

SHORELINE INVENTORY, ANALYSIS, AND CHARACTERIZATION REPORT



Prepared for

City of Pasco

Prepared by

Anchor QEA, LLC

8033 W. Grandridge Blvd., Suite A

Kennewick, Washington 99336

Prepared with assistance from

Oneza & Associates

3131 Western Avenue, Suite 316

Seattle, Washington 98121

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LIST OF ACRONYMS AND ABBREVIATIONS

BLM	U.S. Bureau of Land Management
BNSF	Burlington Northern Santa Fe
CAO	Critical Areas Ordinance
cfs	cubic feet per second
City	City of Pasco
DART	Data Access in Real Time
Ecology	Washington State Department of Ecology
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GIS	geographic information system
IAC	Inventory, Analysis, and Characterization
MAF	million acre-feet
NRHP	National Register of Historic Places
OHWM	ordinary high water mark
PHS	priority habitat and species
PMC	Pasco Municipal Code
ppm	parts per million
RCW	Revised Code of Washington
SF	square foot
SMA	Shoreline Management Act
SMP	Shoreline Master Program
SR	subreach
TMDL	total maximum daily load
UGA	urban growth area
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WDNR	Washington Department of Natural Resources

1 INTRODUCTION

1.1 Background and Purpose

The City of Pasco (City) is in the process of updating its Shoreline Master Program (SMP). The City received grant funding from the Washington State Department of Ecology (Ecology) to develop an updated SMP. A primary purpose of this effort is to update the SMP to comply with Chapter 90.58 Revised Code of Washington (RCW), the Shoreline Management Act (SMA), and Ecology's 2003 Shoreline Master Program Guidelines (Chapter 173-26 Washington Administrative Code [WAC]).

The Inventory, Analysis, and Characterization Report provides a technical foundation for the SMP update. This report includes a discussion of the setting and ecosystem-wide processes that influence ecological functions within the City's shorelines. The report also addresses alterations based on existing land use patterns and future potential development within the shoreline jurisdiction area. Inventory, analysis, and characterization tables summarizing conditions by reach are provided in Appendix A. A map folio is provided in Appendix B.

The guidelines require the City to demonstrate that the SMP will result in no net loss to shoreline ecological functions during implementation. This report will serve to describe the existing baseline conditions of shoreline ecological function. An associated Shoreline Restoration and Protection Plan and a Cumulative Impacts Analysis report will follow development of the draft program and code elements. The Cumulative Impacts Analysis report will demonstrate how future development under the proposed SMP will result in no net loss of shoreline ecological function. The restoration measures described in the Shoreline Restoration and Protection Plan could be implemented to improve shoreline ecological functions beyond existing conditions.

1.2 Report Organization

The report is organized in the following sections:

- **Regulatory Overview** – Describes the SMA; local, state, and federal regulations, and cultural resource considerations.

- **Shoreline Jurisdiction Analysis** – Reviews the data and analysis used to determine the shoreline jurisdiction waterbodies and extents of the SMA shoreline jurisdiction.
- **City of Pasco Inventory** – Provides a description of the project area, including ownership and land cover characteristics, land use and SMP environment designations, geology, climate, surface water resources, water quality, floodplains and floodways, channel migration zones, groundwater resources, geologic hazards, and cultural resources characteristics.
- **Shoreline Analysis and Characterization** – Describes the ecosystem processes and the level to which they are currently functioning, impaired, or altered. The processes most critical to ecological functions are described for the Columbia and Snake rivers. Also included is a review of the reach characterization methods and an overview of the inventory, analysis, and characterization tables included in Appendix A. This section also provides an overview of the future land use and development potential analysis, which identify developable residential, commercial, and industrial lands within the City.
- **Public Access** – Identifies existing public access goals and policies.
- **Information Sources, Assumptions, and Limitations** – are also described.

2 REGULATORY OVERVIEW

Counties, cities, and towns develop or update local SMPs to be in compliance with Washington state's SMA (RCW 90.58) and consistent with Ecology's guidelines. Washington's SMA addresses concerns about the effects of unregulated development on shorelines. The SMP update process indicates the joint state/local nature of the SMA program as local governments develop SMPs in close coordination with Ecology, informed by local opportunities and constraints, and consistent with state law and guidelines.

2.1 Local, State, and Federal Plans and Regulations

SMPs provide provisions to protect archaeological resources, historic resources, and environmentally critical areas within the shoreline, as well as to maintain flood hazard protection (WAC 173-26-221). Environmentally sensitive areas (critical areas) within the City include wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas.

The City references Franklin County's existing SMP, originally adopted in 1974, for shoreline development and also has critical areas regulations under Pasco Municipal Code Title 28 for wetlands, fish and wildlife habitat, aquifer recharge areas, flood hazard areas, and geologically hazardous areas. Table 1 includes a summary of critical area buffer and mitigation requirements identified in these regulations for the City.

Critical areas for shoreline jurisdiction areas and individual reaches are also described within the flooding and geological hazards and habitat characteristics sections of the Reach Characterization Tables provided in Appendix A. These features are also identified, as applicable, in the map folio provided in Appendix B.

Table 1
Critical Areas Buffers and Mitigation Requirements Summary (as of 2014)

PMC CAO (2009)		Protection Standards				
Wetlands						
Chapter 28.16	Wetland Delineation and Rating System		• Washington State Wetlands Identification and Delineation Manual (1997), as amended • Washington State Wetlands Rating System for Eastern Washington - Revised and the most current copy should be referred to for additional information ¹			
	Buffers and Mitigation Ratios		Category			
			I	II	III	IV
	Buffer (feet)	Land Use with High Impact	250	200	150	50
		Land Use with Moderate Impact	190	150	110	40
		Land Use with Low Impact	125	100	75	25
Mitigation Ratio	Restoration/Creation	4:1	2:1	2:1	1.25:1	
Fish and Wildlife Habitat Areas						
Chapter 28.20	Classification		Protection Standards			
	Primary and Secondary Habitats		Detailed Study shall be required for any activity within 200 feet of a fish and wildlife habitat area and shall: • Be completed by (or subject to review by) a fish and wildlife biologist • Identify the required habitat • Recommend appropriate buffers based on WDFW PHS management recommendations			
	Primary Habitat (includes rivers identified as “Shorelines of the State” under the City SMP and streams within the SMA jurisdiction)		Habitats and species that have been identified as Priority Species or Priority Habitats by the WDFW PHS Program should not be reduced and shall be preserved through regulation, acquisition, incentives and other techniques			

Notes:

1 = The most current copy at the time of this SMP Update is the Washington State Department of Ecology Publication # 04-06-15 (Ecology 2004, Revised 2007)

CAO = Critical Areas Ordinance

PMC = Pasco Municipal Code

SMP = Shoreline Master Program

PHS = Priority Habitat and Species

SMA = Shoreline Management Act

WDFW = Washington Department of Fish and Wildlife

In addition, federal, state, and local regulations also apply to these features. Federal regulations include the Clean Water Act (Sections 404 and 401), Endangered Species Act (ESA), Federal Water Pollution Control Act, National Environmental Policy Act, and the National Floodplain Insurance Program.

State regulations are administered through the RCW and include the State Environmental Policy Act, the Hydraulic Project Approval, the Bald Eagle Protection Rules, the Surface Mining Act, the State Water Code and Water Pollution Control Act, and the SMA.

2.1 Cultural Resources and Shoreline Development

Federal, state, and local cultural resource laws apply to shoreline development. Section 106 of the National Historic Preservation Act requires a cultural resource review process for federally funded and permitted projects. State laws include RCW 27.53 (Archaeological Sites and Records), which prohibits the unpermitted removal of archaeological materials and establishes a permitting process, and RCW 27.44 (Indian Graves and Records), which describes how human remains must be treated.

3 SHORELINE JURISDICTION ANALYSIS

3.1 Shoreline Management Act Shoreline Criteria

The shoreline jurisdiction is the geographic area where the SMA applies and includes all Shorelines of the State and shorelands as defined by the SMA (RCW 90.58.030). See Table 2 for a summary of definitions for areas that are included within a shoreline jurisdiction.

Table 2
Shoreline Criteria Definitions per RCW 90.58.030 and WAC 173-26-020

Term	Definition
Shoreline Jurisdiction (WAC)	All "shorelines of the state" and "shorelands" as defined in RCW 90.58.030.
Shorelands (RCW)	<ul style="list-style-type: none">• Those lands extending landward for two hundred feet in all directions as measured on a horizontal plane from the ordinary high water mark (OHWM)• Floodways and contiguous floodplain areas landward two hundred feet from such floodways; and• All wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter; the same to be designated as to location by the Ecology.
Shorelines of the State (RCW)	The total of all "shorelines" and "shorelines of statewide significance" within the state.
Shorelines (RCW)	All of the water areas of the state, including reservoirs, and their associated shorelands, together with the lands underlying them; except: (i) shorelines of statewide significance; (ii) shorelines on segments of streams upstream of a point where the mean annual flow is twenty cubic feet per second or less and the wetlands associated with such upstream segments; and (iii) shorelines on lakes less than twenty acres in size and wetlands associated with such small lakes.
Shorelines of Statewide Significance ¹ (RCW)	The natural rivers or segments thereof as follows: (A) Downstream of a point where the annual flow is measured at two hundred cubic feet per second or more, or (B) Downstream from the first three hundred square miles of drainage area, whichever is longer.

Notes:

1 = The definition provided is for streams and rivers of statewide significance east of the crest of the Cascade Range. See Revised Code of Washington (RCW; 90.58.030(2)(f) for full description of specific larger waterbodies under the classification of shorelines of statewide significance.

OHWM = ordinary high water mark

RCW = Revised Code of Washington

WAC = Washington Administrative Code

3.2 Study Area

The City of Pasco is located at the confluence of the Columbia and Snake rivers in southeastern Washington within Franklin County. The Columbia River is to the south of the City, and the Snake River is to the east. The study area for this report includes all land currently within the shoreline jurisdiction for incorporated City and the City's unincorporated Urban Growth Area (UGA). The study area includes relevant discussion of the contributing watersheds.

3.3 Shorelines Currently Designated in the City of Pasco

The WAC, Title 173 – Chapter 18 – Section 150, and Chapter 20 – Sections 240 and 250 list lakes and streams of Statewide Significance and Shorelines of the State and Shorelines of Statewide Significance designated by statute in Franklin County (including shorelines within the City). Where there is a conflict with the criteria set forth in RCW 90.58.030(2) and WAC 173-18-040, the RCW criteria shall control. The designation of the stream or river shall be governed by the criteria, except that the local government must amend the local SMP to reflect the new designation (WAC 173-18-046).

Four Streams of Statewide Significance are currently designated for Franklin County per WAC 173-18-150, three of which are located within the City, based on their historical application of designation criteria. The streams designated in Franklin County that are historically included within the City jurisdiction are summarized below in Table 3.

There are no lakes specifically listed in WAC 173-20-240 or 250 as meeting the lake criteria within City jurisdiction.

Table 3
Streams of Statewide Significance per WAC 173-18-150 for Franklin County and within City of Pasco Jurisdiction¹

Stream Name	Legal Description	Estimated Length (miles)
Columbia River	From Hanford Works boundary (Sec.23, T12N, R28E) downstream left bank only to (Sec.13, T9N, R28E) questionable. The flow exceeds 200 cfs MAF at Hanford Works boundary.	14.4
Esquatzel Coulee	From mouth of Old Maid Coulee (Sec.11, T12N, R30E) downstream to a sump (Sec.12, T9N, R29E) (Esquatzel River gradually sinking into ground). This stream has over 300 square miles of drainage area ending at mouth of Old Maid Coulee.	1.2
Snake River	All of Snake River within Franklin County is under federal jurisdiction. The flow exceeds 200 cfs MAF at Whitman County line.	2.8

Notes:

1 = The Palouse River is also listed in WAC 173-18-150 but is not located within City jurisdiction.

cfs = cubic feet per second

MAF = million acre-feet

WAC = Washington Administrative Code

3.4 Preliminary Shoreline Jurisdiction Analysis and Findings for the Shoreline Master Program Update

3.4.1 Shoreline Jurisdiction Data Analysis

Anchor QEA reviewed information in the WAC and compared it to a number of data sources to determine, as accurately as possible with the available data, which waterbodies in the City fit the definition of Shorelines of the State. Anchor QEA received and downloaded GIS-format datasets from the City, Franklin County Planning, the Franklin County GIS website, U.S. Geological Survey (USGS), U.S. Department of Agriculture (USDA), U.S. Fish and Wildlife Service (USFWS), and Ecology containing information from a variety of sources about the waterbodies and potential shorelands within the City.

Anchor QEA has reviewed and appended a Shoreline Management Plan, Lakes, and Rivers dataset developed to identify those waterbodies and associated lands within the City that meet the definition of Shoreline of the State or Shoreline of Statewide Significance per RCW

90.58.030. Anchor QEA used several data sources in determining if a waterbody met this definition. Those most used include:

- Designated streams named in WAC 173-18-150
- Designated lakes named in WAC 173-20-240 and WAC 173-20-250
- Ecology suggested shoreline arcs (stream) and points (at which streams reach the threshold of significance)
- Ecology-suggested shoreline polygons (for lakes)
- USGS National Hydrography Dataset
- USDA National Agriculture Imagery Program 2013 imagery (USDA 2013)
- Google Earth historical aerial imagery
- USFWS National Wetland Inventory
- Federal Emergency Management Agency (FEMA) flood insurance rate maps

3.4.2 Identification of Shorelines for the Shoreline Master Program Update

Anchor QEA reviewed the existing datasets and classified the accuracy of the Shoreline Management Plan, Lakes, and Rivers data to represent the ordinary high water mark (OHWM) of the shoreline. The USGS's National Hydrography Dataset Area, Flowline, and Waterbody datasets, as well as Ecology's suggested shoreline polygon and line datasets, were used as baseline for comparison. There were significant variations in the accuracy related to differences in the sources of data. In many cases, recent and historical aerial imageries were used to determine which of the available datasets provided the most accurate representation of the actual shoreline locations.

Anchor QEA determined the upstream extent for the Columbia and Snake rivers, based on geographic boundaries of the City and its UGA, from WAC listings for Franklin County for these waterbodies. Using these upstream extents, datasets were compared to recent imagery to determine the accuracy of various datasets in representing the stream OHWM, as well as the extent of associated features such as riparian wetlands.

In a separate Shoreline Jurisdiction Analysis completed for Franklin County (Anchor QEA 2014), it was recommended that Esquatzel Coulee be removed from the shoreline jurisdiction due to physical factors and the authorized uses for the water for

irrigation. Additionally, within the SMA, there are criteria to provide for reasonable access to water and water-related uses. In Esquatzel Coulee, downstream of the Esquatzel Diversion Channel, there are few to no water-related uses; data suggest little water exists within the creek.

The current City SMP includes two Shorelines of Statewide Significance; Anchor QEA's analysis does not change this result, as shown in Table 4.

Table 4
Streams of Statewide Significance to be Included in the SMP Update

Stream/Lake Name	Included in Current City of Pasco SMP	Total Length/Area Proposed Shoreline
Columbia River	Yes	14.4 miles
Snake River	Yes	2.8 miles

3.4.3 Preliminary Shoreline Jurisdiction Areas

As discussed in Section 3.1, the shoreline jurisdiction is the geographic area where the SMA applies and includes all Shorelines of the State and shorelands as defined by the SMA (RCW 90.58.030). Shorelines of the State to be included in the SMP update are summarized in Section 3.4.2. This section describes how the extent of the shoreline jurisdiction, including the shorelands, was determined.

The extent of the preliminary shoreline jurisdiction was determined (mapped) using the following steps:

- All shorelines meeting the definitions described in Table 2 and identified above were buffered by 200 feet.
- All wetlands from the USFWS National Wetland Inventory dataset that intersected any part of the 200-foot buffer were provisionally included.
- Those wetlands identified were reviewed for spatial accuracy to determine if any part of them intersected the 200-foot buffer. If so, they were included.
- Any additional wetlands in the floodway of streams, meeting the shoreline definition above, were provisionally included.

3.5 Reach Breaks

Reaches are specific segments of the shoreline that are typically distinguished by the relative intensity of land use development patterns, the physical landscape, or critical biological processes. Reaches are numbered sequentially (i.e., 1, 2, 3, etc.) with subreaches listed alphanumerically (i.e., a, b, c, etc.). Reaches and subreaches provide the basis for the in-depth analysis and characterization information in this report. Physical changes often translate into differences in the function of the shoreline with regards to ecological and physical processes, which in turn may influence the shoreline designation.

The reach delineation was performed by evaluating aerial photography, topographic data, geologic maps, land cover data, and existing and future land use, which was considered in concert with the rivershore segments identified in the City's Rivershore Linkage and Amenity Plan (Pasco 2012). The Rivershore Linkage and Amenity Plan (attached as Appendix C) provides guidance for a coordinated long-term development plan along the City's waterfront. In many cases, reaches were further divided into subreaches in the analysis and characterization to identify different patterns in land use, ownership, zoning, level of development, and future development plans.

A list of the IAC reaches and subreaches for the shoreline jurisdiction areas within the City and the associated rivershore segments as delineated in the Rivershore Linkage and Amenity Plan are provided in Table 5.

Table 5
IAC Reach and Subreaches and Associated Rivershore Segments

Shoreline	Reach (Subreaches)	Rivershore Segment ¹
Columbia River	1a	Kohler
	1b	Dream View
	1c	Pasco Ranch
	1d	Horrigan Farms
	1e	Rivershore Estates
	2	Columbia View
	3a	Chiawana Park
	3b	Sunset Acres
	4a	Levee #2
	4b	Wade Park
	5a	Moore Mansion
	5b	Flamingo Village
	5c	Riverview Park
	5d	West Cable Bridge
Snake River ²	6a	Marine Terminal
	6b	Boat Basin
	6c	Port of Pasco
	7	Sacajawea Park
	8a	Ainsworth Town
	8b	Tidewater Terminal

Notes:

1 = Rivershore segments are mapped in the City's 2012 Rivershore Linkage and Amenity Plan.

2 = Reach 8 is along the Snake River just upstream of the confluence of the Columbia and Snake rivers.

4 CITY OF PASCO INVENTORY

Section 4 provides an inventory of the existing shoreline areas. The review includes information on existing land use, zoning, shoreline designations, geology, climate, water resources, geologic hazards, and historical and cultural resources.

The summary of acreages provided in the Tables 6 through 12 are meant to illustrate the general distribution of ownership, land cover, and land use types within the City and its shoreline jurisdiction. The acre values are based on a variety of data sources and do not reflect the exact total acreage of land within the City or its shoreline jurisdiction. Data mismatched between the total acreages provided in Tables 6 through 12 are due to the data sources and the lack of zoning designations for UGAs.

4.1 Ownership and Land Cover

Ownership within the City is dominated by private lands. Public lands are dominated by City-owned parcels. The U.S. Army Corps of Engineers owns lands at various locations along the shoreline of Columbia River. Sacajawea State Park is public space owned by Washington State Parks and Recreation at the confluence of the Columbia River and the Snake River. Table 6 summarizes the percentage of ownership types within the City limits and UGA.

Table 6
Ownership Types within the City of Pasco

Ownership Type		Owner	Acreage	Percentages
Public	Federal	United States	168	0.60%
		U.S. Army Corps of Engineers	220	1.0%
		U.S. Bureau of Reclamation	411	1.5%
	State	Department of Natural Resources	1,015	3.62%
		Washington State Parks and Recreation	286	1.0%
		Washington Department of Transportation	65	0.23%
		Other	7	0.03%
	Local	City of Pasco	584	2.1%
		Port of Pasco	2,764	9.8%
Private	All Private		22,540	80.3%
TOTAL			28,060	100%

Land ownership within shoreline jurisdiction includes upland lands (above the OHWM) and aquatic lands (below the OHWM). Upland shoreline jurisdiction lands are roughly 73% publically owned and 27% privately owned. Washington State Parks and Recreation is the largest public owner of shoreline lands at 31%, including Sacajawea State Park. The U.S. Army Corps of Engineers owns 21% of the upland area from Chiawana Park to State Route 397 bridge. Port of Pasco owns 11% in the industrial area between State Route 397 bridge and Sacajawea State Park. The remaining publically owned lands can be found at various locations in Reaches 1, 5, and 6. Aquatic shoreline jurisdiction lands are almost entirely publically owned among various federal and state agencies. See Table 7 for a summary of ownership for upland shoreline jurisdiction areas.

Table 7
Ownership Types within City of Pasco Shoreline Jurisdiction

Ownership Type		Owner	Acreage (above OHWM)	Percentages
Public	Federal	United States	43	7.4%
		U.S. Army Corps of Engineers	123	21.1%
	State	Washington State Parks and Recreation	179	30.7%
		Washington State Department of Transportation	8	1.4%
	Local	City of Pasco	7	1.2%
		Port of Pasco	66	11.3%
Private	All Private		157	26.9%
TOTAL			583	100%

Note:

OHWM = ordinary high watermark

Land cover is dominated by developed areas and shrub/scrub habitat (not including open water) within the City limits and within the shoreline jurisdiction. See Tables 8 and 9 for a summary of land cover types within the City limits and UGA within the City's shoreline jurisdiction.

Table 8
Land Cover Types within City Limits and Urban Growth Area

Land Cover Type	Acreage	Percentages
Agriculture	5,117	19.9%
Shrub/Scrubland	5,643	21.9%
Pasture/Grass	427	1.6%
Developed	14,528	56.4%
Wetlands	48	0.2%
TOTAL	25,763 ¹	100

Notes:

Source: U.S. Department of Agriculture-National Agricultural Statistics Service Cropland Data 2012

1 = Not including open water

Table 9
Land Cover Types within City of Pasco Shoreline Jurisdiction

Land Cover Type	Acreage	Percentages
Agriculture	43	7.7%
Shrub/Scrubland	220	39.2%
Pasture/Grass	5	0.9%
Developed	243	43.1%
Wetlands	51	9.1%
TOTAL	562 ¹	100%

Note:

Source: U.S. Department of Agriculture-National Agricultural Statistics Service Cropland Data 2012

1 = Not including open water

4.2 Land Use

4.2.1 Existing Land Use

The City is part of the Tri-Cities Metropolitan Area in southeast Washington and includes 25,247 acres in the current incorporated City limits and an additional 5,433 acres within its associated UGA. The City is located at the southern edge of Franklin County, bounded by the Columbia River to the south and the Snake River to the southeast. The City is the major urban area within Franklin County. The City and its associated UGA comprise about 72% of the 55 square miles of designated UGA in Franklin County (Franklin County 2008).

The City includes a variety of land uses from residential and commercial/industrial to Open Space. The City's land use designations and acreages are identified in the 2008 Comprehensive Plan. Residential land is the predominant use in the City, containing over 45% of the City's total land. Residential land use is followed by industrial land use, which consists of more than 36% of the total land use within the City. Commercial lands are mostly located near the City Center and along the Interstate-182. Open space land use is distributed throughout the City in the form of parks and natural open spaces. The shoreline areas consist of several parks, trails, and natural open space. See Table 10 for a summary of land use types in the City.

Table 10
Existing Land Use in the City

Land Use Designations	Acreage ¹	% of Total
Residential Lands	11,505	45.6%
Low Density	9,791	
Mixed Density	1,577	
High Density	137	
Commercial Lands	2,546	10.1%
Mixed Residential/Commercial	374	
Commercial	2,172	
Industrial Lands	9,229	36.6%
Public/Quasi-Public Lands	732	2.9%
Open Space Lands	1,235	4.9%
TOTAL	25,247	100%

Note:

1 = Includes shoreline jurisdiction

Unlike the Citywide land use pattern, the City's shoreline is dominated by Open Space land use consisting of 60% of the total shoreline area. Industrial land use consists of over 25% of the shoreline. Much of the Open Space area is owned by the U.S. Army Corp of Engineers. Washington State Parks and Recreation Department also owns Open Space (Sacajawea State Park) within the shoreline. Other major public landowners include Port of Pasco and Washington State Department of Transportation. Industrial land along the shoreline is

mostly owned by the Port of Pasco on the south and southeast sides of the City. Residential uses are mostly concentrated on the south side of I-182. See Table 11 for a summary of land use within the shoreline jurisdiction.

Table 11
Existing Land Use within the City's Shoreline Jurisdiction

Land Use Category	Acres in Shoreline	% of Land Use
Open Space	307.30	60.2%
Low Density Residential	68.24	13.3%
Mixed Residential	2.53	0.5%
Mixed Residential Commercial	2.38	0.5%
Industrial	130.21	25.5%
Commercial	0.02	0.0%
TOTAL	510.68	100%

The City's Comprehensive Plan land use categories and their purposes are discussed below.

- **Open Space/Nature** – This land use designation applies to areas where development will be severely restricted. Park lands, trails, and critical areas are examples of different types of open spaces.
- **Low Density Residential** – This land use allows residential development at a density of two to five dwelling units per acre. The land use designation criteria includes, sewer availability or approval from the Benton-Franklin Health District when sewer is not available, suitability for home sites, and market demand.
- **Mixed Residential** – This land use designation includes single-family dwellings, patio homes, townhouses, apartments, and condominiums at a density of 5 to 20 dwelling units per acre. This is designated to areas where the location is convenient to major circulation routes and it provides transition between more intense uses and low density uses. Availability of sewer services and market demand are also key criteria for this land use designation.
- **Mixed Residential Commercial** – This land use designation is a mix of residential and commercial uses. Residential uses include single-family dwellings, patio homes, townhouses, apartments, and condominiums at a density of 5 to 20 dwelling units per acre. Commercial uses include neighborhood shopping and specialty centers, business

parks, service, and office uses. This is designated to areas where the location is convenient to major circulation routes and land is suitable for heavy building sites.

- **Commercial** – This land use is designated for neighborhood, community and regional shopping and specialty centers, business parks, service, and office uses. This is designated to areas where the location is convenient to major circulation routes and land is suitable for heavy building sites.
- **Industrial** – This land use is designated for manufacturing, food processing, storage, and wholesale distribution of equipment and products, hazardous material storage, and transportation-related facilities.

The zoning regulates different uses and development within the City. See Table 12 for a summary of zoning within the City's shoreline jurisdiction.

Table 12
Existing Zoning within the City's Shoreline Jurisdiction

Zoning	Acres	% of Total
Low Density Residential (R-1)	0.15	0.04%
Medium Density Residential (R-2)	1.24	0.29%
Medium Density Residential (R-3)	0.35	0.08%
Residential Park (RP)	0.34	0.08%
Suburban (RS-1)	0.03	0.01%
Suburban (RS-12)	0.89	0.21%
Suburban (RS-20)	161.02	37.84%
Residential Transition (RT)	16.28	3.83%
Light Industrial (I-1)	61.27	14.40%
Medium Industrial (I-2)	119.20	28.01%
Heavy Industrial (I-30)	64.75	15.22%
TOTAL	425.52	100.0%

Notes:

Source: City of Pasco

Data mismatch between the total acreages provided in Table 11 and 12 is due to the lack of zoning designations for urban growth areas.

4.2.2 Water-dependent Uses

Water-dependent use means a use or portion of a use, which cannot exist in a location that is not adjacent to the water and is dependent on the water by reason of the intrinsic nature of its operations (WAC 173-26-020(36)).

Water-dependent uses in the City include boat launches, docks, and piers on Chiawana, Wade, and Sacajawea parks. The marina is located near the Schlagel Park. Private docks are also located adjoining residential properties on Columbia River. Port facilities include a barge dock on the Columbia River. Tidewater, a private transportation and terminal company, owns a barge dock along the Snake River.

4.2.3 Water-related and Water-enjoyment Uses

Water-related use means a use or portion of a use, which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because: a) the use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or b) the use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient (WAC 173-26-020 (40)).

Water-enjoyment use means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use. It can also be defined as a use that provides for recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general characteristic of the use and which through location, design, and operation ensures the public's ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment (WAC 173-26-020 (37)).

The City's shoreline consists of water-related uses such as industrial and barge facilities along the Snake River and the Port of Pasco's industrial facilities along the Columbia River. Water-enjoyment uses include much of the park and open space areas along the shoreline that provides for recreational use, including beach and shoreline access, as well as aesthetic

enjoyment of the shoreline on trail systems. The shoreline also contains fishing and passive recreation (e.g., bird watching) opportunities on multiple shoreline locations.

4.2.4 Non-water-related Uses

Non-water-related uses directly adjacent to the water are largely limited to a small area of single family use along the Columbia River in the vicinity of I-182 and the northern part of the UGA. There are also some agricultural uses within the UGA.

4.3 Current Shoreline Master Program Environment Designation

The City uses the current Franklin County SMP to regulate developments within its shoreline. The 1974 Franklin County SMP includes four shoreline environment designations:

1. Natural
2. Conservancy
3. Rural
4. Urban

4.3.1 Natural

The purpose of assigning an area to the Natural environment is to preserve and restore those natural resource systems existing relatively free of human influence. Local policies to achieve this objective should aim to regulate all potential developments degrading or changing the natural characteristics, which make these areas unique and valuable.

The primary determination for designating an area as a Natural environment is the actual presence of some unique natural or cultural features considered valuable in their natural and original condition, which are relatively intolerant of intensive human use.

4.3.2 Conservancy

The purpose of assigning an area to the Conservancy is to protect, conserve, and manage existing natural resources and valuable historic and cultural areas to ensure a continuous flow of recreational benefits to the public and to achieve sustained resource utilization.

The Conservancy environment is for those areas that are intended to maintain their existing character. Nonconsumptive use of the physical and biological resources of the area is preferred. Nonconsumptive uses utilize resources on a sustained basis, while minimally reducing opportunities for other future uses of the resources in the area. Activities and uses of a non-permanent nature, which do not substantially degrade the existing character of an area, are appropriate uses for a Conservancy environment. Examples of predominant uses include diffuse outdoor recreation activities and passive agricultural uses such as pasture and range lands.

4.3.3 Rural

The purpose of Rural environment is to protect agricultural land from urban expansion, restrict intensive development along undeveloped shorelines, function as a buffer between urban areas, and maintain open spaces and opportunities for recreational uses compatible with agricultural activities.

The Rural environment is intended for those areas characterized by intensive agricultural and recreational uses and those areas having a high compatibility to support active agricultural practices and intensive recreational development.

4.3.4 Urban

The purpose of assigning an area to Urban environment is to ensure optimum utilization of shorelines occurring within urbanized areas by providing for intensive public use and managing development, so it enhances and maintains shorelines for a multiplicity of urban uses.

The Urban environment is an area of high intensity land use, including residential, commercial, and industrial development. It is particularly suitable to those areas presently subject to extremely intensive use pressure, as well as areas planned to accommodate urban expansion.

4.4 Geology

The geology, soils, and topography of the City area are primarily dictated by glacial outburst flooding that occurred near the end of the last major glacial period, approximately 18,000 to 20,000 years ago. This event is referred to as the Missoula Floods. The geologic makeup is the result of erosion of pre-flood geologic units, deposition of sediments carried by the floodwaters, and the formation of the unique topographic features that influence present-day hydrology. Prior to the Missoula Floods, the geology of Franklin County consisted primarily of Miocene-aged Columbia River Basalt flows that were in some places (e.g., plateaus) capped with varying thicknesses of wind-blown fine sands and silt known as loess (Grolier and Bingham 1978). The segments of the Columbia and Snake rivers around the City are located in a wide valley primarily comprising alluvial soils with relatively high infiltration rates. Within upland areas, particularly areas farther from the confluence of the river, outburst flood deposits of gravel occur as well.

4.5 Climate

The City falls within the Central Basin region of Washington, which has the lowest precipitation rates within Washington. Annual precipitation in the City averages around 7.15 inches and precipitation is commonly associated with summer thunderstorms and winter rains and snowfall. Snowfall depths rarely exceed 2 to 3 inches and occur from November to March. High temperatures in January can range from 35 to 45 degrees Fahrenheit (1.6 to 7.2 degrees Celsius [°C]) with low temperatures between 20 to 30 degrees Fahrenheit (-6.7 to -1.1 °C). Summer high temperatures are usually in the high 80s to low 90s with low temperatures in the high 50s (WRCC 2013).

4.6 Water Resources

4.6.1 Surface Water Resources

The planning area is mostly located in the Esquatzel Coulee basin (Water Resource Inventory Area 37). A small area along the eastern boundary of the planning area is located in the lower Snake River basin (Water Resource Inventory Area 33). Major surface water resources are the Columbia River and Snake River.

Lake Wallula is the major surface water resource for the planning area. The portion of the Columbia and Snake rivers within the planning area is part of the upstream portion of Lake Wallula. The lake is created from the impoundment of the Columbia River by McNary Dam.

The Columbia River's active continuous USGS gage nearest to the planning area is gage #12514500 (Columbia River on Clover Island at Kennewick, Washington). The Columbia River at this gage drains 104,000 square miles. This gage is a water surface elevation gage and has records from Water Year 1988 to present. The water surface elevation at this gage ranges from 335 feet to 344 feet (NGVD 1929).

The closest Snake River historic USGS gage that measured streamflow near the City is gage #13353000 (Snake River below Ice Harbor Dam, Washington). The Snake River at this gage drains 108,500 square miles. It has records from Water Years 1913 to 2000.

Because the planning area is within the Lake Wallula portion of the Columbia and Snake rivers, water levels are generally stable. Floodplain levels are also confined due to river regulation.

4.6.2 *Surface Water Quality*

The Columbia and Snake rivers are on the Ecology 303(d) list of impaired waters for temperature within the planning area. The Columbia River also has a total maximum daily load (TMDL) for total dissolved gas and is a 305(b) water of concern for pH. Additionally, the Snake River has TMDLs for dioxin and total dissolved gas, and it is a 305(b) water of concern for pH and dissolved oxygen.

Temperature and total dissolved gas are measured in the Columbia and Snake rivers at several gages as part of the Columbia River Data Access in Real Time (DART) program. The DART gage nearest to the planning area on the Columbia River is gage PAQW (Columbia River at Pasco, Washington). This gage has been in operation since 2000. The DART gage nearest to the planning area on the Snake River is gage IDSW (Ice Harbor Tailwater). This gage has been in operation since 2005.

4.6.3 Floodplain and Floodway

Damage from flooding along the Columbia River occurred in 1948 prior to the construction of the dam system. The flood stage for the Columbia River is 32.0 feet and is measured at the gage downstream of the Priest Rapids dam. During maintenance of the Priest Rapids Dam spillway in July of 2012, high outflows from the dam raised the river near flood stage in the Tri-Cities (KNDU 2012). The floodway boundary is shown in the Map Folio in Maps 2a and 2b. The flood stage for the Snake River is 20.0 feet and is measured at USGS gage #13334300 (Snake River near Anatone, Washington).

4.6.4 Channel Migration Zone

The Channel Migration Zone is the area along a river within which the channels can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings (WAC 173-26-020). These areas adjacent to a stream or river are susceptible to future erosion (Rapp and Abbe 2003).

The Columbia and Snake rivers are stable, confined, single-thread channels with low sinuosity and largely unvegetated depositional mid-channel islands and bars. The flooding risk is low in the Columbia and Snake rivers due to the levy and dam system maintained by the U.S. Army Corps of Engineers. Therefore, no Channel Migration Zone is present adjacent to the City.

4.6.5 Groundwater Resources

Groundwater in the planning area is within the Columbia Plateau aquifer system, which consists of the Columbia River Basalt Group overlain by quaternary flood deposits. Groundwater in the planning area is hydraulically connected to surface water, so the amount of groundwater pumping affects surface water stream flow, and groundwater resources are recharged by surface water interaction. The estimated mean annual groundwater recharge in the planning area is up 2 inches (USGS 2011).

4.7 Geologic Hazards

Geologically hazardous areas are defined as those lands susceptible to erosion, landslides, seismic, or mine hazard events. Surficial geology is shown on Map 4 in the map folio. The boundary of this area is based on a 200-foot buffer from either the OHWM of the Columbia and Snake rivers or from the floodway boundary as determined by FEMA flood insurance maps.

Table 13
Geologic Hazards of the City

Hazard	Description	Summary	Source
Erosion	Soil units susceptible to erosion by wind, water, and unstable slopes	About 0.62% (17.41 acres) of shoreline jurisdiction areas have been identified as being severe water erosion hazards (Riverwash).	Soils – Water Erosion Hazards GIS Data (Franklin County)
Landslides	Steep Slopes underlain by weak, fine, and unstable geology	About 0.003% (8.45 acres) of shoreline jurisdiction area has slopes greater than 15% underlain by alluvium or dune sand. No area in the City is mapped as an active landslide area.	Generalized Slope GIS Data (Franklin County), Surface Geology Polygon, 1: 100,000 Scale (WDNR) Active Landslide Area GIS Data (Franklin County)
Seismic Hazards	Active faults and earthquake locations	There is no known fault exist in the City.	Active fold and fault GIS data layers (WDNR)
Mine Sites	Active (permitted) mine sites	Two mine sites were identified; both mines were for sand or gravel. Underground mining practices are currently not taking place in Franklin County. There are no known inactive mines sites; however, if they exist, these areas may present slope hazards.	Mining and Energy Resources GIS data (WDNR) 2004, 2010, 2011, and 2012

Note:

WDNR = Washington Department of Natural Resources

4.8 Cultural Resources

The City is located at the confluence of the Columbia and Snake rivers. It is in the Southern Plateau, part of the larger Columbia Plateau culture area. The Southern Plateau stretches from southern Okanogan County in the north to the northern border of the Great Basin to

the south. The prehistory and history of the Southern Plateau is briefly summarized here. Known archaeological and historic sites are discussed, as well as potential for archaeological and historic sites.

4.8.1 Historical Background

At the end of the Pleistocene era, hunters of large mammals fanned out across North America. This period is known in the Columbia Plateau as Paleoindian (Ames and Maschner 1999), and in the southern Plateau as Period Ia (Ames et al. 1998). In the Columbia Plateau as a whole, Chatters and Pokotylo (1998) included these early mobile foragers in the Early Period from about 11,000 to 8,000 years ago. The earliest Paleoindian sites recorded in the Columbia Plateau are attributed to the Clovis culture, including the Ritchey-Roberts Clovis cache in East Wenatchee, which dates to 12,250 ago (Mehring and Foit 1990).

After the brief but widespread Clovis occupation, a broad-spectrum, hunter-gatherer culture developed in the Columbia Plateau region and persisted until the middle Holocene, around 5,300 years ago. This culture spans the latter part of the Early Period and the Early Middle Period in the Columbia Plateau sequence (Chatters and Pokotylo 1998), and Period Ib in the Southern Plateau sequence (Ames et al. 1998).

A shift toward more permanent settlement began around 6,000 years ago. Known as the Late Middle Period in the Columbia Plateau, and Period II in the Southern Plateau, this period lasted until the beginning of the early Holocene around 3,000 years ago (Chatters and Pokotylo 1998; Ames et al. 1998). In general, Period II tool assemblages are characterized by the addition of groundstone and bone/antler tools to the existing flaked stone technology.

Late Holocene cultures in the Columbia Plateau region exhibit a, “shift in adaptations...to storage-dependent collector strategies” (Chatters and Pokotylo 1998), which are characterized by intensive salmon fishing and associated storage features, social inequality, large permanent winter villages, and diverse tool assemblages. Labeled the Late Period, this shift begins around 4,000 years ago and persists until historic contact (Chatters and Pokotylo 1998). In the southern Columbia Plateau, the contemporaneous Period III also

includes evidence of intensive camas processing and fiber and wood artifacts preserved in the relatively dry climate (Ames et al. 1998). The late Holocene archaeological cultures correlate with historical ethnographic descriptions.

The Columbia-Snake River confluence has a rich archaeological record, with sites in the area attributed to all of the Southern Plateau cultural phases. There are 22 recorded archaeological sites within a mile of the confluence. National Register of Historic Places (NRHP)-listed properties include the Lower Snake River Archaeological District and the historic Ainsworth town site.

The City is in the traditional territory of Sahaptin-speaking Plateau peoples (Walker 1998; Kershner 2008). Traditional Plateau cultures were based on a seasonal round that took advantage of fish runs, game, and root resources, as well as trade, kinship ties, and intermarriage among groups (Walker 1998). Prior to historic resettlement, permanent winter villages anchored the seasonal round (Boyd and Hajda 1987). Villages consisted of large mat lodges, each housing an extended family, and occasionally also smaller conical structures (Stern 1998; Schuster 1998). Villages were the basic political unit (Schuster 1998).

Fishing activities revolved around an early salmon run in March, and a second, larger run in June (Schuster 1998). Fishing technology included the portable (toggling harpoons, leisters, hook-and-line, and nets) and the non-portable (traps, weirs, and platforms at permanent fishing stations; Schuster 1998). Gathering activities took place throughout the year. Fish, roots, and berries were processed, dried, and stored. Although salmon were a key staple, plant foods also made up a significant portion of the diet (Hunn 1981). Religious life involved adherence to the Guardian-Spirit complex, which included the sweatlodge and curative sings and the Washat religion, which was based on ceremonies held in the longhouse and included first food feasts in the spring celebrating the return of the salmon and newly sprouting plants (Schuster 1998).

By the time of the first sustained contact between the tribes of the City area and Euro-American settlers in the mid-1800s, tribal life had already been significantly impacted. Introduced diseases decimated the population (Vibert 1997) while the introduction of the

horse altered social and economic activities. Still, the area is described in historical accounts as a busy gathering place for trade and resource procurement (Kershner 2008).

The earliest recorded Euro-American exploration of the Columbia River was in 1792 (Hayes 1999), but settlement of the region was slow until the 1840s when Americans were attempting to wrest control from the British (Mackie 1997). The Oregon Treaty of 1846 awarded the Oregon Territory to the United States. In 1853, Washington became a territory separate from Oregon, and by the next year, governors of both territories began pursuing treaties that relegated tribes to reservations (Wilma 2003). Fourteen tribes and bands signed the Treaty of 1855 that established the Yakama Indian Reservation (YNM 2011).

The Lewis and Clark expedition recorded the first description of the confluence of the Columbia and Snake rivers in October of 1805, and David Thompson passed through in 1811 (Nisbet 2005). The North Pacific Railroad through the area was built in the late 19th century (partially by Chinese laborers), bringing additional settlement. The town of Ainsworth was platted in 1879 as a railroad camp at what is now Sacajawea State Park, and became the county seat of Franklin County when it was created from Whitman County in 1883 (Kershner 2008). A rail bridge over the Columbia River from Pasco to Kennewick was built in 1887. Pasco was named the county seat in 1885 and incorporated in 1891. A roadway bridge across the Columbia River was constructed in 1922 (Gibson 2005). The economy was primarily agricultural until the 1940s, when the Pasco airfield became a Naval air station and plutonium production was established across the river at Hanford (Sanger 1995; Gibson 2005). Pasco maintained economic activities beyond supporting Hanford, including agricultural chemical storage and distribution, and those became more prominent as the military sector declined in the 1950s. Agriculture, transportation, and logistics remain important today (Kershner 2008). The Hanford plant was deactivated piecemeal in the 1990s, though many Pasco residents are still employed in maintenance and cleanup at the site (Gerber 1992).

4.8.2 Recorded Cultural and Historical Resources

The Department of Archaeology and Historic Preservation maintains an electronic database of archaeological sites, historic structures, and cemeteries. The database shows 13 recorded

sites within City limits, 12 of them along the shoreline. The Tri-Cities Archaeological District, an NRHP-eligible district, is partially within the City. Almost the entire Columbia River shoreline within City limits is within the boundaries of an archaeological site or district. Several of the sites include human remains. There are dozens of potentially historic structures in the City, at least seven of which are located within the shoreline jurisdiction, as is the NRHP-listed James Moore house (commonly known as the Moore Mansion).

4.8.3 *Potential for Archaeological and Historic Resources*

The City area has a dense concentration of archaeological and historic resources, many with exceptional significance and cultural value. The following archaeological and historical site types could be expected:

- Lithic scatters, quarries, and caches
- Precontact habitation sites (camps, villages, and cave sites)
- Burial sites and cemeteries
- Resource procurement sites (fish traps and camas ovens)
- Pictographs and petroglyphs
- Historic habitation sites (homesteads, farms, and cabins)
- Historic agricultural infrastructure
- Historic and precontact transportation corridors (trails, routes, railroad grades, and road grades)
- Historic public works infrastructure (dams and transmission corridors)

Some sites may be on or near the surface, and others may be deeply buried, depending on the localized geomorphology.

4.8.4 *Cultural Resources and Shoreline Development*

State and local cultural resources laws apply to shoreline development. State laws include RCW 27.53 (Archaeological Sites and Records), which prohibits the unpermitted removal of archaeological materials and establishes a permitting process, and RCW 27.44 (Indian Graves and Records), which describes how human remains must be treated.

Given the importance of shoreline locations throughout the human history of the area, the potential for cultural resources should be considered high for any shoreline development permit unless demonstrated otherwise. To comply with state and local law, applicants should be prepared to follow the provisions of RCW 27.53 and 27.44 if cultural resources are identified or encountered during the planning or construction process.

5 SHORELINE ANALYSIS AND CHARACTERIZATION

5.1 Ecosystem-wide Processes and Conditions

An ecosystem is a natural system consisting of biological (plants, animals, and microorganisms), physical, and chemical factors that together make up the environment. Ecosystem-wide processes are defined by statute as, “the suite of naturally occurring physical and geologic processes of erosion, transport, and deposition; and specific chemical processes that shape landforms within a specific shoreline ecosystem and determine both the types of habitat and the associated ecological functions” (WAC 173-26-020 (14)). Processes occur at multiple scales and are influenced by hydrology, geology, topography, soils, land cover, and land use characteristics. These processes determine the types and quality of shoreline functions or services that contribute to the maintenance of aquatic and terrestrial environments that make up an ecosystem (WAC 173-26-020 (13)).

The following sections discuss ecosystem processes and habitat structures that these processes form and maintain. This section also describes conditions, including alterations to the ecosystem process, for the Columbia and Snake rivers and shoreline within the City and the UGA boundary. Alterations to ecosystem processes can affect habitat structure and the availability of habitat services, especially during long periods of time. Ecosystem processes and conditions in the City are presented through the categories of hydrology, sediment, water quality, and habitat.

5.1.1 Hydrology

5.1.1.1 Ecosystem Process

The process of water delivery, movement, and storage within an ecosystem is largely affected by landform, geology, soil characteristics, and climate, including precipitation. Rain and snowmelt provide the hydrologic inputs into a watershed. This cycle affects other physical, chemical, and biological functions of the river system. The speed that water flows through the watershed also affects whether nutrients, sediments, or other materials are deposited or retained in the water and transported through the watershed.

Water is delivered to streams primarily from surface water runoff from higher elevations and, in some cases, from groundwater. The horizontal structure of river and stream channels includes the wetted channel zone where water is present during low-flow events, an active channel that is seasonally inundated, and the riparian zone located above seasonal high water elevations. The vertical structure of these systems includes a benthic zone along the surface of the bottom substrate and the hyporheic zone, which provides a transition between the surface and the groundwater, or phreatic zone. Hyporheic and benthic zones cycle out excessive nutrients and contaminants, store and transport water and sediment, maintain base flows, and can support vegetation and microorganism communities. The interaction of hydrologic and geomorphic processes contributes to habitat structures useful to aquatic species, including shallow water and off-channel refugia, gravel bars, pools, riffles, and the transport of organic material, including large woody debris.

5.1.1.2 *Conditions in the City of Pasco*

The Columbia River and Snake River are the City's two major surface water resources. Along the Columbia and Snake rivers, McNary Dam operations affect the hydrologic processes. Major alterations from this system include the artificial storage and release cycle that produces higher than natural flows in the late summer and fall and lower than natural flows in the spring and early summer. Riparian vegetation and aquatic species adapt to seasonal inundation fluxes, and these changes in the natural flows may adversely affect these systems and species.

