnamed (43.8883,−123.7157); Unnamed (43.8906,−123.7759); Unnamed (43.8916,−123.8765); Unnamed (43.8922,−123.8144); Unnamed (43.8953,−123.8772); Unnamed (43.8980,−123.7865); Unnamed (43.8997,−123.7993); Unnamed (43.8998,−123.7197); Unnamed (43.9015,−123.8386); Unnamed (43.9015,−123.8949); Unnamed (43.9023,−123.8241); Unnamed (43.9048,−123.8316); Unnamed (43.9075,−123.7208); Unnamed (43.9079,−123.8263); Vincent Creek (43.7035,−123.7882); Wassen Creek (43.7419,−123.8905); West Branch North Fork Smith River (43.9113,−123.8958).

(vii) *Lower Umpqua River Watershed 1710030308.* Outlet(s) = Umpqua River (Lat 43.6696, Long −124.2025) upstream to endpoint(s) in: Alder Creek (43.6310,−124.0483); Bear Creek (43.7053,−123.9529); Butler Creek (43.7157,−124.0059); Charlotte Creek (43.6320,−123.9307); Dean Creek (43.6214,−123.9740); Dry Creek (43.6369,−124.0595); Franklin Creek (43.6850,−123.8659); Hakki Creek (43.6711,−124.0161); Indian Charlie Creek (43.6611,−123.9404); Johnson Creek (43.6711,−123.9760); Koepke

Slough (43.6909,−124.0294); Little Franklin Creek (43.6853,−123.8863); Luder Creek (43.6423,−123.9046); Miller Creek (43.6528,−124.0140); Oar Creek (43.6620,−124.0289); Providence Creek (43.7083,−124.1289); Scholfield Creek (43.6253,−124.0112); Umpqua River (43.6556,−123.8752); Unnamed (43.6359,−123.9572); Unnamed (43.6805,−124.1146); Unnamed (43.6904,−124.0506); Unnamed (43.6940,−124.0340); Unnamed (43.7069,−123.9824); Unnamed (43.7242,−123.9369); Winchester Creek (43.6657,−124.1247); Wind Creek, South Fork (43.6346,−124.0897).

(11) Coos Subbasin 17100304

(i) *South Fork Coos Watershed 1710030401*. Outlet(s) = South Fork Coos (Lat 43.3905, Long −123.9634) upstream to endpoint(s) in: Beaver Slide Creek (43.2728,−123.8472); Bottom Creek (43.3751,−123.7065); Bottom Creek, North Fork (43.3896,−123.7264); Buck Creek (43.2476,−123.8023); Burnt Creek (43.2567,−123.7834); Cedar Creek (43.3388,−123.6303); Cedar Creek, Trib E (43.3423,−123.6749); Cedar Creek, Trib F (43.3330,−123.6523); Coal Creek (43.3426,−123.8685); Eight River Creek (43.2638,−123.8568); Fall Creek (43.2535,−123.7106); Fall Creek (43.4106,−123.7512); Fivemile Creek (43.2341,−123.6307); Gods Thumb Creek (43.3440,−123.7013); Gooseberry Creek (43.2452,−123.7081); Hatcher Creek (43.3021,−123.8370); Hog Ranch Creek (43.2754,−123.8125); Lake Creek (43.2971,−123.6354); Little Cow Creek (43.1886,−123.6133); Lost Creek (43.2325,−123.5769); Lost Creek, Trib A (43.2224,−123.5961); Mink Creek (43.3068,−123.8515); Panther Creek (43.2593,−123.6401); Shotgun Creek (43.2920,−123.7623); Susan Creek (43.2720,−123.7654); Tioga Creek (43.2110,−123.7786); Unnamed (43.2209,−123.7789); Unnamed (43.2305,−123.8360); Unnamed (43.2364,−123.7818); Unnamed (43.2548,−123.8569); Unnamed (43.2713,−123.8320); Unnamed (43.2902,−123.6662); Unnamed (43.3168,−123.6491); Unnamed (43.3692,−123.8320); Unnamed (43.3698,−123.8321); Unnamed (43.3806,−123.8327); Unnamed (43.3846,−123.8058); Unnamed (43.3887,−123.7927); Unnamed (43.3651,−123.7073); Wilson Creek (43.2083,−123.6691).

(ii) *Millicoma River Watershed 1710030402*. Outlet(s) = West Fork Millicoma River (Lat 43.4242, Long −124.0288) upstream to endpoint(s) in: Bealah Creek (43.4271,−123.8445); Buck Creek (43.5659,−123.9765); Cougar Creek (43.5983,−123.8788); Crane Creek (43.5545,−123.9287); Dagget Creek (43.4862,−124.0557); Darius Creek (43.4741,−123.9407); Deer Creek (43.6207,−123.9616); Deer Creek, Trib A (43.6100,−123.9761); Deer Creek, Trib B (43.6191,−123.9482); Devils Elbow Creek (43.4439,−124.0608); East Fork Millicoma River (43.4204,−123.8330); Elk Creek (43.5441,−123.9175); Fish Creek (43.6015,−123.8968); Fox Creek (43.4189,−123.9459); Glenn Creek (43.4799,−123.9325); Hidden

Creek (43.5646,–123.9235); Hodges Creek (43.4348,–123.9889); Joes Creek (43.5838,–123.9787); Kelly Creek (43.5948,–123.9036); Knife Creek (43.6163,–123.9310); Little Matson Creek (43.4375,–123.8890); Marlow Creek (43.4779,–123.9815); Matson Creek (43.4489,–123.9191); Otter Creek (43.5935,–123.9729); Panther Creek (43.5619,–123.9038); Rainy Creek (43.4293,–124.0400); Rodine Creek (43.4434,–123.9789); Schumacher Creek (43.4842,–124.0380); Totten Creek (43.4869,–124.0457); Trout Creek (43.5398,–123.9814); Unnamed (43.4686,–124.0143); Unnamed (43.5156,–123.9366); Unnamed (43.5396,–123.9373); Unnamed (43.5450,–123.9305); West Fork Millicoma River (43.5617,–123.8788).
(iii) *Lakeside Frontal Watershed 1710030403*. Outlet(s) = Tenmile Creek (43.5618,–124.2308) upstream to endpoint(s) in: Adams Creek (43.5382,–124.1081); Alder Creek (43.6012,–124.0272); Alder Gulch (43.5892,–124.0665); Benson Creek (43.5813,–124.0086); Big Creek (43.6085,–124.0128); Blacks Creek (43.6365,–124.1188); Clear Creek (43.6040,–124.1871); Hatchery Creek (43.5275,–124.0761); Johnson Creek (43.5410,–124.0018); Murphy Creek (43.6243,–124.0534); Noble Creek (43.5897,–124.0347); Parker Creek (43.6471,–124.1246); Roberts Creek (43.5557,–124.0264); Saunders Creek (43.5417,–124.2136); Shutter Creek (43.5252,–124.1398); Swamp Creek (43.5550,–124.1948); Unnamed (43.5203,–124.0294); Unnamed (43.6302,–124.1460); Unnamed (43.6353,–124.1411); Unnamed (43.6369,–124.1515); Unnamed (43.6466,–124.1511); Unnamed (43.5081,–124.0382); Unnamed (43.6353,–124.16770; Wilkins Creek (43.6304,–124.0819); Winter Creek (43.6533,–124.1333).
(iv) *Coos Bay Watershed 1710030404*. Outlet(s) = Big Creek (Lat 43.3326, Long –124.3739); Coos Bay (43.3544,–124.3384) upstream to endpoint(s) in: Bear Creek (43.5048,–124.1059); Bessey Creek (43.3844,–124.0253); Big Creek (43.2834,–124.3374), Big Creek (43.3980,–123.9396); Big Creek, Trib A (43.2999,–124.3711); Big Creek, Trib B (43.2854,–124.3570); Blossom Gulch (43.3598,–124.2410); Boatman Gulch (43.3445,–124.2483); Boone Creek (43.2864,–124.1762); Cardwell Creek (43.2793,–124.1277); Catching Creek (43.2513,–124.1586); Coalbank Creek (43.3154,–124.2503); Coos Bay (43.3566,–124.1592); Daniels Creek (43.3038,–124.0725); Davis Creek (43.2610,–124.2633); Day Creek (43.3129,–124.2888); Deton Creek (43.4249,–124.0771); Echo Creek (43.3797,–124.1529); Elliot Creek (43.3037,–124.2670); Farley Creek (43.3146,–124.3415); Ferry Creek (43.2628,–124.1728); Goat Creek (43.2700,–124.2109); Haywood Creek (43.3067,–124.3419); Hendrickson Creek (43.3907,–124.0594); Isthmus Slough (43.2622,–124.2049); Joe Ney Slough (43.3382,–124.2958); John B Creek (43.2607,–124.2814); Johnson Creek (43.4043,–124.1389); Kentuck Creek (43.4556,–124.0894); Larson Creek (43.4930,–124.0764); Laxstrom Gulch (43.3372,–124.1350); Lillian

Creek (43.3550,−124.1330); Mart Davis Creek (43.3911,−124.0927); Matson Creek (43.3011,−124.1161); McKnight Creek (43.3841,−123.9991); Mettman Creek (43.4574,−124.1293); Millicoma River (43.4242,−124.0288); Monkey Ranch Gulch (43.3392,−124.1458); Morgan Creek (43.3460,−124.0318); North Slough (43.5032,−124.1408); Noble Creek (43.2387,−124.1665); Packard Creek (43.4058,−124.0211); Palouse Creek (43.5123,−124.0667); Panther Creek (43.2733,−124.1222); Pony Slough (43.4078,−124.2307); Rogers Creek (43.3831,−124.0370); Ross Slough (43.3027,−124.1781); Salmon Creek (43.3618,−123.9816); Seaman Creek (43.3634,−124.0111); Seelander Creek (43.2872,−124.1176); Shinglehouse Slough (43.3154,−124.2225); Smith Creek (43.3579,−124.1051); Snedden Creek (43.3372,−124.2177); Southport Slough (43.2981,−124.2194); Stock Slough (43.3277,−124.1195); Storey Creek (43.3238,−124.2969); Sullivan Creek (43.4718,−124.0872); Talbott Creek (43.2839,−124.2954); Theodore Johnson Creek (43.2756,−124.3457); Unnamed (43.5200,−124.1812); Unnamed (43.2274,−124.3236); Unnamed (43.2607,−124.2984); Unnamed (43.2772,−124.3246); Unnamed (43.2776,−124.3148); Unnamed (43.2832,−124.1532); Unnamed (43.2888,−124.1962); Unnamed (43.2893,−124.3406); Unnamed (43.2894,−124.2034); Unnamed (43.2914,−124.2917); Unnamed (43.2942,−124.1027); Unnamed (43.2984,−124.2847); Unnamed (43.3001,−124.3022); Unnamed (43.3034,−124.2001); Unnamed (43.3051,−124.2031); Unnamed (43.3062,−124.2030); Unnamed (43.3066,−124.3674); Unnamed (43.3094,−124.1947); Unnamed (43.3129,−124.1208); Unnamed (43.3149,−124.1347); Unnamed (43.3149,−124.1358); Unnamed (43.3149,−124.1358); Unnamed (43.3169,−124.0638); Unnamed (43.3224,−124.2390); Unnamed (43.3356,−124.1542); Unnamed (43.3356,−124.1526); Unnamed (43.3357,−124.1510); Unnamed (43.3357,−124.1534); Unnamed (43.3368,−124.1509); Unnamed (43.3430,−124.2352); Unnamed (43.3571,−124.2372); Unnamed (43.3643,−124.0474); Unnamed (43.3741,−124.0577); Unnamed (43.4126,−124.0599); Unnamed (43.4203,−123.9824); Unnamed (43.4314,−124.0998); Unnamed (43.4516,−124.1023); Unnamed (43.4521,−124.1110); Unnamed (43.5345,−124.1946); Vogel Creek (43.3511,−124.1206); Wasson Creek (43.2688,−124.3368); Willanch Creek (43.4233,−124.1061); Willanch Creek, Trib A (43.4032,−124.1169); Wilson Creek (43.2652,−124.1281); Winchester Creek (43.2145,−124.3116); Winchester Creek, Trib E (43.2463,−124.3067); Woodruff Creek (43.4206,−123.9746); Wren Smith Creek (43.3131,−124.0649).

(12) Coquille Subbasin 17100305

(i) *Middle Fork Coquille Watershed 1710030502*. Outlet(s) = Middle Fork Coquille River (Lat 43.0340, Long −124.1161) upstream to endpoint(s) in: Anderson Creek (43.0087,−123.9445); Axe Creek

(43.0516,−123.9468); Bear Creek (43.0657,−123.9284); Belieu Creek (43.0293,−123.9470); Big Creek (43.0991,−123.8983); Brownson Creek (43.0879,−123.9583); Endicott Creek (43.0401,−124.0710); Fall Creek (43.0514,−123.9910); Indian Creek (43.0203,−124.0842); Little Rock Creek (42.9913,−123.8335); McMullen Creek (43.0220,−124.0366); Middle Fork Coquille River (42.9701,−123.7621); Myrtle Creek (42.9642,−124.0170); Rasler Creek (42.9518,−123.9643); Rock Creek (42.9200,−123.9073); Rock Creek (43.0029,−123.8440); Salmon Creek (43.0075,−124.0273); Sandy Creek (43.0796,−123.8517); Sandy Creek, Trib F (43.0526,−123.8736); Sheilds Creek (42.9184,−123.9219); Slater Creek (42.9358,−123.7958); Slide Creek (42.9957,−123.9040); Smith Creek (43.0566,−124.0337); Swamp Creek (43.0934,−123.9000); Unnamed (43.0016,−123.9550); Unnamed (43.0681,−123.9812); Unnamed (43.0810,−123.9892).

(ii) *Middle Main Coquille Watershed 1710030503*. Outlet(s) = South Fork Coquille River (Lat 43.0805, Long −124.1405) upstream to endpoint(s) in: Baker Creek (42.8913,−124.1297); Beaver Creek (42.9429,−124.0783); Catching Creek, Middle Fork (42.9913,−124.2331); Catching Creek, South Fork (42.9587,−124.2348); Coquille River, South Fork (42.8778,−124.0743); Cove Creek (43.0437,−124.2088); Dement Creek (42.9422,−124.2086); Gettys Creek (43.0028,−124.1988); Grants Creek (42.9730,−124.1041); Horse Hollow (43.0382,−124.1984); Knight Creek (43.0022,−124.2663); Koontz Creek (43.0111,−124.2505); Long Tom Creek (42.9342,−124.0992); Matheny Creek (43.0495,−124.1892); Mill Creek (42.9777,−124.1663); Rhoda Creek (43.0007,−124.1032); Roberts Creek (42.9748,−124.2385); Rowland Creek (42.9045,−124.1845); Russell Creek (42.9495,−124.1611); Unnamed (42.9684,−124.1033); Ward Creek (43.0429,−); 124.2358); Warner Creek (43.0196,−124.1187); Wildcat Creek (43.0277,−124.2225); Wolf Creek (43.0136,−124.2318); Woodward Creek (42.9023,−124.0658).

(iii) *East Fork Coquille Watershed 1710030504*. Outlet(s) = East Fork Coquille River (Lat 43.1065, Long −124.0761) upstream to endpoint(s) in: Bills Creek (43.1709,−123.9244); China Creek (43.1736,−123.9086); East Fork Coquille River (43.1476,−123.8936); Elk Creek (43.1312,−123.9621); Hantz Creek (43.1832,−123.9713); South Fork Elk Creek (43.1212,−123.9200); Steel Creek (43.1810,−123.9354); Unnamed (43.0908,−124.0361); Unnamed (43.0925,−124.0495); Unnamed (43.0976,−123.9705); Unnamed (43.1006,−124.0052); Unnamed (43.1071,−123.9163); Unnamed (43.1655,−123.9078); Unnamed (43.1725,−123.9881); Weekly Creek (43.0944,−124.0271); Yankee Run (43.1517,−124.0483); Yankee Run, Trib C (43.1626,−124.0162).

(iv) *North Fork Coquille Watershed 1710030505*. Outlet(s) = North Fork Coquille River (Lat 43.0805, Long −124.1405) upstream to endpoint(s) in: Alder Creek (43.2771,−123.9207); Blair Creek (43.1944,−124.1121); Cherry Creek, North Fork (43.2192,−123.9124); Cherry Creek, South Fork (43.2154,−123.9353); Coak Creek (43.2270,−124.0324); Coquille River, Little North Fork (43.2988,−123.9410); Coquille River, North Fork (43.2974,−123.8791); Coquille River, North Fork, Trib E (43.1881,−124.0764); Coquille River, North Fork, Trib I (43.2932,−123.8920); Coquille River, North Fork, Trib Y (43.3428,−123.9678); Evans Creek (43.2868,−124.0561); Fruin Creek (43.3016,−123.9198); Garage Creek (43.1508,−124.1020); Giles Creek (43.3129,−124.0337); Honcho Creek (43.2628,−123.8954); Hudson Creek (43.2755,−123.9604); Jerusalem Creek (43.1844,−124.0539); Johns Creek (43.0760,−124.0498); Little Cherry Creek (43.2007,−123.9594); Llewellyn Creek (43.1034,124.1063); Llewellyn Creek, Trib A (43.0969,−124.0995); Lost Creek (43.1768,−124.1047); Lost Creek (43.2451,−123.9745); Mast Creek (43.2264,−124.0207); Middle Creek (43.2332,−123.8726); Moon Creek (43.2902,−123.9493); Moon Creek, Trib A (43.2976,−123.9837); Moon Creek, Trib A-1 (43.2944,−123.9753); Neely Creek (43.2960,−124.0380); Park Creek (43.2508,−123.8661); Park Creek, Trib B (43.2702,−123.8782); Schoolhouse Creek (43.1637,−124.0949); Steele Creek (43.2203,−124.1018); Steinnon Creek (43.2534,−124.1076); Unnamed (43.1305,−124.0759); Unnamed (43.2047,−124.0314); Unnamed (43.2127,−124.1101); Unnamed (43.2165,−123.9144); Unnamed (43.2439,−123.9275); Unnamed (43.2444,−124.0868); Unnamed (43.2530,−124.0848); Unnamed (43.2582,−124.0794); Unnamed (43.2584,−123.8846); Unnamed (43.2625,−124.0474); Unnamed (43.2655,−123.9269); Unnamed (43.2676,−124.0367); Vaughns Creek (43.2378,−123.9106); Whitley Creek (43.2899,−124.0115); Wimer Creek (43.1303,−124.0640); Wood Creek (43.1392,−124.1274); Wood Creek, North Fork (43.1454,−124.1211).

(v) *Lower Coquille Watershed 1710030506*. Outlet(s) = Coquille River (Lat 43.1237, Long −124.4261) upstream to endpoint(s) in: Alder Creek (43.1385,−124.2697); Bear Creek (43.0411,−124.2893); Beaver Creek (43.2249,−124.1923); Beaver Creek (43.2525,−124.2456); Beaver Slough, Trib A (43.2154,−124.2731); Bill Creek (43.0256,−124.3126); Budd Creek (43.2011,−124.1921); Calloway Creek (43.2060,−124.1684); Cawfield Creek (43.1839,−124.1372); China Creek (43.2170,−124.2076); Cold Creek (43.2038,−124.1419); Coquille River (43.0805,−124.1405); Coquille River, Trib A (43.2032,−124.2930); Cunningham Creek (43.2349,−124.1378); Dutch John Ravine (43.1744,−124.1781); Dye Creek (43.2274,−124.1569); Fahys Creek (43.1676,−124.3861); Fat Elk Creek (43.1373,−124.2560); Ferry Creek (43.1150,−124.3831); Fishtrap Creek (43.0841,−124.2544); Glen Aiken Creek (43.1482,−124.1497); Grady Creek (43.1032,−124.1381); Gray Creek (43.1222,−124.1286); Hall Creek (43.0583,−124.2516); Hall Creek, Trib A (43.0842,−124.1745); Harlin

Creek (43.1326,−124.1633); Hatchet Slough, Trib A (43.1638,−124.3065); Hatchet Slough (43.1879,−124.3003); Lampa Creek (43.0531,−124.2665); Little Bear Creek (43.0407,−124.2783); Little Fishtrap Creek (43.1201,−124.2290); Lowe Creek (43.1401,−124.3232); Mack Creek (43.0604,−124.3306); Monroe Creek (43.0705,−124.2905); Offield Creek (43.1587,−124.3273); Pulaski Creek (43.1398,−124.2184); Randleman Creek (43.0818,−124.3039); Rich Creek (43.0576,−124.2067); Rink Creek (43.1764,−124.1369); Rock Robinson Creek (43.0860,−124.2306); Rollan Creek (43.1266,−124.2563); Sevenmile Creek (43.2157,−124.3350); Sevenmile Creek, Trib A (43.1853,−124.3187); Sevenmile Creek, Trib C (43.2081,−124.3340); Unnamed (43.1084,−124.2727); Unnamed 43.1731,−124.1852); Unnamed (43.1924,−124.1378); Unnamed (43.1997,−124.3346); Unnamed (43.2281,−124.2190); Unnamed (43.2424,−124.2737); Waddington Creek (43.1105,−124.2915).

