Cities of Aberdeen, Cosmopolis, and Hoquiam
Shoreline Master Program Update

Cumulative Impacts Analysis and No Net Loss Report

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LIST OF ABBREVIATIONS

AMC – Aberdeen Municipal Code

BMP – Best Management Practices

Cities – Cities of Aberdeen, Cosmopolis, and Hoquiam

CMC – Cosmopolis Municipal Code

CMZ – Channel Migration Zone

CIA – Cumulative Impacts Analysis

Ecology – Washington State Department of Ecology

EPA – United States Environmental Protection Agency

ESA – Federal Endangered Species Act

FEMA – Federal Emergency Management Agency

FPA – Washington State Forest Practices Act (Chapter 76.09 RCW)

GHEMP – Grays Harbor Estuary Management Plan

HMC – Hoquiam Municipal Code

MA – Management Area

NMFS – National Marine Fisheries Service

OHWM – Ordinary High Water Mark

RCW – Revised Code of Washington

SEPA – State Environmental Policy Act (Chapter 43.21C RCW)

SIC – Shoreline Inventory and Characterization

SMA – Shoreline Management Act (Chapter 90.58 RCW)

SMP – Shoreline Master Program

State – State of Washington

USACE – United States Army Corps of Engineers

USFWS – United States Fish and Wildlife Service

WAC – Washington Administrative Code

WDFW – Washington State Department of Fish and Wildlife

WDNR – Washington State Department of Natural Resources

WSDOT – Washington State Department of Transportation

1 INTRODUCTION

1.01 DEPARTMENT OF ECOLOGY DIRECTION AND GUIDANCE

The Shoreline Management Act (SMA) rules in Chapter 173-26 of the Washington Administrative Code (WAC) require local shoreline master programs (SMPs) to include goals, policies, and regulations to ensure that SMP implementation will "achieve no net loss of ecological function" over the long term. The SMP Guidelines (WAC 173-26-186(8)(d)) state that:

> *"To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts."*

The SMP Guidelines discuss the concept of net loss in more detail in WAC 173-26-201(2)(c). An SMP must contain goals, policies, and regulations that are designed to direct development activities and uses in a manner that will prevent degradation of ecological functions relative to the existing conditions.

The cities of Aberdeen, Hoquiam, and Cosmopolis (cities') updated SMP contains goals, policies, and regulations that prevent degradation of ecological functions relative to the existing conditions as documented in the *Shoreline Inventory and Characterization (SIC) Report* (Herrera and AHBL, 2014). For those projects that result in degradation of ecological functions, the required mitigation must return the resultant ecological function back to the baseline, as illustrated in Figure 1-1. In addition, the SMP must address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities (WAC 173-26-186(8)(d)).

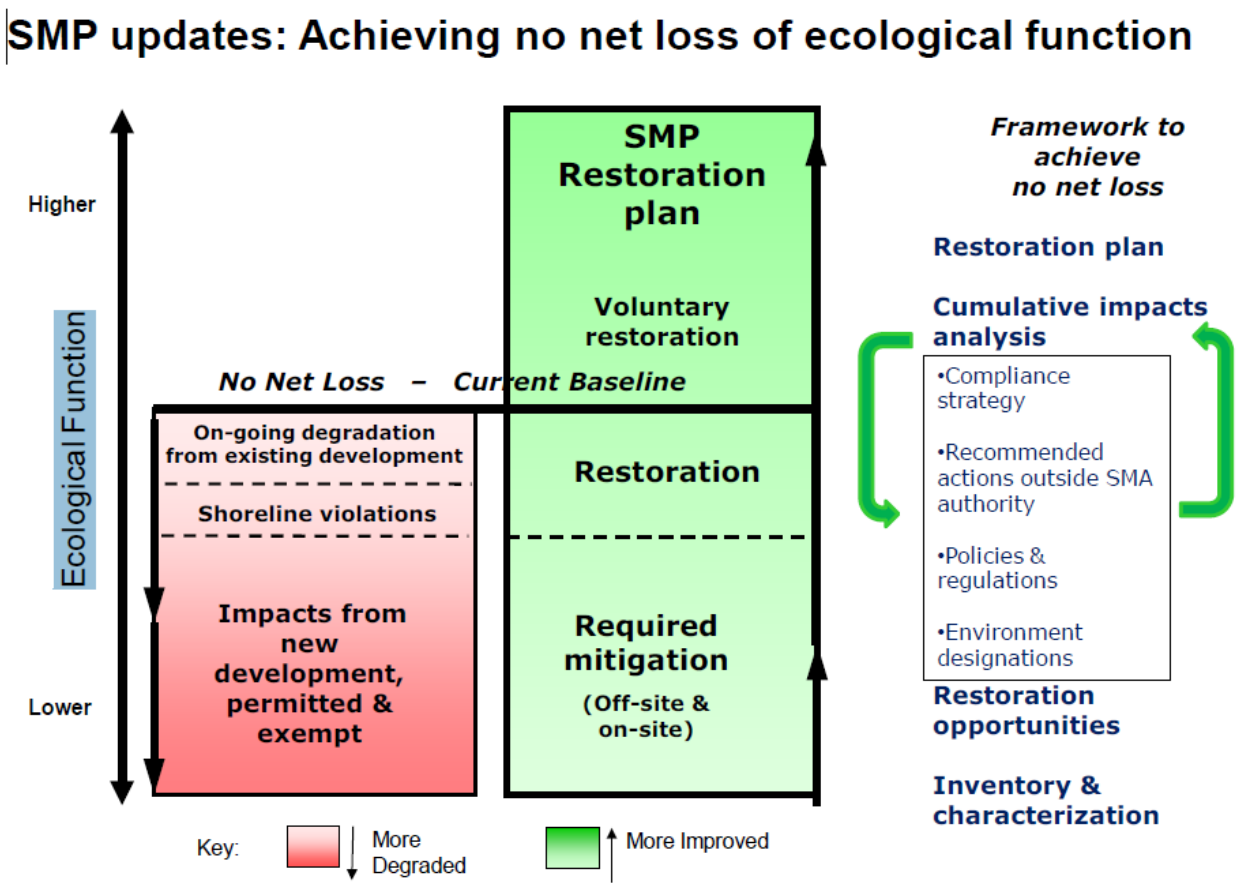

Figure 1-1. Shoreline Master Program Process for Achieving the No-Net Loss Standard.
Source: Washington State Department of Ecology (Ecology) (2012)

The purpose of the *Cumulative Impacts Analysis* (CIA) is to ensure that implementation of the updated SMP for the cities, prepared by AHBL (2015), will not result in a net loss of shoreline ecological functions over the long term. Consistent with guidance from the Washington State Department of Ecology (Ecology), the CIA analyzes how the proposed SMP policies, regulations, and environment designations meet this requirement. This analysis includes only those impacts that would result from development and uses within the cities' shoreline jurisdiction, and that are subject to regulation under their SMP. Potential impacts of development outside the shoreline jurisdiction are not considered in the CIA.

The CIA forecasts the estimated impacts of development in shoreline areas, taking into account the SMP policies, programs, and regulations, as well as:

- Existing conditions that affect the shorelines and relevant natural processes. The SIC provides this existing condition, or baseline, information.
- Reasonably foreseeable future development and use of the shorelines that is likely to occur during the next 20 years or so, based on the proposed shoreline environment

designations, proposed land use density and bulk standards, and current shoreline development patterns.

- Beneficial effects of any established regulatory programs under other local, state, and federal laws, such as the federal Clean Water Act.

To be consistent with the SIC, this analysis organizes the shorelines by city. Combined, the cities have approximately 7,500 acres and 86 miles of shoreline associated with these stream, lake, and marine water bodies.

In accordance with Ecology guidance, the shoreline assessed in the SIC may contain a nested system of management areas (MAs) and reaches. However, since all of the cities' shorelines are associated with a single watershed, the lower Chehalis River, it is appropriate to consider each city as a single MA. The MAs were broken down into reaches for the purposes of the SIC and CIA.

The cities were divided into the 16 shoreline reaches shown in Figure 1-2, Figure 1-3, and Figure 1-4. The reaches are listed below by city, based on areas having similar physical and ecological characteristics, land use, and development patterns.

<u>City of Aberdeen</u>

1. Aberdeen Lake
2. Charley Creek
3. Chehalis River – Aberdeen
4. Fry Creek – Aberdeen
5. Grays Harbor North Bank
6. Grays Harbor South Bank
7. Newskah Creek
8. Wedekind Confluence
9. Wishkah River

<u>City of Cosmopolis</u>

10. Chehalis River – Cosmopolis
11. Mill Creek

<u>City of Hoquiam</u>

12. East Hoquiam River
13. Fry Creek – Hoquiam
14. Grays Harbor
15. Hoquiam River
16. Little Hoquiam River

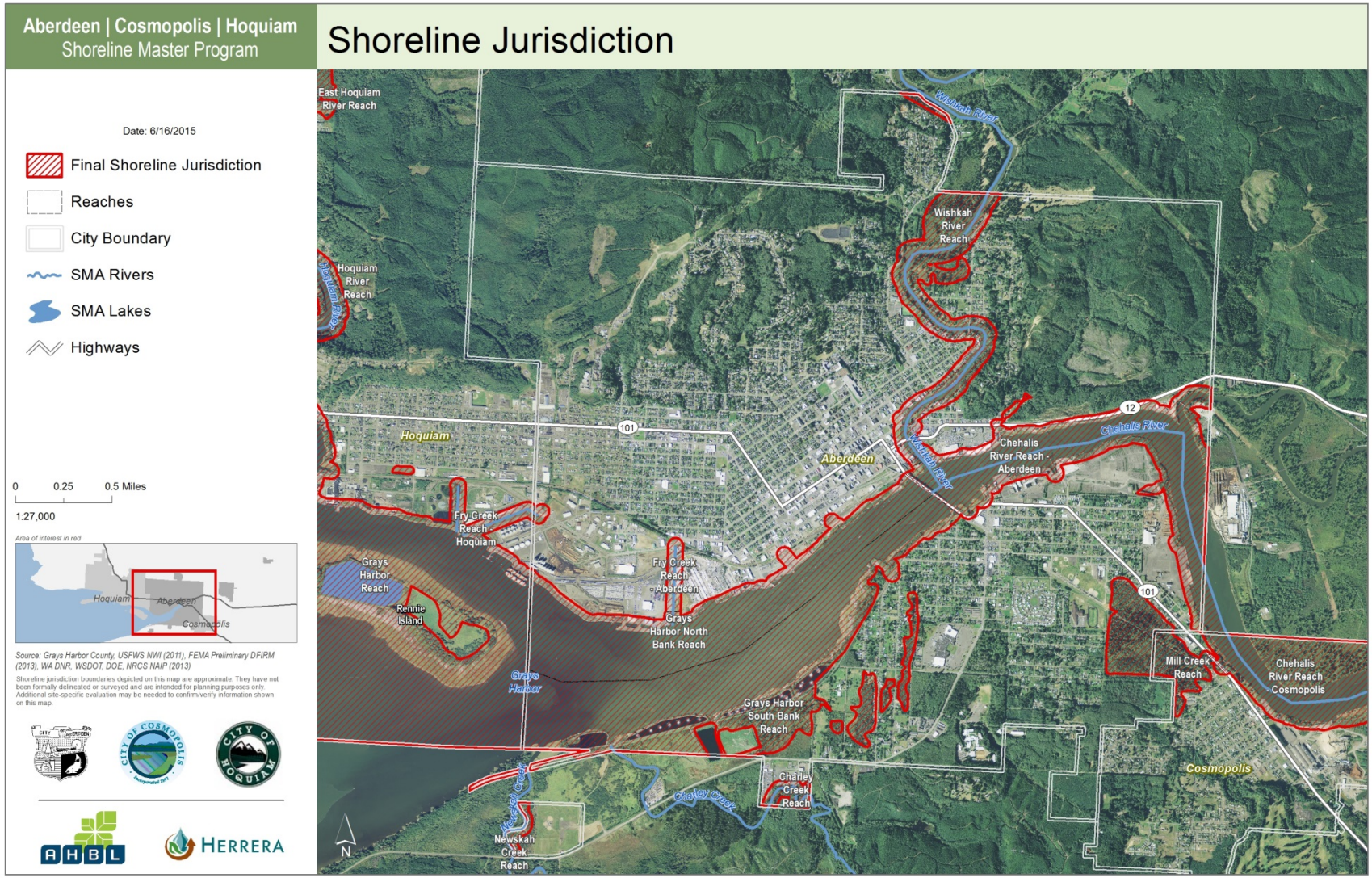

Figure 1-2. Shoreline Reaches within the Jurisdictional Boundaries of the City of Aberdeen.

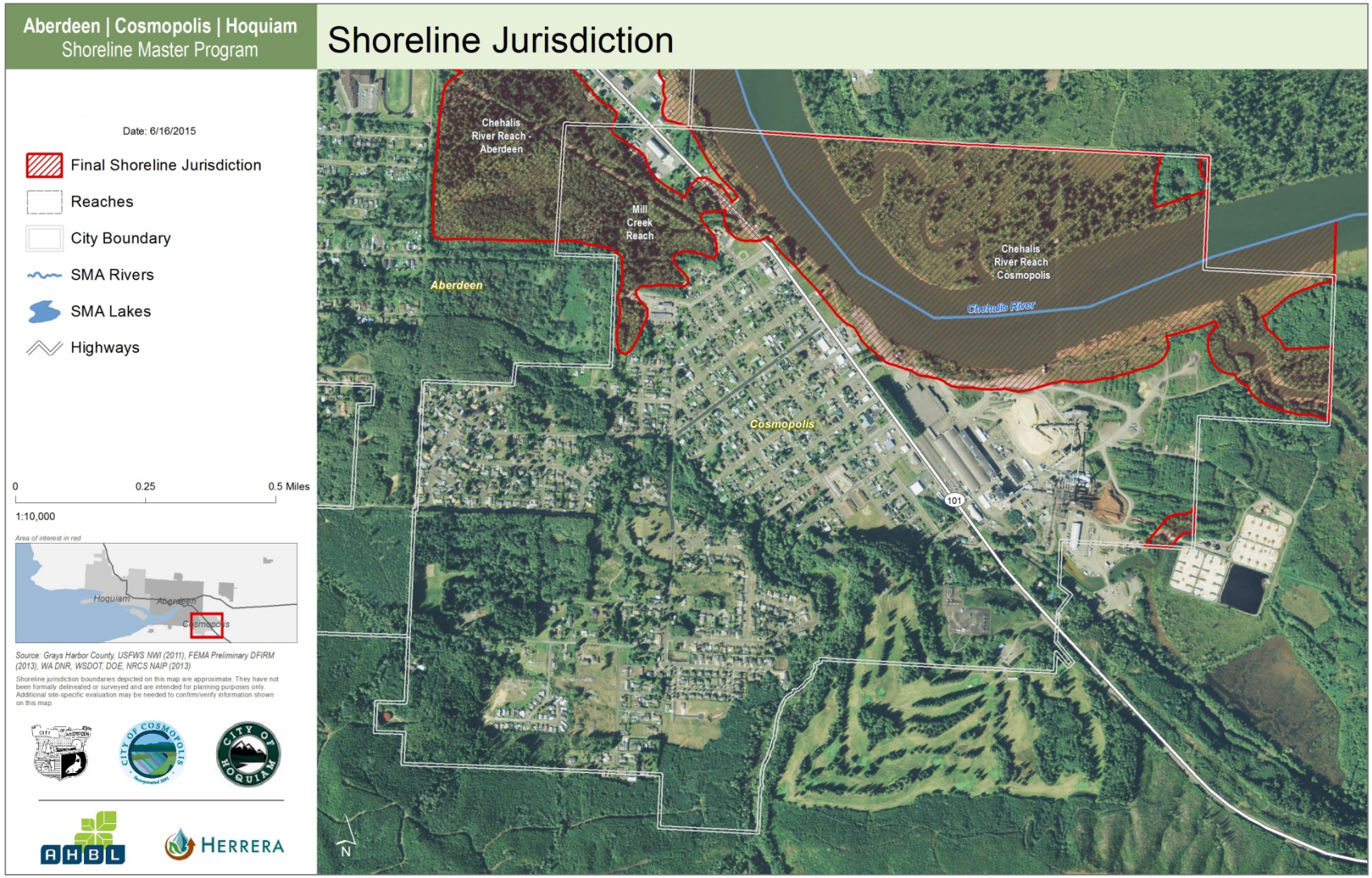

Figure 1-3. Shoreline Reaches within the Jurisdictional Boundaries of the City of Cosmopolis.

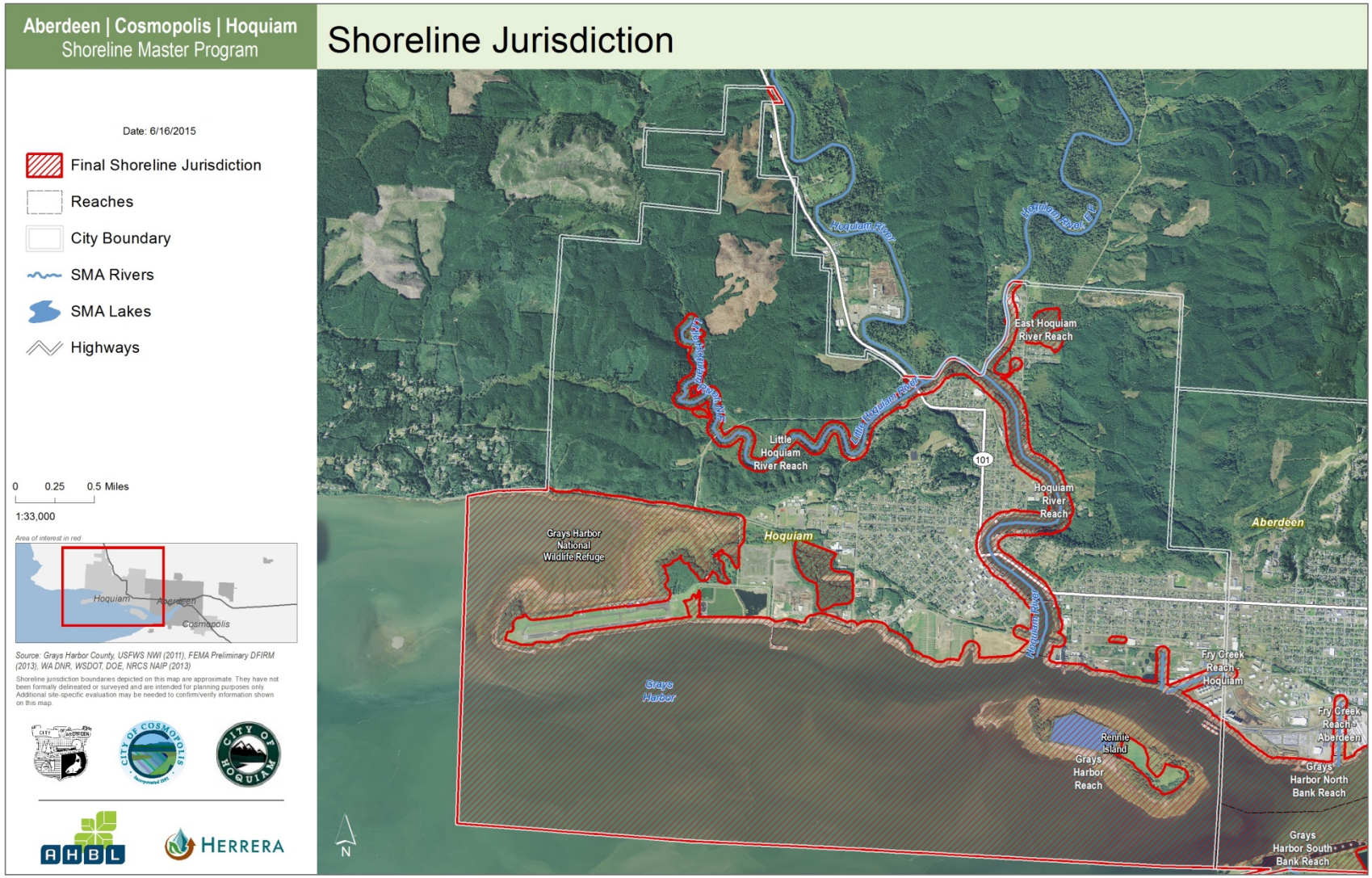

Figure 1-4. Shoreline Reaches within the Jurisdictional Boundaries of the City of Hoquiam.

