# 3.1 Ecosystems

Ecosystems are generally understood to be defined by the combined physical and biological components of the environment and can be organized in many ways to help understand the interactions between them. For discussion purposes, it is helpful to organize ecosystems in hierarchical manner, discussing the largest physical attribute at a landscape scale, followed by a discussion of habitats and species that interact in the landscape.

As in the Draft EIS, for this Final EIS, the *Ecosystems* section is organized first by a brief discussion of Grays Harbor, the estuarine habitat within which other habitats exist and within which wildlife species breed, forage, and disperse. Resources within the Ecosystems analysis are further divided into three topics: wetlands, fish and aquatic resources (including shoreline and mudflat areas), and wildlife. In the context of ecosystems, watersheds, as defined by state Water Resource Inventory Areas (WRIAs), are discussed primarily within the *Fish and Aquatic Resources* section and include portions of Grays Harbor. (See Section 3.4, Water Resources, for more discussion of watersheds.)

Grays Harbor is the fourth-largest estuarine environment in the western United States (Seiler 1989; USACE 1998), and it comprises both estuarine (semienclosed coastal body of water with a river or stream flowing into it) and open-water (ocean) habitats (Levinton 1982). The mouth of Grays Harbor is constricted by two sand spits, Point Brown to the north and Point Chehalis to the south, which were formed by coastal processes in recent geologic time. Grays Harbor contains many intertidal (area of the shore exposed between the highest and lowest tides) mudflats, which are dissected by several navigation channels.

Grays Harbor is one of two estuaries on the Pacific coast of Washington and is the only coastal estuary in the state with an authorized deep-water navigation channel and major port. The north bay of Grays Harbor is relatively undeveloped, while the inner harbor is heavily industrialized. The habitats of Grays Harbor and the lower Chehalis River (which flows into the harbor) have been altered by dredging, diking, filling, jetty construction, industrial discharges, and other human activities over the past century. These activities caused the loss of wetland and other intertidal habitats, as well as converted shallow-water habitats to deeper water. The inner harbor, which supports Aberdeen and Hoquiam, is heavily populated and industrialized with pulp mills, landfills, sewage treatment plants, and log storage facilities.

The tides at Grays Harbor are semidiurnal (twice a day). Extreme tides in the spring cause expansive mudflats to be exposed in Grays Harbor,

**What is the Ecosystems Discipline Report?**

This section was derived from Appendix C, Ecosystems Discipline Report, which includes detailed information about the following:

- How WSDOT identified and classified wetlands in the study area.
- Study area wetlands
- The effects analysis
- Fish, aquatic, and wildlife species—and their habitats—in the study area
- The biology and life histories of the salmon stocks in the study area and the conditions of the shoreline habitats in the study area
- Shoreline conditions in the study area
- Suitable habitat for federally and state-listed wildlife species in the study area
- Specific sources and methods used to evaluate the wildlife and habitat in the study area and project vicinity
- Habitat cover types, how they were designated, and their ecological functions

with an extensive labyrinth of channels forming during low tide. These expansive mudflats are the predominant physical feature of Grays Harbor, covering 63 percent of the harbor's surface area at low tide (USACE 1998).

## Wetlands

Wetlands improve water quality by filtering and removing pollutants. They also provide hydrologic functions, such as retaining floodwater to protect humans, natural resources, and infrastructure. Wetlands also provide important habitat for native plants, fish, and wildlife. Wetlands vary considerably in appearance, and their boundaries fluctuate over time, making them difficult to recognize.