(13) Sixes Subbasin 17100306

(i) *Sixes River Watershed 1710030603.* Outlet(s) = Sixes River (Lat 42.8543, Long −124.5427) upstream to endpoint(s) in: Beaver Creek (42.7867,−124.4373); Carlton Creek (42.8594,−124.2382); Cold Creek (42.7824,−124.2070); Crystal Creek (42.8404,−124.4501); Dry Creek (42.7673,−124.3726); Edson Creek (42.8253,−124.3782); Hays Creek (42.8455,−124.1796); Little Dry Creek (42.8002,−124.3838); Murphy Canyon (42.8516,−124.1541); Sixes River (42.8232,−124.1704); Sixes River, Middle Fork (42.7651,−124.1782); Sixes River, North Fork (42.8878,−124.2320); South Fork Sixes River (42.8028,−124.3022); Sugar Creek (42.8217,−124.2035); Unnamed (42.8189,−124.3567); Unnamed (42.7952,−124.3918); Unnamed (42.8276,−124.4629).

(ii) *New River Frontal Watershed 1710030604.* Outlet(s) = New River (Lat 43.0007, Long−124.4557); Twomile Creek (43.0440,−124.4415) upstream to endpoint(s) in: Bethel Creek (42.9519,−124.3954); Boulder Creek (42.8574,−124.5050); Butte Creek (42.9458,−124.4096); Conner Creek (42.9814,−124.4215); Davis Creek (42.9657,−124.3968); Floras Creek (42.9127,−124.3963); Fourmile Creek (42.9887,−124.3077); Fourmile Creek, South Fork (42.9642,−124.3734); Langlois Creek (42.9238,−124.4570); Little Creek (43.0030,−124.3562); Long Creek (42.9828,−124.3770); Lower Twomile Creek (43.0223,−124.4080); Morton Creek (42.9437,−124.4234); New River (42.8563,−124.4602); North Fourmile Creek (42.9900,−124.3176); Redibough Creek (43.0251,−124.3659); South Twomile Creek (43.0047,−124.3672); Spring Creek (43.0183,−124.4299); Twomile Creek (43.0100,−124.3291); Unnamed (43.0209,−124.3386); Unnamed (43.0350,−124.3506); Unnamed (43.0378,−124.3481); Unnamed (43.0409,−124.3544); Unnamed (42.8714,−124.4586); Unnamed (42.9029,−124.4222); Unnamed (42.9031,−124.4581); Unnamed (42.9294,−124.4421); Unnamed

(42.9347,−124.4559); Unnamed (42.9737,−124.3363); Unnamed (42.9800,−124.3432); Unnamed (43.0058,−124.4066); Willow Creek (42.8880,−124.4505).

(t) ***Lower Columbia River Coho Salmon*** *(Oncorhynchus kisutch)*. Critical habitat is designated to include the areas defined in the following subbasins:

(1) Middle Columbia-Hood Subbasin 17070105

(i) *East Fork Hood River Watershed 1707010506*. Outlet(s) = Hood River (Lat 45.605237, Long −121.633264); upstream to endpoint(s) in: Bear Creek (45.491952, −121.648262); Cat Creek (45.470499, −121.555174); Dog River (45.447412, −121.567406); East Fork Hood River (45.310783, −121.626954); East Fork Hood River (45.412671, −121.570369); Evans Creek (45.486998, −121.590438); Graham Creek (45.551655, −121.567021); Griswell Creek (45.522055, −121.577151); Pinnacle Creek (45.460671, −121.656379); Pocket Creek (45.302362, −121.597799); Tony Creek (45.540932, −121.644048); Yellowjacket Creek (45.502652, −121.561138).

(ii) *West Fork Hood River Watershed 1707010507*. Outlet(s) = West Fork Hood River (Lat 45.605237, Long −121.633264); upstream to endpoint(s) in: Green Point Creek (45.590219, −121.681893); McGee Creek (45.443322, −121.774845).

(iii) *Hood River Watershed 1707010508*. Outlet(s) = Hood River (Lat 45.712335, Long −121.508062); upstream to endpoint(s) in: Lenz Creek (45.627282, −121.527217); Unnamed (45.695827, −121.499524); Hood River (45.605237, −121.633264); Neal Creek (45.589032, −121.495443); West Fork Neal Creek (45.589791, −121.50157); Whiskey Creek (45.682589, −121.507362).

(iv) *White Salmon River Watershed 1707010509*. Outlet(s) = White Salmon River (Lat 45.722453, Long −121.522507); upstream to endpoint(s) in: White Salmon River (45.767475, −121.538582).

(v) *Little White Salmon River Watershed 1707010510*. Outlet(s) = Little White Salmon River (Lat 45.709771, −121.648828); upstream to endpoint(s) in: Little White Salmon River (45.721722, −121.640905).

(vi) *Wind River Watershed 1707010511*. Outlet(s) = Wind River (Lat 45.708031, Long −121.7937); upstream to endpoint(s) in: Little Wind River (45.764902, −121.743713); Wind River (45.738012, −121.805768).

(vii) *Middle Columbia/Grays Creek Watershed 1707010512*. Outlet(s) = Columbia River (Lat 45.704232, Long −121.799197); upstream to endpoint(s) in: Unnamed (45.709771, −121.648828); Unnamed (45.71305, −121.765469); Unnamed (45.717006, −121.775974); Unnamed (45.724676, −121.733359); Dog Creek (45.711575, −121.670928); Gorton Creek (45.691091, −121.773139); Columbia River (45.712335, −121.508062); Lindsey Creek (45.686538, −121.716427); Perham Creek (45.694389, −121.636322); Viento Creek (45.697116, −121.668995).

(viii) *Middle Columbia/Eagle Creek Watershed 1707010513.* Outlet(s) = Unnamed (Lat 45.644489, Long −121.940679); upstream to endpoint(s) in: Unnamed (45.665271, −121.8177); Unnamed (45.667271, −121.849896); Unnamed (45.668788, −121.845446); Unnamed (45.681125, −121.861863); Unnamed (45.710132, −121.845697); Camp Creek (45.667436, −121.817935); Carson Creek (45.715784, −121.820829); Columbia River (45.704232, −121.799197); Eagle Creek (45.636481, −121.918349); East Fork Herman Creek (45.653835, −121.814038); Herman Creek (45.65053, −121.819282); Kanaka Creek (45.703936, −121.886202); Nelson Creek (45.70486, −121.863199); Ruckel Creek (45.646027, −121.920243).

(2) Lower Columbia-Sandy Subbasin 17080001

(i) *Salmon River Watershed 1708000101.* Outlet(s) = Salmon River (Lat 45.247288, Long −121.897384); upstream to endpoint(s) in: Unnamed (45.294351, −121.93992); Unnamed (45.327567, −121.964685); Unnamed (45.333577, −121.954887); Unnamed (45.343325, −121.993355); Bighorn Creek (45.261413, −121.920687); Boulder Creek (45.344594, −122.022551); Cheeney Creek (45.298138, −121.966984); Copper Creek (45.250573, −121.906523); Salmon River (45.250793, −121.903932); South Fork Salmon River (45.262376, −121.94569); Welches Creek (45.322357, −121.96209); Little Cheney Creek (45.315925, −121.957706).

(ii) *Zigzag River Watershed 1708000102.* Outlet(s) = Zigzag River (Lat 45.348502, Long −121.945268); upstream to endpoint(s) in: Unnamed (45.264488, −121.835176); Unnamed (45.309925, −121.867436); Little Zigzag Canyon (45.313577, −121.804646); Camp Creek (45.304981, −121.813197); Cool Creek (45.292765, −121.884534); Henry Creek (45.328447, −121.895142); Lady Creek (45.319762, −121.823709); Still Creek (45.266162, −121.82967); Wind Creek (45.298307, −121.856182); Zigzag River (45.326883, −121.779753).

(iii) *Upper Sandy River Watershed 1708000103.* Outlet(s) = Sandy River (Lat 45.348695, −121.945224); upstream to endpoint(s) in: Unnamed (45.375211, −121.831255); Unnamed (45.381082, −121.827389); Unnamed (45.38147, −121.902185); Unnamed (45.394711, −121.794578); Unnamed (45.399767, −121.901436); Unnamed (45.37727, −121.865508); Unnamed (45.393118, −121.862562); Unnamed (45.388254, −121.908771); Cast Creek (45.38071, −121.858383); Clear Creek (45.398769, −121.855261); Clear Fork (45.402752, −121.848249); Little Clear Creek (45.379681, −121.914907); Lost Creek (45.372028, −121.818608); Minikahda Creek (45.36933, −121.94042); Sandy River (45.388349, −121.842458); Short Creek (45.376861, −121.863405).

(iv) *Middle Sandy River Watershed 1708000104.* Outlet(s) = Sandy River (Lat 45.446429, Long −122.248369); upstream to endpoint(s) in:

Unnamed (45.37949, −122.03096); Unnamed (45.386346, −122.036698); Unnamed (45.371975, −122.039565); Unnamed (45.380525, −122.033513); Alder Creek (45.376772, −122.100846); Bear Creek (45.336648, −121.927798); Cedar Creek (45.404272, −122.252578); Hackett Creek (45.352288, −121.951609); North Boulder Creek (45.384502, −122.014263); Whisky Creek (45.377566, −122.128088); Wildcat Creek (45.370157, −122.077485).

(v) *Bull Run River Watershed 1708000105*. Outlet(s) = Bull Run River (Lat 45.445672, −122.247943); upstream to endpoint(s) in: Bull Run River (45.449500, −122.1536); Little Sandy River (45.408124, −122.066052).

(vi) *Washougal River Watershed 1708000106*. Outlet(s) = Washougal River (Lat 45.581011, Long −122.408885); upstream to endpoint(s) in: Unnamed (45.58717, −122.413316); Unnamed (45.600016, −122.332175); Unnamed (45.611824, −122.242999); Unnamed (45.612809, −122.324998); Unnamed (45.620381, −122.345921); Unnamed (45.626874, −122.34346); Unnamed (45.627736, −122.256085); Unnamed (45.629474, −122.247482); Unnamed (45.638035, −122.292731); Unnamed (45.647483, −122.367738); Unnamed (45.648358, −122.334455); Unnamed (45.650547, −122.157413); Unnamed (45.653255, −122.275218); Unnamed (45.657929, −122.220622); Unnamed (45.659093, −122.207653); Unnamed (45.6692, −122.156539); Unnamed (45.670112, −122.34117); Unnamed (45.672008, −122.173594); Unnamed (45.674178, −122.299555); Unnamed (45.683465, −122.334825); Unnamed (45.696755, −122.315224); Unnamed (45.700417, −122.32238); Unnamed (45.708896, −122.266302); Unnamed (45.708947, −122.252235); Unnamed (45.720695, −122.249333); Unnamed (45.729294, −122.195616); Cougar Creek (45.651259, −122.268846); Dougan Creek (45.67684, −122.153333); East Fork Little Washougal River (45.672014, −122.283888); Jackson Creek (45.675271, −122.254193); Jones Creek (45.689112, −122.291063); Lacamas Creek (45.597039, −122.394477); Texas Creek (45.689165, −122.187421); Washougal River (45.67269, −122.153567); West Fork Washougal River (45.733609, −122.214819); Wildboy Creek (45.671, −122.218436); Winkler Creek (45.632735, −122.261321); Hagen Creek (45.706875, −122.25864); Little Washougal River (45.676574, −122.342287); Little Washougal River (45.653083, −122.347546); Winkler Creek (45.631081, −122.26165).

(vii) *Columbia Gorge Tributaries Watershed 1708000107*. Outlet(s) = Columbia River (Lat 45.573261, Long −122.397377); upstream to endpoint(s) in: Unnamed (45.548138, −122.351565); Unnamed (45.588566, −122.294521); Unnamed (45.590912, −122.2823); Unnamed (45.593653, −122.144297); Unnamed (45.596322, −122.298126); Unnamed (45.602186, −122.045501); Unnamed (45.603278, −122.117957); Unnamed (45.60427, −122.114465);

Unnamed (45.604686, −122.111908); Unnamed (45.608658, −122.034755); Unnamed (45.618526, −122.046564); Unnamed (45.627848, −122.059877); Unnamed (45.644489, −121.940679); Unnamed (45.648055, −121.973672); Unnamed (45.648286, −121.937896); Unnamed (45.651152, −121.948423); Unnamed (45.663009, −121.945288); Unnamed (45.668112, −121.944275); Unnamed (45.705738, −122.030562); Unnamed (45.706583, −122.030264); Unnamed (45.712761, −122.031391); Bridal Veil Creek (45.554125, −122.180231); Campen Creek (45.588421, −122.32304); Coopey Creek (45.56249, −122.165304); Duncan Creek (45.668084, −122.087311); Gibbons Creek (45.578553, −122.280402); Greenleaf Creek (45.680477, −121.961898); Hamilton Creek (45.724649, −122.025155); Hardy Creek (45.637053, −122.006906); Horsetail Creek (45.588381, −122.068121); Indian Mary Creek (45.626983, −122.08352); Latourell Creek (45.54047, −122.218884); Lawton Creek (45.57449, −122.251177); Little Creek (45.644317, −122.037293); McCord Creek (45.611378, −121.994145); Moffett Creek (45.618491, −121.967182); Multnomah Creek (45.575938, −122.115489); Oneonta Creek (45.582044, −122.072688); Tanner Creek (45.629297, −121.954011); Tumalt Creek (45.609963, −122.029615); Wahkeena Creek (45.573123, −122.126812); Walton Creek (45.575513, −122.26303); Woodward Creek (45.632266, −122.044788); Young Creek (45.546713, −122.198337); Hardy Creek (45.633735, −121.99603).

(viii) *Lower Sandy River Watershed 1708000108.* Outlet(s) = Sandy River (Lat 45.574301, Long −122.380188); upstream to endpoint(s) in: Unnamed (45.553991, −122.377876); Beaver Creek (45.497368, −122.360034); Big Creek (45.506685, −122.297833); Buck Creek (45.497012, −122.277464); Cat Creek (45.489237, −122.238503); Gordon Creek (45.502328, −122.181652); Kelly Creek (45.513162, −122.396503); Middle Fork Beaver Creek (45.488652, −122.352533); Sandy River (45.446429, −122.248369); Trout Creek (45.481334, −122.27692).

(ix) *Salmon Creek Watershed 1708000109.* Outlet(s) = Unnamed (Lat 45.608827, Long −122.628396); Unnamed (45.782133, −122.770935); Unnamed (45.79137, −122.779096); Lake River (45.842318, −122.780058); Unnamed (45.583634, −122.493678); Unnamed (45.725544, −122.762187); Unnamed (45.708956, −122.765945); upstream to endpoint(s) in: Unnamed (45.597056, −122.48085); Unnamed (45.618497, −122.625455); Unnamed (45.692522, −122.750865); Unnamed (45.705359, −122.654729); Unnamed (45.736541, −122.738658); Unnamed (45.740616, −122.457587); Unnamed (45.741057, −122.541219); Unnamed (45.745405, −122.701278); Unnamed (45.750243, −122.641509); Unnamed (45.751664, −122.635603); Unnamed (45.758152, −122.697981); Unnamed (45.759293, −122.753826); Unnamed (45.760094,

−122.420422); Unnamed (45.760678, −122.510984); Unnamed (45.763086, −122.392563); Unnamed (45.766128, −122.402833); Unnamed (45.768661, −122.410137); Unnamed (45.768856, −122.458956); Unnamed (45.771241, −122.481058); Unnamed (45.77272, −122.42969); Unnamed (45.779683, −122.608053); Unnamed (45.783976, −122.432545); Unnamed (45.785031, −122.709594); Unnamed (45.788669, −122.739027); Unnamed (45.796251, −122.438508); Unnamed (45.801421, −122.517285); Unnamed (45.807105, −122.454757); Unnamed (45.807885, −122.425007); Unnamed (45.808519, −122.754502); Unnamed (45.813822, −122.449343); Unnamed (45.817459, −122.771105); Unnamed (45.827212, −122.764666); Burnt Bridge Creek (45.660818, −122.511162); Cold Canyon (45.663287, −122.66699); Cougar Canyon Creek (45.707212, −122.682567); Curtin Creek (45.684387, −122.586094); Flume Creek (45.779893, −122.71596); Lalonde Creek (45.707849, −122.642314); Little Salmon Creek (45.784979, −122.421225); Mill Creek (45.77898, −122.566195); Morgan Creek (45.751434, −122.446616); Mud Creek (45.731816, −122.478143); Packard Creek (45.757922, −122.699539); Rock Creek (45.815043, −122.456123); Salmon Creek (45.757766, −122.424507); Weaver Creek (45.793553, −122.495211); Whipple Creek (45.734817, −122.657695).

(3) Lewis Subbasin 17080002

(i) *Upper Lewis River Watershed 1708000201*. Outlet(s) = Lewis River (Lat 46.069463, Long −122.006838); upstream to endpoint(s) in: Big Creek (46.094659, −121.913097); Chickoon Creek (46.148528, −121.878749); Crab Creek (46.141771, −121.890849); Curly Creek (46.057396, −121.970510); Cussed Hollow (46.148088, −121.904757); Lewis River (46.154732, −121.880642); Little Creek (46.071497, −121.911930); Pepper Creek (46.076039, −121.986316); Rush Creek (46.050925, −121.905817); Spencer Creek (46.143417, −121.910603).

(ii) *Muddy River Watershed 1708000202*. Outlet(s) = Muddy River (Lat 46.069463, Long −122.006838); upstream to endpoint(s) in: Clear Creek (46.210439, −121.951602); Clearwater Creek (46.208811, −122.016938); Muddy River (46.180853, −122.070616); Smith Creek (46.229009, −122.091210).

(iii) *Swift Reservoir Watershed 1708000203*. Outlet(s) = Lewis River (46.061988, −122.192687); upstream to endpoint(s) in: Unnamed (46.067280, −122.031517); Unnamed (46.030884, −122.025805); Unnamed (46.021441, −122.094836); Unnamed (46.076975, −122.134548); Unnamed (46.096016, −122.067449); Drift Creek (45.992711, −122.064320); Lewis River (46.069463, −122.006838); Marble Creek (46.075248, −122.138077); Pine Creek (46.123411, −122.079154); Range Creek (46.028641, −122.121759); Swift Creek (46.090717, −122.205248).