1.02 RELATIONSHIP TO SEPA

The State Environmental Protection Act (SEPA) requires an assessment of environmental impacts. The CIA is a supplement to the nonproject environmental review done under SEPA and is intended to address cumulative impacts, rather than isolated or individual impacts, that might not be considered otherwise as part of the environmental checklist.

The SEPA review process is intended to provide a list of possible environmental impacts that may occur because of a project (SEPA project review) or change in policy (SEPA nonproject review). This helps identify potential impacts that may need to be mitigated or conditioned, or which may result in the denial of a project or proposal. The CIA is intended to look at impacts as a whole based on whether multiple similar projects collectively result in gradual, but significant impacts. While SEPA looks at impacts by topic and the effects they may have as a whole for the project area, the CIA examines cumulative impacts that may result from multiple projects over time.

1.03 ASSUMPTIONS

The CIA considered foreseeable impacts over a 20-year planning horizon and examines how provisions of the revised SMP are likely to affect existing conditions documented in the SIC. In addition, site-specific impacts are expected to be addressed on a case-by-case basis during individual shoreline project reviews.

1.04 DOCUMENT ROADMAP

The CIA summarizes existing conditions in the 16 shoreline reaches of the cities, including shoreline characteristics, land use, public access, shoreline modifications, and ecological functions. It summarizes the applicable policies and regulations in the SMP that will act together to ensure that no net loss of ecological function occurs in the shoreline jurisdiction. It identifies potential upland and in-water development opportunities within each reach.

Potential development opportunities were determined based on existing conditions, shoreline environment designations, zoning, and limiting environmental factors such as the presence of wetlands or channel migration zones (CMZs). This report details the potential impacts and risks to shoreline functions and processes, identifies anticipated development in each shoreline reach and how the SMP regulations would address this development, discusses how other local, state and federal regulations would address these potential impacts, and describes the net

effect on ecological functions and processes. Cumulative impacts analysis tables are included in Chapter 7. The tables describe the relationship between ecological function, potential alteration, resources at risk, and proposed SMP regulations and non-regulatory measures designed to assure no net loss, at a minimum.

2 EXISTING CONDITIONS

This chapter summarizes information presented in the SIC. For each shoreline reach, this chapter presents a summary of shoreline characteristics and uses, and describes ecological functions considered to be at risk, such as habitat, water quantity, and water quality. Descriptions of reaches include all lands waterward of OHWM.

2.01 CITY OF ABERDEEN

2.01.01 REACH 1 – ABERDEEN LAKE

The Aberdeen Lake Reach is approximately 114 acres in area. Land cover is comprised of 40 percent open water, 18 percent woody wetlands, 18 percent evergreen forest, seven percent emergent herbaceous wetlands, six percent developed open space, five percent low intensity development, four percent shrub/scrub, three percent deciduous forest, one percent barren land, and less than one percent of medium intensity development, herbaceous, and mixed forest. Thirty-nine percent (44 acres) of the Aberdeen Lake Reach is in public ownership.

A. Shoreline Characteristics

The Aberdeen Lake Reach is inland from the Grays Harbor and Chehalis River shorelines, and does not have the development intensity or pressure that is present in most other shoreline reaches throughout the city. The reach is influenced only by lowland rainfall.

B. Land Use

The primary land use within Aberdeen Lake Reach is the Lake Aberdeen Recreation Area, a 640-acre park. The park consists mostly of undeveloped forestlands but also includes five acres of land developed for recreational purposes.

The zoning designation from Aberdeen Municipal Code (AMC) Title 17 – Zoning is Industrial, reflecting the presence of the Aberdeen Lake Dam.

C. Existing Public Access

Aberdeen Lake includes one of the two public boat-launching facilities in the city, which allows non-motorized boats to access the lake. The lake is used for swimming and fishing activities. The city has identified expansion opportunities for areas directly adjacent to the

lake, which would allow for more public access. Long-term plans for Aberdeen Lake include adding tent camping areas and a native / interpretive trail around the lake.

D. Shoreline Modifications

The primary shoreline modification in this reach is the Aberdeen Lake Dam. Additionally, there is a public boat launching facility located at the lake, which is used to support non-motorized boating and other recreational activities that occur around the lake.

E. Ecological Functions

The Aberdeen Lake Reach scored the highest on the functional assessment out of all Aberdeen reaches, primarily due to good vegetative conditions along the shoreline, relatively low level of shoreline development, and good connectivity between habitats. There are areas of altered vegetation along the south shore associated with the dam, roads, parking areas, and the fish hatchery. Although it is an anthropogenic structure, the dam is the key physical feature responsible for the presence of the lake, its current character, and much of the function that it provides, particularly in terms of floodwater storage.

1. Geologically Hazardous Areas

Eighteen percent of the area within the Aberdeen Lake Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics present throughout the reach. Nine percent of the reach is also subject to deep-seated landslide hazard zones based on the topography within and directly adjacent to the reach's boundary.

2. Flood Hazard Areas

The Aberdeen Lake Reach is mapped outside of the Federal Emergency Management Agency (FEMA) 100-year floodplain area.

3. Wetlands

Approximately 71 acres of identified wetlands exist within the Aberdeen Lake Reach, comprising 63 percent of the reach's total area.

4. Streams

No river or stream features within the Aberdeen Lake Reach qualify as an instream habitat area. The shorelines within this reach are more closely associated with lake's habitat and ecological processes.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Aberdeen Lake Reach, with their associated habitat type and length of documented presence listed in Table 2-1 below:

Table 2-1. Fish Species in the Aberdeen Lake Reach.

Fish Species	Habitat Type
Chinook Salmon	Presence/Migration
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing
Coho Salmon	Presence/Migration
Steelhead Trout	Presence/Migration
Steelhead Trout	Planted

Coastal resident trout use habitats in nearly all of the shoreline jurisdictions, and cutthroat trout are Washington State Department of Fish and Wildlife (WDFW) designated priority species due to their recreational value. Pacific lamprey (Entosphenus tridentate) is documented near the outfall of Aberdeen Lake, and are listed as a state priority species and federal species of concern.

Bald eagles are present throughout the cities' shorelines and have been observed perching on natural and human-made structures throughout the shoreline jurisdiction. Wood duck priority areas are mapped around Aberdeen Lake and the immediately surrounding area. There are approximately 76 acres of wood duck habitat located in this reach.

2.01.02 REACH 2 – CHARLEY CREEK

The Charley Creek Reach is approximately 17 acres in area. Land cover is comprised of 60 percent woody wetlands, 14 percent emergent herbaceous wetlands, nine percent medium intensity development, eight percent low intensity development, eight percent barren land, and three percent high intensity development. There are no publicly owned lands within the Charley Creek Reach.

A. Shoreline Characteristics

The Charley Creek Reach is located south of Grays Harbor in Aberdeen and along the portion of Charley Creek that crosses into the city boundary. The north shoreline of the reach is more intensely developed than the southern shoreline, which currently has no development.

B. Land Use

The Charley Creek Reach is zoned entirely Industrial. The northern portion of the reach contains industrial land uses, including an auto-wrecking yard.

C. Existing Public Access

There is no existing public access to shorelines in the Charley Creek Reach.

D. Shoreline Modifications

There are no visible or identified shoreline modifications present in the Charley Creek Reach.

E. Ecological Functions

The Charley Creek Reach scored high on the functional assessment, partly due to good vegetation and channel conditions, despite existing development and lack of vegetation in the northern portion of the reach. The National Wetlands Inventory indicates only two percent of wetland cover in the reach, although land cover data indicates significant amounts of woody wetland (scrub-shrub and forested areas likely containing wetlands) comprising 59 percent of the reach. The northern portion of the reach is characterized by the wrecking yard and is an area identified as a potential restoration opportunity. Charley Creek channel migration is dominated by marine flooding events that extend throughout the lower reaches of the creek.

1. Geologically Hazardous Areas

The entire Charley Creek Reach is subject to liquefaction hazards based on the soil characteristics: 85 percent of the area subject to moderate to high risk and the remaining 15 percent subject to very low to low risks. Nearly ten percent of the reach is also subject to deep-seated landslide hazard zones based on the topography within and directly adjacent to the reach's boundary. The entire extents of the reach are within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Seventy-six percent of the Charley Creek Reach is within the 100-year floodplain.

3. Wetlands

Approximately 0.4 acres of identified wetlands exist within the Charley Creek Reach, comprising 2.3% of the reach's total area.

4. **Streams**

   Instream priority habitats exist within the Charley Creek Reach, and serve as areas where a combination of physical, biological, and chemical processes and conditions interact to provide functional life history requirements for instream fish and wildlife resources.

5. **Other Fish and Wildlife Habitat Conservation Areas**

   Coastal resident cutthroat trout is present in the Charley Creek Reach. Coastal resident trout use habitats in almost the entire shoreline jurisdiction, and cutthroat trout are WDFW designated priority species due to their recreational value. Additionally, bald eagles are likely present in this reach.

2.01.03 REACH 3 – CHEHALIS RIVER – ABERDEEN

The Chehalis River – Aberdeen Reach is approximately 429 acres. Land cover is comprised of 50 percent open water, 15 percent woody wetlands, nine percent low intensity development, seven percent medium intensity development, six percent high intensity development, four percent herbaceous, four percent barren land, three percent emergent herbaceous wetlands, three percent developed open space, and less than one percent evergreen forest. Eight percent (33 acres) of the Chehalis River Reach – Aberdeen is in public ownership.

A. Shoreline Characteristics

The Chehalis River – Aberdeen Reach is located in central Aberdeen and splits the city into its northern and southern banks. The reach flows directly into Grays Harbor. There are extensive levees and shoreline armoring present throughout the reach, particularly along the southern shoreline.

B. Land Use

Chehalis River – Aberdeen Reach merges with Elliot Slough and it is primarily used for passive recreation and log staging along the cleared land waterward of the levees.

The current land use patterns found in the Chehalis River – Aberdeen Reach are provided in Table 2-2 below.

Table 2-2. Current Land Use Patterns for the Chehalis River – Aberdeen Reach.

Current Land Use Patterns	Percentage of Reach
Industrial	39%
Vacant/Undeveloped	30%

Current Land Use Patterns	Percentage of Reach
Commercial	14%
Manufacturing	8%
Public Services	6%
Residential	<1%
Transportation/Communication/Utilities	<1%
Parks/Open Space	<1%
Cultural/Entertainment/Recreational	<1%

The zoning designations from the Title 17 – Zoning found in the Chehalis River – Aberdeen Reach are provided in Table 2-3 below.

Table 2-3. Current Zoning Designations for the Chehalis River – Aberdeen Reach.

Description	Symbol	Percentage of Reach
Industrial	I	53%
Single Family Residential	RS	18%
Waterfront Development	WD	14%
Multiple Family Residential	RM	12%
Commercial/ Residential	CR	2%
Light Industrial	LI	<1%
General Commercial	CG	<1%

C. Existing Public Access

Within the Chehalis River – Aberdeen Reach, residents have access to the shoreline at the Morrison Riverfront Park on the northern bank of the river, which includes waterfront access and a pavilion, picnic tables, and a fishing/viewing dock. A public access site adjacent to the Walmart store provides access to an associated trail connecting to the Morrison Riverfront Park. A trail also connects the Morrison Riverfront Park to the Chehalis River via the East Aberdeen Waterfront Walkway. Aberdeen Ramp, also on the Chehalis River, is a concrete plank ramp providing boat access to the river. A three mile trail also connects the Chehalis River on the south side of Aberdeen to the Bishop Athletic Complex along the abandoned Burlington Northern railroad grade and levee.

D. Shoreline Modifications

Extensive shoreline modifications are present throughout the Chehalis River – Aberdeen Reach. Most of the shoreline modifications in the reach are along the northern bank of the Chehalis River. There is over 4,100 feet of dike/levee in the reach. There are also 2,290 feet

of riprap, 375 feet of concrete bulkhead, 520 feet of landfill, 20 tide gates, and three partial road-crossing blockages.

E. Ecological Functions

The Chehalis River – Aberdeen Reach scored low on the function assessment, primarily due to the extensive levees along the entire southern shoreline and armoring along the active channel. However, the reach provides an important migration corridor for species moving upstream and downstream to key habitats in the Chehalis River's tidal surge plain. Due to levee construction and fill, the entire reach is disconnected permanently from the remainder of its historical CMZ.

1. Geologically Hazardous Areas

Forty-four percent of the area within the Chehalis River – Aberdeen Reach is subject to moderate to high risk of liquefaction hazards based on the soil characteristics, and 43 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Eighty percent of the Chehalis River – Aberdeen Reach is within the 100-year floodplain.

3. Wetlands

Approximately 82 acres of identified wetlands exist within the Chehalis River – Aberdeen Reach, comprising 19 percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Chehalis River – Aberdeen Reach, serving as areas where a combination of physical, biological, and chemical processes and conditions interact, providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Chehalis River – Aberdeen Reach, with their associated habitat type and length of documented presence listed in Table 2-4 below:

Table 2-4. Fish Species in the Chehalis River – Aberdeen Reach.

Fish Species	Habitat Type
Bull Trout	Presence/Migration
Chinook Salmon	Presence/Migration

Fish Species	Habitat Type
Chum Salmon	Presence/Migration
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing
Coho Salmon	Presence/Migration
Largemouth Bass	Presence/Migration
Steelhead Trout	Juvenile Rearing
Steelhead Trout	Spawning
Steelhead Trout	Presence/Migration

The Chehalis River – Aberdeen Reach is designated under the federal Endangered Species Act (ESA) as critical habitat for bull trout (75 FR 63898). The reach provides freshwater and marine foraging, migration, and overwintering habitat outside of the Hoh, Queets, and Quinault core areas where breeding populations occur. Coastal resident trout use habitats in nearly all of the shoreline jurisdictions, including this reach.

The lower estuarine waters of the Chehalis River are a common foraging area for harbor seals. Additionally, bald eagles are likely present in this reach. There are approximately 19 acres of peregrine falcon habitat in this reach.

2.01.04 REACH 4 – FRY CREEK – ABERDEEN

The Fry Creek – Aberdeen Reach is approximately 22 acres in area. Land cover is comprised of 46 percent medium intensity development, 41 percent low intensity development, and 13 percent high intensity development. Sixty-six percent (15 acres) of the Fry Creek – Aberdeen Reach is in public ownership.

A. Shoreline Characteristics

The Fry Creek – Aberdeen Reach extends north from the eastern portion of Grays Harbor North Bank Reach into the city of Aberdeen. The shoreline has been extensively modified throughout its history to make the surrounding area suitable for development, which is primarily comprised of industrial uses.

B. Land Use

Fry Creek Reach – Aberdeen is an industrial reach that ranges from standard to light industrial land uses. The zoning designations from AMC Title 17 – Zoning are Industrial (88 percent) and Light Industrial (12 percent).

C. Existing Public Access

There is no existing public access to shorelines in the Fry Creek – Aberdeen Reach.

D. Shoreline Modifications

Shoreline modifications present in the Fry Creek – Aberdeen Reach are limited to eight tide gates and one partial road-crossing blockage. There is no visible or identified shoreline armoring.

E. Ecological Functions

The Fry Creek – Aberdeen Reach scored low on the functional assessment. The reach is highly altered by development and by reduced vegetative conditions. Fry Creek likely once meandered throughout the city, prior to substantial fill, development, and channelization. Therefore, a CMZ is no longer present in this constructed channel and floodplain.

1. Geologically Hazardous Areas

The majority, or 96 percent, of the area within the Fry Creek – Aberdeen Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics. The entire reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Nineteen percent of the Fry Creek – Aberdeen Reach is within the 100-year floodplain.

3. Wetlands

There are no identified wetlands within the Fry Creek – Aberdeen Reach.

4. Streams

Instream priority habitats exist within the Fry Creek – Aberdeen Reach, serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Fry Creek – Aberdeen Reach, with their associated habitat type and length of documented presence listed in Table 2-5 below:

Table 2-5. Fish Species in the Fry Creek – Aberdeen Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing

Additionally, bald eagles are likely present in this reach. There are approximately two acres of peregrine falcon habitat in this reach.

2.01.05 REACH 5 – GRAYS HARBOR NORTH BANK

The Grays Harbor North Bank Reach is approximately 414 acres in area. Land cover is comprised of 76 percent open water, seven percent low intensity development, six percent medium intensity development, five percent high intensity development, three percent barren land, three percent herbaceous, and less than one percent emergent herbaceous wetlands and shrub/scrub. Six percent (22 acres) of the Grays Harbor North Bank Reach is in public ownership.

A. Shoreline Characteristics

The Grays Harbor North Bank Reach runs adjacent to the northern bank of Aberdeen's shoreline along the Chehalis River as it spills into Grays Harbor. Two other reaches, Fry Creek – Aberdeen and Chehalis River – Aberdeen, feed directly into this reach. The shoreline has been extensively modified and armored.

B. Land Use

Grays Harbor North Bank Reach is used as industrial land; industrial land with buildings; commercial land; churches; and other water systems transportation, communication, and utilities. The zoning designations from AMC Title 17 – Zoning found in the Grays Harbor North Bank Reach are Industrial (75 percent) and Light Industrial (25 percent).

The current upland land use patterns found in the Grays Harbor North Bank Reach are provided in Table 2-6 below.

Table 2-6. Current Land Use Patterns for the Grays Harbor North Bank Reach.

Current Land Use Patterns	Percentage of Reach
Industrial	67%
Commercial	25%
Public Services	5%
Transportation/Communication/Utilities	2%

Current Land Use Patterns	Percentage of Reach
Manufacturing	<1%

C. Existing Public Access

There is no existing public access to shorelines in the Grays Harbor North Bank Reach.

D. Shoreline Modifications

Much of the north shore of Grays Harbor waterfront has been filled in the past and subsequently armored. Tide gates placed throughout the reach are necessary to prevent marine or river inundation of developed areas during high water events. These gates are most likely at least a partial barrier to fish, though most stormwater infrastructure does not provide access to valuable habitat.

Table 2-7 lists shoreline modifications observed on aerial photographs in the course of doing reach functional assessments. Comprehensive information on shoreline modifications is not available for this reach.

Table 2-7. Grays Harbor North Bank Reach Shoreline Modifications.

Shoreline Modifications
1,514 feet of concrete bulkhead
7,652 feet of landfill
2,000 feet of rip rap
550 feet of wooden bulkhead
8 tide gates
1 total road crossing blockage

E. Ecological Functions

The Grays Harbor North Bank Reach scored low on the function assessment, due to extensive industrial development and shoreline modifications that reduce many of the functions provided by native vegetation and wetlands that would otherwise occur with less developed conditions. Although functions in the reach are relatively impaired due to historical filling and development, the reach is still an important migration corridor for salmon migrating from the Chehalis River and its tributaries to the Pacific Ocean.

1. Geologically Hazardous Areas

Thirteen percent of the area within the Grays Harbor North Bank Reach is subject to moderate-to-high risk of liquefaction hazards, based on the soil characteristics. Sixteen percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. **Flood Hazard Areas**

   Thirty-five percent of the Grays Harbor North Bank Reach is within the 100-year floodplain.

3. **Wetlands**

   There are no identified wetlands within the Grays Harbor North Bank Reach.

4. **Streams**

   No river or stream features within the Grays Harbor North Bank Reach qualify as an instream habitat area. The shorelines within this reach are more closely associated with marine habitats and ecological processes, however, since the entire shoreline jurisdiction is dominated by river and stream water features, there is a close ecological association with nearby instream habitats.

5. **Other Fish and Wildlife Habitat Conservation Areas**

   The following fish have been identified within the Grays Harbor North Bank Reach, with their associated habitat type and length of documented presence listed in Table 2-8 below:

Table 2-8. Fish Species in the Grays Harbor North Bank Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing

The Grays Harbor North Bank Reach is designated under the ESA as critical habitat for bull trout (75 FR 63898).

Coastal resident trout use habitats in nearly all of the shoreline jurisdictions, including Grays Harbor. Forage fish spawning areas (including sand lance, smelt, and herring spawning) are mapped just outside of the Grays Harbor North Bank Reach, but they may indirectly support eelgrass and coastal nearshore habitat in the shoreline jurisdiction by providing water quality and rearing habitat for larvae and juvenile forage fish. Numerous species of groundfish and rockfish are state priority species and may be present in Grays Harbor. Marine shorelines in Grays Harbor are designated EFH for English sole (Pleuronectes vetulus) and black rockfish (Sebastes melanops). Although groundfish and rockfish are more likely to use habitat in the outer harbor and offshore areas due to their habitat preferences, their presence within the shoreline jurisdiction has been identified.