The following Federal Register definition of wetlands is used for regulatory and permitting purposes:

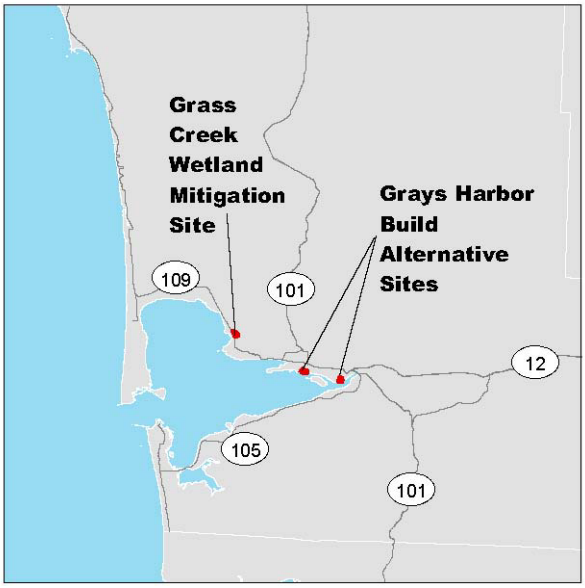
> *Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal conditions do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar* areas. 45 FR 85344, Dec. 24, 1980, as amended at 58 FR 45037, Aug. 25, 1993.

## Has any new information been developed since the Draft EIS?

Since the publication of the Draft EIS, the casting basin design has been modified, with a significantly narrower launch channel. As a result of the reduced launch channel width, effects on shoreline estuarine wetlands and intertidal and subtidal aquatic habitat at the Aberdeen Log Yard site (Preferred Alternative) have been significantly reduced from those discussed in the Draft EIS.

WSDOT has documented its wetlands mitigation strategy in a technical report entitled the *Conceptual Wetland and Aquatic Resources Mitigation Report, Grass Creek* (WSDOT 2010a). This report, which was developed in cooperation with the regulatory agencies and the Tribes, describes how WSDOT would mitigate for wetland and aquatic resource effects resulting from construction of the pontoon casting basin. The mitigation would take place at the Grass Creek mitigation site in Grays Harbor County (see Exhibit 3.1-1).

EXHIBIT 3.1-1
Location of Grass Creek Mitigation Site



The site, an approximately 66-acre area, is located along Grass Creek, a tributary to Gray Harbor. Proposed mitigation would entail removing a dike and reestablishing estuarine wetlands. A summary of the mitigation strategy, approach, and design is presented in Chapter 5, Mitigation. WSDOT submitted the conceptual mitigation plan to the regulatory agencies in August 2010 as a requirement of project permitting. In addition, this section has been updated to reflect comments received from the public, tribes, and resource agencies.

## What regulatory programs govern activities in and around wetlands?

Wetlands are regulated at the federal level under Section 404 of the CWA, which is implemented by the U.S. Army Corps of Engineers, with oversight by the EPA. Applicants receiving a Section 404 permit from the U.S. Army Corp of Engineers are required to obtain a Section 401 Water Quality Certification from Ecology. Issuing a Section 401 Certification means that Ecology anticipates that the applicant's project will comply with state water quality standards and other aquatic resource protection requirements under Ecology's authority. Conditions of the certification become conditions of the federal permit. Ecology, along with the Washington State Department of Commerce, provides guidance to local governments regulating wetlands in compliance with the state's Growth Management Act (36.70A Revised Code of Washington [RCW]). Local governments adopt critical areas ordinances (36.70A.170), which regulate activities in and around wetlands and other critical areas, as designated by Washington's Growth Management Act.

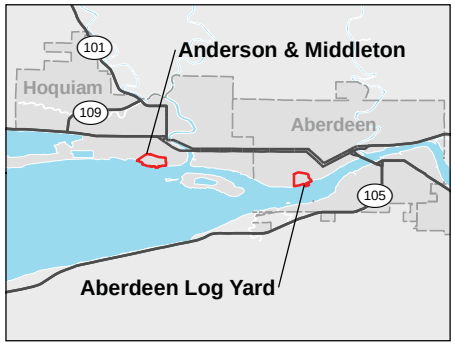
Wetlands are also protected under Executive Order 11990 of 1977, which requires federal agencies to minimize the loss or degradation of wetlands and enhance their natural state. To comply with this executive order, the U.S. Department of Transportation, as stated in Order 5660.1A, set forth the policy that transportation projects should be planned, constructed, and operated to ensure the protection, preservation, and enhancement of the nation's wetlands to the fullest extend practicable.