(iv) *Yale Reservoir Watershed 1708000204.* Outlet(s) = Lewis River (Lat 45.966180, Long −122.334825); upstream to endpoint(s) in: Dog Creek (46.061456, −122.317143); Cougar Creek (46.071149, −122.269881); Lewis River (46.061988, −122.192687); Ole Creek (46.049968, −122.239259); Panamaker Creek (46.076309, −122.298414); Rain Creek (46.041972, −122.204391).
(v) *East Fork Lewis River Watershed 1708000205.* Outlet(s) = Gee Creek (Lat 45.846474, Long −122.784009); East Fork Lewis River (45.865974, −122.720015); upstream to endpoint(s) in: Unnamed (45.780025, −122.60805); Unnamed (45.794783, −122.698153); Unnamed (45.801134, −122.682844); Unnamed (45.804692, −122.580745); Unnamed (45.807413, −122.629756); Unnamed (45.814729, −122.56657); Unnamed (45.816914, −122.575875); Unnamed (45.822904, −122.708092); Unnamed (45.823983, −122.639331); Unnamed (45.828994, −122.605197); Unnamed (45.835126, −122.485374); Unnamed (45.836667, −122.650975); Unnamed (45.837829, −122.469846); Unnamed (45.846989, −122.749763); Unnamed (45.847364, −122.649785); Unnamed (45.848031, −122.441525); Unnamed (45.849976, −122.524001); Unnamed (45.853522, −122.598543); Unnamed (45.855146, −122.593372); Unnamed (45.859839, −122.612419); Unnamed (45.861417, −122.70149); Unnamed (45.866041, −122.5784); Unnamed (45.866516, −122.575586); Unnamed (45.867718, −122.647281); Unnamed (45.869512, −122.678967); Unnamed (45.872474, −122.647396); Unnamed (45.875583, −122.487609); Unnamed (45.881115, −122.478516); Unnamed (45.905677, −122.519797); Allen Creek (45.827926, −122.698134); Basket Creek (45.832585, −122.459163); Brezee Creek (45.880461, −122.655871); East Fork Lewis River (45.839345, −122.447538); Gee Creek (45.791622, −122.674464); Jenny Creek (45.870366, −122.700692); Lockwood Creek (45.8722, −122.612928); Mason Creek (45.865932, −122.544237); McCormick Creek (45.851953, −122.691964); Riley Creek (45.872133, −122.62657); Unnamed Creek (45.843693, −122.648975).
(vi) *Lower Lewis River Watershed 1708000206.* Outlet(s) = Lewis River (Lat 45.855546, Long −122.775762); upstream to endpoint(s) in: Unnamed (45.870633, −122.756138); Unnamed (45.88666, −122.723102); Unnamed (45.892632, −122.422093); Unnamed (45.893766, −122.438283); Unnamed (45.901311, −122.727541); Unnamed (45.919994, −122.535139); Unnamed (45.920149, −122.456867); Unnamed (45.920747, −122.693543); Unnamed (45.923838, −122.424899); Unnamed (45.924295, −122.37431); Unnamed (45.928026, −122.689314); Unnamed (45.929363, −122.504918); Unnamed (45.939172, −122.41088); Unnamed (45.941429, −122.704591); Unnamed (45.942762, −122.671288); Unnamed (45.943605, −122.620229); Unnamed (45.944513,

−122.644954); Unnamed (45.947599, −122.643073); Bitter Creek (45.913105, −122.460482); Brush Creek (45.927783, −122.468661); Cedar Creek (45.906562, −122.381815); Chelatchie Creek (45.935564, −122.379567); Colvin Creek (45.939847, −122.609332); Houghton Creek (45.951179, −122.634346); John Creek (45.943278, −122.477146); Johnson Creek (45.953443, −122.61949); Lewis River (45.966180, −122.334825); North Fork Chelatchie Creek (45.945494, −122.393811); Pup Creek (45.948425, −122.525655); Robinson Creek (45.936812, −122.725723); Ross Creek (45.94883, −122.703391); Staples Creek (45.942126, −122.667681).

(4) Lower Columbia-Clatskanie Subbasin 17080003

(i) *Kalama River Watershed 1708000301*. Outlet(s) = Burris Creek (Lat 45.892513, Long −122.790279); Bybee Creek (45.966376, −122.816532); Kalama River (46.03393, −122.870595); Mill Creek (45.95816, −122.803634); Schoolhouse Creek (45.978378, −122.829247); Unnamed (45.999928, −122.848159); upstream to endpoint(s) in: Unnamed (45.903312, −122.780386); Unnamed (45.934119, −122.781977); Unnamed (45.977147, −122.825526); Unnamed (45.993614, −122.813527); Unnamed (46.043843, −122.856105); Burke Creek (45.94516, −122.775084); Burke Slough (45.924545, −122.797017); Burris Creek (45.932376, −122.743342); Bybee Creek (45.969366, −122.814717); Cedar Creek (46.03313, −122.812264); Hatchery Creek (46.049047, −122.801448); Indian Creek (46.049668, −122.752333); Indian Creek (46.0452, −122.752907); Kalama River (46.025868, −122.739474); Mill Creek (45.961948, −122.795944); Schoolhouse Creek (45.981238, −122.825927); Spencer Creek (46.025203, −122.829696).

(ii) *Beaver Creek/Columbia River Watershed 1708000302*. Outlet(s) = Beaver Slough (Lat 46.121253, Long −123.22089); Fox Creek (46.092512, −122.938467); Goble Creek (46.020615, −122.876532); Green Creek (46.166661, −123.099119); Tide Creek (45.994307, −122.866712); upstream to endpoint(s) in: Unnamed (45.914995, −122.870367); Unnamed (45.985132, −122.928842); Unnamed (46.0165, −122.963794); Unnamed (46.019529, −122.944997); Unnamed (45.919698, −122.809782); Beaver Creek (46.104384, −123.124089); Fox Creek (46.069709, −122.937725); Goble Creek (46.006921, −122.989536); Green Creek (46.143721, −123.074477); McBride Creek (45.889718, −122.827703); Merrill Creek (45.908708, −122.887674); North Fork Stewart Creek (46.134963, −123.142788); South Fork Goble Creek (45.967146, −122.912205); Stewart Creek (46.121924, −123.134473); Tide Creek (45.998871, −123.005909).

(iii) *Clatskanie River Watershed 1708000303*. Outlet(s) = Beaver Slough (Lat 46.139926, Long −123.230807); upstream to endpoint(s) in: Unnamed (45.871279, −123.016852); Unnamed (46.057, −123.256303); Unnamed (46.095794, −123.22606); Beaver Slough (46.121253, −123.22089); Carcus Creek (45.988589, −123.087952);

Clatskanie River (45.878919, −122.9959); Conyers Creek (46.056042, −123.241614); Dribble Creek (45.902229, −123.009241); Fall Creek (46.10887, −123.212892); Keystone Creek (46.075658, −123.145555); Little Clatskanie River (45.914012, −122.995923); Merril Creek (46.081981, −123.187026); Miller Creek (46.043933, −123.146664); North Fork Clatskanie River (46.028796, −123.052308); Page Creek (46.04337, −123.126689); Perkins Creek (46.045692, −123.202675).
(iv) *Germany/Abernathy Watershed 1708000304*. Outlet(s) = Abernathy Creek (46.190946, −123.16764); Coal Creek Slough (46.189618, −123.116548); Germany Creek (46.190472, −123.124221); Mill Creek (Lat 46.188644, Long −123.175717); upstream to endpoint(s) in: Unnamed (46.174387, −123.284405); Unnamed (46.177806, −123.244713); Unnamed (46.179048, −123.28534); Unnamed (46.179783, −123.014957); Unnamed (46.199235, −123.017367); Unnamed (46.209772, −123.250435); Unnamed (46.210569, −123.02174); Unnamed (46.2212, −123.233862); Unnamed (46.230005, −123.243579); Unnamed (46.23735, −123.217724); Unnamed (46.257704, −123.211771); Unnamed (46.260394, −123.156937); Unnamed (46.282123, −123.215419); Unnamed (46.28956, −123.229955); Unnamed (46.302937, −123.18012); Unnamed (46.30502, −123.175317); Unnamed (46.313744, −123.186815); Unnamed (46.315329, −123.111068); Unnamed (46.318441, −123.123571); Unnamed (46.329631, −123.132487); Abernathy Creek (46.298183, −123.20799); Cameron Creek (46.266183, −123.196747); Coal Creek (46.214039, −123.020114); Erick Creek (46.283486, −123.165659); Germany Creek (46.323938, −123.150029); Harmony Creek (46.191588, −123.045625); Hunter Creek (46.200371, −123.277768); Midway Creek (46.280132, −123.179387); North Fork Mill Creek (46.237142, −123.227829); Ordway Creek (46.312588, −123.1944); Slide Creek (46.251167, −123.180153); South Fork Mill Creek (46.184454, −123.282779); Spruce Creek (46.19379, −123.270758); Wiest Creek (46.27626, −123.159368).
(v) *Skamokawa/Elochoman Watershed 1708000305*. Outlet(s) = Birnie Creek (Lat 46.200249, Long −123.388149); Elochoman River (46.22667, −123.400822); Jim Crow Creek (46.266028, −123.552297); Skamokawa Creek (46.268566, −123.45637); upstream to endpoint(s) in: Unnamed (46.225162, −123.303945); Unnamed (46.242407, −123.369715); Unnamed (46.264248, −123.311602); Unnamed (46.268968, −123.328113); Unnamed (46.27795, −123.384622); Unnamed (46.281109, −123.369818); Unnamed (46.294907, −123.320218); Unnamed (46.299508, −123.553063); Unnamed (46.30403, −123.499255); Unnamed (46.30564, −123.54826); Unnamed (46.320411, −123.244937); Unnamed (46.320842, −123.35815); Unnamed (46.325433, −123.281587); Unnamed (46.328108, −123.296011); Unnamed (46.33764,

−123.44219); Unnamed (46.337892, −123.462614); Unnamed (46.34415, −123.256674); Unnamed (46.347782, −123.392349); Unnamed (46.349787, −123.211987); Unnamed (46.351596, −123.313042); Unnamed (46.35173, −123.19359); Unnamed (46.360802, −123.261039); Unnamed (46.364365, −123.276383); Unnamed (46.368463, −123.242642); Unnamed (46.377205, −123.262108); Unnamed (46.382024, −123.242299); Unnamed (46.386679, −123.223722); Unnamed (46.303663, −123.365059); Unnamed (46.311328, −123.478976); Unnamed (46.306534, −123.546046); Beaver Creek (46.216566, −123.297152); Bell Canyon Creek (46.288173, −123.405772); Birnie Creek (46.204016, −123.384532); Cadman Creek (46.302299, −123.508597); Clear Creek (46.260761, −123.300874); Duck Creek (46.265653, −123.337856); East Fork Elochoman River (46.378345, −123.193512); Falk Creek (46.321532, −123.381397); Fink Creek (46.276734, −123.570228); Jim Crow Creek (46.312074, −123.539923); Kelly Creek (46.32257, −123.48111); Left Fork Skamokawa Creek (46.339453, −123.470344); Longtain Creek (46.25861, −123.369188); McDonald Creek (46.346651, −123.382328); Nelson Creek (46.257717, −123.35252); North Fork Elochoman River (46.375393, −123.284959); Otter Creek (46.388034, −123.217495); Pollard Creek (46.307613, −123.412558); Quarry Creek (46.337806, −123.42712); Risk Creek (46.25136, −123.399855); Rock Creek (46.277795, −123.275871); Standard Creek (46.333628, −123.357041); West Fork Elochoman River (46.351711, −123.329823); West Fork Skamokawa Creek (46.327805, −123.498954); West Valley Creek (46.291358, −123.51591); Wilson Creek (46.31583, −123.328008); Unnamed Creek (46.306534, −123.546046); Unnamed Creek (46.311328, −123.478976); Unnamed Creek (46.386679, −123.223722); Unnamed Creek (46.303663, −123.365059).

(vi) *Plympton Creek Watershed 1708000306*. Outlet(s) = Hunt Creek (Lat 46.202277, Long −123.445724); Westport Slough (46.143868, −123.383472); upstream to endpoint(s) in: Eilertsen Creek (46.099706, −123.328684); Graham Creek (46.09157, −123.277339); Hunt Creek (46.120882, −123.428478); Ok Creek (46.099703, −123.321777); Olsen Creek (46.101357, −123.360299); Plympton Creek (46.127423, −123.391111); Ross Creek (46.108505, −123.368667); Tandy Creek (46.102255, −123.293854); West Creek (46.121298, −123.373425); Westport Slough (46.124151, −123.245135).

(5) Upper Cowlitz Subbasin 17080004

(i) *Headwaters Cowlitz River Watershed 1708000401*. Outlet(s) = Cowlitz River (Lat 46.657731, Long −121.604374); upstream to endpoint(s) in: Unnamed (46.675388, −121.580086); Clear Fork Cowlitz River (46.684326, −121.568004); Muddy Fork Cowlitz River (46.696095, −121.617841); Ohanapecosh River (46.68812, −121.582120); Purcell Creek (46.671171, −121.587667).

(ii) *Upper Cowlitz River Watershed 1708000402*. Outlet(s) = Cowlitz River (46.576161, −121.706256); Johnson Creek (Lat 46.575836, Long −121.705564); upstream to endpoint(s) in: Unnamed (46.62375, −121.671832); Unnamed (46.641142, −121.654691); Unnamed (46.654671, −121.631508); Unnamed (46.692847, −121.803752); Butter Creek (46.646075, −121.675424); Coal Creek (46.643541, −121.611604); Cowlitz River (46.657731, −121.604374); Hall Creek (46.60701, −121.662269); Hinkle Tinkle Creek (46.651852, −121.63912); Johnson Creek (46.555366, −121.639734); Lake Creek (46.623804, −121.61673); Skate Creek (46.684892, −121.806283).

(iii) *Cowlitz Valley Frontal Watershed 1708000403*. Outlet(s) = Cowlitz River (Lat 46.476278, Long −122.096306); upstream to endpoint(s) in: Unnamed (46.489922, −122.083268); Unnamed (46.518735, −121.858756); Burton Creek (46.541954, −121.750428); Cowlitz River (46.576161, −121.706256); Cunningham Creek (46.512691, −121.844636); Davis Creek (46.527807, −121.827406); Dry Creek (46.560084, −121.705732); Garrett Creek (46.523043, −121.773614); Hampton Creek (46.537971, −121.939923); Hopkin Creek (46.53512, −121.841854); Johnson Creek (Lat 46.575836, Long −121.705564); Kilborn Creek (46.507622, −121.801739); Kiona Creek (46.564304, −122.049702); Miller Creek (46.539348, −121.960377); Oliver Creek (46.543328, −121.993492); Peters Creek (46.538087, −121.983762); Schooley Creek (46.500722, −121.964414); Sethe Creek (46.534578, −121.867518); Siler Creek (46.492992, −121.911187); Silver Creek (46.55632, −121.91673); Smith Creek (46.561932, −121.693911); Surrey Creek (46.543475, −121.888707); Willame Creek (46.580526, −121.733077).

(iv) *Upper Cispus River Watershed 1708000404*. Outlet(s) = Cispus River (Lat 46.443752, Long −121.798269); upstream to endpoint(s) in: Cispus River (46.344891, −121.68424); East Canyon Creek (46.347337, −121.703867); North Fork Cispus River (46.435538, −121.657768); Twin Creek (46.374273, −121.729578).

(v) *Lower Cispus River Watershed 1708000405*. Outlet(s) = Cispus River (Lat 46.476761, Long −122.095709); upstream to endpoint(s) in: Unnamed (46.430554, −121.825682); Unnamed (46.455387, −121.954511); Unnamed (46.465418, −121.958732); Unnamed (46.452951, −122.046625); Ames Creek (46.466423, −121.918257); Camp Creek (46.449033, −121.832281); Cispus River (Lat 46.443752, Long −121.798269); Copper Canyon Creek (46.467296, −122.082101); Covell Creek (46.431961, −121.851825); Crystal Creek (46.445224, −122.024601); Dry Creek (46.452466, −121.852225); Greenhorn Creek (46.421576, −121.905397); Iron Creek (46.38938, −121.971317); McCoy Creek (46.389343, −121.822002); Quartz Creek (46.42561, −122.053071); Woods Creek (46.475527, −121.949635); Yellowjacket Creek (46.386924, −121.834674).

(6) Cowlitz Subbasin 17080005

(i) *Tilton River Watershed 1708000501*. Outlet(s) = Tilton River (Lat 46.543356, Long −122.533164); upstream to endpoint(s) in: Unnamed (46.588777, −122.17989); Unnamed (46.608368, −122.314024); Unnamed (46.595355, −122.27852); Coal Creek (46.573383, −122.243464); Connelly Creek (46.603783, −122.316111); Coon Creek (46.615117, −122.275972); Eagle Creek (46.653164, −122.259058); East Fork Tilton River (46.594049, −122.170519); Jesse Creek (46.644485, −122.414873); Johnson Creek (46.531381, −122.237744); Little Creek (46.666231, −122.404381); Minnie Creek (46.539791, −122.234089); Nineteen Creek (46.599433, −122.22251); Otter Creek (46.620348, −122.409391); Rockies Creek (46.642452, −122.399153); Snow Creek (46.620326, −122.266924); South Fork Tilton Creek (46.564501, −122.161837); Tilton River (46.624549, −122.215133); Trout Creek (46.65834, −122.25936); Wallanding Creek (46.621001, −122.372088); West Fork Tilton River (46.658406, −122.308887); Winnie Creek (46.654766, −122.420066).
(ii) *Riffe Reservoir Watershed 1708000502*. Outlet(s) = Cowlitz River (Lat 46.5031, Long −122.588332); upstream to endpoint(s) in: Cowlitz River (46.476278, −122.096306); Winston Creek (46.459003, −122.370859).
(iii) *Jackson Prairie Watershed 1708000503*. Outlet(s) = Cowlitz River (Lat 46.367511, Long −122.934945); upstream to endpoint(s) in: Unnamed (46.383522, −122.679974); Unnamed (46.383941, −122.725937); Unnamed (46.385081, −122.705907); Unnamed (46.387856, −122.695831); Unnamed (46.39224, −122.75946); Unnamed (46.399666, −122.898638); Unnamed (46.400754, −122.733303); Unnamed (46.409488, −122.589866); Unnamed (46.410097, −122.680278); Unnamed (46.410422, −122.708726); Unnamed (46.411433, −122.756574); Unnamed (46.413363, −122.783988); Unnamed (46.417067, −122.637699); Unnamed (46.424466, −122.818117); Unnamed (46.427206, −122.613403); Unnamed (46.428381, −122.643499); Unnamed (46.429253, −122.83625); Unnamed (46.431112, −122.808741); Unnamed (46.440469, −122.519079); Unnamed (46.445258, −122.867273); Unnamed (46.449715, −122.529087); Unnamed (46.450991, −122.871663); Unnamed (46.472774, −122.686245); Unnamed (46.488493, −122.807753); Unnamed (46.517532, −122.654378); Unnamed (46.5309, −122.820885); Unnamed (46.533357, −122.758003); Unnamed (46.542935, −122.748007); Unnamed (46.464970, −122.610288); Unnamed (46.448115, −122.654992); Unnamed (46.442894, −122.667057); Unnamed (46.442944, −122.700366); Unnamed (46.465822, −122.580513); Unnamed (46.449279, −122.605026); Bear Creek (46.463967, −122.913037); Blue Creek (46.488339, −122.726491); Brights Creek (46.496407, −122.605179); Cedar Creek (46.482264, −122.580944); Coon Creek (46.445182, −122.895851); Cougar Creek (46.393389, −122.795962);

Cowlitz River (46.5031, −122.588332); Foster Creek (46.40711, −122.890926); Hopkey Creek (46.459049, −122.554437); Jones Creek (46.518881, −122.675281); Lacamas Creek (46.556204, −122.688969); Little Salmon Creek (46.439872, −122.747395); Mill Creek (46.517371, −122.622126); Mill Creek (46.502438, −122.803167); North Fork Cedar Creek (46.462224, −122.673900); Otter Creek (46.479854, −122.700841); Pin Creek (46.411782, −122.832479); Rapid Creek (46.432098, −122.547553); Skook Creek (46.474731, −122.757751); Unnamed Creek (46.515124, −122.681226).

(iv) *North Fork Toutle River Watershed 1708000504*. Outlet(s) = North Fork Toutle River (Lat 46.371819, Long −122.585848); upstream to endpoint(s) in: Unnamed (46.292893, −122.508359); Unnamed (46.294391, −122.526416); Unnamed (46.317597, −122.321791); Unnamed (46.321385, −122.488684); Unnamed (46.331761, −122.316562); Bear Creek (46.309744, −122.430749); Hoffstadt Creek (46.319718, −122.325454).

(v) *Green River Watershed 1708000505*. Outlet(s) = North Fork Toutle River (Lat 46.366681, Long −122.587092); upstream to endpoint(s) in: Unnamed (46.332935, −122.298073); Unnamed (46.33485, −122.279213); Unnamed (46.355641, −122.205783); Unnamed (46.359811, −122.326801); Unnamed (46.373265, −122.389499); Unnamed (46.38427, −122.434721); Unnamed (46.387374, −122.488301); Unnamed (46.402102, −122.555537); Unnamed (46.40583, −122.542922); Unnamed (46.408718, −122.507384); Unnamed (46.410468, −122.431267); Unnamed (46.412392, −122.451557); Unnamed (46.416538, −122.283286); Unnamed (46.42, −122.292272); Unnamed (46.422599, −122.304017); Unnamed (46.428205, −122.267496); Beaver Creek (46.405735, −122.568826); Cascade Creek (46.417916, −122.331675); Devils Creek (46.401481, −122.409722); Elk Creek (46.41719, −122.250256); Green River (46.394118, −122.205161); Jim Creek (46.388361, −122.526853); Miners Creek (46.349143, −122.194242); Shultz Creek (46.344058, −122.275039); Tradedollar Creek (46.376142, −122.23987).