Flood storage occurring in the upper Snake River and Columbia Basin outside of the City reduces the frequency, duration, and magnitude of floodplain inundation, while decreasing the floodplain size. This change in the hydraulic regime also affects the cycling of sediment, nutrients, and organic materials within the river, as discussed below.

5.1.2 *Sediment*

5.1.2.1 *Ecosystem Process*

Sediment delivery through a watershed is based on interactions among gravity, wind, and water across the various geologic features, soils, and land covers. Landslides and mass wasting are a function of slope, soil, and water interacting to create instability. Soil erosion is

a function of slope, soil cohesiveness, and ground cover interacting with water or wind forces. Sediments transported by water or wind are deposited wherever and whenever the water or wind transporting them slows. As the size of sediment increases, the water or wind force required to transport the sediment increases, so smaller sediment is able to travel farther than larger sediment when the transporting forces decrease. This is often within topographic depressions where sediment is deposited into lakes, stream pools, wetlands, and floodplains. The sediment erosion, transport, and deposition cycle is a major aspect of river and stream channel formation and channel migration.

The maintenance of shallow water habitat along the Columbia and Snake rivers is driven by the recruitment and transport of appropriately sized sediments. Shallow water areas with small and clean natural substrates (e.g., sand and pebbles) are important for benthic production and as refuge for juvenile fish. Coarser substrates tend to provide habitat for predatory fish. Fine sediment (e.g., silt and clay) can decrease water quality by creating turbidity that adversely affects some aquatic species.

Shoreline armoring typically exists in developed areas or in areas where significant infrastructure exists, such as overwater bridge crossings or boat ramps. These armoring structures tend to disconnect natural sediment sources from erosion by forming a physical barrier between the shore and the water itself. The wave energy reflected off of these types of armoring leads to the washing away of smaller substrate sizes that support small benthic animals and also prevents riparian vegetation establishment with associated habitat functions.

5.1.2.2 Conditions in the City of Pasco

Channelization of streams can include hardening of banks with levees or revetments, straightening of channels, deepening of channels, removal of roughness that impedes flow, and other efforts to minimize the migration of the channel while maximizing flow capacity. The McNary Levee System (also known as the Tri-Cities Levees), along the banks of the Columbia and Snake rivers, is located in the planning area.

Fine sediment inputs to the Columbia and Snake rivers are accelerated through agricultural tillage and disturbed, undeveloped lands adjacent to or upland of the planning area. Urban development adjacent to Reaches 2 through 7 may protect these reaches from agricultural runoff impacts.

Sediment transport is affected by diking of river segments. Dikes reduce spring flooding and associated sediment deposition within the surrounding floodplain. Dike grading occurs along the Columbia and Snake rivers to protect residential and commercial properties, as well as infrastructure. The dikes are topped with multi-use trails throughout much of the shoreline, allowing for public recreation and enjoyment of the waterfront. Sediment in the Columbia and Snake rivers is generally restricted by regulated operations upstream. Geologic units with higher landslide potential in some City areas could contribute to increased sediment input during storm events. Sediment may build up within the City areas due to generally slower velocities within the pool of Lake Wallula.

5.1.3 *Water Quality*

5.1.3.1 *Ecosystem Process*

The combined processes that deliver, transport, and store water and sediment in the ecosystem have a substantial impact on water quality. Impacts to water quality occur through land cover changes and development; chemical use in manufacturing, agriculture, and recreation; pathogens from waste; temperature; and natural processes such as plant respiration.

Human-induced changes to water quality (e.g., industrial effluents, sewer overflows, and runoff from upland areas) can alter river and lake water temperatures, turbidity, and oxygen content, as well as nutrient, toxin, and pathogen concentrations (Karr 1995; Welch and Lindell 1992). In general, these changes can affect the presence, abundance, and vitality of all aquatic organisms. Water delivery and water quality is affected by soil loss, soil compaction, and road and building construction typically associated with development and urbanization. These activities increase the amount of impervious surface (e.g., parking lots and roads), reduce the percolation of precipitation into the ground, and concentrate pollutants into stormwater discharge areas. Reduced water infiltration increases the amount

and rate of surface water runoff, causing high stream discharge or high direct delivery of water to the stream and lake shorelines (Dunne and Leopold 1978; Arnold and Gibbons 1996; Poff et al. 1997).

Fertilizers, pesticides, and automobile- and boat-generated pollutants are linked to runoff-borne pollution that enters streams and lakes. Toxins from these and other human-induced changes previously described can settle in river pools, contaminating the sediments of the benthic zone. This leads to toxins either directly affecting benthic species through illness and mortality, or indirectly affecting aquatic and terrestrial species through bioaccumulation from animals lower on the food chain.

Many pathogenic protozoa, bacteria, and viruses can be found naturally in the environment, some of which occur as a result of fecal wastes deposited by animals. These come from fecal material of wildlife and domesticated animals deposited within upland areas that drain into aquatic ecosystems or deposited directly into them (Sherer et al. 1992; Stanley et al. 2005). A higher concentration of domesticated livestock (such as in livestock farms or concentrated animal feeding operations) can increase the potential of fecal material draining to shoreline areas.

Solar energy input can be another important factor that impacts water quality, especially in the summer when high temperatures coincide with high nutrient loads from agricultural runoff and lower river flows. This can result in high water temperatures and very low levels of dissolved oxygen, both of which can alter the ecology of rivers and streams. Water temperature, a physical characteristic, affects the chemical process of breaking down organic material into nutrients, as well as the biological processes of phytoplankton and zooplankton reproduction and the metabolism of fish species.

Water temperatures, plant respiration, and biological decomposition are also inversely related to dissolved oxygen levels, which play a critical role in supporting aquatic organisms such as salmonids. Similarly, alkalinity/pH and nutrient concentrations influence biological processes, particularly phytoplankton production.

5.1.3.2 *Conditions in the City of Pasco*

The Columbia and Snake rivers are on the Ecology 303(d) list of impaired waters for temperature within the planning area. (See Section 4.6.2 for further description of water quality conditions in the City of Pasco.) Features within the City that may contribute to water quality concerns include impervious development over and near the river, recreational boating, and herbicide and pesticide use in residential landscaping.

5.1.4 *Habitat*

This section describes aquatic and terrestrial habitat conditions and the stressors that may affect the functions provided by these habitats in the City, focusing on habitat types such as aquatic, riparian, shrub-steppe; and functions such as foraging, breeding/nesting, and migration elements for terrestrial species; and spawning, rearing, and migration requirements for aquatic species.

5.1.4.1 *Habitat Structures*

Habitat is the natural environment in which particular species or populations have adapted to live. Habitat provides the physical conditions and biological functions needed to support the species as part of a larger ecosystem. The lifecycles of aquatic, avian, and terrestrial species vary, but are often interdependent, meaning the habitat requirements of a single species include other species on which they depend. A species may occupy several types of habitat throughout their life span, because the habitat requirements of a species can vary during different life stages and different seasons.

Habitat is often described in terms of the functions of reproduction, forage, and shelter (Morrison 1992):

- The reproduction needs of species vary greatly. All species have specific needs for areas to find a mate, reproduce, and successfully rear offspring (often referred to as breeding sites, birthing areas, and nest sites). Some species have very specific needs; for example, amphibians (frogs, toads, and salamanders) require water or moist areas for laying eggs and for larval development.
- Forage includes water and food sources. Water is a universal need of all species, while forage needs vary greatly by species. An important consideration is whether a

species is prey or a predator. Predators obviously require that the habitat needs for prey species are met.

- Shelter includes areas for safe resting, refuge or cover from predators, and shelter from environmental hazards (e.g., daytime or nighttime temperatures, extreme weather events, seasonal climate fluctuations, and unpredictable disturbances such as drought, fire, or flooding).

The shoreline zone within the City provides freshwater and terrestrial habitat, with a wide variety of habitat types and features within those types.

5.1.4.1.1 Aquatic Habitat

The aquatic habitat within the City consists of the Columbia and Snake rivers. The quality of the aquatic habitat within these systems is controlled by a number of key ecosystem features that combine to provide important ecological functions (or ecosystem services) and support an interconnected array of species, including numerous salmonids species listed as threatened under the ESA. Aquatic habitat features that support healthy salmonids stocks likely also support other aquatic dependent and aquatic-associated birds and terrestrial species. Some ecosystem features applicable to aquatic habitat within the shoreline management jurisdiction of the City include water quality (including presence of contaminants as well as water temperature); water depth; instream cover (such as presence of large rocks and woody debris); substrate size; aquatic and riparian vegetation; floodplain extent and health; and channel migration access.

Water quality is a primary ecosystem feature that affects presence and health of aquatic life. Within aquatic habitats, water quality can affect survival of fish through low dissolved oxygen conditions (less than 3 parts per million [ppm] in warm water streams, or less than 5 ppm in cold water streams), very low alkalinity, high turbidity conditions, presence of contaminants, and high temperatures. Freshwater fish in the Columbia and Snake rivers include cold water fish (including ESA-listed salmon and bull trout [*Salvelinus confluentus*]) that have an upper lethal limit of approximately 25 degrees Celsius (°C), warm water fish (e.g., largemouth bass [*Micropterus salmoides*]) that can tolerate temperatures as high as 36°C, and cool water fish (e.g., non-native smallmouth bass [*Micropterus dolomieu*]) that have

similar tolerances to warm water fish but require cooler average temperatures during the growing season.

Water depth and water quantity requirements vary by species and life stage; for example, areas near channel margins with shallow water depths are needed for migration of salmonids juveniles, while migrating adults may utilize deeper waters. Substrate requirements can vary by species, but many salmon cannot spawn in substrate smaller than gravel.

Instream cover increases the structural complexity of a system through presence of large wood and larger rocks or boulders that improve the habitat quality for most fish. Instream vegetation, similar to instream cover, can improve habitat as long as the amount of aquatic vegetation does not create a low dissolved oxygen issue; in general, native aquatic vegetation provides important habitat conditions while introduced species such as Eurasian watermilfoil (*Myriophyllum spicatum*) do not. As a result of habitat simplification arising from the completion of hydroelectric dams, these features of instream cover are largely absent from within the Columbia and Snake River systems within the City.

Riparian vegetation stabilizes banks, reduces summer temperatures, provides nutrients through leaf debris and insect fall, and provides in-stream cover through tree-fall. Floodplain habitat is required for many fish species during multiple life stages. Extensive and unaltered floodplains that are accessible to fish species are ideal. However, the aforementioned completion of hydroelectric dams have inundated original floodplain habitat within the City. Water levels of the Columbia and Snake rivers are tightly managed, and access to remaining floodplain habitat by aquatic species is generally rare.

Instream cover, presence of riparian vegetation, and alteration of shorelines also affect the quality and intensity of available light energy in freshwater systems. Light energy affects water temperature, animal behavior (such as the relationship between predators and prey), and plant photosynthesis and growth (Tilzer et al. 1975). Natural light is altered when riparian vegetation is removed or when structures such as docks are built that create shade and prevent natural light from reaching the water. Reductions in this natural light preclude plant colonization and growth beneath these structures and can cause changes in animal

behavior. Natural light can also be reduced by the presence of algal blooms caused by excess nutrient additions that can collect in slack water areas.

5.1.4.1.2 Terrestrial Habitat

Urban and agricultural development within the City has resulted in loss, fragmentation, and degradation of shrub-steppe habitat. Habitat fragmentation occurs through the building of roads, utility corridors, agricultural use (including irrigation channels), and urban development, all of which can affect, aquatic and riparian habitat types. Movement corridors, which are crucial to wildlife, are affected by development through fragmentation. The migratory movement through these corridors may be seasonal, depending on the species. The primary function of a corridor is to connect disjunctive areas of habitat by allowing migration and dispersal among the areas. Movement corridors provide the following functions essential to healthy wildlife populations:

- Connectivity and, thereby, genetic variation and biodiversity among differing populations and habitats, connecting isolated habitats, and allowing recolonization of extirpated species
- Varying habitats for migration patterns (e.g., foraging, mating and nesting, rearing, shelter, and wintering) and allowing populations to move in response to habitat changes, such as fires
- Potential habitat for corridor dwellers—species that live within corridors for extended periods (Beier and Loe 1992)

Shrub-steppe upland habitat is the largest native land cover type in Franklin County and is also found within the City as small remnant patches. In some areas, shrub-steppe communities abut or nearly abut the shoreline, and there are small remnants of shrub-steppe habitat interspersed among the irrigated agricultural fields that displaced the original habitat. The primary remaining shrub-steppe plant association type in the City area is the big sagebrush (*Artemisia tridentata*)-bunch wheatgrass association. The habitat structure of this association includes an overstory of 6-foot-tall big sagebrush, an understory of bluebunch wheatgrass (*Pseudoroegneria spicata*) and Sandberg's bluegrass (*Poa secunda*), and groundcover dominated by algae, lichens, and moss providing a microbiotic crust (Link et al. 2006).

Riparian areas are located along the shorelines of the City, with varying levels of structural diversity and productivity in terms of organic material, with reductions in diversity and productivity due to levees and upland developed areas. Habitat characteristics of healthy riparian areas include a connected corridor for fish and wildlife travel, vegetation types adapted to wetter soils, occasional flooding, and natural disturbance regimes. Riparian areas also offer important functions for species that inhabit the shrub- steppe, as well as species more limited in range to the riparian zone. For shrub-steppe species, they provide a critical water source and often a more productive environment for forage, escape, thermal cover, and nesting sites. For many species, they provide critical winter habitat. Riparian areas typically support larger flocks and a greater density of upland birds than shrub-steppe habitat due to the greater production of biomass and the more complex mosaic of vegetation (Stinson and Schroeder 2012).

The removal of native riparian vegetation in riparian and shrub-steppe habitat, the introduction and proliferation of invasive plant species, like Russian Olive (*Elaeagnus angustifolia*), and the filling or degradation of wetlands along shorelines impact the organic inputs that fuel production of the lower levels of the food chain and, therefore, can have impacts throughout the entire food web. Organic matter produced by these habitats supports terrestrial and aquatic insects and other organisms that are then eaten themselves by birds, juvenile salmonids, and various fish species. An example of invasive plants is the aquatic plant Eurasian water milfoil, which can cover lake bottoms and out-compete the native aquatic species (altering the plant community), deplete dissolved oxygen, and lead to fish mortality (Frodge et al. 1995).

5.1.4.2 *Conditions in the City of Pasco*

5.1.4.2.1 Important Wildlife and Priority Habitat and Species

Table 14 summarizes the ESA-listed fish species known to occur in the Columbia and Snake rivers in the City, and also includes Washington State Priority Habitat Species identified for Franklin County. Many of the non-aquatic species of animals and plants identified for Franklin County would not be expected to currently occur within the shoreline zone of the City due to the level of development along the shoreline.

Table 14
ESA-listed Fish Species and Washington State Priority Habitat Species in Franklin County

Species Category	Common Name	Scientific Name
ESA-listed Fish Species	Bull Trout	<i>Salvelinus confluentus</i>
	Chinook	<i>Oncorhynchus tshawytscha</i>
	Steelhead	<i>Oncorhynchus mykiss</i>
	Sockeye	<i>Oncorhynchus nerka</i>
Washington Priority Species – Fish	Coho	<i>Oncorhynchus kisutch</i>
	Giant Columbia River Limpet	<i>Fisherola nuttalli</i>
	Leopard Dace	<i>Rhinichthys falcatus</i>
	Mountain Sucker	<i>Catostomus platyrhynchus</i>
	Pacific and River Lamprey	<i>Lampetra tridentate; Petromyzontiformes</i>
	Rainbow Trout/Inland Redband Trout	<i>Oncorhynchus mykiss</i>
	Westslope Cutthroat	<i>Oncorhynchus clarki lewisi</i>
	White Sturgeon	<i>Acipenser transmontanus</i>
Washington Priority Species – Rare Plants ¹	Canadian St. John's-wort	<i>Hypericum majus</i>
	Common Northern Sweet Grass	<i>Anthoxanthum hirtum</i>
	Coyote tobacco	<i>Nicotiana attenuata</i>
	Desert Codder	<i>Cuscuta denticulata</i>
	Dwarf Evening Primrose	<i>Camissonia pygmaea</i>
	Grand Redstem	<i>Ammannia robusta</i>
	Gray Cryptantha	<i>Cryptantha leucophaea</i>
	Great Basin Gilia	<i>Aliciella leptomeria</i>
	Halfchaff Awned Sedge	<i>Lipocarpha aristulata</i>
	Lowland Toothcup	<i>Rotala ramosior</i>
	Mat Buckwheat	<i>Eriogonum caespitosum</i>
	One-cone Ground-pine	<i>Lycopodium lagopus</i>
	Pauper Milk-vetch	<i>Astragalus misellus</i> var. <i>pauper</i>
	Persistentsepal Yellowcress ²	<i>Rorippa columbiae</i>
	Prairie Cordgrass	<i>Spartina pectinata</i>
	Piper's Daisy	<i>Erigeron piperianus</i>
	Red Poverty-weed	<i>Micromonolepis pusilla</i>
	Shy Gilly-flower	<i>Gilia inconspicua</i>
	Smooth Willowherb	<i>Epilobium pygmaeum</i>
	Snake River Cryptantha ²	<i>Ryptantha spiculifera</i>
	Twincrest Onion	<i>Allium bisceptrum</i>
	Whited's Penstemon	<i>Penstemon eriantherus</i> var. <i>whitedii</i>

Table 14
ESA-listed Fish Species and Washington State Priority Habitat Species in Franklin County

Species Category	Common Name	Scientific Name
Washington Priority Species – Other	American White Pelican	<i>Pelecanus erythrorhynchos</i>
	Bald Eagle	<i>Haliaeetus leucocephalus</i>
	Black-crowned Night-heron	<i>Nycticorax nycticorax</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	Burrowing Owl	<i>Athene cunicularia</i>
	Chukar	<i>Alectoris chukar</i>
	Columbia Pebble Snail	<i>Fluminicola columbiana</i>
	Columbia River Tiger Beetle	<i>Cicindela columbica</i>
	Ferruginous Hawk	<i>Buteo regalis</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Great Blue Heron	<i>Ardea herodias</i>
	Juniper Hairstreak	<i>Callophrys gryneus</i>
	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Merriam's Shrew	<i>Sorex merriami</i>
	Mountain Sucker	<i>Catostomus platyrhynchus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Peregrine Falcon	<i>Falco peregrinus</i>
	Prairie Falcon	<i>Falco mexicanus</i>
	Preble's Shrew	<i>Sorex preblei</i>
	Ring-necked Pheasant	<i>Phasianus colchicus</i>
	Sage Sparrow	<i>Amphispiza belli</i>
	Sage Thrasher	<i>Oreoscoptes montanus</i>
	Sagebrush Lizard	<i>Sceloporus graciosus</i>
	Striped Whipsnake	<i>Masticophis taeniatus</i>
	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
	Washington Ground Squirrel	<i>Urocitellus washingtoni</i>
	Western Grebe	<i>Aechmophorus occidentalis</i>
	White-tailed Jackrabbit	<i>Lepus townsendii</i>
	Yellow-billed Cuckoo	<i>Coccyzus americanus</i>

Notes:

1 = U.S. National Resource Conservation Service website, accessed February 12, 2014

2 = Species are also under federal listing.

ESA = Endangered Species Act

5.1.4.2.2 Aquatic Habitat

The Snake and Columbia rivers make up the border of the southern half of the City and provide the only shoreline jurisdictional aquatic habitat within the City. The aquatic habitat supports numerous resident and anadromous fish, aquatic invertebrates, and numerous migratory bird species.

Many ESA-listed anadromous salmonid species are found within the two rivers, including bull trout, steelhead, sockeye, and spring and fall Chinook salmon. Coho salmon are rare but may occur through reintroduction programs underway in the Yakima River Basin and this population segment is not ESA-listed. Pacific lamprey are present but have experienced population decline in recent years.

Resident fish include a mix of native and non-native species, such as smallmouth (*Micropterus dolomieu*) and largemouth bass (*Micropterus salmoides*), northern pikeminnow (*Ptychocheilus oregonensis*), sculpin (*Cottoidea sp.*), mountain whitefish (*Prosopium williamsoni*), white sturgeon, catfish (*Ictalurus punctatus*), sucker (*Catostomidae sp.*), walleye (*Sander vitreus*), chiselmouth (*Acrocheilus alutaceus*), dace (*Leuciscus leuciscus*), common carp (*Cyprinus carpio*), redbelly darter (*Richardsonius balteatus*), peamouth (*Mylocheilus caurinus*), and various minnow species. Shellfish include the Columbia River limpet, spire snail (*Heleobia stagnorum*) and California floater (*Anodonta californiensis*). Non-native species found in the Columbia and Snake rivers that are managed by Washington Department of Fish and Wildlife (WDFW) as game species include bluegill (*Lepomis macrochirus*), bass, crappie (*Pomoxis*), shad (*Alosa sapidissima*), carp (*Cyprinus carpio*), channel catfish (*Ictalurus punctatus*), perch (*Perca*), and walleye.

The aquatic nearshore and riparian shoreline areas of the Columbia and Snake rivers near the City support concentrations of wintering migratory waterfowl, and primarily serve as resting and feeding areas for Canada goose (*Branta Canadensis*) and dabbling ducks (*Anas*); primarily mallard (*Anas platyrhynchos*), canvasback (*Aythya valisineria*), ring-necked duck (*Aythya collaris*), and wood duck (*Aix sponsa*). Some waterfowl nesting likely occurs in areas with wider riparian buffers, potentially near the confluence of the Snake and Columbia rivers and along reaches of the Columbia River where development is less intensive, such as residential zones, parks, and open spaces. The Columbia River in the vicinity of the City also provides a

breeding area for long billed curlew (*Numenius americanus*) and a variety of gulls, as well as a resting area with limited nesting for great blue heron (*Ardea herodias*) and egret (*Ardea alba*).

Aquatic invertebrate forage species found in the Columbia and Snake rivers near the City are typical of large river systems. The Columbia River in this reach supports larger invertebrates such as crawfish, as well as numerous aquatic insects, mollusks and gastropods. Significant studies have been conducted along the Hanford Reach, which includes some locations near the City. It is anticipated that presence of aquatic invertebrates may be somewhat representative, although likely differ due to land use changes at the transition from the Washington Department of Energy-managed Hanford Reach into the urban development boundary of the City. Mollusk surveys conducted in the Hanford Reach in 2003, 2004, and 2006 found 17 taxa (5 mussels and 12 snails); 3 taxa are considered to be special status species by federal or state agencies (Mueller 2014). Throughout the past 50 years, the macroinvertebrate fauna of the Hanford Reach has changed, with certain taxa and taxonomic groups increasing while others decrease: Mayfly (*Ephemeroptera*) diversity has increased; stoneflies (*Plecoptera*) have disappeared; caddisfly (*Trichoptera*) diversity and abundance remain high; dragonflies and damselflies (*Odonata*), true bugs (*Hemiptera*), butterflies and moths (*Lepidoptera*) and beetles (*Coleopteras*) are rare; and fly (*Diptera*) diversity remains relatively constant (Evans 2003).

Limitations to aquatic habitat in the City are the low habitat complexity along the shoreline due to water regime management on the Columbia and Snake rivers. The following aquatic restoration opportunities may be feasible in the City:

- Improve migration conditions in the lower Snake River by changing hydrograph of Snake River dam storage.
- Reconnect floodplain/side channels and oxbows near this reach, and investigate leasing/purchasing floodplain areas.
- Reduce influence of predatory fishes such as smallmouth bass and northern pikeminnow.
- Retain and recruit large woody debris or engineered logjams along the shoreline of both rivers to restore and enhance fish habitat, taking into consideration the risk of possible predation issues on juvenile salmonids.

- Restore riparian buffers where possible.
- Update irrigation intakes, as applicable, for protection of salmon from uptake and impingement.

5.1.4.2.3 Terrestrial Habitat

The City's population is generally concentrated around and near the confluence of the Columbia and Snake rivers, leaving little terrestrial habitat within the shoreline jurisdictional zone throughout much of City undeveloped. Irrigated agricultural lands are prevalent throughout the northern ends of the City.

Dam development on the Columbia and Snake rivers has altered these waterbodies, impacting the quantity and quality of water in these systems, as well as the shorelines within the City. Alterations specifically affecting the riparian zone in the City include reduced wood recruitment and transport within the river basins, and the lack of connectivity to floodplain habitats. In addition, levee systems along the Columbia and Snake River shorelines in the City further reduce the connectivity of the rivers to their floodplains and also limit the vegetation community development in the riparian zone.

Human-induced alterations to light transmission may interfere with plant production and aquatic animal behavior. Plants and animals are adapted to natural light intensities and timing of lighted periods. Light energy affects water temperature, animal behavior (such as the relationship between predators and prey), and plant photosynthesis and growth (Tilzer et al. 1975). Natural light is altered when riparian vegetation is removed or when structures such as docks are built that create shade and prevent natural light from reaching the water. Reductions in this natural light preclude plant colonization and growth beneath these structures and can cause changes in animal behavior. For example, shade cast by overwater structures may disrupt juvenile salmon migration in the Columbia and Snake rivers by creating visual barriers to their movement (Carrasquero 2001). Natural light can also be reduced by the presence of algal blooms caused by excess nutrient additions that can collect in slack-water areas.

Artificial light refers to the light that humans create at night, such as lights used for roads, parking lots, industrial complexes (including dams), houses, docks, piers, and sports fields. This light can interfere with aquatic and terrestrial animals' routines and change predator-prey relationships.

The shrub-steppe habitat common to Eastern Washington and historically prevalent throughout Franklin County provides many ecosystem services including soil stabilization, wildfire moderation, and overall biodiversity. The displacement of shrub-steppe plant species by cheat-grass (*Bromus tectorum*), Russian thistle (*Salsola tragus*), and other invasive species increases fire intensity and frequency which, in addition to the hazards this creates for humans and wildlife, also impacts the dominant shrub-steppe plant species big sagebrush (*Artemisia tridentata*), an important species for rare birds such as the sage grouse (*Centrocercus urophasianus*) (Link et al. 2006). While undisturbed shrub-steppe habitat is rare in the City, disturbed shrub-steppe communities remain in spaces between agricultural fields and adjacent to the rivers, within the shoreline jurisdictional area. Such areas have been affected to various degrees by grazing, invasive plant infestations, agriculture, and development.

Relatively undisturbed shrub-steppe habitat in the City area may still be dominated by native grasses and sagebrush. Undisturbed shrub-steppe lands are characterized by an intact cryptogam crust (a thin layer of moss and lichen that indicates an undisturbed community), mostly native shrubs (e.g., big sagebrush and bitterbrush), and a predominantly native grass understory. The shrub-steppe habitat communities in the City area, while damaged by a variety of activities, may still provide cover, food, and nesting habitat for many species of wildlife and insects. These shrub-steppe areas have been identified in other nearby areas to be particularly important during winter months when nearby and adjacent cultivated fields provide no vegetative cover for wildlife (YSFWPB 2004), and the same may be true for the disturbed, remnant shrub-steppe habitats in Pasco.

Recommendations for preserving shrub-steppe habitat consist of limiting development footprints, including agricultural land cover changes, limiting road and utility corridors to avoid fragmenting habitat, restricting vegetation clearing, keeping domestic pets and

livestock out of sensitive species habitat, limiting fencing to avoid barriers to native wildlife, and limiting irrigation canals through shrub-steppe habitat (Azerrad et al. 2011).

An abundant and diverse community of wildlife inhabits and utilizes shrub-steppe communities in the region, although few of these species are likely to exist along the shoreline areas of the City. In addition to the species identified in Table 14, species that may be found at the margins of the shoreline in less developed areas include reptiles such as the western rattlesnake (*Crotalus viridis*), Great Basin spadefoot toad (*Spea intermontana*), and northern sagebrush lizard (*Sceloporus graciosus*). Birds noted in Table 14 may be found at various times near the shorelines within the City. The City has many species that have adapted to urban environments, such as raccoons (*Procyon lotor*), possum (*Didelphis virginiana*), small rodents, coyotes (*Canis latrans*), pigeons (*Columbidae*), house sparrows (*Passer domesticus*), and crows (*Corvus*). Less common are other small mammals such as Townsend ground squirrel (*Uroditellus townsendii*), black-tailed jackrabbit (*Lepus californicus*), white-tailed jackrabbit (*Lepus townsendii*), Merriam's shrew (*Sorex merriami*), and large mammals such as badger (*Taxidea taxus*), mule deer (*Odocoileus hemionus*), and elk (*Cervus canadensis*).

Riparian and floodplain areas, as well as wetlands, are primarily associated with the mainstem Columbia and Snake rivers. Black cottonwood (*Populus trichocarpa*) is the dominant plant species in lowland riparian areas and plays a key role in the integrity of riparian systems (USBR 2008). Other species include a variety of willow species, red-osier dogwood (*Cornus sericea*), aspen (*Populus*), water birch (*Betula occidentalis*), serviceberry (*Amelanchier*), chokecherry (*Prunus virginiana*), rose (*Rosaceae*), hawthorn (*Crataegus*), and snowberry (*Symphoricarpos*), as well as invasive species such as Russian Olive. Reptile and amphibian species found in these habitats include western painted turtle (*Chrysemys picta*), spotted frog (*Rana pretiosa*), gopher snakes (*Pituophis melanoleuces*), garter snake (*Thamnophis sirtalis*), and others. Small mammals include beaver (*Castor canadensis*), river otter (*Lutra canadensis*), muskrat (*Ondatra zibethicus*), mink (*Mustela vison*), porcupines (*Erethizon dorsatum*), raccoons, skunks (*Mephitis mephitis*), silver-haired bats (*Lasionycteris noctivagans*), and pallid bats (*Antrozous pallidus*). River otters are occasionally observed in the Hanford Reach. Common avian species include Wilson's phalarope (*Phalaropus tricolor*), belted kingfisher (*Megaceryle*

alcyon), peregrine falcon (*Falco peregrinus*), hairy woodpecker (*Picoides villosus*) and downy woodpecker (*Picoides pubescens*). Species of waterfowl that utilize the wetland and riparian habitats within the affected area include mallard, American wigeon (*A. Americana*), and others (USFWS 2008, 2012).

The City area is located in the Pacific Flyway and serve as a resting area for neotropical migrant birds, migratory waterfowl, and shorebirds. Other species observed in the area include great blue heron, American white pelicans (*Pelecanus erythrorhynchos*), egrets, double-crested cormorants (*Phalacrocorax auritus*), coots (*Fulica americana*), and common loons (*Gavia immer*) (USFWS 2008, 2012).

In the Lower Columbia Basin, wildlife resources are positively affected by several large public land holdings, including the Hanford Reach National Monument to the north and the McNary Wildlife Refuge, which provide large contiguous range for native species. For City shorelines, several factors affect the suitability of wildlife habitat:

- A lack of connectivity along the shoreline riparian habitat presents challenges for wildlife movement up the Columbia River from the Snake River confluence. Ongoing efforts to remove barriers to wildlife movement benefits species with a wider ranging territory.
- Islands in the Columbia River that are part of the McNary National Wildlife Refuge and provide resting areas for a range of migratory wildlife. The river provides a substantial buffer from human disturbance on these islands.
- Ongoing efforts to enhance existing habitat in areas where past disturbance has occurred, together with limiting access to critical nesting areas, provides the potential to substantially enhance habitat values in existing floodplain areas.

Table 15 summarizes the key stressors affecting ecological functions provided by the specific aquatic and terrestrial systems within the City.

Table 15
Key Stressors Affecting Ecological Functions

Key Stressors	Columbia River		Snake River	
	Aquatic	Terrestrial	Aquatic	Terrestrial
Recreational access – existing	X	X	X	X
Recreational area – potential development		X		X
Agricultural use – irrigation	X		X	X
Agricultural use – livestock			X	X
Residential development – existing shoreline development	X	X		
Residential development – land use change (e.g., development of new roads, utilities)		X		X
Residential development – future	X	X	X	X
Hydrologic management regimes	X	X	X	X

5.2 Reach Characterizations

Characterization of shoreline reaches and subreaches is provided in Appendix A. These reach and subreach characterization tables summarize existing physical conditions; characterizations and analyses for water quantity and sediment, water quality, and habitat and species; ecological functions analysis, including identifying functional conditions, stressors, and restoration and protection opportunities; preliminary shoreline environment designation considerations; existing public access and potential additional public access opportunities; and cumulative impact considerations.

Each reach was categorized overall in terms of ecosystem function. The categories include functioning, partially functioning, and impaired. The framework, definitions, and categories for this analysis were adapted from a system originally developed for Riparian Area Management guidelines proposed by the U.S. Bureau of Land Management (BLM; Prichard 1998). This assessment is a relative assessment with some degree of calibration to reflect the overall conditions found in the City.

The potential ecological function is defined as the highest ecological status a shoreline reach can attain given no development or management constraints, which takes into account the extent to which management (particularly water management) supports ecological function.

Ecological function is defined here as the degree of similarity between existing physical and biological conditions, and the potential ecological function of a site; the higher the ecological function, the closer the site is to potential. Potential, for this assessment, encompasses all the resources defined by the interaction of hydrology, vegetation, water quality, and erosion/deposition (soils), and aquatic and riparian habitat. For example, the potential of the hydrologic component includes the concept of a stream channel's physical characteristics (dimension, pattern, and profile) being within a normal or usual range (e.g., entrenchment, sinuosity, width, depth, and slope of the bankfull channel) as defined by landform and geomorphic stream type given current flows. The three categories of ecological function are as follows:

- **Functioning** is a state of resiliency that will allow a shoreline to hold together during high-flow events with a high degree of reliability. This resiliency allows an area to then produce desired values, such as fish habitat, bird habitat, or forage, over time. Riparian-wetland areas that are not functioning properly cannot sustain these values over time and are susceptible to stochastic disturbances such as fire.
- **Partially functioning** is a state in which the ecological function of the shoreline is somewhat compromised by development or management trends, or is particularly susceptible to future degradation due to development, management, or ecological conditions. A partially functioning shoreline has some ability to recover through changes in management or the removal of identified stressors on ecological function.
- **Impaired** is a state in which the ecological functions of the shoreline are heavily compromised by development or management of the reach. An impaired reach has a low probability of recovery through restoration due to the degree of structural change to the shoreline, waterbody, and surrounding shorelands. Impaired shorelines can be functionally improved, but are unlikely to be self-sustainable.

5.3 Future Land Use and Development Potential

5.3.1 Methodology

The future development potential is analyzed using existing City and Franklin County GIS data. GIS data used includes parcel, land ownership, existing land use, and zoning. These datasets were overlaid on the reach map with shoreline jurisdiction boundary. The overlaid map indicates parcels within the shoreline jurisdiction. These parcels were reviewed and analyzed for future development potential. In most cases, portions of the parcels fell within the shoreline. In some other instances, already subdivided and vacant lots were identified as developable land within the shoreline.

The undivided land within the shoreline jurisdiction was used to calculate the number of developable lots where applicable. Allowed densities were also taken into account to establish number of developable units. For non-residential lots (e.g., industrial), the portion of land within the shoreline jurisdiction was included in area calculations, which helped determine development potential.

5.3.2 Data Gaps

The analysis does not include the critical areas or steep slopes. Setbacks and other buffers were not factored in the calculation, as these are applied at the time of development. Analysis did not include the detailed area calculation for recreational improvements on public land.

5.3.3 Land Development Potential Summary

Table 16 indicates the future land development potential within the City's shoreline. The purpose of the analysis is to estimate potential development that may take place along shorelines in the planning timeframe, according to the existing land use and zoning designations. The analysis uses the existing GIS datasets provided by Franklin County and the City, existing planning documents, and current development trends. These results are intended to provide a general overview of the future development potential, but not to dictate how the development should occur. Future development potential may vary from this analysis based on the overall market condition, intent of the property owner, or other local or regional factors.

Table 16
Future Development Potential by Shoreline Reach

Reach	Area (acres)	Land Use	Future Development Constraints	Developable	Future Development
Reach 1	63.02	<ul style="list-style-type: none"> – Low Density Residential – Mixed Residential – Mixed Residential Commercial – Open Space Nature 	<ul style="list-style-type: none"> – USACE ownership of land – Existing road – Gravel pit (Broadmoor) with long-term lease 	<ul style="list-style-type: none"> – Entire SR 1a – Vacant parcels in SR 1b, 1d, and 1e 	<ul style="list-style-type: none"> – 32 residential lots
Reach 2	34.39	<ul style="list-style-type: none"> – Low Density Residential – Open Space Nature 	<ul style="list-style-type: none"> – Mostly build-out 	<ul style="list-style-type: none"> – Vacant lots within the subdivision 	<ul style="list-style-type: none"> – 3 residential lots
Reach 3	54.32	<ul style="list-style-type: none"> – Low Density Residential – Open Space Nature 	<ul style="list-style-type: none"> – Chiawana Park – USACE ownership 	<ul style="list-style-type: none"> – No developable land except for recreational facility improvements 	<ul style="list-style-type: none"> – Park improvement for additional boat launch and beach area (Pasco 2012) – Trail improvement
Reach 4	50.65	<ul style="list-style-type: none"> – Low Density Residential – Open Space Nature 	<ul style="list-style-type: none"> – USACE ownership of land and levee – Wade Park; mostly build-out 	<ul style="list-style-type: none"> – Development on vacant lots behind the levee and the drainage ditch. These lots have portions within the shoreline area. 	<ul style="list-style-type: none"> – 15 residential lots

Reach	Area (acres)	Land Use	Future Development Constraints	Developable	Future Development
Reach 5	59.54	<ul style="list-style-type: none"> – Low Density Residential – Mixed Residential – Mixed Residential Commercial – Industrial – Open Space Nature 	<ul style="list-style-type: none"> – Public ownership of land by USACE – WSDOT – City of Pasco – Port of Pasco – BNSF Railway Company; existing levee and railtrack 	<p>Park development on vacant BNSF land:</p> <ul style="list-style-type: none"> – Development of the industrial area only after the abandonment of the BNSF rail track – Portion of the industrial land within shoreline is approximately 0.35 acres 	<ul style="list-style-type: none"> – 7,623 square-foot industrial area (approximately 50% land coverage)
Reach 6	95.91	<ul style="list-style-type: none"> – Industrial – Open Space Nature 	<ul style="list-style-type: none"> – Remediation of the toxic spillage on the Port of Pasco property – BNSF railtrack 	<ul style="list-style-type: none"> – The Port's vacant industrial property (SR 6a) could be developed to add about 11,000-square-foot area (approximately 50% land coverage) within the shoreline. However, this is contingent upon the spillage remediation process which progresses slowly. Future development is unlikely to take place within the planning timeframe. – Osprey Pointe development in SR 6c would include parking area development within the shoreline. Proposed buildings are mostly located outside the 200-foot shoreline jurisdiction with some portions of the buildings being within the shoreline. 	<ul style="list-style-type: none"> – Park and trail improvements near the marina – Development of parking lot at Osprey Pointe – About 18,672 square feet of building area is proposed within the shoreline
Reach 7	62.78	<ul style="list-style-type: none"> – Industrial – Open Space Nature 	<ul style="list-style-type: none"> – Washington State Parks Department ownership 	<ul style="list-style-type: none"> – Park amenities could be improved 	<ul style="list-style-type: none"> – Park and trail improvements

Reach	Area (acres)	Land Use	Future Development Constraints	Developable	Future Development
Reach 8	90.06	<ul style="list-style-type: none"> Industrial Open Space Nature 	<ul style="list-style-type: none"> BNSF railtrack Ainsworth historic town Industrial area is mostly developed with fuel tanks 	<ul style="list-style-type: none"> Low development potential. Industrial area is less likely to have additional development within the planning timeframe Potential for trail connection to the east 	<ul style="list-style-type: none"> Trail improvements

Notes:

BNSF = Burlington Northern Santa Fe

SF = square foot

SR = Subreach

USACE = U.S. Army Corps of Engineers

WSDOT = Washington State Department of Transportation

5.3.4 Preliminary Shoreline Environment Designation Considerations

The information in this report provides the foundation for developing the City's SMP. Information is organized by waterbodies and reaches to allow for SMP provisions tailored to local conditions found along shorelands. Goals, policies, and regulations will be established based on these conditions. Described in this section are background information on environment designations and a preliminary discussion on how elements of the Washington classification system may apply to conditions in the City.

Environment designations are applied based on specific criteria, and include a purpose statement, a description of the classification criteria, management policies, and environment-specific regulations.

5.3.4.1 State Recommended Classification System

Washington has identified a recommended classification system that can be used as a starting point in considering environment designations most applicable to the City. These consist of: high-intensity, shoreline residential, urban conservancy, natural, and aquatic as described in WAC 173-26-211.

The purpose for each of these environment designations is described in WAC 173-26-211:

- **High-intensity** – "...Provide for high-intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded."
- **Shoreline residential** – "...Accommodate residential development and appurtenant structures that are consistent with this chapter. An additional purpose is to provide appropriate public access and recreational uses."
- **Urban conservancy** – "...Protect and restore ecological functions of open space, flood plain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses."
- **Natural** – "...Protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use. These systems require that only very low intensity uses be allowed in order to maintain the ecological functions and ecosystem-wide processes. Consistent with the

policies of the designation, local government should include planning for restoration of degraded shorelines within this environment.”

- **Aquatic** – "...Protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark.”

Local governments may also establish a different designation system or may retain their current environment designations, provided these are consistent with the purposes and policies of WAC 173-26-211. Parallel environments can also be used where appropriate, with shorelands divided into different sections generally running parallel to the shoreline or along a physical feature such as a bluff. In applying environment designations, the state reminds local governments that they should ensure that existing shoreline ecological functions are protected with the proposed pattern and intensity of development, and that restoration potential for an area is considered (WAC 173-26-211).

5.3.4.2 Preliminary Considerations

Developing and applying environment designations in the City will come in later steps in the SMP update process. In preparation for this, an initial description of shoreland areas with high intensity, residential, conservancy and natural characteristics is described in Table 17. This initial description will provide a starting point for drafting environment designations, which will be applied at the reach level in the future. The listing of these areas under the high intensity and other categories should not imply that this is what these areas will be designated in the SMP update process. Developing and applying environment designations in the City will occur with more detailed analysis of the information in this report, input from the City Planning Commission, Ecology, and from the public during the shoreline visioning process and other public forums.

Table 17
Preliminary Environment Designation Consideration

Shoreland Characteristics	Applicable Geographic Areas
High intensity	<ul style="list-style-type: none"> • Industrial areas, including water-dependent facilities on the Columbia (SR 6a) and Snake rivers (SR 8b) • Chiawana, Wade, Riverview, Schlagel, and Sacajawea parks (SR 3a, 5c, and 6b and portions of Reaches 7 and 8)
Residential	Several areas along the Columbia River (Reaches 1, 2; and SR 3b, 4a, and 4b, and portions of SR 5b and 6b)
Conservancy	Open space areas located in SR 1c, 3a, 3b, 5c, and 6c and portions of Reaches 7 and 8, which include lower intensity recreation areas at Chiawana and Sacajawea parks
Natural	All islands
Other	<ul style="list-style-type: none"> • Consider a special designation area for leveed areas along the Columbia River (portions of SR 5a, 5b, and 5d), where limited ecological function and future development potential exists, and the areas dedicated for public recreation as part of the regional trail system • Consider a recreation-based designation for the several park areas

Note:

SR = Subreach

6 PUBLIC ACCESS

The City shoreline has public access opportunities in multiple locations in parks, trails, and road termini. The City has developed the Rivershore Linkage and Amenity Plan (Pasco 2012; attached as Appendix C). This plan provides an in depth analysis of public access opportunities, needs, and constraints for the entire shoreline. It also makes short-term and long-term recommendations for public access and other rivershore improvements. For the purpose of the IAC Report, the shoreline reaches and subreaches have been delineated to match the rivershore segments identified in the Rivershore Linkage and Amenity Plan (see Table 5). This Rivershore Linkage and Amenity Plan is being used as the public access plan. Instead of applying uniform public access requirements to all future developments, future public accesses should be consistent with this plan as recommended in WAC 173-26-221(4)(c).

The City shoreline has multiple parks along the shoreline. These include Chiawana Park, Wade Park, Riverview Park, Schlagel Park, and Sacajawea State Park. In addition, Sacajawea Heritage Trail parallels almost the entire stretch of shoreline starting from Reach 2 and ending at the Sacajawea State Park at Reach 7. Public access opportunities exist in many of the publicly owned properties, including the long-term goal of developing the Sacajawea Heritage Trail to connect to the Columbia Plateau Trail/Ice Harbor Dam (Section 6.1.4 includes additional discussion of Washington State Parks and Recreation goals related to the Columbia Plateau Trail). Additional discussion on public access opportunities by reach are provided in Appendix A.

6.1 Public Access Goals

6.1.1 City of Pasco

The City's Comprehensive Plan includes recreation goal as follows:

- **Recreation Goal CF-4** – In conjunction with Franklin County, provide parks, greenways, trails, and recreation facilities throughout the UGA.

The City's Parks, Recreations and Forestry Plan objectives include:

- **Goal 1 (Physical) Objective** – Take advantage of the river frontage as a recreational, natural, and scenic asset.
- **Goal 3 (Management and Operations) Trail Policies** – Trails should be routed to provide visual and physical access to natural areas and to the riverfront.

6.1.2 U.S. Army Corps of Engineers

The U. S. Army Corps of Engineers' environmental operating principles were developed to ensure that its missions include totally integrated sustainable environmental practices. The Walla Walla district operates and manages dams on Snake River. It provides a variety of recreational opportunities within its management areas.

6.1.3 Washington State Department of Fish and Wildlife

WDFW's vision for Lands 20/20 (WDFW 2005) intends to offer all Washington citizens, "an opportunity to access and appreciate this state's fish and wildlife." Recreational uses of land are consistent with WDFW's land policy for providing outdoor recreation opportunities when they, "don't threaten fish and wildlife or degrade the habitats that support them." WDFW intends to continue providing wildlife viewing opportunities.

WDFW's Swanson Lake Wildlife Area Management Plan (Anderson 2006) indicates that the agency's management objective is to provide recreation compatible with fish, wildlife, and habitat protection. It indicates that access and recreation must be controlled to protect fish and wildlife resources and to comply with federal and state regulations.

6.1.4 Washington State Parks and Recreation

Washington State Parks and Recreation applies land classification systems to its parks and recreation areas such as:

- Recreational areas for high-intensity outdoor recreational use
- Resource recreation for high-intensity outdoor recreational use
- Natural areas for preservation, restoration, and interpretation of natural processes
- Heritage areas for preservation, restoration, and interpretation of unique or unusual archaeological, historical, scientific, and/or cultural features

- Natural forest areas for preservation, restoration, and interpretation of natural forest processes
- Natural area preserves designated for preservation of rare or vanishing flora, fauna, geological, natural historical, or similar features of scientific or educational value

Sacajawea Park is operated by Washington State Parks and Recreation.

7 INFORMATION SOURCES, ASSUMPTIONS, AND LIMITATIONS

This document is based on the best information available to the City at the time this document was produced. This information was obtained from a variety of sources and was collected and prepared for a variety of different purposes. The information was collected during a long time period; however, a substantial effort was made to use the most accurate and current information available.

Existing data, reports, and information used for the shoreline inventory are shown in the reference section. Generally, the documents used include the City's Comprehensive Plan and municipal code, USFWS wetland inventories and datasets, and WDFW subbasin and habitat conservation plans, historical references, and scientific literature on ecological functions. GIS data illustrated in the map folio includes information on hydrology, soils, topography, vegetation, land cover, priority habitat and species concentrations, and other features.