Bald eagles are likely present in this reach. Common loons (Gavia inmer), a state sensitive species, are regularly observed foraging for fish in the cities' marines shorelines, including the Grays Harbor North Bank Reach. Other priority marine birds such as brown pelican (Pelecanus occidentalis), listed as endangered in the state, may occasionally enter the cities' shoreline areas during migration or foraging forays, although their presence is limited and regular concentrations are not mapped by WDFW.

2.01.06 REACH 6 – GRAYS HARBOR SOUTH BANK

The Grays Harbor South Bank Reach is approximately 603 acres in area. Land cover is comprised of 50 percent open water, 20 percent emergent herbaceous wetlands, 12 percent woody wetlands, 11 percent barren lands, two percent herbaceous, two percent low intensity development, two percent developed open space, and less than one percent of shrub/scrub. Ten percent of the Grays Harbor South Bank Reach is in public ownership.

A. Shoreline Characteristics

The Grays Harbor South Bank Reach runs adjacent to the southern bank of Aberdeen's shoreline along the Chehalis River as it spills into Grays Harbor. There is less development in this reach than the North Bank, but there are still modifications and armoring present throughout the shoreline.

B. Land Use

Grays Harbor South Bank Reach contains industrial, single-family residential and commercial uses.

C. Existing Public Access

There is no existing public access to shorelines in the Grays Harbor South Bank Reach.

D. Shoreline Modifications

The south shore of Grays Harbor within the Aberdeen shoreline jurisdiction is less intensely developed as the north shore, and it requires less shoreline armoring and modification. There are levee systems (approximately 3,385 feet) in place protecting the city from riverine and marine floods. Six tide gates throughout the reach are necessary to prevent marine or river inundation of developed areas during high water events. These gates are most likely at least a partial barrier to fish, though most stormwater infrastructure does not provide access to valuable habitat.

E. Ecological Functions

The Grays Harbor South Bank Reach scored moderate on the functional assessment, due to similar impairments as the north bank. However, it is less developed and it retains important vegetative characteristics. The riparian areas in the reach are relatively well connected with other habitats such as Charley Creek, Newskah Creek, and forested upland areas outside the shoreline jurisdiction. Like the north bank, this reach is likely a key migration corridor for salmon.

1. Geologically Hazardous Areas

Nearly half of the area within the Grays Harbor South Bank Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics, and nearly half of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Forty percent of the Grays Harbor South Bank Reach is within the 100-year floodplain.

3. Wetlands

There are approximately 328 acres of identified wetlands within the Grays Harbor South Bank Reach, comprising 54 percent of the reach.

4. Streams

No river or stream features within the Grays Harbor South Bank Reach qualify as an instream habitat area. The shorelines within this reach are more closely associated with marine habitats and ecological processes; however, since the entire shoreline jurisdiction is dominated by river and stream water features, there is a close ecological association with nearby instream habitats.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Grays Harbor South Bank Reach, with their associated habitat type and length of documented presence listed on Table 2-9 below:

Table 2-9. Fish Species in the Grays Harbor South Bank Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing

The Grays Harbor South Bank Reach is designated under the ESA as critical habitat for bull trout (75 FR 63898). Coastal resident trout use habitats in nearly all of the shoreline jurisdictions, and are likely present in this reach.

Forage fish spawning areas including sand lance, smelt, and herring spawning are mapped just outside of the Grays Harbor South Bank Reach, but they may indirectly support eelgrass and coastal nearshore habitat in the shoreline jurisdiction by providing water quality and rearing habitat for larvae and juvenile forage fish.

Numerous species of groundfish and rockfish are state priority species and may be present in Grays Harbor. Marine shorelines in Grays Harbor are designated EFH for English sole (Pleuronectes vetulus) and black rockfish (Sebastes melanops). Although groundfish and rockfish are more likely to use habitat in the outer harbor and offshore areas due to their habitat preferences, their presence within the shoreline jurisdiction has been identified.

Bald eagles are likely present in this reach. Common loons (Gavia inmer), a state sensitive species, are regularly observed foraging for fish in the cities' marines shorelines, including the Grays Harbor South Bank Reach. Other priority marine birds such as brown pelican (Pelecanus occidentalis), listed as endangered in the state, may occasionally enter the cities' shoreline areas during migration or foraging forays, although their presence is limited and regular concentrations are not mapped by WDFW.

2.01.07 REACH 7 – NEWSKAH CREEK

The Newskah Creek Reach is approximately 12 acres in area. Land cover is comprised of 99 percent wetlands and less than one percent of low intensity development. Nearly 100 percent of the Newskah Creek Reach is in public ownership, with 69 percent of public land owned by the city of Aberdeen and 31 percent owned by the WDFW.

A. Shoreline Characteristics

The Newskah Creek Reach is located along the southwestern boundary of the city and flows into the Grays Harbor South Bank Reach. The reach is zoned almost entirely Industrial, but has seen very little development. The most prevalent use currently is the Bishop Athletic Complex, a large recreational area consisting of multiple soccer and ball fields.

B. Land Use

The Newskah Creek Reach is a restored estuarine riparian area. The reach includes portions of the Bishop Athletic Complex. The reach is zoned Industrial.

C. Existing Public Access

There is no existing public access to shorelines in the Newskah Creek Reach.

D. Shoreline Modifications

A limited amount, or 610 feet, of riprap shoreline armoring is present in the Newskah Creek Reach, as observed on aerial photographs in the course of doing reach functional assessments.

E. Ecological Functions

The Newskah Creek Reach scored high on the functional assessment. The only criteria with a low rank are related to water-quality concerns including temperature and bacteria. The reach includes a restoration site in the floodplain and riparian buffer between the creek and the adjacent Bishop Athletic Complex. The floodplain side channel and LWD in the restored floodplain provide a complex habitat structure that supports a variety of species. Newskah Creek channel migration is dominated by marine flooding events that extend throughout the lower portions of the creek, including the reach in Aberdeen's shoreline jurisdiction.

1. Geologically Hazardous Areas

All of the area within the Newskah Creek Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristic. The entire reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Nearly 75 percent of the Newskah River Reach is within the 100-year floodplain.

3. Wetlands

Approximately seven acres of identified wetlands are found in the Newskah Creek Reach, comprising 60 percent of the total reach area.

4. Streams

Instream priority habitats exist within the Newskah Creek Reach, serving as areas where a combination of physical, biological, and chemical processes and conditions interact to provide functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

No fish or wildlife species have been directly identified within the Newskah Creek Reach, but ecological functions present throughout the reach certainly maintain natural processes supporting fish and other wildlife.

2.01.08 REACH 8 – WEDEKIND CONFLUENCE

The Wedekind Confluence Reach is approximately 45 acres in area. Land cover is comprised of 29 percent developed open space, 28 percent emergent herbaceous wetlands, 21 percent woody wetlands, seven percent hay/pasture, six percent evergreen forest, four percent low intensity development, two percent deciduous forest, and two percent shrub/scrub. Nearly 90 percent of the Wedekind Confluence Reach is in public ownership, owned by the city of Aberdeen.

A. Shoreline Characteristics

The Wedekind Confluence Reach is located at the convergence of Wedekind Creek and Wynoochee River. The majority of the reach is undeveloped and covered by forest and wetlands. The city has a water diversion facility located in this reach, which affects the ecological functions of the shoreline.

B. Land Use

Wedekind Confluence Reach is primarily forested and undisturbed riparian areas. The zoning designation from AMC Title 17 – Zoning for the Wedekind Confluence Reach is Industrial.

C. Existing Public Access

There is no existing public access to shorelines in the Wedekind Confluence Reach.

D. Shoreline Modifications

Although not present within the reach itself, a water supply diversion dam on the Wynoochee River has caused upstream deposition, which has initiated significant river migration upstream from the dam. There are no other shoreline modifications in the reach.

E. Ecological Functions

The Wedekind Confluence Reach exhibits stream-related hydrologic functions including flood protection and support of base flows. The reach scored moderate or high in most categories, with a relatively high rank overall on the functional assessment. Functions may

be limited due to vegetation conditions and altered shoreline, primarily associated with the city's water diversion facility.

1. **Geologically Hazardous Areas**

   Sixty-nine percent of the area within the Wedekind Confluence Reach is subject to moderate-to-high risk of liquefaction hazards, based on the soil characteristics.

2. **Flood Hazard Areas**

   Ninety-three percent of the Wedekind Confluence Reach is within the 100-year floodplain.

3. **Wetlands**

   Approximately 12 acres of identified wetlands are within the Wedekind Confluence Reach, comprising 26 percent of the reach's total area.

4. **Streams**

   Instream priority habitats exist within the Wedekind Confluence Reach, serving as areas where a combination of physical, biological, and chemical processes and conditions interact, providing functional life history requirements for instream fish and wildlife resources.

5. **Other Fish and Wildlife Habitat Conservation Areas**

   The following fish have been identified within the Wedekind Confluence Reach, with their associated habitat type and length of documented presence listed in Table 2-10 below:

Table 2-10. Fish Species in the Wedekind Confluence Reach.

Fish Species	Habitat Type
Bull Trout	Presence/Migration
Chinook Salmon	Spawning
Chum Salmon	Spawning
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Spawning
Steelhead Trout	Spawning
Steelhead Trout	Presence/Migration

Harlequin duck priority habitat areas are mapped in within the Wedekind Confluence Reach. There are approximately 45 acres of harlequin duck habitat located in this reach.

2.01.09 REACH 9 – WISHKAH RIVER

The Wishkah River Reach is approximately 211 acres in area. Land cover is comprised of 24 percent low intensity development, 17 percent woody wetlands, 13 percent developed open space, 13 percent barren land, ten percent medium intensity development, seven percent emergent herbaceous wetlands, five percent evergreen forest, five percent high intensity development, four percent open water, and less than one percent deciduous forest and mixed forest. Six percent of the Wishkah River Reach is in public ownership.

A. Shoreline Characteristics

The Wishkah River Reach extends north through Aberdeen from the Chehalis River – Aberdeen Reach. Multiple modifications present throughout the shoreline are related to the development intensity occurring adjacent to the reach. Much of the land in the reach contains wetlands, which accounts for the majority of the vacant and undeveloped land.

B. Land Use

Wishkah River Reach is mostly undeveloped land, platted land, and single-family households. The east shore of the Wishkah River contains a significant segment of undeveloped, forested shorelands.

The zoning designations from AMC Title 17 – Zoning found in the Wishkah River Reach are provided in Table 2-11 below.

Table 2-11. Current Zoning Designations for the Wishkah River Reach.

Description	Symbol	Percentage of Reach
Multiple Family Residential	RM	54%
Single Family Residential	RS	29%
Waterfront Development	WD	14%
Light Industrial	LI	2%
General Commercial	CG	1%

C. Existing Public Access

There is no existing public access to shorelines in the Wishkah River Reach.

D. Shoreline Modifications

The Wishkah River Reach has limited bulkhead armoring and multiple tide gates present throughout the shoreline. Table 2-12 lists shoreline modifications observed on aerial photographs in the course of doing reach functional assessments.

Table 2-12. Wishkah River Reach Shoreline Modifications.

Shoreline Modifications
368 feet of wooden bulkhead
17 tide gates
1 partial road crossing blockage

E. Ecological Functions

Functions in The Wishkah River Reach are moderate based on the functional assessment, partly due to numerous docks, pilings, bridge structures, bulkheads, tide gates, altered vegetation, and development throughout the reach. Channel and flow configuration is simple, and lacks LWD, limiting some of the hydrologic and habitat functions of the reach.

1. Geologically Hazardous Areas

Sixty-six percent of the area within the Wishkah River Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics. Nearly 90 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Wishkah River Reach has 80 percent of its total area within the 100-year floodplain. The CMZ of the Wishkah River reach has not been formally mapped, but it likely extends beyond the channel in the upstream portions of the reach where the floodplain wetlands are located. However, the historical CMZ does not extend into presently developed areas.

3. Wetlands

Approximately 84 acres of identified wetlands exist within the Wishkah River Reach, comprising 40 percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Wishkah River Reach, and serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Wishkah River Reach, with their associated habitat type and length of documented presence listed in Table 2-13 below:

Table 2-13. Fish Species in the Wishkah River Reach.

Fish Species	Habitat Type
Bull Trout	Presence/Migration
Chinook Salmon	Juvenile Rearing
Chum Salmon	Spawning
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing
Coho Salmon	Spawning
Largemouth Bass	Presence/Migration
Steelhead Trout	Presence/Migration

2.02 CITY OF COSMOPOLIS

2.02.01 REACH 10 – CHEHALIS RIVER – COSMOPOLIS

The Chehalis River – Cosmopolis Reach is approximately 255 acres in area. Land cover is comprised of 41 percent open water, 35 percent woody wetlands, 12 percent emergent herbaceous wetlands, seven percent low intensity development, two percent barren land, two percent developed open space, one percent high intensity development, and one percent medium intensity development. Over half, or 63 percent, of the Chehalis River – Cosmopolis Reach is in public ownership. The majority of public land is owned by the Port of Grays Harbor.

A. Shoreline Characteristics

The Chehalis River – Cosmopolis Reach cuts through the northeastern portion of the city and creates the northern and southern banks of the city. The southern bank has a higher development intensity related to the location of the majority of the city, while the northern bank is largely undeveloped.

B. Land Use

The Chehalis River – Cosmopolis Reach contains primarily manufacturing uses with a smaller area set aside for public use. Cosmo Specialty Fibers is a large mill within the reach. The remainder of the reach is mostly open water and wetlands. The Weyerhaeuser Boat Ramp is located in the reach, providing public access to the shoreline.

The zoning designations from Cosmopolis Municipal Code (CMC) Title 18 – Zoning found in the Chehalis River – Cosmopolis Reach are provided in Table 2-14 below.

Table 2-14. Current Zoning Designations for the Chehalis River – Cosmopolis Reach.

Description	Symbol	Percentage of Reach
Manufacturing	M	74%
Public Reserve	PR	18%
Waterfront Use	WUD	8%

C. Existing Public Access

Public access in the Chehalis River – Cosmopolis Reach include the Weyerhaeuser Boat Ramp along the south bank of the river, which includes one asphalt ramp, one gravel ramp, and 50 gravel parking spaces. Fluctuations in the river and tidal changes influence the boat ramp. On the riverfront, a small park commemorates the Cosmopolis Treaty Grounds and includes a mural and small recreational structure. A bike and pedestrian trail also runs along the river.

D. Shoreline Modifications

On the south bank, a levee approximately 2,900 feet in length exists between the city and the Chehalis River approximately along the former Northern Pacific Railway alignment, between the Weyerhaeuser property and the city limits. A portion of the levee near the center of the city appears to be armored with rock due to the proximity of the levee with the active channel. Within the Weyerhaeuser property, there also appears to be shoreline hardening to protect fill, and possibly fill placed to prevent inundation from the Chehalis River.

Table 2-15 lists shoreline modifications observed on aerial photographs in the course of doing reach functional assessments.

Table 2-15. Chehalis River – Cosmopolis Reach Shoreline Modifications.

Shoreline Modifications
357 feet of landfill
3 tide gates
1 partial road crossing blockage

E. Ecological Functions

The Chehalis River – Cosmopolis Reach was evaluated in two subreaches in the functional assessment because of the unequal development intensity present along the north and south banks. The north bank scored high on the functional assessment, primarily because it is currently undeveloped and retains good vegetation structure and hydrologic functions. The south bank is comparatively more developed than the north bank and ranks moderate

on the functional assessment. It is characterized partly by a levee and reduced and altered vegetation.

Estuarine wetlands along the north bank and forested wetlands in the surge plain along an unnamed slough provide key habitat and water-quality functions that are relatively unimpaired by development compared to other portions of the reach. Due to levee construction and fill, the entire south bank is disconnected permanently from the remainder of its historical CMZ, with the exception of 1,000 feet upstream of the unnamed slough. In the north bank of the slough, all area within the city limits is within the historical CMZ.

1. **Geologically Hazardous Areas**

   Sixty-three percent of the area within the Chehalis River – Cosmopolis Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics, and 56 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. **Flood Hazard Areas**

   Ninety-six percent of the Chehalis River – Cosmopolis Reach is within the 100-year floodplain.

3. **Wetlands**

   Approximately 108 acres of identified wetlands exist within the Chehalis River – Cosmopolis Reach, comprising 42 percent of the reach's total area.

4. **Streams**

   Instream priority habitats exist within the Chehalis River – Cosmopolis Reach, serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. **Other Fish and Wildlife Habitat Conservation Areas**

   The following fish have been identified within the Chehalis River – Cosmopolis Reach, with their associated habitat type and length of documented presence listed in Table 2-16 below:

Table 2-16. Fish Species in the Chehalis River – Cosmopolis Reach.

Fish Species	Habitat Type
Bull Trout	Presence/Migration

Fish Species	Habitat Type
Chinook Salmon	Presence/Migration
Chum Salmon	Presence/Migration
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Presence/Migration
Steelhead Trout	Presence/Migration

The lower estuarine waters of the Chehalis River are a common foraging area for harbor seals. Bald eagles are likely present in this reach. There are approximately 52 acres of wood duck habitat in this reach.

2.02.02 REACH 11 – MILL CREEK

The Mill Creek Reach is approximately 49 acres in area. Land cover is comprised of 76 percent woody wetlands, 10 percent developed open space, six percent low intensity development, six percent emergent herbaceous wetlands, two percent high intensity development, and less than one percent medium intensity development. Over 20 percent, or nine acres, of the Mill Creek Reach is owned by the city of Cosmopolis.

A. Shoreline Characteristics

The Mill Creek Reach is located along the northwestern corner of Cosmopolis' city boundary and is comprised primarily of wetlands. The reach has been extensively filled and modified to create a constructed channel and floodplain.

B. Land Use

The reach is mostly open water and wetlands. The zoning designations from CMC Title 18 – Zoning found in the Mill Creek Reach are provided in Table 2-17 below.

Table 2-17. Current Zoning Designations for the Mill Creek Reach.

Description	Symbol	Percentage of Reach
Multiple Use	MU	81%
Medium Density Residential	R57	18%
Public Reserve	PR	2%

C. Existing Public Access

A rail trail, the Basich Trailway, connects the city of Cosmopolis to Aberdeen through the Mill Creek Reach wetlands.

D. Shoreline Modifications

Mill Creek has been regulated by a USACE structure at its confluence with the Chehalis River. The tide gate at the Mill Creek confluence with the Chehalis River modifies natural geomorphic processes at this ecological hot spot. The tide gate is contained within the levee, positioned parallel to the Chehalis River shoreline. Additionally, one partial road-crossing blockage was observed on aerial photographs in the course of doing reach functional assessments.

E. Ecological Functions

The Mill Creek Reach ranks moderately on the functional assessment, primarily due to the presence of wetlands and quality vegetation cover in the northern portion of the reach. Fill and shoreline modifications such as culvert crossings and tide gates may impair hydrologic and habitat functions, particularly in the heavily developed southern portion of the reach. Mill Creek likely once meandered throughout the city, prior to substantial fill, development, and channelization. Therefore, a CMZ is no longer present in the constructed channel and floodplain.

1. Geologically Hazardous Areas

All of the area within the Mill Creek Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics, and the entire reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Mill Creek Reach has 42 percent of its total area within the 100-year floodplain.

3. Wetlands

Approximately 43 acres of identified wetlands exist within the Mill Creek Reach, comprising 100 percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Mill Creek Reach, and serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

Coho salmon have been identified within the Mill Creek Reach.

2.03 CITY OF HOQUIAM

2.03.01 REACH 12 – EAST HOQUIAM RIVER

The East Hoquiam River Reach is approximately 53 acres in area. Land cover is comprised of 43 percent woody wetlands, 15 percent low intensity development, 12 percent barren land, 11 percent open water, seven percent emergent herbaceous wetlands, six percent medium intensity development, four percent developed open space, two percent high intensity development, and less than one percent of shrub/scrub and mixed forest.

A. Shoreline Characteristics

The East Hoquiam River Reach is located to the north of the city and to the northeast of the East Fork Hoquiam River and Hoquiam River confluence. There is residential and industrial development along the east bank in the reach, although the majority of the reach is identified as wetlands. There are small streams snaking through the reach and connecting to the Hoquiam River Reach, which provide limited ecological functions.

B. Land Use

The East Hoquiam River Reach is primarily undeveloped. Nearly one-quarter of land cover is industrial uses. The zoning designations from Hoquiam Municipal Code (HMC) Chapter 10.03 found in the East Hoquiam River Reach are provided in Table 2-18 below.