(vi) *South Fork Toutle River Watershed 1708000506*. Outlet(s) = Toutle River (Lat 46.329223, Long −122.725131); upstream to endpoint(s) in: Unnamed (46.185704, −122.299471); Unnamed (46.186193, −122.40715); Unnamed (46.188524, −122.445753); Unnamed (46.199665, −122.471338); Unnamed (46.201636, −122.296552); Unnamed (46.206594, −122.331284); Unnamed (46.21036, −122.431482); Unnamed (46.21081, −122.427763); Unnamed (46.210915, −122.428229); Unnamed (46.211429, −122.279573); Unnamed (46.215533, −122.347972); Unnamed (46.223287, −122.327701); Unnamed (46.223773, −122.524201); Unnamed (46.226916, −122.337898); Unnamed (46.227233, −122.373391); Unnamed (46.238958, −122.490827); Unnamed (46.243346, −122.38038); Unnamed (46.245202, −122.629903); Unnamed

(46.258398, −122.534433); Unnamed (46.260587, −122.550523); Unnamed (46.261618, −122.571707); Unnamed (46.268347, −122.577391); Unnamed (46.287125, −122.685581); Unnamed (46.292576, −122.659948); Unnamed (46.295532, −122.596926); Unnamed (46.296678, −122.585207); Unnamed (46.297388, −122.614534); Unnamed (46.310391, −122.606122); Unnamed (46.311754, −122.626346); Unnamed (46.312178, −122.704274); Unnamed (46.321553, −122.649148); Bear Creek (46.187484, −122.431406); Big Wolf Creek (46.225469, −122.567295); Brownell Creek (46.280407, −122.649708); Disappointment Creek (46.213614, −122.309153); Eighteen Creek (46.244881, −122.600184); Harrington Creek (46.247692, −122.419362); Johnson Creek (46.306181, −122.579585); Sheep Canyon (46.206343, −122.268258); South Fork Toutle River (46.209387, −122.263037); Studebaker Creek (46.28238, −122.681733); Thirteen Creek (46.237634, −122.624229); Trouble Creek (46.182362, −122.387761); Twenty Creek (46.232994, −122.5836); North Fork Toutle River (46.328728, −122.722386); Whitten Creek (46.203701, −122.502013).

(vii) *East Willapa Watershed 1708000507*. Outlet(s) = Cowlitz River (46.265795, −122.915793); upstream to endpoint(s) in: Unnamed (46.241179, −122.990022); Unnamed (46.247733, −123.018044); Unnamed (46.247998, −122.777916); Unnamed (46.260464, −122.956364); Unnamed (46.263008, −123.020122); Unnamed (46.263983, −122.930316); Unnamed (46.266093, −122.981616); Unnamed (46.27194, −122.770063); Unnamed (46.281159, −122.760238); Unnamed (46.287658, −122.906283); Unnamed (46.289048, −122.963514); Unnamed (46.302765, −123.0657); Unnamed (46.307415, −122.93938); Unnamed (46.313054, −122.816361); Unnamed (46.314382, −122.943084); Unnamed (46.314535, −123.010247); Unnamed (46.315942, −122.865345); Unnamed (46.317235, −122.896545); Unnamed (46.319898, −122.814207); Unnamed (46.320644, −122.892218); Unnamed (46.322067, −122.814053); Unnamed (46.32332, −122.859461); Unnamed (46.323446, −122.886965); Unnamed (46.326968, −123.025803); Unnamed (46.328758, −122.817082); Unnamed (46.329235, −122.909613); Unnamed (46.334118, −122.817188); Unnamed (46.334241, −123.017807); Unnamed (46.336993, −122.893299); Unnamed (46.337756, −122.611236); Unnamed (46.337802, −122.940117); Unnamed (46.339026, −122.940678); Unnamed (46.343885, −122.762274); Unnamed (46.34681, −122.946071); Unnamed (46.348905, −122.769029); Unnamed (46.349667, −123.053432); Unnamed (46.350564, −122.799855); Unnamed (46.358221, −123.038147); Unnamed (46.358277, −122.791338); Unnamed (46.3604, −122.696281); Unnamed (46.360599, −122.736153); Unnamed (46.36403, −123.005163); Unnamed (46.36632, −122.634646); Unnamed (46.366869,

−122.89658); Unnamed (46.368123, −122.894117); Unnamed (46.374172, −122.622494); Unnamed (46.375592, −123.099965); Unnamed (46.380427, −122.610242); Unnamed (46.38163, −122.883768); Unnamed (46.38939, −123.065756); Unnamed (46.394019, −122.98067); Unnamed (46.401297, −123.028366); Unnamed (46.41997, −123.040973); Unnamed (46.428911, −123.047482); Unnamed (46.43562, −123.045801); Unnamed (46.437797, −122.999776); Unnamed (46.460336, −123.01792); Unnamed (46.472152, −122.999706); Unnamed (46.508924, −122.885928); Unnamed (46.522845, −122.854611); Unnamed (46.534744, −122.980706); Unnamed (46.537092, −122.823206); Unnamed (46.543646, −122.855197); Arkansas Creek (46.334118, −123.054814); Baxter Creek (46.335963, −122.985106); Becker Creek (46.366541, −123.077711); Brim Creek (46.444408, −123.040408); Campbell Creek (46.345799, −123.069223); Cline Creek (46.339582, −122.856216); Cowlitz River (46.367511, −122.934945); Cowlitz River (46.280749, −122.908759); Cowlitz River (46.270301, −122.918872); Curtis Creek (46.479675, −122.978296); Delameter Creek (46.27323, −123.020718); Duffy Creek (46.436886, −122.972934); Ferrier Creek (46.469037, −122.92969); Hemlock Creek (46.258298, −122.728132); Hill Creek (46.385982, −122.887561); King Creek (46.528608, −123.017282); Monahan Creek (46.304091, −123.062738); North Fork Brim Creek (46.461931, −123.022977); North Fork Toutle River (46.366681, −122.587092); Olequa Creek (46.522827, −122.88994); Owens Creek (46.39917, −123.045965); Rock Creek (46.347737, −122.815672); Rock Creek (46.36466, −122.979025); Snow Creek (46.448627, −122.9822); Stankey Creek (46.325726, −122.827854); Stillwater Creek (46.376492, −123.114458); Sucker Creek (46.257038, −122.763973); Toutle River (46.329223, −122.725131); Tucker Creek (46.256345, −123.017401); Whittle Creek (46.313257, −122.951576); Unnamed Creek (46.365968, −123.078372); Unnamed Creek (46.366574, −122.6278); Unnamed Creek (46.322752, −122.727564); Unnamed Creek (46.358525, −122.749069); Wyant Creek (46.348562, −122.655808).

(viii) *Coweeman Watershed 1708000508*. Outlet(s) = Cowlitz River (Lat 46.09677, Long −122.917179); Owl Creek (46.076672, −122.869072); upstream to endpoint(s) in: Unnamed (46.07177, −122.861942); Unnamed (46.080968, −122.726324); Unnamed (46.082482, −122.722033); Unnamed (46.08384, −122.719656); Unnamed (46.103901, −122.735682); Unnamed (46.11823, −122.725869); Unnamed (46.128746, −122.897993); Unnamed (46.133211, −122.702488); Unnamed (46.134412, −122.877742); Unnamed (46.134559, −122.874501); Unnamed (46.137294, −122.570127); Unnamed (46.140549, −122.616015); Unnamed (46.142157, −122.858404); Unnamed (46.142862, −122.813885); Unnamed (46.143869, −122.609969); Unnamed (46.147673,

−122.866141); Unnamed (46.151541, −122.875978); Unnamed (46.157716, −122.6488); Unnamed (46.162608, −122.527406); Unnamed (46.164373, −122.573871); Unnamed (46.16697, −122.62965); Unnamed (46.169603, −122.912787); Unnamed (46.173346, −122.82947); Unnamed (46.174933, −122.844098); Unnamed (46.175151, −122.934081); Unnamed (46.175276, −122.532665); Unnamed (46.175583, −122.668586); Unnamed (46.180534, −122.898644); Unnamed (46.181396, −122.766774); Unnamed (46.183838, −122.820311); Unnamed (46.188804, −122.78364); Unnamed (46.193597, −122.911471); Unnamed (46.196887, −122.713022); Unnamed (46.20058, −122.827779); Unnamed (46.201892, −122.695345); Unnamed (46.202726, −122.560647); Unnamed (46.213243, −122.666442); Unnamed (46.217243, −122.951394); Unnamed (46.219673, −122.838549); Unnamed (46.220679, −122.889953); Unnamed (46.223168, −122.968869); Unnamed (46.226103, −122.771549); Unnamed (46.226208, −122.803239); Unnamed (46.237678, −122.887353); Unnamed (46.242901, −122.885918); Baird Creek (46.194037, −122.549476); Brown Creek (46.138569, −122.581603); Butler Creek (46.148896, −122.518149); Coweeman River (46.150297, −122.51847); Cowlitz River (46.265795, −122.915793); Goble Creek (46.109525, −122.68388); Hill Creek (46.178271, −122.600223); Jim Watson Creek (46.177642, −122.74165); Leckler Creek (46.231526, −122.948175); Little Baird Creek (46.190281, −122.572141); Mulholland Creek (46.201136, −122.646167); Nineteen Creek (46.140604, −122.623774); North Fork Goble Creek (46.136853, −122.680068); Nye Creek (46.121737, −122.805205); Ostrander Creek (46.210956, −122.764306); Owl Creek (46.091102, −122.865692); Owl Creek (46.076526, −122.861672); Salmon Creek (46.254572, −122.885114); Sam Smith Creek (46.165941, −122.725633); Sandy Bend Creek (46.231734, −122.915112); Skipper Creek (46.169104, −122.577264); South Fork Ostrander Creek (46.184505, −122.826132); Turner Creek (46.116534, −122.816196).

(7) Lower Columbia Subbasin 17080006

(i) *Youngs River Watershed 1708000601.* Outlet(s) = Lewis and Clark River (Lat 46.157276, Long −123.8567); Adair Slough (46.164573, −123.890158); Youngs River (46.168659, −123.838128); Skipanon Waterway (46.183693, −123.907231); Alder Creek (46.183694, −123.923138); upstream to endpoint(s) in: Unnamed (45.961144, −123.760693); Unnamed (45.975677, −123.784472); Unnamed (45.987168, −123.864135); Unnamed (46.075646, −123.74625); Unnamed (46.074307, −123.722161); Unnamed (46.081494, −123.687949); Unnamed (46.098839, −123.782036); Unnamed (46.101257, −123.777885); Unnamed (46.101582, −123.791448); Unnamed (46.104561, −123.790689); Unnamed (46.105278, −123.778981); Unnamed (46.115179, −123.862193); Unnamed

(46.11823, −123.798015); Unnamed (46.125146, −123.900778); Unnamed (46.133731, −123.821982); Unnamed (46.155148, −123.772037); Unnamed (46.163155, −123.798112); Unnamed (45.956438, −123.752083); Unnamed (45.992690, −123.779916); Unnamed (46.079767, −123.848993); Unnamed (46.081156, −123.752043); Unnamed (46.098781, −123.713321); Unnamed (46.11386, −123.748487); Abercrombie Creek (46.087084, −123.88937); Adair Slough (46.153356, −123.897783); Alder Creek (46.171207, −123.933132); Barrett Slough (46.12204, −123.85348); Binder Creek (46.142527, −123.821985); Binder Slough (46.121358, −123.819543); Brown Creek (46.172014, −123.806343); Casey Slough (46.115066, −123.815982); Cullaby Slough (46.022576, −123.880488); Green Slough (46.124806, −123.869053); Heckard Creek (46.057636, −123.87837); Hortill Creek (46.056683, −123.839636); Jeffers Slough (46.14965, −123.85163); Johnson Slough (46.071237, −123.882259); Klickitat Creek (46.049861, −123.842997); Lewis and Clark River (45.953527, −123.731398); Little Wallooskee River (46.140199, −123.737638); Loowit Creek (46.022396, −123.832364); Middle Fork North Fork Klaskanine River (46.061237, −123.638614); Moosmoos Creek (46.074807, −123.777539); North Fork Klaskanine River (46.048838, −123.636273); North Fork North Fork Klaskanine River (46.097739, −123.674883); Peterson Slough (46.10793, −123.85242); Shweeash Creek (46.019839, −123.839507); South Fork Klaskanine River (46.048461, −123.713622); South Fork Lewis and Clark River (45.981399, −123.841473); Speelyai Creek (46.032437, −123.83321); Stowebolt Creek (46.060439, −123.825132); Tucker Creek (46.075512, −123.824939); Wallooskee River (46.104416, −123.699695); Youngs River (46.06718, −123.789692).

(ii) *Big Creek Watershed 1708000602*. Outlet(s) = Hillcrest Creek (Lat 46.171377, Long −123.655493); Bear Creek (46.1716, −123.665605); Marys Creek (46.173116, −123.668452); Fertile Valley Creek (46.188744, −123.588332); Blind Slough (46.20114, −123.584906); Big Creek (46.184561, −123.596303); John Day River (46.181573, −123.7404); Little Ferris Creek (46.158288, −123.629531); Mill Creek (46.19298, −123.759637); upstream to endpoint(s) in: Unnamed (46.067847, −123.49896); Unnamed (46.155656, −123.731589); Unnamed (46.176667, −123.477624); Unnamed (46.180584, −123.796858); Unnamed (46.199516, −123.501455); Unnamed (46.211835, −123.534242); Unnamed (46.213817, −123.557667); Unnamed (46.219749, −123.496059); Unnamed (46.183645, −123.484347); Bear Creek (46.122269, −123.636516); Big Creek (46.068744, −123.477937); Big Noise Creek (46.160378, −123.50188); Blind Slough (46.230154, −123.5256); Coon Creek (46.072977, −123.551698); Davis Creek (46.193487, −123.48968); Elk Creek (46.057446, −123.531954); Fertile Valley Creek (46.180229, −123.574191); McNary Creek (46.131584, −123.45871); Grizzly Slough

(46.209179, −123.551962); Hillcrest Creek (46.155615, −123.633555); John Day River (46.151824, −123.718295); Gnat Creek (46.134382, −123.492375); Little Bear Creek (46.11197, −123.661934); Little Creek (46.138483, −123.606302); Marys Creek (46.136519, −123.685932); Mill Creek (46.143237, −123.582679); Mud Creek (46.089977, −123.55188); Pigpen Creek (46.102416, −123.559042); Saspal Slough (46.213023, −123.5376); Supply Creek (46.163644, −123.538404).
(iii) *Grays Bay Watershed 1708000603.* Outlet(s) = Unnamed (Lat 46.242128, Long −123.884815); Unnamed (46.242369, −123.889547); Unnamed (46.246062, −123.909891); Unnamed (46.249228, −123.863946); Unnamed (46.259183, −123.852059); Unnamed (46.260409, −123.850081); Unnamed (46.261711, −123.842086); Unnamed (46.269817, −123.830183); Crooked Creek (46.296355, −123.677056); Sisson Creek (46.301761, −123.72555); Chinook River (46.303571, −123.968574); Grays River (46.306824, −123.685025); Deep River (46.310771, −123.714286); Wallacut River (46.315209, −124.020283); upstream to endpoint(s) in: Unnamed (46.252832, −123.906587); Unnamed (46.255601, −123.883337); Unnamed (46.257057, −123.892766); Unnamed (46.261834, −123.877718); Unnamed (46.26971, −123.872478); Unnamed (46.272099, −123.863261); Unnamed (46.272788, −123.855154); Unnamed (46.273099, −123.847441); Unnamed (46.273923, −123.833921); Unnamed (46.27462, −123.841297); Unnamed (46.282558, −123.76132); Unnamed (46.289926, −123.938085); Unnamed (46.296119, −123.751262); Unnamed (46.305607, −123.945919); Unnamed (46.320823, −123.638104); Unnamed (46.332306, −123.674913); Unnamed (46.349054, −123.563997); Unnamed (46.362133, −123.397387); Unnamed (46.367197, −123.661101); Unnamed (46.370018, −123.661652); Unnamed (46.383643, −123.54663); Unnamed (46.3861, −123.399009); Unnamed (46.389563, −123.443531); Unnamed (46.398896, −123.603127); Unnamed (46.409223, −123.563384); Unnamed (46.40988, −123.591182); Unnamed (46.414991, −123.598881); Unnamed (46.419132, −123.377411); Unnamed (46.4231, −123.465561); Unnamed (46.427724, −123.449351); Unnamed (46.428912, −123.389161); Unnamed (46.429717, −123.393596); Unnamed (46.429964, −123.55265); Unnamed (46.432969, −123.434984); Unnamed (46.435352, −123.530908); Unnamed (46.440181, −123.389495); Unnamed (46.440236, −123.539966); Unnamed (46.445599, −123.389398); Unnamed (46.453434, −123.501054); Unnamed (46.466604, −123.486435); Unnamed (46.472739, −123.394404); Unnamed (46.478038, −123.431439); Beaver Creek (46.401593, −123.550548); Blaney Creek (46.403572, −123.442837); Cabin Creek (46.44222, −123.485741); Campbell Creek (46.358257, −123.709343); Chinook River (46.274479, −123.902553); Crooked Creek (46.313288, −123.59644); Deep River (46.354054,

−123.688621); East Fork Grays River (46.42414, −123.36983); Empi Creek (46.31383, −123.638514); Fossil Creek (46.354523, −123.484306); Grays River (46.491024, −123.4354); Hendrickson Canyon (46.373524, −123.664774); Hendrickson Creek (46.361368, −123.655366); Honey Creek (46.375646, −123.603913); Hull Creek (46.405494, −123.57846); Impie Creek (46.318309, −123.617177); Johnson Creek (46.463847, −123.502087); Kessel Creek (46.33321, −123.586047); King Creek (46.34008, −123.577604); Klints Creek (46.352885, −123.546067); Lassila Creek (46.330703, −123.717849); Malone Creek (46.362725, −123.638537); Mitchell Creek (46.457074, −123.405992); North Fork South Fork Crooked Creek (46.302415, −123.588653); Rangila Slough (46.379454, −123.663919); Salme Creek (46.345311, −123.727176); Seal Creek (46.330013, −123.666112); Shannon Creek (46.397758, −123.544779); Silver Creek (46.361718, −123.606566); Sisson Creek (46.326508, −123.744171); South Creek (46.298871, −123.634124); South Fork Crooked Creek (46.291379, −123.594068); South Fork Grays River (46.378555, −123.338976); Sweigiler Creek (46.421912, −123.519244); Thadbar Creek (46.338413, −123.617861); Wallacut River (46.320188, −124.009121); West Fork Grays River (46.45098, −123.56517); Unnamed Creek (46.30366, −123.59053).

(8) Clackamas Subbasin 17090011

(i) *Collawash River Watershed 1709001101*. Outlet(s) = Collowash River (Lat 45.032022, Long −122.061189); upstream to endpoint(s) in: Collawash River (44.950761, −122.036265); Fan Creek (44.990371, −122.070099); Farm Creek (44.964523, −122.056455); Hot Springs Fork (44.938225, −122.172924); Nohorn Creek (44.951768, −122.178914); Pansy Creek (44.961276, −122.142173); Thunder Creek (44.971026, −122.114357).

(ii) *Upper Clackamas River Watershed 1709001102*. Outlet(s) = Clackamas River (Lat 45.032073, Long −122.060326); upstream to endpoint(s) in: Unnamed (44.921586, −121.891779); Unnamed (44.946758, −121.870376); Unnamed (44.965941, −121.890584); Unnamed (44.984829, −121.88591); Unnamed (45.00955, −121.913461); Unnamed (45.009742, −121.911448); Berry Creek (44.842515, −121.913476); Clackamas River (44.872157, −121.84842); Cub Creek (44.840609, −121.886756); Fawn Creek (44.918888, −121.906568); Hunter Creek (44.892373, −121.929425); Kansas Creek (44.983299, −121.898876); Last Creek (44.971428, −121.855763); Lowe Creek (44.950581, −121.911761); Pinhead Creek (44.947076, −121.856905); Pot Creek (45.018321, −121.903626); Rhododendron Creek (44.935961, −121.905497); Wall Creek (44.954634, −121.88565); Wolf Creek (45.009327, −121.896447); Unnamed Creek (44.939221, −121.896788).

(iii) *Oak Grove Fork Clackamas River Watershed 1709001103*. Outlet(s) = Oak Grove Fork Clackamas River (Lat

45.074631, Long −122.053402); upstream to endpoint(s) in: Oak Grove Fork Clackamas River (45.082079, −121.987346); Pint Creek (45.083562, −122.037835).