This report relied largely on GIS data and remotely sensed imagery. Integrating various GIS layers together into map folio projects often resulted in polygon boundary discrepancies. Rectification of these discrepancies was only conducted for layers and geographic locations most relevant to the SMP update. For example boundaries for zoning or land use designations do not always match identified OHWM. The identified shoreline jurisdiction areas are only an approximation for purposes of updating the SMP. Precise OHWM delineation and associated shoreline jurisdiction boundaries will be determined on a project-by-project basis, based on site-specific analysis during the development application and review process for project-specific proposals.

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APPENDIX A
CITY OF PASCO REACH
CHARACTERIZATION TABLES AND
REACH MAPS

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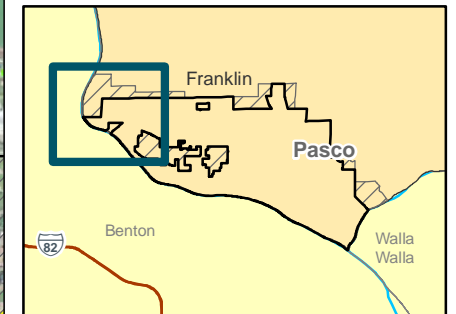


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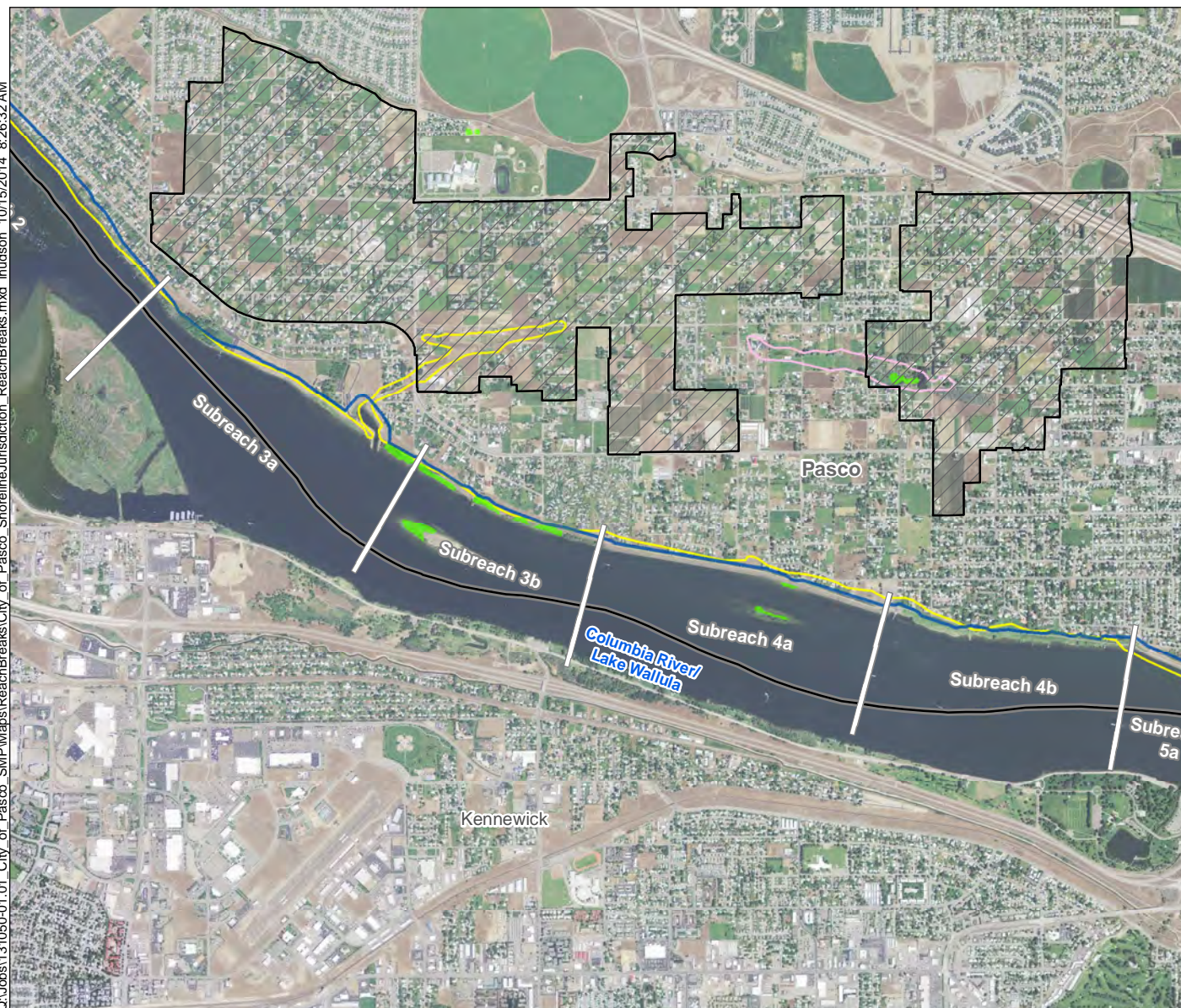
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- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- NWI Wetland
- 100-year Floodplain

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Floodplain and floodway data acquired from FEMA.



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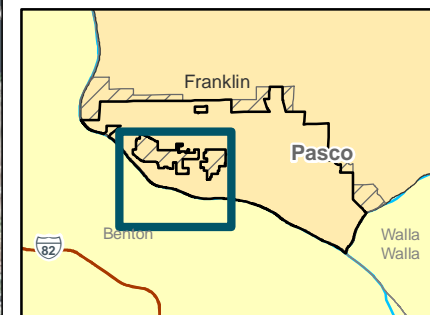


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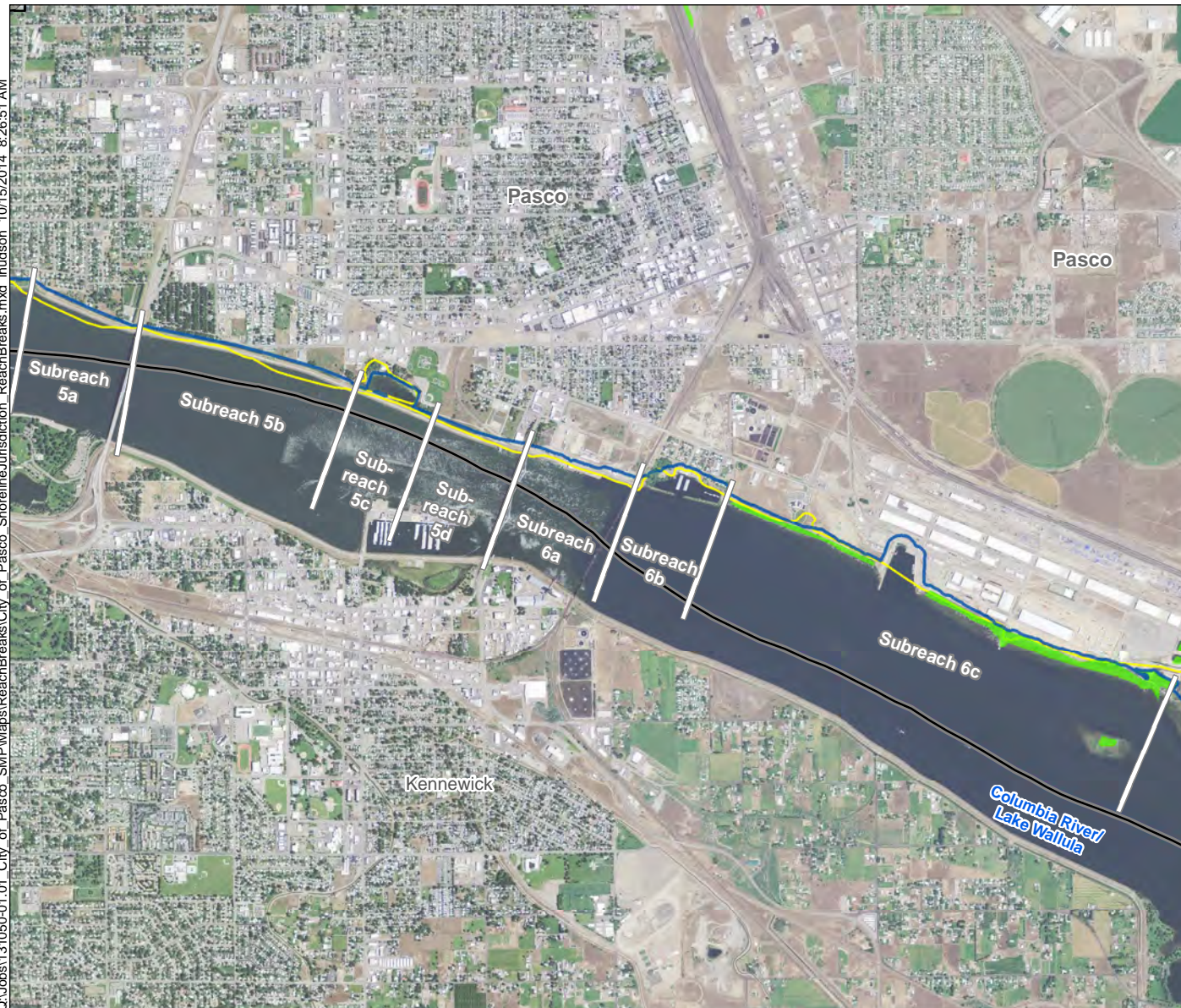
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- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- NWI Wetland
- 100-year Floodplain
- 500-year Floodplain

NOTES:








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3. NWI data acquired from USFWS.
4. Floodplain and floodway data acquired from FEMA.



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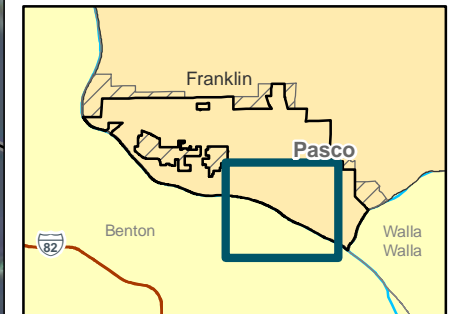


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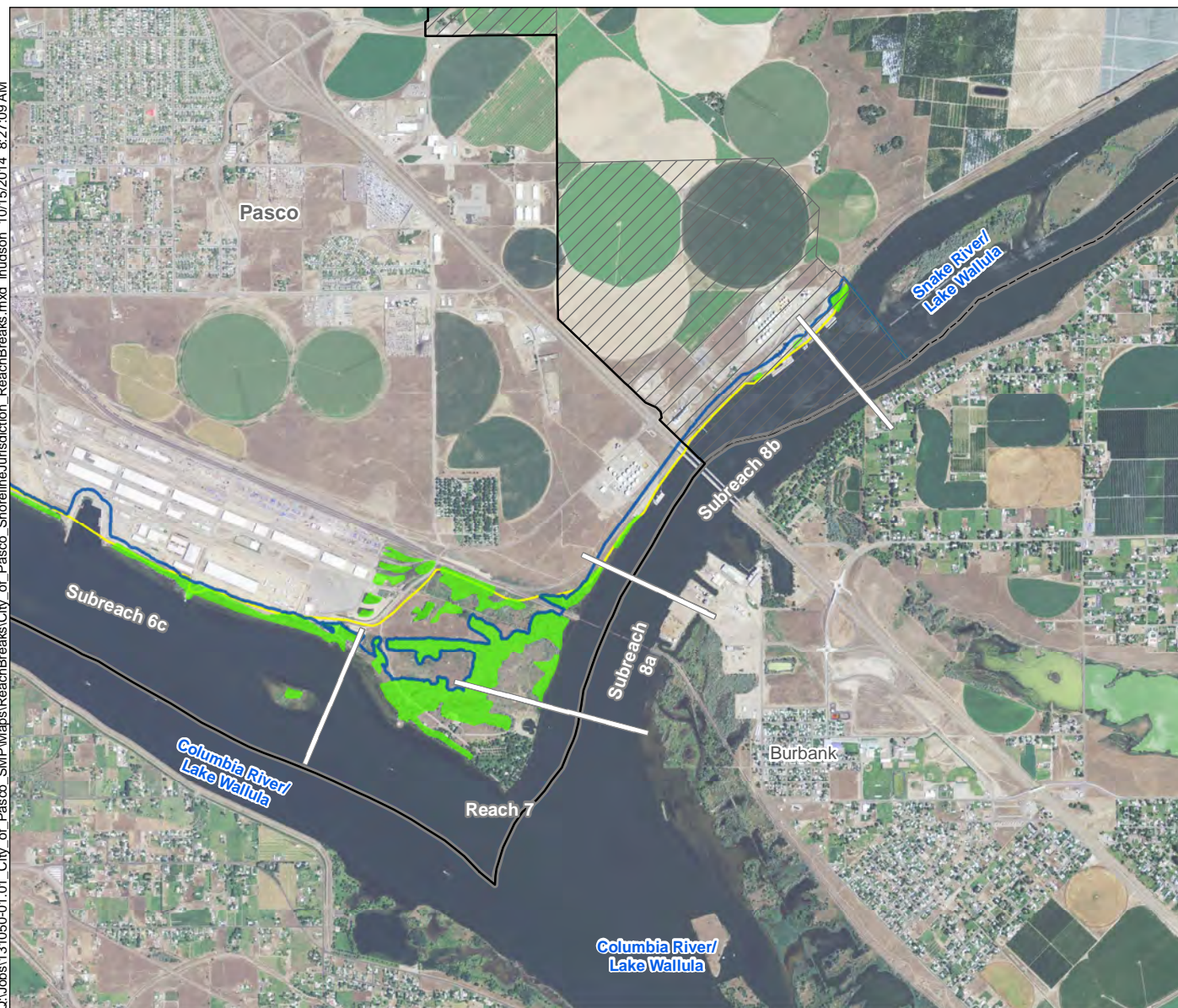
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-  Urban Growth Area
-  County Boundary
-  SMA Jurisdiction
-  NWI Wetland
-  100-year Floodplain

NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Floodplain and floodway data acquired from FEMA.



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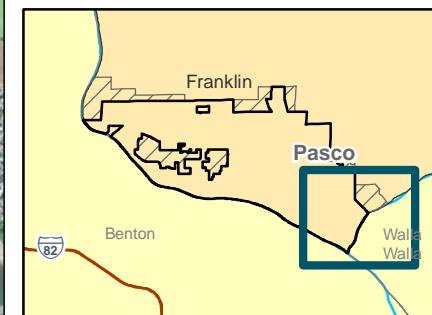



LEGEND

- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- NWI Wetland
- 100-year Floodplain

NOTES:

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2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Floodplain and floodway data acquired from FEMA.




Reach 1	City of Pasco
Reach Description: Columbia River from City of Pasco boundary to Interstate 182 bridge	
Shoreline Jurisdiction: 368 acres	
 <p style="text-align: right; font-size: small;">© 2007 Washington State Department of Ecology</p>	
Source: https://fortress.wa.gov/ecy/coastalatlas/UICoastalAtlas/Tools/ShorePhotos.aspx	
Subreaches (SRs); see Map 1: SR 1a: Begins at City of Pasco Urban Growth Area (UGA) boundary extending south to the edge of residential developments SR 1b: Extends 0.5 mile to the south to the edge of agricultural lands SR 1c: Extends 0.7 mile to the south to the beginning of river bend and where the City limits begin SR 1d: Extends 0.9 mile to the southeast to the edge of residential developments where the City limits end SR 1e: Extends 0.8 mile to the southeast to the Interstate 182 bridge and entirely within the UGA	
CHARACTERISTICS	
Ownership: Reach 1 is mostly private with a small amount (less than 10%) of public ownership.	
Land Use/Current Shoreline Master Program (SMP): Land use designation: <ul style="list-style-type: none"> • Current land uses are Low Density Residential, Mixed Residential, Mixed Residential Commercial, and Open Space Nature • Zoning – Suburban District (RS-20) and Residential Transition (RT) Current SMP Environment Designation: Rural and Urban (SR 1e)	

Reach 1	City of Pasco
Existing Land Cover/Development: Reach 1 includes a mix of natural unimproved land, riparian vegetation, agricultural land, roads, utilities, and residential structures. SR 1b and SR 1e include residential and accessory structures. SR 1c includes a boat dock, irrigation pump, and parking. SR 1d includes a boat launch.	
Geomorphic Character: Description: The shoreline throughout the reach consists of mostly of outburst flood deposits with relatively low banks. In addition, a minor amount of alluvium and sand dune deposits are located at the most downstream extent of the reach (SR 1e). Residential and some industry infrastructure are present along the shoreline throughout Reach 1. Hardened Banks: A minor amount of hardened banks appear to exist along the Reach 1 extent and is primarily associated with the Interstate 182 bridge crossing at downstream extent (SR 1e).	
Flooding and Geological Hazards: Flooding: Flooding is regulated by upstream dam operations and Lake Wallula pool elevation controls (SR 1d and SR 1e). Geological Hazards: SR 1b, 1c, and 1d have soils susceptible to erosion. SRs 1d and 1e contain slopes that are greater than 15% and underlain by dune sand, which make them designated landslide hazard areas.	
Existing Public Access: Reach 1 currently does not include any significant public access amenities. West Court Street parallels much of the Columbia River in this reach. Dent Road ends near the shoreline providing access to the publicly owned portion of the shoreline. The Pasco Ranch boat dock is also located on U.S. Army Corps of Engineers (USACE) property. Identified Public Access Improvements: The Rivershore Linkage and Amenity Plan (Pasco 2012) indicates opportunities to preserve right-of-ways on Dent Road in SR 1a. It also recommends the extension of the Sacajawea Heritage Trail in this reach. The Broadmoor Area Plan encompassing SR 1d plans to provide trail and boat accesses.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: Local inputs to water quantity include a minor drainage ditch in SR 1c. An irrigation pump in SR 1d appears to withdraw water from the reach. Sediment may aggrade in SR 1d where the normal pool elevation of Lake Wallula begins, which would likely cause reduced velocities. Agricultural runoff from SR 1a, 1c, and 1e may contribute some sediment, as well as a gravel mining operation in SR 1d.	

Reach 1	City of Pasco
<p>Water Quality:</p> <p>Water quality may be slightly impacted from agricultural runoff in SR 1a, SR 1c, and SR 1e. Water quality may also be impacted by gravel mining in SR 1d and residential runoff in SR 1b and SR 1e. Boat use may also impact water quality throughout the reach. These impacts are expected to be minor compared to the volume of water in the river.</p>	
<p>Habitat Characteristics and Priority Habitat Species (PHS) Presence:</p> <p>This reach has minimal undeveloped habitat and is noted for presence of chukar, urban natural open space, waterfowl concentrations, and specifically, grebe species. The Columbia River in this reach supports a number of Endangered Species Act (ESA)-listed fish species, as identified in the Inventory, Analysis, and Characterization Report (IAC) Report.</p> <p>SR 1a: SR 1a is adjacent to an agricultural area with crops extending almost to the water. There is a 20-to 50-foot band of vegetation of mostly larger trees immediately adjacent to the shoreline. No docks occur in this subreach.</p> <p>SR 1b: SR 1b is adjacent to a low-density residential neighborhood with landscaped vegetation extending almost to the water's edge on several parcels. Some parcels maintain a 30-foot band of vegetation, including larger trees along the shoreline edge of their property, although some have significantly more tree cover. This subreach does not include any residential docks.</p> <p>SR 1c: SR 1c contains upland lands in agricultural and orchard use. There is a small manmade/dredged off-channel area adjacent to Court Street and Dent Road that contains a private small craft boat dock and that may provide private access for the upland land owners. Shoreline vegetation is either absent or limited mainly to small shrubs in a wide 50- to 100-foot band. Waterfowl, including grebes, are known to congregate here.</p> <p>SR 1d: The main land use in the northern half of this subreach is orchards, and the main use in the southern half is upland aggregate sorting operations. The river makes a bend along this subreach, and the riparian vegetation zone along the curve of this bend is wider. This zone may be partially flooded subject to changes in water levels, as aerial photos show some evidence of standing water and potential off-channel habitat. Farther downstream, the riparian vegetation becomes more confined and sparse where it is adjacent to the aggregate facility. The northern end of this subreach also contains a small embayment that is used as an intake water supply and water access area for foot traffic. Because shoreline riparian habitat is limited, this subreach provides lower functioning habitat to ESA-listed and resident fish species that populate the river.</p> <p>SR 1e: The north half of this subreach is adjacent to low-density residential development and includes another small portion of land near the Interstate 182 bridge. Along the residential area are five visible residential boat docks with two other informal river access points, and the riparian vegetation is thin and patchy, but does include overhanging trees and shrubs. Wildlife habitat is sparse due to development. The south half of this subreach is adjacent to agricultural use. Because shoreline riparian habitat is limited or patchy, this subreach provides lower functioning habitat to ESA-listed and resident fish species that populate the river.</p>	


Reach 1	City of Pasco
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 1a	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Orchard field and dirt maintenance access areas in between riparian area (approximately a 25-foot width) an orchard, overhead power lines, a few non-native riparian species (Russian-olive).</p> <p>Recreational use: Informal water access area</p> <p>Potential Restoration Opportunities: Replace non-native riparian species with native alternatives. Control dust through placing gravel on access roads.</p> <p>Potential Protection Opportunities: Protect existing riparian areas. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 1b	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Single family residential development with irrigated landscaping, limited riparian areas in northern half of subreach, established riparian buffers in southern half though approximately half consists of non-native (Russian-olive species), informal water access paths.</p> <p>Potential Restoration Opportunities: Establish riparian plantings at northern half of subreach, considering the use of lower shrubs to preserve views of the water, consider incentives for homeowners to replace irrigated turf with native plantings of shrub-steppe or riparian vegetation. Replace non-native riparian species with native alternatives.</p> <p>Potential Protection Opportunities: Protect existing riparian areas. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 1c	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Irrigated agricultural fields, rural residential development, armored banks associated with infrastructure, small segment of W. Court Street within shoreline jurisdiction, non-native riparian species (Russian-olive) where tall trees are present.</p> <p>Recreational use: One overwater structure associated with informal boat launch.</p> <p>Potential Restoration Opportunities: Establish riparian buffer within central portion of subreach. Replace non-native riparian species with native alternatives.</p> <p>Potential Protection Opportunities: Protect existing riparian areas. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

Reach 1	City of Pasco
SR 1d	
<p>Level of Existing Function: Functioning</p> <p>Stressors:</p> <p>Upland development: Armoring within cove associated with infrastructure (water intake facilities), sparse non-native (Russian-olive) trees within riparian area.</p> <p>Recreational use: Upland recreation trails and a few water access areas at north side of subreach.</p> <p>Potential Restoration Opportunities: Replace non-native riparian species with native alternatives. Formalize recreation trail to discourage new informal trails through upland and riparian areas.</p> <p>Potential Protection Opportunities: Protect riparian area and intact shrub-steppe habitat.</p>	
SR 1e	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Industrial development and Harris Road outside of shoreline jurisdiction, limited riparian buffer, and presence of non-native (Russian-olive) trees, single family residential development with irrigated landscaping and limited quantity of overwater structures, small area of upland irrigated agricultural fields adjacent to shoreline slope, W. Court Street, bridge for Highway 12 and Interstate 182.</p> <p>Recreational use: Boat ramp water access and associated trails to the water at north end of subreach.</p> <p>Potential Restoration Opportunities: Establish riparian buffers where not present, replace non-native riparian species with native alternatives, add vegetative filter strip where not present around agriculture fields.</p> <p>Potential Protection Opportunities: Protect existing riparian areas. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

Reach 2	City of Pasco
Reach Description: Columbia River from Interstate 182 bridge (City limits boundary) to the end of waterfront residential developments	
Shoreline Jurisdiction: 102 acres	
 <p style="text-align: right; font-size: small;">© 2007 Washington State Department of Ecology</p>	
Source: https://fortress.wa.gov/ecy/coastalatlantools/UICoastalAtlas/Tools/ShorePhotos.aspx	
Subreaches; see Map 1:	
Not Applicable	
CHARACTERISTICS	
Ownership: Reach 2 is mostly private with a very small amount (less than 5%) of public ownership (Washington Department of Transportation).	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land uses are Low Density Residential and Open Space Nature • Zoning – Residential Suburban (RS-12) and Residential Suburban (RS-20) Current SMP Environment Designation: Urban	
Existing Land Cover/Development: Reach 2 is primarily residential and accessory structures and private boat docks. Parking, an inlet filtration pump (under the Interstate 182 bridge), and an irrigation pump station are also within this reach.	
Geomorphic Character: Description: The shoreline throughout the reach consists of outburst flood deposits with relatively low banks. Moderate-density residential infrastructure is present along the shoreline throughout this reach.	


Reach 2	City of Pasco
Hardened Banks: A minor amount of hardened bank exists along the reach extent at certain private docks and landscaped areas associated with waterfront residences.	
Flooding and Geological Hazards: Flooding: Flooding is regulated by Lake Wallula pool levels. Geological Hazards: There are no geologic hazard areas in Reach 2.	
Existing Public Access: Reach 2 is mostly privately owned and developed and doesn't include direct public access. There is one parking area beneath the Interstate 182 bridge, located adjacent to the Sacajawea Heritage Trail. Identified Public Access Improvements: The Rivershore Linkage and Amenity Plan (Pasco 2012) identifies an action to work with the Franklin County Irrigation District to provide public access on this property.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: No local water quantity or sediment inputs are noted in this reach. Sediment may aggrade in this reach from Yakima River input reaching the Lake Wallula pool, which may cause reduced velocities, although this predominately occurs on the right bank of the Columbia River.	
Water Quality: Minor inputs from residential runoff and boat traffic may slightly impact this reach. This reach is also likely in the mixing zone of the confluence between the Columbia River and Yakima River, so water quality may be impacted from Yakima River input.	
Habitat Characteristics and PHS Presence: This reach contains 21 overwater docks and ramps located in low density residential area. Landscaped vegetation extends to the river in most cases, and most yards have terracing and/or vertical bulkheads. Most residential land parcels within this reach have at least one row of trees adjacent to the water. Because of the residential nature of this reach, undeveloped areas do not exist in the uplands; therefore, wildlife habitat is limited and connectivity is low between the river and upland habitat areas. ESA-listed and resident fish species are expected to be present in the river.	
ECOLOGICAL FUNCTIONS ANALYSIS	
Level of Existing Function: Partially Functioning Stressors: Upland development: Single family residences with irrigated landscaping, fairly limited riparian buffers (though most parcels have at least a small area with a vegetative buffer), overwater structure docks for many parcels.	

Reach 2	City of Pasco
Potential Restoration Opportunities: Consider incentives for homeowners to convert irrigated turf to native plant species.	
Potential Protection Opportunities: Protect existing riparian areas. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	

Reach 3	City of Pasco
Reach Description: Columbia River from the upstream end of Chiawana Park to the edge of the hardened bank	
Shoreline Jurisdiction: 382 acres	
 <p style="text-align: right; font-size: small;">© 2007 Washington State Department of Ecology</p>	
Source: https://fortress.wa.gov/ecy/coastalatlas/UICoastalAtlas/Tools/ShorePhotos.aspx	
Subreaches; see Map 2: SR 3a: Begins at the upstream end of Chiawana Park extending east to near Road 84 SR 3b: Extends 0.8 mile to the east ending at the edge of the hardened bank	
CHARACTERISTICS	
Ownership: Reach 3 is mostly owned by US Army Corps of Engineers with a very small amount (less than 5%) of private ownership.	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land uses are Low Density Residential and Open Space Nature • Zoning – Residential Suburban (RS-20) Current SMP Environment Designation: Urban	
Existing Land Cover/Development: Reach 3 predominantly consists of riparian vegetation, vacant land, park land (Chiawana Park) along with trail, parking, pier, and boat launch facilities.	
Geomorphic Character: Description: The shoreline throughout the reach consists of outburst flood deposits with relatively low banks.	


Reach 3	City of Pasco
Hardened Banks: Hardened bank exists at the Chiawana Park boat dock.	
Flooding and Geological Hazards:	
Flooding: Flooding is controlled by Lake Wallula pool elevations.	
Geological Hazards: There are no geologic hazard areas in Reach 3.	
Existing Public Access:	
Reach 3 has public access along Chiawana Park. The Sacajawea Heritage Trail parallels the shoreline in this reach. The park contains public access amenities such as a boat launch and pier.	
Identified Public Access Improvements:	
The Rivershore Linkage and Amenity Plan (Pasco 2012) identifies improvement of park amenities and adding a second boat launch and a beach along the park. The Plan also recommends improving the trail amenities by adding park areas at the termini of Roads 76 and 84 and developing the USACE area as an extension of Chiawana Park.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment:	
A minor drainage ditch appears to be a minor input to SR 3a. No known local sediment inputs are noted.	
Water Quality:	
Water quality in this reach may be slightly impacted by residential and recreational (boating) use.	
Habitat Characteristics and PHS Presence:	
Reach 3 is primarily characterized by a park-like environment, with public use areas along the shoreline for the entirety of the reach. While shoreline vegetation is rather limited, open and undeveloped areas are present within several hundred feet of the shore, which may support limited numbers of upland mammal and bird species, and provide access from the upland areas to the shoreline. ESA-listed and resident fish species are present in the river.	
SR 3a: This subreach almost entirely comprises Chiawana Park, which exhibits riparian vegetation of several hundred feet in width at the northern end of the subreach. Otherwise, mowed areas extend to the water's edge. The park has landscaped areas and picnic pavilions throughout the upland area. There is one dock present in this subreach, an 80-foot-long, T-shaped structure associated with the park. There is also a dredged inlet serving as a public boat launch at the southern end of this subreach.	
SR 3b: Low-density residential areas characterize this subreach with lawns that end about 275 feet short of the shoreline. The remaining area near the shoreline contains unvegetated areas with a multi-use recreational trail. Sparse trees in patchy zones are along the water's edge. These areas are identified as habitat for Townsend's ground squirrel and burrowing owl.	

Reach 3	City of Pasco
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 3a	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Park development, including parking areas and buildings, irrigated turf landscaping, limited riparian buffer throughout park.</p> <p>Recreational use: Boat launch, overwater structures, shoreline trail associated with Chiawana Park.</p> <p>Potential Restoration Opportunities: Riparian buffer restoration within park.</p> <p>Potential Protection Opportunities: Protect intact shrub-steppe habitat. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 3b	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Bulkhead area and access road in central portion of subreach, some non-native species (Russian-olive) within riparian buffer.</p> <p>Recreational use: Multiple informal upland trails to water connected to formal paved trail at top of slope.</p> <p>Potential Restoration Opportunities: Replace non-native species with native alternatives. Formalize water access trails to discourage new informal access trails.</p> <p>Potential Protection Opportunities: Protect intact shrub-steppe and riparian habitat. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

Reach 4	City of Pasco
Reach Description: Columbia River from the upstream edge of hardened bank to the downstream end of Wade Park	
Shoreline Jurisdiction: 463 acres	
 <p style="text-align: right; font-size: small;">Source: https://fortress.wa.gov/ecy/coastalatlas/UICoastalAtlas/Tools/ShorePhotos.aspx</p>	
Subreaches; see Map 2:	
SR 4a: Begins at the upstream edge of hardened bank to the downstream end of hardened bank	
SR 4b: Extending 1 mile to east ending at the downstream edge of Wade Park	
CHARACTERISTICS	
Ownership: Reach 4 is mostly owned by USACE with a very small amount (less than 5%) of private ownership.	
Land Use/Current SMP:	
Land use designation:	
<ul style="list-style-type: none"> • Current land uses are Low Density Residential and Open Space Nature • Zoning – Suburban District (RS-12), Suburban District (RS-20) and Suburban District (RS-1) 	
Current SMP Environment Designation: Urban	
Existing Land Cover/Development:	
There is a levee along the entire stretch of SR 4a and parkland along the entire stretch of SR 4b. SR 4a groundcover consists mostly of riprap with a trail on top of the levee and some riparian vegetation. SR 4b groundcover consists of improved parkland (Wade Park) with a boat launch, piers, a trail, and gravel parking.	

Reach 4	City of Pasco
Geomorphic Character: Description: The shoreline throughout the reach consists of outburst flood deposits (SR 4a) and alluvium (SR 4b) with relatively low banks. Hardened Banks: Approximately 6,000 feet of artificial hardened banks exist along the Columbia River (left bank) and occur along the entire length of SR 4a.	
Flooding and Geological Hazards: Flooding: Flooding is controlled by Lake Wallula pool levels. Levees are present along SR 4a that reduce flooding potential. Geological Hazards: There are no geologic hazard areas in Reach 4.	
Existing Public Access: Reach 4 consists of the Sacajawea Heritage Trail on top of the levee and Wade Park. Access points to the trail are limited due to the drainage ditch behind the levee. Wade Park consists of a boat launch, piers, a trail, and gravel parking. Identified Public Access Improvements: The Rivershore Linkage and Amenity Plan (Pasco 2012) recommends adding amenities to the park, lowering the levee, creating beach area, and creating parks with boats or access points along Roads 60 and 68.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: A pump connected to a drainage ditch may locally impact water quantity in SR 4a. Sediment may be impacted by levees in subreach 4a as the hardened banks may cause higher velocities, which may result in more sediment movement, and cause potential aggradation in SR 4b downstream of the levees.	
Water Quality: Water quality may be slightly impacted from residential runoff and recreational use in this reach.	
Habitat Characteristics and PHS Presence: Reach 4 contains park and multi-use path shorelines adjacent to moderate residential development, offering undeveloped areas, but not a great deal of habitat. The shores are managed for the main use and recreational enjoyment. Fish and wildlife habitat is limited. SR 4a: Banks of this subreach are rocky, contain little to no vegetation, and are within 40 to 50 feet of the multi-use trail that lines the shore. There is a linear ditch that parallels the trail for the length of the subreach. Wetlands and waterfowl concentrations are found just offshore on the small channel islands. There are no docks in this subreach. SR 4b: This subreach contains three smaller docks and one larger dock at the western end of the subreach, all within the waterfront of Wade Park. The park exhibits mowed grass to the water's edge and shoreline vegetation is absent except for several sparse trees. As such, wildlife habitat is limited in this subreach.	


Reach 4	City of Pasco
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 4a	
<p>Level of Existing Function: Impaired</p> <p>Stressors:</p> <p>Upland development: Armored levee, single family residential, and irrigated agriculture upland of levee.</p> <p>Recreational use: Paved trail/maintenance road at top of levee.</p> <p>Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where possible.</p> <p>Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 4b	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Bulkhead area at north end of subreach, minimal riparian buffers, irrigated turf within Wade Park.</p> <p>Recreational use: Overwater structures and boat launch with informal parking associated with Wade Park.</p> <p>Potential Restoration Opportunities: Riparian buffer restoration within park.</p> <p>Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

Reach 5	City of Pasco
Reach Description: Columbia River from the edge of hardened bank upstream of US 395 (Blue Bridge) to State Route 397 bridge (Cable Bridge)	
Shoreline Jurisdiction: 195 acres	
 <p style="text-align: right; font-size: small;">©2007 Washington State Department of Ecology</p>	
Source: https://fortress.wa.gov/ecy/coastalatlant/UICoastalAtlas/Tools/ShorePhotos.aspx	
Subreaches; see Map 3: SR 5a: Begins at the edge of hardened bank to the US 395 bridge SR 5b: Extending 0.9 mile to the east to the upstream edge of water retention facility SR 5c: Extending 0.4 mile to the east to the downstream end of retention facility SR 5d: Extending 0.4 mile to the east to the State Route 397 bridge	
CHARACTERISTICS	
Ownership: Reach 5 is mostly owned by USACE, City of Pasco, and Washington Department of Transportation. There is a very small amount (less than 5%) of private ownership.	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land uses are Open Space Nature, Low Density Residential, Mixed Residential, Mixed Residential Commercial, Commercial, and Industrial • Zoning – Low Density Residential (R-1), Residential Suburban (RS-12), Residential Suburban (RS-20), Residential Park (RP) and Light Industrial (I-1) Current SMP Environment Designation: Urban	

Reach 5	City of Pasco
Existing Land Cover/Development: Reach 5 is primarily consists of a levee, riprap, a drainage ditch behind the levee, and a trail on top of the levee. There is riparian vegetation, parking, and a park facilities structure on SR 5c. A rail line on SR 5d is near the Blue Bridge.	
Geomorphic Character: Description: The shoreline throughout the reach consists of alluvium with relatively low banks through urban development area. Hardened Banks: Approximately 10,500 linear feet of artificial hardened banks exist along the Columbia River (left bank).	
Flooding and Geological Hazards: Flooding: Flooding is controlled by Lake Wallula pool levels. Levees are present along the reach, which reduce flooding potential. Geological Hazards: There are no geologic hazard areas in Reach 5.	
Existing Public Access: Reach 5 contains the Sacajawea Heritage Trail and Riverview Park. Similar to Reach 4, access points to the trail are limited due to the levee and drainage ditch behind the levee. Identified Public Access Improvements: The Rivershore Linkage and Amenity Plan (Pasco 2012) recommends improving the open space area near W. Havstad Street, adding beach area at the Wade Park entrance and south of the Riverview Park, adding a multi-use path over the Blue Bridge, developing the levee, and improving access from the levee to the river.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: Pumps connected to a drainage ditch (all subreaches) and a connected pond (in SR 5c) may locally impact water quantity. Sediment may be impacted by levees as the hardened banks may cause higher velocities, which may result in more sediment movement.	
Water Quality: Water quality may be slightly impacted from residential runoff and recreational use in this reach.	
Habitat Characteristics and PHS Presence: Reach 5 shorelines include park areas and multi-use paths, with mixed development ranging from residential to light industrial areas. There is little habitat for wildlife along the shoreline, and the habitat function of the nearshore river area is limited due to the lack of riparian vegetation along the shoreline. No PHS are noted within this reach, except for ESA-listed and resident fish in the river. SR 5a: Similar to SR 4a (in Reach 4), the banks of this subreach are rocky, contain little to no vegetation	

Reach 5	City of Pasco
<p>and are within 40 to 50 feet of the multi-use trail that lines the shore. There is a linear ditch that parallels the trail for the length of the subreach. There are no docks within this subreach. Wildlife habitat is limited here due to the level of development.</p> <p>SR 5b: Similar to SR 5a, the banks of this subreach are rocky, contain little to no vegetation, and are within 40 to 50 feet of the multi-use trail that lines the shore. There is a linear ditch just landward of the trail that parallels the trail for the length of this subreach. There are no docks within this subreach. There is a shoreline park at the street end at South 25th Avenue where patchy shrubs occur. This subreach has limited habitat function for wildlife or aquatic species.</p> <p>SR 5c: The Pasco Youth Baseball Complex is adjacent to this subreach, and Riverview Park sits along the water. This subreach has shorelines similar to SR 5b, with rocky unvegetated shorelines, a multi-use path within 40 to 50 feet of the shore, and a linear ditch present. Riverview Park is directly east of an open-water pond approximately 1,000 feet in length that connects to the ditch on the pond's western end. The pond is not connected to the river, but does contain emergent vegetation and trees for upland wildlife habitat.</p> <p>SR 5d: Similar to SR 5a in this reach, the banks of this subreach are rocky, contain little to no vegetation, and are within 40 to 50 feet of the multi-use trail that lines the shore. There are no docks within this subreach but there is one small structure just west of the Cable Bridge across the Columbia River on the eastern end of SR 5d. Riparian habitat is limited in this subreach due to development and encroachment by the trail and highway, and this also affects the function of the nearshore aquatic habitat for fish species.</p>	
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 5a	
<p>Level of Existing Function: Impaired</p> <p>Stressors:</p> <p>Upland development: Armored levee, residential and vacant lots upland of levee, substantial non-native species (Russian-olive) within vacant lot, Blue Bridge.</p> <p>Recreational use: Paved trail/maintenance road at top of levee.</p> <p>Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where possible.</p> <p>Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 5b	
<p>Level of Existing Function: Impaired</p> <p>Stressors:</p> <p>Upland development: Armored levee, behind levee is a residential area at north end of subreach and industrial and vacant lands in southern portion.</p> <p>Recreational use: Paved trail/maintenance road at top of levee.</p> <p>Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where</p>	


Reach 5	City of Pasco
possible. Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	
SR 5c	
Level of Existing Function: Impaired Stressors: Upland development: Armored levee, stormwater treatment basin landward of levee, substantial non-native species (Russian-olive) surrounding basin. Recreational use: Paved trail/maintenance road at top of levee. Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where possible. Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	
SR 5d	
Level of Existing Function: Partially Functioning Stressors: Upland development: Armored levee, Pasco Youth Baseball Complex and associated landscaping upland of levee, and infrastructure (water intake) at south end of this subreach. Recreational use: Paved trail/maintenance road at top of levee. Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where possible. Potential Protection Opportunities: Protect intact shrub-steppe habitat upland of levee. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	

Reach 6	City of Pasco
Reach Description: Columbia River from State Route 397 (Cable) bridge to the upstream edge of Sacajawea State Park	
Shoreline Jurisdiction: 744 acres	
 <p style="text-align: center;">Source: https://fortress.wa.gov/ecy/coastalatlas/UICoastalAtlas/Tools/ShorePhotos.aspx</p>	
Subreaches; see Map 3: SR 6a: Begins at the Cable Bridge to the railroad bridge upstream of Schlagel Park SR 6b: From the railroad bridge to the end of marina facility/breakwater SR 6c: From the edge of marina facility/breakwater to the upstream edge of Sacajawea State Park	
CHARACTERISTICS	
Ownership: Reach 6 is entirely owned by Port of Pasco, with an exception of SR 6b. The Boat Basin in SR 6b is owned by USACE.	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land uses are Industrial and Open Space Nature • Zoning – Light Industrial (I-1), Heavy Industrial (I-3), Medium Density Residential (R-2) and Medium Density Residential (R-3) 	

Reach 6	City of Pasco
Current SMP Environment Designation: Urban	
Existing Land Cover/Development: Reach 6 consists of a mix of riprap, riparian vegetation, a trail, a marina, residential structures, warehouses, parking, unimproved vacant land, and industrial land. SR 6a is mostly riprap that includes a barge dock. SR 397 crosses the shoreline on SR 6a. SR 6b has riparian vegetation around the marina and Schlagel Park. Industrial land cover dominates SR 6c. There is riparian vegetation on the edge of the shoreline in SR 6b and 6c.	
Geomorphic Character: Description: The shoreline throughout the reach consists of alluvium with relatively low banks through a developed area. Hardened Banks: Approximately 6,500 linear feet of artificial hardened banks exist along the Columbia River (left bank) within all the subreaches.	
Flooding and Geological Hazards: Flooding: Flooding is controlled by Lake Wallula pool levels. Levees are present along SR 6a, which reduce flooding potential. Geological Hazards: There are no geologic hazard areas in Reach 6.	
Existing Public Access: Sacajawea Heritage Trail parallels part of the shoreline in Reach 6 and shifts away from the shoreline in SR 6c. Schlagel Park area includes boat marina and related facilities. The Port of Pasco property in SR 6c does not include any major public access. Identified Public Access Improvements: The Port of Pasco Boat Basin/Marine Terminal Master Plan proposes improvements to the marina, and the addition of public beach, viewpoints, and a marina park. In addition to the Boat Basin Plan/Marine Terminal Master, the Rivershore Linkage and Amenities Plan (Pasco 2012) recommends development of water enjoyment facilities (e.g., dining) along the shoreline, improvement of trail connection between the boat basin and Pasco's urban center, and building a Sacajawea Trail underpass through the Schlagel Park boat basin neighborhood. The plan recommends building a shoreline park between the boat basin and Osprey Point. The Port of Pasco Osprey Pointe Business Park Plan indicates trail connections along the shoreline.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: No local impacts to water quantity are noted in this reach. Sediment may be impacted by levees as the hardened banks may cause higher velocities, which may result in more sediment movement in SR 6a and may cause aggradation in SR 6b where the levees end and velocities may slow.	


Reach 6	City of Pasco
Water Quality: Water quality may be impacted by industrial activities in SRs 6a and 6c and recreational activities throughout the reach. A boating area in SR 6b may have the potential for impacting water quality.	
Habitat Characteristics and PHS Presence: The shorelines of Reach 6 are generally armored and landscaped and offer little wildlife habitat, except for pockets of shallow water and riparian vegetation that appear near Cascade Marina and Sacajawea State Park. The reach is generally industrialized and landscaped for human use. ESA-listed and resident fish species occur within the Columbia River in this reach. SR A: Shorelines in this subreach are armored with riprap and contain overwater structures and several sets of piles, as well as a railroad bridge at the eastern end of this subreach. Riparian vegetation is absent, as access roads, parking lots, and the multi-use trail wind through the adjacent shoreline of the properties. Fish and wildlife habitat function is limited by this development. SR B: This subreach contains the Cascade Marina and Schlagel Park, which exhibit mostly armored shorelines with a thin strip of riparian tree vegetation around the perimeter of the marina embayment. The embayment has two large boat houses and one long dock with boat slips. Open water habitat is available for waterfowl and other birds, and quiet shallow water provides refugia for juvenile fish. SR C: The western third of this subreach, which contains the Port of Pasco building and property, has mowed landscaped areas along the water, as well as the multi-use trail 30 to 50 feet from the shore. Sparse vegetation grows in this area. The eastern two-thirds is industrialized in the uplands and has bare ground within 30 to 150 feet of the shore, but the immediate shoreline contains a sizeable riparian buffer with shrubs and trees next to the water for wildlife use. Nearing Sacajawea State Park on the eastern end of this subreach, waterfowl concentrations occur, and habitat begins to appear that could be potentially suitable for sage grouse and burrowing owl. There is one small dock at the end of Southeast Road 27.	
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 6a	
Level of Existing Function: Impaired Stressors: Upland development: Armored levee, industrial development upland of levee, bridge for Highway 397 and railroad bridge, fill area waterward of levee alignment with warehouse structures and wooden overwater structures, mooring dolphins, and rock armoring with a small area of sheetpile armoring. Potential Restoration Opportunities: Consider incorporating wood structure and vegetation where possible. Replace creosote dock and dolphin material with material that has less water quality implications. Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	

Reach 6	City of Pasco
SR 6b	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Breakwater structures, marina in central portion of subreach with covered and uncovered moorage, armored shoreline and upland parking lot, single family residential development in southern portion of subreach, shared dock.</p> <p>Recreational use: Trails along breakwater structures, boat ramp, and associated dock at Schlagel Park.</p> <p>Potential Restoration Opportunities: Incorporate riparian buffers where absent. Offer incentives for low-impact development stormwater measures.</p> <p>Potential Protection Opportunities: Protect existing riparian areas within park, near residential areas, and along breakwater structures. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 6c	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Vegetated riparian area with areas of mowed turf adjacent to Osprey Point, with undeveloped, non-native vegetated upland in this same vicinity. Southern portion of subreach includes industrial port development hard banks in moorage areas and elsewhere intact riparian buffers.</p> <p>Recreational use: Paved trail/maintenance road at top of levee, unpaved roads waterward of E. Commerce Street at south end of subreach.</p> <p>Potential Restoration Opportunities: Consider more riparian buffer areas within industrial complex.</p> <p>Potential Protection Opportunities: Preserve existing riparian vegetation and if possible do not mow these woody species. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

Reach 7	City of Pasco
Reach Description: Columbia River from the upstream edge of Sacajawea State Park to Snake River just east of the Sacajawea State Park boat basin	
Shoreline Jurisdiction: 295 acres	
 <p style="text-align: right; font-size: small;">©2007 Washington State Department of Ecology</p>	
Source: https://fortress.wa.gov/ecy/coastalatlant/UICoastalAtlas/Tools/ShorePhotos.aspx	
Subreaches; see Map 4:	
Not Applicable.	
CHARACTERISTICS	
Ownership: Reach 7 is owned by Washington State Parks and Recreation Commission.	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land use is Industrial and Open Space Nature • Zoning – Medium Industrial (I-2), and Heavy Industrial (I-3) Current SMP Environment Designation: Conservancy	
Existing Land Cover/Development: This reach primarily consists of riparian vegetation in the Sacajawea State Park. There is also a boat launch, dock, a beach, and utility poles within this reach.	
Geomorphic Character: Description: Reach 7 consists of a topographic low area at the confluence of the Columbia River and Snake River. The shoreline throughout the reach consists of alluvium with relatively low banks throughout Sacajawea State Park.	

