1 EIS OVERVIEW

1.1 Introduction

This Washington State Environmental Policy Act (SEPA) Programmatic Environmental Impact Statement (EIS) has been prepared to evaluate alternatives designed to reduce flood damage and restore aquatic species habitat in the Chehalis Basin located in Southwestern Washington. The Chehalis Basin has experienced both major flooding and substantial degradation of aquatic species habitat. These issues have persisted for almost 100 years without a comprehensive response. As shown in Figure 1.1, the Study Area for the EIS encompasses the entire Chehalis Basin (Water Resource Inventory Areas [WRIAs] 22 and 23).

The Governor and Washington State Legislature have made it a priority to develop a comprehensive response that integrates flood damage reduction and aquatic species habitat restoration within the Chehalis Basin.
A considerable amount of time and effort has been invested into studying the problems and identifying potential solutions. The purpose of this EIS is to evaluate alternatives for addressing these problems and to support the development of an integrated strategy for the Chehalis Basin that is fundable and implementable.

In 2011, the legislature called upon the Office of Financial Management (OFM) to evaluate alternative flood damage reduction projects and—in coordination with tribal governments, local governments, and state and federal agencies—to recommend priority actions to mitigate flood hazards. These recommended actions were described in an OFM report finalized in December 2012. The report provided the legislature and other decision-makers with information to set the course for furthering effective solutions to reduce the adverse impacts of flooding and, at the same time, support the economic prosperity of communities and restore fish populations and other natural resources in the Chehalis Basin.

Chehalis Basin Flooding

According to accounts dating back to the 1930s, minor flooding in the Chehalis Basin generally occurred every 2 to 5 years, and major flooding took place roughly every 10 years. Yet, in 2007 and 2009, two catastrophic floods occurred in the Chehalis Basin only 13 months apart. People lost their homes, farms, livestock, and businesses; and roads and infrastructure were inundated with floodwaters.

Peak flood levels have been rising in the Chehalis Basin over the last 30 years and climate scientists predict a continued increase in the years ahead. Many people in the Chehalis Basin have expressed the need to take action to improve conditions for people and the environment. As one resident conveyed, “Do something, do it soon, and do it well.”

In November 2012, the Governor's Chehalis Basin Work Group (Work Group), a small work group of Chehalis Basin leaders convened by then-Governor Christine Gregoire, recommended a series of actions for continued feasibility and design work. Taken together, the recommendations of the Work Group represented a substantial investment to reduce flood damage and restore natural floodplain functions and aquatic species habitat in the Chehalis Basin. Governor Gregoire endorsed the recommendations from the Work Group, and recommended funding to implement them in the 2013 to 2015 biennium budget proposal. Governor Jay Inslee also included this request in the 2013 to 2015 capital budget proposal, and the legislature approved an investment of $28 million to begin to implement the approach. Over the past several years, the Work Group—working with a team of natural and water resource experts from federal and state agencies, tribes, and environmental groups—has overseen a series of technical analyses to support decision-making on long-term, large-scale actions in the Chehalis Basin. In the short term, the Work Group's recommendations have enabled the implementation of a number of small-scale flood damage reduction and aquatic species habitat restoration projects in the Chehalis Basin. These projects have occurred in coordination with the Chehalis River Basin Flood Authority and Chehalis Lead Entity.