### What is the Washington wetland rating system?

The State Wetland Rating System for Western Washington characterizes the water quality, hydrologic, and habitat functions provided by each wetland; this system also assigns a category rating. According to this wetland rating system, wetlands decrease in quality from Category I (highest quality) to Category IV (lowest quality). Category I wetlands include, but are not limited to, rare, unique wetlands that are more sensitive to disturbance than most wetlands and that contain ecological attributes that are impossible to replace in a human lifetime.

## How did WSDOT identify and classify wetlands?

WSDOT defined the project wetlands study area as falling within the build alternative site boundaries (see Exhibit 3.1-2 for the Grays Harbor build alternative sites). WSDOT confirmed via analysis of aerial photographs that there are no wetlands on the CTC site or near the site; therefore, WSDOT did not further evaluate wetlands at that site.




- Ditch
- Potential wetland area (unconfirmed by US Army Corps of Engineers)
- Jurisdictional wetland (confirmed by US Army Corps of Engineers)
- Build Alternative Site

Source: WSDOT (2005, 2006) Aerial Photograph, Grays Harbor County (2006) GIS Data (Waterbody and Street).Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for layers is NAVD88.

N

0 250 500 1,000 Feet

Exhibit 3.1-2. **Grays Harbor Build Alternative Sites and Wetland Areas**

SR 520 Pontoon Construction Project

**Washington State Department of Transportation**

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WSDOT wetlands analysts visited both Grays Harbor build alternative sites to identify and map the wetlands. Before the site visits, the analysts reviewed numerous digital and paper maps to determine the location of known and potential wetlands at both sites. During the onsite field work, the analysts looked for indications of wetlands based on guidelines in the 1987 U.S. Army Corps of Engineers *Wetlands Delineation Manual* (Environmental Laboratory 1987) and the *Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual: Western Mountains, Valleys, and Coast Region* (USACE 2008).Wetlands were classified according to the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al 1979)—also known as the Cowardin system—and the hydrogeomorphic (HGM) classification system, which is based on the methods defined in *A Hydrogeomorphic Classification for Wetlands* (Brinson 1993).

**What are the Cowardin and hydrogeomorphic classification systems?**

The Cowardin system, which divides wetlands into several subcategories of five ecological systems, is used to describe the type of habitat found in each wetland. The hydrogeomorphic—commonly called HGM—HGM classification system is used to describe the landscape position and the hydrologic characteristics of each wetland.

**What is a jurisdictional determination?**

A jurisdictional determination is the process of identifying and locating jurisdictional waters of the United States (including wetlands) regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act. This process uses a multiparameter approach that requires positive evidence of hydrophytic vegetation, hydric soils, and wetlands hydrology for a determination that an area is a wetland. The process establishes a line that separates and identifies USACE-regulated wetland areas from areas not regulated by the USACE.

The U.S. Army Corps of Engineers completed a jurisdictional determination at the Aberdeen Log Yard site in December 2009 to confirm the wetland boundaries onsite. The Corps' jurisdictional determination was agreed to by Ecology in January 2010. The wetlands were also delineated for the Anderson & Middleton site. If the Anderson & Middleton site is selected as the casting basin facility site, then WSDOT would submit a formal wetland delineation report to the agencies with regulatory jurisdiction over wetlands.

For wetlands on the Anderson & Middleton site, WSDOT analysts estimated wetland categories based on best professional judgment from their extensive use of the Washington State Wetland Rating System for Western Washington (Hruby 2004) developed by Ecology. The cities of Hoquiam and Aberdeen also both follow the Ecology wetland rating system (Aberdeen Critical Areas Ordinance [CAO] 14.100.200[C], 2009; Hoquiam CAO Chapter 11.06.130[2][b], 2008a).

During the permit review process, wetland categories will be used to establish buffer requirements, define allowable effects, and determine the replacement ratios for compensatory mitigation when wetlands have been fully delineated. WSDOT has assigned wetland categories and buffers at the Aberdeen Log Yard site to comply with City of Aberdeen critical area regulations.

View of wetland at Anderson & Middleton site, facing northeast.