Table 2-18. Current Zoning Designations for the East Hoquiam River Reach.

Description	Symbol	Percentage of Reach
High Density Residential	R2	68%
Industrial	I	32%

C. Existing Public Access

There is no existing public access to shorelines in the East Hoquiam Reach.

D. Shoreline Modifications

Small rock revetments and "sugar dikes," small berms or levees comprised of pushed-up native soil, are common along the rivers throughout Hoquiam. Abandoned piles, some of which may be creosote treated, are also common in the rivers. The information on the rivers throughout the city is limited and generally of poor quality. Shoreline modifications observed on aerial photographs in the course of doing reach functional assessments include 410 feet of wooden bulkhead and two tide gates.

E. Ecological Functions

The East Hoquiam River Reach is ranked moderate on the functional assessment. A significant wetland area east of Broadway Avenue contains most of the wetlands in the reach.[1] Hydrologic and habitat functions in the reach may be reduced by shoreline modifications including hard armoring along the east bank and piling along the channel.

1. Geologically Hazardous Areas

Nearly all, or 93 percent, of the area within the East Hoquiam River Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics. Fifteen percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

Sixty-one percent of the East Hoquiam River Reach is within the 100-year floodplain. Although a CMZ was not formally mapped, it is likely that the East Hoquiam River historical CMZ extends from valley wall to valley wall, encompassing much of the Woodlawn neighborhood.

3. Wetlands

Approximately 33 acres of identified wetlands exist within the East Hoquiam River Reach, comprising 62 percent of the reach's total area.

4. Streams

Instream priority habitats exist within the East Hoquiam River Reach, and serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the East Hoquiam River Reach, with their associated habitat type and length of documented presence listed in Table 2-19 below:

Table 2-19. Fish Species in the East Hoquiam River Reach.

Fish Species	Habitat Type
Chinook Salmon	Spawning

[1] 62 percent of the reach is mapped as wetland in the NWI

Fish Species	Habitat Type
Chum Salmon	Spawning
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing
Coho Salmon	Presence/Migration
Steelhead Trout	Presence/Migration

2.03.02 REACH 13 – FRY CREEK – HOQUIAM

The Fry Creek – Hoquiam Reach is approximately 27 acres in area. Land cover is comprised of 53 percent low intensity development, 23 percent high intensity development, 23 percent medium intensity development, and less than one percent of developed open space, open water, and emergent herbaceous wetland. Nearly 84 percent, or 23 acres of the Fry Creek – Hoquiam Reach is in public ownership and the Port of Grays Harbor owns 21 of these acres.

A. Shoreline Characteristics

The Fry Creek – Hoquiam Reach extends north on two divergent paths from the Grays Harbor Reach in the southeast portion of the city. The shoreline has been heavily modified in the past to accommodate the medium and high intensity development located within the reach.

B. Land Use

The Fry Creek Reach is almost entirely covered by industrial uses. The zoning designation from HMC Chapter 10.03 found in the Fry Creek – Hoquiam Reach is Industrial.

C. Existing Public Access

There is no existing public access to shorelines in the Fry Creek – Hoquiam Reach.

D. Shoreline Modifications

Table 2-20 lists the total length of dikes and levees for reaches where they are found in the available data, along with other shoreline modifications observed on aerial photographs in the course of doing reach functional assessments.

Table 2-20. Fry Creek – Hoquiam Reach Shoreline Modifications.

Shoreline Modifications
2,300 feet of dikes and levees
257 feet of rip rap
2 tide gates

E. Ecological Functions

The Fry Creek – Hoquiam Reach ranks low on the functional assessment. The reach is highly modified from historical conditions by fill and channelization.

1. Geologically Hazardous Areas

Nearly three-quarters of the area within the Fry Creek – Hoquiam Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics. The entire reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Fry Creek – Hoquiam Reach has 12 percent of its total area within the 100-year floodplain. Fry Creek likely once meandered throughout the city, prior to substantial fill, development, and channelization. Therefore, a CMZ is no longer present in this constructed channel and floodplain.

3. Wetlands

Slightly over one acre of identified wetlands exists within the Fry Creek – Hoquiam Reach, comprising five percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Fry Creek – Hoquiam Reach, and serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Fry Creek – Hoquiam Reach, with their associated habitat type and length of documented presence listed in Table 2-21 below:

Table 2-21. Fish Species in the Fry Creek – Hoquiam Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Presence/Migration

Coastal resident trout use habitats in nearly all of the shoreline jurisdictions, and cutthroat trout are WDFW designated priority species due to their recreational value.

The presence of Olympic mudminnow (Novumbra hubbsi) is not well documented throughout the cities' shoreline jurisdictions, however their range includes all the cities' freshwater shorelines. Their typical environment includes slow-moving streams, wetlands, ponds, ditches, or sloughs with muddy substrate, still or slow moving water, and areas with abundant aquatic vegetation. Wetland protection is considered essential for the conservation of the species (WDFW 2013b).

Bald eagles are present throughout the cities' shorelines and have been observed perching on natural and human-made structures throughout the shoreline jurisdiction. There are approximately 20 acres of peregrine falcon habitat in this reach.

2.03.03 REACH 14 – GRAYS HARBOR

The Grays Harbor Reach is approximately 4,778 acres in area. Land cover is comprised of 36 percent open water, 26 percent emergent herbaceous wetlands, 19 percent barren land, six percent woody wetlands, four percent herbaceous, three percent developed open space, two percent low intensity development, one percent medium intensity development, and less than one percent high intensity development, deciduous forest, and shrub/scrub. Fifteen percent (731 acres) of the Grays Harbor Reach is in public ownership, with 569 acres of public land owned by the Port of Grays Harbor.

A. Shoreline Characteristics

The Grays Harbor Reach extends to the Hoquiam boundaries, but the harbor is connected to the Pacific Ocean outside of the city limits, creating an ecologically diverse reach. The shoreline has experienced extensive fill and creation of a peninsula that is used as the Bowerman Airport. Adjacent to the north of the airport is the Bowerman Basin, which accounts for a large portion of the Grays Harbor National Wildlife Refuge. The Grays Harbor Reach also encompasses the Rennie Island shoreline.

B. Land Use

The predominant land uses in the Grays Harbor reach are industrial and transportation, natural resources, communication, and utilities. The zoning designations from HMC Chapter 10.03 found in the Grays Harbor Reach are provided in Table 2-22 below.

Table 2-22. Current Zoning Designations for the Grays Harbor Reach.

Description	Symbol	Percentage of Reach
Industrial	I	46%
Natural Resources	NR	42%

Description	Symbol	Percentage of Reach
Low Density Residential	R1	6%
Waterfront Overlay District	WF-1	6%

C. Existing Public Access

The Port of Grays Harbor Viewing Tower provides scenic views of the harbor and Rennie Island. A public boat launch is located adjacent to tower. Bowerman Basin, located just north of Bowerman Airport, provides excellent bird watching opportunities.

D. Shoreline Modifications

There has been extensive fill along the entire length of the Grays Harbor shoreline. This includes the formation of a new peninsula that now contains the Bowerman Airport. Formerly Moon Island, at the west end of the airport, was an island separated from the mainland by a shallow tidal channel (US Coast and Geodetic Survey, 1911). In addition to the fill, most of the shoreline along Grays Harbor that was modified has required some sort of protection. This includes, but is not limited to, the construction of levees, timber revetments, and placement of rock and other structural protection.

Table 2-23 lists the total length of dikes and levees along with other shoreline modifications observed on aerial photographs in the course of doing reach functional assessments.

Table 2-23. Grays Harbor Reach Shoreline Modifications.

Shoreline Modifications
18,494 feet of dikes and/or levees
32,044 feet of landfill
14,196 feet of rip rap
5 tide gates

E. Ecological Functions

The Grays Harbor Reach ranked moderate on the functional assessment, primarily due to habitat features that support numerous priority species, despite a wide range of shoreline modifications that reduce other functions of the shoreline in many respects. A significant portion of the Grays Harbor National Wildlife Refuge occurs in this reach in the Bowerman Basin between Moon Island (Bowerman Airport) and the north shore along SR-109.

1. Geologically Hazardous Areas

Ten percent of the area within the Grays Harbor Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics, and 11 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Grays Harbor Reach has 46 percent of its total area within the 100-year floodplain.

3. Wetlands

Approximately 614 acres of identified wetlands exist within the Grays Harbor Reach, comprising 13 percent of the reach's total area. A forested wetland west of South Adam Street likely provides water-quality functions and additional habitat functions. Wetlands are less common in the more developed areas, much of which are built on historical fill and not supporting shoreline functions to the same degree as less developed areas in the reach.

4. Streams

No river or stream features within the Grays Harbor Reach qualify as instream habitat area. The shorelines within this reach are more closely associated with marine habitats and ecological processes, however, since the entire shoreline jurisdiction is dominated by river and stream water features, there is a close ecological association with nearby instream habitats.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Grays Harbor Reach, with their associated habitat type and length of documented presence listed in Table 2-24 below:

Table 2-24. Fish Species in the Grays Harbor Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Spawning

In the Bowerman Basin, the wildlife refuge and the Port of Grays Harbor contain important habitat that also supports priority nearshore vegetation and dunegrass communities. Rennie Island and the north shore of Grays Harbor in the eastern portion of the reach also contain important nearshore and riparian vegetation communities. Estuarine wetlands, saltmarsh, and freshwater emergent wetlands are prevalent in Bowerman Bay and around Rennie Island, and provide functions related to sediment stabilization, bank protection, and habitat diversity for shoreline-dependent species.

Numerous species of groundfish and rockfish are state priority species and may be present in Grays Harbor. Marine shorelines in Grays Harbor are designated EFH for English sole (Pleuronectes vetulus) and black rockfish (Sebastes melanops). Although

groundfish and rockfish are more likely to use habitat in the outer harbor and offshore areas due to their habitat preferences, their presence within the shoreline jurisdiction has been identified.

The Grays Harbor estuary is used by green sturgeon (Acipenser medirostis) and white sturgeon (Acipenser trensmontanus) as migratory congregation area during the summer and fall. Green sturgeon is listed as threatened under the ESA, and it utilizes the reach for rearing, feeding, and holding. No sturgeon spawning is thought to occur in Grays Harbor.

Grays Harbor Estuary is a common foraging area for harbor seals. The reach also supports a variety of other marine mammals, although they are usually observed in the outer harbor outside of the shoreline jurisdiction rather than within it. Stellar sea lions (Eumetopias jubatus), southern resident killer whales (Orcinus orca), humpback whales (Megaptera novaeangliae), which are federally listed species, and gray whales (Eschrichtius robustus), which are designated sensitive in Washington state, have been observed offshore and in the outer harbor. Occurrences of these species would be rare in the inner harbor and cities' shorelines.

Bald eagles are present throughout the cities' shorelines and have been observed perching on natural and human-made structures throughout the shoreline jurisdiction. They have also been observed near nesting sites throughout Grays Harbor, including on Rennie Island. Priority areas for peregrine falcons are designated along much of the Grays Harbor marine shoreline in Hoquiam. Common loons (Gavia inmer), a state sensitive species, are regularly observed foraging for fish in the cities' marines shorelines, including the Grays Harbor Reach. Other priority marine birds such as brown pelican (Pelecanus occidentalis), listed as endangered in the state, may occasionally enter the cities' shoreline areas during migration or foraging forays, although their presence is limited and regular concentrations are not mapped by WDFW.

The estuary area between SR-109 and Bowerman Airport in Hoquiam is designated as priority area for waterfowl concentrations.

Although the species is not listed as sensitive, threatened, or endangered, great blue herons are a species strongly associated with shorelines, and breeding areas are designated priority areas in the state. An active heron rookery is located on Rennie Island.

There are approximately 2,386 acres of peregrine falcon habitat, 61 acres of purple martin habitat, 717 acres of Shorebird Concentration habitat, and 679 acres of Waterfowl Concentration habitat located within this reach.

2.03.04 REACH 15 – HOQUIAM RIVER

The Hoquiam River Reach is approximately 273 acres in area. Land cover is comprised of 37 percent open water, 21 percent low intensity development, 11 percent medium intensity development, ten percent developed open space, five percent barren land, five percent high intensity development, five percent woody wetlands, three percent emergent herbaceous wetlands, two percent evergreen forest, and one percent herbaceous. A small amount (seven percent / 18 acres) of the Hoquiam River Reach is in public ownership.

A. Shoreline Characteristics

The Hoquiam River Reach extends to the north in the eastern portion of Hoquiam. The development intensity along the reach varies by shoreline, with the eastern bank featuring less development than the western bank. There are more modifications present along the western bank, which coincides with the industrial uses and development intensity.

B. Land Use

The primary upland land use in the Hoquiam River reach is industrial followed by residential, undeveloped, and commercial.

C. Existing Public Access

The Eighth Street Landing provides 120 feet of public access to the Hoquiam River, and includes picnic tables, a shelter, and a boat dock for fishing and river access. Riverside Dike Park serves as an access point for hiking trails along the river.

D. Shoreline Modifications

Table 2-25 lists the total length of dikes and levees for reaches where they are found in the available data, along with other shoreline modifications observed on aerial photographs in the course of doing reach functional assessments. Comprehensive information on shoreline modifications other than dikes and levees is not available for this reach.

Table 2-25. Hoquiam River Reach Shoreline Modifications.

Other Shoreline Modifications
13,478 feet of dikes and/or levees
1,449 feet of landfill

Other Shoreline Modifications
1,269 feet of rip rap
13 tide gates
4 partial road crossing blockages

E. Ecological Functions

The Hoquiam River Reach is evaluated in two subreaches in the functional assessment because of the unequal development intensity present along the west and east banks. The west subreach of the Hoquiam River is ranked low on the functional assessment, primarily due to extensive levees in the lower portion (most of which are armored and hard shorelines), as well as impervious surface and poor vegetative conditions. Due to levee construction and fill, the entire subreach is disconnected permanently from nearly all of the remainder of its historical CMZ.

The east subreach of the Hoquiam River is comparatively less developed than the west subreach and therefore it likely provides a higher level of function. The levee is limited to the southern portion of the reach, while the northern portion has few shoreline modifications. However, due to levee construction and fill, the entire subreach is disconnected permanently from nearly all of the remainder of its historical CMZ. The reach has few wetlands present, which reduces the ecological functions provided by wetlands.

1. Geologically Hazardous Areas

Approximately 60 percent of the area within the Hoquiam River Reach is subject to moderate-to-high risk of liquefaction hazards based on the soil characteristics, and 54 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Hoquiam River Reach has 84 percent of its total area within the 100-year floodplain.

3. Wetlands

Approximately 16 acres of identified wetlands exist within the Hoquiam River Reach, comprising six percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Hoquiam River Reach, and serving as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Hoquiam River Reach, with their associated habitat type and length of documented presence listed on Table 2-26 below:

Table 2-26. Fish Species in the Grays Harbor Reach.

Fish Species	Habitat Type
Chinook Salmon	Presence/Migration
Chum Salmon	Spawning
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Juvenile Rearing
Coho Salmon	Presence/Migration
Steelhead Trout	Spawning
Steelhead Trout	Presence/Migration

The lower estuarine waters of the Hoquiam River are a common foraging area for harbor seals. Bald eagles are likely present in this reach. There are approximately two acres of peregrine falcon habitat and eight acres of purple martin habitat located in the reach.

2.03.05 REACH 16 – LITTLE HOQUIAM RIVER

The Little Hoquiam River Reach is approximately 165 acres in area. Land cover is comprised of 46 percent woody wetlands, 33 percent evergreen forest, six percent low intensity development, five percent developed open space, four percent deciduous forest, four percent emergent herbaceous wetlands, one percent medium intensity development, and less than one percent of shrub/scrub and open water. Approximately 32 percent, or 53 acres, of the Little Hoquiam River Reach is in public ownership.

A. Shoreline Characteristics

The Little Hoquiam River Reach is located directly to the north of the city, and flows into the Hoquiam River. Although the majority of the reach is zoned for residential uses, it remains largely undeveloped. Few shoreline modifications that affect ecological functions are present in this reach.

B. Land Use

The predominant land uses in the Little Hoquiam River Reach are parks, open space, and undeveloped land. The zoning designations found in the Little Hoquiam River Reach are

Low Density Residential (81 percent), Natural Resources (17 percent) and less than one percent of High Density Residential, Waterfront Overlay District, and Industrial.

C. Existing Public Access

The Little Hoquiam Boat Launch provides public access to the Little Hoquiam River, and includes a paved launch lane and 10 parking spaces. The boat launch covers 120 feet of shoreline frontage.

D. Shoreline Modifications

There are over 1,300 feet of levee and four tide gates in the Little Hoquiam River Reach.

E. Ecological Functions

The Little Hoquiam River scored the highest on the functional assessment among reaches in Hoquiam. Most of the reach is in the floodplain, well vegetated, and undeveloped, providing good habitat conditions for a variety of species.

1. Geologically Hazardous Areas

Approximately 61 percent of the area within the Little Hoquiam River Reach is subject to moderate-to-high risk of liquefaction hazard, and 54 percent of the reach is within the mapped Cascadia Scenario 1A seismic hazard area.

2. Flood Hazard Areas

The Little Hoquiam River Reach has 81 percent of its total area within the 100-year floodplain. The historical CMZ for the Little Hoquiam River extends from valley wall to valley wall, which for the lower portion of the reach is approximately between SR-109 and Endresen Road. The upper portion is wider, likely encompassing the mapped floodplain.

3. Wetlands

Approximately 38 acres of identified wetlands exist within the Little Hoquiam River Reach, comprising 23 percent of the reach's total area.

4. Streams

Instream priority habitats exist within the Little Hoquiam River Reach, and serve as areas where a combination of physical, biological, and chemical processes and conditions interact providing functional life history requirements for instream fish and wildlife resources.

5. Other Fish and Wildlife Habitat Conservation Areas

The following fish have been identified within the Little Hoquiam River Reach, with their associated habitat type and length of documented presence listed in Tale 2-27 below:

Table 2-27. Fish Species in the Little Hoquiam River Reach.

Fish Species	Habitat Type
Coast Resident Cutthroat	Presence/Migration
Coho Salmon	Presence/Migration
Steelhead Trout	Spawning

Olympic mudminnow (Novumbra hubbsi) presence is not well documented throughout the cities' shoreline jurisdictions, however their range includes all the cities' freshwater shorelines. Additionally, bald eagles are likely present in this reach.

3 REASONABLY FORESEEABLE DEVELOPMENT

According to the SMP Guidelines, the CIA should evaluate the reasonably foreseeable future development and use of the shoreline that is likely to occur based upon the proposed shoreline environment designations within the planning period. The planning period for the SMP is 20 years.

3.01 CITIES OF ABERDEEN, COSMOPOLIS, AND HOQUIAM SHORELINE MASTER PROGRAM

This section provides a brief overview of the entire SMP and how the SMP generally addresses the protection of ecological functions and processes from cumulative impacts. This chapter is intended to put the SMP regulations in context with the other regulations that apply to the shoreline jurisdiction.

The SMP Guidelines include the following recommendations to help achieve no net loss of ecological functions:

- Restrict uses that are not water-dependent or preferred shoreline uses.
- Require that all future shoreline development, including water-dependent and preferred uses, be carried out in a manner that limits further degradation of the shoreline environment.
- Establish appropriate shoreline environment designations. The environment designations must reflect the findings of the SIC. A shoreline landscape that is relatively unaltered should be designated Urban Conservancy and protected from any use that would degrade the natural character of the shoreline.
- Require buffers and setbacks. Vegetated buffers and building setbacks from those buffers reduce the impacts of development in the shoreline environment.
- In all cases, require mitigation sequencing. The SMP must include regulations that require developers to follow mitigation sequencing: avoid impacts, minimize impacts, rectify impacts, reduce impacts over time, compensate for impacts, monitor impacts, and take corrective measures.

- Establish strong policies and regulations. Policies and regulations will define what type of development can occur in each shoreline environment designation, determine the level of review required through the type of shoreline permit, and set up mitigation measures and restoration requirements.

Measures described in Sections 3.01.01 and 3.01.05 below will implement the above recommendations, helping the cities achieve no net loss of shoreline ecological functions.

3.01.01 ENVIRONMENT DESIGNATIONS

The first level of protection provided by the SMP is the recognition of four different shoreline environment designation types in the cities: Aquatic, High Intensity, Shoreline Residential, and Urban Conservancy. These environment designations were assigned based primarily on existing and proposed land uses, which implicitly encompasses differing levels of ecological functions and different probabilities and potentials for improvements of ecological functions, as well as the location of critical areas and their buffers. The designated area for each shoreline environment designation is outlined below.