Aquatic Species Conditions

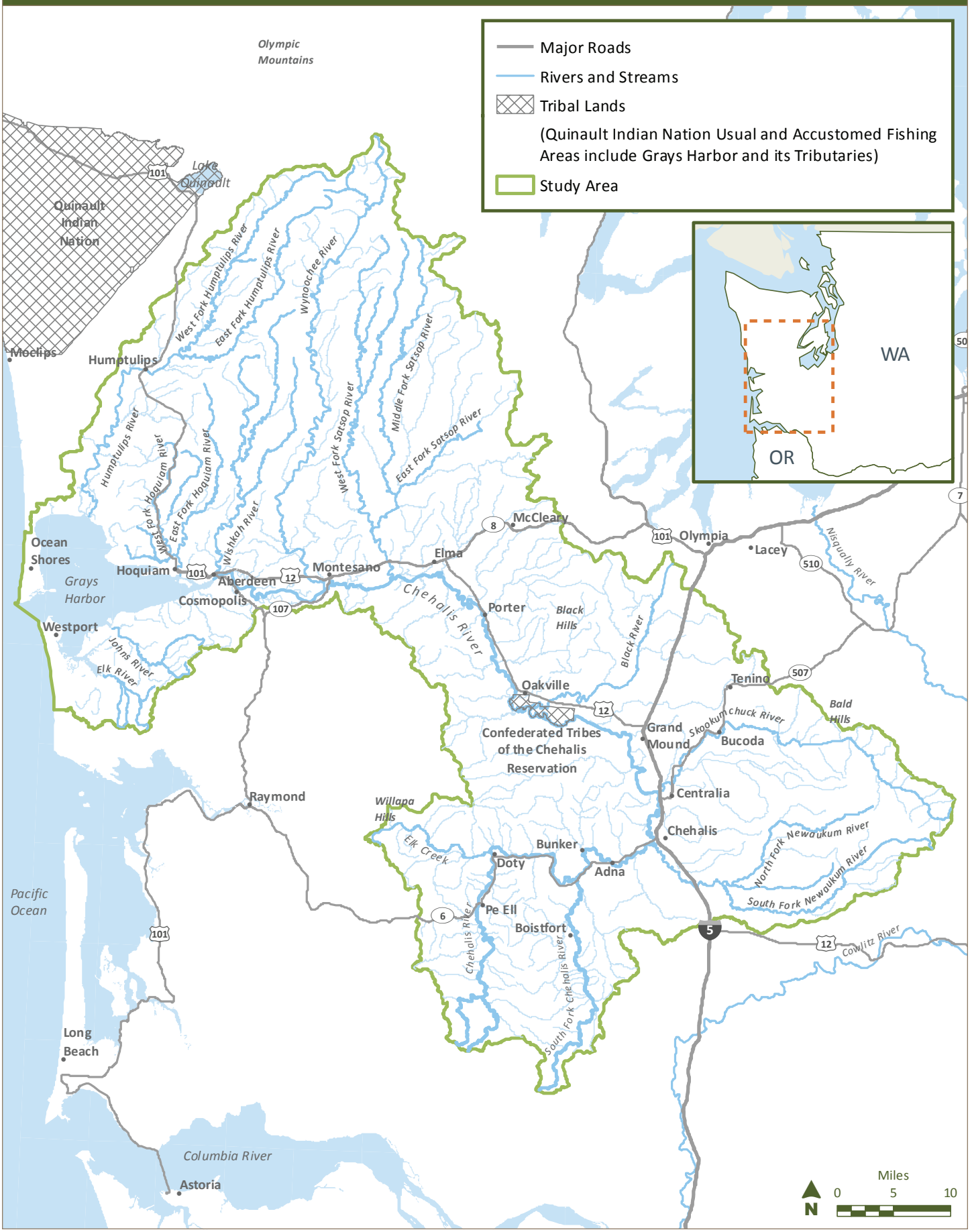
The Chehalis Basin is the second largest river basin within Washington, and one of the only remaining systems that maintains a generally active connection with the floodplain. Extensive and diverse in-channel and off-channel habitats support multiple salmonid species, an abundance of mudminnow, the highest amphibian diversity in Washington, and numerous native species.

Although there have been robust runs of salmon every year for the last 30 years, poor returns of one or more species of salmon have significantly limited tribal and non-tribal harvest. The productivity of the current habitat has been degraded by as much as 87 % for some species.

Starting in the 1850s, human-caused impacts on aquatic species habitat have been extensive. Further impacts on aquatic habitat have the potential to affect state or federally sensitive, candidate, or listed species and result in further Endangered Species Act listings.

At the end of 2014, the Work Group published its Recommendation Report, outlining a program of integrated, long-term, flood damage reduction and aquatic species habitat restoration actions (Ruckelshaus Center 2014). The Work Group also recommended the preparation of a Programmatic EIS to evaluate the potential environmental, social, and economic impacts associated with its recommended package of actions, as well as a No Action Alternative. The EIS process provides an opportunity for the public, interested tribes, agencies, stakeholders, and other parties to review the impacts, timing, and cost of these actions.