## What are the existing wetlands in the study area?

### CTC Facility

Historically, the area in and around the CTC facility was intertidal mudflat, which was filled and converted to an

active industrial area during the late nineteenth and early twentieth centuries; no freshwater wetlands likely existed in this portion of Commencement Bay. Currently, the CTC facility is within a fully built-out industrial area. There is little native vegetation, although pickleweed, rockweed, salt grasses, and other marine vegetation do exist; however, there is no natural shoreline within the built-out industrial CTC facility. No freshwater wetlands exist on the site or in the immediate vicinity. Because the CTC casting basin facility is completely developed, it contains no vegetative cover and no potential to support wetlands; therefore, the CTC facility is not addressed in the wetlands analysis.

### Grays Harbor Build Alternatives

Hydrological, biological, and geological conditions favorable to wetlands occur at both the Aberdeen Log Yard and Anderson & Middleton alternative sites.

Wetlands classified as palustrine (freshwater) exist in the central portion of each build alternative site, and estuarine (fresh-brackish-marine water with daily tidal cycle) wetlands are in the intertidal zone on the shorelines. These wetlands are described generally here for both sites and more specifically below for each alternative.

The palustrine wetlands at both Grays Harbor build alternative sites were formed on fill within active or formerly active industrial areas. As such, they are young wetland systems and, therefore, have a simple vegetative structure, typically limited to one Cowardin habitat classification. Most consist primarily of emergent (nonwoody) vegetation.

**What is an emergent wetland?**

Emergent wetlands—commonly called marshes and meadows—are dominated by herbaceous (nonwoody) plants, such as grasses, sedges, and forbs (broad-leaved plants) that "emerge" from the saturated soil.

Where trees and shrubs exist within the wetland areas, these species are probably less than 10 to 20 years old, and they include species that grow in disturbed areas fairly quickly, such as alder (*Alnus rubra*) and salmonberry (*Rubus spectabilis*). Many of the emergent wetland areas—in particular on the Aberdeen Log Yard site—likely reestablish season to season and year to year as the logs on the sites are moved and new tire ruts and former log storage areas pond during the rainy season (November through May). Generally speaking, the wetlands on both sites are relatively small and of low value in terms of water quantity and habitat functions. They do have, however, some water quality and habitat-related function.

View of wetland at the Aberdeen Log Yard site, facing north.

The wetlands on the higher and interior upland areas of both sites are all palustrine wetland systems and rated Category III or IV wetlands, ranging in size

from less than 0.001 acre to over 4.5 acres.

### Aberdeen Log Yard Alternative (Preferred Alternative)

The wetland areas on the Aberdeen Log Yard site formed on fill that covered the historic intertidal mud flat and salt marsh habitat. WSDOT identified these wetland areas during October and November 2008 site investigations (Exhibit 3.1-2). There are approximately 1.04 acres of palustrine wetland and approximately 0.50 acre of estuarine wetland on the Aberdeen Log Yard site.

### Anderson & Middleton Alternative

WSDOT identified many palustrine wetlands and one Category I estuarine emergent wetland on the Anderson & Middleton site during November 2008 and January 2009 site investigations (Exhibit 3.1-2). Approximately 8.9 acres of freshwater wetland are located on fill at the site. These wetlands have developed over the approximately 20 to 30 years since the previous industrial activity on the site ceased. Most of these wetland features have developed in depressional areas that were created to facilitate drainage of the site. An approximately 2.4-acre estuarine emergent wetland (Category I) is located along the southwestern portion of the site.

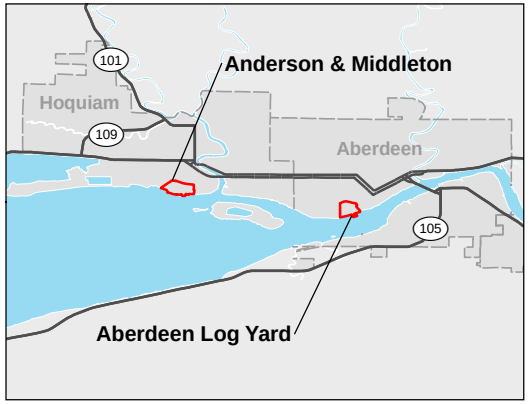
View of estuarine wetlands on the west side of Anderson & Middleton site, facing west.