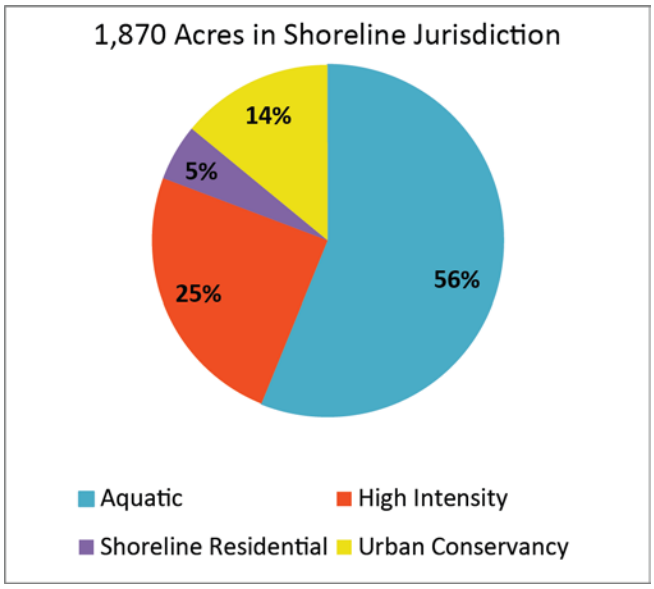

Figure 3-1. Shoreline Environment Designation Distribution - Aberdeen

New environment designations were developed based on a review of existing development patterns, biological and physical characteristics of the shoreline, and goals and aspirations of the communities as expressed through the city's Comprehensive Plan, and associated plans and regulations, and the SMP Guidelines (WAC 173-26-211). The four environment designations include either the upland property landward of the Ordinary High Water Mark (OHWM) or water areas lying waterward of the OHWM. The percentage of the shoreline jurisdictions each of the four shoreline environment designations in each city is displayed in Figures 3-1 through 3-3.

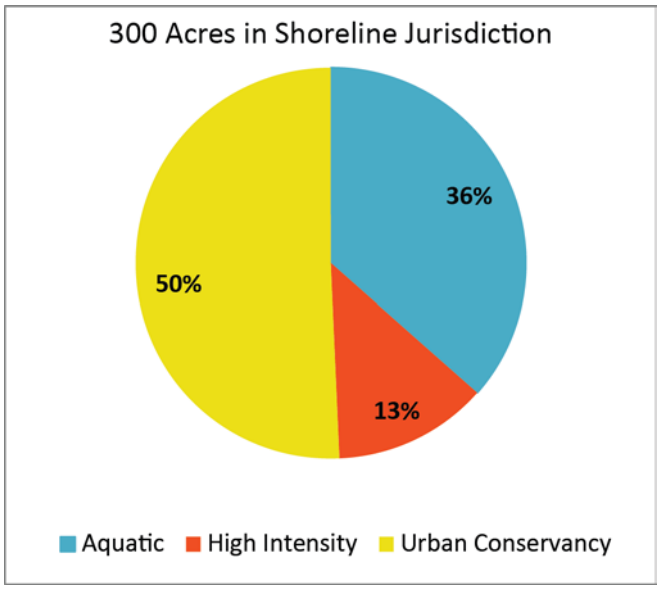

Figure 3-2. Shoreline Environment Designation Distribution - Cosmopolis

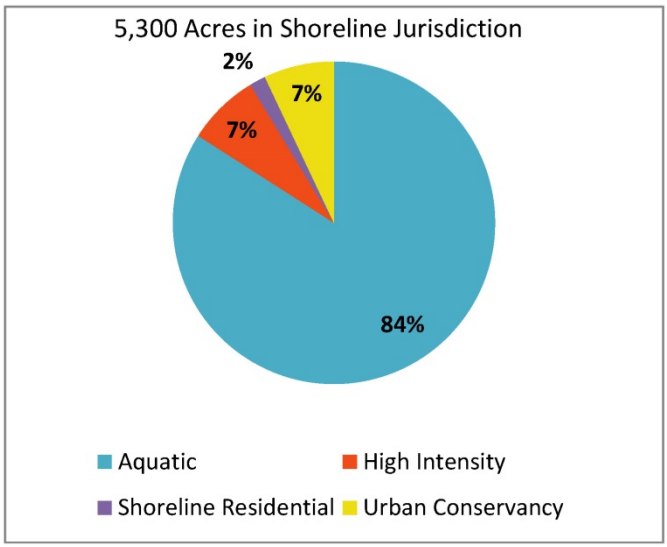

Figure 3-3. Shoreline Environment Designation Distribution - Hoquiam

A. Aquatic

The Aquatic shoreline environment designation consists of all lands waterward of the OHWM. The Aquatic shoreline environment designation is assigned to protect, restore, and manage the unique characteristics and resources of the areas waterward of the OHWM. All

lands waterward of the OHWM in the cities is in the Aquatic shoreline environment designation.

B. High Intensity

The High Intensity shoreline environment designation consists of shoreline areas that currently support high intensity uses related to commerce or are suitable for high intensity water-oriented commercial and transportation uses. The purpose of the High Intensity shoreline environment designation is to provide for high intensity water-oriented commercial and transportation uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded.

The High Intensity shoreline environment designation is assigned to the entirety of Reach 4: Fry Creek – Aberdeen, Reach 5: Grays Harbor North Bank, and Fry Creek – Hoquiam. It is also assigned to portions of Reach 2: Charley Creek, Reach 3: Chehalis River – Aberdeen, Reach 6: Grays Harbor South Bank, Reach 9: Wishkah River, Reach 10: Chehalis River – Cosmopolis, Reach 12: East Hoquiam River, Reach 14: Grays Harbor, Reach 15: Hoquiam River, and Reach 16: Little Hoquiam River that currently support high intensity uses related to commerce, industry, public facilities, or transportation, or are suitable for high intensity water-oriented uses.

C. Shoreline Residential

The Shoreline Residential shoreline environment designation consists of shoreline areas that are predominantly single-family residential development or are planned and platted for residential development. The Shoreline Residential shoreline environment designation is designed to provide for residential uses where necessary facilities for development can be provided. An additional purpose is to provide public access and recreational uses.

The Shoreline Residential shoreline environment designation is assigned to portions of Reach 6: Grays Harbor South Bank, Reach 9: Wishkah River, Reach 11: Mill Creek, Reach 12: East Hoquiam River, Reach 15: Hoquiam River, and Reach 16: Little Hoquiam River.

D. Urban Conservancy

The Urban Conservancy shoreline environment designation consists of those shorelines and shoreland areas that most closely match the following characteristics:

1. They are suitable for water-related or water-enjoyment uses;
2. Areas containing extensive forested and recreational uses;

3. They are open space, flood plain, wetland or wetland buffer, stream buffer or other sensitive areas that should not be more intensively developed;
4. They have the potential for development that is compatible with ecological restoration;
5. Areas with existing non-water dependent shoreline development that will not be expanded;
6. They have potential for ecological restoration;
7. Areas that retain important ecological functions, even though partially developed; or
8. Newly annexed areas where there is no designation.

The purpose of the Urban Conservancy shoreline environment designation is to protect and restore ecological functions of open space and other sensitive lands where they exist in urban and developed settings, while allowing a variety of water-oriented uses and uses consistent with effective environmental management. The designation will provide for ecological protection and rehabilitation in relatively undeveloped shoreline areas anticipated for or containing existing agricultural, recreation, and open space uses and limited development suitable to lands characterized by ecological and flood hazard constraints.

The Urban Conservancy shoreline environment designation is assigned to the entirety of Reach 1: Aberdeen Lake, Reach 7: Newskah Creek, and Reach 8: Wedekind Confluence. It is also assigned to portions of Reach 2: Charley Creek, Reach 3: Chehalis River – Aberdeen, Reach 9: Wishkah River, Reach 10: Chehalis River – Cosmopolis, Reach 11: Mill Creek, Reach 14: Grays Harbor, Reach 15: Hoquiam River, and Reach 16: Little Hoquiam River.

3.01.02 GENERAL GOALS, POLICIES, AND REGULATIONS

General goals, policies, and regulations are included in SMP Chapter 4. There are numerous policies, with supporting regulations intended to protect the ecological functions of the shoreline and maintain, at a minimum, the current level of function. Sections of the proposed SMP that provide protection to ecological functions and ensure no net loss are referenced and summarized below.

- SMP Section 4.03: Environmental Impacts and Mitigation contains the mitigation sequence that applies to all development in the shoreline jurisdiction. This component of the SMP is critical to ensuring that no net loss of ecological function is achieved.

- SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation protects and restores the ecological functions and ecosystem-wide processes performed by critical areas, buffers, and vegetation in shoreline jurisdiction. Critical area protections, which are detailed in SMP Appendix 2: Critical Areas Regulations apply to the management of critical areas in shoreline jurisdiction in the city, including wetlands, critical aquifer recharge areas, frequently flooded areas, landslide hazard areas, erosion hazard areas, seismic hazard areas, and fish and wildlife habitat conservation areas. Within the SMP, buffers for rivers, lakes, and streams that are shorelines of the state are considered "shoreline buffers" while the buffers for all other critical areas regulated under SMP Appendix 2: Critical Areas Regulations are called "critical areas buffers." Regulations addressing Shoreline Buffers are found in 4.04.02(B), providing protection according to the type of Shoreline Environment designation and specific uses.

  Provisions for shoreline vegetation conservation within this section include regulations regarding natural plant clearing, vegetation restoration, and the control of invasive weeds and non-native species. These provisions apply to any activity, development, or use in shoreline jurisdiction unless otherwise stated, whether or not that activity requires a shoreline permit. Such activities include clearing, grading, grubbing, and trimming of vegetation. Provisions also apply to vegetation protection and enhancement activities, but exclude agricultural activities and activities covered under the Washington State Forest Practices Act (FPA), unless otherwise stated.

  Additionally, this section contains regulations addressing plant clearing, earth grading, vegetation restoration, and invasive species control. This section now applies to the entire shoreline jurisdiction, regardless of whether a shoreline permit is required. In all shoreline areas, land clearing, grading, filling and alteration of natural drainage features and landforms is limited to the minimum necessary for development. Within all shoreline areas, tree removal is limited to the minimum necessary to accommodate proposed buildings, structures, and uses or to mitigate a hazard to life or property.

- SMP Section 4.05: Flood Hazard Management limits development within the floodway, floodplain, and CMZ.

3.01.03 SPECIFIC SHORELINE USE PROVISIONS

The general policies and regulations in SMP Chapter 5 apply to all developments, uses, or activities in any shoreline environment designation in the shoreline jurisdiction.

- SMP Section 5.03: Allowed Shoreline Uses dictates what uses are allowed in the shoreline jurisdiction based on shoreline environment designation. Uses are prohibited that would harm ecologically sensitive areas.

- SMP Section 5.07: Boating and Water Access Facilities regulates piers, docks, and boat launches. Regulations are designed to protect aquatic resources.

- SMP Section 5.10: Industrial and Port Development regulates marine terminal and port activities. Regulations are designed to protect aquatic resources.

3.01.04 SHORELINE MODIFICATION PROVISIONS

Shoreline modifications are generally related to construction of a physical element such as a dike, breakwater, dredged basin, or fill, but they can include other actions such as clearing, grading, application of chemicals, or significant vegetation removal. Shoreline modifications usually are undertaken in support of or in preparation for a shoreline use; for example, fill (shoreline modification) required for a cargo terminal (industrial use) or dredging (shoreline modification) to allow for a marina (boating facility use). See Table 6-1, Table 6-2, and Table 6-3 of the Aberdeen, Cosmopolis, and Hoquiam SMP for allowable shoreline modification activities within each of the shoreline environment designations.

SMP Chapter 6 contains shoreline modification policies and regulations.

- SMP Section 6.01: Introduction establishes allowable shoreline modification activities within each of the shoreline environments.

- SMP Section 6.03: Clearing, Grading, and Fill limits these development activities to the minimum extent necessary and it provides specific instances when they are permitted in wetlands, floodways, or CMZs. The section establishes provisions to regulate speculative clearing and grading, require mitigation, and regulate these activities within wetlands, among other protective provisions.

- SMP Section 6.04: Dredging and Dredge Material Disposal establishes the regulations for dredging and dredge disposal in a manner that utilizes mitigation sequencing and ensures no net loss of shoreline ecological functions

- SMP Section 6.07: Shoreline Stabilization contains numerous protective regulations including requirements that new development on steep or unstable slopes shall be set back sufficiently to ensure that shoreline stabilization will not be needed during the life of the building or structure.

3.01.05 RESTORATION PLAN

The cities have identified several potential restoration opportunities that would assist in restoring shoreline processes and functions along the shorelines of the cities. Detailed descriptions of the projects identified by the cities are included in the Restoration Plan.

In Aberdeen, restoration opportunities include targeting and replacing aging infrastructure such as culverts, tide gates, and bridges in Charley Creek, Fry Creek, Stewart Creek, and Wilson Creek. This would enable fish access. Additionally, removal of creosote-treated piles in the Wishkah River and Grays Harbor are identified as a restoration opportunity.

The removal of the Mill Creek dam in Cosmopolis in conjunction with re-grading the stream channel and placing streambed gravel suitable for spawning is the primary restoration opportunity identified.

The Restoration Plan identifies opportunities in Hoquiam where the Grays Harbor shoreline could be restored, including Adams Street and Moon Island Road.

3.02 CITY OF ABERDEEN

3.02.01 REACH 1 – ABERDEEN LAKE

According to the SMP Guidelines, the CIA should evaluate the reasonably foreseeable future development and use of the shoreline that is likely to occur based upon the proposed shoreline environment designations within the planning period. The planning period for the SMP is 20 years. Information in the following sections is drawn primarily from the SIC prepared for the cities.

A. Patterns of Shoreline Activity

The Aberdeen Lake Reach consists of Aberdeen Lake and contains six parcels totaling 39[2] acres. Two parcels have some form of development located on them. Four parcels are vacant. All six parcels are protected from development by public or conservation group ownership, conservation easements, or similar mechanisms.

[2] This acreage includes only area landward of OHWM.

B. Development Potential

The area is used for recreation and serves as a destination for fishing, swimming, and boating. Future development within this reach not related to the city's current use of the park is unlikely. A WDFW fish hatchery is located adjacent to the dam. In the Comprehensive Park Plan, the city identified expansion opportunities at Aberdeen Lake, which would allow for more access to the lake. Long-term plans for Aberdeen Lake include adding tent camping areas and a native/interpretive trail around the lake. It should be assumed that the existing recreational opportunities will continue.

3.02.02 REACH 2 – CHARLEY CREEK

The Charley Creek Reach consists entirely of industrial zoned land. The majority of this reach is undeveloped forested wetland and riparian areas.

A. Patterns of Shoreline Activity

The Charley Creek Reach contains five parcels, as shown in Table 3-1. Of these parcels, two are vacant. No parcels are protected from development by public or conservation group ownership, conservation easements, or similar mechanisms. The parcels on the developed northern portion of the reach are designated as the High Intensity shoreline environment designation and they have significant impervious surface coverage. The two parcels on the south portion of the reach are vacant and designated Urban Conservancy.

Table 3-1. Vacant and Developed Parcels in the Charley Creek Reach.

Charley Creek	Number of Parcels	Area in Acres
Vacant	2	4
Developed	3	13
Total	**5**	**17**

B. Development Potential

1. Commercial, Industrial, and Utility Development

The Charley Creek Reach contains five parcels zoned Industrial (I). Of these parcels, two are vacant. New development in this reach is limited by the presence of wetlands.

2. Recreational Development

The Charley Creek Reach contains no parcels zoned for recreational development, and recreational development is unlikely.

3. Shoreline Modifications

Additional shoreline modification or stabilization measures in the Charley Creek Reach are unlikely.

3.02.03 REACH 3 – CHEHALIS RIVER – ABERDEEN

The Chehalis River – Aberdeen Reach zoning consists of Industrial (65 acres), Single Family Residential (26 acres), Multi-family (17 acres), Waterfront Development (14 acres), Commercial/Residential (2 acres), Light Industrial (1 acres) and General Commercial (1 acre). Industrial areas in this reach are largely developed and it will remain in industrial use unless changes in the adopted zoning code are made.

A. Patterns of Shoreline Activity

The Chehalis River – Aberdeen Reach contains 216 parcels, as shown in Table 3-2. Of these parcels, 173are vacant.

Table 3-2. Vacant and Developed Parcels in the Chehalis River – Aberdeen Reach.

Chehalis River – Aberdeen	Number of Parcels	Area in Acres
Vacant	173	96
Developed	43	29
Total	**216**	**125**[3]

B. Development Potential

1. Residential Development

The Chehalis River – Aberdeen Reach contains 122 parcels zoned either RS or RM (Single Family Residential or Multiple Family Residential), as shown in Table 3-3. The vacant parcels are located in a large wetland associated with Mill Creek. Future development will have to comply with the critical areas regulations found in SMP Appendix 2.

[3] This acreage includes only areas landward of OHWM.

Table 3-3. Vacant and Developed Residential Parcels in the Chehalis River – Aberdeen Reach.

Chehalis River – Aberdeen	Number of Parcels	Area in Acres
Vacant	107	42
Developed	15	1
Total	**122**	**43**

2. Commercial, Industrial, and Utility Development

The Chehalis River – Aberdeen Reach contains 74 parcels zoned General Commercial (CG), Commercial/Residential (CR), Industrial (I), or Light Industrial (LI). Of these parcels, 58 are vacant. Several large undeveloped parcels are the site of former Weyerhaeuser mill operations. There is potential for new commercial or industrial development to locate on the vacated properties.

3. Waterfront Development

The Chehalis River – Aberdeen Reach contains 20 parcels zoned WD (Waterfront Development), as shown in Table 3-4. According to the city of Aberdeen Comprehensive Plan, the Waterfront Development area should encourage the appropriate redevelopment of under-utilized and vacant waterfront areas suitable for a mix of uses. Because of the unique opportunities provided by access to shorelines of statewide significance, special provisions are included to encourage compatibility among these various uses. New waterfront development or redevelopment may occur in the 20-year planning horizon.

Table 3-4. Vacant and Developed Waterfront Development Parcels in the Chehalis River – Aberdeen Reach.

Chehalis River – Aberdeen	Number of Parcels	Area in Acres
Vacant	8	5
Developed	12	10
Total	**20**	**14**

4. Recreational Development

Recreational development may occur in this reach over the 20-year planning horizon. The city's Comprehensive Park Plan states the city plans to pursue funding sources to extend the East Aberdeen Waterfront Walkway from the South Aberdeen Boat Launch to the Chehalis River Bridge. For Morrison Riverfront Park, the city plans to pursue funding sources to fund the construction of a floating fishing dock.

5. Shoreline Modifications

The city has determined that a boat launch could potentially be developed on the south shore of the Chehalis River. The site is an undeveloped street right-of-way that the city owns. It has been used as an unimproved and unmaintained boat launch site for many years. The boat launch would only allow space for a 24-foot-wide roadway and a parking area for up to 26 vehicles /trailer units.

6. Boating Facilities

Ongoing use and maintenance of the South Aberdeen concrete boat launch near the fire station should be expected over the 20-year planning horizon, potentially as part of the East Aberdeen Waterfront Walkway project.

7. Development by Shoreline Environment Designation

There are 96 acres in the shoreline jurisdiction, as shown in Table 3-5. Development potential exists in both the Urban Conservancy and High Intensity shoreline environment designations. Mill-related structures have been removed from several of the parcels listed as vacant. Redevelopment on these parcels may occur within the 20-year planning horizon, depending on economic factors.

Table 3-5. Development Potential by Shoreline Environment Designation in the Chehalis River – Aberdeen Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	43
High Intensity	53
Total	**96**

3.02.04 REACH 4 – FRY CREEK – ABERDEEN

The Fry Creek – Aberdeen Reach zoning consists of Industrial (18 acres) and Light Industrial (3 acres). The area is highly developed and due to limited industrial land within the city, it will likely remain in this designation.

A. Patterns of Shoreline Activity

The Fry Creek – Aberdeen Reach contains 12 parcels, as shown in Table 3-6. Seven parcels are owned by the Port of Grays Harbor and Washington State Department of Transportation (WSDOT).

Table 3-6. Vacant and Developed Parcels in the Fry Creek – Aberdeen Reach.