Figure 1.1
Chehalis Basin Study Area



During the 2015 to 2017 biennium, the Work Group will continue to analyze and recommend further actions to advance the Chehalis Basin Strategy. In addition to completing this EIS, work in the 2015 to 2017 biennium includes continued evaluation of large-scale flood damage reduction options; identification of aquatic species habitat restoration actions and completion of priority early implementation actions; construction of local-scale flood damage reduction actions such as farm pads, protection of key infrastructure, and elevating homes; and engagement with Chehalis Basin communities, agencies, and tribes to explore whether proposed actions are feasible.

1.2 Flooding

Flooding is a common, historical occurrence in the Chehalis Basin and can provide many ecologically important functions. Flooding occurs on the Chehalis River and its tributaries in Lewis County, Thurston County, Grays Harbor County, and the Confederated Tribes of the Chehalis Reservation (Chehalis Tribe reservation). One of the earliest reported floods (in 1887) inundated most of the area between Centralia and Chehalis, causing damage to farms, fences, and the Northern Pacific Railroad trestle (*The Chronicle* staff 2007). In the past 60 years, major floods occurred eight separate times starting in 1972, with flood levels and flood damage in the Chehalis Basin increasing. The 1996, 2007, and 2009 floods are the three largest floods on record. The 2007 and 2009 floods occurred only 13 months apart, with minimal opportunity to restore the area between floods. Climate scientists predict a continued increase in peak flood levels.

Recent Flooding in the Chehalis Basin

February 1996

The result of a large frontal storm following low-elevation snow accumulation, this was the highest flood in the valley at the time.

- Major flooding in Grays Harbor, Lewis, and Thurston counties
- 33% of Centralia and Chehalis Urban Growth Areas inundated
- I-5 closed for 4 days
- Flood depths up to 10 feet
- 75% of the Chehalis Tribe reservation inundated; access routes were under 1 to 4 feet of fast-moving water

December 2007

The result of heavy rain within a concentrated geographic area (the heaviest rainfall occurred over a 12-hour period); this was the largest flood to date on the Chehalis River.

- Major flooding in Grays Harbor, Lewis, and Thurston counties
- Disproportionate flood damage in the upper Chehalis Basin
- 47% of agricultural land between Pe Ell and Adna inundated
- I-5 closed for 4 days
- Flood depths up to 12 feet
- Heavy flooding on the Chehalis Tribe reservation with up to 4 feet of water in some homes

January 2009

The result of heavy rainfall in the northeast portion of the Chehalis Basin and in the upper Chehalis River, this flood ranged from the second- to fifth-largest flood in the Chehalis Basin, depending on location.

- High flows in the lower Chehalis Basin on the Satsop, Wynoochee, and Black rivers
- I-5 closed for 2 days
- Chehalis River discharge peaked at more than 50,000 cubic feet per second at Grand Mound

Flooding in the Chehalis Basin is variable in severity and geographic extent, as described in the *Chehalis Basin Flood Hazard Mitigation Alternatives Report* (Ruckelshaus Center 2012):

> *In the Chehalis Basin, the track of an atmospheric river is an important factor in determining the extent and magnitude of floods. When storms are widespread over the Basin, they cause widespread flooding. When storms center over the Willapa Hills, they cause flooding in the upper Chehalis and, as the water moves downstream, throughout the Basin. When storms are centered over the Black Hills and Cascade foothills, they can cause flooding in the Skookumchuck and Newaukum Rivers and locally near the confluence of these rivers with the Chehalis in the Centralia/Chehalis area; however, they generally do not cause major flooding downstream on the Chehalis. Storms over the southern Olympics in the Satsop and Wynoochee Basins can cause flooding in the lower Chehalis, without having much effect in the upper Basin. Any riverine flood event can be exacerbated by high tides and tidal storm surges at the Grays Harbor estuary, affecting the coastal cities of Aberdeen, Hoquiam, and Cosmopolis. Tidal flooding also can occur in the absence of any significant river flows.*

Peak annual flows from the 1996, 2007, and 2009 floods rank in the top five at stream gages at the Chehalis River near Grand Mound, the Newaukum River near Chehalis, and the South Fork Chehalis River. These extreme floods caused the losses of homes, farms, and businesses, and floodwater inundation resulted in the closure of Interstate 5 (I-5) for several days. The majority of the flood damage occurred in the cities of Chehalis and Centralia where there is more intensive development in the floodplain.