(iv) *Middle Clackamas River Watershed 1709001104.* Outlet(s) = Clackamas River (Lat 45.243027, Long −122.28019); upstream to endpoint(s) in: Big Creek (45.071509, −122.07317); Clackamas River (45.032073, −122.060326); Fish Creek (45.063717, −122.160481); North Fork Clackamas River (45.238149, −122.218497); Oak Grove Fork Clackamas River (45.074631, −122.053402); Mag Creek (45.058467, −122.049959); Roaring River (45.181144, −122.060589); Sandstone Creek (45.088154, −122.075766); South Fork Clackamas River (45.193817, −122.226266); Tag Creek (45.060352, −122.048674); Tar Creek (45.049246, −122.058186); Trout Creek (45.037826, −122.073273); Wash Creek (45.047152, −122.190238); Whale Creek (45.110262, −122.085444).

(v) *Eagle Creek Watershed 1709001105.* Outlet(s) = Eagle Creek (Lat 45.353023, Long −122.38235); upstream to endpoint(s) in: Unnamed (45.306541, −122.253481); Bear Creek (45.333888, −122.257969); Currin Creek (45.337212, −122.357579); Delph Creek (45.266726, −122.169986); Eagle Creek (45.276382, −122.200963); Little Eagle Creek (45.301454, −122.167019); North Fork Eagle Creek (45.315132, −122.116618); Trout Creek (45.330806, −122.124752).

(vi) *Lower Clackamas River Watershed 1709001106.* Outlet(s) = Clackamas River (Lat 45.372568, Long −122.607652); upstream to endpoint(s) in: Unnamed (45.258538, −122.299446); Unnamed (45.350086, −122.487187); Unnamed (45.367637, −122.306895); Unnamed (45.377873, −122.36847); Unnamed (45.405591, −122.323467); Unnamed (45.411148, −122.302642); Bargfeld Creek (45.319393, −122.440978); Clackamas River (45.243027, −122.28019); Clear Creek (45.202385, −122.314579); Deep Creek (45.341779, −122.281223); Foster Creek (45.377099, −122.440414); Goose Creek (45.361912, −122.356092); Little Clear Creek (45.194779, −122.32996); Little Clear Creek (45.279953, −122.406729); Mosier Creek (45.268224, −122.452581); North Fork Deep Creek (45.426893, −122.304417); Richardson Creek (45.409345, −122.450358); Rock Creek (45.41554, −122.502566); Tickle Creek (45.391446, −122.27456).

(9) Lower Willamette Subbasin 17090012

(i) *Johnson Creek Watershed 1709001201.* Outlet(s) = Johnson Creek (Lat 45.443607, Long −122.646568); upstream to endpoint(s) in: Unnamed (45.395793, −122.637786); Unnamed (45.479793, −122.637275); Unnamed (45.400038, −122.643353); Unnamed (45.427915, −122.679059); Unnamed (45.482333, −122.416496); Unnamed (45.483664, −122.416638); Unnamed (45.485757, −122.422255); Unnamed (45.490889, −122.423876); Badger Creek (45.459757, −122.386165); Crystal Springs Creek (45.481991,

−122.636282); Hogan Creek (45.479786, −122.417896); Johnson Creek (45.462435, −122.305859); Kellogg Creek (45.416585, −122.599025); Kelly Creek (45.467217, −122.484045); Mount Scott Creek (45.430427, −122.557033); Oswego Creek (45.410712, −122.662215); Sunshine Creek (45.462297, −122.398193); Tryon Creek (45.453787, −122.691186); Willamette River (45.372568, −122.607652)).

(ii) *Scappoose Creek Watershed 1709001202*. Outlet(s) = Multnomah Channel (Lat 45.618917, Long −122.796356); Multnomah Channel (45.856115, −122.795022); upstream to endpoint(s) in: Brush Creek (45.811623, −122.98903); Cox Creek (45.857229, −122.945231); Dart Creek (45.880546, −122.886563); Deep Creek (45.789148, −122.918002); Fall Creek (45.80123, −122.93963); Gourlay Creek (45.725088, −122.960632); Lazy Creek (45.745352, −122.992007); Lizzie Creek (45.824543, −122.994287); McCarthy Creek (45.616212, −122.859047); McNulty Creek (45.836482, −122.859642); Miller Creek (45.611495, −122.812947); Milton Creek (45.910301, −122.975949); North Scappoose Creek (45.826402, −123.0147); Raymond Creek (45.72705, −122.929237); Salmon Creek (45.867532, −122.901361); Scappoose Bay (45.790852, −122.876349); South Scappoose Creek (45.76167, −123.011604); Sturgeon Lake (45.72323, −122.79232); Sturgeon Lake (45.749815, −122.802752); Sturgeon Lake (45.725503, −122.830343); Wolf Creek (45.746648, −122.949214).

(iii) *Columbia Slough/Willamette River Watershed 1709001203.* Outlet(s) = Willamette River (Lat 45.653521, Long −122.764965); upstream to endpoint(s) in: Swan Island Basin (45.565019, −122.713073); Columbia Slough (45.583522, −122.647913); Unnamed (45.615235, −122.740691); Unnamed (45.627985, −122.754739); Willamette River (45.372568, −122.607652).

(10) Lower Columbia River Corridor—Lower Columbia River Corridor.Outlet(s) = Columbia River (Lat 46.2485, Long −124.0782) upstream to endpoint(s) in: Columbia River (Lat 45.605237, Long −121.633264).

(u) ***Puget Sound Steelhead*** (*Oncorhynchus mykiss*). Critical habitat is designated to include the areas defined in the following subbasins:

(1) Strait Of Georgia Subbasin 17110002

(i) *Bellingham Bay 1711000201.* Outlet(s) = Chuckanut Creek (Lat 48.700204, Long −122.4949); Colony Creek (48.596632, −122.419321); Padden Creek (48.720212, −122.507267); Squalicum Creek (48.761135, −122.508464); Unnamed (48.614316, −122.441055); Whatcom Creek (48.754617, −122.482672); upstream to endpoint(s) in: Chuckanut Creek (48.695855, −122.459009); Colony Creek (48.595012, −122.368655); Padden Creek (48.716119, −122.492112); Squalicum Creek (48.800413, −122.401884); Toad Creek (48.790221, −122.420404); Unamed (48.61781, −122.439544); Unnamed

(48.694566, −122.460342); Unnamed (48.749891, −122.443697); Unnamed (48.776621, −122.485934); Unnamed (48.798187, −122.478488); Unnamed (48.804196, −122.480665); Unnamed (48.808622, −122.395832); Unnamed (48.81125, −122.390305); Unnamed (48.818485, −122.394634); Whatcom Creek (48.755728, −122.439609).

(ii) *Samish River Watershed 1711000202*. Outlet(s) = Samish River (Lat 48.554929, Long −122.456811); upstream to endpoint(s) in: Bear Creek (48.636953, −122.378411); Butler Creek (48.604896, −122.321047); Doolittle Creek (48.636011, −122.217771); Dry Creek (48.59728, −122.276992); Ennis Creek (48.656411, −122.192383); Friday Creek (48.648567, −122.371833); Parson Creek (48.601221, −122.282987); Silver Creek (48.64571, −122.329513); Swede Creek (48.558933, −122.226206); Thomas Creek (48.547551, −122.26923); Thunder Creek (48.597861, −122.214046); Unnamed (48.547031, −122.265845); Unnamed (48.601928, −122.266484); Unnamed (48.60898, −122.23177); Unnamed (48.624483, −122.220011); Unnamed (48.635349, −122.312454); Unnamed (48.636660, −122.376452); Unnamed (48.684736, −122.198027); Vernon Creek (48.592764, −122.243096).

(iii) *Birch Bay 1711000204*. Outlet(s) = California Creek (Lat 48.96192, Long −122.732814); Dakota Creek (48.971842, −122.723798); Terrell Creek (48.921475, −122.745208); Unnamed (48.937195, −122.752893); upstream to endpoint(s) in: California Creek (48.894356, −122.608319); Haynie Creek (48.991982, −122.649909); North Fork Dakota Creek (48.984477, −122.568636); South Fork Dakota Creek (48.946745, −122.620945); Terrell Creek (48.873999, −122.688964); Unnamed (48.89583, −122.753422); Unnamed (48.937989, −122.750521); Unnamed (48.971309, −122.626164); Unnamed (48.975408, −122.668197); Unnamed (48.984629, −122.692849); Unnamed (48.986989, −122.701077); Unnamed (48.992777, −122.604054).

(2) Nooksack Subbasin 17110004

(i) *Upper North Fork Nooksack River Watershed 1711000401*. Outlet(s) = Canyon Creek (Lat 48.90661, Long −121.989864); North Fork Nooksack River (48.90561, −121.987814); upstream to endpoint(s) in: Canyon Creek (48.922933, −121.966384); Cascade Creek (48.898964, −121.863499); Cornell Creek (48.88507, −121.95911); Deadhorse Creek (48.902507, −121.837147); Gallop Creek (48.883100, −121.947200); Glacier Creek (48.831251, −121.903097); Hedrick Creek (48.89601, −121.971728); Little Creek (48.882629, −121.937123); North Fork Nooksack River (48.905296, −121.8089); Thompson Creek (48.892411, −121.880668); West Cornell Creek (48.882149, −121.967178); Unnamed (48.83788, −121.90421); Unnamed (48.844181, −121.897301); Unnamed (48.891500, −121.967668);

Unnamed (48.902338, −121.849472); Unnamed (48.90707, −121.83948).

(ii) *Middle Fork Nooksack River Watershed 1711000402.* Outlet(s) = Canyon Creek (Lat 48.835008, Long −122.153051); Middle Fork Nooksack River (48.833037, 122.153128); upstream to endpoint(s) in: Canyon Creek (48.841923, −122.103727); Heislers Creek (48.778707, −122.092743); Middle Fork Nooksack River (48.771145, −122.072977); Porter Creek (48.794092, −122.103694); Unnamed (48.779218, −122.121048); Unnamed (48.780767, −122.116975); Unnamed (48.787472, −122.12477); Unnamed (48.820768, −122.122144).

(iii) *South Fork Nooksack River Watershed 1711000403.* Outlet(s) = South Fork Nooksack River (Lat 48.807821, Long −122.20252); upstream to endpoint(s) in: Bell Creek (48.69622, −121.87518); Cavanaugh Creek (48.644428, −122.110678); Deer Creek (48.603978, −122.092479); Hard Scrabble Falls Creek (48.759936, −122.22864); Howard Creek (48.612814, −121.966548); Hutchinson Creek (48.722661, −122.098154); Jones Creek (48.715065, −122.215748); Loomis Creek (48.665079, −121.815934); Mccarty Creek (48.727377, −122.219879); Mcginnis Creek (48.61109, −121.958839); Plumbago Creek (48.607449, −122.097919); Skookum Creek (48.68695, −122.104163); Standard Creek (48.74615, −122.224446); Sygitowicz Creek (48.772017, −122.228041); Unnamed (48.599197, −122.073063); Unnamed (48.600525, −122.039331); Unnamed (48.600658, −122.022203); Unnamed (48.60222, −122.059486); Unnamed (48.602513, −122.016247); Unnamed (48.602549, −122.004019); Unnamed (48.604219, −121.992247); Unnamed (48.604523, −121.915611); Unnamed (48.60507, −122.068393); Unnamed (48.60642, −121.930219); Unnamed (48.607985, −121.918823); Unnamed (48.608266, −121.911587); Unnamed (48.609571, −121.982189); Unnamed (48.61019, −121.954851); Unnamed (48.622868, −122.117508); Unnamed (48.626209, −122.118838); Unnamed (48.630045, −122.118545); Unnamed (48.642631, −122.122994); Unnamed (48.661705, −122.11915); Unnamed (48.679949, −121.933538); Unnamed (48.681, −122.176044); Unnamed (48.687907, −122.159547); Unnamed (48.69125, −121.932816); Unnamed (48.698785, −121.912135); Unnamed (48.700841, −121.880954); Unnamed (48.70222, −122.109268); Unnamed (48.725471, −122.168225); Unnamed (48.738227, −122.105899); Unnamed (48.745076, −122.11099); Unnamed (48.776775, −122.221381); Unnamed (48.784569, −122.220861); Unnamed (48.80173, −122.17607); Unnamed (48.819062, −122.229914); Wanlick Creek (48.66309, −121.801322).

(iv) *Lower North Fork Nooksack River Watershed 1711000404.* Outlet(s) = Anderson Creek (Lat 48.866658, Long −122.324286); Nooksack River (48.869803, −122.319417); upstream to endpoint(s) in: Anderson Creek (48.789701, −122.330514); Bell Creek

(48.849394, −122.163142); Boulder Creek (48.936973, −122.02081); Canyon Creek (48.90661, −121.989864); Coal Creek (48.890899, −122.15529); Kendall Creek (48.926471, −122.148139); Kenney Creek (48.851169, −122.11389); Macaulay Creek (48.834461, −122.236136); Maple Creek (48.926054, −122.07647); Mitchell Creek (48.831119, −122.218653); North Fork Nooksack River (48.90561, −121.987814); Racehorse Creek (48.879840, −122.126400); Smith Creek (48.843717, −122.255666); South Fork Nooksack River (48.807821, −122.20252); Unnamed (48.803428, −122.320427); Unnamed (48.809155, −122.328886); Unnamed (48.816885, −122.229843); Unnamed (48.830856, −122.173308); Unnamed (48.834543, −122.153069); Unnamed (48.843097, −122.158088); Unnamed (48.850754, −122.120796); Unnamed (48.90233, −122.093446); Unnamed (48.904967, −122.085488); Unnamed (48.903288, −122.088323); Unnamed (48.91174, −122.01464); Unnamed (48.916501, −122.063237); Unnamed (48.918962, −122.015676); Unnamed (48.920779, −122.049370); Unnamed (48.916696, −122.103739); Wildcat Creek (48.903709, −122.000478).

(v) *Nooksack River Watershed 1711000405.* Outlet(s) = Nooksack River (Lat 48.773567, Long −122.599888); Silver Creek (48.821901, −122.53218); East Silver Creek (48.81687, −122.529067); upstream to endpoint(s) in: Anderson Creek (48.866658, −122.324286); Bertrand Creek (49.002306, −122.523098); West Bertrand Creek (48.993346, −122.537903); Fishtrap Creek (49.000000, −122.406584); Fourmile Creek (48.888842, −122.422525); Mormon Ditch (48.943782, −122.382402); Nooksack River (48.869803, −122.319417); Pepin Creek (49.000000, −122.473673); Stickney Slough (48.971492, −122.390969); Tenmile Creek (48.841838, −122.377054); Wiser Lake (48.899749, −122.511319); Unnamed (48.840108, −122.411055); Unnamed (48.849253, −122.431795); Unnamed (48.854029, −122.477112); Unnamed (48.854666, −122.439035); Unnamed (48.870978, −122.599973); Unnamed (48.896998, −122.339775); Unnamed (48.913285, −122.364233); Unnamed (48.926314, −122.591314); Unnamed (48.967318, −122.524502); Unnamed (49.00182, −122.50126); Unnamed (49.000000, −122.474268).

(3) Upper Skagit Subbasin 17110005

(i) *Skagit River/Gorge Lake Watershed 1711000504*. Outlet(s) = Goodell Creek (Lat 48.674399, Long −121.26504); Skagit River (48.672375, −121.262508); upstream to endpoint(s) in: Goodell Creek (48.729929, −121.314); Newhalem Creek (48.664832, −121.255072); Skagit River (48.676125, −121.241661).

(ii) *Skagit River/Diobsud Creek Watershed 1711000505.* Outlet(s) = Skagit River (48.522186, −121.431634); upstream to endpoint(s) in: Alma Creek (48.599105, −121.36141); Bacon Creek (48.675306, −121.453097); Copper Creek (48.588469, −121.370907); Damnation Creek (48.627647, −121.339559); Diobsud Creek (48.583981,

−121.441197); East Fork Bacon Creek (48.669034, −121.430334); Falls Creek (48.633251, −121.427043); Oakes Creek (48.619075, −121.412357); Skagit River (48.672375, −121.262508); Thorton Creek (48.649594, −121.307697); Unnamed (48.550953, −121.419261); Unnamed (48.627482, −121.324941); Unnamed (48.630803, −121.424055); Unnamed (48.652391, −121.297267); Unnamed (48.65642, −121.293119); Unnamed (48.657949, −121.279141); Unnamed (48.659526, −121.281845); Unnamed (48.659652, −121.284867).

(iii) *Cascade River Watershed 1711000506*. Outlet(s) = Cascade River (Lat 48.52147, Long −121.431469); upstream to endpoint(s) in: Boulder Creek (48.511828, −121.363515); Cascade River (48.422406, −121.124592); Clark Creek (48.519616, −121.404247); Found Creek (48.481464, −121.244895); Jordan Creek (48.479149, −121.396302); Kindy Creek (48.40346, −121.19997); North Fork Cascade River (48.46574, −121.165301); Sibley Creek (48.511764, −121.255306); Unnamed (48.516916, −121.369934); Unnamed (48.519853, −121.355352); Unnamed (48.522841, −121.416253); Unnamed (48.540716, −121.187277).

(iv) *Skagit River/illabot Creek Watershed 1711000507*. Outlet(s) = Skagit River (Lat 48.533888, Long −121.736697); upstream to endpoint(s) in: Aldon Creek (48.490787, −121.655981); Barr Creek (48.494766, −121.553562); Cascade River (48.52147, −121.431469); Corkindale Creek (48.523793, −121.481226); Illabot Creek (48.420072, −121.375128); Jackman Creek (48.52921, −121.696976); Mcleod Slough (48.478113, −121.628016); Miller Creek (48.483633, −121.657553); Olson Creek (48.554876, −121.448159); Rocky Creek (48.507094, −121.497771); Sauk River (48.48173, −121.607129); Skagit River (48.522186, −121.431634); Sutter Creek (48.495127, −121.549745); Unnamed (48.471463, −121.542227); Unnamed (48.485698, −121.594461); Unnamed (48.487325, −121.545692); Unnamed (48.487425, −121.533453); Unnamed (48.501107, −121.661145).

(v) *Baker River Watershed 1711000508*. Outlet(s) = Baker River (Lat 48.533879, Long −121.736713); upstream to endpoint(s) in: Baker River (48.820068, −121.428469); Bald Eagle Creek (48.786682, −121.426929); Blum Creek (48.753095, −121.54535); Little Sandy Creek (48.704049, −121.698077); Morovitz Creek (48.745746, −121.677314); Park Creek (48.74079, −121.681977); Pass Creek (48.814934, −121.463275); Rocky Creek (48.645389, −121.707383); Skagit River (48.533888, −121.736697); Swift Creek (48.753261, −121.65719); Unnamed (48.734467, −121.636766).

(4) Sauk Subbasin 17110006

(i) *Upper Sauk River Watershed 1711000601*. Outlet(s) = Sauk River (Lat 48.173216, Long −121.472863); upstream to endpoint(s) in: Bedal Creek (48.079796, −121.392862); Black Oak Creek (48.178866,

−121.45057); Camp Creek (48.150358, −121.280495); Chocwich Creek (48.072804, −121.399295); Crystal Creek (48.182984, −121.360841); Dead Duck Creek (48.179803, −121.373501); Elliott Creek (48.055379, −121.415773); Falls Creek (48.136819, −121.432256); Martin Creek (48.091595, −121.402576); North Fork Sauk River (48.096, −121.372171); Owl Creek (48.162177, −121.295991); Peek-A-Boo Creek (48.149748, −121.441535); South Fork Sauk River (47.986322, −121.393336); Stujack Creek (48.176825, −121.392682); Swift Creek (48.099536, −121.40116); Unnamed (48.117404, −121.416221); Unnamed (48.164324, −121.447051); Unnamed (48.165143, −121.33003); Weden Creek (47.986316, −121.44378); White Chuck River (48.09948, −121.182565).

(ii) *Upper Suiattle River Watershed 1711000602.* Outlet(s) = Suiattle River (48.258351, −121.224572); upstream to endpoint(s) in: Downey Creek (48.28262, −121.209548); Suiattle River (48.210571, −121.088734); Sulphur Creek (48.256889, −121.174591).

(iii) *Lower Suiattle River Watershed 1711000603.* Outlet(s) = Suiattle River (Lat 48.335583, Long −121.547106); upstream to endpoint(s) in: All Creek (48.288401, −121.429156); Big Creek (48.343084, −121.441273); Black Creek (48.258382, −121.402801); Buck Creek (48.275388, −121.327822); Captain Creek (48.258384, −121.276479); Circle Creek (48.257783, −121.339964); Conrad Creek (48.276814, −121.414421); Harriet Creek (48.24803, −121.30351); Lime Creek (48.244288, −121.294507); Suiattle River (48.258351, −121.224572); Tenas Creek (48.336889, −121.431586); Unnamed (48.268285, −121.347595); Unnamed (48.2897, −121.432205); Unnamed (48.295835, −121.432122); Unnamed (48.303544, −121.423863).