Most of the freshwater wetland area, or roughly 4.8 acres, is on the central portion of the site that was actively used for log storage; the remainder (4.1 acres) is on the western portion of the site. The wetlands within the former log storage area predominantly occur within existing drainage swales (low areas where water accumulates). Several small wetlands lie along the southern portion of the main log yard area. Estuarine wetlands are also along the shoreline intertidal areas.

View of estuarine emergent wetland at the Aberdeen Log Yard site, facing east.

## How did WSDOT evaluate direct effects on wetlands?

To evaluate project effects on wetlands, WSDOT wetlands analysts overlaid the conceptual casting basin facility designs on wetland area maps of each Grays Harbor build alternative site (see Exhibit 3.1-3). This enabled the analysts to identify the project's effect on wetland areas at each site.




Ditch

Existing railroad

Conceptual casting basin facility layout

Jurisdictional wetland
(confirmed by US Army Corps of Engineers)

Potential wetland area
(unconfirmed by US Army Corps of Engineers)

N

0 125 250 500 Feet

Source: WSDOT (2005, 2006) aerial photograph, USDA-FSA (2006) aerial photograph, Grays Harbor County (2006) GIS Data (Road), Horizontal datum for all layers is State Plane Washington South NAD 83; vertical datum for base layers is NAVD88; vertical datum for design layers is MLLW.

Exhibit 3.1-3. **Wetland Areas Shown on Conceptual Layouts of Grays Harbor Build Alternative Sites**

SR 520 Pontoon Construction Project

**Washington State Department of Transportation**

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## How would construction of the casting basin directly affect wetlands?

### Aberdeen Log Yard Alternative (Preferred Alternative)

WSDOT expects that the entire 1.04 acres of palustrine wetlands on the Aberdeen Log Yard site would be eliminated by casting basin facility construction; 0.06 acres (2,440 square feet) of estuarine wetland located within the proposed launch channel would be eliminated by construction. The estuarine wetlands located along either side of the launch channel likely would not be directly affected by construction of either the casting basin facility or the berm to be built on the upland shoreline portion of the site. This berm would protect water quality treatment facilities on the site from high water and waves.

Launch channel construction would affect an approximately 2.87-acre area within the nearshore and shoreline area, including portions of the subtidal area (this is further quantified in the *Fish and Aquatic Resources* section of this chapter).

### Anderson & Middleton Alternative

The site layout on the Anderson and Middleton site would result in similar effects as those described in the Draft EIS. The casting basin facility construction would eliminate approximately 4.8 acres of palustrine wetland area; this represents 54 percent of the total palustrine wetland area on the site. Construction activities would not directly affect the approximately 2.4-acre estuarine wetland nor the approximately 4.1 acres of palustrine wetland area on the western portion of the property.

## How would pontoon-building operations directly affect wetlands?

### CTC Facility

With no wetlands in the CTC facility study area, pontoon construction would not directly affect wetlands.

### Aberdeen Log Yard Alternative (Preferred Alternative)

Estuarine wetlands located along the shoreline on either side of the launch channel at the Aberdeen Log Yard site would not likely be directly affected by construction of either the casting basin facility or the potential stockpile on the upland shoreline portion of the site. However, these estuarine wetlands could be affected by propeller wash from the tugboats required to move pontoons out of the casting basin. The tugboats could increase wave action and erosion to the estuarine emergent wetlands along the site's shoreline. Furthermore, pontoon towing or other project-related nearshore boat activity could deposit sediment on the vegetation of these wetlands. Because pontoon-towing

cycles are short (one tidal cycle) and would only occur about two to three times each year, such effects would likely be negligible.

#### Anderson & Middleton Alternative

No further direct effects on wetlands beyond those described above for casting basin facility construction would occur during pontoon-building operations at the Anderson & Middleton site. WSDOT does not anticipate any direct effects on the estuarine wetlands located along the Anderson & Middleton site. These wetlands would be much farther from the casting basin and launch channel than the estuarine wetlands at the Aberdeen Log Yard site. The estuarine wetlands are at a higher elevation relative to the shoreline, and they are protected from wind and wave energy by extensive pilings in the nearshore.