Effects of the 2007 Flood in the Chehalis Basin

Public Health and Safety

- People trapped in or rescued from their homes
- Restricted access to hospitals and other public services
- Contaminated drinking water
- Exposure to hazardous materials in floodwater

Agriculture

- 1,600 commercial livestock killed in Lewis County
- Close to $5 million of farm equipment damaged
- Approximately 4,770 acres of agricultural land covered by silt and wood debris

Business

- More than 200 businesses flooded
- Revenue lost because of flood damage and restricted access

Transportation

- Closure of I-5 for 4 days
- Closure of sections of SR 6, US 12, and local roads
- Damage to roads and bridges throughout the Chehalis Basin
- Closure of Chehalis-Centralia Airport for 3 days
- Damage to runways at Chehalis-Centralia Airport

Hazardous Materials

- Flooded areas were contaminated with oil, gasoline, paint, pesticides, anti-freeze, flammable liquids, and corrosive substances
- Cleanup took Ecology 10 months

More than $90 million in Federal Emergency Management Agency (FEMA) relief funds have been distributed to communities within the Chehalis Basin since 1978 (NFIP 2015a), which is a small fraction of the flood damages that have occurred. Precise information on flood costs is difficult to obtain because it is collected by different agencies and does not include all damages. Estimates of private property damage are generally not available.

The non-monetary costs of floods are also high. Impacts from flooding include threats to public health and safety; losses to homeowners, agriculture and commercial businesses; and damage to public infrastructure. Impacts on homes go beyond the financial cost of replacement when people are forced to leave behind personal belongings, which are then destroyed by floodwaters. Repeated flooding also makes it difficult to attract new industry to the Chehalis Basin. The emotional and psychological costs are significant. The losses in the Chehalis Basin from the 2007 flood illustrate the extent of damages that floods can cause.

There are a number of questions about what is causing the recent increase in the magnitude of extreme floods. Many factors affect the frequency and magnitude of extreme floods. In Western Washington, atmospheric rivers are the primary contributor to extreme flooding. Atmospheric rivers funnel large quantities of precipitation in a short time span, typically during a period of a few hours to a few days (Neiman et al. 2011). Winter storms associated with atmospheric rivers produce twice the amount of precipitation as storms not associated with atmospheric rivers (Ralph et al. 2008).

Research into other potential contributors to flooding in the Chehalis Basin has been performed for the Chehalis Basin Strategy. In preparation of one of the actions evaluated in the EIS (Restorative Flood Protection action element), historical changes were studied in river channels and floodplains in the Newaukum River, South Fork Chehalis River, and mainstem Chehalis River. Based on this research, it was determined that significant areas of channel incision (down-cutting of the river) and loss of floodplain storage have occurred. Channel incision and floodplain forest clearing can reduce floodplain connectivity and capacity for flood storage, as well as influence flood timing and extents (Dixon et al. 2016; Watson et al. 2016). This can result in more rapid downstream conveyance of high flows, which directly affects the magnitude and timing of downstream flooding. In the Chehalis Basin, one of the historical practices contributing to channel incision was the use of splash dams to transport logs (see Section 3.2.4). Current land use also contributes to continued down-cutting of the river channels in some locations. Legacy agricultural practices of removing wetlands, straightening and armoring riverbanks, and removing floodplain forests increase flooding downstream. The extent of the increase in extreme flooding from changes to river channels and floodplain conditions in the Chehalis Basin has not been modeled. However, preliminary modeling conducted for the Restorative Flood Protection action element shows that the flood stage of extreme floods in the Chehalis-Centralia area can be reduced by restoring some of the lost floodplain functions (e.g., flood storage) upstream.