Reach 7	City of Pasco
Hardened Banks: Approximately 100 feet of hardened banks exist along the reach extent associated with the State Park basin boat launch.	
Flooding and Geological Hazards: Flooding: Flooding is controlled by Lake Wallula pool levels. Sacajawea State Park in this reach is within the 100-year floodplain. Geological Hazards: There are no geologic hazard areas in Reach 7.	
Existing Public Access: Reach 7 consists of Sacajawea State Park at the confluence of the Snake and Columbia Rivers. This park has historic value regarding the Lewis and Clark Expedition and contains a museum and interpretive center. The park includes boat launch, dock, campsite, and beach area. Identified Public Access Improvements: The Rivershore Linkage and Amenities Plan (Pasco 2012) identifies adding camping facilities and educational opportunities to Sacajawea State Park, and extending the Sacajawea Heritage Trail toward the Columbia Plateau/Ice Harbor Dam trail linkage.	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: No local impacts to water quantity or sediment are identified.	
Water Quality: Water quality in this reach may be impacted by recreational use. Wetlands part of Sacajawea State Park may also have a slight impact on water quality in this reach.	
Habitat Characteristics and PHS Presence: Reach 7 entirely contains Sacajawea State Park, which occurs at the confluence of the Snake and Columbia Rivers. The park has relatively large expanses of undeveloped or restored shoreline with landscaped or natural trees and pockets of off-channel shallow water habitat. The upland portion of the park contains shrub-steppe habitat for upland wildlife species. There is also one armored embayment with a dock and boat launch along the Snake River side of the park. ESA-listed fish species use both rivers for migration and rearing habitat. Compared to adjacent reaches, this reach provides enhanced nearshore aquatic habitat rearing and migratory functions as a result of the intact riparian habitat, characterized by multiple species of native plants, trees, and shrubs.	
ECOLOGICAL FUNCTIONS ANALYSIS	
Level of Existing Function: Partially Functioning	
Stressors Upland development: Park development including five overwater structures, a boat launch, a swim beach, upland turf areas. Overall contains substantial riparian buffer areas, outside of park within upland areas non-native Russian-olive species.	

Reach 7	City of Pasco
Recreational use: Upland trails, water access, boat use.	
Potential Restoration Opportunities: Consider incorporating more riparian buffer plantings near the boat launch area at northeast side of subreach. Replace non-native species with native alternatives.	
Potential Protection Opportunities: Preserve existing riparian and shrub-steppe habitat. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.	

Reach 8	City of Pasco
Reach Description: Snake River just upstream of confluence with Columbia River, extending from City UGA eastern boundary to near Sacajawea State Park	
Shoreline Jurisdiction: 260 acres	
 <p style="text-align: right;">Source: https://fortress.wa.gov/ecy/coastalatlant/UICoastalAtlas/Tools/ShorePhotos.aspx</p>	
Subreaches; see Map 4: SR 8a: Begins at Sacajawea State Park to the edge of industrial developments SR 8b: Extends 0.5 mile to the north ending at the US 12 bridge	
CHARACTERISTICS	
Ownership: SR 8a is owned by Washington State Parks and Recreation Commission and federal government. SR 8b is mostly private with a small amount (less than 10%) of federal ownership.	
Land Use/Current SMP: Land use designation: <ul style="list-style-type: none"> • Current land uses are Industrial and Open Space Nature • Zoning – Light Industrial (I-1), Medium Industrial (I-2), and Heavy Industrial (I-3) Current SMP Environment Designation: Urban	
Existing Land Cover/Development: SR 8a is mostly unimproved natural land with riparian vegetation. SR 8a includes a rail crossing. SR 8b includes State Route 12 crossing, a fuel storage tank, and barge facilities.	
Geomorphic Character: Description: The shoreline in this reach consists mostly of outburst flood deposits. The reach consists of low bank areas near the confluence with the Columbia River. Lake Wallula levels fluctuate with downstream dam management practices. Hardened Banks: Approximately 7,200 linear feet of artificial hardened banks exist along the Columbia River (left bank) within all the subreaches.	

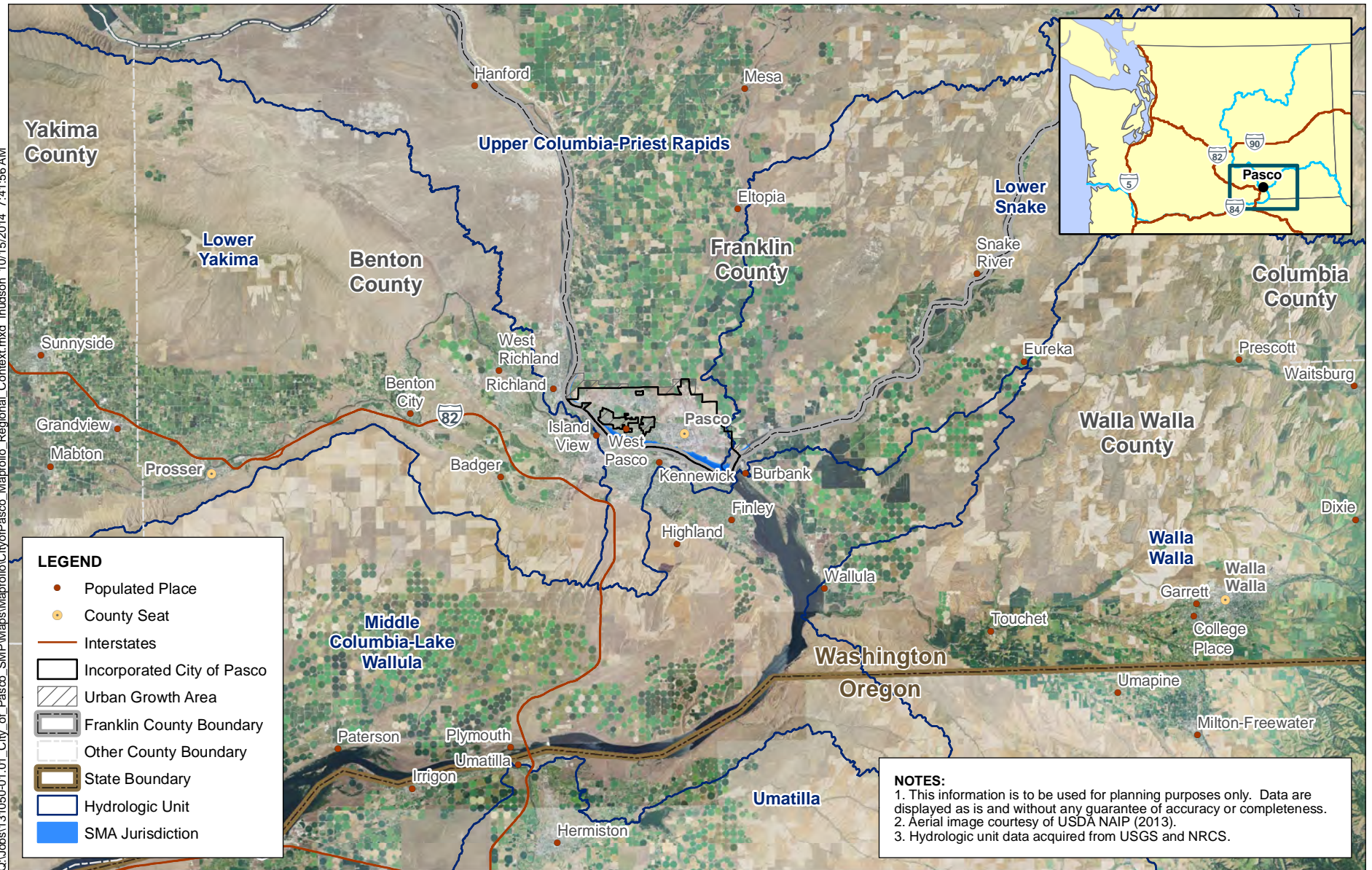
Reach 8	City of Pasco
Flooding and Geological Hazards: Flooding: Flooding is controlled by Lake Wallula pool levels. Sacajawea State Park in SR 8a is located in the 100-year floodplain. Geological Hazards: SR 8b contains slopes that are greater than 15% underlain by alluvium, which make them designated landslide hazard areas.	
Existing Public Access: Reach 8 does not have public access. SR 8a is primarily unimproved and SR 8b is developed with industrial/barge facilities. Identified Public Access Improvements: The Rivershore Linkage and Amenities Plan (Pasco 2012) recommends planning and designing a Sacajawea Heritage Trail extension through the Ainsworth Town site (SR 8a), improving amenities, developing Town of Ainsworth archaeology site, and adding a pedestrian bridge to the side of the Burlington Northern Santa Fe bridge if feasible. Public Access Opportunities:	
ECOLOGICAL CONDITIONS	
Water Quantity and Sediment: Irrigation pumps in SR 8b may have a slight impact on water quantity. Agricultural runoff may cause slight sediment input.	
Water Quality: Water quality may be slightly impacted by agricultural and industrial runoff within the reach.	
Habitat Characteristics and PHS Presence: This reach is adjacent to industrial facilities and artificially hardened shorelines, including a railroad next to the water and numerous overwater structures. There are artificially hardened shorelines along the entire reach, which significantly reduce the function of the riparian zone. SR 8a: This subreach contains barge moorage area and overwater structures, which artificially shade the water in the river. Habitat is limited to open water areas of the Snake River that provide habitat for ESA-listed and resident fish species, as well as areas for waterfowl concentrations. Greater sage grouse breeding habitat occurs in the upland shrub-steppe areas flanking the shoreline of this subreach. SR 8b: This subreach contains the US 12 bridge, which creates artificially shaded overwater cover. Similar to SR 1a, habitat is limited to open water areas of the Snake River that provide habitat for ESA-listed and resident fish species, as well as areas for waterfowl concentrations. There is also greater sage grouse breeding habitat in the upland shrub-steppe areas flanking the shoreline of this subreach.	

Reach 8	City of Pasco
ECOLOGICAL FUNCTIONS ANALYSIS	
SR 8a	
<p>Level of Existing Function: Partially Functioning</p> <p>Stressors:</p> <p>Upland development: Non-native riparian species (Russian-olive), railroad corridor and railroad bridge.</p> <p>Potential Restoration Opportunities: Replace non-native species with native alternative.</p> <p>Potential Protection Opportunities: Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	
SR 8b	
<p>Level of Existing Function: Impaired</p> <p>Stressors:</p> <p>Upland development: Railroad corridor along shoreline, industrial structures and Port development and vessel use, very limited riparian buffers and non-native Russian-olive species where riparian buffer exists, US 12 bridge.</p> <p>Recreational use: Informal roads and possibly off-road vehicle recreation use within upland areas.</p> <p>Potential Restoration Opportunities: Incorporate riparian buffers where absent. Replace non-native species with native alternatives.</p> <p>Potential Protection Opportunities: Protect intact shrub-steppe habitat from degradation by limiting recreation use. Provide stormwater controls consistent with Eastern Washington Stormwater Manual.</p>	

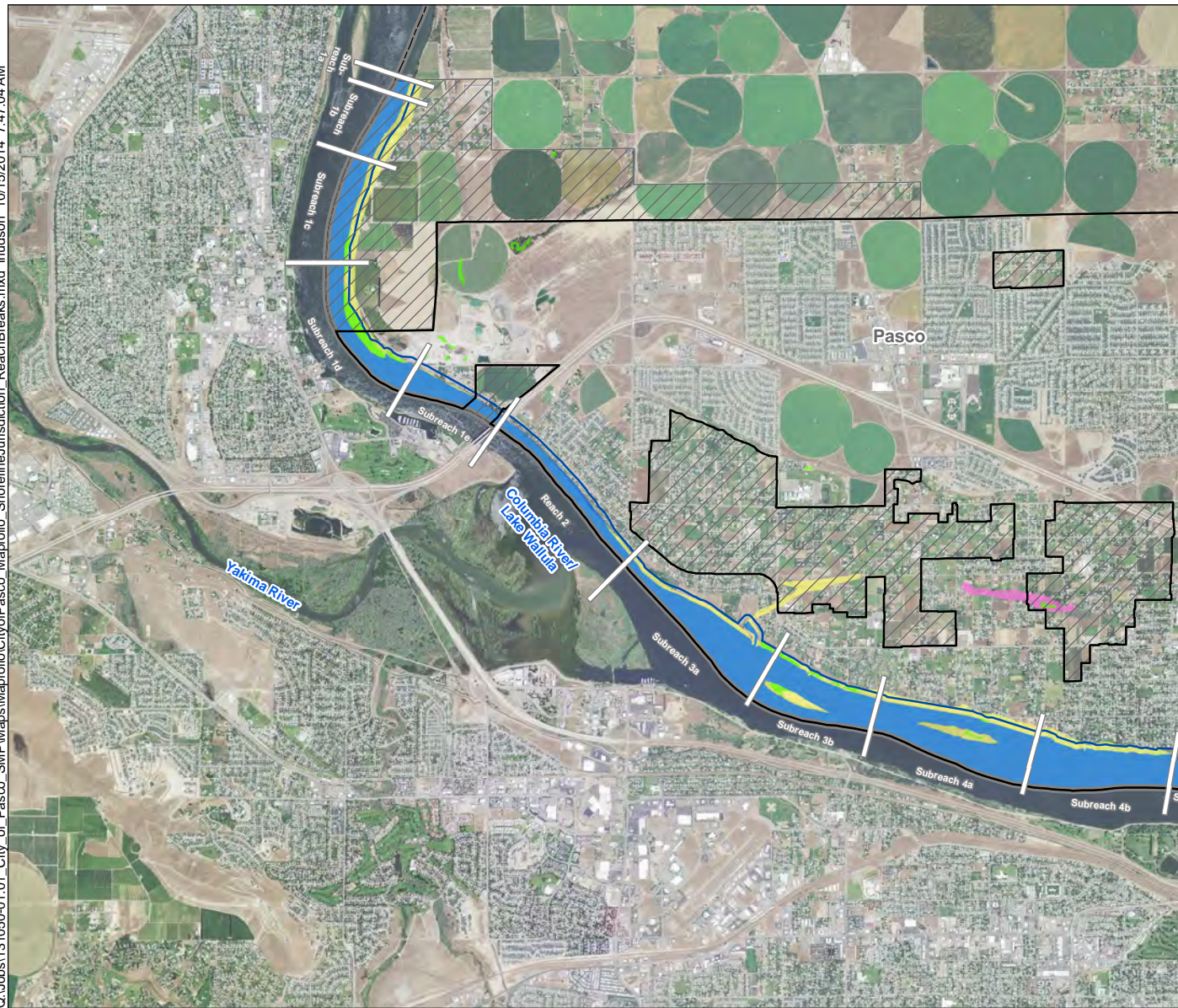
APPENDIX B

MAP FOLIO

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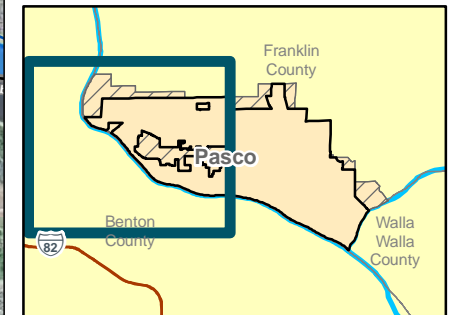


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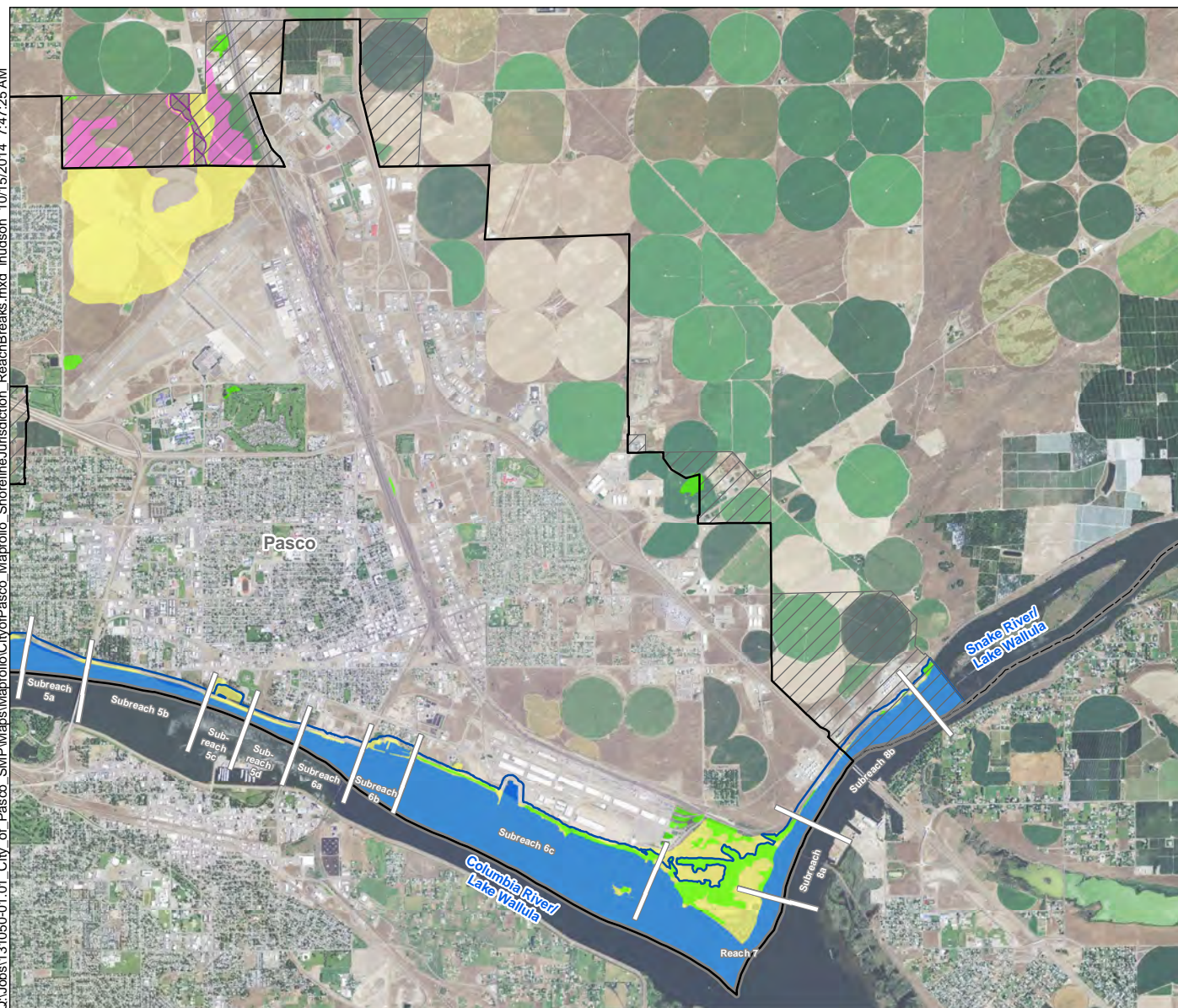
- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark
- NWI Wetland
- 100-year Floodplain
- 500-year Floodplain

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Floodway and floodplain data acquired from FEMA.



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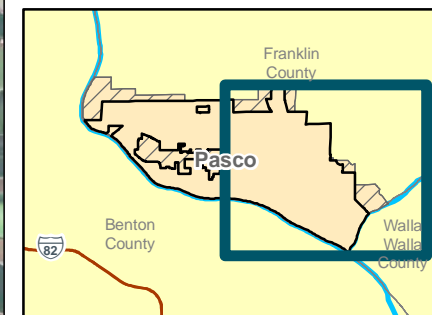


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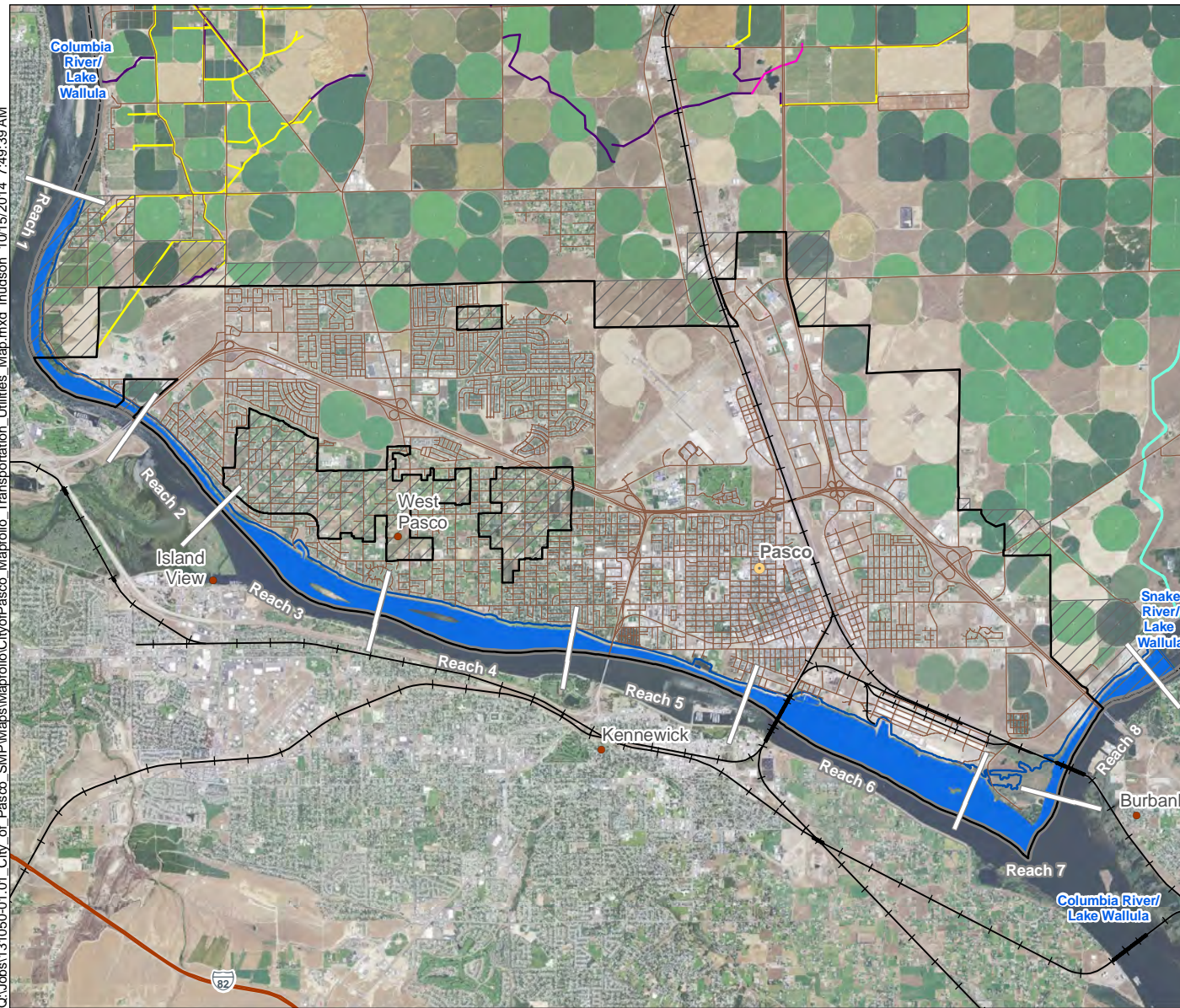
- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark
- NWI Wetland
- FEMA Floodway
- 100-year Floodplain
- 500-year Floodplain

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Floodway and floodplain data acquired from FEMA.



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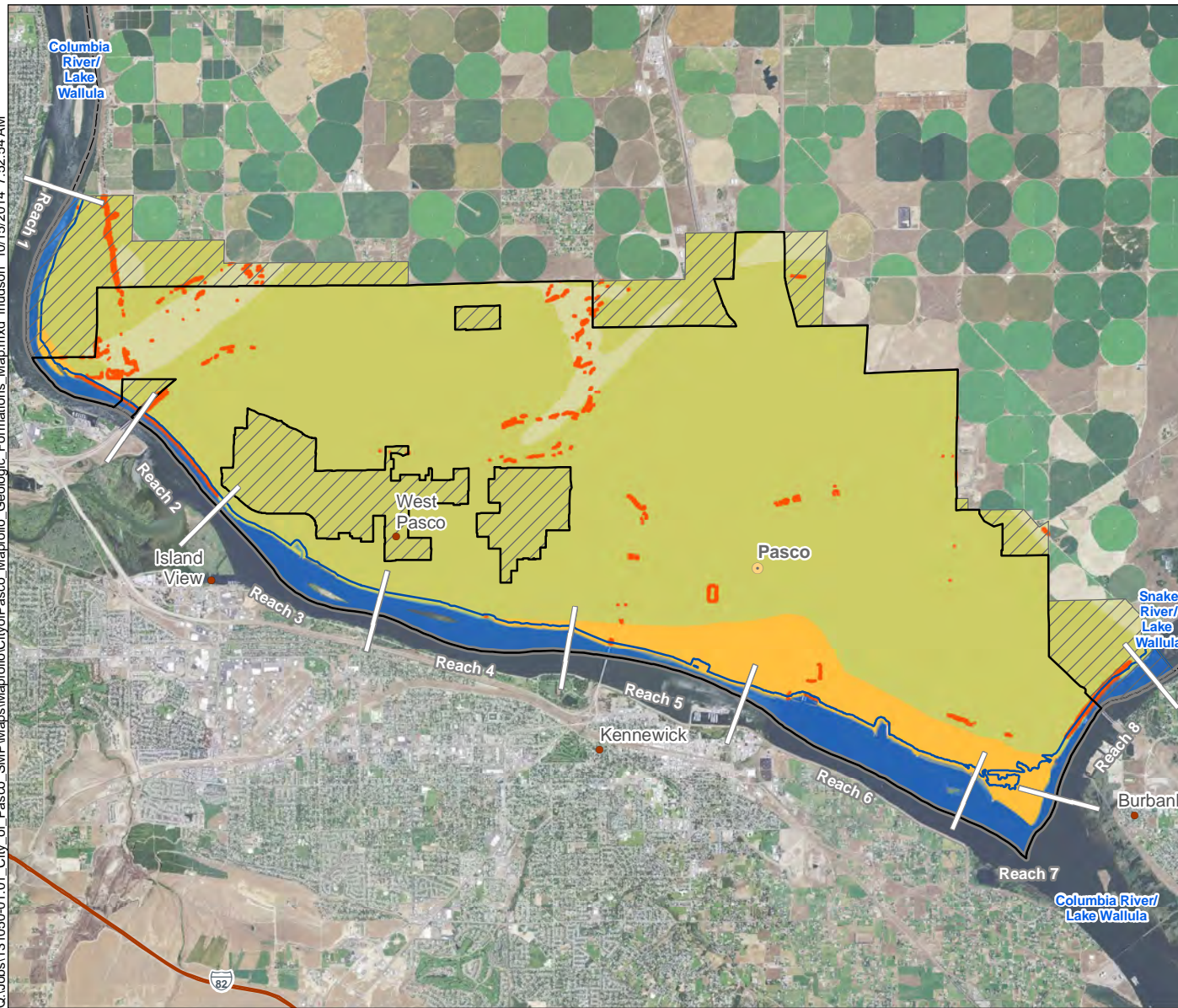
- Reach Break
- Populated Place
- County Seat
- Interstates
- Main County Road
- Railroad: Active
- Main Waterway
- Lateral Canal
- Open Drain
- Wasteway
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Canal, waterway, wasteway, and open drain data acquired from Franklin County.



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LEGEND

- Reach Break
- Populated Place
- County Seat
- Interstates
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark
- Geologic Hazard Area

Geologic Unit

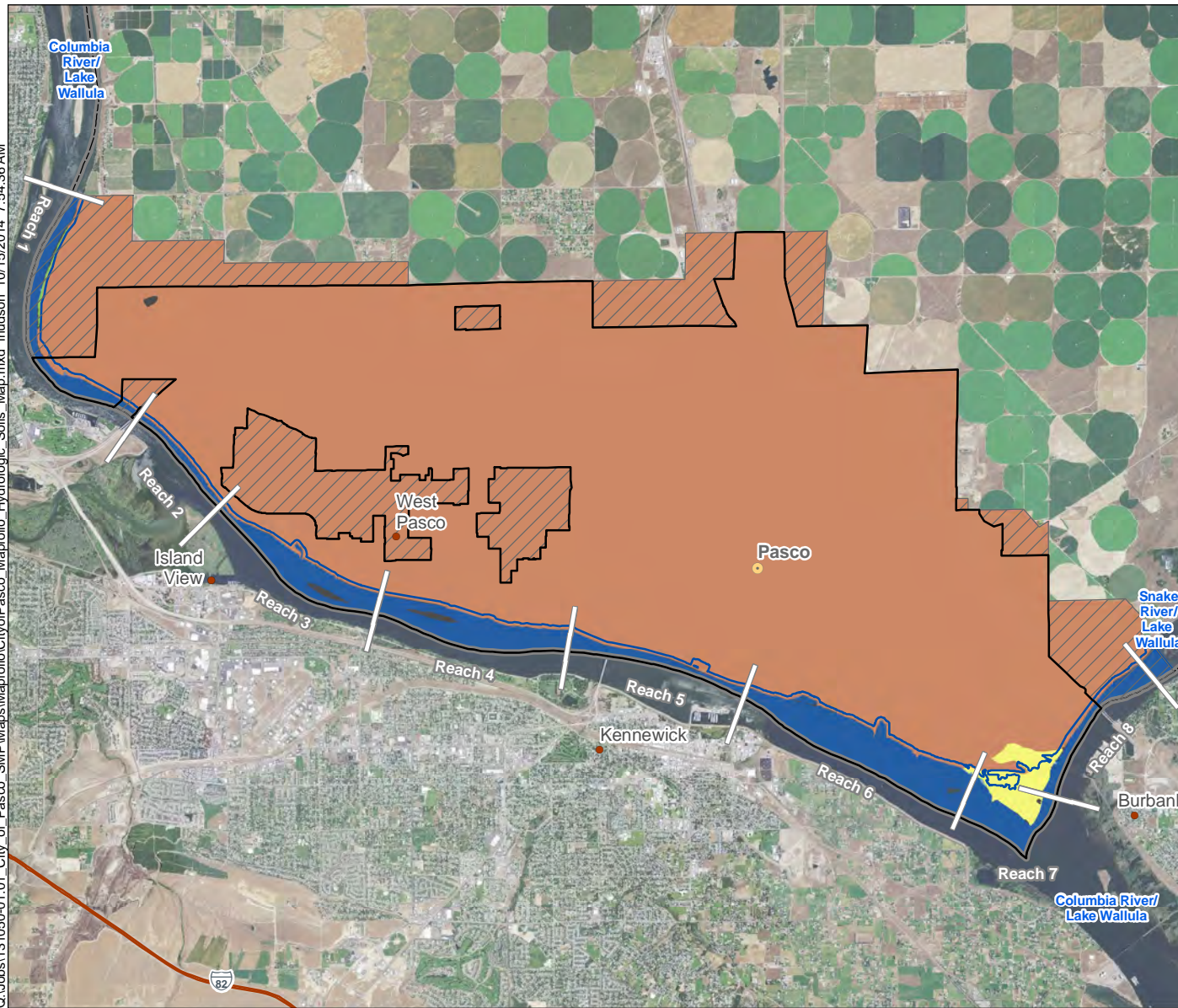
- Dunes
- Alluvial Deposits
- Flood Deposits

NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Geology data acquired from Washington Dept. of Natural Resources.
4. Geologic hazard areas derived from USDA NRCS GSSURGO soils data.



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LEGEND

- Reach Break
- Populated Place
- County Seat
- Interstates
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

Soil Permeability

- High Infiltration Rate
- Moderate Infiltration Rate
- Low Infiltration Rate
- Unknown Infiltration Rate

NOTES:

1. This information is to be used for planning purposes only. Data are displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Soils data acquired from NRCS.



Priority Fish Species in Franklin County:

Bull Trout/Dolly Varden, Chinook, Coho, Leopard Dace, Mountain Sucker, Pacific and River Lamprey, Rainbow Trout/Steelhead/Inland Redband Trout, Sockeye, Westslope Cutthroat, and White Sturgeon

Monitored Species in Franklin County:

Black-crowned Night-heron, Great Blue Heron, Pacific Lamprey, and Prairie Falcon

Sensitive Species in Franklin County:

Bald Eagle and Peregrine Falcon

Candidate Species in Franklin County:

Black-tailed Jackrabbit, Burrowing Owl, Chinook Salmon, Columbia Pebblesnail, Columbia River Tiger Beetle, Giant Columbia River Limpet, Golden Eagle, Juniper Hairstreak, Leopard Dace, Loggerhead Shrike, Merriam's Shrew, Mountain Sucker, Preble's Shrew, River Lamprey, Sage Sparrow, Sage Thrasher, Sagebrush Lizard, Sockeye Salmon, Striped Whipsnake, Townsend's Big-eared Bat, Washington Ground Squirrel, Western Grebe, White-tailed Jackrabbit, Yellow-billed Cuckoo, Bull Trout/Dolly Varden, and Rainbow Trout/Steelhead/Inland Redband Trout

Threatened Species in Franklin County:

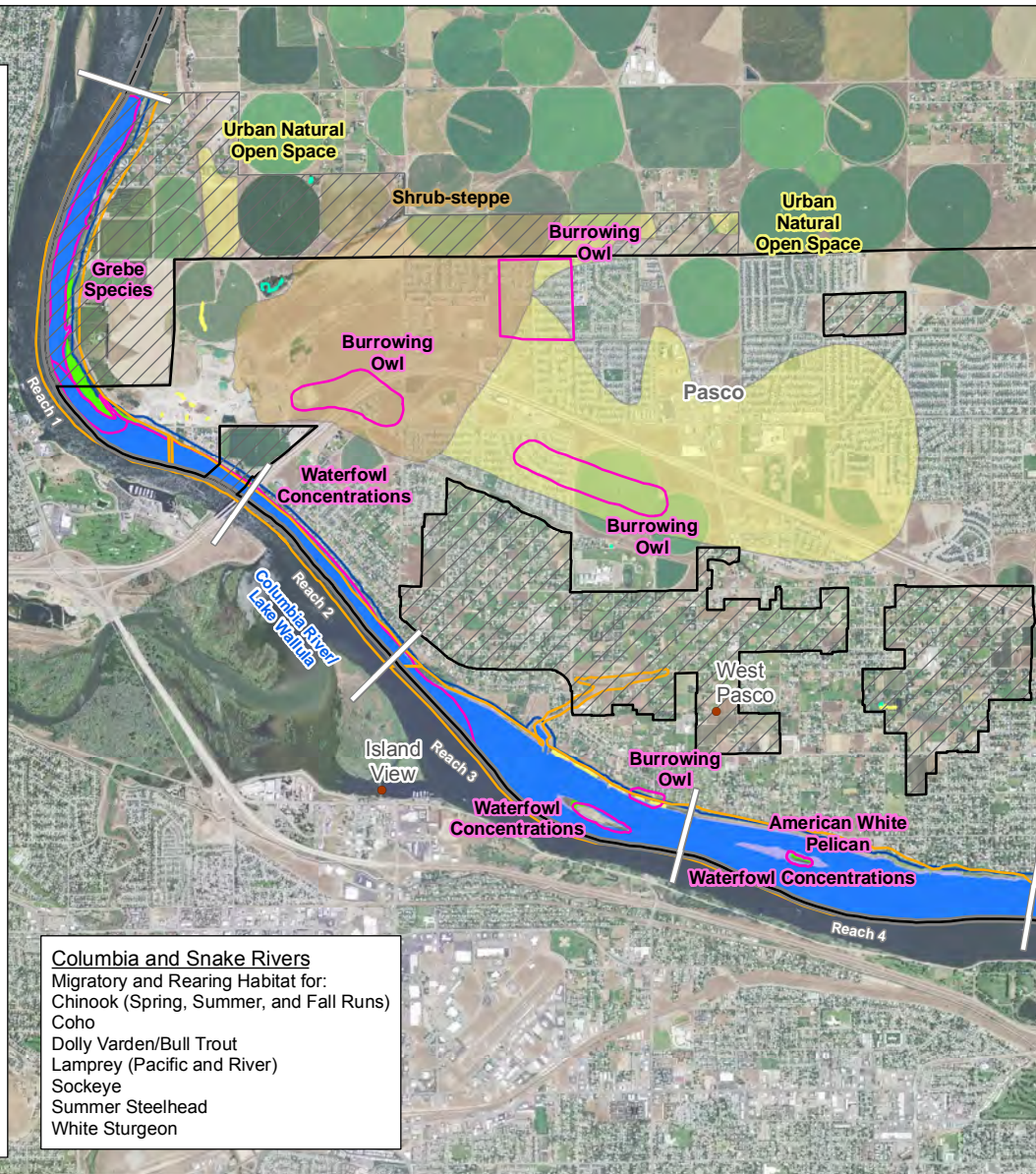
Ferruginous Hawk and White Bluffs bladderpod

Endangered Species in Franklin County:

American White Pelican

Columbia and Snake Rivers

Migratory and Rearing Habitat for:
Chinook (Spring, Summer, and Fall Runs)
Coho
Dolly Varden/Bull Trout
Lamprey (Pacific and River)
Sockeye
Summer Steelhead
White Sturgeon



LEGEND

- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark
- Frequently Flooded Area
- Priority Species Occurrence

Priority Habitat

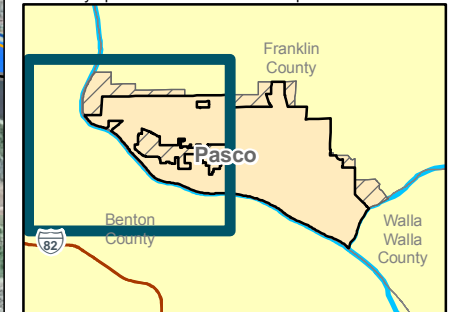
- Shrub-Steppe
- Urban Natural Open Space

NWI Wetland Type

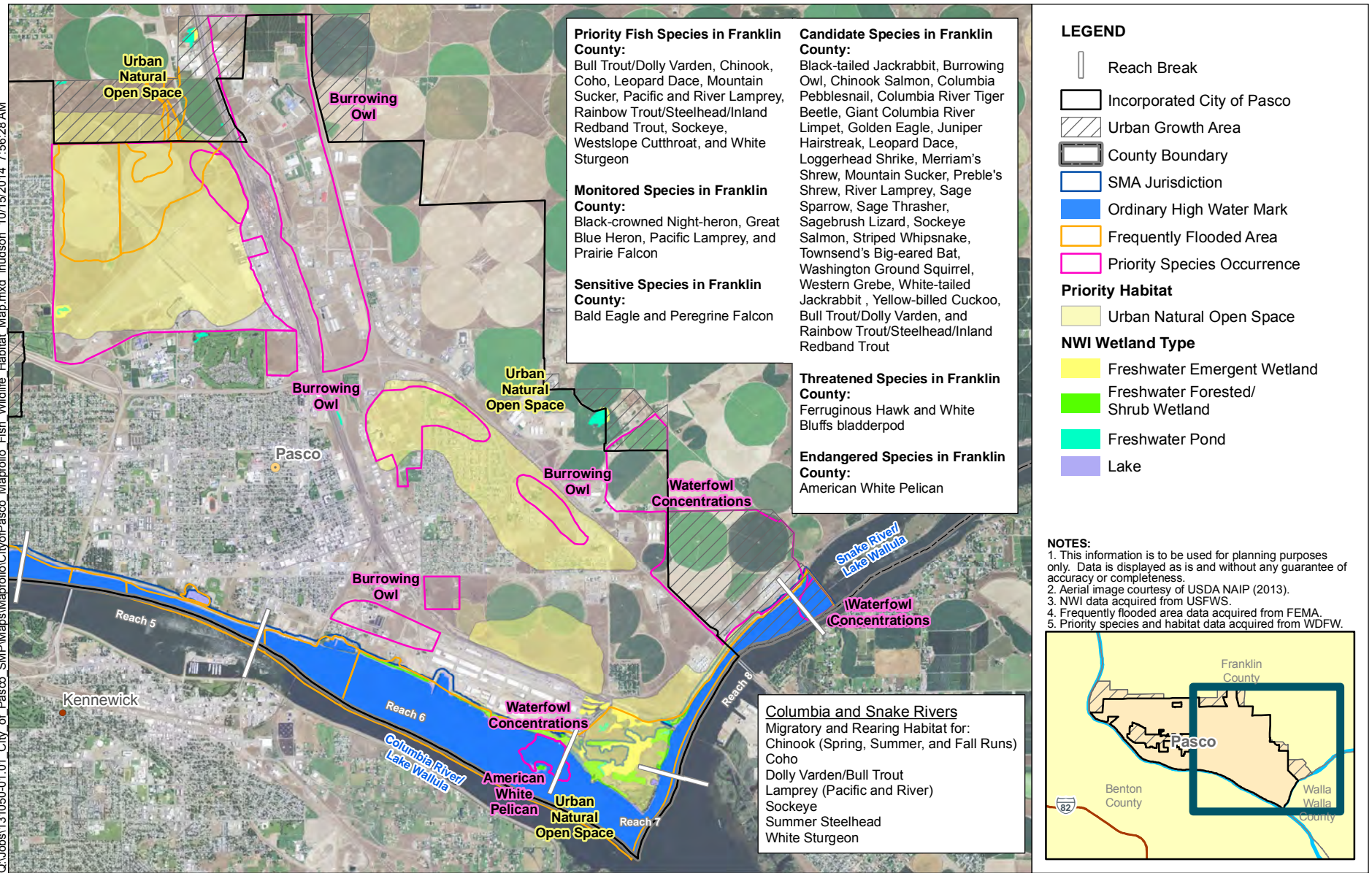
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other

NOTES:

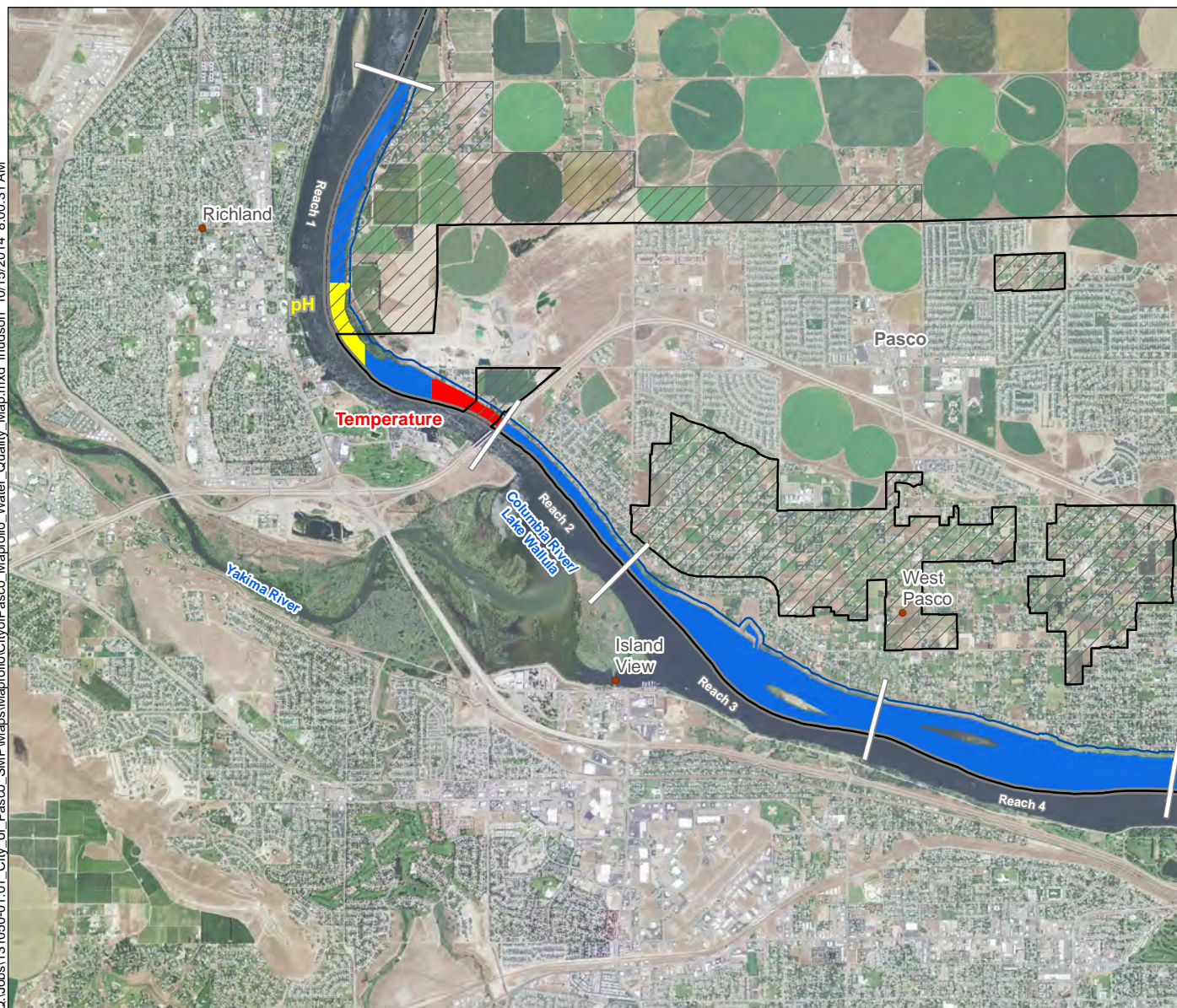
1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. NWI data acquired from USFWS.
4. Frequently flooded area data acquired from FEMA.
5. Priority species and habitat data acquired from WDFW.