### How would pontoon moorage directly affect wetlands?

Pontoon moorage would not directly affect wetlands. Completed pontoons built at the CTC facility would be moored in Puget Sound (at existing marine berths). Pontoons built at the Grays Harbor alternative sites would be moored at a marine site in Grays Harbor (see pontoon moorage location in Exhibit 2-8 in Chapter 2 of this Final EIS). The Grays Harbor site is an open-water environment that does not contain wetlands. Pontoon moorage effects on the aquatic environment are discussed in the *Fish and Aquatic Resources* section of this chapter.

### How would the build alternatives compare in their effects on wetlands?

Exhibit 3.1-4 summarizes and compares the project effects on wetlands by each Grays Harbor build alternative site.

### What indirect effects would the project have on wetlands?

#### CTC Facility

With no wetlands in the CTC study area, pontoon construction and towing would have no indirect effects on wetlands.

EXHIBIT 3.1-4
Wetlands Summary of Direct Effects

| | Aberdeen Log Yard Alternative (Preferred Alternative) [a] | | Anderson & Middleton Alternative [b] | |
|---|---|---|---|---|
| **Effects Category** | **Total Wetland Area Onsite (acres)** | **Wetlands Filled (acres)** | **Total Wetland Area Onsite (acres)** | **Wetlands Filled (acres)** |
| Palustrine emergent wetlands | 1.04 | 1.04 | 8.9 | 4.8 |
| Estuarine wetlands (emergent and rocky shore wetlands) | 0.50 | 0.06 | 2.4 | 0.0 |
| **Total wetland area onsite** | **1.54** | | **11.3** | |
| **Total direct effects on wetlands** | | **1.10** | | **4.8** |

[a] These acreage figures are based on a U.S. Army Corps of Engineers jurisdictional determination made after a wetland delineation of the property.
[b] These acreage figures are conservative estimates based on reconnaissance-level information.

### Aberdeen Log Yard Alternative (Preferred Alternative)

WSDOT's analysis indicates a low likelihood that there would be any indirect project effects on wetlands. The surrounding area in Aberdeen is heavily developed with industrial and residential uses. Based on visual observations by the WSDOT wetland analysts, the adjacent properties only support a small palustrine wetland area (less than 0.5 acre) just north of the site and a tidal channel immediately adjacent to the western property boundary (see Exhibit 3.1-2). This tidal channel would receive treated stormwater from the site via existing approved discharge locations. An NPDES permit for the site would ensure that discharged stormwater would not degrade tidal waters or Grays Harbor.

The Aberdeen Log Yard site is also bordered by a ditch on the north that could reduce dewatering effects offsite. If, however, the offsite wetlands to the north are hydraulically connected to the site, then there would be a risk that, over time as dewatering continues, the hydrology of such wetlands could be adversely affected. The estuarine wetlands remaining along the shoreline would not be further affected by dewatering during facility operation because they receive their primary hydrologic influence from Grays Harbor.

### Anderson & Middleton Alternative

Indirect effects on wetlands from the Anderson & Middleton Alternative include the potential risk that onsite and adjacent wetlands not directly affected during casting basin construction could—over time—be affected by dewatering required during construction, operation, and long-term maintenance of the proposed facility. Although it is not possible to delineate a precise zone of influence where the groundwater

elevation would change as a result of dewatering, WSDOT anticipates that the zone of influence could extend beyond the developed portion of the site. The dewatering zone of influence might extend beyond the casting basin and create a drawdown effect on the perched hydrology of the 4.1-acre palustrine wetland on the western portion of the Anderson & Middleton property or on the 30 acres of freshwater wetland offsite to the east.

Quantifying the likelihood of this effect is difficult, given that the site substrate (soil layers beneath the site) is uneven and how the soil characteristics would influence the dewatering zone of influence is not fully understood at this time. The risk appears minimal because investigations to date indicate that the main hydrological source of these wetlands is isolated from and perched above the groundwater that would be affected by drawdown from dewatering activities. Even so, WSDOT acknowledges that a risk of unanticipated effects on wetland hydrology could occur over time as dewatering continues.