The effects of forest practices on peak flows have been evaluated through a literature review by the University of Washington (see Appendix A). The review concludes that there is no agreement on whether or not forest harvesting causes significant increases in peak flows in extreme floods or in large watersheds such as the Chehalis Basin. Further research and modeling would be needed to understand this interaction in the Chehalis Basin. However, the literature review found consistency in scientific research that in small basins, forest harvest increases the magnitude of channel-forming flows, which are more moderate floods that occur every 1.5 to 5 years (Perry et al. 2016). More frequent channel forming flows are linked to channel incision, where the stream channel erodes downward (Perry et al. 2016; Chamberlin et al. 1991).

Land use activities such as increased impervious surfaces, loss of vegetation, and development in the floodplain can contribute to higher volumes and peak flows during floods (CRBFA 2010). Development in the Chehalis River floodplain has primarily occurred in the Chehalis-Centralia area along the I-5 corridor. Overall, residential, commercial, and industrial land use collectively comprise only a small portion (7%) of the overall land cover in the Chehalis Basin, and impervious surfaces are less than 2% (USGS 2001, 2006, 2011). People have assumed that recent development on the west side of I-5 in Chehalis has contributed to increased flooding downstream in the Ground Mound and Oakville areas. This development is behind a levee built in the 1940s by the U.S. Army Corps of Engineers (USACE). Modeling estimates that the increase caused by fully protecting or filling the 300 acres behind the levee would increase the 100-year flood level at Anderson Road and Oakville by less than 1 inch. Currently, only 60 acres of the 300 acres behind the airport levee are filled.

In the upper Chehalis, Newaukum, and Skookumchuck River basins where extreme flooding has occurred, land cover is dominated by forestlands and contains low-density rural and agricultural development in river valleys. These areas have much less impervious surface than the Chehalis-Centralia area. Literature on this topic supports that extreme floods on the Chehalis River, such as those experienced in 2007 and 2009, are the result of atmospheric rivers that deliver high rates of rainfall in the upper Chehalis Basin above the Chehalis-Centralia area (Neiman et al. 2011; WSE 2014a); however, land uses and floodplain conditions also influence downstream flood timing and extents.

Climate change effects have been documented in a recent study by the Climate Impacts Group (CIG; Mauger et al. 2016) and various other studies, as described in Section 3.7. Rain-on-snow events can also add to flooding, particularly in streams in the Chehalis Basin that originate in the snow-dominated areas of the Olympic Mountains and Cascade Range foothills (Perry et al. 2016).

After the 2007 flood—the largest recorded to date in the Chehalis Basin—state and local governments began to discuss a Basin-wide approach to flood damage reduction. These efforts (described in Section 2.1) led to the development of the flood damage reduction alternatives evaluated in this EIS.

1.3 Habitat Degradation

The Chehalis Basin is unique in the state because of its extensive floodplains, amphibian diversity, relatively healthy and robust salmon runs, and the absence of Endangered Species Act (ESA)-listed salmonids. Substantial diverse in-channel and off-channel habitats support multiple salmonid species, an abundance of Olympic mudminnow, the highest amphibian diversity in Washington (Cassidy et al. 1997), and numerous native species. However, similar to other basins in the state, it has seen significant habitat degradation over the last 100 years, with populations of both fish and wildlife decreasing.

Beginning in the 1850s, habitat for salmon, steelhead, other fish, and various aquatic and upland species has been negatively affected by a number of factors, including urbanization, gravel mining, agriculture, logging, removal of large downed-wood from rivers, dredging and filling, dams, and diversions. The Work Group's 2014 Recommendation Report estimated salmon habitat in the Chehalis Basin is degraded by 44% to 78%, depending on the species (Ruckelshaus Center 2014). While the Chehalis Basin is the only river basin in Washington that does not have any federally listed endangered salmonid species, some salmon populations have declined, and further declines could result in a future endangered species listing (Ruckelshaus Center 2014).

The natural resources of the Chehalis Basin have supported the native people for millennia, and continue to provide value to both tribal and non-tribal people of the Chehalis Basin. Farming, forestry, harvesting of shellfish, and fishing continue to be central to the Chehalis Basin economy. Salmon play a major cultural, recreational, and economic role, and the protection and restoration of salmon habitat is a primary goal for many in the Chehalis Basin. On average, more than 94,000 salmon (Chinook, coho, and steelhead) return to the Chehalis Basin annually (Ruckelshaus Center 2014).