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LEGEND

- Reach Break
- Populated Place
- County Seat
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

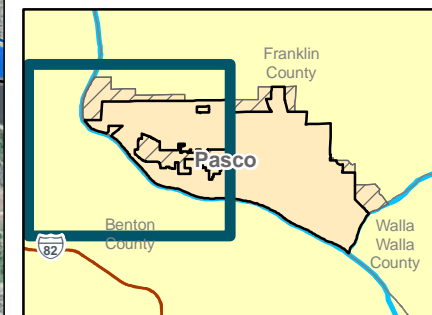
305b Rating

(WA Dept. of Ecology 2008)

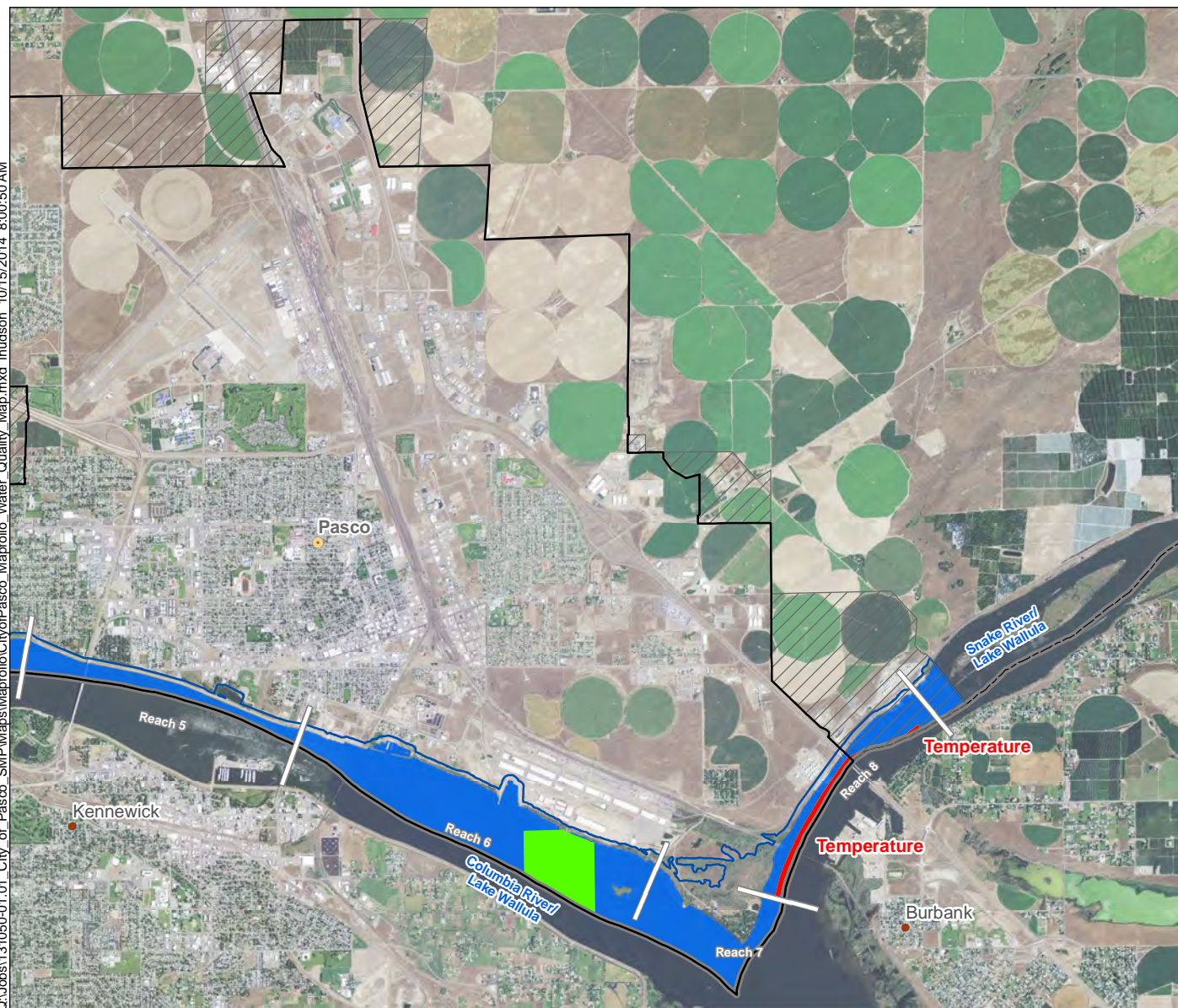
- 5 - Requires TMDL
- 4A - Approved TMDL
- 2 - Waters of Concern

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Water quality data acquired from Washington State Dept. of Ecology.



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LEGEND

- Reach Break
- Populated Place
- County Seat
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

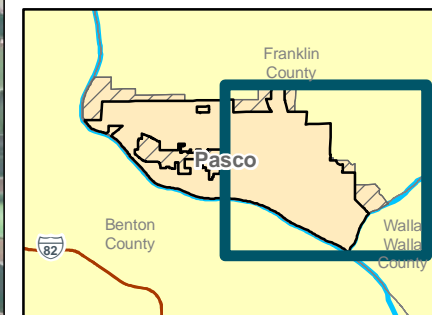
305b Rating

(WA Dept. of Ecology 2008)

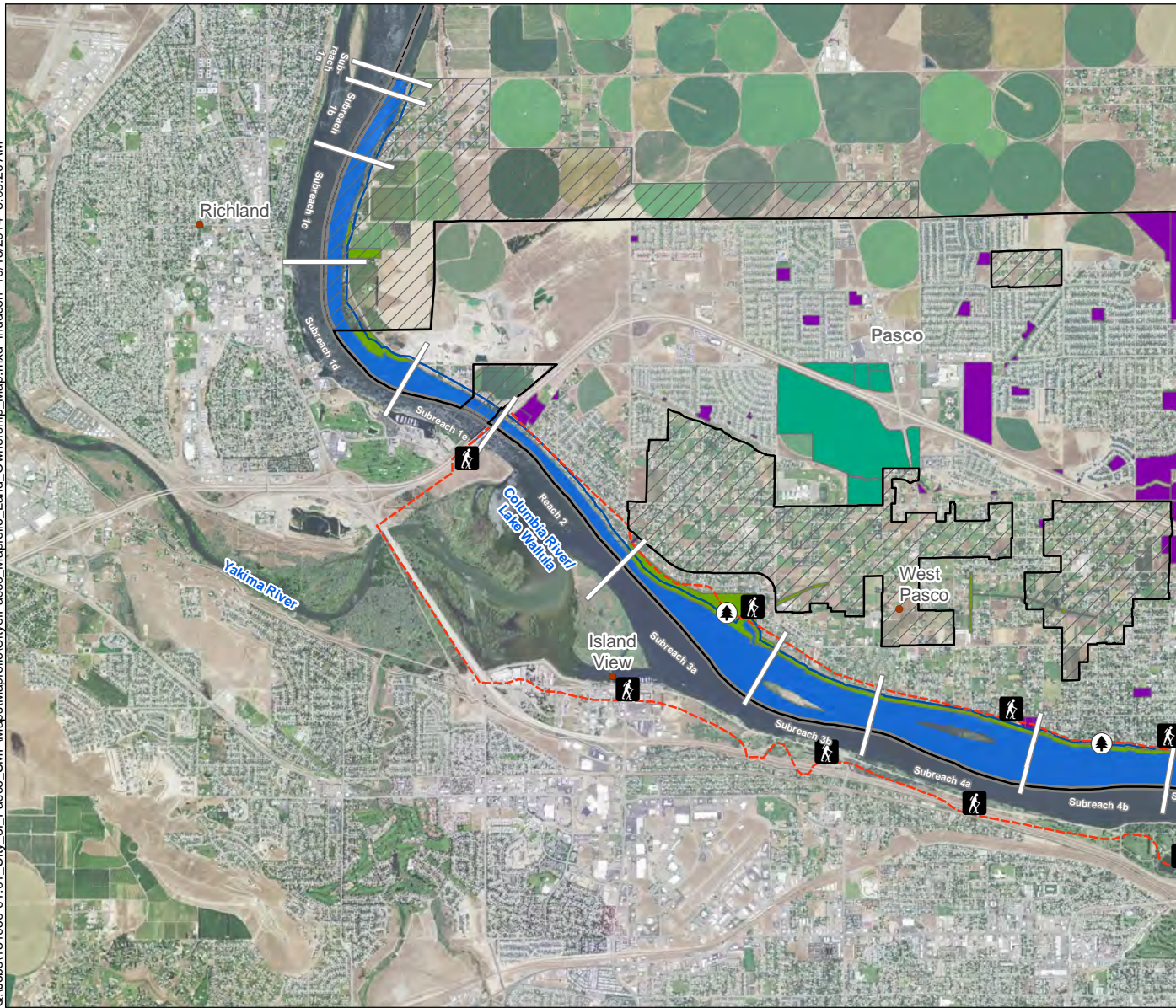
- 5 - Requires TMDL
- 4A - Approved TMDL
- 2 - Waters of Concern

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Water quality data acquired from Washington State Dept. of Ecology.



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- LEGEND**
- Reach Break
 - Populated Place
 - Incorporated City of Pasco
 - Urban Growth Area
 - County Boundary
 - SMA Jurisdiction
 - Ordinary High Water Mark

Public Access

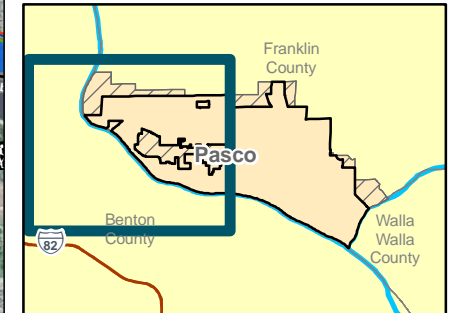
- Park
- Trailhead
- Sacagawea Heritage Trail

Land Ownership

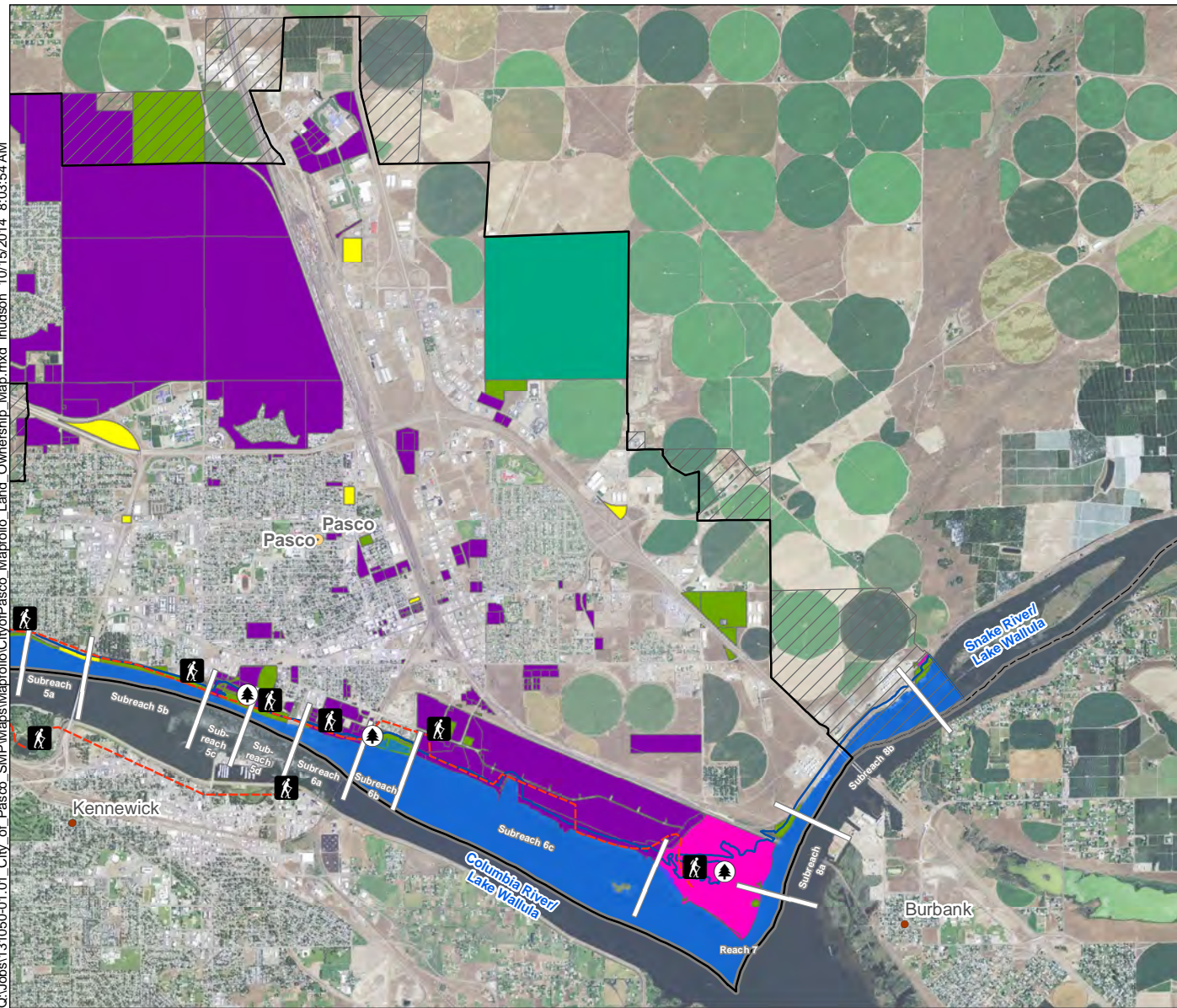
- Federal
- State
- WA State Dept. of Natural Resources
- Local Land

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Land ownership parcels data acquired from Franklin County.
4. State parks and trails data acquired from Washington Dept. of Parks and Recreation.
5. Public access data digitized by Anchor QEA.



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LEGEND

- Reach Break
- Populated Place
- County Seat
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

Public Access

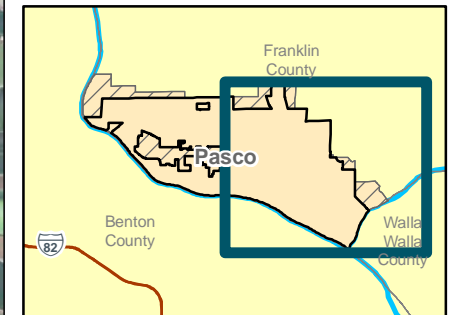
- Park
- Trailhead
- Sacagawea Heritage Trail

Land Ownership

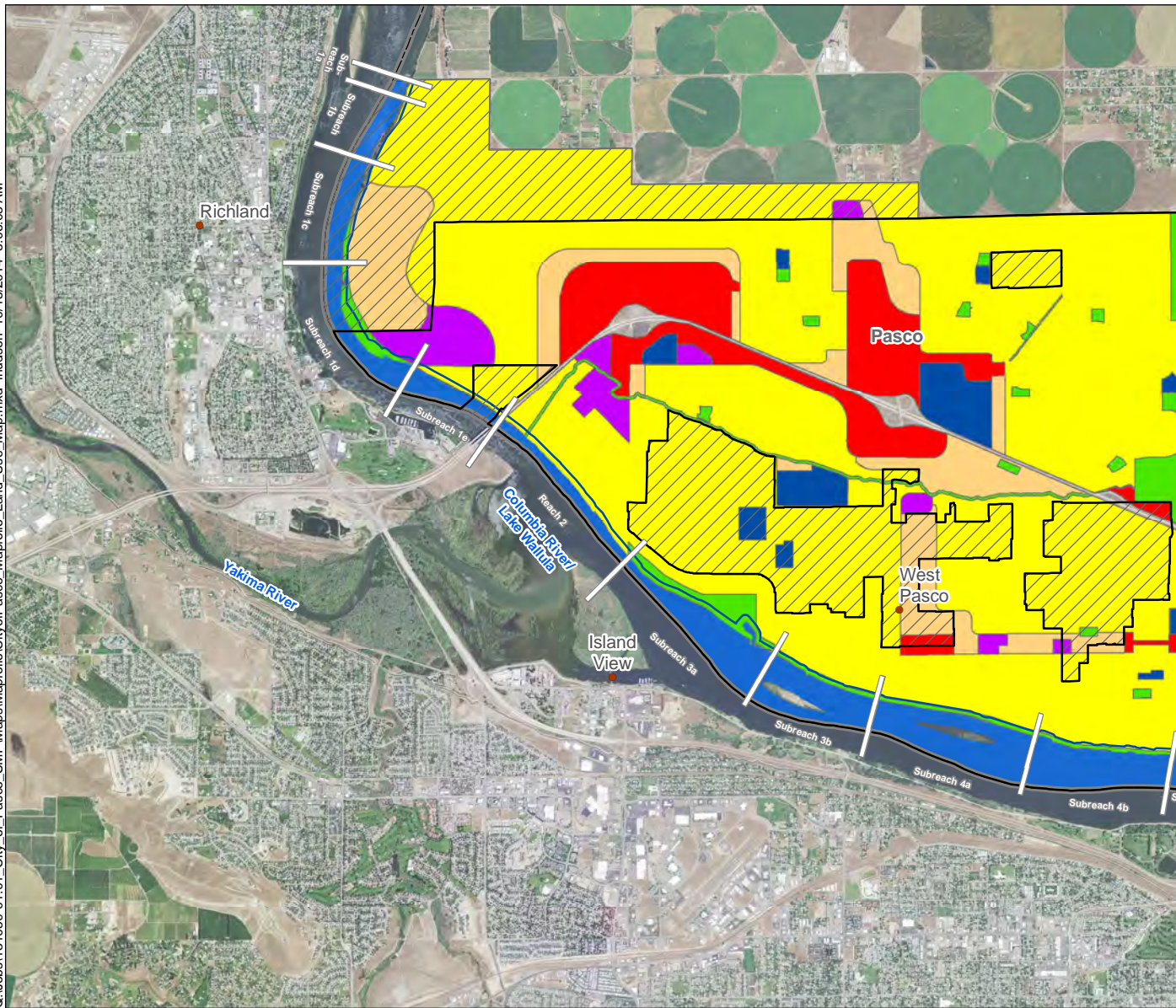
- Federal
- State
- WA State Dept. of Natural Resources
- WA State Dept. of Parks and Recreation
- Local Land

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Land ownership parcels data acquired from Franklin County.
4. State parks and trails data acquired from Washington Dept. of Parks and Recreation.
5. Public access data digitized by Anchor QEA.



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LEGEND

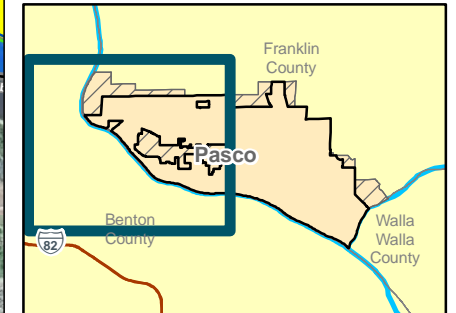
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- Populated Place
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

Land Use

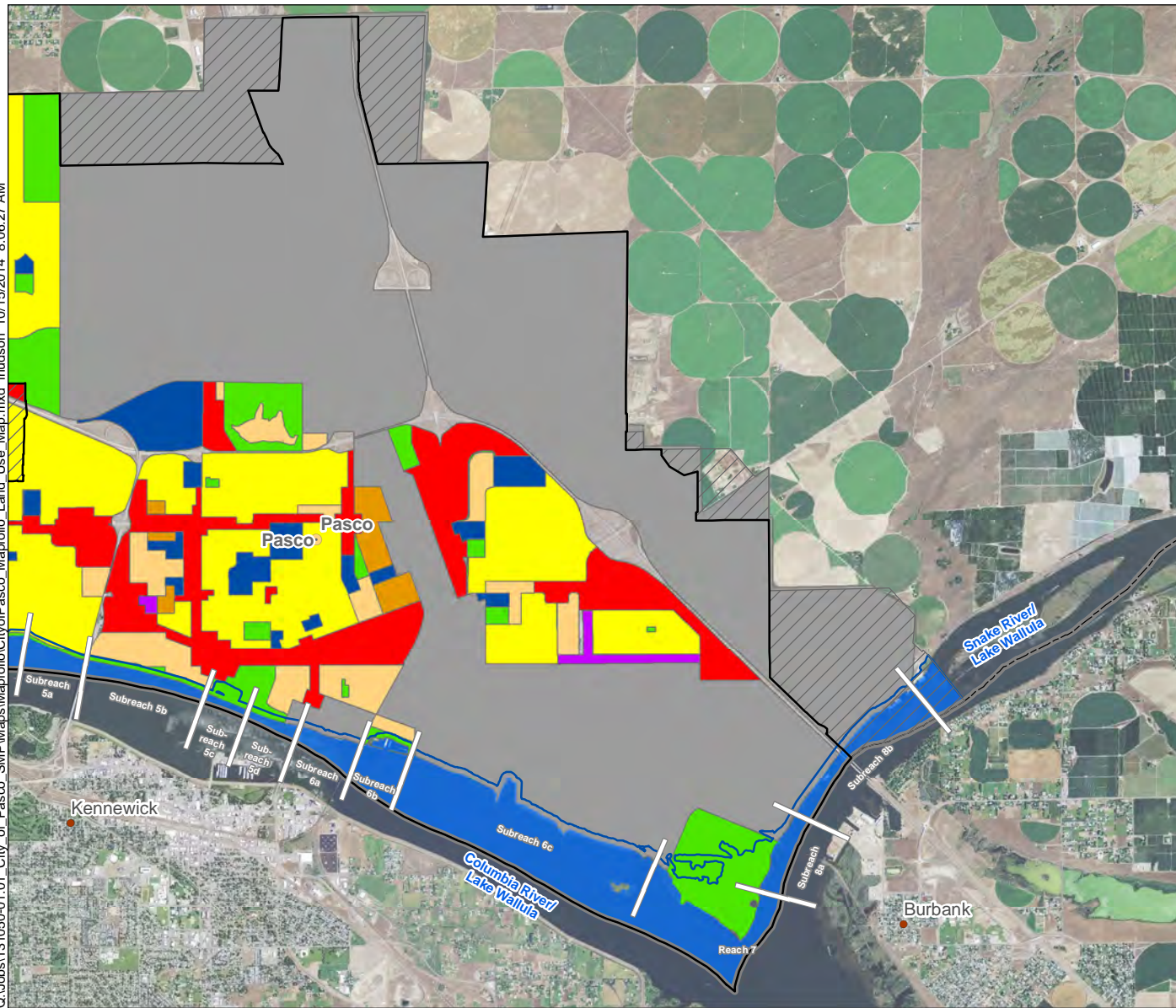
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- Mixed Residential
- Mixed Residential/Commercial
- Commercial
- Public/Quasi-Public
- Parks/Open Space

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Land use data acquired from City of Pasco.



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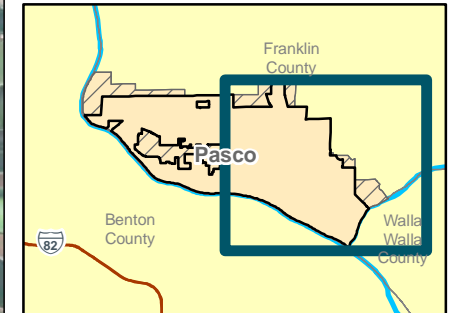
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Land Use

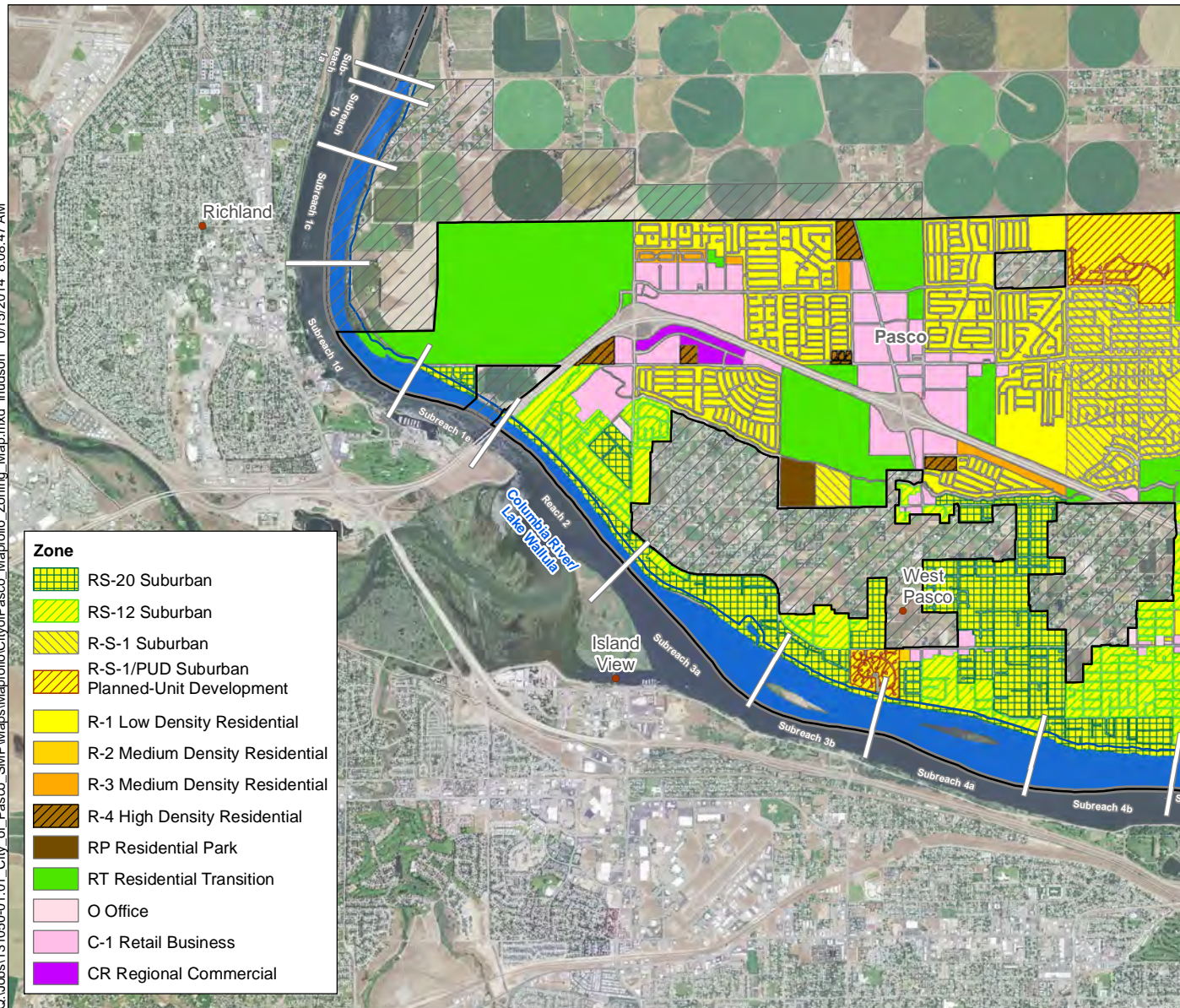
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- High-Density Residential
- Mixed Residential/Commercial
- Commercial
- Industrial
- Public/Quasi-Public
- Parks/Open Space

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Land use data acquired from City of Pasco.



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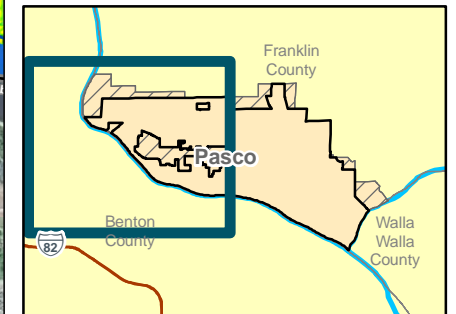
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	RS-12 Suburban
	R-S-1 Suburban
	R-S-1/PUD Suburban Planned-Unit Development
	R-1 Low Density Residential
	R-2 Medium Density Residential
	R-3 Medium Density Residential
	R-4 High Density Residential
	RP Residential Park
	RT Residential Transition
	O Office
	C-1 Retail Business
	CR Regional Commercial

LEGEND

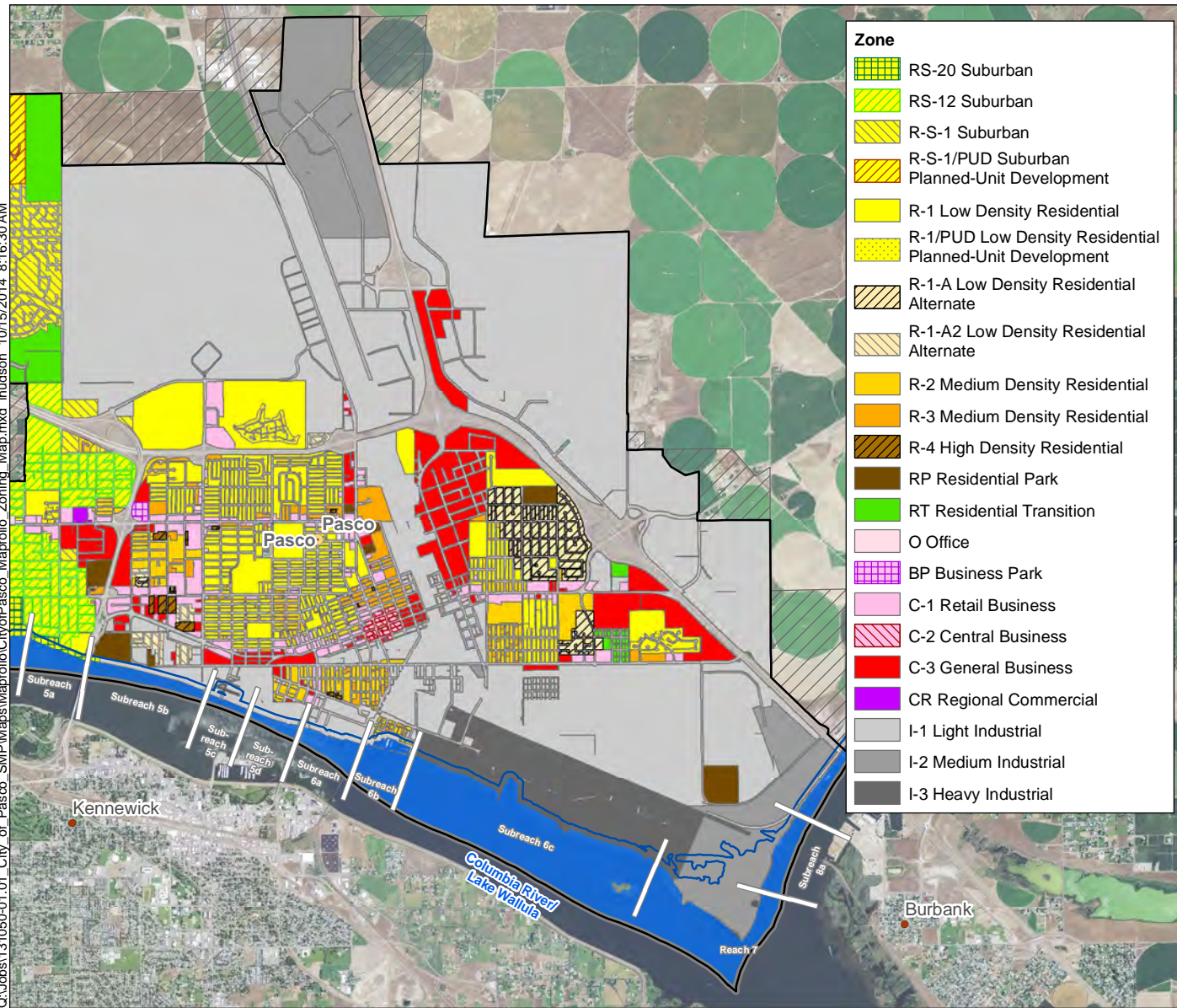
- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Zoning data acquired from City of Pasco.



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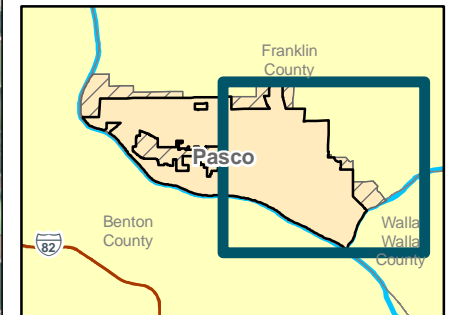


LEGEND

- Reach Break
- Incorporated City of Pasco
- Urban Growth Area
- County Boundary
- SMA Jurisdiction
- Ordinary High Water Mark

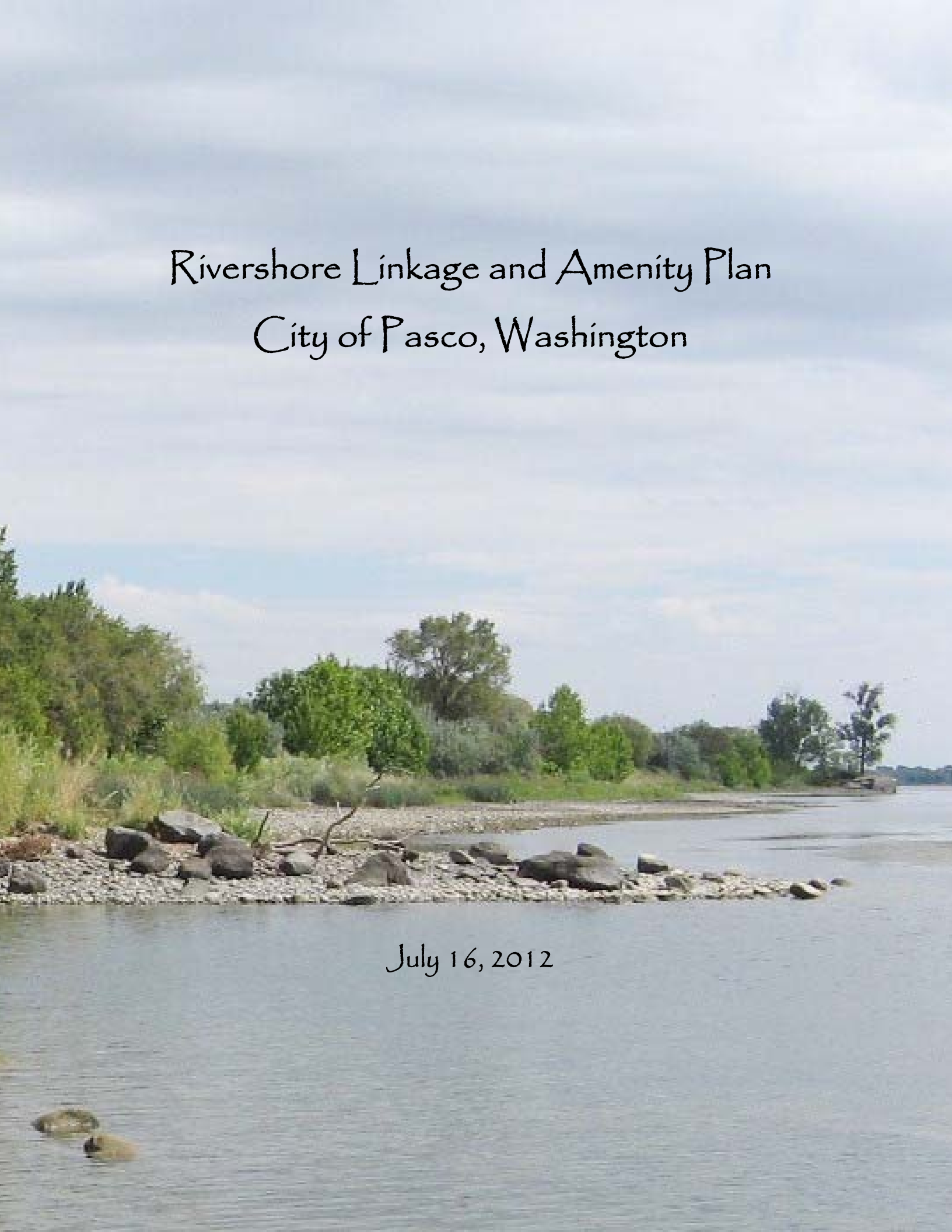
NOTES:

1. This information is to be used for planning purposes only. Data is displayed as is and without any guarantee of accuracy or completeness.
2. Aerial image courtesy of USDA NAIP (2013).
3. Zoning data acquired from City of Pasco.



Map 10b
Zoning
City of Pasco Shoreline Master Program
City of Pasco, WA

APPENDIX C
RIVERSHORE LINKAGE AND AMENITY
PLAN, CITY OF PASCO 2012

The background of the slide is a photograph of a riverbank. In the foreground, there is a calm body of water. A rocky shoreline runs across the middle ground, with several large, dark grey rocks and smaller pebbles. Behind the rocks, there is a dense line of green trees and shrubs. The sky above is filled with soft, white clouds.

Rivershore Linkage and Amenity Plan City of Pasco, Washington

July 16, 2012

Rivershore Linkage and Amenity Plan

City of Pasco, Washington

July 16, 2012

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Definitions

Amenities: Public conveniences which enhance the River/Trail experience, such as Drinking fountains, restrooms, parks and picnic areas, and boat facilities.

Destination: facilities such as recreational areas, community centers, and commercial enterprises which are attractive and enhance the River/Trail experience.

Linkage: (See Upland Linkage)

River: In this Plan “River” refers to the system of Columbia and Snake Rivers which surround the City of Pasco.

Trail: The Sacagawea Heritage Trail winds along the Columbia River around the Tri-Cities area.

Upland Linkage: A multimodal transportation route connecting the Columbia River and Sacagawea Heritage Trail to proximal destinations which have the potential of enriching the River/Trail experience.

Scope and Area

The City of Pasco Shoreline Amenities Plan includes all waterfront areas along the city limits of Pasco, extending along the Snake River from the northeastern reach of the City of Pasco’s Urban Growth Boundary (UGB) near Highway 12, south to the confluence of the Snake and Columbia Rivers at the southernmost point of Sacajawea State Park, and then west and north along the Columbia River to the northern point of the UGB at Dent Road. This plan is focused on rivershore trails, recreation amenities, community gathering spaces, development opportunities, wayfinding, and connecting to downtown and neighborhood lands, as well as establishing or improving gaps across bridges, natural areas, railway tracks, roads and parks.

Jurisdictions and Agencies

- City of Pasco – The City of Pasco is the lead agency for and sole proprietor of this Plan. Located along the Columbia River’s northern shore, the City of Pasco has many residential neighborhoods that abut the Sacagawea Heritage Trail.
- Franklin County – Franklin County is located north of the Columbia River and includes the City of Pasco. Franklin County also has rivershore land in unincorporated areas.

- Port of Pasco - The Port of Pasco operates an intermodal rail hub, barge terminal, industrial and business parks in the riverfront area between the Cable Bridge and Sacajawea State Park. Osprey Pointe is the Port of Pasco's newest business development project along the river.
- U.S. Army Corps of Engineers - The U.S. Army Corps of Engineers (USACE) has jurisdiction over use and development standards along the Columbia River. The constructed levees are maintained by the USACE as a flood control tool for the region.

Background

The Columbia and Snake Rivers form approximately half of the city's border (roughly 14 Miles) making the Pasco Rivershore Area the "front door" to Pasco from the vantage of both Richland and Kennewick, and thus the Rivershore Area is a key resource in the ongoing project of cityscape enhancement.

Past planning efforts pertaining to the local shorelines, including the City of Pasco Rivershore Area have resulted in a plethora of documents ranging from regional, cooperative efforts to local plans.

The following comprise a partial list of documents reviewed in preparation of this plan:

- 1) TREC Tri-Cities Rivershore Master Plan 2012
- 2) Comprehensive Plan 2007-2027
- 3) BPIC Shoreline Permit; April 2008
- 4) Parks & Recreation Plan 2005 Update
- 5) Broadway Properties Land Use and Market Analysis; December 2004
- 6) Master Plan; Sacajawea Heritage Trail; May 2000
- 7) Tri-Cities Rivershore Enhancement; 1997
- 8) Pasco Rivershore Enhancement Vision

Some of the plans are broad in scope and general in their outlook; others are highly focused with measurable outcomes.

Project Purpose

The 2012 Tri-Cities Rivershore Master Plan encourages the participating jurisdictions to “develop facilities and programming that face and embrace the river, rather than turning away from it.” Similarly, The Pasco Vision of the Comprehensive Plan reads: “All residents of the city are afforded access to the Columbia River. Pasco is oriented toward and connected with the River through parks, pathways, bikeways, boats launches and docks” (Comprehensive Plan; “The Pasco Vision for 2027;” Introduction P3).

The ten overarching elements of the 2012 Tri-Cities Rivershore Master Plan are as follows:

1. Improve wayfinding and identity.
2. Integrate and interpret arts, culture, heritage and environmental features.
3. Create “place” through viewpoints, seating areas and user amenities.
4. Enhance water-oriented activities and recreation.
5. Increase birding and wildlife viewing opportunities.
6. Enhance linkages to and from the rivershore, across the river, and through historic downtowns, commerce, and cultural areas.
7. Enliven the rivershore through formal and informal programming.
8. Strengthen the connection with the Yakima Delta and the Yakima and Snake River systems.
9. Re-engage the riverfront through land use.
10. Implement priority rivershore enhancement projects.

The Rivershore Linkage and Amenities Plan provides guidance for a coordinated and efficient overall pattern of development in the long term which can maximize benefit for stakeholders, the City of Pasco, and the wider community. It delineates an approach for connecting the public to the Sacagawea Heritage Trail and the extensive Columbia River waterfront. It is based on a specific vision with supporting goals and objectives drawn from over 35 years of planning efforts.

Project Guiding Principles

The primary Goals of this document are to identify appropriate upland linkages to the Sacagawea Heritage Trail, city parks, and public access points on the Columbia River, and to provide recommendations on future location of same. Linkages to and from the River/Trail only make sense when they lead to recreational facilities such as parks and

sports facilities, commercial enterprises such as retail shops, restaurants and hotels/motels, and community facilities such as art galleries, museums, and theaters. Amenities enhance the River/Trail experience and make it a place worth visiting. The best facilities and amenities are clustered in synergistic relationships and are attractive to local citizens and visitors alike. These amenities are within a comfortable walking distance, and ideally, within sight of the River/Trail. The upland Linkages can be promenades, creating a “view portal” for many of these upland attractions.

General Challenges

While each segment of the River/Trail along Pasco's shoreline offers a unique mix of Challenges and opportunities, a few of these challenges/opportunities can be generalized as follows:

- 1) Way-Finding: The regional rivershore area lacks a cohesive signage and way-finding system; The City of Pasco should work with the other jurisdictions to create and adopt a cohesive, regional signage and way-finding system.
- 2) Parking areas for River/Trail access: Access points to trail and River are not sufficient. Unless a visitor lives within walking/bicycling distance of the Trail/River, they need a place to park vehicles. Parking should be integrated into access features.
- 3) Accessibility from trail/water to commercial amenities: Few connections exist to link the City's urban areas to the rivershore trail system. Trail users need well-marked, direct, safe and convenient walking and bicycling routes to the water at locations that can serve large potential user groups. Improving these connections can bring important economic development and transportation benefits to the City of Pasco. A synergistic relationship can occur between commerce and River/Trail activity, but only if those commercial amenities are within reach of the River/Trail system. Focus should be on River/Trail planning on an area within easy walking distance (not more than ¼ mile) from the River/Trail. Projects to consider include improved trail connections between Pasco's urban center and the Boat Basin/Marine Terminal area; between downtown Pasco and Osprey Pointe Business Park; and between the Pasco urban core area east of I-395 and the river area between the Blue and Cable Bridges.
- 4) Levees: the levees were built to protect the citizens against flood events. However they create a nearly insurmountable obstacle to boaters, waders and anyone desiring general access to the river. The City of Pasco's system of levees creates a visual and physical separation between the rivershore and developed areas. Levee #2 between Wade Park at Road 59 and Ivy Glades should be prioritized as needed trail improvements to establish visual and physical access to the river.
- 5) Army Corps of Engineers "Wildlife Management Area": Wildlife areas are desirable for protecting the environment and enhancing biological functionality. However

overgrown areas adjacent urban areas more often become refuge areas for criminal activity rather than for woodland creatures. With hundreds of miles of river frontage compared to just a few miles along the City limits, it may be wise to rethink how wildlife areas are managed close to urban areas. Elements such as public supervision and access need to be addressed. Trails with periodic “lookout” points would serve the dual function of granting public access to wild areas and create better public supervision of these areas.

- 6) Location/Distribution of current amenities: Amenities attract, and lack of amenities deters visits to the River/Trail. Basic amenities relate directly to River/Trail enjoyment, and include, but are not limited to the following:
 - a) Drinking fountains: Walkers, runners, bicyclists, recreationalists and picnicking families, all depend on availability of water. Drinking fountains should be placed periodically along the Trail and clustered with park facilities such as pavilions and picnic areas.
 - b) Restrooms: River and Trail users also depend on availability of restroom facilities. Restrooms should be clustered with park facilities such as pavilions and picnic areas, and should be stationed periodically in pocket parks along the Trail.
 - c) Shade (trees/picnic pavilions): In the semi-arid Tri-Cities area, protection from the summer sun is desirable and adds to the pleasure of the River/Trail experience. Shade areas are severely lacking along the Trail on the Pasco side of the River. Along with tree planting, placement of picnic pavilions is crucial for enjoyment along the River/Trail. Picnic Pavilions would typically be clustered with parks and pocket parks.
 - d) Benches: The Trail has an assortment of seating areas, although very few of them are coupled with natural or artificial shading. Seating should be strategically clustered with both tree planting and pavilion placement areas along the River/Trail.
 - e) Parks: General gathering places are important for increasing social bonds and a sense of community. Parks serve a community purpose in providing some of those meeting places. Parks should be designed with high public visibility and supervision so as to reduce the incidence of vandalism and criminal activity. A well-designed park will have houses, apartments and/or condominiums along the periphery, each with park-facing porches and balconies. This design will serve the dual function of

- increasing supervision of park facilities and increasing the desirability and value of park-side homes.
- f) Availability of dog cleanup facilities: For the sake of sanitation, good manners, and aesthetics, canine waste cleanup stations should be provided periodically, with City of Pasco dog nuisance code prominently displayed.
 - g) Current residential development along river: One of the main obstacles to linkage and amenities development along the River/Trail will be developed residential areas. Homeowners typically desire parks but resent the higher traffic volumes and intrusion of strangers into their neighborhoods.
- 7) River Crossings: The Blue and Cable Bridges were not designed with non-motorized traffic as a priority, and are severely limited in terms of trail width, accessibility and safety. The effort to provide state-of-the-art separated Class I multiuse paths over them should be explored. MIG Consultants has also suggested exploring the possibility of a cantilevered pedestrian bridge built to the side of the BNSF bridges to improve the range of river crossing choices for trail users. If a future bridge is built, bike and pedestrian access should be a priority.
- 8) Railroad: The BNSF railroad bridge between the Boat Basin and Marine terminal requires pedestrians traveling along the Rivershore to go around and over it via the Ainsworth Overpass, forcing people away from the water. This also serves to further isolate the Boat Basin neighborhood, bringing a higher crime and gang risk factor to the neighborhood. Efforts to build a BNSF/Sacagawea Trail underpass should be enthusiastically pursued.
- 9) Bridge Understructure: Bridge understructures are targets for graffiti and are periodically used as transient shelters. Landscaping, screening, and other measures should be pursued to discourage access to and vandalism of these areas.

General Opportunities

- 1) Provide potential links to commercial and civic districts
- 2) Improve existing trails and build new trails to patch gaps in trail system
- 3) Incorporate more interpretive signage & informational plaques
- 4) Encourage more boat and water-oriented activities
- 5) Commercial/industrial zoning along river:
 - a) Potential accessibility from trail/water to commercial amenities:

- b) Potential restaurants/eateries/refreshment establishments
- c) Potential sporting goods:
 - i) Bicycle/roller blade rental/repair
 - ii) Bait and tackle
 - iii) Boat
 - iv) Mooring/docks/slips
 - v) Sales
 - vi) Rental
 - vii) Maintenance/repair
 - viii) fueling
- d) Potential General Shopping:
 - i) Art galleries
 - ii) Tourist shops
 - iii) Specialty shops
- 6) Provide self-guided smart phone tours addressing unique history, culture and environment of the Tri-Cities. Examples include: Mid-Century House and Historic Alphabet House Tour, Port of Pasco Tour, Environmental Preserve Areas, Tri-Cities Bridges and Pompy's Lessons trail markers.
- 7) Guiding development of vacant land along trails
 - a) Pocket Parks in vacant lots along river: Small lots along the path may be suitable for "pocket" park rest areas, areas with minimal amenities for bicyclists and pedestrians and the occasional boater using the River/Trail
 - b) Possible access points to trail: Small River/Trail-adjacent lots may also serve as ROW and minimal parking for trail access.
 - c) Possible access points to water
- 8) Complement Pompy's Lessons trail markers with smart-phone codes.
- 9) Consider low-profile and night sky sensitive lighting at key gathering spots along the trail for improved safety and visibility
- 10) Develop kiosks and gateway features
- 11) "Zero" habitat along levee areas: Levees are constructed with an impermeable core covered with large basalt rip-rap. As the minimum State of Washington/ Department of Ecology requirement for development along rivers is "no net loss of ecological function," permitting for heavier public access and uses should be easier.