#### Grass Creek

Indirect effects on wetlands at the Grass Creek mitigation site would be associated with project construction. Construction-related activities, such as clearing, grading, and planting, which would occur in a small portion of the site, would result in short-term, temporary increases in turbidity to the waters in and adjacent to the Grass Creek site. However, turbidity would decrease following construction and site stabilization. Construction of the mitigation site will be in compliance with all permit conditions and will meet state water quality standards. .

### How would wetlands be affected if the project were not built?

Under the No Build Alternative, there would be no construction or long-term effects on wetlands beyond those already occurring on the sites. Wetlands on the Aberdeen Log Yard site would continue to be disturbed by existing log-sorting activities, and wetlands on the Anderson & Middleton site would remain mostly undisturbed.

### What would the cumulative effect on wetlands likely be?

#### CTC Facility

WSDOT did not identify any potential direct or indirect effects on wetlands from operating the CTC facility. Therefore, there would be no contribution to cumulative effects on wetlands associated with pontoon-building or towing activities at this site.

### Grays Harbor Build Alternatives

The project's contribution to cumulative effects on wetland resources in Grays Harbor would likely be minor. In fact, after compensatory mitigation, the project would likely help to counter the effects of cumulative wetland losses in the Grays Harbor area.

Past activities discussed previously in this section have resulted in a cumulative loss of wetlands and other intertidal habitats in Grays Harbor, as well as the conversion of shallow-water habitats to deeper water. Many of these past effects were not mitigated because they occurred prior to the 1970s, when regulations protecting wetlands were established. Actions since the early 1970s and future actions in the Grays Harbor area have been and will be subject to federal, state, and local wetland regulations that require avoidance, minimization, and compensatory mitigation for unavoidable wetland impacts based on lost acreage and functions. Such regulations have slowed wetland impacts in the Grays Harbor area, but they have not reversed or corrected the long-term cumulative effects of industrial and residential development. Today the project vicinity is subject to local ordinances as well as state and federal permit programs that have been implemented to protect critical resources and habitat, including wetlands.

Exhibit 3-3 (in the Introduction to this chapter) shows the location of several foreseeable future actions that could also occur in the project vicinity: Actions 9, 10, 12, 14, and 15 (Grays Harbor Deeper Draft, Terminal 1, 2, 3 and 4 Developments). WSDOT analyzed the potential effects of these projects to help assess the future for wetlands in the area—with and without the proposed project. WSDOT found that the likely future projects could eliminate some of the wetlands that might have developed on fill; however, the mitigation associated with the projects would likely adequately compensate for those losses.

Compensatory mitigation for project effects on wetlands at the Grass Creek mitigation site should result in better wetland functions over what is currently occurring on either build alternative site. Mitigation for effects on estuarine wetlands, although offsite, would likely be in-kind (provide similar values and functions as the area disturbed), which would be appropriate given the loss of estuarine wetlands within Grays Harbor over the last century. The conceptual mitigation plan for the Grass Creek site has been submitted to the regulatory agencies and Tribes; however, the final details of the mitigation plan remain to be negotiated with regulatory agencies and tribes. The Grass Creek site is currently primarily freshwater wetland, and it has been used over the past century as a pasture. This site is protected from saltwater influence by a perimeter dike that has breached in one location. The conceptual mitigation plan proposes to reestablish a range of estuarine wetland

habitats along an increasing elevation gradient, from mudflat to upper intertidal salt marsh, and restore natural tidal influence to the site by removing long sections of the dike that currently encompasses most of the site. In addition, existing ditches on the site (intended to drain the site) would be filled. The site would be rehabilitated to improve wetland and buffer functions over existing conditions.

After compensatory mitigation is implemented, the project would not contribute to the cumulative wetland loss in the area that has occurred over the last century. In fact, this project would, after mitigation, be beneficial and help to counter the effects of cumulative wetland loss that have occurred over the last century in the Grays Harbor area.