The 2007 flood had a large impact on aquatic habitat in the Chehalis River system due to high-volume river flows, numerous landslides, bank erosion, sediment accumulation, and extensive deposits of wood in the river channel and floodplain areas. Much of the Chehalis River and its floodplain lack wood and vegetation and are not resilient to impacts from large floods. A significant percentage of the mainstem Chehalis River bank is devoid of vegetation and continually eroding, resulting in increased stream temperatures and causing impacts on habitat. Beneficial

Habitat Needs

Factors limiting the productivity of salmon, which need to be addressed in the Chehalis Basin, include the following:

- Reducing the spread of non-native invasive species (e.g., bass, bullfrogs, sunfish)
- Correcting fish migration barriers (e.g., culverts)
- Replacing degraded and lost riparian corridors
- Replenishing summer low flows and reducing high stream temperatures
- Reducing streambank erosion and sedimentation
- Restoring channel complexity, stability, and floodplain habitat and connectivity

Source: ASEPTC 2014a

effects on aquatic habitat from the 2007 flood included the recruitment of gravel that provides excellent spawning areas for resident and anadromous fish in the upper Chehalis Basin.

Total Maximum Daily Load

A TMDL is a pollution budget that calculates the maximum total amount of a pollutant that can enter a waterbody with the waterbody still meeting applicable water quality standard(s).

Water temperature is a key environmental parameter for aquatic species, and a key policy concern in the Chehalis Basin (ASEPTC 2014a). The Washington State Department of Ecology (Ecology) has recorded water temperature and other conventional water quality parameters under a long-term ambient monitoring program and other water quality studies in the mainstem Chehalis River and prominent tributaries since 1983. Ecology developed a total maximum daily load (TMDL) Detailed Implementation Plan that outlines strategies and specific activities focused on improving water quality with respect to fecal coliform bacteria, stream temperature, and dissolved oxygen (DO), based on eight TMDL projects. Because water quality, particularly water temperature, is a primary concern for aquatic species habitat restoration, extensive water quality monitoring has been conducted in the upper Chehalis Basin.

Aquatic species habitat restoration and water quality improvement opportunities in the Chehalis Basin have been extensively studied. The *Chehalis Basin Salmon Habitat Restoration and Preservation Work Plan for WRIAs 22 and 23* sets out specific strategies for restoring habitat, noting recovery issues, and identifying general recovery actions (CBPHWG 2008). The Washington Coast Sustainable Salmon Partnership developed the *Washington Coast Sustainable Salmon Plan* with the primary goal to "prevent additional ESA listings of Washington Coast salmon and further diminished salmon populations through sustainability instead of ESA recovery planning" (WCSSP 2013).

Bank erosion affects aquatic habitat

Culverts can act as barriers to fish passage

The Chehalis Basin is the second largest river basin within Washington, yet has received far less funding for aquatic species habitat restoration than any other salmon region (Ruckelshaus Center 2014). The Chehalis Lead Entity works to identify and prioritize salmon recovery projects in the Chehalis Basin, and helps allocate federal and state Salmon Recovery Funding Board (SRFB) funding. The U.S. Fish and Wildlife Service (USFWS)'s Chehalis Fisheries Restoration Program (CFRP) provides funding for projects to restore Chehalis River fisheries resources. The Washington Department of Natural Resources (DNR) administers the Family Forest Fish Passage Program (FFFPP), which funds fish barrier removal projects on small forest landowner properties. Projects funded through these organizations have included the creation of riparian and off-channel fish rearing habitat, restoration of agricultural wetlands for fish use, monitoring fish use of these habitats with a focus on aquatic species habitat restoration and preservation, and removal of fish passage barriers.