- 12) Broadmoor Area Plan: The Plan for this area west of Road 100/Broadmoor Boulevard has been approved by the Pasco City Council.
- 13) Osprey Pointe Plan: The Plan for this area South of Ainsworth Avenue and East of the Boat Basin/Marine Terminal has been approved by the Pasco City Council and Phase One is now built.
- 14) Boat Basin/Marine Terminal Plan: The Plan for this area South of Ainsworth Avenue and East of the Cable Bridge has been approved by the Pasco City council.
- 15) Army Corps of Engineers Wildlife Management Area: This stretch of land is under public ownership and can be planned for and permitted as a single entity.

Inventory

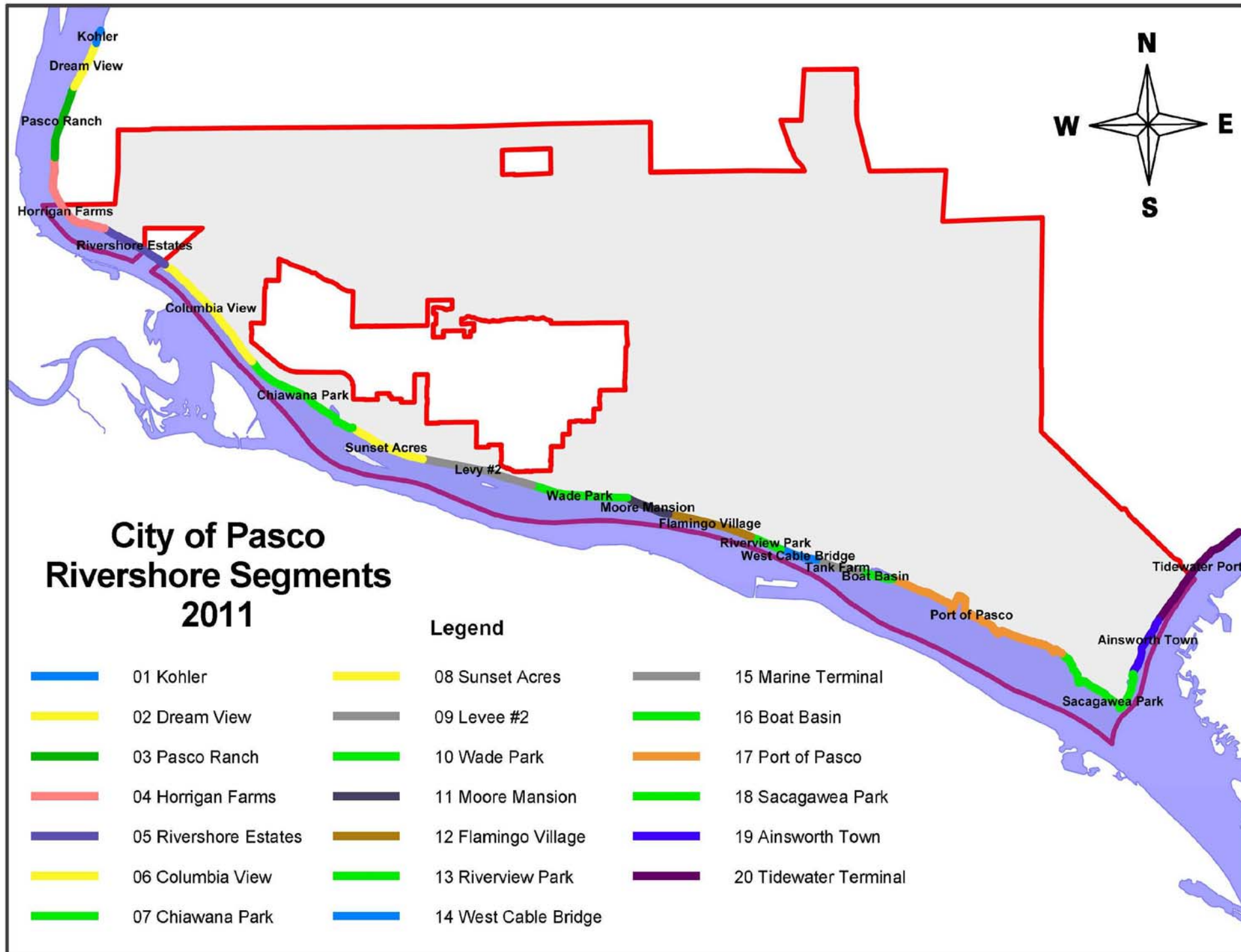
Rivershore Segments

The Segments are numbered 1-20, beginning upriver on the Columbia River at the City of Pasco Urban Growth Boundary (UGB) just north of the Kohler Segment, flowing downstream to Sacagawea Park, and then continuing upstream along the Snake River to the Tidewater Terminal Segment. Each Segment is an arbitrary breakdown of river frontage which contains somewhat similar characteristics (see Rivershore Segments Map below).

Inventory of existing amenities

The following amenities have been installed along the City of Pasco shoreline to date:

- 1) Access points
- 2) Beaches
- 3) Bike Path/ Trail
- 4) Boat Launches
- 5) Environmental/wildlife conservation/protection areas
- 6) Historic markers
- 7) Interpretive elements
- 8) Landscaping
- 9) Levee Lowering
- 10) Parking areas
- 11) Park/ Sport Fields
- 12) Picnic areas/ Pavilions
- 13) Public piers
- 14) Restrooms
- 15) Water fountains



Kohler

- a) **Ownership:** Private/US Government
- b) **Landscape and Natural Features:** The land along this segment is fairly flat, with a short drop-off into the river. The shoreline is thickly vegetated with a mix of native and non-native trees and shrubs. Farming activities occur within about 30 yards of the river. A private unimproved road separates an orchard/vineyard from the river.
- c) **Transportation:** There is no direct public access to the River at this segment. The closest public right-of-way is Kohler Road. While the road connects to Dent Road to the South, right-of-way has not been secured to connect the two.
- d) **General Land Use Pattern:**
 - i) **Agricultural Areas:** Farming activities occur within about 30 yards of the river. A private unimproved road separates an orchard/vineyard from the river.
 - ii) **Natural Area:** A 20 yard strip of US Government-owned natural area lies between the private road and the River.
 - iii) **Preservation of View Corridors:** Due to the flat terrain in this section of the River views would be limited to those structures built close to the River.
- e) **Current Linkage and Amenities Inventory:** None in this segment
- f) **Linkage and Amenities Opportunities:** Public ownership of about 20-30 yards of land along the river would allow the extension of the Sacagawea Heritage Trail along this section. This section is undeveloped except for farming activities, and may lend itself well to a park/River/Trail access point.
- g) **Linkage and Amenities Constraints:** there is neither direct public access to the River nor secure Right-of-Way from Kohler Road to Dent Road at this time. Roads to the property lead through neighborhoods and are designed for low-volume traffic.

h) RECOMMENDATIONS:

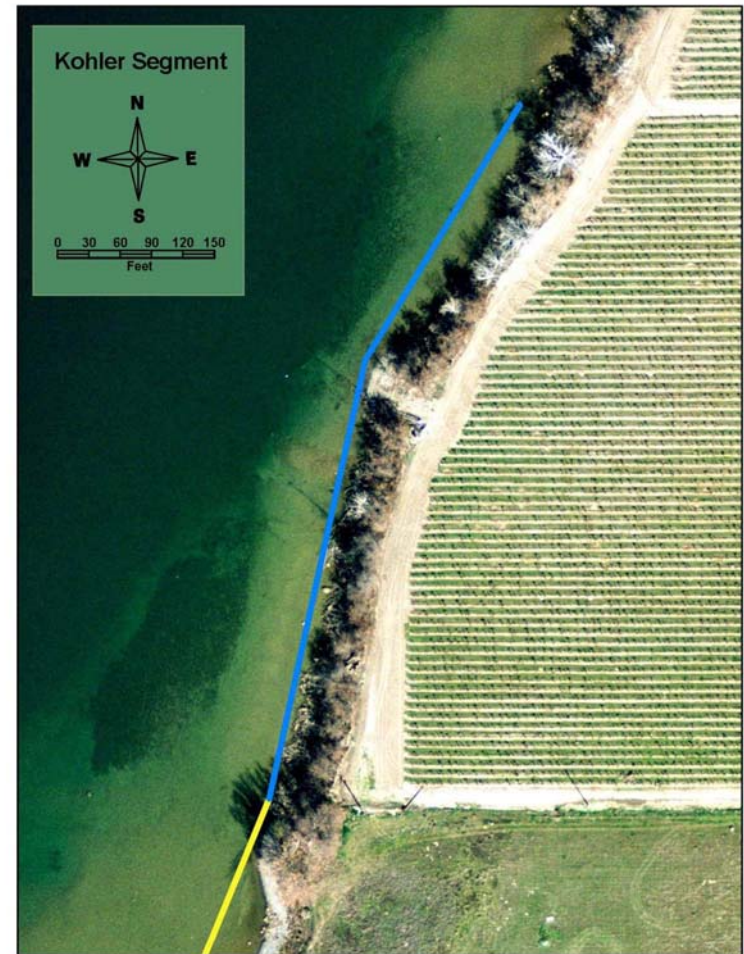
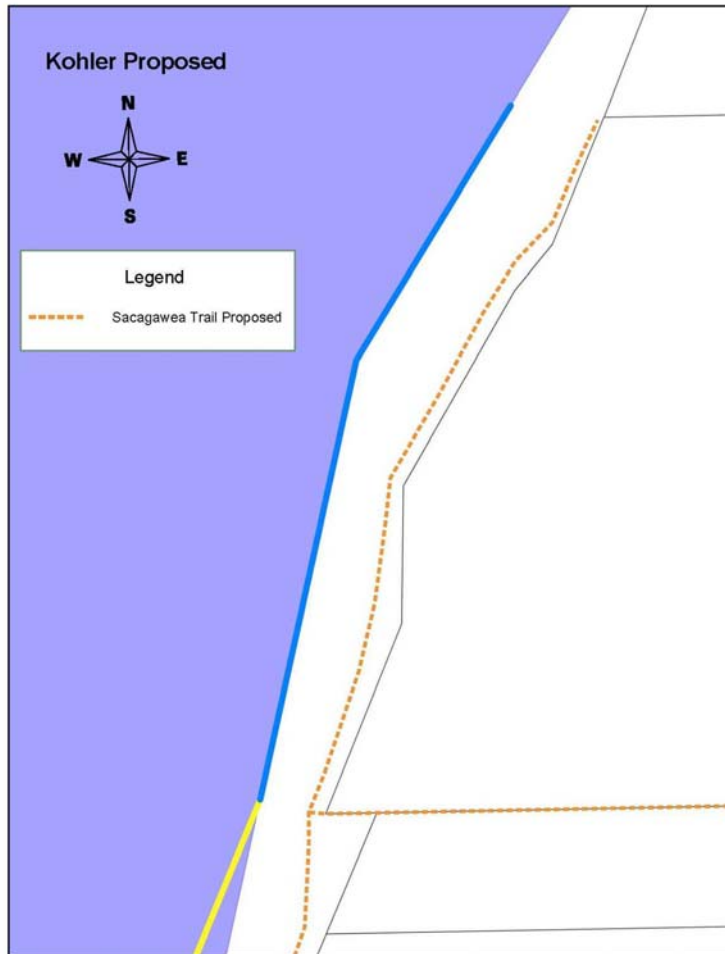
Short-Term Recommendations:

- i) Work with Army Corps, the County and property owners to design and build a continuation of the Sacagawea Trail north to the Urban Growth Boundary (UGB) line.
- ii) Secure the Right-of-Way from Dent Road to Kohler Road and purchase land for ROW from Kohler road to the shoreline and for future park development.
- iii) Include *bona fide* river access points/future parks along this section of trail which connect to Kohler and Dent Roads.
- iv) With Property owner approval (and covenant) Begin irrigation and tree planting along proposed greenbelt.
- v) Secure ROW and purchase park property.

Long-Term Recommendations

- vi) Develop a public park with access off of Dent/Kohler roads. Continue Sacagawea Heritage Trail with “pocket” parks along river.





Dream View

- a) **Ownership:** Private/US Government
- b) **Landscape and Natural Features:** The land along this segment is fairly flat, with a short drop-off into the river. Area developed with high-end residential units within about 100 yards of the river. The shoreline is vegetated with a mix of native and non-native trees and shrubs.
- c) **Transportation:** There is no direct public access to the River at this segment. The closest public rights-of-way are neighborhood streets branching off from Kohler Road. While Kohler road connects to Dent Road to the South, right-of-way has not been secured to connect the two.
- d) **General Land Use Pattern:**
 - i) **Residential Development:** This area is developed with higher-end residential units in a mix of four subdivisions and a series of short plats.
 - ii) **Natural Area:** A strip of US Government-owned natural area between 20 and 150 yards separates the river from residential uses.
 - iii) **Preservation of View Corridors:** Due to the flat terrain in this section of the River views are limited to those structures built close to the River. Most River frontage lots have been developed.
- e) **Current Linkage and Amenities Inventory:** None in this segment
- f) **Linkage and Amenities Opportunities:** Public ownership of about 20-150 yards of land along the river would allow the extension of the Sacagawea Heritage Trail along this section.
- g) **Linkage and Amenities Constraints:** there is neither direct public access to the River nor secure Right-of-Way from Kohler Road to Dent Road at this time. Some homeowners have extended their residential landscaping onto public lands.

h) RECOMMENDATIONS:

Short-Term Recommendations:

- i) Work with Army Corps, the County and property owners to design and build a continuation of the Sacagawea Trail north to the Urban Growth Boundary (UGB) line. Obtain ROW for access to the Trail.
- ii) Include *bona fide* river access points/future parks along this section of trail which connect to Kohler and Dent Roads.
- iii) With Property owner approval (and covenant) Begin irrigation and tree planting along proposed trail extension.

Long-Term Recommendations

- iv) Greenbelt/parks/pocket parks along river;







Pasco Ranch

- a) **Ownership:** Private/US Government
- b) **Landscape and Natural Features:** The land along this segment is fairly flat, with a short drop-off into the river. Orchard farming activities occur within about 100 yards (or less) of the river. The shoreline is vegetated with a mix of native and non-native trees and shrubs. The water is fairly shallow along here, and wide shallow areas are periodically exposed during low water events
- c) **Transportation:** Court Street runs along the south half of this segment up to Dent Road, where direct access is available to an irrigation pump station and a private dock. Right-of-way has not been secured for either Dent or Court Street in this section.
- d) **General Land Use Pattern:**
 - i) **Residential Development:** This area is developed with scattered farmstead residential units at the periphery of farming activity.
 - ii) **Natural Area:** A strip of US Government-owned natural area between 20 and 150 yards separates the river from residential uses. This area has been designated by the US Army Corps of Engineers as a "Wildlife Management Area." Hunting is permitted, but no motorized vehicles are allowed.
 - iii) **Preservation of View Corridors:** There is a slight rise in the terrain in this section of the River, which would allow for subtle views close to the River. A handful of modest homes have been built in a cluster near the river.
- e) **Current Linkage and Amenities Inventory:** None in this segment
- f) **Linkage and Amenities Opportunities:** Dent Road cuts directly inland from the middle of this segment, giving residents of northwest Pasco easy access to the site. As well, Shoreline Road (formerly Court Street) separates the private ownership from the Public lands, reducing the potential for shoreline owner resistance to park and trail proposals. Public ownership of about 20-150 yards of land along the river would allow the extension of the Sacagawea Heritage Trail along this section.
- g) **Linkage and Amenities Constraints:** Land along this segment of the River has been designated by the Army Corps of Engineers as a "Wildlife Management Area."

Any trail development will go through a strict Army corps review and approval process.

- h) **RECOMMENDATIONS:** *NOTE—the Southern ½ of Pasco Ranch is part of the Broadmoor Area Plan and has been extensively evaluated and planned. These recommendations correspond to that general planning effort.*

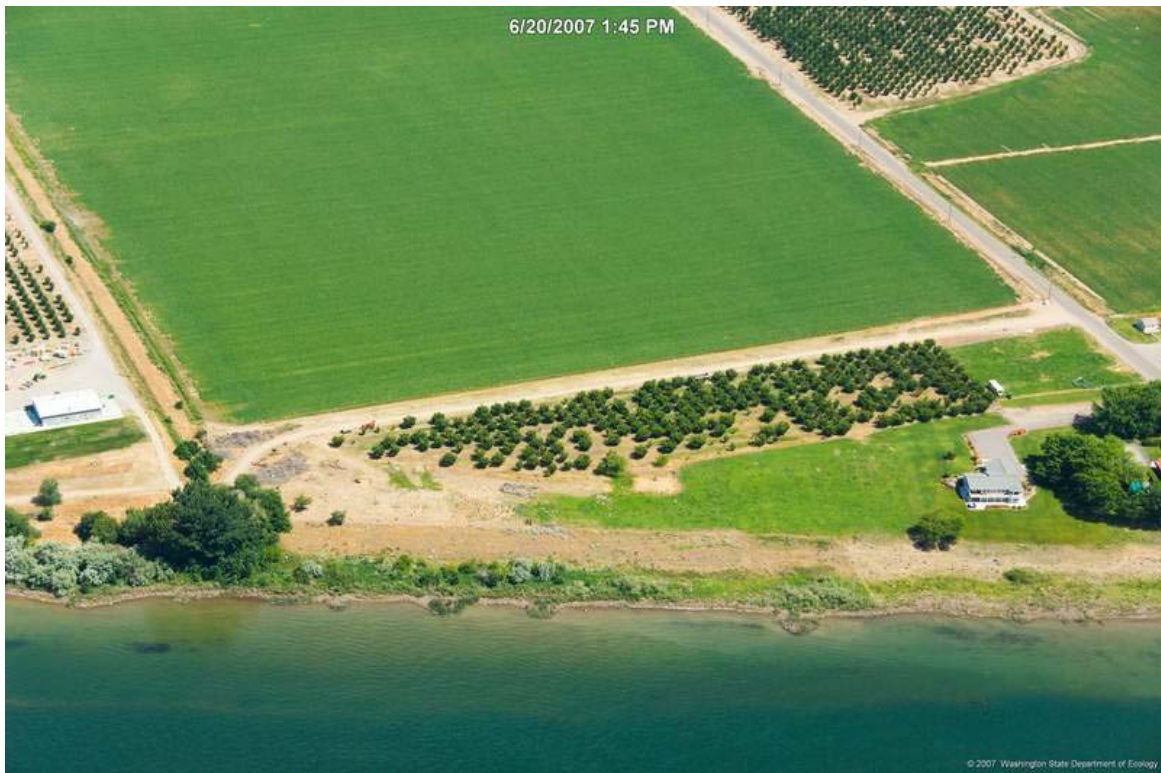
Short-Term Recommendations:

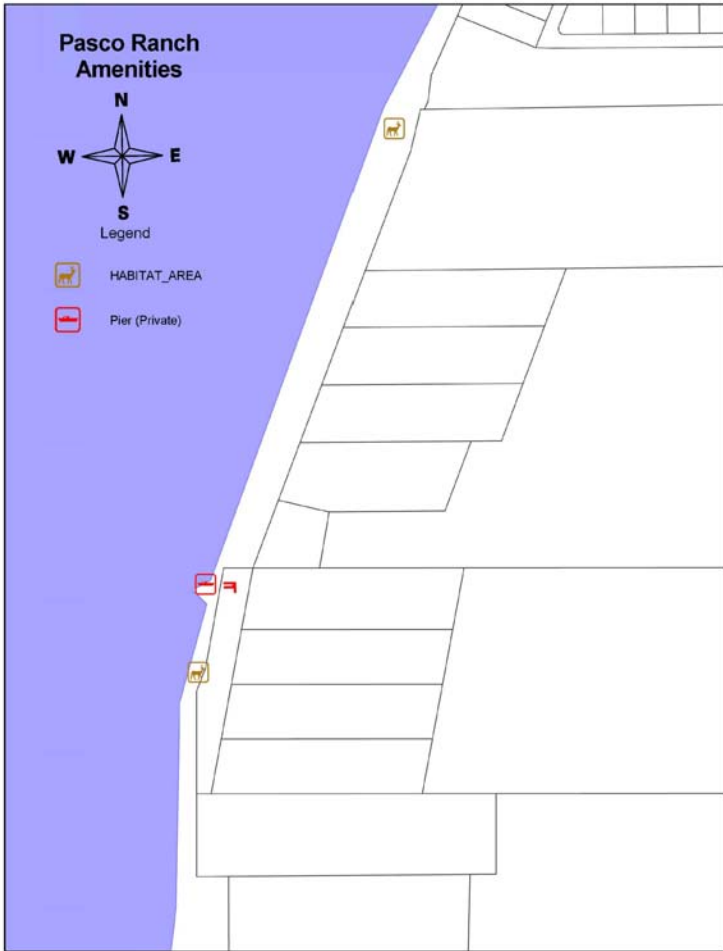
- i) Work with Army Corps, the County and property owners to design and build an extension of the Sacagawea Trail with raised wildlife watching decks on piers as a continuation of the Sacagawea Trail north toward the Urban Growth Boundary (UGB) line.
- ii) Include *bona fide* river access points/future parks along this section of trail which connect to Dent Road and Shoreline Road (formerly Court Street).

Long-Term Recommendations

- iii) Greenbelt/parks/pocket habitat areas along river;











Pasco Ranch
Irrigation Pumps



Pasco Ranch
Boat Dock

Wildlife Management Area

**Hunting Permitted
No Motorized Vehicles**

For Information Contact:

**U.S. Army Corps of Engineers
Walla Walla District
201 N. 3rd St.
Walla Walla, WA 99362
(509) 527-7136**



**US Army Corps
of Engineers**

Horrigan Farms

- a) **Ownership:** Private/US Army Corps of Engineers
- b) **Landscape and Natural Features:** The land along this segment is fairly flat, with a short and increasingly steep drop-off into the river toward the south. East of Shoreline Road (formerly Court Street) orchard farming activities occur on the north of the City Limits line, and Central Pre-Mix gravel extraction operation south of the City Limits line. West of Shoreline Road and down to the River the shoreline is heavily vegetated with a mix of native and non-native trees and shrubs.
- c) **Transportation:** Shoreline Road (formerly Court Street) runs along the entire length of this segment between the Army Corps of Engineers designated Wildlife Management Area to the West and Horrigan Farms Orchard to the East.
- d) **General Land Use Pattern:**
 - i) **Residential Development:** There is one residential unit along this segment.
 - ii) **Industrial Uses:** The Central Pre-Mix gravel extraction operation has a long-term lease on the land.
 - iii) **Natural Area:** A strip of Army Corps of Engineers-owned natural area between 20 and 150 yards separates the river from residential uses. This area is a Wildlife Management Area.
 - iv) **Preservation of View Corridors:** There is a slight rise in the terrain in this section of the River, which would allow for subtle views close to the River. A handful of modest homes have been built in a cluster near the river.
- e) **Current Linkage and Amenities Inventory:** None in this segment
- f) **Linkage and Amenities Opportunities:**
 - i) **Preservation of View Corridors:** Views along the Columbia River in the Broadmoor area have a strong potential for value-added development. View corridors should be maximized for optimal visual access to the river.
 - ii) **Strong Visibility of Broadmoor from I-182 Freeway:** The north end of the I-182 bridge is a major gateway into the City of Pasco and this section especially of the Broadmoor area should be designed and built in such a way as to “put our best foot forward.”

- iii) **Columbia River Natural Character & Recreation:** This section of the Pasco Rivershore lends itself well to fulfilling the needs of both recreationalist and naturalist. Extending the Sacagawea Heritage Trail should be a high near-term priority, granting foot and bicycle access to the more than 40 acres of designated natural area. Boat access via boat launches and docks is an equally high priority.
- iv) **Mineral Extraction Area:** The long-term plan for the mineral extraction area is to create a boat marina and a mixed-development of retail commercial and high-end shorefront residential units.

g) Linkage and Amenities Constraints:

- i) **Impact of Mining / Industrial Uses:** The current gravel mining operation physically separates the upper property from the River. The externalities of a mining operation also have obvious impacts.
- ii) **Local Roadways and Truck Traffic:** Heavy industrial and agricultural traffic negatively impact the area.
- iii) **Physical Separation from the River:** Large tracts of agricultural land separate the River from the upper Broadmoor area.
- iv) **River Flow / Drift Material:** The Broadmoor area is at the curve of the Columbia River, and a natural collection area for silt, debris, drift wood and other waterborne materials.

h) RECOMMENDATIONS: NOTE—*the Broadmoor Area Plan completely encompasses the Horrigan Farms area. The text of the Broadmoor Area Plan indicates the following for the Horrigan Farms area:*

Open Space — The government owned property between the shoreline and Shoreline Road has been designated in the Comprehensive Plan as an open space area. The area is also identified as a critical area geologically and for habitat purposes. Hiking and walking trails through this area would provide for public access and minimal use of the area for recreation and public enjoyment of the river. Trails through this area to view points along the river would support the Comprehensive Plan vision statement dealing with access to the

river. Coordination with the Army Corps of Engineers along with shoreline permits may be necessary for the development of trails in this area.”

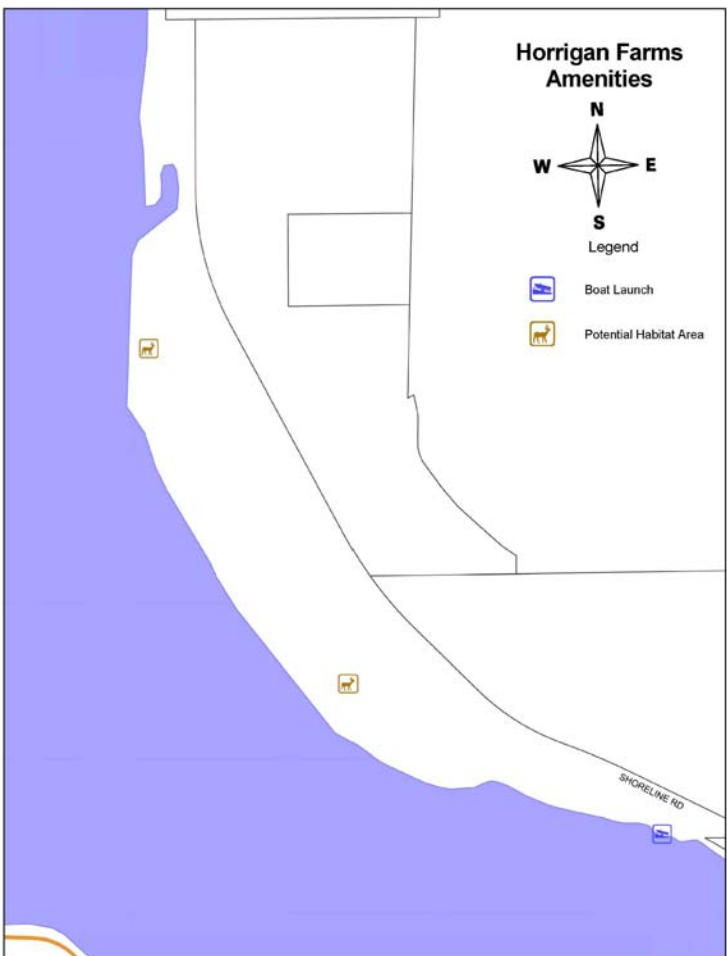
The following recommendations are more focused efforts within the general Broadmoor Area Plan guidelines:

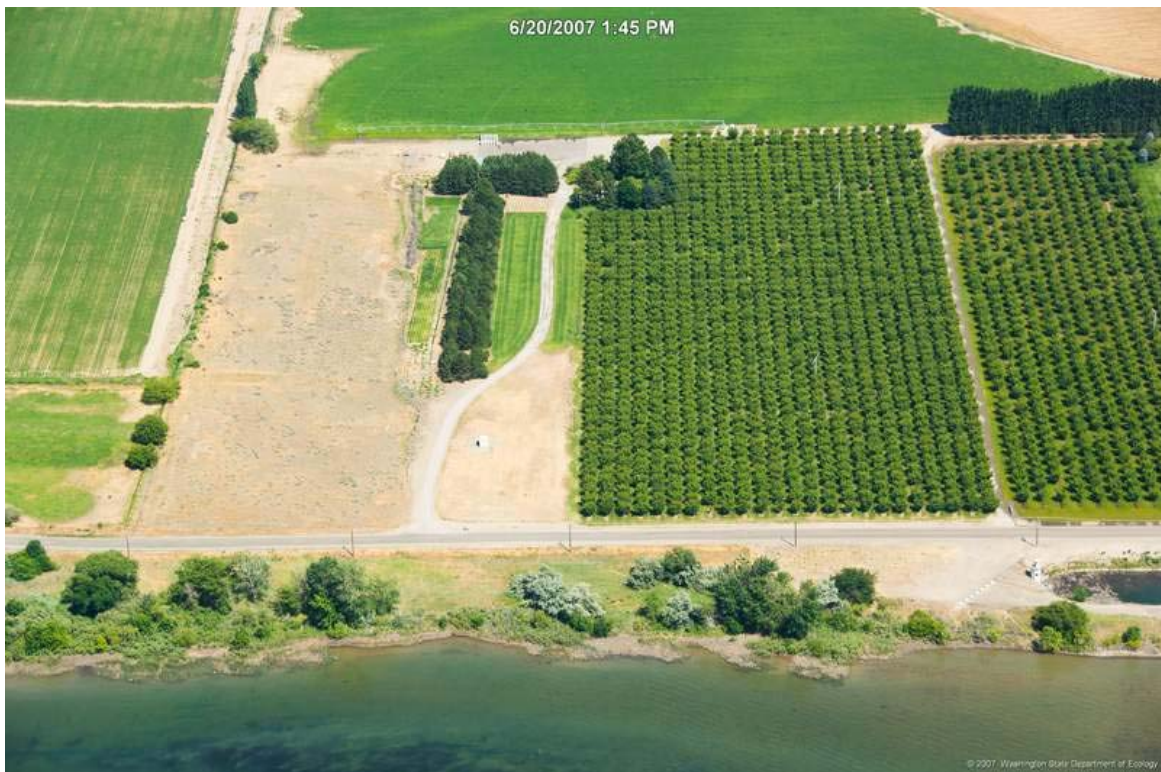
Short-Term Recommendations:

- i) Work with Army Corps to design and build a continuation of the Sacagawea Trail along the river to City Limits line. Work with County and property owners to design and build a continuation of the Sacagawea Trail to the northernmost Urban Growth Boundary line.
- ii) Include *bona fide* river access points/future parks along this section of trail which connect to Shoreline road.
- iii) Begin negotiations with Army Corps to establish park facilities/raised view decks along river (see link recommendation).
- iv) With Property owner approval (and covenant) Begin irrigation and tree planting along proposed greenbelt.

Long-Term Recommendations

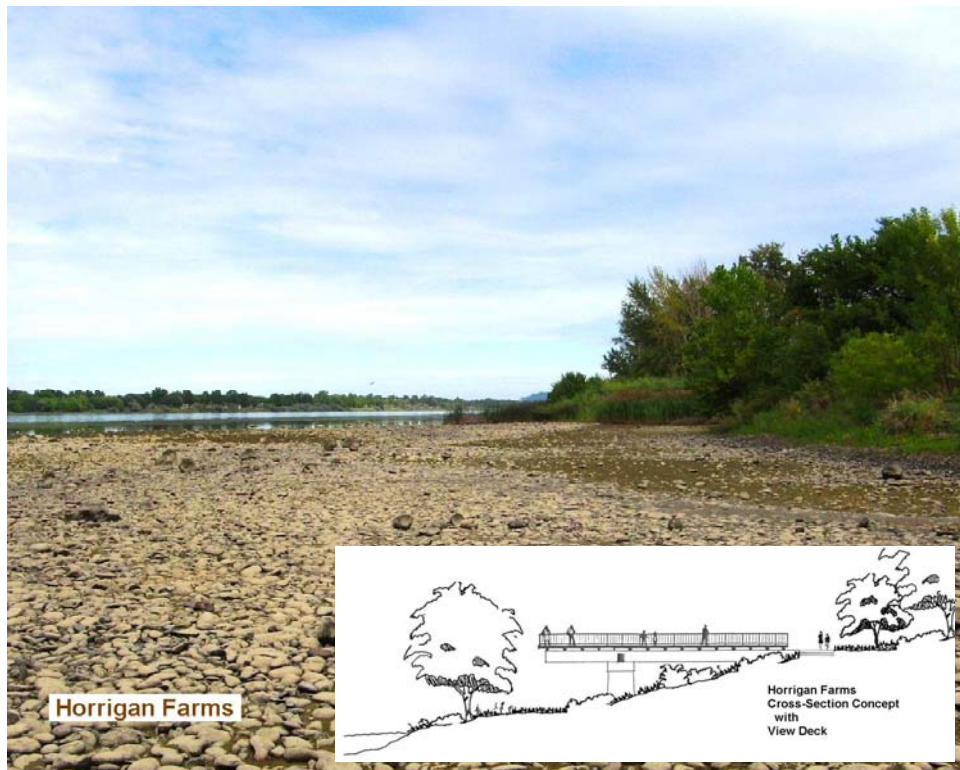
- v) Improve area for waterfowl and elevated bird watching along the rivershore trail, adding nature trails as needed
- vi) Greenbelt/park/pocket wildlife preserve areas along river and along main boulevard;
- vii) Boat basin and launch; Possible restricted, non-motorized only boating area near wildlife reserve area.
- viii) Rivershore commercial development scaled to pedestrian/bicycle traffic.

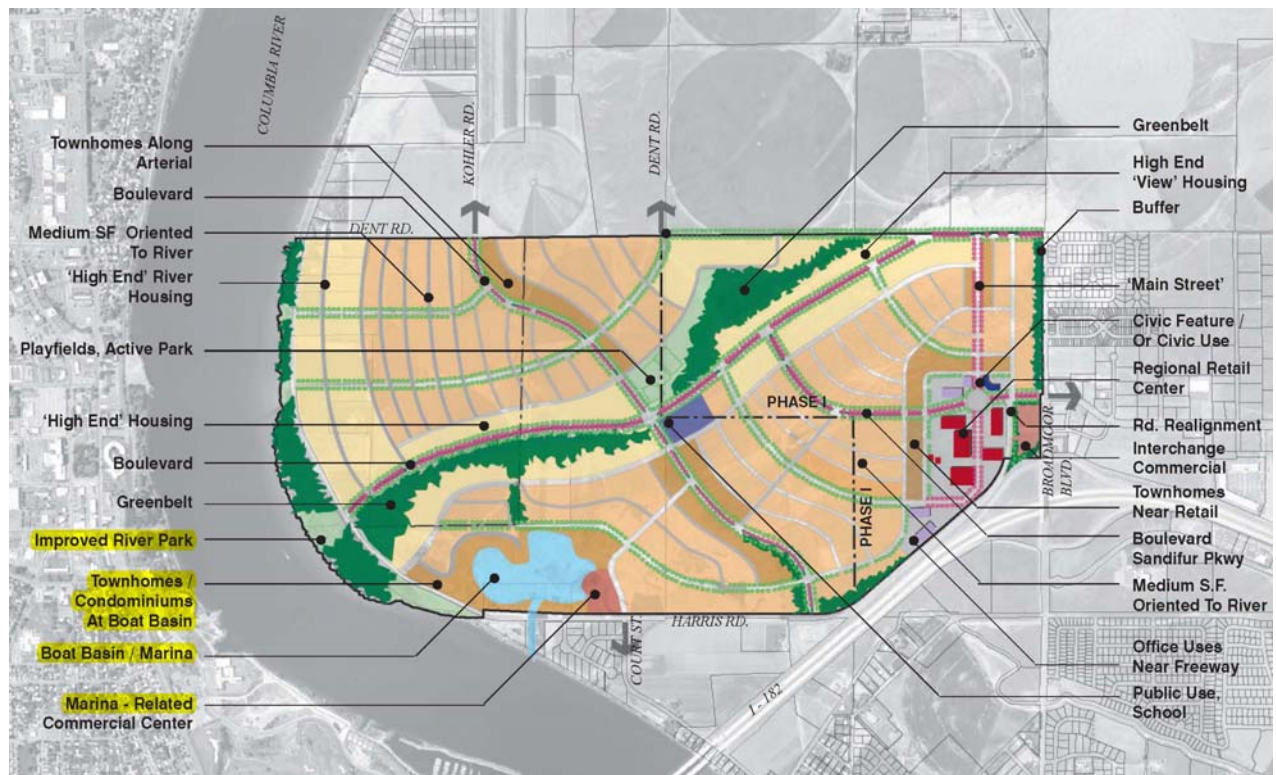




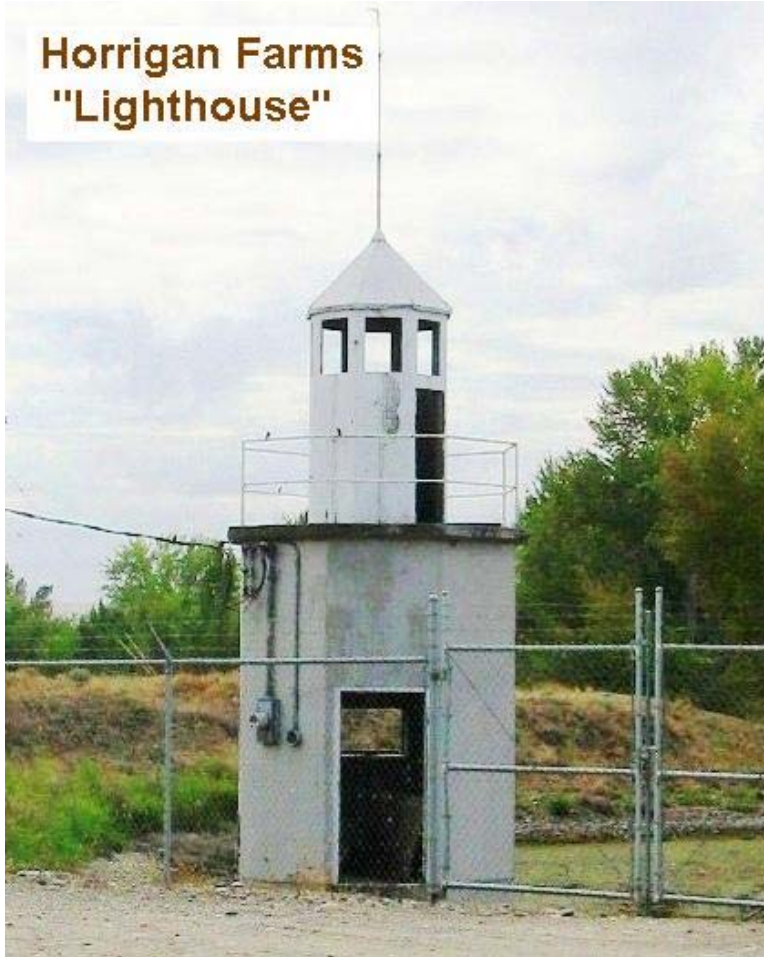








**Horrigan Farms
"Lighthouse"**



Rivershore Estates

- a) **Ownership:** Private/US Government
- b) **Landscape and Natural Features:** The land along this segment has a steep, 40- to 50-foot drop into the river. The shoreline is moderately vegetated with a mix of native and non-native trees and shrubs. A high-end, 33-lot subdivision separates the Central Pre-Mix gravel extraction operation from the River. The development is nearly half built out.
- c) **Transportation:** Shoreline Road and Court Street run between the gravel pit and the residential area along the river. An unimproved river access road connects Shoreline Road to the River about 300 yards west of the subdivision.
- d) **General Land Use Pattern:**
 - i) **Residential Development:** A 33-lot high-end subdivision along the river is nearly half built out.
 - ii) **Natural Area:** A 15-20 yard strip of US Government-owned natural area lies between the residential lots and the River.
 - iii) **Preservation of View Corridors:** Views are limited beyond the 22 river frontage lots.
 - iv) **Industrial Uses:** The Central Pre-Mix gravel extraction operation occupies the majority of the area north of Shoreline Road/Court Street and has a long-term lease on the land.
- e) **Current Linkage and Amenities Inventory:** A parking area has been installed adjacent the Sacagawea Heritage Trail and under the I-182 Bridge.
- f) **Linkage and Amenities Opportunities:** Public ownership of about 15-20 yards of land along the river would allow the extension of the Sacagawea Heritage Trail along this section, although the trail cross-section would need to accommodate the steep sloping bank. There exists an unimproved access road and informal boat launch south of Rivershore Drive about 300 yards west of the subdivision.
- g) **Linkage and Amenities Constraints:** The Central Pre-Mix gravel extraction operation occupies the majority of the area north of Shoreline Road and Court Street and has a long-term lease on the land.

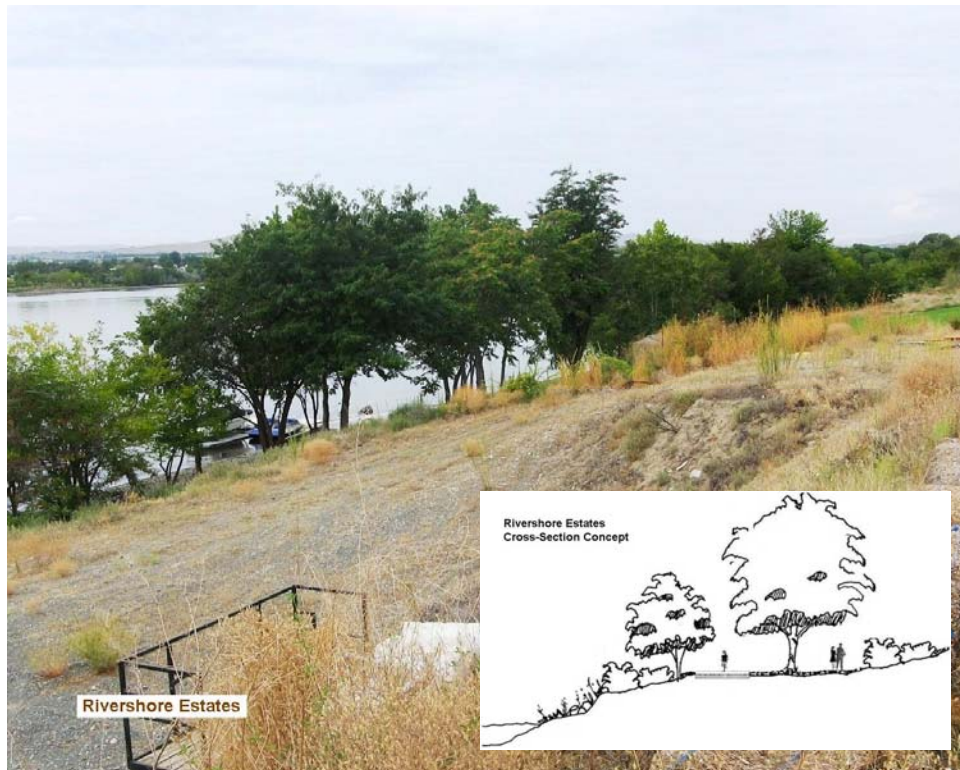
h) RECOMMENDATIONS:

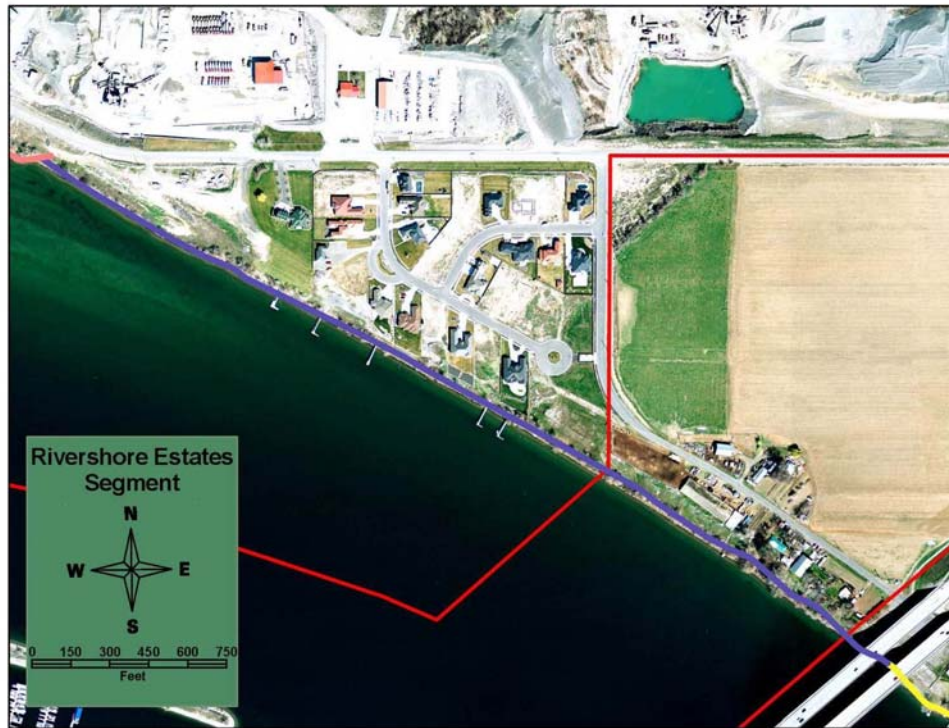
Short-Term Recommendations:

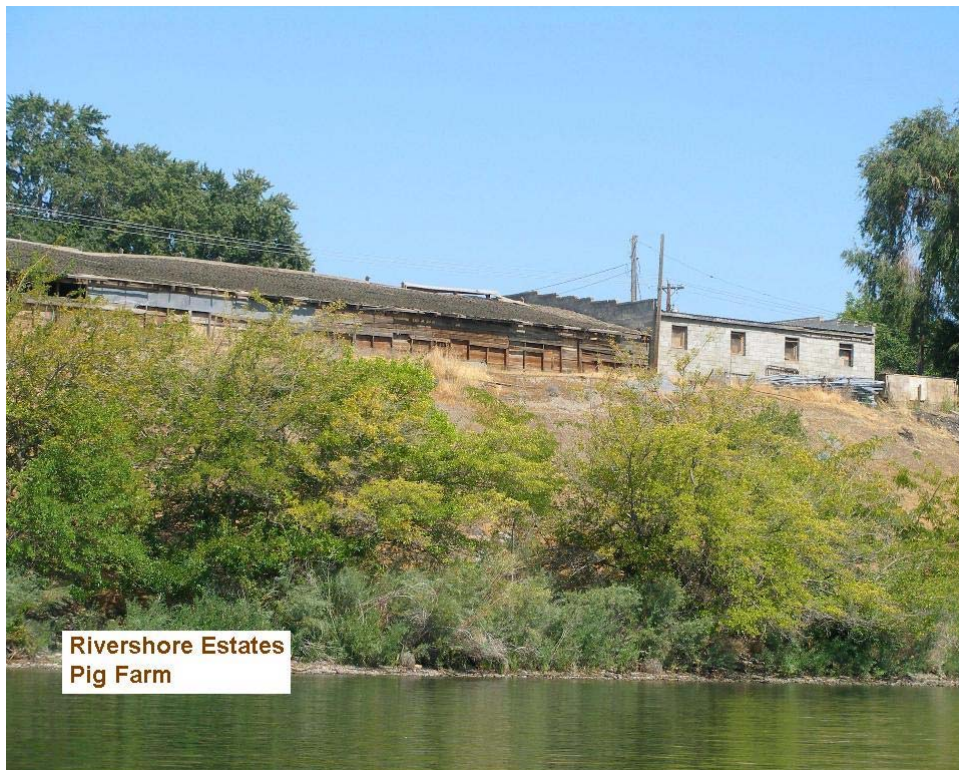
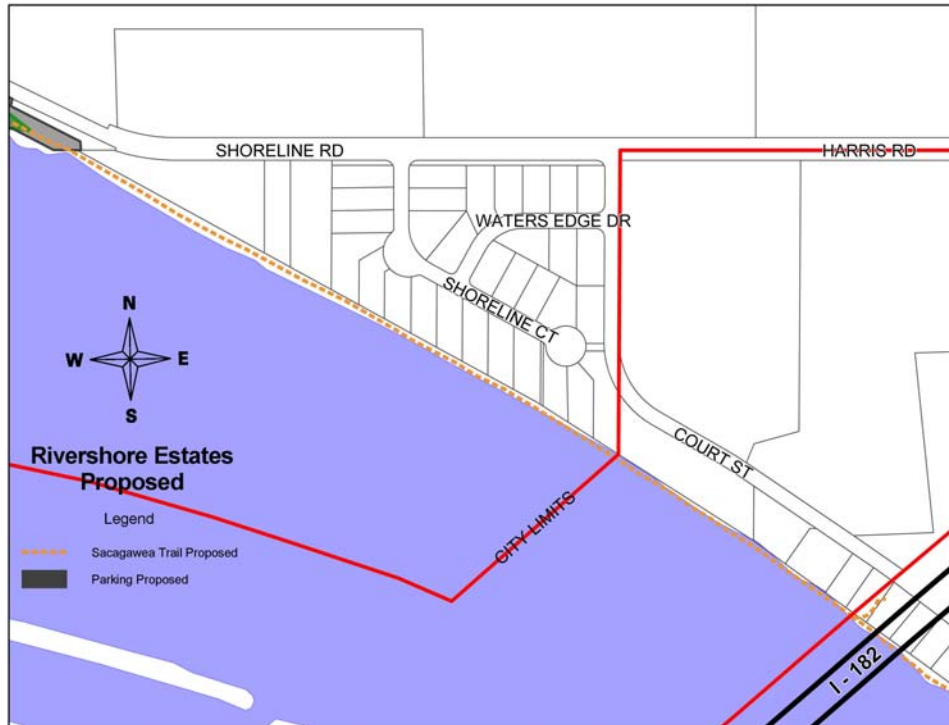
- i) Work with Army Corps, the County and property owners to design and build a continuation of the Sacagawea Trail north along this segment.
- ii) Improve the existing river access point/boat launch and add a “Pocket” park.
- iii) Begin irrigation and tree planting along proposed greenbelt.