Fry Creek – Aberdeen	Number of Parcels	Area in Acres
Vacant	8	8
Developed	4	13
Total	**12**	**21**

B. Development Potential

1. Residential Development

The Fry Creek – Aberdeen Reach is located in an industrial area and contains no residential parcels. No future residential development is anticipated.

2. Commercial, Industrial, and Utility Development

The Fry Creek – Aberdeen Reach contains 12 parcels zoned Industrial (I) or Light Industrial (LI). Of these parcels, eight are vacant. In this instance, the vacant parcels contain no structures but contain active port-related uses. Future use should be anticipated over the 20-year planning horizon.

3. Recreational Development

Recreational development is unlikely in this reach due to the presence of port-related industrial uses.

4. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Fry Creek reaches, the project will include new pumps and road crossings along the high ground through the port area.

The objective of this project is to produce a preliminary levee design for Aberdeen and Hoquiam and an associated binding CLOMR (Conditional Letter of Map Revision), which is a legally-binding document guaranteeing that if a levee system is built as submitted to FEMA, and is in agreement with effective FEMA models and maps at the time of construction, it will result in a Letter of Map Revision (LOMR) for the protected area. A CLOMR is the first step towards an eventual LOMR for removing areas of Aberdeen and Hoquiam from the floodplain and placing them in a mapped Zone X, eliminating mandatory flood insurance through the National Flood Insurance Program for

mortgages while also providing comprehensive protection to frequently flooded areas. The Aberdeen-Hoquiam levee system will include a levee and interior drainage pump system as required by FEMA. In addition, to account for potential future sea level rise, the levee design height will be increased wherever feasible. The goal is to anticipate future conditions and maximize the lifespan of the levee, maximizing the value of the investment and benefit to the community. Additionally, the Cities of Aberdeen and Hoquiam and the Levee Design Team will work proactively with local, state, and federal authorities to identify, understand, and document regulatory requirements for future construction and operation of the levee system.

This project is proposed to occur in conjunction with the Timberworks Coastal Resiliency Master Plan (Master Plan) that was kicked off in Aberdeen and Hoquiam in January 2016. The Master Plan aims to identify options for reducing flooding, improving public space, and improving habitat. The schedule of the North Shore Levee project has been coordinated with the Master Plan such that the two projects will be mutually beneficial. The alignment of the levee will be coordinated through the Master Plan's public outreach and education process while data, modeling, analyses, and design required by the Code of Federal Regulations for a CLOMR application will be available to complement the Master Plan project.

5. **Development by Shoreline Environment Designation**

   There are eight acres that are vacant within the shoreline jurisdiction. Vacant parcels are currently used for the SR-520 Pontoon Construction and uses associated with Port of Grays Harbor Terminal 4. Continuing use or redevelopment should be expected.

3.02.05 REACH 5 – GRAYS HARBOR NORTH BANK

The Grays Harbor North Bank Reach zoning consists of Industrial (36 acres) and Light Industrial (13 acres). Unless changes in the adopted zoning code are made, this area will likely remain industrial.

A. Patterns of Shoreline Activity

The Grays Harbor North Bank Reach contains 27parcels, as shown in Table 3-7. Of these parcels, 19 are vacant. Five parcels are publicly owned.

Table 3-7. Vacant and Developed Parcels in the Grays Harbor North Bank Reach.

Grays Harbor North Bank	Number of Parcels	Area in Acres
Vacant	18	32
Developed	9	18
Total	**27**	**49**[4]

B. Development Potential

1. Residential Development

The Grays Harbor North Bank Reach contains no residential parcels. No future residential development is anticipated.

2. Commercial, Industrial, and Utility Development

The Grays Harbor North Bank Reach contains 27 parcels zoned I, or LI (Industrial, or Light Industrial), as shown in Table 3-8. While some commercial capacity exists, most of the commercial, industrial, and utility land contains active port uses, including the Port of Grays Harbor Terminal 4.

Table 3-8. Vacant and Developed Commercial Parcels in the Grays Harbor North Bank Reach.

Grays Harbor North Bank	Number of Parcels	Area in Acres
Vacant	18	32
Developed	9	18
Total	**27**	**49**

3. Recreational Development

There are preliminary plans for a Downtown Waterfront Park that would be partially located in this reach. The land where the park is planned is in private ownership and funding for the project has not been secured. However, further development of the park concept should be anticipated over the 20-year planning horizon.

4. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller

[4] This acreage includes only areas landward of OHWM.

projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Grays Harbor North Bank reach, the project will tie into the current levee design along the Chehalis River and include new pumps and road crossings along the high ground through the port area. Additional information on the project is found in Section 3.02.04(B)(4).

5. Development by Shoreline Environment Designation

There are 49 vacant acres within the shoreline jurisdiction. Parcels in the aquatic environment are not included in the total acres. As stated previously, there is capacity for development and/or redevelopment in this reach. New development will likely occur on Port of Grays Harbor property and/or the properties identified for the Downtown Waterfront Park, and the extent of development will depend on economic factors.

3.02.06 REACH 6 – GRAYS HARBOR SOUTH BANK

The Grays Harbor South Bank Reach zoning consists of Industrial (197 acres), Single Family Residential (27 acres), Light Industrial (8 acres), Commercial/Residential (7 acres), General Commercial (2 acres) and less than .5 acres of Multi-Family. The area is predominately zoned for industrial use, and much of the undeveloped land within the reach falls into this designation. While the area has some residential development, the levee, existing public access, and estuarine wetlands present may deter additional development.

A. Patterns of Shoreline Activity

The Grays Harbor South Bank Reach contains 133 parcels, as shown in Table 3-9; 23 parcels are owned by public agencies.

Table 3-9. Vacant and Developed Parcels in the Grays Harbor South Bank Reach.

Grays Harbor South Bank	Number of Parcels	Area in Acres
Vacant	70	224
Developed	63	18
Total	**133**	**242**[5]

B. Development Potential

1. Residential Development

The Grays Harbor South Bank Reach contains 78 parcels zoned either RS or RM (Single Family Residential or Multiple Family Residential) as shown in Table 3-10. Future development within this reach will likely include residential development on vacant lots. Due to the presence of wetlands on many undeveloped lots, future development will be required to comply with SMP Appendix 2: Critical Areas Regulations.

Table 3-10. Vacant and Developed Residential Parcels in the Grays Harbor South Bank Reach.

Grays Harbor South Bank	Number of Parcels	Area in Acres
Vacant	26	14
Developed	51	13
Total	**78**	**27**

2. Commercial, Industrial, and Utility Development

The Grays Harbor South Bank Reach contains 44 vacant parcels zoned General Commercial (GC), Commercial/Residential (CR), Industrial (I), or Light Industrial (LI) totaling 210 acres. The Grays Harbor South Bank Reach contains detention ponds, which are located adjacent to Grays Harbor and limit future development.

3. Recreational Development

Minor recreational development may occur in this reach over the 20-year planning horizon. The city's Comprehensive Park Plan states that the city plans to pursue funding sources to extend the East Aberdeen Waterfront Walkway from the South Aberdeen Boat Launch to the Chehalis River Bridge.

[5] This acreage includes only areas landward of OHWM.

4. **Shoreline Modifications**

   Shoreline stabilization data for this reach is limited. The banks of this reach are not as heavily modified as in the Grays Harbor North Bank Reach. It is not possible to forecast changes to shoreline modifications at this time.

5. **Boating Facilities**

   Opportunities for boating facilities have not been identified in this reach for the 20-year planning horizon.

6. **Development by Shoreline Environment Designation**

   There are 224 vacant acres intersecting the shoreline jurisdiction, as shown in Table 3-11. The potential for private development exists primarily in the Shoreline Residential shoreline environment designation, however public development could occur in the High Intensity shoreline environment designation, particularly on Port-owned land.

Table 3-11. Development Potential by Shoreline Environment Designation in the Grays Harbor South Bank Reach.

Shoreline Environment Designation	Area in Acres
Shoreline Residential	18
High Intensity	206
Total	**224**

3.02.07 REACH 7 – NEWSKAH CREEK

The Newskah Creek Reach contains three parcels (12 acres) zoned Industrial (I). Of these parcels, two are vacant. The area adjacent to the reach is currently being developed as an athletic center and as such, it will likely not see any future developments due to deed restrictions and conservation easements that protect it as a mitigation site for wetland impacts associated with utility work at Stafford Creek Prison.

3.02.08 REACH 8 – WEDEKIND CONFLUENCE

The Wedekind Confluence Reach zoning consists of Industrial (37acres). This reach, at the confluence of the Wynoochee River and Wedekind Creek, has little expected development other than maintenance of the utility plant.

A. Patterns of Shoreline Activity

The Wedekind Confluence Reach contains four parcels, as shown in Table 3-12. All of the parcels are within the Urban Conservancy shoreline environment designation. One parcel contains the city's water diversion facility. Two parcels are protected from development by public or conservation group ownership, conservation easements, or similar mechanisms. As stated previously, future development in this reach is very unlikely.

Table 3-12. Vacant and Developed Parcels in the Wedekind Confluence Reach.

Wedekind Confluence	Number of Parcels	Area in Acres
Vacant	1	4
Developed	3	33
Total	**4**	**37**[6]

3.02.09 REACH 9 – WISHKAH RIVER

The Wishkah River Reach zoning consists of Multiple Family Residential (67 acres), Single Family Residential (36 acres) and Waterfront Development (15 acres), Light Industrial (2 acres) and General Commercial (2 acres).

A. Patterns of Shoreline Activity

The Wishkah River Reach contains 396parcels, as shown in Table 3-13; 37 parcels are publicly owned.

Table 3-13. Vacant and Developed Parcels in the Wishkah River Reach.

Wishkah River	Number of Parcels	Area in Acres
Vacant	198	76
Developed	198	45
Total	**396**	**121**[7]

B. Development Potential

1. Residential Development

The Wishkah River Reach contains 260 parcels zoned either RS or RM (Single Family Residential or Multiple Family Residential), as shown in Table 3-14. Future residential

[6] This acreage includes only areas landward of OHWM.
[7] This acreage includes only areas landward of OHWM.

development within this reach will likely include infill on vacant parcels scatted throughout the reach. The intensity of development will depend on market conditions, although it is not expected to increase in intensity from past development patterns. Future development will be limited by the presence of wetlands, particularly in the northern portion of the reach.

Table 3-14. Vacant and Developed Residential Parcels in the Wishkah River Reach.

Wishkah River	Number of Parcels	Area in Acres
Vacant	115	66
Developed	145	36
Total	**260**	**102**

2. Commercial, Industrial, and Utility Development

The Wishkah River Reach contains 12 developed parcels zoned CG or LI (General Commercial or Light Industrial). Commercial development in this reach is limited to redevelopment.

3. Waterfront Development

The Wishkah River Reach contains 41 developed parcels zoned WD (Waterfront Development). Redevelopment may occur on these parcels within the 20-year planning horizon.

4. Recreational Development

There are no parcels zoned for recreational development, although there are existing recreational opportunities within this reach. Plans for this reach are unknown at this time.

5. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Wishkah River reach, the project will include new sheet pile walls and additional pumps from the existing levee to the high ground on the west bank of the river. Additional information on the project is found in Section 3.02.04(B)(4).

6. **Boating Facilities**

   Opportunities for new boating facilities have not been identified in this reach. There is the possibility for construction new docks associated with single-family residential uses. Based on past development patterns, the demand for docks is not anticipated to be high. On the other hand, removal of derelict docks or pilings may occur in the 20-year planning horizon.

7. **Development by Shoreline Environment Designation**

   There are 76 vacant acres within the shoreline jurisdiction, as shown in Table 3-15. Development potential exists primarily in the Shoreline Residential and High Intensity shoreline environment designations. Areas within the Urban Conservancy shoreline environment designation are dominated by wetlands, and development would have to comply with applicable critical areas regulations found in SMP Appendix 2.

Table 3-15. Development Potential by Shoreline Environment Designation in the Wishkah River Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	51
Shoreline Residential	16
High Intensity	9
Total	**76**[8]

3.03 CITY OF COSMOPOLIS

3.03.01 REACH 10 – CHEHALIS RIVER – COSMOPOLIS

The Chehalis River – Cosmopolis Reach zoning consists of Manufacturing (88 acres), with some Public Reserve (25 acres), and Waterfront Use (9 acres). The north side of the river is largely undeveloped; however, it is almost entirely surge-plain wetlands and tidal channels making future development in this area unlikely.

[8] Acreage in the Aquatic Shoreline Environment is not included in the total.

A. Patterns of Shoreline Activity

The Chehalis River – Cosmopolis Reach contains 37 parcels, as shown in Table 3-16. Six parcels are publicly owned and may be protected from development by public or conservation group ownership, conservation easements, or similar mechanisms.

Table 3-16. Vacant and Developed Parcels in the Chehalis River – Cosmopolis Reach.

Chehalis River – Cosmopolis	Number of Parcels	Area in Acres
Vacant	27	114
Developed	10	7
Total	**37**	**121**[9]

B. Development Potential

1. Commercial, Industrial, and Utility Development

The Chehalis River – Cosmopolis Reach contains nine parcels zoned M or MU (Manufacturing or Multiple Use), as shown in Table 3-17. Vacant parcels include the undevelopable wetland areas in the northern portion of the reach. While some commercial and industrial capacity exists, most of the reach is associated with the Cosmo Specialty Fibers mill. Ongoing use or redevelopment of this site should be anticipated over the 20-year planning horizon.

Table 3-17. Vacant and Developed Commercial Parcels in the Chehalis River – Cosmopolis Reach.

Chehalis River – Cosmopolis	Number of Parcels	Area in Acres
Vacant	8	86
Developed	1	2
Total	**9**	**88**

2. Waterfront Development

The Chehalis River – Cosmopolis Reach contains 25 parcels (9 acres) zoned Waterfront Use District (WUD). Of these parcels, 16 are vacant(4 acres). The Waterfront Use District is a classification to provide the opportunity and reserve space for water-related activities that can benefit from Cosmopolis' waterfront location and to protect the

[9] This acreage includes only areas landward of OHWM.

allowed uses from incompatible activities, thereby encouraging the continued development of water-oriented, water-related, and water enjoyment uses within Cosmopolis, and uses that are compatible with those uses and foster a vibrant waterfront.

3. **Recreational Development**

   The Chehalis River – Cosmopolis Reach contains three vacant parcels (25 acres) zoned Public Reserve (PR). Of these parcels, all are unimproved and contain a public park. Development potential is therefore limited.

4. **Shoreline Modifications**

   It is not possible to forecast changes or additions to the exiting levee and shoreline armoring at this time.

5. **Boating Facilities**

   Ongoing use and maintenance of the Weyerhaeuser Boat Ramp should be anticipated over the 20-year planning horizon.

6. **Development by Shoreline Environment Designation**

   There are 120 vacant acres within the shoreline jurisdiction, as shown in Table 3-18. Development potential exists primarily in the High Intensity shoreline environment designation. The Urban Conservancy shoreline designation contains undeveloped areas with wetlands that have a very low potential to develop.

Table 3-18. Development Potential by Shoreline Environment Designation in the Chehalis River – Cosmopolis Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	103
High Intensity	17
Total	**120**

3.03.02 REACH 11 – MILL CREEK

The Mill Creek Reach zoning consists of Mixed Use (33 acres), Medium Density Residential (6 acres), and Public Reserve (<1 acre). The area designated Mixed Use is covered by woody wetlands and may not be ideal for future development.

A. Patterns of Shoreline Activity

The Mill Creek Reach contains 39parcels, as shown in Table 3-19. Eleven parcels are publicly owned or protected from development.

Table 3-19. Vacant and Developed Parcels in the Mill Creek Reach.

Mill Creek	Number of Parcels	Area in Acres
Vacant	31	36
Developed	8	3
Total	**39**	**39**[10]

B. Development Potential

1. Residential Development

The Mill Creek Reach contains 20 parcels (6 acres) zoned Medium Density Residential (R57). Of these parcels, 17 (5 acres) are vacant. Future development within this reach will be constrained by the presence of FEMA floodway and wetlands.

2. Commercial, Industrial, and Utility Development

The Mill Creek Reach contains 17 parcels (33 acres) zoned Multiple Use (MU). Of these parcels, 14 (31 acres) are vacant. While some commercial capacity exists, future development within this reach will be constrained by the presence of FEMA floodway and wetlands.

3. Recreational Development

The Mill Creek Reach contains two parcels zoned PR (Public Reserve). These parcels contain public recreation amenities. Future development within the shoreline jurisdiction is unlikely, as the parcels are large and development could occur outside of the shorelands.

4. Shoreline Modifications

It is not anticipated that the extent of shoreline stabilization will increase in this reach. If anything, shoreline modifications will decrease in this reach within the 20-year planning horizon.

[10] This acreage includes only areas landward of OHWM.

5. **Development by Shoreline Environment Designation**

   There are 39 vacant acres within the shoreline jurisdiction. All parcels are within the Urban Conservancy shoreline environment designation. Development potential is limited due to constraints such as the FEMA Floodway, 100-year floodplain, and wetlands.

3.04 CITY OF HOQUIAM

3.04.01 REACH 12 – EAST HOQUIAM RIVER

The East Hoquiam River Reach zoning consists of High Density Residential (30 acres) and Industrial (14 acres). This reach is moderately developed, and it includes one large plywood manufacturing plant. Future industrial development within this reach could occur south of the plywood manufacturing plant. The residential areas within this reach are built out; and as such, it is unlikely that there would be any additional residential development in the future.

A. Patterns of Shoreline Activity

The East Hoquiam River Reach contains 35 parcels, as shown in Table 3-20.

Table 3-20. Vacant and Developed Parcels in the East Hoquiam River Reach.

East Hoquiam River	Number of Parcels	Area in Acres
Vacant	13	37
Developed	22	6
Total	**35**	**43**[11]

B. Development Potential

1. **Residential Development**

   The East Hoquiam River Reach contains 30 parcels zoned either Low Density Residential or High Density Residential (R-1 or R-2), as shown in Table 3-21. However, of the eight vacant parcels, four are part of large lots accounting for 27acres within the shoreline jurisdiction that appear to be nearly completely covered in wetlands. Future development within this reach will likely be limited and occur on smaller infill lots.

[11] This acreage includes only areas landward of OHWM.

Table 3-21. Vacant and Developed Residential Parcels in the East Hoquiam River Reach.

East Hoquiam River	Number of Parcels	Area in Acres
Vacant	8	27
Developed	21	3
Total	**29**	**30**

2. **Commercial, Industrial, and Utility Development**

   The East Hoquiam River Reach contains six parcels (14 acres) zoned Industrial (I). Of these parcels, five are vacant. Some commercial capacity exists on the southern portion of the reach, but future development is likely, but will be dependent upon market demand.

3. **Recreational Development**

   There are no parcels zoned for recreational development. Plans for this reach are unknown at this time.

4. **Shoreline Modifications**

   Shoreline stabilization data for this reach is limited. It is not possible to forecast changes to shoreline modifications at this time.

5. **Development by Shoreline Environment Designation**

   There are 43 underdeveloped acres within the shoreline jurisdiction. Thirty acres are designated Shoreline Residential and 13 acres are designated High Intensity. Development potential exists primarily in the High Intensity shoreline environment designation.

3.04.02 REACH 13 – FRY CREEK – HOQUIAM

The Fry Creek – Hoquiam Reach zoning consists of Industrial (26 acres) and parts of two commercially zoned parcels totaling approximately 750 square feet. This area is highly developed. Any future development within this reach would be industrial in nature as that is the most suitable land use for this reach.

A. Patterns of Shoreline Activity

The Fry Creek – Hoquiam Reach contains ten parcels (26 acres). All of these parcels four are developed. Four parcels are owned by the Port of Grays Harbor.

B. Development Potential

1. Residential Development

The Fry Creek – Hoquiam Reach does not contain any residential development.

2. Commercial, Industrial, and Utility Development

The Fry Creek – Hoquiam Reach contains eight parcels zoned Industrial (I) and two zoned General Commercial (C1). All parcels are developed with industrial or commercial uses.

3. Recreational Development

There is no recreational development in this reach, and future development potential is limited due to the industrial nature of the area.

4. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Fry Creek – Hoquiam reach, the project will include additional pumps along the existing high ground in the port. Additional information on the project is found in Section 3.02.04(B)(4).

5. Development by Shoreline Environment Designation

There are seven undeveloped acres in this reach. Redevelopment is possible, particularly on the privately owned parcels. All of the parcels are designated High Intensity, and commercial or industrial uses should be expected in this reach over the 20-year planning horizon.