1.4 Purpose and Need

As identified in the Work Group's 2014 Recommendation Report (Ruckelshaus Center 2014), the Chehalis Basin suffers from both major flooding and substantial degradation of aquatic species. There is a clear call to action demonstrated in the report:

> ***Peak flood levels have been rising in the Basin over the last 30 years and are likely to get worse.*** *The five largest floods in the Basin's history have occurred during the past 30 years. Current 'low' estimates of climate change impacts predict an 18% increase in peak flows; the 'high' estimates are upwards of 90%. Under the latter scenario, floodwaters in the City of Centralia would be almost eight feet higher than in the peak of the 2007 flood. The specter of catastrophic flooding casts a shadow over the region's future, affecting economic prosperity and the emotional health of the Basin communities.*
>
> ***Aquatic species in the Chehalis Basin are significantly degraded, and if action is not taken, this degradation is expected to continue.*** *Salmon habitat in the Basin already is degraded by 44%–78%, depending on the species. Failure to take action to restore physical and ecological Basin processes and habitat, coupled with potential impacts of climate change, are predicted to result in the complete loss (extirpation) of Spring-run Chinook from the Basin late this century, and a 70% loss of coho. It is very possible that the current trajectory would lead to Endangered Species Act listings and related restrictions, as well as great economic and cultural losses for tribal, commercial, and recreational fishers and others who depend on or enjoy these species.*

In order to positively effect change, the Chehalis Basin Strategy will need to provide a long-term, integrated approach to substantially reduce damage from a major flood and restore degraded aquatic species habitat in the Chehalis Basin. The solution should provide a safer future for people, reduced social and economic costs associated with floods and degraded aquatic habitat, and a healthier, more resilient Chehalis Basin for aquatic species.

Landowner willingness will be pivotal to the success of the strategy. Implementation of individual or combinations of actions, from large-scale and local-scale flood damage reduction to habitat restoration, will require voluntary participation of landowners, business owners and residents of the Chehalis Basin. No single project alone can accomplish a Basin-wide approach to flooding (Ruckelshaus Center 2012). None of the alternatives evaluated can completely alleviate the adverse impacts of flooding. Flooding in some areas, for example on many of the tributaries to the Chehalis River like the Skookumchuck River or Black River, would need to be addressed through identification of local projects and through programmatic efforts such as additional home elevations or buy-outs in the floodplain, floodproofing, farm pads, and land use management approaches.

Major Floods

A major flood along the Chehalis River is defined as the level where moderate flooding in Lewis County (includes road closures and floodwaters encroaching on some homes and businesses) and major flooding in Thurston County (constituting inundation of farmlands and roads, including U.S. 12) occurs. The threshold for a major flood is 38,800 cubic feet per second (cfs) at the Grand Mound gage located along the Chehalis River (near Grand Mound) in Thurston County, which has a 15% probability of occurrence in any year (or a 7-year recurrence interval). Major floods include events greater than 38,800 cfs with a lower frequency of occurrence such as 10-year, 100-year, and 500-year floods (10%, 1%, and 0.02% probability of occurrence in any year). These floods are more extensive and damaging.

The challenges in the Chehalis Basin are great, but the interest and momentum toward finding an effective solution are reflected in the alternatives brought forward in this EIS. An integrated Basin-wide strategy that is financially viable, sustainable, and supported by the community will have the highest likelihood of being implemented. The strategy is intended to maximize the benefits of flood damage reduction and aquatic species habitat restoration actions over both the short and long term, while avoiding and minimizing adverse environmental, social, cultural, agricultural, and economic impacts. The objectives of the Chehalis Basin Strategy include the following, which will be used as the basis for evaluating the alternatives:

1. Reduce the following conditions caused by a major flood:
    A. Threats to human health and safety, including access to critical medical facilities
    B. Flood damage to commercial and residential properties
    C. Flood damage to agricultural properties, livestock, and crops

D. Disruption in transportation systems, including closures of I-5 and local and regional transportation systems
E. Disruption to industry, commercial businesses, and public services

2. Protect and restore aquatic species habitat function to:
   A. Improve resiliency of natural floodplain processes and ecosystems from the effects of climate change, including warming stream temperatures, low flows, and other effects
   B. Increase abundance of native aquatic species, including increased populations of healthy and harvestable salmon and steelhead
   C. Reduce the potential for future ESA listings
   D. Enhance tribal and non-tribal fisheries

1.5 State Environmental Policy Act Review

As the lead agency, Ecology prepared this EIS in compliance with SEPA to evaluate the Chehalis Basin Strategy alternatives to reduce flood damage and restore degraded aquatic species habitat. The SEPA environmental review process provides a way to identify and assess the possible environmental effects of a proposal (including alternatives, environmental impacts, and mitigation) before deciding whether to proceed. The process helps decision-makers and the public understand how a proposed action would affect the natural and human environment. The SEPA action is the adoption of a long-term integrated program (Chehalis Basin Strategy) that meets the purpose and need of the proposal, and supports the Governor's recommendations on the long-term strategy and future funding.