Long-Term Recommendations

- iv) Build a Boat basin on the current Central Pre-Mix gravel mine. Build the marina as the centerpiece for mixed residential and commercial development.
- v) Develop area according to the Broadmoor Concept Plan adopted by the City.









Columbia view

- a) **Ownership:** Private/US Government
- b) **Landscape and Natural Features:** The land along this segment has a very steep slope profile. The shoreline is moderately vegetated with residential landscaping elements mixed with native and non-native trees and shrubs.
- c) **Transportation:** Court Street runs between the riverfront residential area and more upland residential subdivisions. Although an unimproved road leads from Court Street down to a Franklin County Irrigation District pump station, there are no *bona fide* public access points to the River along this segment.
- d) **General Land Use Pattern:**
 - i) **Residential Development:** The entire length of this segment is built out with upper-middle to high-end single-family residential units, with the exception of a couple of vacant lots and a pump station located about 350 yards from the I-182 freeway bridge. This area also has the highest concentration of private docks in the study area.
 - ii) **Natural Area:** A slim strip of US Government-owned land lies between the residential lots and the River.
 - iii) **Preservation of View Corridors:** Views are very limited beyond the river frontage lots.
 - iv) **Industrial Uses:** A newly installed City potable water filtration plant is located just north of Court Street, next to the I-182 freeway bridge. The inlet pump for the filtration plant is located under the I-182 freeway bridge. The Franklin County Irrigation District pump station is located just beyond the south terminus of Road 111 and blocks the shoreline well into the River.
- e) **Current Linkage and Amenities Inventory:** A parking area has been installed adjacent to the Sacagawea Heritage Trail and under the I-182 Bridge.
- f) **Linkage and Amenities Opportunities:** Public ownership between the residential lots and the river averages around 10 yards, with some lots directly abutting the water line.

g) **Linkage and Amenities Constraints:** The Sacagawea Heritage Trail currently runs alongside Court Street in this segment. Because of the extreme grade, the obstacle of the pump station, the proximity of residential lots to the river, and the high number of private dock facilities, extending the Sacagawea Heritage Trail along the river in this section would require both high-order engineering prowess and strong political will. It is not recommended that the Sacagawea Heritage Trail be extended along the River in this area at this time.

h) RECOMMENDATIONS:

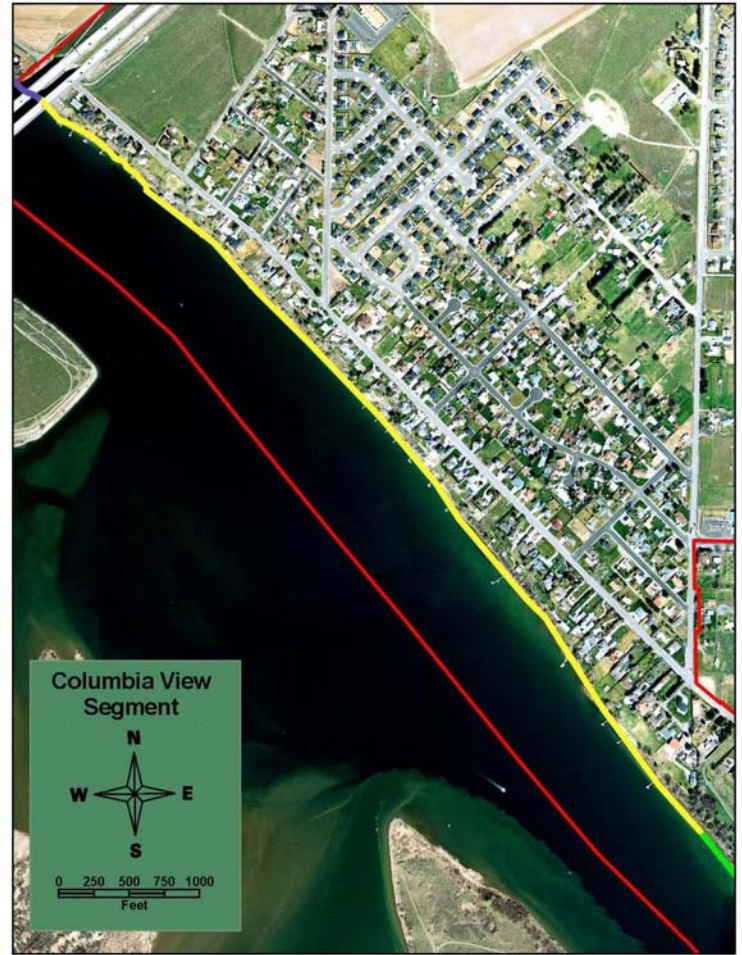
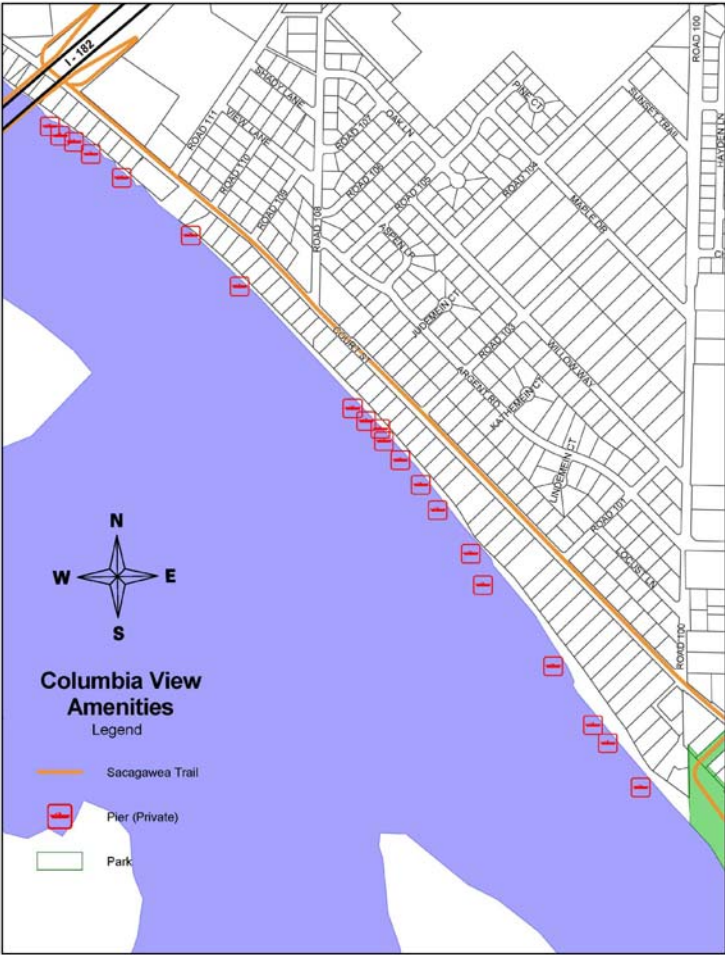
Short-Term Recommendations:

- i) Negotiate with the Franklin County Irrigation District to use the irrigation district land for a view and River access park with parking lot.

Long-Term Recommendations

- ii) Add a view park with parking and River access on the Franklin County Irrigation District land.







Chiawana Park

- a) **OWNERSHIP:** US Government/Local Government leasehold
- b) **Landscape & Natural Features:** Chiawana Park is a partially developed community park with two areas of groomed lawns, one overgrown “natural” area, and the balance of the park periodically-mowed weeded areas.
- c) **Transportation:** the Park has only one open access point leading through a neighborhood street out to Court Street. There are seven potential access points along the length of the park (See Chiawana Access Points Map).
- d) **General Land Use Pattern:** The area is a designated park, although a fraction of it is actually maintained at this point with full amenities.
- e) **Current Linkage and Amenities Inventory:** (See Amenities Map)
- f) **Linkage and Amenities Opportunities:** The Chiawana Park area includes large undeveloped areas with potential for synergistic water-dependent and water-related enterprises and amenities. There are six potential access points along the perimeter of the park.
- g) **Linkage and Amenities Constraints:** The Park is leased from the Army Corps of Engineers, and as such, requires Corps approval for even the smallest activity. As well, the Park is surrounded by an established residential neighborhood. All but one of six potential access points are currently closed to public traffic. Activating any of the potential access points is likely to be unpopular with adjacent property owners.

h) RECOMMENDATIONS:

Short-term Recommendations:

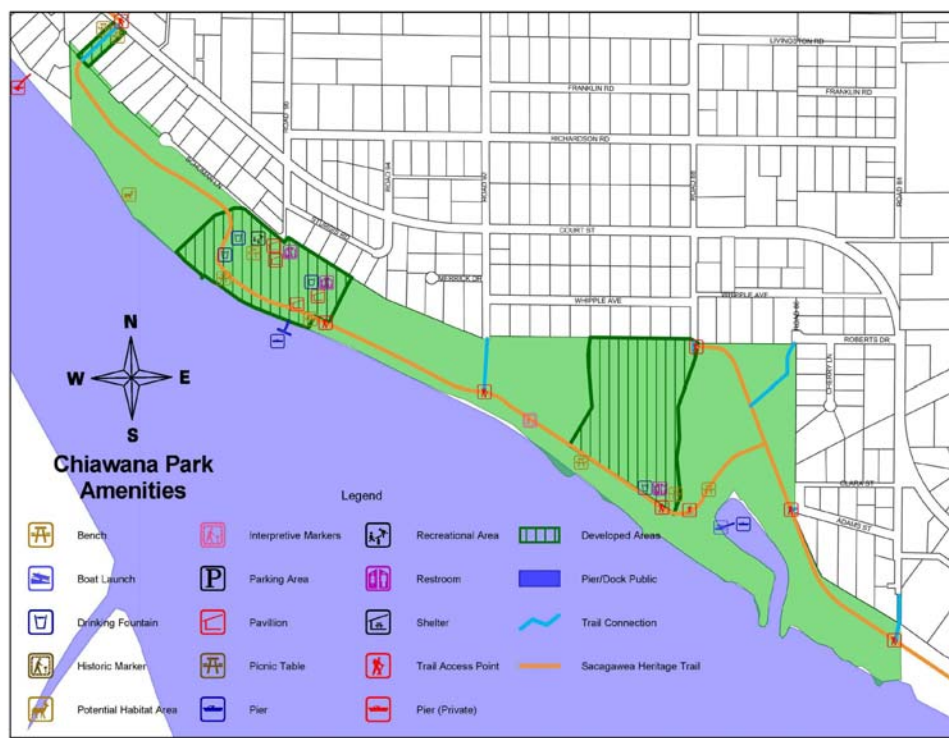
- i) Clear undergrowth in “natural” area at north end of park (vandalism/gang activity/public safety hazard)
- ii) Install (more) drinking fountains
- iii) Construct more small “family” scale, and large “family reunion” scale pavilions.
- iv) Identify and develop future riverside dining venues with scenic, recreational or cultural attributes.

- v) Establish limited, seasonal mobile vendor lease areas for diverse, small-scale vendors near pavilion areas; Include standards for vendor quality/aesthetics.
- vi) Add/Upgrade restrooms
- vii) Complete landscaping: Lawn, trees
- viii) Reserve area for a second boat launch.
- ix) Plan for a beach area.
- x) Add “Community Center” type structure.

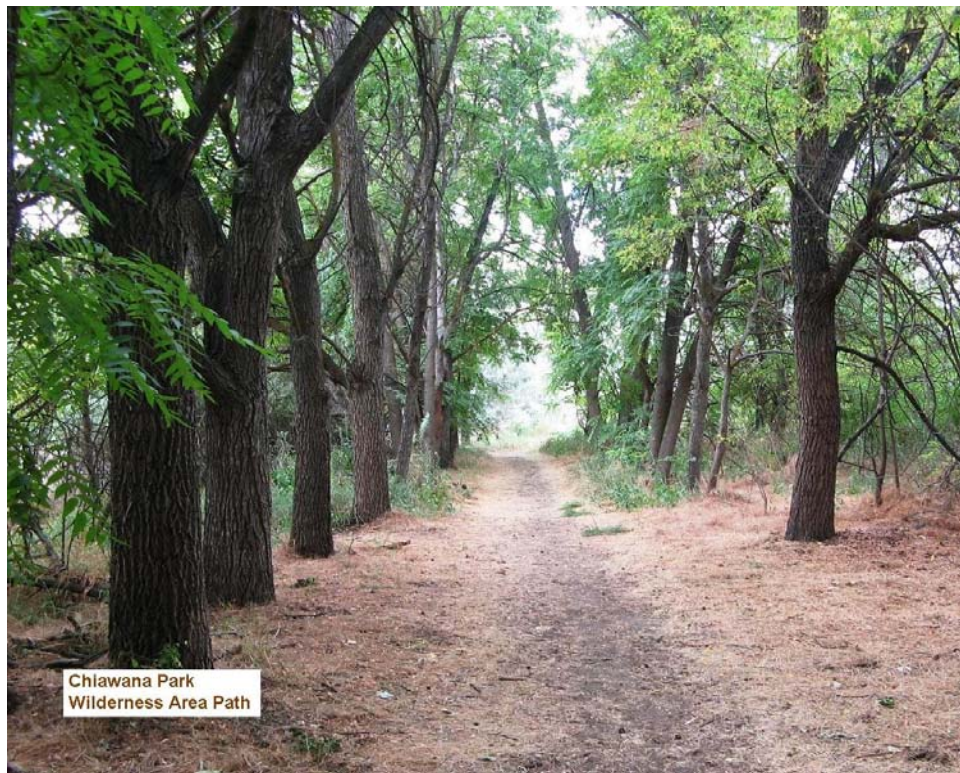
Long-term recommendations:

- xi) Construct high-end, pedestrian-scale “micro-village” lease space for diverse, small-scale vendors.
- xii) Construct second boat launch.
- xiii) Construct beach area.









Chlawana Park
Wilderness Area Path



Chlawana Park
West End Bike Path





Chiawana Park
East Unimproved Area



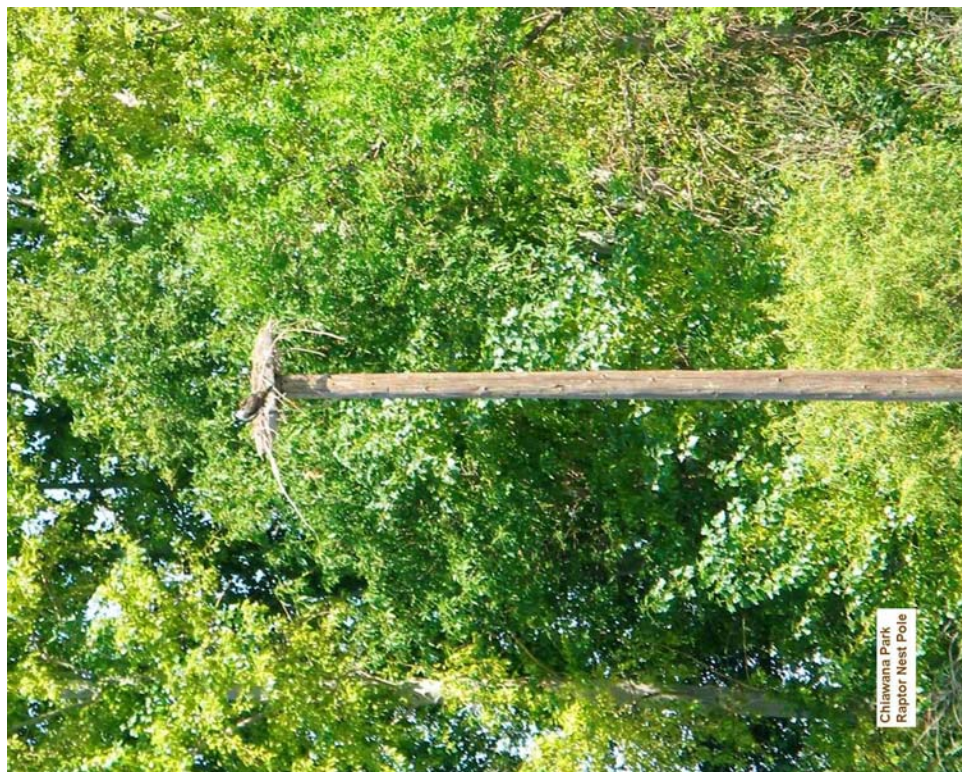
Chiawana Park
Play Equipment and
Pavillions



Chiawana Park
Pavillions



Chiawana Park
Columbia River Shallow Area



Sunset Acres

- a) **Ownership:** Army Corps of Engineers (private ownerships adjacent)
- b) **Landscape & Natural Features:** mostly flat with mix of native and non-native vegetative types. Vegetative growth is mostly sparse weeds and pasture grasses, with dense undergrowth and trees along the River.
- c) **Transportation:** Access from Court Street via Roads 76 and 84. The Sacagawea Heritage Trail is built along the entire segment.
- d) **General Land Use Pattern:**
 - i) **Residential:** Over 65 yards of vacant Army Corps of Engineers land separates two single-family residential subdivisions (Sunset Acres and Ivy Glades) from the River here.
 - ii) **Trail Development:** The Sacagawea Heritage Trail is developed along the entire length of this segment.
 - iii) **Industrial:** A major natural gas transmission line extends south and crosses the River from the south terminus of Road 76.
- e) **Linkage and Amenities Opportunities:** The width of this area lends itself to both developed park and pocket wilderness areas. There are shallower areas to the east which may lend themselves to beach development. A boat launch could be located near the end of Road 76.
- f) **Linkage and Amenities Constraints:** There are two access points, one from Road 84 and one off of Road 76. Neither has developed parking at this point. View opportunities for surrounding residences are very limited due to the flat terrain and the tree growth along the River. Any activity close to Road 76 would be highly limited due to the presence of the natural gas transmission line.

g) RECOMMENDATIONS:

Short-Term Recommendations:

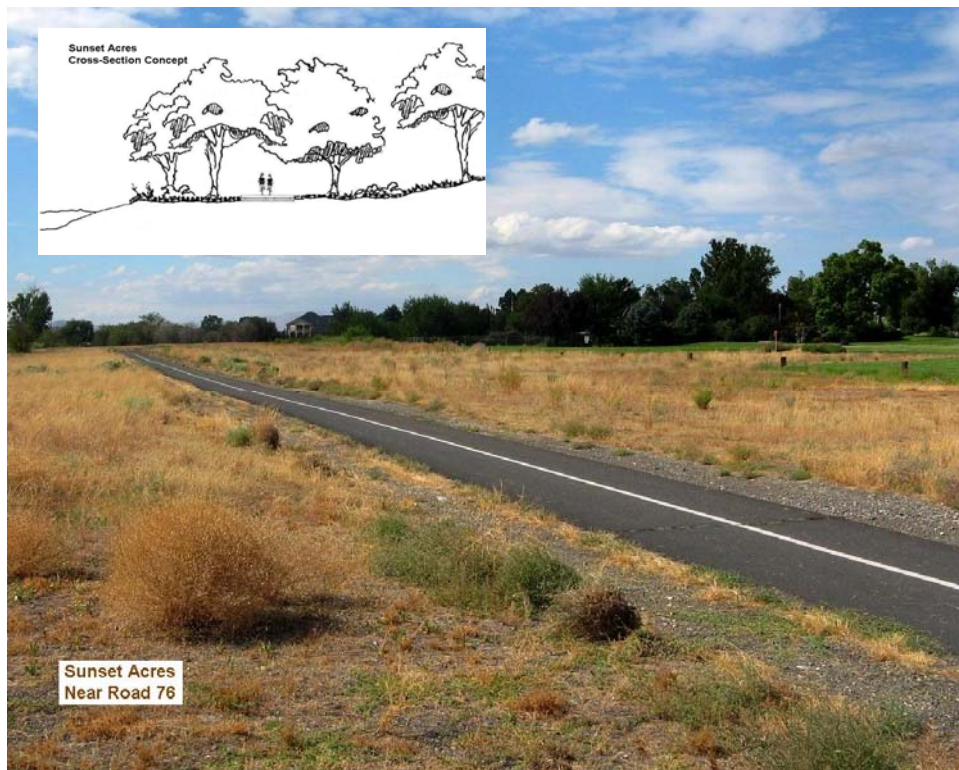
- i) Develop parking facilities at Roads 76 and 84.
- ii) Install seating areas and drinking fountains at strategic points along the Trail.
- iii) Plant clusters of shade trees around the seating areas and drinking fountains.

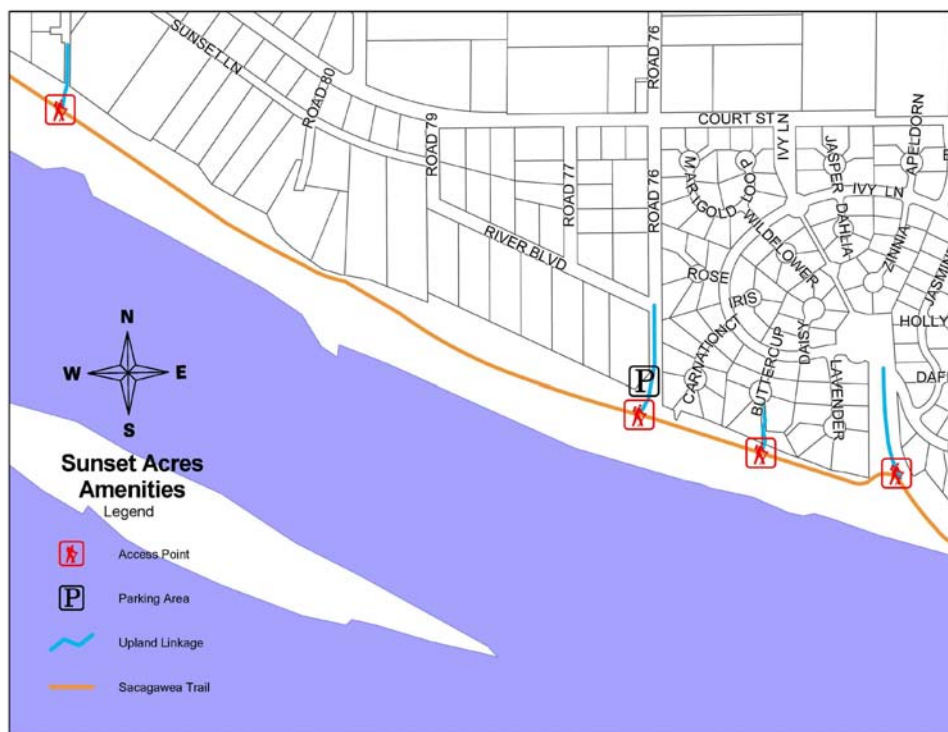
Medium-Range

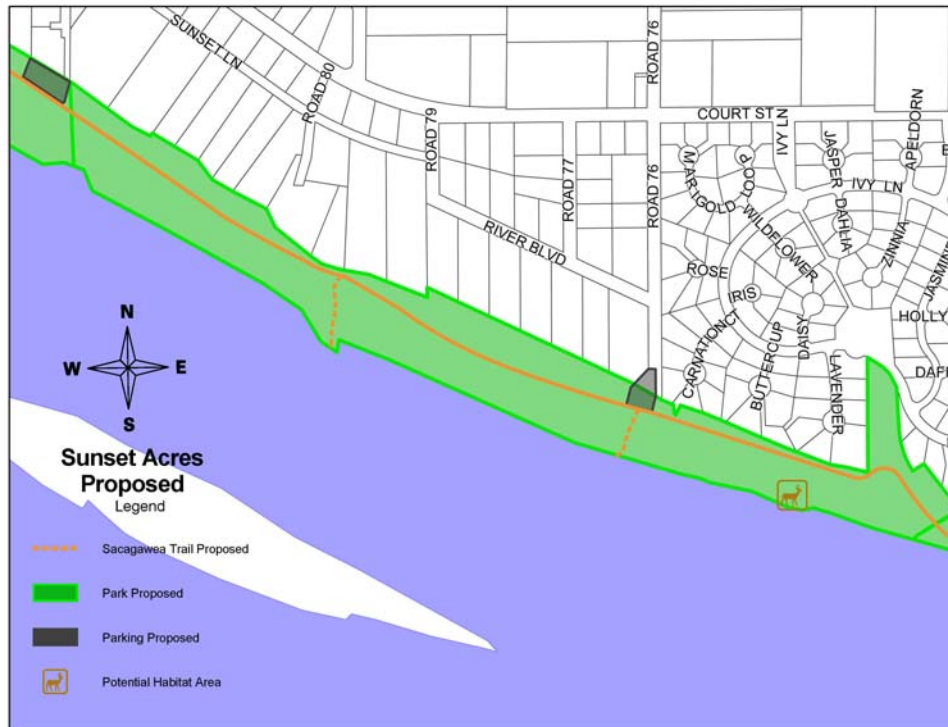
- iv) Develop a parking area and mid-sized park at the terminus of Road 76, complete with restrooms, pavilions, and beach area.
- v) Develop a “pocket park” with restrooms at road 84.

Long-Term Recommendations:

- vi) Develop the entire width of the Army Corps land with linear park as an extension of Chiawana Park, including small, clustered wildlife areas.
- vii) Investigate the need for another boat launch.











Sunset Acres
Ivy Glades Area



Sunset Acres
Ivy Glades/
Beginning of Levee #2

Levee No. 2

- a) **Ownership:** Army Corps of Engineers (private ownerships adjacent)
- b) **Landscape & Natural Features:** Army Corps of Engineers rip rap levee
- c) **Transportation:** There are three developed public access points (Roads 54, 60, and 68) and one access point through a private subdivision (Ivy Glade between the 7200-7400 blocks) to the levee.
- d) **General Land Use Pattern:** Single-family dwelling units in the Ivy Glades, Park Estates, Summer's Park, Allstrom view, and Glen Acres Subdivisions.
- e) **Linkage and Amenities Opportunities:** There are three developed public access points to the levee.
- f) **Linkage and Amenities Constraints:** The levee and drainage canal between the levee and residential development hinder access to Trail and River along this segment of river shore. While the trail is readily accessible at strategic points, access to the water is accomplished only by a careful climb down a steep, oversized rock embankment. Levee height blocks most river views.

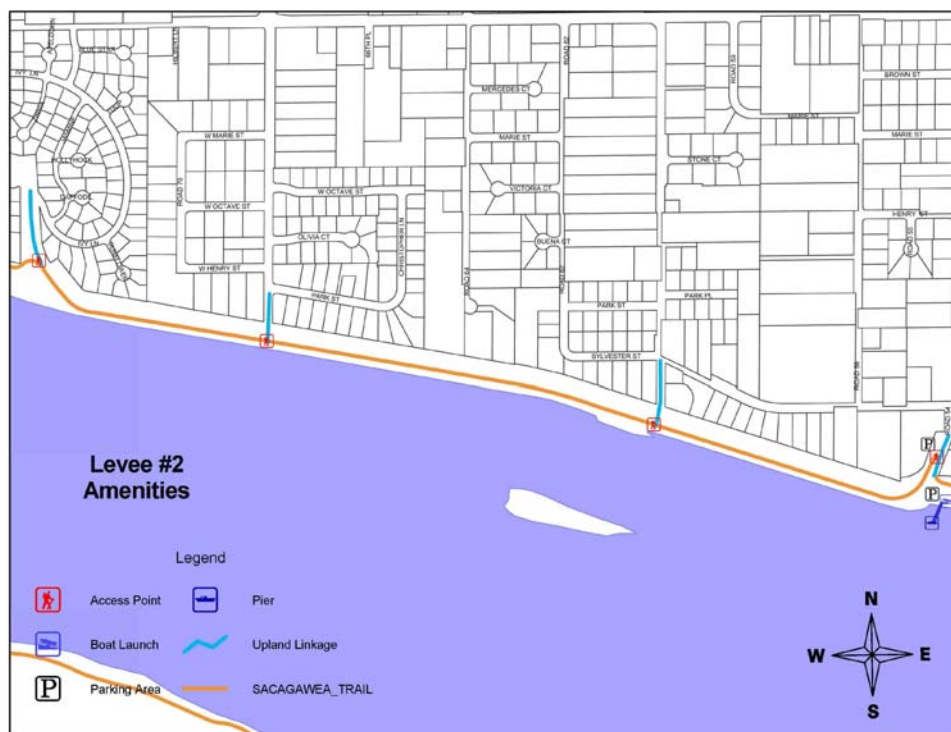
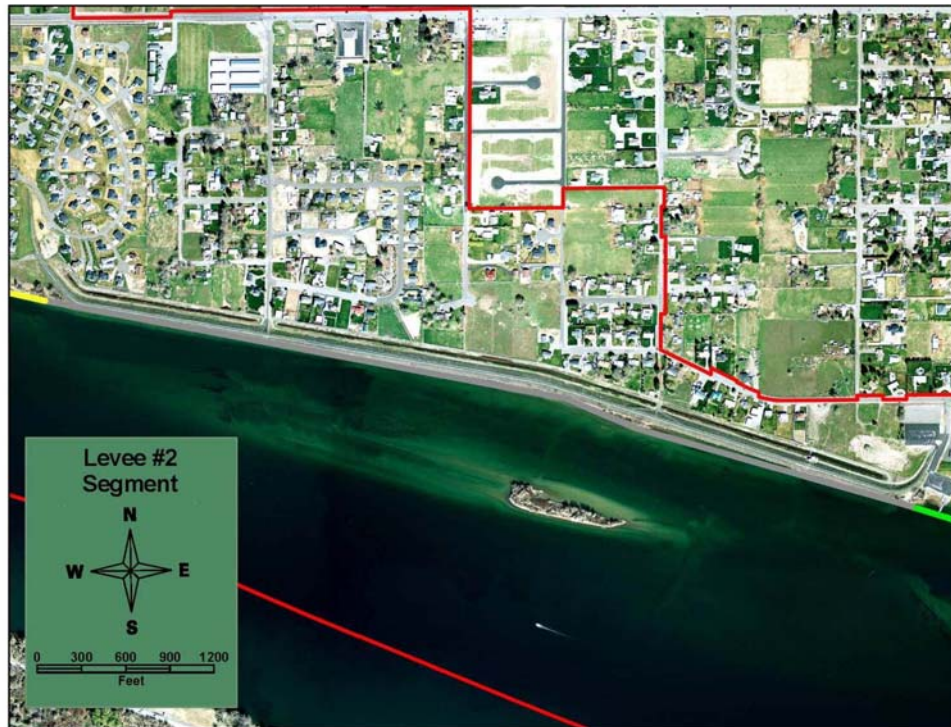
g) RECOMMENDATIONS:

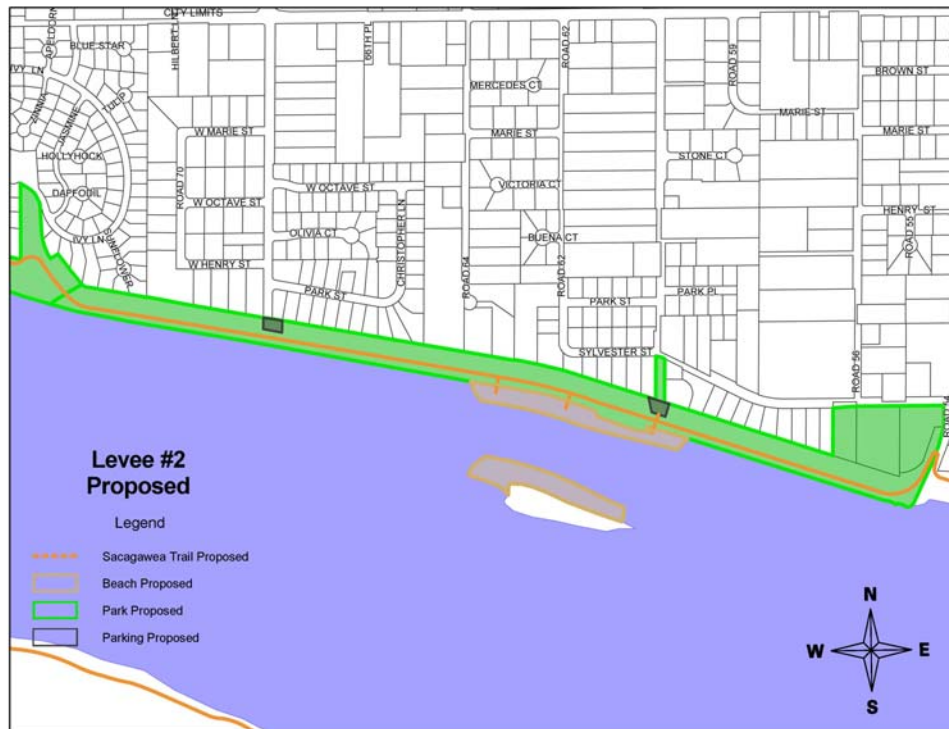
Short-Term Recommendations

- i) Lower Levee; widen path and add landscape features;
- ii) pipe and fill landward side of ditch at select locations;
- iii) Design and build interpretive signage that describes living river concepts as related to shoreline development, such as rivershore management, natural flood processes, and impacts of manmade levees.

Long-term Recommendations

- iv) Fill, grade, and vegetate river face of levee;
- v) Create parks with "step" access points/ boat docks at road 60, 68.
- vi) Create beach area in shallows between levee and island.
- vii) Develop strategically sited signature gateway at I-182 & Road 68











Levee No. 2
River Vantage Point



Levee No. 2
Access to Road 68

Wade Park

- a) **OWNERSHIP:** Army Corps of Engineers with City of Pasco/Franklin County lease(?)
- b) **Landscape & Natural Features:** gently sloping with park-type vegetation: grass and trees
- c) **Transportation:** The Trail is fully developed along Wade Park. Wade park can be directly accessed from River Haven Street off of Roads 39, 40, and Road 44, from Road 52, and from Road 54. A boat launch has been developed at Road 54.
- d) **General Land Use Pattern:** The land around Wade Park is fully developed with single-family residential units. The boat launch at Road 54 includes paved parking. Another park extension with parking, restrooms and other amenities is being developed at Road 54. A rough gravel parking lot at the east end of Wade Park between Road 39 and 40 is owned by a private party but has been made available to the public.
- e) **Linkage and Amenities Opportunities:** The new boat launch at the west end of Wade Park is easily accessible from Court Street via Road 54, and is near a proposed park with existing parking. This area is adjacent to the boat race course and is augmented with temporary commercial refreshment enterprises during the races. More permanent parking pads with power hookups, which would double as pavilion/picnic areas during the off-season, could be installed.
- f) **Linkage and Amenities Constraints:** The Trail along Wade Park can get very hot in the summer due to the lack of shade trees; however adjacent neighbors may object to additional tree plantings of these public areas.

g) RECOMMENDATIONS:

Short-term Recommendations:

- i) Place water fountains at strategic locations along path;
- ii) Plant more shade trees in clusters along the Trail;
- iii) Place canine cleanup stations at strategic locations along path.

Long-Term Recommendations:

- iv) Build restrooms at both ends of the park.
- v) Identify and develop future riverside dining venues with scenic, recreational or cultural attributes.
- vi) Develop beach area(s), as practical.







Moore Mansion

- a) **Ownership:** Army Corps of Engineers/ WA State Dept of Transportation
- b) **Landscape & Natural Features:** Army Corps of Engineers rip-rap levee
- c) **Transportation:** The Trail extends the length of the Moore Mansion segment; it can only be accessed from River Haven Street off of Roads 39 and 40.
- d) **General Land Use Pattern:** Levee #1 terminates between Road 39 and 40 next to a rough gravel parking lot at the east end of Wade Park which is owned by a private party but has been made available to the public.
- e) **Linkage and Amenities Opportunities:** As the segment name implies, this path could have direct access to the Moore Mansion, a prominent historic site within the City. Shallow areas in the River and easy river access near the Road 39/40 Park entrance may lend to construction of a beach in this area. There is a dedicated, but as yet undeveloped (Havistad) park platted as part of the Amended Pierret's Subdivision south of Havistad Street which could also add to the appeal of this segment.
- f) **Linkage and Amenities Constraints:** Due to the levee and the drainage ditch behind, the area is accessible only at one point, a gravel parking area at Road 39/40, which is rather small and is currently under private ownership. There are at present no potable water or restroom facilities at this location. The platted, but undeveloped Havistad park lot is at a considerably lower elevation than the levee, and would not have the "feel" of a riverfront amenity without visual access to the river. As well, it is separated from the River by the levee drainage canal.

g) RECOMMENDATIONS:

Short-Term Recommendations:

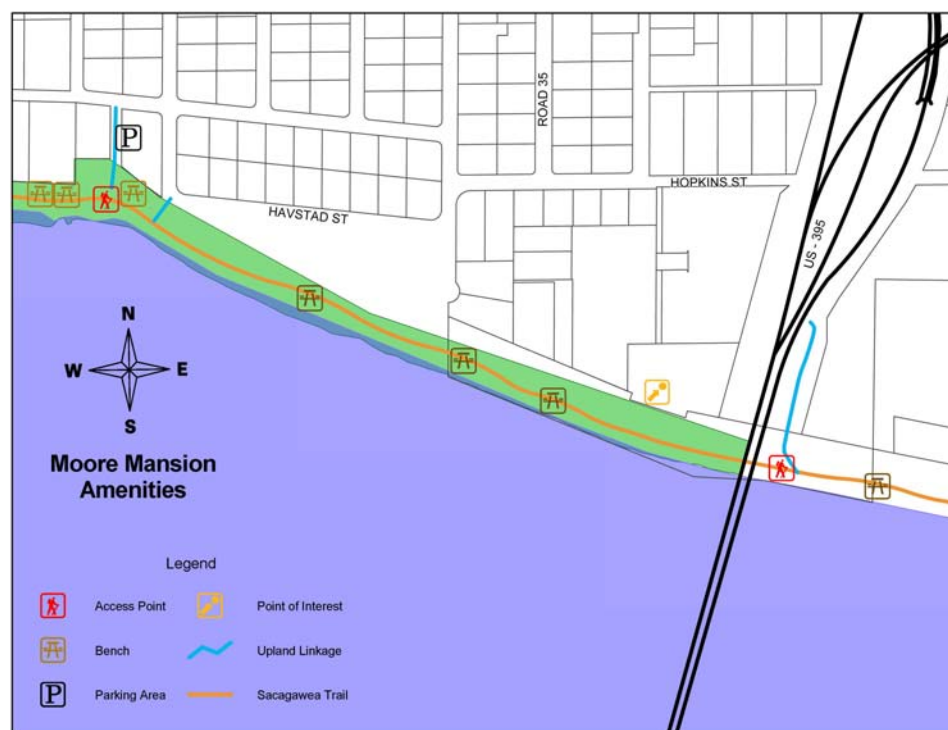
- i) pipe and fill landward side of ditch;
- ii) Vegetate landward side of levee with grass, shade trees.
- iii) Fill, grade, and vegetate river face of levee.

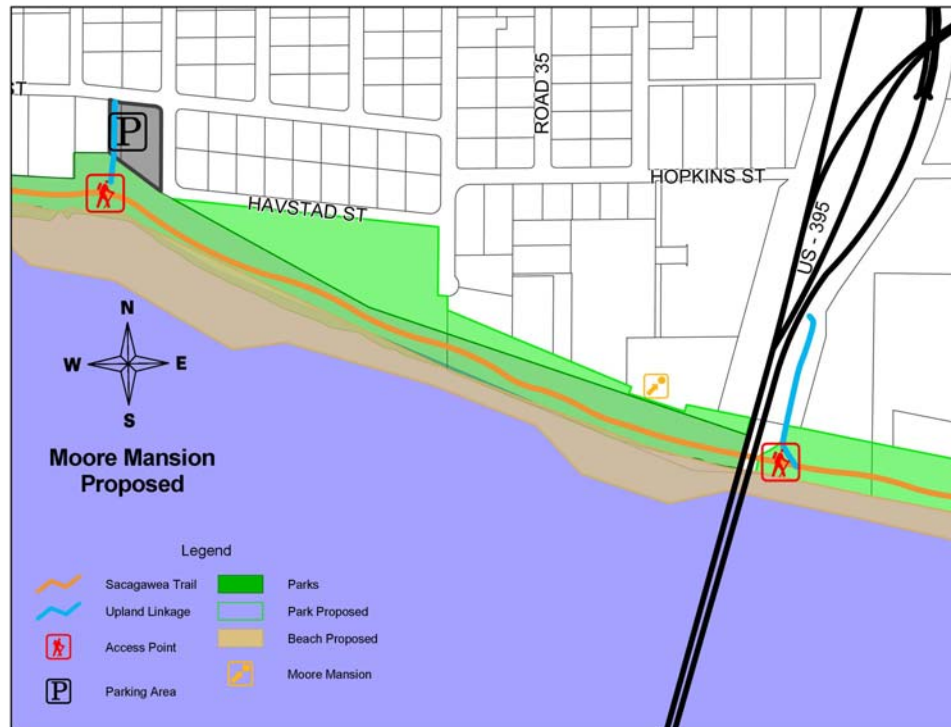
Long-Term Recommendations:

- iv) Develop Havistad Park level with levee.