(iv) *Lower Sauk River Watershed 1711000604.* Outlet(s) = Mcleod Slough (Lat 48.478113, Long −121.628016); Sauk River (48.48173, −121.607129); upstream to endpoint(s) in: Clear Creek (48.202408, −121.569295); Dan Creek (48.265631, −121.540646); Dutch Creek (48.179125, −121.486809); Everett Creek (48.283836, −121.526243); Goodman Creek (48.185225, −121.499311); Hilt Creek (48.440932, −121.573433); Murphy Creek (48.183863, −121.523654); Rinker Creek (48.395207, −121.583449); Sauk River (48.173216, −121.472863); Suiattle River (48.335583, −121.547106); Unnamed (48.235207, −121.590179); Unnamed (48.282638, −121.530751); Unnamed (48.286653, −121.524888); Unnamed (48.305253, −121.545097); Unnamed (48.439232, −121.616077); White Creek (48.403202, −121.537828).

(5) Lower Skagit Subbasin 17110007

(i) *Middle Skagit River/Finney Creek Watershed 1711000701.* Outlet(s) = Skagit River (Lat 48.488951, Long −122.217614); upstream to endpoint(s) in: Alder Creek (48.552575, −121.932183); Boyd Creek (48.504855, −121.892273); Childs Creek (48.536412, −122.080267); Coal Creek (48.533942, −122.153196);

Cumberland Creek (48.510468, −121.993332); Day Creek (48.406901, −121.97766); Finney Creek (48.465302, −121.687051); Gilligan Creek (48.48009, −122.130644); Grandy Creek (48.561171, −121.818094); Hansen Creek (48.559859, −122.208046); Jones Creek (48.558032, −122.046527); Loretta Creek (48.492814, −122.018527); Marietta Creek (48.511246, −121.930245); Mill Creek (48.500192, −121.873597); Muddy Creek (48.545767, −121.985109); O Toole Creek (48.508466, −121.919329); Pressentin Creek (48.509721, −121.846156); Quartz Creek (48.50301, −121.788233); Red Cabin Creek (48.552388, −122.016014); Skagit River (48.533385, −121.737928); Sorenson Creek (48.488763, −122.104541); Unnamed (48.480893, −122.141637); Unnamed (48.489945, −122.098925); Unnamed (48.495815, −121.753486); Unnamed (48.506371, −122.061784); Unnamed (48.509168, −122.104561); Unnamed (48.514861, −122.118166); Unnamed (48.528239, −122.166675); Unnamed (48.528601, −122.102507); Unnamed (48.535185, −122.087068); Unnamed (48.536394, −122.085423); Unnamed (48.537986, −122.186437); Unnamed (48.542105, −122.059915); Unnamed (48.547274, −122.185153); Unnamed (48.547956, −122.187094); Unnamed (48.548129, −121.954555); Unnamed (48.550762, −122.195456); Unnamed (48.552902, −121.959069); Unnamed (48.558115, −122.198368); Unnamed (48.558227, −121.99464); Unnamed (48.561171, −121.818094); Unnamed (48.562984, −121.811731); Unnamed (48.55177, −122.204332); Wiseman Creek (48.532064, −122.135004).

(ii) *Lower Skagit River/Nookachamps Creek Watershed 1711000702*. Outlet(s) = Freshwater Slough (Lat 48.310713, Long −122.389592); North Fork Skagit River (48.362362, −122.470128); South Fork Skagit River (48.291833, −122.368233); upstream to endpoint(s) in: Britt Slough (48.393312, −122.358366); Carpenter Creek (48.394245, −122.277339); East Fork Nookachamps Creek (48.404247, −122.180275); Fisher Creek (48.30521, −122.296248); Lake Creek (48.324016, −122.224344); Skagit River (48.488951, −122.217614); Turner Creek (48.447398, −122.195845); Unnamed (48.358837, −122.422683); Unnamed (48.366754, −122.41293); Unnamed (48.43207, −122.314617); Unnamed (48.380192, −122.17967); Walker Creek (48.375354, −122.176074).

(6) Stillaguamish Subbasin 17110008

(i) *North Fork Stillaguamish River Watershed 1711000801*. Outlet(s) = North Fork Stillaguamish River (Lat 48.203615, Long −122.126717); upstream to endpoint(s) in: Boulder River (48.245122, −121.828242); Brooks Creek (48.289564, −121.906883); Deer Creek (48.364935, −121.794539); Deforest Creek (48.393279, −121.853014); Dicks Creek (48.300579, −121.836549); French Creek (48.239427, −121.774131); Fry Creek (48.256369, −121.897103); Furland Creek (48.25189, −121.699139); Grant Creek (48.295612, −122.031716); Hell Creek

(48.252119, −121.964447); Higgins Creek (48.329407, −121.791932); Little Deer Creek (48.431748, −121.938181); Little French Creek (48.268189, −121.738851); Montague Creek (48.250887, −121.867164); Moose Creek (48.253373, −121.710713); North Fork Stillaguamish River (48.296662, −121.636091); Rick Creek (48.349662, −121.899994); Rock Creek (48.272543, −122.084907); Rollins Creek (48.292951, −121.851904); Segelsen Creek (48.301774, −121.705063); Snow Gulch (48.241837, −121.688972); Squire Creek (48.201836, −121.630783); Unnamed (48.225817, −122.090659); Unnamed (48.23139, −122.079834); Unnamed (48.236267, −121.625132); Unnamed (48.236753, −122.051497); Unnamed (48.243945, −121.64302); Unnamed (48.24766, −122.036676); Unnamed (48.252573, −122.029955); Unnamed (48.255611, −121.714995); Unnamed (48.256057, −122.095346); Unnamed (48.256367, −121.939918); Unnamed (48.256695, −122.025848); Unnamed (48.257104, −121.90825); Unnamed (48.258393, −122.05691); Unnamed (48.258869, −121.764439); Unnamed (48.259213, −121.70866); Unnamed (48.263641, −121.763092); Unnamed (48.264861, −121.758039); Unnamed (48.265601, −122.004059); Unnamed (48.267786, −122.043722); Unnamed (48.268038, −121.715334); Unnamed (48.272044, −121.726641); Unnamed (48.27601, −121.935088); Unnamed (48.277489, −122.036087); Unnamed (48.27989, −121.990779); Unnamed (48.281081, −121.995266); Unnamed (48.281713, −121.649707); Unnamed (48.283383, −121.683334); Unnamed (48.28395, −121.646562); Unnamed (48.284296, −121.658284); Unnamed (48.28446, −121.920135); Unnamed (48.285216, −121.62783); Unnamed (48.2891, −121.769358); Unnamed (48.289217, −121.680426); Unnamed (48.289395, −121.755674); Unnamed (48.289507, −121.702145); Unnamed (48.290513, −121.743771); Unnamed (48.290671, −121.721475); Unnamed (48.290801, −121.746827); Unnamed (48.291004, −121.691566); Unnamed (48.291597, −121.693818); Unnamed (48.294273, −121.732756); Unnamed (48.294703, −121.826142); Unnamed (48.294855, −121.94067); Unnamed (48.295803, −121.789706); Unnamed (48.296128, −121.825352); Unnamed (48.297676, −121.802133); Unnamed (48.319239, −121.964661); Unnamed (48.359397, −121.920923); Unnamed (48.361324, −121.93455); Unnamed (48.365655, −121.915496); Unnamed (48.366918, −121.941311); Unnamed (48.367183, −121.958052); Unnamed (48.367255, −121.956483); Unnamed (48.367469, −121.95337); Unnamed (48.370765, −121.89953); Unnamed (48.371334, −121.834956); Unnamed (48.372057, −121.893537); Unnamed (48.37667, −121.887195); Unnamed (48.384027, −121.879147); Unnamed (48.410307, −121.91761); Unnamed (48.297464, −121.81382); Unnamed (48.321184, −121.95493).

(ii) *South Fork Stillaguamish River Watershed 1711000802*. Outlet(s) = North Fork Stillaguamish River (Lat 48.203615, Long −122.126716); South Fork Stillaguamish River (48.203615, −122.126717); upstream to endpoint(s) in: Bear Creek (48.064612, −121.729061); Bear Creek (48.184588, −122.027434); Beaver Creek (48.088637, −121.513947); Bender Creek (48.066866, −121.589809); Benson Creek (48.10167, −121.738611); Blackjack Creek (48.051331, −121.624223); Boardman Creek (48.04009, −121.674988); Buck Creek (48.051042, −121.469806); Coal Creek (48.093827, −121.535554); Cranberry Creek (48.121886, −121.803277); Cub Creek (48.211009, −121.940174); Deer Creek (48.094863, −121.554797); Eldredge Creek (48.074512, −121.637347); Gordon Creek (48.086169, −121.660042); Hawthorn Creek (48.078912, −121.8082); Heather Creek (48.086826, −121.782066); Hempel Creek (48.075711, −121.743146); Jim Creek (48.209443, −121.929313); Mallardy Creek (48.067197, −121.657137); March Creek (48.196056, −122.15374); Marten Creek (48.079769, −121.613497); North Fork Canyon Creek (48.17598, −121.82868); Palmer Creek (48.0427, −121.474893); Perry Creek (48.077976, −121.482351); Porter Creek (48.197684, −122.008959); Rotary Creek (48.092322, −121.828833); Schweitzer Creek (48.06862, −121.69012); Siberia Creek (48.166246, −122.022375); South Fork Canyon Creek (48.153787, −121.785021); South Fork Stillaguamish River (48.028261, −121.483458); Triple Creek (48.077106, −121.798123); Turlo Creek (48.108542, −121.764124); Twentytwo Creek (48.075825, −121.758819); Unnamed (48.047402, −121.505486); Unnamed (48.05552, −121.520966); Unnamed (48.075811, −121.563225); Unnamed (48.077807, −121.591337); Unnamed (48.080052, −121.580689); Unnamed (48.082802, −121.695828); Unnamed (48.084671, −121.683128); Unnamed (48.090013, −121.877766); Unnamed (48.091037, −121.815954); Unnamed (48.094741, −121.861679); Unnamed (48.100032, −121.796066); Unnamed (48.102487, −121.760967); Unnamed (48.10534, −122.027687); Unnamed (48.106381, −121.783693); Unnamed (48.107979, −121.790154); Unnamed (48.110592, −121.795323); Unnamed (48.11262, −121.80435); Unnamed (48.117007, −121.82596); Unnamed (48.118957, −121.83034); Unnamed (48.125862, −122.006135); Unnamed (48.131466, −121.905515); Unnamed (48.131881, −121.883717); Unnamed (48.134683, −121.938153); Unnamed (48.139202, −122.040321); Unnamed (48.140702, −121.932885); Unnamed (48.141896, −121.932379); Unnamed (48.143639, −121.932372); Unnamed (48.14431, −121.924623); Unnamed (48.14619, −122.017379); Unnamed (48.151471, −122.062372); Unnamed (48.166951, −122.097499); Unnamed (48.19464, −122.074897); Unnamed (48.199265, −122.091343); Unnamed (48.212118, −121.923782); Unnamed (48.21329, −122.028497); Unnamed (48.216753, −122.005396); Unnamed

(48.219125, −121.989143); Unnamed (48.219724, −121.994297); Unnamed (48.224672, −121.975855); Unnamed (48.227563, −121.937492); Unnamed (48.233562, −121.953975); Wiley Creek (48.092015, −121.720605); Wisconsin Creek (48.068182, −121.719162).

(iii) *Lower Stillaguamish River Watershed 1711000803.* Outlet(s) = Hat Slough (Lat 48.198102, Long −122.359125); Stillaguamish River (48.238335, −122.376115); upstream to endpoint(s) in: Church Creek (48.26413, −122.283181); Freedom Creek (48.271454, −122.314228); Harvey Creek (48.233538, −122.128366); Jackson Gulch (48.210323, −122.241546); North Fork Stillaguamish River (48.203615, −122.126716); Pilchuck Creek (48.317396, −122.149205); Portage Creek (48.178785, −122.182919); Stillaguamish River (48.203562, −122.126899); Unnamed (48.171029, −122.260136); Unnamed (48.186672, −122.277088); Unnamed (48.195788, −122.283335); Unnamed (48.195835, −122.168612); Unnamed (48.196884, −122.166822); Unnamed (48.20183, −122.295689); Unnamed (48.203545, −122.315975); Unnamed (48.203747, −122.19962); Unnamed (48.214373, −122.151954); Unnamed (48.224202, −122.14526); Unnamed (48.227416, −122.199181); Unnamed (48.232175, −122.226793); Unnamed (48.23644, −122.226298); Unnamed (48.240242, −122.207791); Unnamed (48.241888, −122.201199); Unnamed (48.251066, −122.202687); Unnamed (48.256206, −122.197528); Unnamed (48.262756, −122.185006); Unnamed (48.271258, −122.316101); Unnamed (48.281636, −122.206013); Unnamed (48.300059, −122.213286); Unnamed (48.303378, −122.161323).

(7) Skykomish Subbasin 17110009

(i) *Tye And Beckler Rivers Watershed 1711000901.* Outlet(s) = Beckler River (Lat 47.715467, Long −121.341085); South Fork Skykomish River (47.71526, −121.339458); upstream to endpoint(s) in: Alpine Creek (47.70063, −121.253227); Beckler River (47.86115, −121.306314); East Fork Foss River (47.648892, −121.276727); Rapid River (47.819406, −121.237866); Tye River (47.717046, −121.226571); West Fork Foss River (47.627377, −121.310419).

(ii) *Skykomish River Forks Watershed 1711000902.* Outlet(s) = North Fork Skykomish River (Lat 47.813603, Long −121.577995); South Fork Skykomish River (47.812617, −121.577943); upstream to endpoint(s) in: Barclay Creek (47.791478, −121.48993); Bear Creek (47.889803, −121.382157); Beckler River (47.715467, −121.341085); Bitter Creek (47.841172, −121.50341); Bridal Veil Creek (47.798538, −121.56095); East Fork Miller River (47.648482, −121.373599); Excelsior Creek (47.869782, −121.486781); Goblin Creek (47.925037, −121.311518); Index Creek (47.759736, −121.496132); Kimball Creek (47.701302, −121.431138); Lewis Creek (47.81892, −121.505851); Maloney Creek (47.704343, −121.354423); Money Creek (47.707177, −121.442116); North Fork Skykomish River (47.920573, −121.303744); Salmon Creek

(47.904002, −121.467022); Silver Creek (47.940366, −121.437503); Snowslide Gulch (47.857696, −121.508333); South Fork Skykomish River (47.71526, −121.339458); Troublesome Creek (47.899315, −121.400435); Trout Creek (47.832847, −121.433624); West Cady Creek (47.897548, −121.305775); West Fork Miller River (47.665692, −121.400066).

(iii) *Skykomish River/Wallace River Watershed 1711000903.* Outlet(s) = Mccoy Creek (Lat 47.847628, Long −121.824315); Skykomish River (47.860377, −121.819105); Unnamed (47.855571, −121.819268); upstream to endpoint(s) in: Anderson Creek (47.8044, −121.596583); Deer Creek (47.818891, −121.581685); Duffey Creek (47.833436, −121.689636); Hogarty Creek (47.842003, −121.612106); May Creek (47.856805, −121.632414); Mccoy Creek (47.831308, −121.826994); North Fork Skykomish River (47.813603, −121.577995); North Fork Wallace River (47.879351, −121.659897); Olney Creek (47.879416, −121.717566); Proctor Creek (47.816171, −121.652091); South Fork Skykomish River (47.812617, −121.577943); Unnamed (47.823821, −121.641583); Unnamed (47.854927, −121.788254); Unnamed (47.857101, −121.75812); Unnamed (47.858007, −121.797344); Unnamed (47.860413, −121.635072); Unnamed (47.84923, −121.784034); Unnamed (47.855893, −121.752873); Wagleys Creek (47.873165, −121.773098); Wallace River (47.877046, −121.645838).

(iv) *Sultan River Watershed 1711000904.* Outlet(s) = Sultan River (Lat 47.861005, Long −121.820933); upstream to endpoint(s) in: Sultan River (47.959618, −121.796288); Unnamed (47.887034, −121.829974).

(v) *Skykomish River/Woods Creek Watershed 1711000905.* Outlet(s) = Skykomish River (Lat 47.829872, Long −122.045091); upstream to endpoint(s) in: Barr Creek (Lat 47.829715, −121.905589); Carpenter Creek (48.015168, −121.930236); Elwell Creek (47.803646, −121.853672); Foye Creek (47.822602, −121.970674); High Rock Creek (47.837811, −121.959755); Mccoy Creek (47.847628, −121.824315); Richardson Creek (47.886315, −121.943935); Riley Slough (47.844202, −121.936904); Skykomish River (47.847403, −121.886481); Skykomish River (47.852292, −121.878907); Skykomish River (47.854738, −121.82681); Sorgenfrei Creek (47.961588, −121.934368); Sultan River (47.861005, −121.820933); Unnamed (47.818865, −122.005592); Unnamed (47.81969, −122.00526); Unnamed (47.829214, −121.844279); Unnamed (47.855571, −121.819268); Unnamed (47.88559, −121.921368); Unnamed (47.828244, −122.013516); Unnamed (47.834405, −122.016728); Unnamed (47.834695, −122.021191); Unnamed (47.836191, −121.980947); Unnamed (47.839322, −121.952037); Unnamed (47.839419, −121.843256); Unnamed (47.842963, −121.90049); Unnamed (47.844848, −121.889155); Unnamed (47.851422, −121.852499); Unnamed (47.853708, −121.907276); Unnamed (47.853713, −121.91338); Unnamed (47.857546, −121.830245); West

Fork Woods Creek (47.983648, −121.957293); Woods Creek (47.895095, −121.875437); Youngs Creek (47.807915, −121.83447).

(8) Snoqualmie Subbasin 17110010

(i) *Middle Fork Snoqualmie River Watershed 1711001003*. Outlet(s) = Langlois Creek (Lat 47.635728, Long −121.90751); Snoqualmie River (47.640786, −121.927225); upstream to endpoint(s) in: Canyon Creek (47.568828, −121.981984); East Fork Griffin Creek (47.667678, −121.79524); Griffin Creek (47.679643, −121.802134); Lake Creek (47.506498, −121.871475); Langlois Creek (47.632423, −121.900585); Langlois Creek (47.63436, −121.910479); Patterson Creek (47.643294, −122.008601); Raging River (47.443286, −121.841753); Snoqualmie River (47.54132, −121.837391); Tokul Creek (47.556115, −121.829753); Unnamed (47.435758, −121.840802); Unnamed (47.469131, −121.887371); Unnamed (47.552211, −121.892074); Unnamed (47.55902, −121.959053); Unnamed (47.594862, −121.869153); Unnamed (47.602188, −121.86105); Unnamed (47.611929, −121.844129); Unnamed (47.617761, −121.987517); Unnamed (47.620823, −121.818809); Unnamed (47.67586, −121.821881); Unnamed (47.550625, −121.860269); Unnamed (47.573184, −121.882046); Unnamed (47.574562, −121.935597); Unnamed (47.574643, −121.923532); Unnamed (47.575296, −121.934856); Unnamed (47.575302, −121.928863); Unnamed (47.577661, −121.922239); Unnamed (47.580744, −121.89107); Unnamed (47.604032, −121.909863); Unnamed (47.60579, −121.908524); Unnamed (47.611586, −121.940718); Unnamed (47.61275, −121.923865); Unnamed (47.619886, −121.913184); Unnamed (47.624753, −121.913661).