3.04.03 REACH 14 – GRAYS HARBOR

The Grays Harbor Reach zoning consists of Industrial (I, 227 acres), Natural Resources (NR, 124 acres) and Low Density Residential (R-1, 20 acres). Thirty-four acres of this reach are included in the Waterfront Overlay District(WF-1). While there is a significant portion of Natural Resource designated land within this reach, it is entirely on Rennie Island, which would likely not be subject to development pressure. The Industrial areas within this reach are largely built out and they include the airport and port activities. Any future development activity within this reach would likely be industrial in nature as that is the most suitable land use for this reach.

A. Patterns of Shoreline Activity

The Grays Harbor Reach contains 60 parcels, as shown in Table 3-22. Twenty-three parcels are publicly owned.

Table 3-22. Vacant and Developed Parcels in the Grays Harbor Reach.

Grays Harbor	Number of Parcels	Area in Acres
Vacant	44	249
Developed	16	122
Total	**60**	**371**[12]

B. Development Potential

1. Residential Development

The Grays Harbor Reach contains 11 parcels zoned Low Density Residential (R-1), as shown in Table 3-23. Future development is highly unlikely as the residential zoned parcels are part of the Grays Harbor National Wildlife Refuge.

Table 3-23. Vacant and Developed Residential Parcels in the Grays Harbor Reach.

Grays Harbor	Number of Parcels	Area in Acres
Vacant	10	20
Developed	1	<1
Total	**11**	**20**

2. Commercial, Industrial, and Utility Development

The Grays Harbor Reach contains 45 parcels (227 acres) zoned Industrial (I). Of these parcels, 30 (105 acres) are vacant. While industrial capacity exists, particularly on the vacant Anderson Middleton site, additional development will likely occur outside of the shoreline jurisdiction. Lots within this reach are large, allowing for flexible site design.

3. Recreational Development

Recreational uses in this reach are passive and associated with the Grays Harbor National Wildlife Refuge. Recreational uses will continue over the 20-year planning horizon.

[12] This acreage includes only areas landward of OHWM.

4. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Hoquiam – Grays Harbor reach, the project will include new earthen levee, additional pumps, and road crossings. Additional information on the project is found in Section 3.02.04(B)(4).

5. Development by Shoreline Environment Designation

Excluding the Aquatic Environment, there are 385 acres within the shoreline jurisdiction, as shown in Table 3-24. Development and redevelopment potential exists primarily in the High Intensity shoreline environment designation, particularly on parcels owned by the Port of Grays Harbor.

Table 3-24. Development Potential by Shoreline Environment Designation in the Grays Harbor Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	197
High Intensity	188
Total	**385**

3.04.04 REACH 15 – HOQUIAM RIVER

The Hoquiam River Reach zoning consists of Industrial (I, 42 acres), High Density Residential (R-2, 31 acres), General Commercial (C-1, 30 acres), Downtown Commercial (C-2, 7 acres), and Natural Resources (NR, 2 acres). Portions of this reach are included in the Waterfront Overlay District (WF-1) and the Pedestrian Overlay District (POD). Most of the land within this reach is developed. A few barren or platted areas exist, posing a potential for some development within this reach. However, due to the wetlands, this area may not be ideal for high-density development; and any other type of development would require changes in the adopted zoning code.

A. Patterns of Shoreline Activity

The Hoquiam River Reach contains 265 parcels, as shown in Table 3-25.

Table 3-25. Vacant and Developed Parcels in the Hoquiam River Reach.

Hoquiam River	Number of Parcels	Area in Acres
Vacant	121	74
Developed	140	38
Total	**261**	**112**[13]

B. Development Potential

1. Residential Development

The Hoquiam River Reach contains 124 parcels (31 acres) zoned High Density Residential (R-2). Of these parcels, 50 (15 acres) are vacant. Future development within this reach is dependent on market conditions and it will likely include residential infill development.

2. Commercial, Industrial, and Utility Development

The Hoquiam River Reach contains 135 parcels (79 acres) zoned General Commercial, Downtown Commercial, or Industrial (C-1, C-2, or I). Of these parcels, 69 (58 acres) are vacant. Commercial capacity exists and is dependent on market factors.

3. Recreational Development

There are existing recreational opportunities within this reach including the 8th Street Landing and Riverside Dike Park. The city also recommends in its Comprehensive Plan acquisition of two waterfront properties, totaling approximately 5 acres, located in the Hoquiam River Reach area along Levee Street . The properties currently include a boat launch and park. Once acquired, the city plans to upgrade the boat launch facility to include a paved launch and a boarding ramp that would be ADA accessible to passengers. Capacity for up to 30 moored vessels would also be added to the site.

4. Shoreline Modifications

The cities of Aberdeen and Hoquiam are working with the state of Washington and the Chehalis River Basin Flood Authority on the North Shore Levee project from February 2016 to July 2017. The project combines funding and conclusions from earlier, smaller projects to create a master project that will comprehensively protect the cities of Aberdeen and Hoquiam. Along the Hoquiam River reach, the project will include new

[13] This acreage includes only areas landward of OHWM.

earthen levee, sheet pile walls, additional pumps, and road crossings along the east bank of the river. Additional information on the project is found in Section 3.02.04(B)(4).

5. Boating Facilities

The city is in the process of upgrading the boat launch near 9th Street and Levee Street with access to the Hoquiam River. Plans for new boating facilities beyond this addition are unknown at this time. Existing derelict piers, docks, and pilings within this reach may be removed over the 20-year planning horizon.

6. Development by Shoreline Environment Designation

There are 112 vacant acres within the shoreline jurisdiction, as shown in Table 3-26. Development potential exists primarily in the Shoreline Residential and High Intensity shoreline environment designations. Land within the Urban Conservancy shoreline environment designation is limited.

Table 3-26. Development Potential by Shoreline Environment Designation in the Hoquiam River Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	2
Shoreline Residential	15
High Intensity	58
Total	**75**

3.04.05 REACH 16 – LITTLE HOQUIAM RIVER

The Little Hoquiam River Reach zoning consists of Low Density Residential (90 acres), Natural Resources (20 acres), High Density Residential (1 acre), and Industrial (0.5 acres). Most of this reach is covered by heavy forests and wetlands and it would not likely see any development in the future.

A. Patterns of Shoreline Activity

The Little Hoquiam River Reach contains 37 parcels, as shown in Table 3-27. Ten parcels are publicly owned.

Table 3-27. Vacant and Developed Parcels in the Little Hoquiam River Reach.

Little Hoquiam River	Number of Parcels	Area in Acres
Vacant	23	104
Developed	14	7
Total	**37**	**111**[14]

B. Development Potential

1. Residential Development

The Little Hoquiam River Reach contains 35 parcels (91 acres) zoned either Low Density Residential or High Density Residential (R-1 or R2-). Of these parcels, 22 (84 acres) are vacant. Future development within this reach will likely include residential infill on small vacant lots in the western portion of the reach.

2. Commercial, Industrial, and Utility Development

The Little Hoquiam River Reach contains one developed parcel (less than one acre) zoned Industrial (I). Future development is unlikely.

3. Recreational Development

Plans for recreational development in this reach are unknown at this time.

4. Shoreline Stabilization

Shoreline stabilization data for this reach is limited. It is not possible to forecast changes to shoreline modifications at this time.

5. Development by Shoreline Environment Designation

There are111 vacant acres within the shoreline jurisdiction, as shown in Table 3-28. Development potential exists primarily in the Shoreline Residential shoreline environment designation despite the relatively small amount of vacant land in this designation. Commercial forestry activities may occur in the Urban Conservancy designation, although any such activities would likely occur outside of the shoreline jurisdiction.

[14] This acreage includes only areas landward of OHWM.

Table 3-28. Development Potential by Shoreline Environment Designation in the Little Hoquiam River Reach.

Shoreline Environment Designation	Area in Acres
Urban Conservancy	102
Shoreline Residential	2
Total	**104**

4 STATE, LOCAL, AND FEDERAL REGULATIONS

4.01 LOCAL PLANS AND REGULATIONS

Local plans and regulations other than the SMP that influence development activity in the shoreline are listed below.

4.01.01 COMPREHENSIVE PLANS

Aberdeen updated and amended its 1971 Comprehensive Plan in 2001. The 2001 Comprehensive Plan includes several policies supporting integration of the SMP and the Grays Harbor Estuary Management Plan (GHEMP) with the city's other policies and regulations, as well as policies related to shoreline development. One example of these policies included establishing a Waterfront Development Area to encourage redevelopment of underutilized and vacant waterfront areas suitable for a mix of uses. Additionally, the 2001 Comprehensive Plan recognizes unique opportunities that access to shorelines of statewide significance provides, and included special provisions encouraging compatibility among these various uses. The Aberdeen 2001 Comprehensive Plan also addresses the development of aquaculture resources.

Cosmopolis adopted a Comprehensive Development Plan in the early 2000s. Similar to the Aberdeen Comprehensive Plan, it includes several policies supporting the integration of the SMP and the GHEMP with the city's other policies and regulations, as well as policies related to shoreline development such as provisions for waterfront development and aquaculture. The Comprehensive Development Plan also notes that waterfront development within the city should be consistent with the Port of Grays Harbor's most current Industrial Properties Master Plan, WSDOT's most current Washington Coastal Corridor Master Plan, and the most current Revitalization Potentials on the Grays Harbor Waterfront report.

Hoquiam adopted a Comprehensive Plan in 2009. The following year, the city adopted the Downtown Hoquiam Historic Preservation Plan that addresses the preservation of structures within the shoreline jurisdiction along the Hoquiam River. As part of this SMP update, policies related to integration of the SMP with the city's Comprehensive Plan will likely be added to the Comprehensive Plan.

4.01.02 MUNICIPAL REGULATIONS

The city of Aberdeen provides development guidelines and public works standards applicable to development in the shoreline jurisdiction, such as standards related to storm drainage and surface water in AMC Title 13. The city's storm and surface water management regulations are found in AMC Chapter 13.70 (Ordinance 6503, 2010). The next update to AMC Chapter 13.70 will include revisions responding to the 2013-18 Phase II Western Washington Municipal Stormwater Permit due June 30, 2018.

The city of Cosmopolis provides development guidelines and public works standards applicable to development in the shoreline jurisdiction, such as standards related to storm drainage and surface water in CMC Title 12. The city's storm drainage regulations are found in CMC Chapter 12.12 (Ordinance 1090, added 2000). It is not clear how the city regulates fill and grade activities, outside of SEPA review.

The city of Hoquiam's storm and surface water management regulations are found in HMC Chapter 8.14 (Ordinance 05-24§1, 2005). The city regulates fill and grade activities via SEPA review.

4.01.03 CRITICAL AREAS REGULATIONS

The city of Aberdeen's critical areas regulations are found in AMC Chapter 14.100 and were last updated in 2009 (Ordinance 6474). AMC Chapter 14.100 addresses critical aquifer recharge areas, wetlands, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservations areas. The city updated its critical areas regulations in 2009. In general, protection of critical areas is provided through survey, analysis, and reporting requirements, regulating certain activities, requiring buffers, setbacks, and critical area tracks, and by requiring mitigation for unavoidable impacts.

The city of Aberdeen specifies in AMC 14.100.550, Type S Water, which are all waters defined as "shorelines of the state" under the jurisdiction of the SMA, are assigned buffers of 150 feet. The stream buffers for other types of streams range from 50 to 150 feet. In AMC 14.100.554, other types of fish and habitat conservation area buffers are based on the type of area and, depending upon the type of area, recommendations by the WDFW PHS Program, site managers, or on a case-by-case basis with the city coordinating with the WDFW and other state, federal, or tribal experts.

The city of Cosmopolis has not completed the required update of the CAO, according to the Department of Commerce, as of April 4, 2014; and the city is developing a set of critical areas regulations for the shoreline jurisdiction that will be adopted as part of the SMP update.

The city of Hoquiam's critical areas regulations are found in HMC Chapter 11.06 (Ordinance 08.21§1, 2008). HMC Chapter 11.06 addresses wetlands, geologically hazardous areas, fish and wildlife habitat conservation areas, and frequently flooded areas. In HMC Chapter 11.06.260, Type S Waters are assigned buffers of 150 feet. The stream buffers for other types of streams range from 50 to 150 feet.

4.02 STATE REGULATIONS

Aside from the SMA, the state regulations most relevant to development in shorelines include the Aquatic Lands Act, the FPA, Hydraulic Code, SEPA, and Watershed Planning Act. Those regulations are summarized below.

A number of state agencies, such as Ecology, the WDFW, and the Washington State Department of Natural Resources (WDNR) are involved in implementing these regulations. Ecology can review all shoreline projects that require a shoreline permit, but has specific regulatory authority over shoreline conditional use permits and shoreline variances. Other agency reviews of shoreline developments are typically triggered by in-water or over-water work, discharges of fill or pollutants into the water, or substantial land clearing.

Depending on the nature of the proposed development, state regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts on shoreline functions and values are avoided, minimized, and/or mitigated.

4.02.01 AQUATIC LANDS ACT

In 1984, the Washington State Legislature passed what is commonly referred to as the Aquatic Lands Act (Chapters 79.105 through 79.135 Revised Code of Washington (RCW)) and delegated to WDNR the responsibility to manage state-owned aquatic lands including harbor areas. The aquatic lands statutes (Chapters 79.100 through 79.145 RCW) direct WDNR to manage aquatic lands to achieve a balance of public benefits, including public access, navigation and commerce, environmental protection, renewable resource use, and revenue generation when consistent with the other mandates. In addition, it also identifies water-dependent uses as priority uses for the transport of useful commerce.

If a proposed project requires the use of state-owned aquatic lands, the project may be required to obtain an Aquatic Use Authorization from WDNR and enter into a lease agreement. WDNR recommends that all proponents of a project waterward of the OHWM contact WDNR to determine whether the project will be located on state-owned aquatic lands, and, if so, to

determine whether the land is available, whether the proposed use is appropriate, and how the project can be constructed to avoid or minimize impacts to aquatic resources.

Aberdeen, Cosmopolis, and Hoquiam each have designated Harbor Areas, which are public lands that are defined in RCW 79.105.060 as "…area[s] of navigable waters determined as provided in Article XV, section 1 of the state Constitution, which shall be forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce." Chapter 79.115 RCW describes the process for establishing harbor line and areas, the process to follow if they are relocated, as well as harbor area leases. The harbor area is to be "…forever reserved for landings, wharves, streets, and other conveniences of navigation and commerce" according to RCW 79.115.010.

4.02.02 FOREST PRACTICES ACT

The FPA (Chapter 76.09 RCW) regulates activities related to growing, harvesting, or processing timber. The FPA is implemented by the Forest Practices Rules, which are administered by the WDNR. The Forest Practices Rules establish standards for forest practices such as timber harvest, pre-commercial thinning, road construction, fertilization, and forest chemical application. The rules are designed to protect public resources such as water quality and fish habitat while maintaining a viable timber industry.

Forest practices are not regulated under the SMA unless the land is being converted to a use besides growing trees, or the commercial harvest is within 200 feet of a shoreline of statewide significance and exceeds the harvest limits established in the SMA. Conversions must comply with the provisions in the SMP for the new use.

4.02.03 HYDRAULIC CODE

Chapter 77.55 RCW, the Hydraulic Code, gives the WDFW the authority to review, condition, and approve or deny any construction activity that will use, divert, obstruct, or change the bed or flow of state waters. These activities include projects such as the installation or modification of piers, shoreline stabilization measures, culverts, and bridges. These types of projects must obtain a hydraulic project approval from WDFW, which will contain conditions intended to prevent damage to fish and other aquatic life, and their habitats. In some cases, the project may be denied if significant impacts would occur that could not be adequately mitigated.

4.02.04 STATE ENVIRONMENTAL POLICY ACT

SEPA provides a way to identify possible environmental impacts that may result from governmental decisions. These decisions may be related to issuing permits for private projects, constructing public facilities, or adopting regulations, policies or plans. Information provided

during the SEPA review process helps agency decision-makers, applicants, and the public understand how a proposal will affect the environment. This information can be used to change a proposal to reduce likely impacts, or to condition or deny a proposal when adverse environmental impacts are identified.

4.02.05 WATERSHED PLANNING ACT

The Watershed Planning Act of 1998 (Chapter 90.82 RCW) was passed to encourage local planning of local water resources. The act recognizes that citizens and entities in each watershed have the greatest knowledge of both the resources and the aspirations of those who live and work in the watershed; and who have the greatest stake in the proper, long-term management of the resources.

4.03 FEDERAL REGULATIONS

Federal regulations most pertinent to development in the shorelines within the cities include the Clean Water Act, the ESA, the Rivers and Harbors Act, and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Those regulations are summarized below. Other relevant federal regulations include the National Environmental Policy Act, Anadromous Fish Conservation Act, Clean Air Act, and Migratory Bird Treaty Act.

A variety of agencies , such as the US Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), and US Fish and Wildlife Service (USFWS), are involved in implementing these regulations, with review of shoreline development typically triggered by in-water or over-water work, or discharges of fill or pollutants into the water. Depending on the nature of the proposed development, federal regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated.

4.03.01 CLEAN WATER ACT

Two sections of the federal Clean Water Act are particularly relevant to regulating activity in shoreline areas: Section 402 and Section 404.

Section 402 requires the United States Environmental Protection Agency (EPA) to develop and implement the National Pollutant Discharge Elimination System (NPDES) program. The NPDES program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Municipal, industrial, and other facilities must obtain permits if their discharges

go directly to surface waters. In the state, the EPA delegated the responsibility for managing implementation of this program to Ecology.

Section 404 of the Clean Water Act provides the USACE, under oversight by the EPA, with the authority to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. Under Section 404, the extent of USACE jurisdiction extends to mean high water line. USACE must review and approve many activities in the shoreline, including, but not limited to, depositing fill, dredged, or excavated material in waters and/or adjacent wetlands; shoreline and wetland restoration projects; and culvert installation or replacement.

4.03.02 ENDANGERED SPECIES ACT

Section 9 of the ESA prohibits the "take" of listed species. "Take" has been defined in Section 3 of the ESA as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The take prohibitions of the ESA apply to everyone, so any action of the cities that results in a take of listed fish or wildlife would be a violation of the ESA and expose the cities to risk of lawsuit. Per Section 7 of the ESA, USACE must consult with the NMFS and the USFWS on any projects that fall within USACE jurisdiction (e.g., Clean Water Act Section 404 or Rivers and Harbors Act Section 10 permits) that could affect species listed under the Endangered Species Act. These agencies ensure that the project includes impact minimization and compensation measures for protection of listed species and their habitats.

4.03.03 RIVERS AND HARBORS ACT

Section 10 of the Rivers and Harbors Act of 1899 provides USACE with the authority to regulate activities that may affect navigable waters of the United States. These waters are subject to the ebb and flow of the tide and/or they are currently used, have been used in the past, or may be used to transport interstate or foreign commerce. The Chehalis River is included in the list of federally designated navigable waters up to river mile 68.0. Under Section 10, the extent of USACE jurisdiction in navigable waterways extends to the mean high water line. Proposals to construct new or modify existing in-water structures (including, but not limited to, piers, marinas, bulkheads, and breakwaters), to excavate or dredge, or to alter or modify the course, location, condition, or capacity of navigable waters must be reviewed and approved by USACE.

4.03.04 COASTAL ZONE MANAGEMENT ACT

The Coastal Zone Management Act (CZMA) of 1972 provides management of the nation's coastal resources. The CZMA is administered by National Oceanic and Atmospheric Administration(NOAA), and the goal of the act is to "preserve, protect, develop, and where possible, to restore or enhance the resources of the nation's coastal zone." The CZMA has

three programs including the Coastal Zone Management Program. Through this program, the federal government and coastal states enter into voluntary partnerships to address coastal issues and create state and territorial coastal management programs.

4.03.05 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

CERCLA, commonly known as Superfund, established requirements for closed and abandoned hazardous waste sites, established liability for releases of hazardous waste at such sites, and established a fund to provide for cleanup when no responsible party could be identified. The law authorizes two kinds of response actions:

- Short-term removals, for which actions may be taken to address releases or threatened releases requiring prompt response; or
- Long-term remedial response actions, which permanently and significantly reduce the dangers associated with releases or threats of releases of hazardous substances that are serious but not immediately life threatening. Such actions can be conducted only at sites listed on EPA's National Priorities List.