Evaluating the Alternatives

The alternatives in this EIS will be evaluated with regard to their ability to address the purpose and need for the Chehalis Basin Strategy: substantially reducing flood damage and restoring aquatic species habitat.

Achieving the purpose and need involves identifying specific actions for flood damage reduction and aquatic species habitat restoration throughout the Chehalis Basin. A long-term strategy for funding will be developed to implement these integrated actions.

For the Chehalis Basin Strategy, a planning-level analysis under a programmatic EIS is appropriate at this stage in the decision-making process. A programmatic (nonproject) SEPA review considers the effects of a broad proposal or planning-level decisions that include any or all of the following: a range of individual projects, implementation over a long timeframe, or implementation across a large geographic area. The impact assessment in a programmatic EIS is more qualitative than a project-specific EIS; mitigation measures are also typically more general and focus on actions that could be implemented or might be required.

Once a preferred alternative has been selected, more quantitative evaluations will occur through subsequent project-level environmental reviews in order to identify the site- and project-specific impacts associated with implementation of given actions. Environmental and land use permits may also be necessary for construction of any projects that move forward. The following illustrates different levels of environmental review and their applicability.

Programmatic Environmental Review

- Planning-level concept evaluation
- General description of potential impacts and mitigation

Project-level Environmental Review

- Individual project evaluation
- Identification of specific impacts and mitigation measures

Project Permitting

- Individual project compliance
- Identification of permit conditions, best management practices, mitigation design and monitoring, and other measures to reduce impacts

In accordance with SEPA, a scoping period was conducted from September 18 to October 19, 2015, for interested tribes, agencies, and the public to provide input on the content and scope of this EIS. The scoping comments were used to help define the purpose and need, refine the alternatives, and determine which elements of the environment were evaluated. Comments and questions received during scoping are further detailed in Chapter 6 and in the *Scoping Summary Report* (see Appendix B).

1.6 EIS Scope and Organization

This EIS evaluates how combinations of action elements could function together to meet the purpose and need of flood damage reduction and aquatic species habitat restoration. It describes how the Chehalis Basin Strategy would be implemented, and the potential impacts that could result from the implementation of the action elements, the EIS action alternatives, and the No Action Alternative.

The remainder of this EIS is organized into the following chapters to meet the requirements of SEPA:

- **Chapter 2 – Alternatives** summarizes the background and history of the Chehalis Basin Strategy development and details the range of alternatives assessed during the EIS process.
- **Chapter 3 – Affected Environment** describes the current conditions existing in the Study Area for each element of the environment examined in this EIS.
- **Chapter 4 – Action Elements: Impacts and Mitigation** provides the results of an evaluation of

Elements of the Environment

Elements of the environment are defined in Washington Administrative Code 197-11-444, and comprise natural and built elements (such as fish and wildlife, or public services and utilities). This EIS evaluates impacts on these resources from constructing and operating the action elements or combined alternatives.

potential short-term and long-term effects of the action elements relative to each element of the environment in the Study Area. This chapter also identifies potential mitigation measures that could be implemented to reduce potential effects.

- **Chapter 5 – Combined Alternatives: Impacts and Mitigation** contains the results of an evaluation of potential long-term and cumulative effects of the combined alternatives relative to the No Action Alternative. This chapter also identifies potential mitigation measures that could be implemented to reduce potential effects.
- **Chapter 6 – Consultation and Coordination** summarizes comments and questions received during scoping; details the roles of Ecology, other agencies, and tribal governments in the development of the Chehalis Basin Strategy and this EIS; and summarizes Ecology's coordination with tribes and other agencies.
- **Chapter 7 – References** provides a list of other materials and studies used to inform preparation of this EIS.
- **Chapter 8 – List of Contributors** identifies individuals from Ecology, other state agencies, tribes, and consulting firms who participated in the evaluation.
- **Appendices** include specific detailed information relevant to the evaluation provided in this EIS.