(ii) *Lower Snoqualmie River Watershed 1711001004*. Outlet(s) = Snohomish River (47.832905, −122.05029); Unnamed (47.818865, −122.005592); upstream to endpoint(s) in: Adair Creek (47.713532, −122.00603); Cherry Creek (47.767647, −121.835764); Langlois Creek (47.635728, −121.90751); Margaret Creek (47.754562, −121.894491); North Fork Cherry Creek (47.747274, −121.922417); North Fork Creek (47.709704, −121.813858); Pearson Eddy Creek (47.7629, −121.993362); Peoples Creek (47.797003, −121.969785); Snoqualmie River (47.640786, −121.927225); South Fork Tolt River (47.692382, −121.690691); Stossel Creek (47.760057, −121.854479); Tolt River (47.639682, −121.925064); Tuck Creek (47.760138, −122.029513); Unnamed (47.66549, −121.969734); Unnamed (47.688103, −121.841747); Unnamed (47.697681, −121.877351); Unnamed (47.699359, −121.72867); Unnamed (47.711538, −121.835344); Unnamed (47.718309, −121.778212); Unnamed (47.719516, −121.683676); Unnamed (47.721128, −121.842676); Unnamed (47.721491, −121.711688); Unnamed (47.72187, −121.872933); Unnamed (47.639628, −121.916512); Unnamed (47.644835, −121.876373); Unnamed (47.652724, −121.927754); Unnamed

(47.653832, −121.900784); Unnamed (47.663562, −121.912794); Unnamed (47.666377, −121.921884); Unnamed (47.66645, −121.968042); Unnamed (47.671854, −121.944823); Unnamed (47.6722, −121.934103); Unnamed (47.672893, −121.963119); Unnamed (47.673234, −121.906003); Unnamed (47.68202, −121.984816); Unnamed (47.683549, −121.985897); Unnamed (47.685397, −121.98674); Unnamed (47.688482, −121.942011); Unnamed (47.691215, −121.959693); Unnamed (47.691787, −121.975697); Unnamed (47.694662, −121.994754); Unnamed (47.701955, −121.998995); Unnamed (47.704253, −122.001792); Unnamed (47.709025, −122.004767); Unnamed (47.709854, −121.98468); Unnamed (47.716945, −122.001237); Unnamed (47.721749, −121.989604); Unnamed (47.722623, −121.987303); Unnamed (47.723963, −121.996696); Unnamed (47.726844, −121.989954); Unnamed (47.733263, −122.010612); Unnamed (47.733962, −121.989698); Unnamed (47.734647, −122.013111); Unnamed (47.736303, −122.013677); Unnamed (47.736874, −121.98844); Unnamed (47.741838, −122.009593); Unnamed (47.744396, −121.949708); Unnamed (47.745593, −121.952919); Unnamed (47.745918, −121.954099); Unnamed (47.747444, −122.005028); Unnamed (47.747524, −121.957434); Unnamed (47.747678, −121.996583); Unnamed (47.74965, −121.977289); Unnamed (47.750208, −121.96435); Unnamed (47.750524, −121.965961); Unnamed (47.75188, −121.927084); Unnamed (47.752108, −121.969501); Unnamed (47.752268, −122.004156); Unnamed (47.75256, −121.964546); Unnamed (47.752757, −121.969499); Unnamed (47.752947, −121.957481); Unnamed (47.753339, −121.969357); Unnamed (47.754942, −121.97775); Unnamed (47.756436, −122.004367); Unnamed (47.758452, −122.002775); Unnamed (47.761886, −122.000354); Unnamed (47.762689, −121.991876); Unnamed (47.762853, −121.977877); Unnamed (47.767489, −122.000623); Unnamed (47.775507, −121.995614); Unnamed (47.775755, −121.99995); Unnamed (47.776255, −121.999798); Unnamed (47.779073, −121.991757); Unnamed (47.782249, −121.966177); Unnamed (47.788539, −122.000183); Unnamed (47.797789, −121.978354); Unnamed (47.801619, −121.981418); Unnamed (47.815259, −121.976869); Unnamed (47.815443, −121.99813); Unnamed (47.818865, −122.005592).

(9) Snohomish Subbasin 17110011

(i) *Pilchuck River Watershed 1711001101*. Outlet(s) = French Creek (Lat 47.888547, Long −122.087439); Pilchuck River (47.900972, −122.092133); upstream to endpoint(s) in: Boulder Creek (48.024989, −121.811255); Catherine Creek (48.033209, −122.077074); Dubuque Creek (47.996688, −122.010406); French Creek (47.898794, −122.057083); Kelly Creek (48.035392, −121.830635); Little Pilchuck

Creek (48.112494, −122.060843); Miller Creek (47.996242, −121.781617); Pilchuck River (47.991273, −121.736285); Purdy Creek (48.008866, −121.892703); Worthy Creek (48.060661, −121.889486); Scott Creek (47.94956, −122.05759); Unnamed (47.946107, −122.078197); Unnamed (47.981529, −122.022251); Unnamed (48.014987, −122.065111); Unnamed (48.050521, −121.960436); Unnamed (48.052319, −121.873027); Unnamed (48.056823, −121.920701); Unnamed (47.893981, −122.064909); Unnamed (47.90029, −122.055264); Unnamed (47.900781, −122.071709); Unnamed (47.902216, −122.060278); Unnamed (47.909758, −122.055179); Unnamed (47.91308, −122.079588); Unnamed (47.91411, −122.073471); Unnamed (47.930159, −122.045611); Unnamed (47.970802, −122.07904); Wilson Creek (48.007178, −121.772124).

(ii) *Snohomish River Watershed 1711001102.* Outlet(s) = Quilceda Creek (48.045077, −122.207633); Snohomish River (48.020024, −122.199952); Steamboat Slough (48.035252, −122.187716); Union Slough (48.033026, −122.187941); Unnamed (48.042687, −122.203304); upstream to endpoint(s) in: Allen Creek (48.060189, −122.155845); Anderson Creek (47.823494, −122.063169); Batt Slough (47.893752, −122.101932); Burri Creek (47.996254, −122.12825); Ebey Slough (47.942077, −122.172019); Elliott Creek (47.832096, −122.058076); Evans Creek (47.837998, −122.084366); French Creek (47.905702, −122.006538); Lake Beecher (47.853003, −122.08659); Larimer Creek (47.889935, −122.141659); Quilceda Creek (48.126701, −122.136538); Snohomish River (47.845642, −122.066164); Swan Trail Slough (47.924299, −122.144247); Thomas Creek (47.885779, −122.133759); Unnamed (47.89605, −122.024132); Unnamed (47.874632, −122.06789); Unnamed (47.878911, −122.062819); Unnamed (47.883214, −122.075259); Unnamed (47.883685, −122.064291); Unnamed (47.977505, −122.164439); Unnamed (47.989661, −122.153303); Unnamed (47.989986, −122.157628); Unnamed (47.992902, −122.153788); Unnamed (47.994226, −122.155257); Unnamed (47.999821, −122.157617); Unnamed (47.999833, −122.154307); Unnamed (48.000441, −122.160006); Unnamed (48.131795, −122.131717); Unnamed (47.826251, −122.063007); Unnamed (47.839617, −122.088583); Unnamed (47.842605, −122.060737); Unnamed (47.842773, −122.09302); Unnamed (47.845642, −122.066164); Unnamed (47.845758, −122.092344); Unnamed (47.846844, −122.064563); Unnamed (47.851113, −122.010167); Unnamed (47.852079, −122.018572); Unnamed (47.861172, −122.029372); Unnamed (47.864352, −122.091793); Unnamed (47.868184, −122.033887); Unnamed (47.868667, −122.071745); Unnamed (47.871627, −122.007148); Unnamed (47.872067, −122.012574); Unnamed (47.872807, −122.007458); Unnamed (47.872892, −122.020313);

Unnamed (47.873683, −122.02625); Unnamed (47.873838, −122.023394); Unnamed (47.873972, −122.020824); Unnamed (47.873974, −122.018382); Unnamed (47.874621, −122.033932); Unnamed (47.87602, −122.018838); Unnamed (47.876587, −122.038858); Unnamed (47.877086, −122.10383); Unnamed (47.878155, −122.093306); Unnamed (47.878365, −122.047458); Unnamed (47.879616, −122.121293); Unnamed (47.880169, −122.120704); Unnamed (47.880744, −122.124328); Unnamed (47.880801, −122.115079); Unnamed (47.881683, −122.018106); Unnamed (47.882464, −122.049811); Unnamed (47.88295, −122.036805); Unnamed (47.883214, −122.128361); Unnamed (47.887449, −122.136266); Unnamed (47.887628, −122.115244); Unnamed (47.889292, −122.138508); Unnamed (47.889733, −122.139749); Unnamed (47.889949, −122.045002); Unnamed (47.891627, −122.052284); Unnamed (47.893918, −122.1473); Unnamed (47.893921, −122.15179); Unnamed (47.900751, −122.162699); Unnamed (47.901957, −122.165281); Unnamed (47.903224, −122.152517); Unnamed (47.905749, −122.171392); Unnamed (47.906952, −122.1713); Unnamed (47.909784, −122.174177); Unnamed (47.917745, −122.179549); Unnamed (47.91785, −122.170724); Unnamed (47.917965, −122.176424); Unnamed (47.918881, −122.166131); Unnamed (47.919953, −122.159256); Unnamed (47.920163, −122.112239); Unnamed (47.922557, −122.152328); Unnamed (47.926219, −122.164369); Unnamed (47.927044, −122.187844); Unnamed (47.927115, −122.181581); Unnamed (47.928771, −122.182785); Unnamed (47.929155, −122.1575); Unnamed (47.9292, −122.16225); Unnamed (47.931447, −122.155867); Unnamed (47.935459, −122.190942); Unnamed (47.935975, −122.19135); Unnamed (47.936814, −122.170221); Unnamed (47.939084, −122.174422); Unnamed (47.939185, −122.192305); Unnamed (47.939694, −122.150153); Unnamed (47.940939, −122.155435); Unnamed (47.940947, −122.157858); Unnamed (47.94244, −122.157373); Unnamed (47.942726, −122.17536); Unnamed (47.945442, −122.192582); Unnamed (47.94649, −122.146106); Unnamed (47.946592, −122.146917); Unnamed (47.947975, −122.179796); Unnamed (47.949211, −122.139884); Unnamed (47.949321, −122.159191); Unnamed (47.949477, −122.132724); Unnamed (47.949525, −122.141519); Unnamed (47.954551, −122.127872); Unnamed (47.954673, −122.126737); Unnamed (47.954755, −122.131233); Unnamed (47.955528, −122.131243); Unnamed (47.956927, −122.19563); Unnamed (47.959917, −122.126245); Unnamed (47.960424, −122.126126); Unnamed (47.960595, −122.12673); Unnamed (47.961773, −122.130148); Unnamed (47.99053, −122.133921); Unnamed (48.001732, −122.129584); Unnamed (48.035728, −122.158051); Unnamed (48.038525, −122.160828);

Unnamed (48.039738, −122.153565); Unnamed (48.041372, −122.151583); Unnamed (48.042963, −122.150051); Unnamed (48.044102, −122.147735); Unnamed (48.047591, −122.150945); Unnamed (48.048094, −122.159389); Weiser Creek (48.004603, −122.127993); West Fork Quilceda Creek (48.114329, −122.192036); Wood Creek (47.925014, −122.184669); Wood Creek (47.946568, −122.177043).

(10) Lake Washington 17110012

(i) *Cedar River 1711001201*. Outlet(s) = Cedar River (Lat 47.500458, Long −122.215889); upstream to endpoint(s) in: Cedar River (47.419017, −121.781807); Hotel Creek (47.412859, −121.910189); Madsen Creek (47.454959, −122.139271); Molasses Creek (47.458236, −122.160236); North Rock Creek (47.398935, −121.906887); Peterson Creek (47.421385, −122.071428); Rock Creek (47.361425, −121.989528); Seventeen Creek (47.392916, −121.820937); Steele Creek (47.41485, −121.820204); Taylor Creek (47.371712, −121.827216); Webster Creek (47.415607, −121.919722); Williams Creek (47.406308, −121.859432); Unnamed (47.412034, −122.005441); Unnamed (47.397644, −122.015869); Walsh Lake Diversion Ditch (47.388412, −121.983268).

(ii) [Reserved]

(11) Duwamish Subbasin 17110013

(i) *Upper Green River Watershed 1711001301*. Outlet(s) = Green River (Lat 47.147332, Long −121.337530); Smay Creek (47.22558, −121.608029); upstream to endpoint(s) in: Friday Creek (47.220272, −121.457068); Green Canyon (47.224794, −121.573207); Intake Creek (47.205494, −121.400407); Lester Creek (47.201505, −121.478166); Mccain Creek (47.209121, −121.530424); Sawmill Creek (47.169396, −121.450398); Smay Creek (47.262876, −121.571182); Snow Creek (47.267186, −121.414); Rock Creek (47.178042, −121.519565); Twin Camp (47.172731, −121.380409); West Creek (47.261865, −121.413235); West Fork Smay Creek (47.274569, −121.606566); Wolf Creek (47.21422, −121.581762); Sunday Creek (47.258566, −121.367101); Tacoma Creek (47.187342, −121.364175).

(ii) *Middle Green River Watershed 1711001302*. Outlet(s) = Green River (Lat 47.288124, Long −121.97032); upstream to endpoint(s) in: Bear Creek (47.277192, −121.800206); Boundary Creek (47.274726, −121.71933); Charley Creek (47.245104, −121.789334); Cougar Creek (47.243692, −121.645414); Eagle Creek (47.304949, −121.723086); Gale Creek (47.263433, −121.700312); Green River (47.222773, −121.608297); North Fork Green River (47.284327, −121.665707); Piling Creek (47.281819, −121.756524); Smay Creek (47.22558, −121.608029); Sylvester Creek (47.245565, −121.654863).

(iii) *Lower Green River Watershed 1711001303*. Outlet(s) = Duwamish Waterway (Lat 47.583483, Long −122.359684); Unnamed (47.588989,

−122.34426); upstream to endpoint(s) in: Big Soos Creek (47.372078, −122.144432); Black River (47.417508, −122.185115); Burns Creek (47.289464, −122.075333); Crisp Creek (47.294623, −122.055513); Cristy Creek (47.27092, −122.017489); Green River (47.288124, −121.97032); Jenkins Creek (47.37728, −122.080576); Little Soos Creek (47.378342, −122.106081); Mill Creek (47.303262, −122.272491); Newaukum Creek (47.225659, −121.906874); Ravensdale Creek (47.33485, −122.02312); Rock Creek (47.310539, −122.024859); Stonequarry Creek (47.244084, −121.932273); Unnamed (47.220884, −122.023242); Unnamed (47.220892, −122.016139); Unnamed (47.234075, −121.931801); Unnamed (47.325011, −122.200079); Unnamed (47.335135, −122.154992); Unnamed (47.353478, −122.258274); Unnamed (47.360321, −122.225589); Unnamed (47.374183, −122.103011); Unnamed (47.389595, −122.225993).

(12) Puyallup Subbasin 17110014

(i) *Upper White River Watershed 1711001401*. Outlet(s) = Greenwater River (Lat 47.158517, Long −121.659041); White River (47.158251, −121.659559); upstream to endpoint(s) in: George Creek (47.099306, −121.472868); Greenwater River (47.091025, −121.456044); Huckleberry Creek (47.053496, −121.616046); Pyramid Creek (47.113047, −121.455762); Twentyeight Mile Creek (47.060856, −121.511537); Unnamed (47.051445, −121.71716); Unnamed (47.12065, −121.554216); Unnamed (47.134311, −121.583518); West Fork White River (47.047717, −121.692719); Whistle Creek (47.118448, −121.489277); White River (47.01416, −121.529457); Wrong Creek (47.043096, −121.699618).

(ii) *Lower White River Watershed 1711001402*. Outlet(s) = White River (Lat 47.200025, Long −122.255912); upstream to endpoint(s) in: Boise Creek (47.195608, −121.947967); Camp Creek (47.147051, −121.703951); Canyon Creek (47.13331, −121.862029); Clearwater River (47.084983, −121.783524); Greenwater River (47.158517, −121.659041); Scatter Creek (47.162429, −121.87438); Unnamed (47.222955, −122.097188); Unnamed (47.229087, −122.07162); Unnamed (47.233808, −122.109926); Unnamed (47.245631, −122.058795); Unnamed (47.247135, −122.22738); Unnamed (47.25371, −122.264826); Unnamed (47.261283, −122.13136); Unnamed (47.268104, −122.25123); Unnamed (47.238173, −122.223415); White River (47.158251, −121.659559).

(iii) *Carbon River Watershed 1711001403*. Outlet(s) = Carbon River (Lat 47.123651, Long −122.229222); upstream to endpoint(s) in: Carbon River (46.993075, −121.926834); Coplar Creek (47.072996, −122.167682); Gale Creek (47.086262, −122.015047); Page Creek (47.12503, −122.009401); South Fork South Prairie Creek (47.099283, −121.954505); Unnamed (47.096464, −122.141219); Unnamed (47.097218, −122.145432); Unnamed (47.141246, −122.058699);

Voight Creek (47.077134, −122.131266); Wilkeson Creek (47.089113, −122.011371).

(iv) *Upper Puyallup River Watershed 1711001404*. Outlet(s) = Carbon River (Lat 47.130578, Long −122.232672); Puyallup River (47.130572, −122.232719); upstream to endpoint(s) in: Carbon River (47.123651, −122.229222); Fox Creek (47.012694, −122.183844); Kellog Creek (46.913785, −122.083644); Le Dout Creek (46.935374, −122.054579); Niesson Creek (46.88451, −122.032222); Ohop Creek (46.941896, −122.222784); Puyallup River (46.904305, −122.03511); Unnamed (46.901022, −122.053271); Unnamed (46.915301, −122.08532); Unnamed (47.033738, −122.183585); Unnamed (47.072524, −122.217752); Unnamed (47.077709, −122.21324).

(v) *Lower Puyallup River Watershed 1711001405*. Outlet(s) = Hylebos Creek (Lat 47.260936, Long −122.360296); Puyallup River (47.262018, −122.419738); Wapato Creek (47.254142, −122.376043); upstream to endpoint(s) in: Canyonfalls Creek (47.141497, −122.220946); Carbon River (47.130578, −122.232672); Clarks Creek (47.175558, −122.318004); Clarks Creek (47.214046, −122.341441); Fennel Creek (47.149294, −122.186141); Hylebos Creek (47.268092, −122.304897); Puyallup River (47.130572, −122.232719); Simons Creek (47.223614, −122.306576); Swam Creek (47.198605, −122.392952); Unnamed (47.192643, −122.338319); Unnamed (47.212642, −122.362772); Unnamed (47.284933, −122.328406); West Hylebos Creek (47.28045, −122.319677); White River (47.200025, −122.255912).

(13) Nisqually Subbasin 17110015

(i) *Mashel/Ohop Watershed 1711001502*. Outlet(s) = Lackamas Creek (Lat 46.8589, Long −122.488209); Nisqually River (46.864078, −122.478318); Tobolton Creek (46.863143, −122.480177); upstream to endpoint(s) in: Beaver Creek (46.858889, −122.187968); Busy Wild Creek (46.797885, −122.041534); Little Mashel River (46.850176, −122.27362); Lynch Creek (46.879792, −122.275113); Mashel River (46.84805, −122.104803); Nisqually River (46.823001, −122.30402); Ohop Valley Creek (46.924846, −122.260991); Powell Creek (46.84388, −122.436634); Tanwax Creek (46.941782, −122.280108); Tobolton Creek (46.823649, −122.48512); Twentyfive Mile Creek (46.924778, −122.259359); Unnamed (46.832309, −122.528978); Unnamed (46.907314, −122.261798).

(ii) *Lowland Watershed 1711001503*. Outlet(s) = Mcallister Creek (Lat 47.086256, Long −122.72842); Nisqually River (47.098476, −122.698813); Red Salmon Creek (47.096419, −122.687018); upstream to endpoint(s) in: Horn Creek (46.917907, −122.464722); Lacamas Creek (46.974424, −122.477971); Lacamas Creek (47.008577, −122.53729); Lackamas Creek (46.8589, −122.488209); Mcallister Creek (47.029715, −122.724885); Muck Creek (47.024063, −122.333195); Murray Creek (46.978923, −122.494325); Nisqually River (46.864078, −122.478318); Red Salmon Creek (47.083089,

−122.678869); South Creek (46.985228, −122.287693); Thompson Creek (46.953803, −122.63521); Tobolton Creek (46.863143, −122.480177); Unnamed (46.88276, −122.481929); Unnamed (46.92337, −122.522371); Unnamed (46.999957, −122.652251); Unnamed (47.034211, −122.674166); Unnamed (47.03749, −122.735619); Unnamed (47.083824, −122.682663); Yelm Creek (46.947774, −122.606162).

(14) Deschutes 17110016

(i) *Deschutes River-Lake Lawrence 1711001601*. Outlet(s) = Deschutes River (Lat 46.858414, −122.703615); upstream to endpoint(s) in: Deschutes River (46.803719, −122.41723); Fall Creek (46.801851, −122.508518); Hull Creek (46.815628, −122.551688); Johnson Creek (46.771083, −122.424056); Mitchell Creek (46.764822, −122.520257); Pipeline Creek (46.815019, −122.557139); Thurston Creek (46.787177, −122.426181); Unnamed (46.776798, −122.456757); Unnamed (46.821012, −122.552051); Unnamed (46.825293, −122.597406).