5 NET EFFECT ON ECOLOGICAL FUNCTIONS

As described in the previous chapters, the proposed SMP provides a substantially increased level of protection to shoreline ecological functions. Implementation of the proposed SMP is expected to protect shorelines within the cities, resulting in no net loss of shoreline ecological function. In addition, the application of the SMP may improve ecological functions over time through restoration efforts in targeted areas, such as in the Urban Conservancy environment designation.

State and federal regulations, acting in concert with this SMP, will provide further assurances of improved shoreline ecological functions over time. Together with the implementation of the Shoreline Restoration Plan, the SMP is expected to begin to address the enhancement and restoration of shoreline functions in those areas where they are currently impaired.

5.01 EFFECTS OF SMP PROVISIONS

Despite a relatively limited potential or likelihood for significant development to occur over the 20-year planning period, it is an overall goal of the SMP and SMP update process to ensure no net loss, as well as the long-term enhancement, of unique shoreline features, natural resources, and fish and wildlife habitat. The SIC identified four ecologic function categories including hydrologic, vegetation, hyporheic, and habitat.

Table 7-5 and Table 7-6 provide summaries of potential cumulative impacts to shoreline ecological function categories associated with reasonably foreseeable future development, and the elements that are included in the SMP which act as countermeasures toward ensuring no net loss of ecological function. Table 7-7 provides a summary of the SMP provisions, goals, policies, and regulations that support no net loss of ecological functions in the cities' shoreline jurisdiction. It also summarizes the effects of cumulative impacts on shoreline functions.

5.02 NET EFFECT

As described above, the proposed SMP provides a substantial level of protection for shoreline ecological functions through strategies such as shoreline buffers, shoreline structural setbacks, and mitigation requirements where impacts are not otherwise avoided, resulting in no net loss

of ecological function. Additional protection and potential for enhancement of ecological functions is provided through consistency with other federal, state, and local laws and policies. Together, with implementation of the Shoreline Restoration Plan, the proposed SMP has a high potential for improving ecological functions in areas of the shoreline jurisdiction where they are currently impaired. Therefore, the cumulative impacts of development in the shoreline jurisdiction are expected to result in no net loss of shoreline ecological functions.

5.03 UNANTICIPATED CUMULATIVE IMPACTS

In accordance with (WAC 173-26-201(3)(d)(iii)), the SMP has been developed to avoid or mitigate unanticipated or uncommon impacts that cannot be reasonably identified at this time. Impact avoidance and mitigation will occur during the cities' permit review process for future development in the shoreline jurisdiction. Conditional use permits will be required for development proposals or shoreline uses that are not classified or set forth in the SMP.

Mitigation sequencing will be applied to all development during permit review under SMP Section 4.03: Environmental Impacts and Mitigation to avoid new incremental impacts to shoreline ecological functions. To ensure mitigation sequencing is applied, the cities' critical areas regulations, which regulates wetlands, streams, fish and wildlife habitat areas, and other critical areas, was modified to reflect the requirements of the SMA and included as SMP Appendix 2.

Additionally, minimum criteria for review and approval of conditional use permits have been incorporated into the SMP administration provisions pursuant to WAC 173-27-210 and WAC 173-27-160. The criteria include the provision that

> *"the proposed use will cause no unreasonably adverse effects to the cities shoreline jurisdiction, will not result in a net loss of ecological functions, and will not be incompatible with the environment designation or zoning classification in which it is to be located."*

Additionally, it includes the criteria that

> *"…consideration of cumulative impacts resultant from the proposed use has occurred and has demonstrated that no substantial cumulative impacts are anticipated, consistent with WAC 173-27-160(2)."*

5.04 CONCLUSION

The reasonably foreseeable future development and associated impacts on shoreline ecological functions were reviewed and compared for the CIA, in conjunction with the cities' SMP provisions, goals, policies, and regulations; the Shoreline Restoration Plan; and other existing laws, policies, and regulations beyond the SMP. Together, they provide the basis for evaluating the net effect of both anticipated and unanticipated cumulative impacts of development on shoreline functions. Based on the CIA, the proposed SMP includes policies and regulations that will achieve no net loss of ecological functions as the SMP is implemented over time.

6 CONCLUSIONS REGARDING NO NET LOSS

The SMP update process has provided the opportunity to identify baseline environmental conditions, anticipate future impacts to shoreline resources, and provide restoration opportunities within the cities' shoreline jurisdiction. Changes to the SMP were informed by the best technical information gathered during the update process. The proposed SMP provides a new system of shoreline environment designations that establishes more uniform management of the cities' shorelines.

The system of shoreline environment designations and use regulations in the proposed SMP is consistent with current conditions established in the SIC, the existing land use pattern, as well as the land use vision planned for in the cities' comprehensive plan, zoning, and other long-range planning documents. Based on this consistency, it is unlikely that substantial changes in the type of shoreline land uses will occur in the future. Furthermore, the use of aquatic designations will provide a means for protecting and managing the resources that are unique to the aquatic environments.

The updated development standards and regulation of shoreline modifications provides an increased level of protection for shoreline processes. The updated standards and regulations are more restrictive of activities that would result in adverse impacts to the shoreline environment. In addition, the *Restoration Plan* developed as part of the SMP Update provides the cities with descriptions of opportunities to improve or restore ecological functions that have been impaired because of past development activities. Furthermore, the proposed SMP is meant to complement city, state, and federal efforts to protect shoreline functions and values.

The cities are required to monitor development under the proposed SMP to ensure no net loss. The *Restoration Plan* recommends that city staffs track all land use and development activity, including exemptions, within shoreline jurisdiction, and incorporate actions and programs of individual departments as well. It is suggested that city staffs assemble a report to coincide with the eight-year periodic review of the SMP required by RCW 90.58.080. Following the goals and objectives of the proposed SMP, the report could be used to determine whether implementation of the SMP is meeting the basic goal of no net loss of ecological functions relative to the baseline condition established in the SIC.

Based on assessment of these factors, the cumulative actions taken over time in accordance with the provisions outlined in the proposed SMP are not likely to result in a net loss of overall ecological functions from the existing baseline conditions within the cities' shoreline

jurisdiction. An overall improvement in ecologic functions is expected in the cities' shorelines due to restoration efforts proposed along the shoreline with redevelopment and shoreline enhancement.

7 CUMULATIVE IMPACT ANALYSIS TABLES

Table 7-1. Cumulative Impacts to the Shoreline Environment – Nutrient/Pollutant Delivery and Removal
Function: Water Quality
Resources at Risk: Waterways and their floodplains, riparian corridors and potential, undelineated wetlands

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
Current Condition: Existing impervious surfaces increase delivery of nutrients to waterways. Ditching, draining, and filling of wetlands and clearing of riparian has occurred previously within the cities. Degree of future cumulative impact: New development may result in additional impervious surfaces and may result in further impacts to existing aquatic resources at risk including associated wetlands. Potential development of residential lots adjacent to the shoreline is small, so future impacts should be low. Nutrient/pollutant processes and water quality functions within the cities' shorelines may be impacted	Proposed Overall Measures: Protect existing waterway resources and associated wetlands (SMP Section 4.03: Environmental Impacts and Mitigation, SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation, and SMP Appendix 2: Critical Areas Regulations) and restore riparian areas (SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation). SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation, and SMP Appendix 2: Critical Areas Regulations regulate critical areas such as critical aquifer recharge areas within the shoreline jurisdiction. All shoreline uses and activities shall utilize best management practices (BMPs) to minimize any increase in surface runoff and to control, treat and release surface water runoff so that receiving water quality is not adversely affected during both construction and operation (SMP Chapter 6: Shoreline Modification Policies & Regulations). The SMP specifically addresses water quality in SMP Section 4.07: Water Quality. The cities' Comprehensive Plans addresses cooperation with the Grays Harbor County Health District to ensure pollutants from	Restore degraded wetlands. Restore degraded riparian areas through replanting with native species. The *Shoreline Restoration Plan* outlines the non-regulatory measures that will be available to the cities to help address these issues.

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
by existing roadways, septic systems, and potential expansions.	septic systems do not enter groundwater.	

Table 7-2. Cumulative Impacts to the Shoreline Environment – Surface and Groundwater Flow
Function: Reducing downstream flooding and erosion (surface storage), aquifer recharge and storage
Resources at Risk: Waterways and their floodplains, riparian corridors and potential, undelineated wetlands

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
Current Condition: Impervious areas and clearing decrease infiltration recharge, subsurface storage, and groundwater discharge to rivers and wetlands. Wetland fill, development in floodplain (including shoreline protective structures) reduces surface storage, overbank flooding and increased flooding frequency and duration. Degree of future cumulative impact: New development will remove vegetated areas and increase impervious cover. Additional impacts to surface storage functions may occur from shoreline fill and encroachment. Potential development of residential lots adjacent to the shoreline is small, so future impacts should be low. Residential development is allowed in the High Intensity, Shoreline Residential, and Urban Conservancy shoreline designation areas adjacent to the waterways.	Proposed Overall Measures: Minimize impacts to surface and groundwater processes by employing nonstructural approach to reducing downstream flooding and erosion. This would include protecting and restoring wetlands. Reference found in SMP Section 4.05: Flood Hazard Management, SMP Section 4.03: Environmental Impacts and Mitigation, SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation, and SMP Chapter 6: Shoreline Modification Policies & Regulations. SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation, SMP Section 4.05: Flood Hazard Management, and SMP Appendix 2: Critical Areas Regulations regulate frequently flooded areas and riparian corridors. SMP Chapter 3: Shoreline Environment Designations and SMP Section 5.03: Allowed Shoreline Uses regulate the type of development that is permitted by shoreline environment designation. The SMP specifically addresses flood hazard	Restore degraded wetlands. Restore degraded floodplain and riparian areas through replanting with native species. The *Shoreline Restoration Plan* outlines the non-regulatory measures that will be available to the cities to help address these issues.

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
	reduction in SMP Section 4.05: Flood Hazard Management.	

Table 7-3. Cumulative Impacts to the Shoreline Environment – Sediment Transport
Function: Sediment delivery and removal from area water systems
Resources at Risk: Waterways and their floodplains, riparian corridors and potential, undelineated wetlands

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
Current Condition: Sediment delivery and removal processes have been affected by both natural and man-made factors. Development in the watershed has altered the process of sediment transport. Converting vegetation to roads and development has altered or accelerated sediment transport processes within the basin. Future Cumulative Impact: Potential for further sediment delivery into water systems without protective vegetation due to land clearing and development upstream of the cities. Development may affect storage of surface waters in wetlands and floodplains in this basin, which in turn could affect flooding, and erosion functions within downstream shoreline areas along waterways.	Proposed Overall Measures: Minimize the delivery of sediment from land alterations through retention of natural vegetation, protection of riparian corridors, application of a comprehensive erosion and sedimentation control program and measures and proper siting of development. References found in SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation and SMP Section 6.03: Clearing, Grading, and Fill. SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation and SMP Appendix 2: Critical Areas Regulations regulates geologically hazardous areas and riparian corridors in the shoreline jurisdiction. The SMP specifically addresses water quality in SMP Section 4.07: Water Quality. In SMP Section 6.03: Clearing, Grading, and Fill, land clearing, grading, and filling must be limited to the minimum necessary for development. SMP Section 6.07: Shoreline Stabilization prefers nonstructural to structural measures to stabilize banks.	Create incentive programs to conserve and retain native vegetation and restore native vegetation where none is present. Programs such as on-site density transfers and conservation easements could help protect these areas. The *Shoreline Restoration Plan* outlines the non-regulatory measures that will be available to the cities to help address these issues.

Table 7-4. Cumulative Impacts to the Shoreline Environment – Habitat Biodiversity
Function: Fish and wildlife habitat, food production and delivery
Resources at Risk: Waterways and their floodplains, riparian corridors and potential, undelineated wetlands

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
Current Condition: Important in-stream, riparian, and marine habitat is present in waterways. Habitat elements important to fish include riparian cover, passage for migration, clean water, and spawning habitat and forage habitat, and the availability of food sources. Habitat functions are altered with development, shoreline armoring, road construction, culvert installation, loss of riparian cover, and stream and riverbank modification. Alteration of scrubland habitat, loss of wetlands, streams, and rivers reduce the overall habitat for wildlife species, including mammals, amphibians, reptiles, waterfowl, birds and other wildlife species. Habitat connectivity is diminished as riparian cover is removed and culverts, bridges, bulkheads, riprap, filling, and	Proposed Overall Measures: Protect and restore riparian habitat, aquatic habitat, and wetlands (SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation and SMP Appendix 2: Critical Areas Regulations). The SMP specifically addresses water quality in SMP Section 4.07: Water Quality. The SMP specifically addresses protection and restoration of native vegetation within the shoreline jurisdiction. In SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation and SMP Section 6.03: Clearing, Grading, and Fill, the purpose is to conserve vegetation in the shoreline jurisdiction, restrict clearing and grading to the minimum amount necessary, and control invasive weeds and non-native species. SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation calls for the cities to protect and restore diversity of vegetation and habitat associated with shoreline areas. SMP Section 4.04: Critical Areas and Shoreline Vegetation	Restore degraded wetlands and the aquatic system. This includes restoring degraded riparian and aquatic habitat by planting with native species where possible and the addition of habitat features. The *Shoreline Restoration Plan* will outline the non-regulatory measures that will be available to the cities to help address these issues.

Shoreline Alterations Impacting Processes and Functions	Proposed Restoration/ Protection Measures and Draft SMP Policies and Regulations	Non-Regulatory Measures
dredging interrupt aquatic systems. Loss of habitat features such as banks with scrubland vegetation decreases wildlife cover, denning, perching, and nesting habitat. <u>Future cumulative impacts:</u> Future impacts should be low if provisions of the SMP are followed. Any future development may affect habitat and water quality functions within the cities' shorelines.	Conservation and SMP Appendix 2: Critical Areas Regulations regulate critical fish and wildlife conservation areas within the shoreline jurisdiction. These sections require all shoreline development to be located, designed, constructed, and managed to avoid disturbance of and minimize adverse impacts to wildlife resources, including spawning, nesting, rearing and habitat areas and migratory routes.	

Table 7-5. Shoreline Function Impacts Associated with Development or Agriculture and SMP Counter Measures

Function Category	Potential Cumulative Impacts to Shoreline Functions	SMP Countermeasures
Hydrologic	• Altered flows and water quality associated with increased impervious surface.	• In SMP Chapter 3: Shoreline Environment Designations, environment designations concentrate development in least sensitive areas. • SMP Section 5.12: Parking limits type and location of parking facilities. • SMP Section 4.07: Water Quality requires development to follow the applicable local jurisdiction stormwater management programs and regulations.
Vegetation	• Reduced water quality from increase in pesticide and fertilizer. • Increased risk of bank instability, increased erosion, and increased turbidity associated with vegetation clearing.	• SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation requires increased buffers if necessary to protect functions and provides for minimum building setbacks • SMP Section 4.07: Water Quality requires BMPs and compliance with the city's stormwater management program for clearing and grading. • SMP Section 4.03: Environmental Impacts and Mitigation establish mitigation standards for vegetation clearing. • SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation regulates clearing of vegetation clearing.

Function Category	Potential Cumulative Impacts to Shoreline Functions	SMP Countermeasures
Hyporheic	• Increased need for bank stabilization or protection structures could result in direct disturbance and alteration of the hyporheic zone, reducing the potential for water or sediments storage, and removal of nutrients or toxins, altered water temperatures, or other water quality conditions. • Altered surface water and groundwater exchange due to agricultural practices.	• SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation requires shoreline buffers and structural setbacks. • SMP Section 6.07: Shoreline Stabilization limits shoreline stabilization and encourages non-structural treatments.
Habitat	• Reduced habitat area or suitability for specific species. • Reduced habitat complexity and habitat connectivity.	• SMP Section 5.03: Allowed Shoreline Uses limits non-water oriented uses. • SMP Section 6.06: Restoration provides standards for restoration activities and consistency with the *Shoreline Restoration Plan*.

Table 7-6. Shoreline Function Impacts Associated with In-water and Overwater Structures or Shoreline Modifications and SMP Counter Measures

Function Category	Potential Cumulative Impacts to Shoreline Functions	SMP Countermeasures
Hydrologic	• Altered hydraulics that affects habitat conditions or reduce potential for habitat formation. • Altered movement of sediments.	• SMP Chapter 6: Shoreline Modification Policies & Regulations establish limitations and standards for shoreline modifications including dredging, fill, and shoreline stabilization.
Vegetation	• Reduced riparian vegetation resulting in increased erosion, bank instability, and altered habitat.	• SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation includes provisions for vegetation conservation. • SMP Section 4.07: Water Quality requires BMPs and compliance with city's stormwater management program for clearing and grading.
Hyporheic	• Water quality impacts resulting from structures interfering with hyporheic flows.	• SMP Section 6.07: Shoreline Stabilization limits shoreline stabilization and encourages non-structural treatments.
Habitat	• Altered substrate composition due to hydrologic and wave energy impacts. • Reduced habitat complexity and connectivity between terrestrial and aquatic environments. • Increased shading or substrate alteration affecting plant growth, benthic community, and behavior of aquatic organisms. • Altered ecological interactions.	• SMP Section 5.07: Boating and Water Access Facilities provides provisions for boating facility design, including location, size, number, and operation standards. • SMP Section 5.06: Aquaculture prohibits aquaculture facilities. • SMP Section 4.03: Environmental Impacts and Mitigation SMP Section 4.04: Critical Areas and Shoreline Vegetation Conservation include provisions for habitat enhancement, vegetation conservation, and mitigation standards.

Table 7-7. Summary of Shoreline Master Program and Effects of Cumulative Impacts on Shoreline Functions

SMP Chapter containing goals, policies, or regulations, to protect ecological functions	Purpose of SMP Provision, Goals, Policy or Regulation	Summary of Cumulative Impacts Effects on Key Shoreline Functions [1]
SMP Chapter 2: *Shoreline Management Goals*	• Establishes a framework upon which the more detailed SMP shoreline use environments, policies, regulations, and administrative procedures are based. • Specifically, includes a conservation element to preserve natural resources and provide for no net loss of ecological function.	• Serves to protect all functions potentially affected by the SMP, future development, and shoreline restoration or enhancement activities.
SMP Chapter 3: *Shoreline Environment Designations*	• Defines and maps the shoreline jurisdiction and environment designations of all the shorelines in the cities. Policies and regulations specific to the four designated shoreline environments (Aquatic, High Intensity, Shoreline Residential, and Urban Conservancy) are detailed in this chapter. • The shoreline environment designations are the key to providing specific management policies and regulations to ensure no net loss in both developed and undeveloped areas with high functions.	• Protects all functions, with focus on preserving and enhancing existing shoreline ecological functions.
SMP Chapter 4: *General Policies & Regulations*	• Sets forth the general policies and regulations that apply to uses, developments, and activities in all shoreline areas of the cities. • Specifically, it contains the requirement that all development and uses meet no net loss, and include measures to mitigate environmental impacts. • Provides specific standards for critical areas, environmental impacts, flood hazard reduction, restoration, shoreline modifications, vegetation conservation, and water quality to achieve no net loss.	• Protects all functions with focus on critical areas, riparian vegetation, and water quality and quantity. • Provides standards for environmental impacts review and mitigation

SMP Chapter containing goals, policies, or regulations, to protect ecological functions	Purpose of SMP Provision, Goals, Policy or Regulation	Summary of Cumulative Impacts Effects on Key Shoreline Functions [1]
	• Requires periodic review of shoreline conditions to determine whether other actions are necessary to ensure no net loss with the provisions in SMP Chapter 7: Administration.	
SMP Chapter 5: *Specific Shoreline Use Policies & Regulations*	• Sets forth policies and regulations governing specific categories of uses and activities typically found in shoreline areas. • For example, establishes minimum shoreline setbacks, prohibits industry and mining, and limits in-stream structures to fish habitat enhancements.	• Protects all functions, with specific focus on the unique aspects of uses that require specific and unique requirements to assure no net loss.
SMP Chapter 6: *Shoreline Modification Policies & Regulations*	• Sets forth policies and regulations that apply to shoreline modifications. • Specifically regulates in-water structures, and clearing and grading.	• Protects all functions with focus on in-water uses and modifications.
SMP Appendix 2: *Critical Areas Regulations*	• Sets forth policies and regulations that apply to critical areas within the shoreline jurisdiction. • Critical areas regulations will apply to the shoreline jurisdiction associated with the cities' rivers and lakes.	• Protects critical areas within the shoreline jurisdiction to assure no net loss.

1 Key functions for the shoreline jurisdiction and specific reaches are described in the SIC.

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