(ii) *Deschutes River-Capitol Lake 1711001602*. Outlet(s) = Deschutes River (Lat 47.043613, Long −122.909102); upstream to endpoint(s) in: Deschutes River (46.858414, −122.703615); Unnamed (46.883422, −122.791346); Unnamed (46.885585, −122.765692); Unnamed (46.900133, −122.761883); Unnamed (46.920776, −122.814054).

(15) Skokomish Subbasin 17110017

(i) *Skokomish River Watershed 1711001701*. Outlet(s) = Skokomish River (Lat 47.354102, Long −123.113454); Unnamed (47.346915, −123.1288); upstream to endpoint(s) in: Aristine Creek (47.339036, −123.330797); Brown Creek (47.426884, −123.273846); Cedar Creek (47.438747, −123.412558); Church Creek (47.460295, −123.455165); Fir Creek (47.336146, −123.302908); Frigid Creek (47.378231, −123.241695); Gibbons Creek (47.401886, −123.237898); Harp Creek (47.403646, −123.307961); Kirkland Creek (47.31996, −123.290062); Le Bar Creek (47.42431, −123.321985); Mctaggert Creek (47.415308, −123.249773); Mussel Shell Creek (47.299392, −123.154163); North Fork Skokomish River (47.398124, −123.201673); Pine Creek (47.443201, −123.429394); Purdy Canyon (47.30192, −123.181551); Purdy Creek (47.304446, −123.188829); South Fork Skokomish River (47.490355, −123.460444); Unnamed (47.307518, −123.202431); Unnamed (47.309215, −123.151179); Unnamed (47.312777, −123.250097); Unnamed (47.314724, −123.179082); Unnamed (47.315244, −123.177395); Unnamed (47.317283, −123.233949); Unnamed (47.318056, −123.168869); Unnamed (47.319036, −123.198978); Unnamed (47.320262, −123.233188); Unnamed (47.321111, −123.168254); Unnamed (47.32192, −123.307559); Unnamed (47.32264, −123.166947); Unnamed (47.324298, −123.166032); Unnamed (47.32618, −123.165265); Unnamed (47.327954, −123.1645); Unnamed (47.340589, −123.229732); Vance

Creek (47.363339, −123.37747); Weaver Creek (47.309516, −123.23971).

(ii) [Reserved]

(16) Hood Canal Subbasin 17110018

(i) *Lower West Hood Canal Frontal Watershed 1711001802*. Outlet(s) = Eagle Creek (Lat 47.484737, Long −123.077896); Finch Creek (47.406474, −123.13894); Fulton Creek (47.618077, −122.974895); Jorsted Creek (47.526147, −123.050128); Lilliwaup Creek (47.468701, −123.114852); Unnamed (47.457462, −123.112951); Unnamed (47.570832, −123.01278); upstream to endpoint(s) in: Eagle Creek (47.499033, −123.100927); Finch Creek (47.406575, −123.145463); Fulton Creek (47.628033, −122.985435); Jorsted Creek (47.52439, −123.066123); Lilliwaup Creek (47.470625, −123.116282); Unnamed (47.459167, −123.133047); Unnamed (47.57275, −123.020786).

(ii) *Hamma Hamma River Watershed 1711001803*. Outlet(s) = Hamma Hamma River (Lat 47.546939, Long −123.045218); upstream to endpoint(s) in: Hamma Hamma River (47.560258, −123.066043); North Fork John Creek (47.545766, −123.072377); South Fork John Creek (47.541154, −123.07576).

(iii) *Duckabush River Watershed 1711001804*. Outlet(s) = Duckabush River (Lat 47.650063, Long −122.936017); Unnamed (47.651985, −122.935914); upstream to endpoint(s) in: Duckabush River (47.683876, −123.069991); Unnamed (47.656559, −122.939617); Unnamed (47.658797, −122.946881); Unnamed (47.664171, −122.958939); Unnamed (47.665164, −122.971688).

(iv) *Dosewallips River Watershed 1711001805*. Outlet(s) = Dosewallips River (Lat 47.687868, Long −122.895799); upstream to endpoint(s) in: Dosewallips River (47.728734, −123.112328); Gamm Creek (47.740548, −123.064117); Rocky Brook (47.720965, −122.941729); Unnamed (47.703663, −122.942585); Unnamed (47.718461, −123.001437).

(v) *Big Quilcene River Watershed 1711001806*. Outlet(s) = Big Quilcene River (Lat 47.818629, Long −122.861797); upstream to endpoint(s) in: Big Quilcene River (47.81031, −122.91278); Unnamed (47.844904, −122.934513).

(vi) *Upper West Hood Canal Frontal Watershed 1711001807*. Outlet(s) = Donovan Creek (Lat 47.827622, Long −122.858429); Indian George Creek (47.807881, −122.869227); Little Quilcene River (47.826459, −122.862109); Spencer Creek (47.745578, −122.875483); Tarboo Creek (47.860282, −122.813536); Thorndyke Creek (47.816713, −122.739675); Unnamed (47.69516, −122.807343); Unnamed (47.742597, −122.767326); Unnamed (47.780439, −122.865654); Unnamed (47.803054, −122.748043); Unnamed (47.809788, −122.791892); Unnamed (47.827807, −122.696476); Unnamed (47.870429, −122.693831); upstream to endpoint(s) in: Donovan Creek (47.852344, −122.859015); Indian George Creek

(47.806041, −122.872191); Leland Creek (47.87993, −122.878552); Little Quilcene River (47.87162, −122.920887); Spencer Creek (47.757649, −122.895277); Tarboo Creek (47.917525, −122.825126); Unnamed (47.700468, −122.804836); Unnamed (47.745248, −122.772127); Unnamed (47.780486, −122.870015); Unnamed (47.817369, −122.763825); Unnamed (47.826301, −122.786512); Unnamed (47.845809, −122.709645); Unnamed (47.847797, −122.878694); Unnamed (47.857542, −122.837721); Unnamed (47.86785, −122.773687); Unnamed (47.871141, −122.795142); Unnamed (47.886493, −122.830585); Unnamed (47.888336, −122.801101); Unnamed (47.889882, −122.698239).

(vii) *West Kitsap Watershed 1711001808*. Outlet(s) = Anderson Creek (Lat 47.566784, Long −122.967625); Anderson Creek (47.665387, −122.757767); Big Beef Creek (47.651916, −122.783607); Boyce Creek (47.609223, −122.915305); Dewatto River (47.45363, −123.048642); Mission Creek (47.430736, −122.872828); Seabeck Creek (47.63558, −122.834296); Stavis Creek (47.625046, −122.872893); Tahuya River (47.376565, −123.038419); Union River (47.44818, −122.838076); Unnamed (47.453546, −123.048616); Unnamed (47.585137, −122.945064); Unnamed (47.826269, −122.56367); upstream to endpoint(s) in: Anderson Creek (47.660179, −122.756351); Bear Creek (47.498732, −122.811755); Big Beef Creek (47.589887, −122.846319); Boyce Creek (47.609187, −122.914277); Mission Creek (47.499061, −122.850487); Seabeck Creek (47.623835, −122.838375); Stavis Creek (47.605496, −122.872936); Tin Mine Creek (47.577069, −122.829158); Union River (47.527109, −122.785967); Unnamed (47.416887, −122.999502); Unnamed (47.43499, −123.053793); Unnamed (47.438227, −123.043285); Unnamed (47.451055, −123.016346); Unnamed (47.451077, −122.914789); Unnamed (47.454548, −122.986648); Unnamed (47.457926, −122.82675); Unnamed (47.459434, −122.841199); Unnamed (47.461807, −122.986012); Unnamed (47.464136, −122.996728); Unnamed (47.471436, −123.026462); Unnamed (47.472953, −122.853144); Unnamed (47.473856, −122.98827); Unnamed (47.496903, −122.832756); Unnamed (47.499811, −122.959843); Unnamed (47.513538, −122.976821); Unnamed (47.518086, −122.944624); Unnamed (47.533867, −122.966128); Unnamed (47.556351, −122.93869); Unnamed (47.578134, −122.831814); Unnamed (47.578146, −122.944137); Unnamed (47.617962, −122.881294); Unnamed (47.823731, −122.557569).

(17) Kitsap Subbasin 17110019

(i) *Kennedy/Goldsborough Watershed 1711001900*. Outlet(s) = Campbell Creek (Lat 47.222039, Long −123.025109); Cranberry Creek (47.262433, −123.015892); Deer Creek (47.259411, −123.009378); Goldsborough Creek (47.209541, −123.09519);

Kennedy Creek (47.096767, −123.085708); Johns Creek (47.246105, −123.042959); Lynch Creek (47.152742, −123.052635); Malaney Creek (47.25142, −123.0197); Mill Creek (47.195478, −122.996269); Perry Creek (47.04923, −123.005168); Schneider Creek (47.091599, −123.075637); Shelton Creek (47.213868, −123.095177); Sherwood Creek (47.375171, −122.835464); Skookum Creek (47.127879, −123.088396); Uncle John Creek (47.223441, −123.028998); Unnamed (47.138813, −123.076426); Unnamed (47.348035, −123.073581); Unnamed (47.406636, −122.887438); Unnamed (47.43145, −122.848454); Unnamed (47.378832, −122.974308); Unnamed (47.382516, −122.948722); upstream to endpoint(s) in: Campbell Creek (47.226397, −122.997893); Cranberry Creek (47.283615, −123.111755); Deer Creek (47.327279, −122.911546); Gosnell Creek (47.132634, −123.208108); Johns Creek (47.252177, −123.129051); Kamilche Creek (47.109481, −123.120016); Kennedy Creek (47.079184, −123.126612); Lynch Creek (47.16124, −123.063246); Malaney Creek (47.248952, −123.011342); North Fork Goldsborough Creek (47.226417, −123.221454); Perry Creek (47.053893, −123.021482); Rock Creek (47.173241, −123.200765); Schneider Creek (47.071686, −123.056453); Shelton Creek (47.22776, −123.11259); Shumocher Creek (47.31782, −122.992107); South Fork Goldsborough Creek (47.186447, −123.252006); Uncle John Creek (47.230245, −123.028211); Unnamed (47.081522, −123.102753); Unnamed (47.097705, −123.216015); Unnamed (47.100105, −123.216045); Unnamed (47.1455, −123.081178); Unnamed (47.149979, −123.116498); Unnamed (47.154715, −123.122654); Unnamed (47.182813, −123.154821); Unnamed (47.183317, −122.993257); Unnamed (47.187858, −123.166457); Unnamed (47.209485, −123.249564); Unnamed (47.223587, −122.981336); Unnamed (47.225845, −123.243846); Unnamed (47.226397, −122.997893); Unnamed (47.25604, −123.060758); Unnamed (47.293868, −123.03765); Unnamed (47.322265, −122.993083); Unnamed (47.345989, −123.087997); Unnamed (47.361619, −122.901294); Unnamed (47.36676, −122.866433); Unnamed (47.37043, −122.975612); Unnamed (47.378331, −122.84611); Unnamed (47.37179, −122.957923); Unnamed (47.385117, −122.898154); Unnamed (47.41665, −122.847985).

(ii) *Puget Sound 1711001901.* Outlet(s) = Anderson Creek (Lat 47.527851, Long −122.683072); Barker Creek (47.637847, −122.670114); Blackjack Creek (47.542244, −122.627229); Burley Creek (47.412304, −122.631424); Chico Creek (47.602679, −122.705419); Clear Creek (47.652349, −122.68632); Coulter Creek (47.406361, −122.819291); Crescent Valley (47.345209, −122.583101); Crouch Creek (47.652147, −122.62956); Curley Creek (47.523499, −122.546087); Gorst Creek (47.527855, −122.697881); Illahe Creek (−122.595950, 47.610235); Mccormick Creek (47.371692,

−122.624236); Minter Creek (47.371035, −122.702469); North Creek (47.337484, −122.592533); Olalla Creek (47.425398, −122.551857); Purdy Creek (47.387232, −122.626582); Rocky Creek (47.371062, −122.78137); Unnamed (47.538696, −122.65636); Unnamed (47.645936, −122.69393); Unnamed (47.712429, −122.613727); Unnamed (47.717886, −122.656445); Unnamed (47.750936, −122.649151); Unnamed (47.770208, −122.559178); Unnamed (47.794724, −122.512034); upstream to endpoint(s) in: Anderson Creek (47.505029, −122.69725); Barker Creek (47.647598, −122.658222); Blackjack Creek (47.477097, −122.648962); Burley Creek (47.477671, −122.616862); Clear Creek (47.685465, −122.684758); Coulter Creek (47.44497, −122.768147); Crescent Valley (47.387661, −122.573475); Crouch Creek (47.652949, −122.636766); Curley Creek (47.470853, −122.591807); Dickerson Creek (47.574216, −122.730548); Gorst Creek (47.517739, −122.743902); Heins Creek (47.532474, −122.719281); Huge Creek (47.416967, −122.697785); Illahe Creek (−122.610219, 47.608727); Kitsap Creek (47.565562, −122.705833); Lost Creek (47.580058, −122.772143); Mccormick Creek (47.360692, −122.616179); Minter Creek (47.417427, −122.68133); North Creek (47.345176, −122.602062); Olalla Creek (47.458804, −122.575015); Parish Creek (47.525007, −122.715043); Purdy Creek (47.424097, −122.601949); Rocky Creek (47.406815, −122.784426); Salmonberry Creek (47.521201, −122.583691); Unnamed (47.375417, −122.764465); Unnamed (47.407431, −122.816273); Unnamed (47.458461, −122.654176); Unnamed (47.461146, −122.658942); Unnamed (47.508334, −122.678469); Unnamed (47.647488, −122.631401); Unnamed (47.652615, −122.705727); Unnamed (47.655222, −122.70488); Unnamed (47.656966, −122.63518); Unnamed (47.669431, −122.688117); Unnamed (47.717933, −122.672648); Unnamed (47.718897, −122.613062); Unnamed (47.760942, −122.618495); Unnamed (47.763767, −122.637787); Unnamed (47.809222, −122.537334); Unnamed (47.80967, −122.532478); Unnamed (47.583852, −122.799196); Unnamed (47.386707, −122.68788); Unnamed (47.772157, −122.560033); Unnamed (47.772641, −122.555341); Unnamed (47.796516, −122.513062); Unnamed (47.689613, −122.537011); Wildcat Creek (47.601646, −122.774958).

(iii) *Woodland Creek-McLane Creek Frontal 1711001902.* Outlet(s) = McLane Creek (Lat 47.03475, Long −122.990395); Unnamed (47.095699, −122.94549); Woodard Creek (47.120914, −122.861775); Woodland Creek (47.092725, −122.823614); upstream to endpoint(s) in: McLane Creek (47.001481, −123.009329); Swift Creek (47.031622, −123.008267); Unnamed (47.028842, −122.985445); Unnamed (47.060468, −122.964496); Unnamed (47.071776, −122.827649);

Woodard Creek (47.040784, −122.853709); Woodland Creek (47.034018, −122.781534);

(iv) *Puget Sound-East Passage 1711001904*. Outlet(s) = Christensen Creek (Lat 47.403038, Long −122.51902); Judd Creek (47.402315, −122.467989); Lunds Gulch (47.859951, −122.334873); Shingle Mill Creek (47.480286, −122.482557); Unnamed (47.646085, −122.567546); Unnamed (47.694552, −122.536480); upstream to endpoint(s) in: Judd Creek (47.416852, −122.47661); Lunds Gulch (47.859132, −122.327183); Shingle Mill Creek (47.467927, −122.474433); Unnamed (47.40206, −122.512865); Unnamed (47.641478, −122.566998); Unnamed (47.689613, −122.537011).

(v) *Chambers Creek 1711001906*. Outlet(s) = Chambers Creek (Lat 47.186966, Long −122.583739); upstream to endpoint(s) in: Chambers Creek (47.155756, −122.527739); Clover Creek (47.136455, −122.433679); Clover Creek (47.155756, −122.527739); Flett Creek (47.179364, −122.497762); Leach Creek (47.209364, −122.512372); Ponce De Leon Creek (47.162148, −122.52888).

(vi) *Port Ludlow Creek-Chimacum Creek 1711001908*. Outlet(s) = Chimacum Creek (Lat 48.050532, Long −122.784429); Unnamed (47.917613, −122.703872); upstream to endpoint(s) in: Unnamed (47.918337, −122.709325); Unnamed (47.927687, −122.805588); Unnamed (47.947673, −122.850871); Unnamed (47.954906, −122.7614); Unnamed (47.986329, −122.80519).

(18) Dungeness-Elwha Subbasin 17110020

(i) *Discovery Bay Watershed 1711002001*. Outlet(s) = Contractors Creek (Lat 48.04559, Long −122.874989); Salmon Creek (47.989306, −122.889155); Snow Creek (47.989848, −122.88472); upstream to endpoint(s) in: Andrews Creek (47.916408, −122.900812); Contractors Creek (48.041198, −122.879974); Salmon Creek (47.968169, −122.963869); Snow Creek (47.935356, −122.943211).

(ii) *Sequim Bay Watershed 1711002002*. Outlet(s) = Bell Creek (Lat 48.083191, Long −123.052803); Jimmycomelately Creek (48.023348, −123.005179); Johnson Creek (48.062731, −123.040899); Unnamed (48.028495, −122.996498); upstream to endpoint(s) in: Bell Creek (48.062921, −123.103118); Jimmycomelately Creek (47.991106, −123.012853); Johnson Creek (48.054282, −123.060541); Unnamed (47.98473, −123.004078); Unnamed (48.028602, −122.994476); Unnamed (48.077698, −123.085489).

(iii) *Dungeness River Watershed 1711002003*. Outlet(s) = Cassalery Creek (Lat 48.134645, Long −123.096671); Dungeness River (48.150413, −123.132404); Gierin Creek (48.115086, −123.060063); Unnamed (48.137866, −123.101098); Unnamed (48.153473, −123.12799); upstream to endpoint(s) in: Bear Creek (48.05479, −123.159906); Canyon Creek (48.022505, −123.141514); Cassalery Creek (48.105307, −123.121002); Dungeness River (47.938446, −123.089756); Gierin Creek (48.091597, −123.095521); Gold Creek

(47.941297, −123.086086); Gray Wolf River (47.916035, −123.242895); Matriotti Creek (48.068168, −123.193047); Unnamed (48.065991, −123.17376); Unnamed (48.06625, −123.169857); Unnamed (48.068168, −123.193047); Unnamed (48.068308, −123.193024); Unnamed (48.090644, −123.191398); Unnamed (48.106277, −123.076132); Unnamed (48.107219, −123.187879); Unnamed (48.112875, −123.160292); Unnamed (48.116253, −123.157937); Unnamed (48.116481, −123.141572); Unnamed (48.118304, −123.078321); Unnamed (48.124002, −123.143503); Unnamed (48.127704, −123.111613); Unnamed (48.12912, −123.148566); Unnamed (48.130335, −123.127456).

(iv) *Port Angeles Harbor Watershed 1711002004*. Outlet(s) = Bagley Creek (Lat 48.114035, Long −123.340599); Dry Creek (48.134316, −123.520821); Ennis Creek (48.117472, −123.405373); Lees Creek (48.114686, −123.388339); McDonald Creek (48.125382, −123.220649); Morse Creek (48.117713, −123.351674); Siebert Creek (48.120481, −123.289579); Tumwater Creek (48.124386, −123.445396); Valley Creek (48.122912, −123.437893); upstream to endpoint(s) in: Bagley Creek (48.057013, −123.319844); Dry Creek (48.123255, −123.520058); East Fork Lees Creek (48.075209, −123.37549); East Fork Siebert Creek (48.02011, −123.287767); Ennis Creek (48.052991, −123.411534); Lees Creek (48.078066, −123.394993); McDonald Creek (48.017887, −123.232576); Morse Creek (48.061048, −123.349345); Pederson Creek (48.026991, −123.253803); Tumwater Creek (48.092665, −123.4702); Unnamed (48.0143, −123.260326); Unnamed (48.030295, −123.301668); Valley Creek (48.106808, −123.451781); West Fork Siebert Creek (48.000634, −123.304205).

(v) *Elwha River Watershed 1711002007*. Outlet(s) = Elwha River (Lat 48.146456, Long −123.568438); upstream to endpoint(s) in: Elwha River (47.742466, −123.54088); Unnamed (48.13353, −123.557816); Unnamed (48.143336, −123.555008); Indian Creek (48.07806, −123.725186); Little River (48.05994, −123.520805).

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