- v) Install a beach area at the Road 39/40 Wade Park entrance, and extending east approximately 100-200 yards.
- vi) provide state-of-the-art separated Class I multiuse paths over the Blue Bridge







Flamingo Village

- a) **Ownership:** Army Corps of Engineers with City of Pasco/Franklin County lease(?)/City of Pasco.
- b) **Landscape & Natural Features:** Army Corps of Engineers rip rap levee
- c) **Transportation:** Access to the Trail is by way of "A" Street near the terminus of 25th Avenue. An undeveloped access point also exists at 20th Avenue. The 25th Avenue access point has been developed as a pocket park with parking but no amenities
- d) **General Land Use Pattern:** The west end of this segment lies adjacent to the Flamingo Village Trailer Park. Further east is mostly vacant industrially zoned land. The trail is separated from the trailer park and industrially zoned land by a drainage canal and a significant elevation change up towards the levee. The Levee blocks the view of the river and there is no developed access from the Trail down to the water.
- e) **Linkage and Amenities Opportunities:** Because of its largely vacant nature, this area between the Pioneer Memorial ("Blue") Bridge and Ed Hendler ("Cable") Bridge has perhaps the most development potential of all City of Pasco segments. Retail commercial development could conceivably be built over the current drainage canal with ground-level parking and levee-level (and higher) retail, restaurant, entertainment, and water-dependent/water-related uses. Steps could be built down the face of the levee to the river for "toes-in-the-water" access.
- f) **Linkage and Amenities Constraints:** Levees are owned and maintained by the Army Corps of Engineers. Any development on or around the levees would require complex and time-consuming reviews.

g) RECOMMENDATIONS:

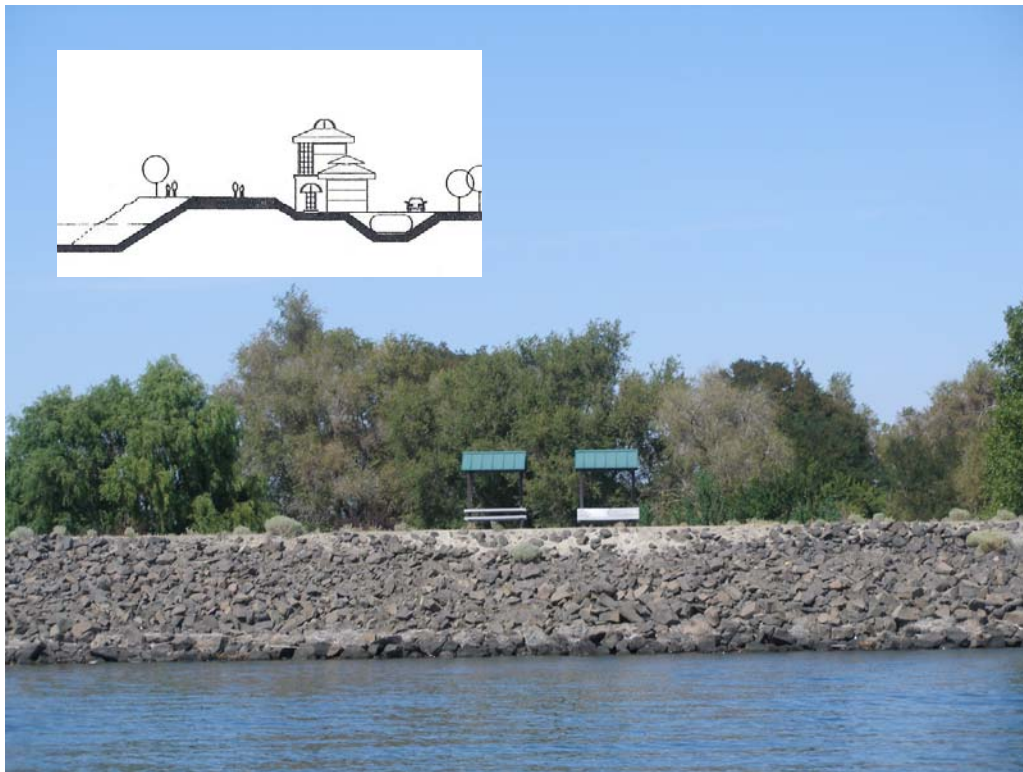
Short-Term Recommendations:

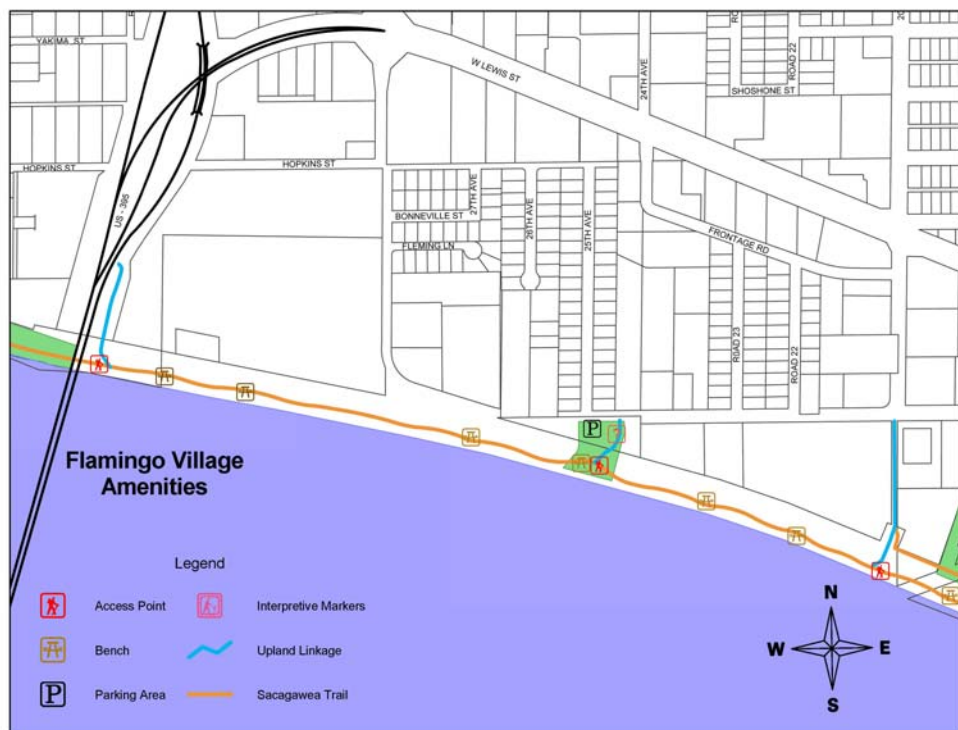
- i) Pipe and fill landward side of ditch;
- ii) Rezone the area along the River for Retail Commercial development

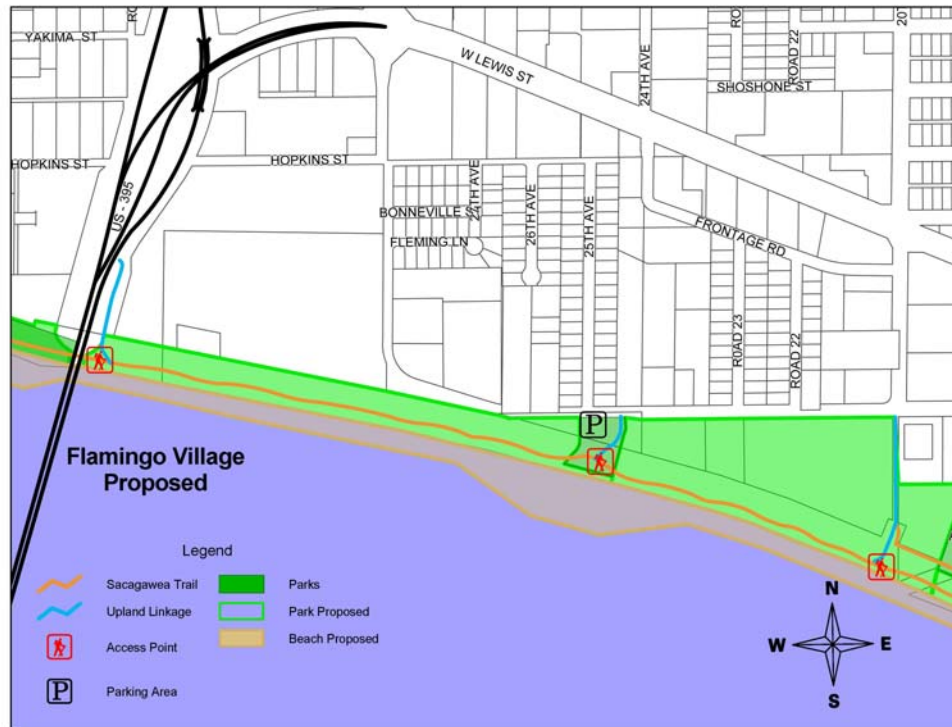
Long-Term Recommendations:

- iii) Fill, grade, and vegetate parts of the river face of levee (see Pasco Rivershore Enhancement vision).

- iv) Develop levee top as a wide commercial boardwalk with periodic River view decks.
- v) Build stair/step access on parts of the River face of the levee down to the water.
- vi) Allow/encourage retail commercial to build with street-level parking and upper floor shopping, level with, and directly up to the levee, with full levee access.
- vii) provide state-of-the-art separated Class I multiuse paths over the Blue Bridge
- viii) Develop strategically sited signature gateway at and 20th & Sylvester







Riverview Park

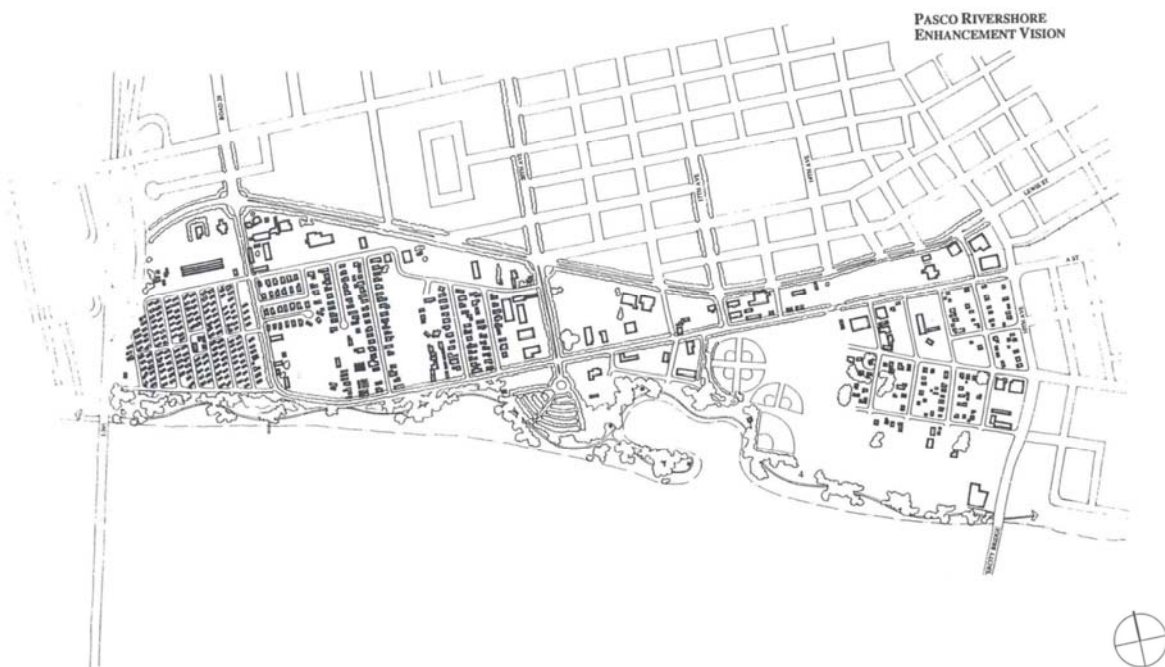
- a) **Ownership:** Army Corps of Engineers with City of Pasco/Franklin County lease(?)/City of Pasco
- b) **Landscape & Natural Features:** Army Corps of Engineers rip rap levee; City of Pasco Baseball/softball facility; City of Pasco Riverview Park. There is a shallow, manmade drainage pond to the west of the park.
- c) **Transportation** Access to the Trail is by way of “A” Street from an undeveloped access point at 20th Avenue, and between 17th and 18th Avenues through the City of Pasco baseball/softball field and Riverview Park. A loop of the Trail circles around near the Animal Shelter at 18th Avenue. A BNSF rail spur crosses “A” Street, curving south along the ball fields and loops east roughly parallel to the river. This rail spur is currently being utilized by a single client, a small concrete company leasing land at the Port of Pasco. The spur will be abandoned when the lease expires.
- d) **General Land Use Pattern:** This area is developed with an animal shelter, a City of Pasco baseball/softball field and Riverview Park.
- e) **Linkage and Amenities Opportunities:** This is one of the few areas not locked out of potential “destination” development by residential zoning. The area south of “A” Street could be enhanced with river-oriented commercial uses, augmenting the developed park and sports facilities. The manmade pond has potential for wildlife viewing, fishing for young families, and should be enhanced as park land with grassy areas, pavilions, restrooms, pond access and barbecue amenities. There is potential for a pocket wildlife area as part of the pond-centric development. Once the BNSF rail spur is abandoned the City should negotiate with the BNSF to acquire the land adjacent to the ball fields. This area could benefit from additional baseball fields and the addition of soccer facilities.
- f) **Linkage and Amenities Constraints:** The area is still zoned I-1 Light Industrial, and as such can be legally developed with such things as building material storage yards, trucking companies, a central power station, automotive assembly and repair facilities, and blacksmith, welding or other metal shops.
- g) **RECOMMENDATIONS:**

Short-Term Recommendations:

- i) Rezone the area south of "A" Street as C-1 Retail Commercial.
- ii) Improve Riverview Park for waterfowl and elevated bird watching along the rivershore trail, adding nature trails as needed; Develop a park around the pond with a pocket wildlife viewing area, fishing areas for young families, grassy areas, pavilions, restrooms and barbecue amenities.
- iii) Place drinking fountains, shade trees, and restroom facilities at strategic points;

Long-Term Recommendations:

- iv) Fill, grade, and vegetate river face of levee (see Pasco Rivershore Enhancement vision).
- v) Purchase the BNSF lands east of the ball fields; add baseball and soccer fields.
- vi) Develop a beach area just south of the Riverview Park.







West Cable Bridge

- a) **Ownership:** Army Corps of Engineers
- b) **Landscape & Natural Features:** Army Corps of Engineers rip-rap levee; BNSF Railroad spur line; undeveloped scrub land.
- c) **Transportation:** A BNSF Rail spur bisects most of this area; One unfinished access point leads to 13th Avenue. The trail leading to 13th crosses BNSF land and the BNSF rail spur.
- d) **General Land Use Pattern:** This area is mostly vacant with some residential and industrial uses along Washington Avenue, extending south towards the River.
- e) **Linkage and Amenities Opportunities:** Because this area is mostly undeveloped it has more flexibility for future plans. It is close to the ballpark and Riverview park and could eventually be an extension of and expansion area for that facility.
- f) **Linkage and Amenities Constraints:** The BNSF-owned rail spur is a prominent and central barrier to any development in this area. Until the spur is abandoned and the land changes hands this area is essentially off-limits to any redevelopment.

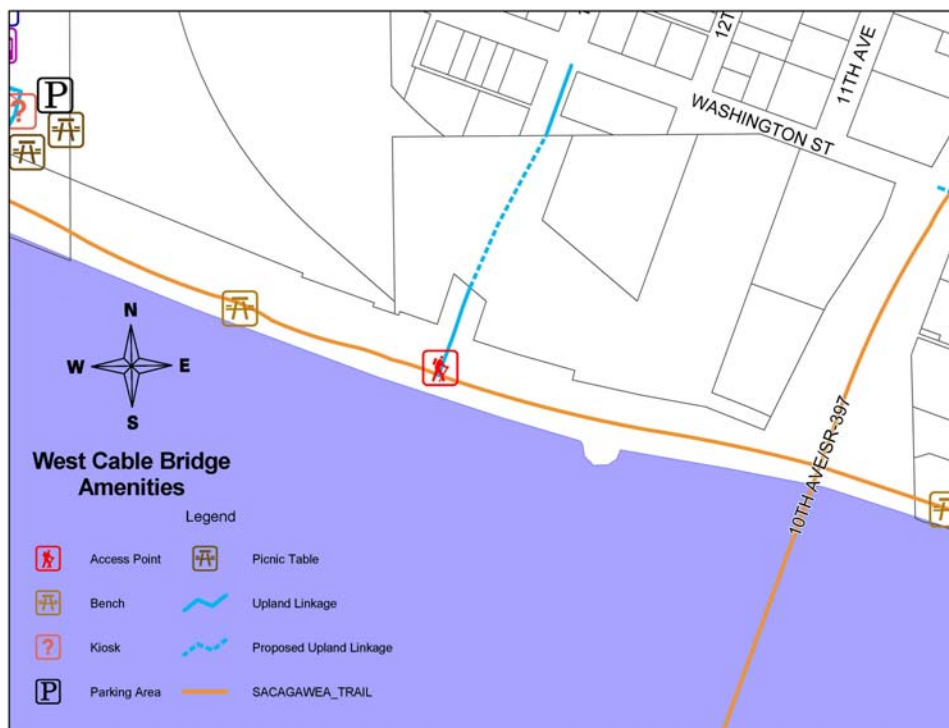
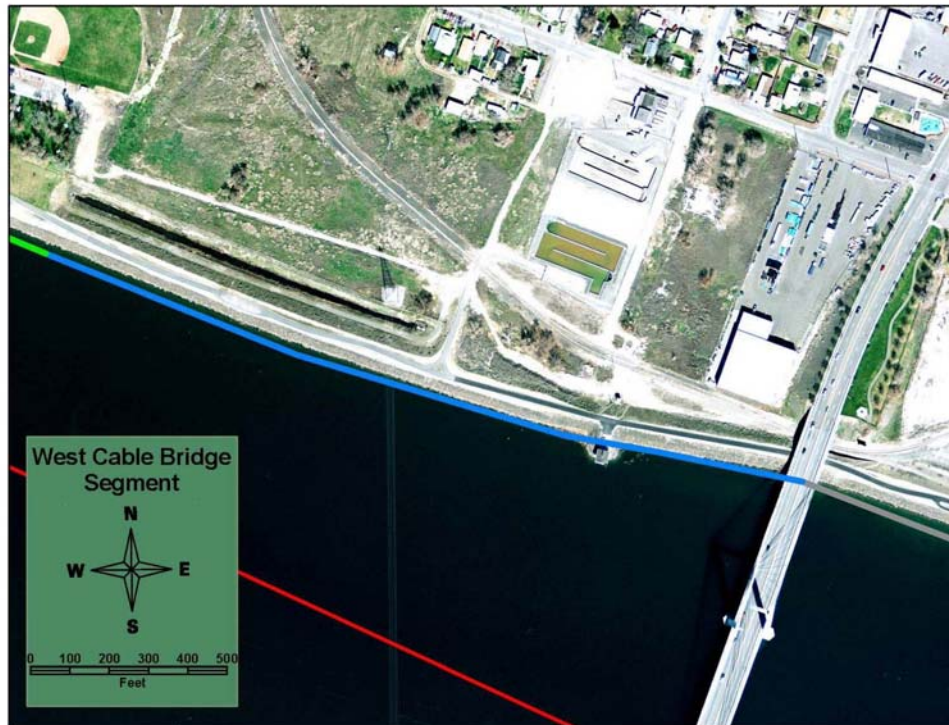
g) RECOMMENDATIONS:

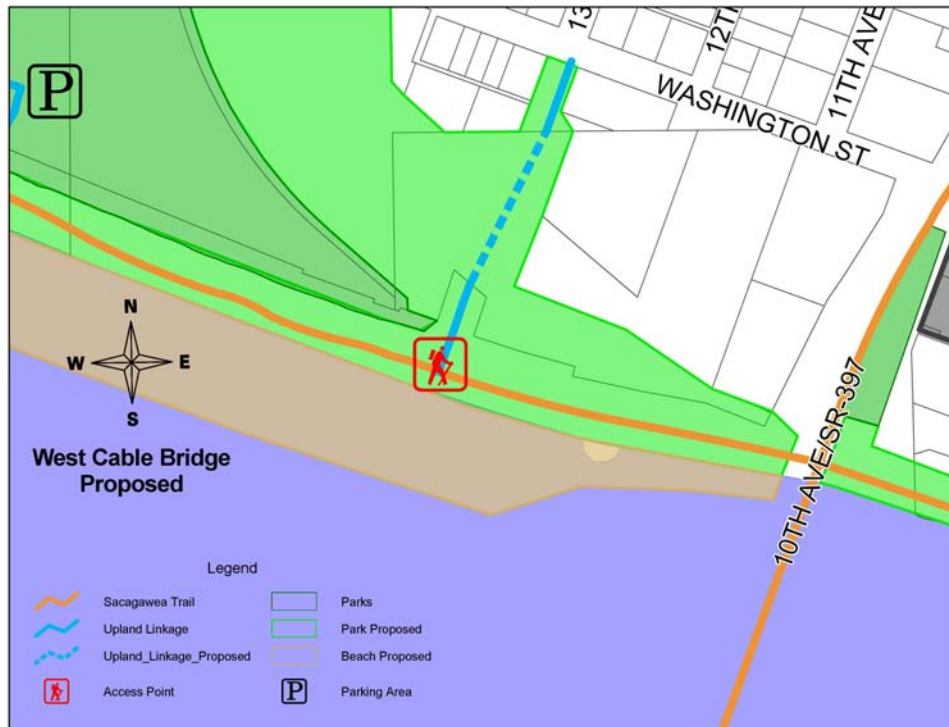
Short-Term Recommendations:

- i) Acquire BNSF land upon rail spur abandonment.
- ii) pipe and fill landward side of ditch;

Long-Term Recommendations:

- iii) Extend park facilities east, with picnic areas and typical park amenities.
- iv) Fill, grade, and vegetate river face of levee (see Pasco Rivershore Enhancement vision).
- v) provide state-of-the-art separated Class I multiuse paths over the Cable Bridge





Marine Terminal

- a) **Ownership:** Port of Pasco/Some private
- b) **Landscape & Natural Features:** Army Corps of Engineers rip-rap levee; commercial/industrial area (mostly vacant—marine terminal side); BNSF railroad main line and trestle bridge to the east; Sacagawea trail does not connect former Port of Pasco marine terminal with Boat basin area due to BNSF Railroad tracks and trestle bridge.
- c) **Transportation:** The Trail extends through the entire length of this segment. Access is from 10th Avenue, Washington Street, 9th Avenue, Ainsworth Avenue, and 4th Avenue.
- d) **General Land Use Pattern:** Mostly Vacant industrially zoned land.
- e) **Linkage and Amenities Opportunities:** The Trail extends through the entire length of this segment. There is a barge dock which would be an excellent location for an indoor/outdoor waterfront restaurant with integrated dock facilities. Retail commercial development should be built with ground-level parking and levee-level (and higher) retail, restaurant, entertainment, and water-dependent/water-related uses. This is another prime potential retail commercial area.
- f) **Linkage and Amenities Constraints:** This is the site of a former WWII fuel tank facility. Some toxic spillage has occurred along the west end of the Marine Terminal area and is in the remediation process. Unfortunately, the remediation is “low-tech” and thus more time-consuming. The area may not be “shovel-ready” for some time. An anxious developer may choose to invest in a more intensive (and expensive) remediation process, but this is not a current likelihood. The two available direct north-south routes from this neighborhood to downtown Pasco are 4th Avenue under the Ainsworth Underpass, and north along the BNSF main rail line to the City Center; and north on 10th Avenue. While both routes are fairly well sidewalk-equipped for pedestrians, however neither is designed for bicycle traffic. As well, neither route is aesthetically pleasing.
- g) **RECOMMENDATIONS:** (See Boat Basin/Marine Terminal Master Plan).

2) Short-Term Recommendations:

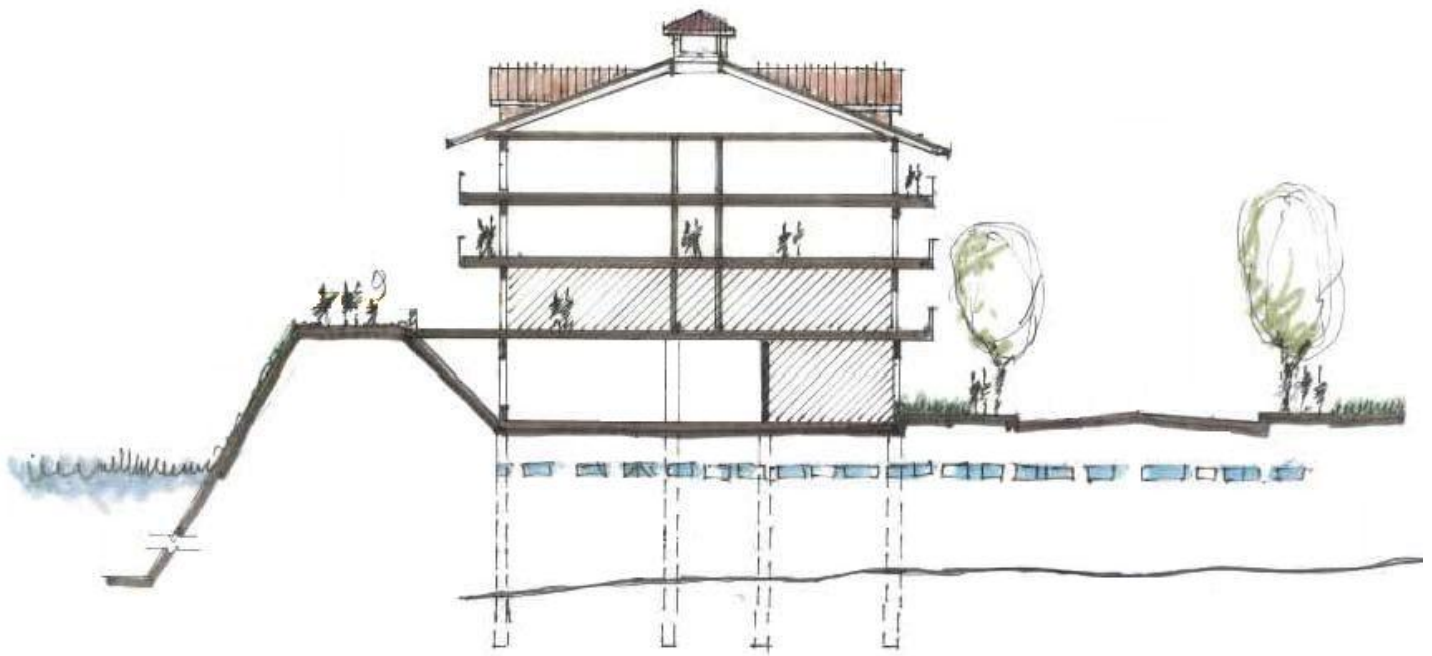
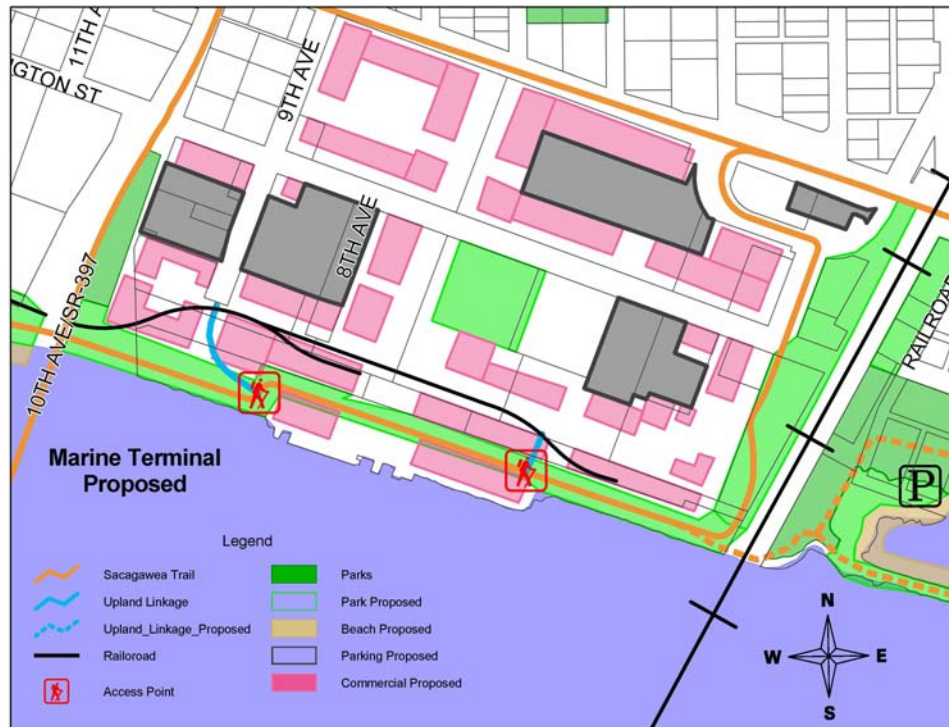
- i) Rezone the area for Business Park/Commercial retail.

3) Long-Term Recommendations:

- i) Invest in higher-tech toxic spill remediation
- ii) Encourage/promote development as per the Boat Basin/Marine Terminal Plan.
- iii) Build an improved trail connections between Pasco's urban center and the Boat Basin/Marine Terminal area
- iv) Consider the possibility of a cantilevered pedestrian bridge built to the side of the BNSF bridge
- v) Develop strategically sited signature gateway at 4th Ave & Lewis St
- vi) Identify and develop future riverside dining venues with scenic, recreational or cultural attributes.







Boat Basin

- a) **Ownership:** Army Corps of Engineers with City of Pasco lease/Private owners
- b) **Landscape & Natural Features:** Army Corps of Engineers rip-rap levee and dike; commercial/industrial boat marina area and boat launch and dock in disrepair; BNSF railroad main line and trestle bridge to the west, separating the Port Marine terminal from the Boat Basin; Schlagle City park; modest residential areas; boat launch in disrepair, private marina facility; Sacagawea trail does not connect former Port of Pasco marine terminal with Boat basin area, due to BNSF Railroad tracks and trestle bridge.
- c) **Transportation:** This area is barricaded in by the BNSF Railroad main line to the west, The Ainsworth Overpass along the north, and the Port of Pasco's Osprey Pointe project to the east. Access is from 2nd and Gray avenues to the northeast, and a foot access from the Osprey Pointe development to the east. Since the construction of the Ainsworth overpass this area has become further isolated and less accessible, as the overpass cut off access from Railroad, 4th, and 3rd Avenues. Furthermore, the Sacagawea Heritage Trail does not go through this area, instead winding north across the overpass avoiding the Boat Basin neighborhood, and then back down along the river at Osprey Pointe. Neighbors have reported that crime is higher here because the area is isolated from public supervision.
- d) **General Land Use Pattern:** A private marina operates in the industrially zoned waterfront area, next to a public boat launch and a public park. Modest residential units occupy the residentially zoned north half of the area. A large percent of these units are owner-occupied and are neatly maintained. There are a few industrially zoned lots in the east part of the neighborhood.
- e) **Linkage and Amenities Opportunities:** A neighborhood park is already in place, with a boat launch close by. This basin lends itself well to development of a separate beach/swimming area. However the beach should be designed in a way as to separate swimming and boating activities. If the BNSF Railroad would allow a trail underpass for the Sacagawea Trail under its main line, the Trail could continue through the neighborhood, opening up the neighborhood somewhat and adding public supervision to the area. As the Osprey Pointe project develops to the east, this area will be in higher demand for upscale residential development and an

upgrade will be warranted to the marina facility, with demand for mini-market, boat fueling, fishing supplies, and perhaps restaurant facilities at the marina.

- f) **Linkage and Amenities Constraints:** The BNSF Railroad has been reluctant in times past to allow for an underpass under its mainline, citing transportation security issues. As well, the Port of Pasco is reluctant to include the Boat Basin in its plans as long as the neighborhood remains unsightly and uninviting to business visitors. The high owner-occupied ratio reduces the likelihood of any major upgrades to the residential neighborhood in the short-term, although as land values in the neighborhood increase due to Osprey Pointe development, owners may be induced to sell for a reasonable profit. There are no direct north-south routes from this neighborhood to downtown Pasco. The closest access would require a circuitous route either west along Ainsworth Avenue and south at 6th Avenue, thence circling east and north to 4th Avenue under the Ainsworth Underpass, and north to the City Center; or east to Oregon Avenue, north to Lewis Street, and west again to the city Center. The former route navigates through industrial and residential areas, the latter primarily through industrial zones on a truck route that is not bike/pedestrian friendly.

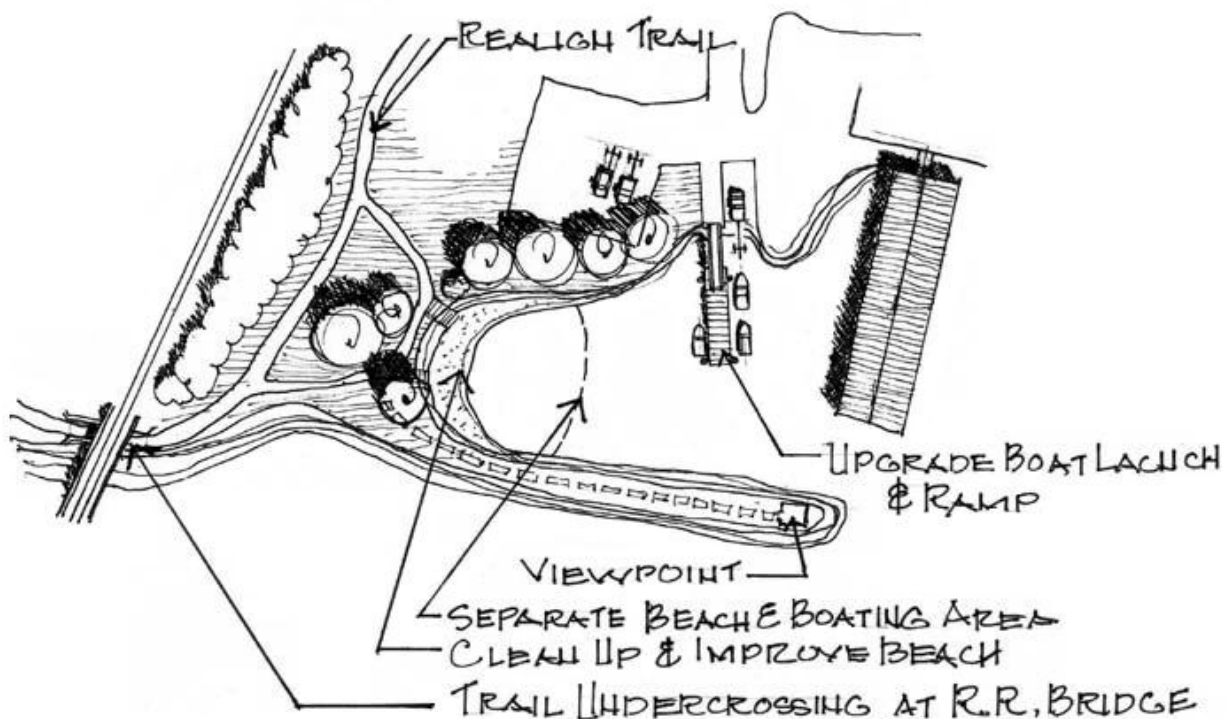
g) **RECOMMENDATIONS:** (See Boat Basin/Tank Farm Master Plan)

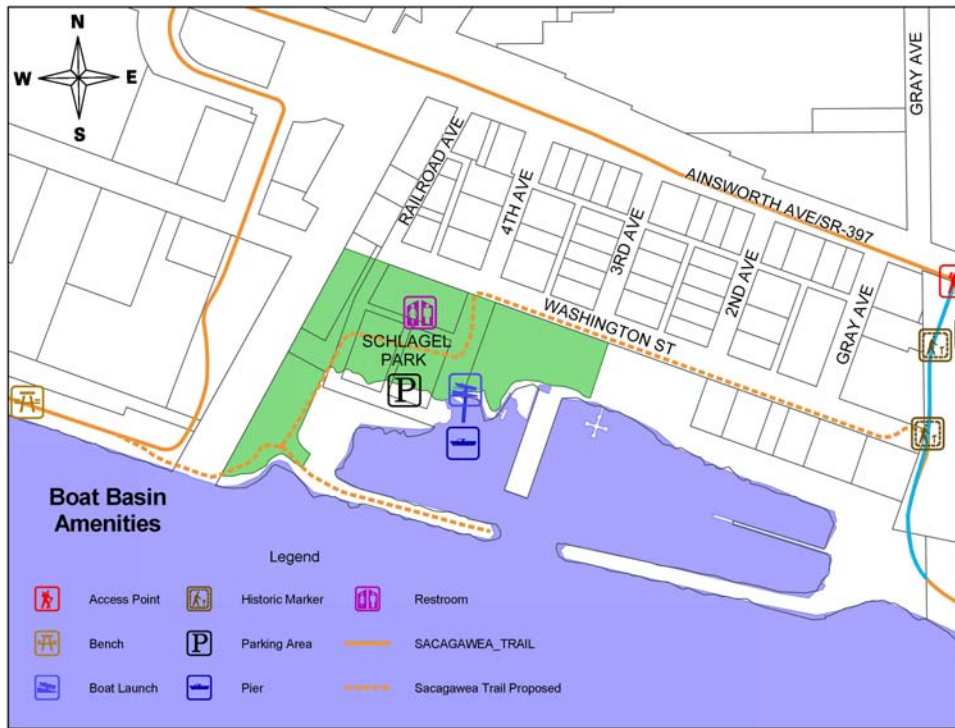
Short-Term Recommendations:

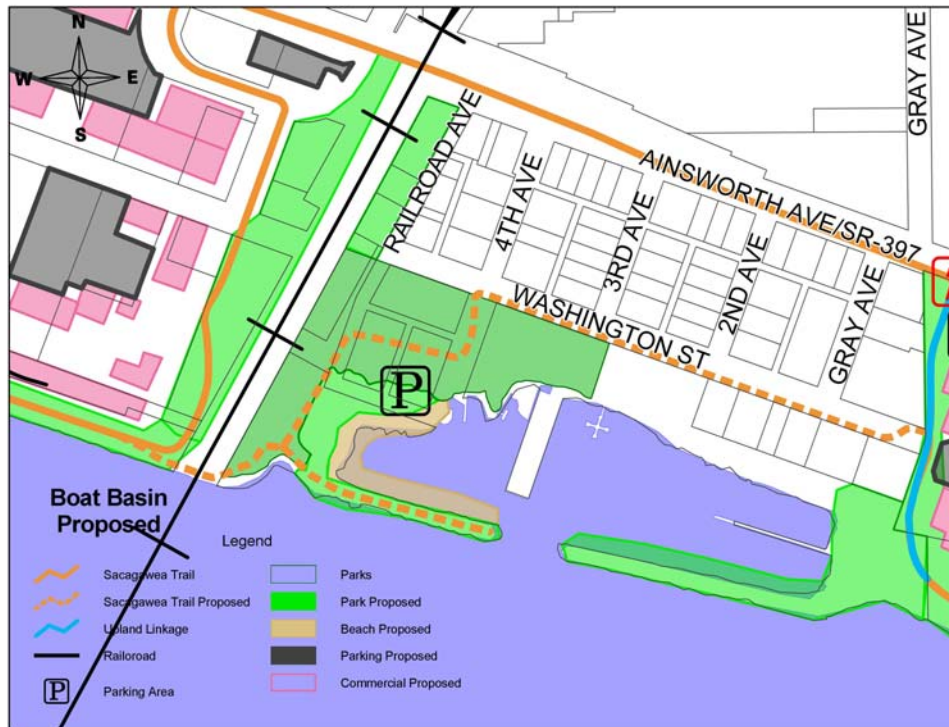
- i) Rezone neighborhood to higher-density residential, to allow for higher-end condos. Establish design standards for all new construction compatible with the Marine Terminal and Osprey Pointe themes.
- ii) Begin negotiations for a BNSF/Sacagawea Trail underpass. Prepare a “plan B” “floating deck” option for the trail to drop into and floats on the River, if necessary.
- iii) Begin plans for continuation of the Sacagawea Trail through the neighborhood.
- iv) Begin plans for a public beach separated from the boat launch facility.
- v) Upgrade dike and park facility.
- vi) Add path and view deck at harbor entrance of dike.

Long-Term Recommendations:

- vii) Build Sacagawea Trail underpass and trail through the Boat Basin neighborhood.
- viii) Build a beach and swimming area as part of Schlager Park, separating boat launch uses from swimming.
- ix) Upgrade boat launch and dock facilities.
- x) Build a park along the River between the Boat Basin and Osprey Pointe, thematically connecting the two developments.
- xi) Consider the possibility of a cantilevered pedestrian bridge built to the side of the BNSF bridge







Port of Pasco

- a) **Ownership:** Port of Pasco
- b) **Landscape & Natural Features:** gently sloping to increased slope, scrub vegetation with thick tree growth along river edge (NOTE—Trees have recently been thinned around the Osprey Pointe development to the west).
- c) **Transportation:** The port of Pasco is a hub of industrial River, rail, and truck transportation. The Port owns a barge docking and loading facility on the Columbia River, which leads out to the Pacific and to markets in the Pacific Rim and beyond. This barge facility is located just east of the Osprey Pointe development. Several rail-spurs access the BNSF main lines through the Port from both the northwest and northeast. Ainsworth and Oregon Avenues provide quick access for trucking to major highways heading in all directions. The Trail has been developed through the Port property; along the river of the Osprey Pointe area and then inland along Ainsworth Avenue to the last block of warehouses, and then back south to the river. The Trail ends at the Sacagawea State Park access road.
- d) **General Land Use Pattern:** The Port of Pasco has a mix of WWII-era warehouse facilities and vacant lands, and is zoned for heavy industrial use, though Osprey Pointe is planned as a higher-end business park.
- e) **Linkage and Amenities Opportunities:** The completion of the first Osprey Pointe building (the Port of Pasco office) and utilities infrastructure has set the stage for further office development in the park. The Port has designed the building as an example of the design standards expected of future buildings on the site. Landscaping (including the removal of dead trees and undergrowth along the River) is professional and aesthetically pleasing, as well as drought-resistant. The rest of the Port will remain heavy industrial into the foreseeable future.
- f) **Linkage and Amenities Constraints:** Trail location is constrained by industrial uses in the area. The Trail currently follows Ainsworth Avenue through the heaviest industrial use areas, leaving the river to avoid the barge loading facility and some outdoor warehousing. One river view access trail weaves between some outdoor storage areas down to the River, but does not subsequently join up with the Trail.

g) **RECOMMENDATIONS:** (See Port of Pasco Osprey Pointe Business Park Plan).

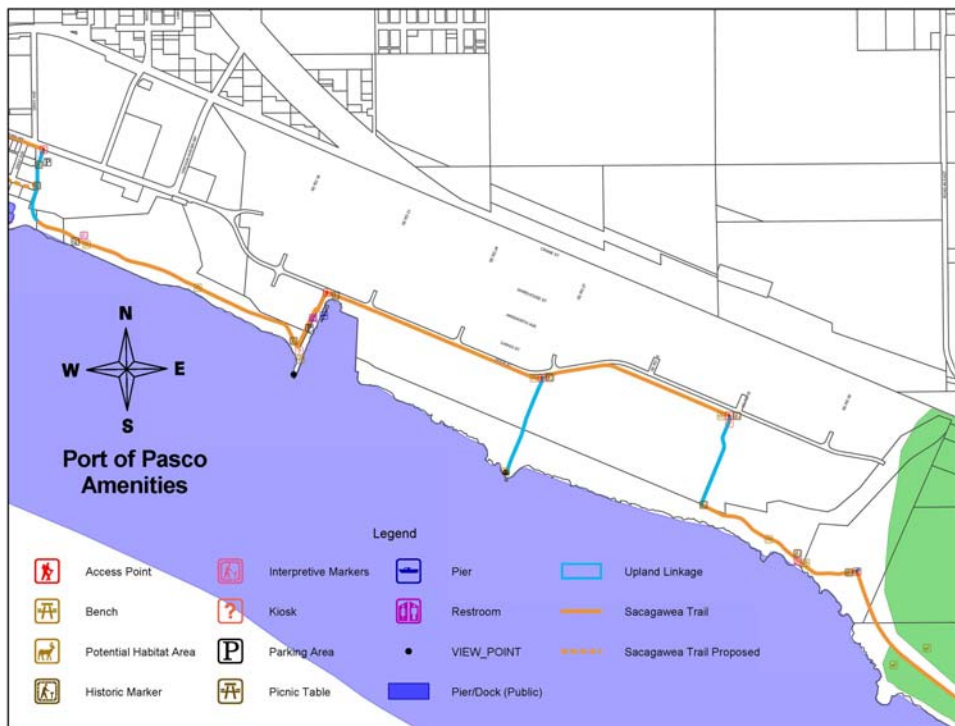
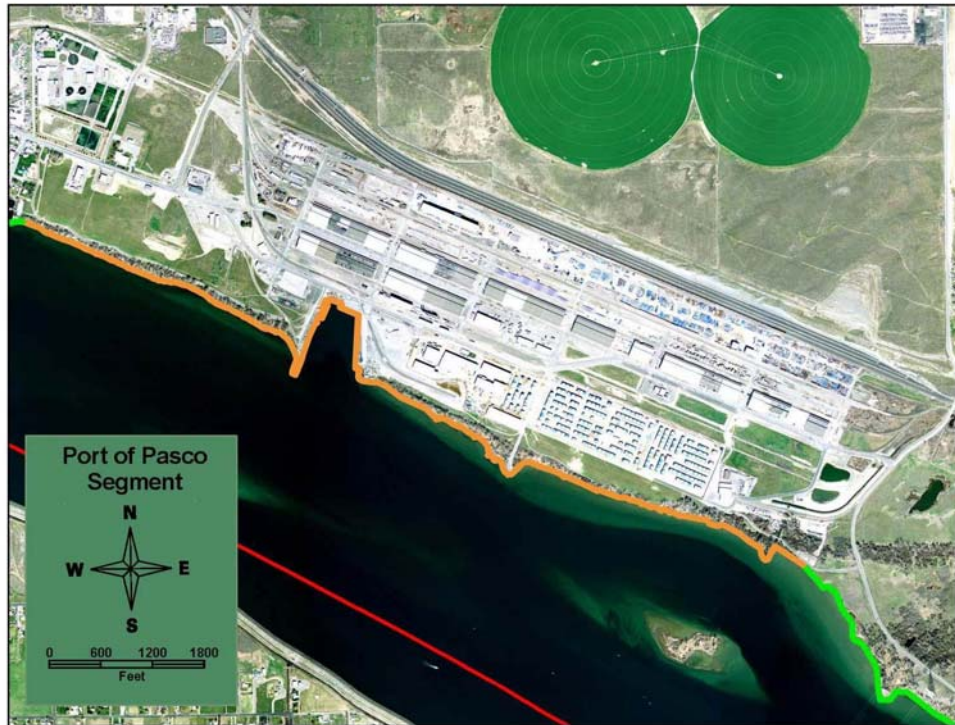
Short-Term Recommendations:

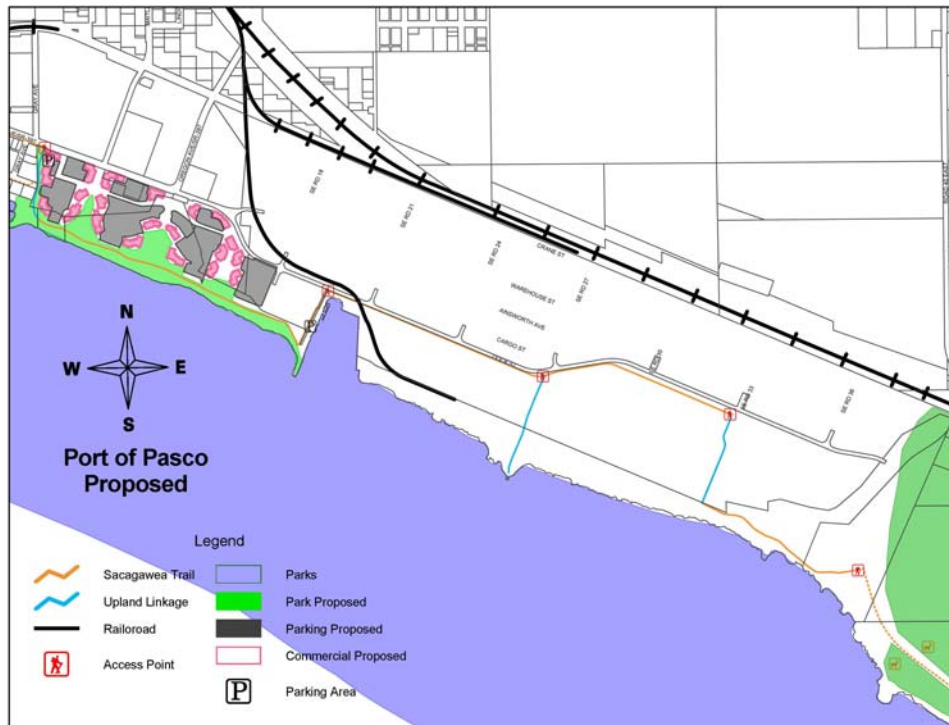
- i) Continue development of Osprey Pointe as planned.
- ii) Connect Lookout point trail to main Trail along the River.
- iii) Provide self-guided smart phone tours addressing unique history, culture and environment of the Port of Pasco; Highlight Big Pasco's working port and businesses as a trail exhibit

Long-Term Recommendations:

- iv) Build a park along the River between the Boat Basin and Osprey Pointe, thematically connecting the two developments.
- v) Build an improved trail connection between Pasco's urban center and the Osprey Pointe Business Park.







Sacagawea Park

- a) **Ownership:** Army Corps of Engineers/Wash St Parks & Recreation
- b) **Landscape & Natural Features:** State park; mostly flat, mix of native and non-native (park) vegetation; beach areas; docks; boat launch; historic Ainsworth Town site.
- c) **Transportation:** Access to the Park is limited to a single two-lane road entering the park from the northwest. The Trail ends at this road. An undeveloped path/road meanders through the historic Ainsworth town site.
- d) **General Land Use Pattern:** This area is partially developed as a state park with patron amenities such as parking, family and group picnic areas, a boat launch and docks, and a beach. There is housing for park staff and a museum/interpretive center. The balance of the park is vacant, with the exception of some high voltage power lines utilities crossing the Columbia River at the south shore.
- e) **Linkage and Amenities Opportunities:** Sacagawea State Park is partially developed and contains the only developed beach within Pasco city limits. This park rests at the confluence of the Snake and Columbia Rivers and is historic for its role in the Lewis and Clark Expedition, and contains a museum and interpretive center. The park is periodically used for sternwheeler riverboat docking as they come up river from the Pacific coast. While this may be an ideal site for summer food vending, any commercial activity would need to be sanctioned by the State Parks Department. The Park is just south of the historic Ainsworth town site, and the only public access to the site. The Sacagawea Trail should continue through the park along the north border of the access road and developed park areas, continuing along the meandering Ainsworth access road, and then north up along the Snake River. Many areas of the park are ideal for local camping and scouting/wilderness club-type activities. The balance of the park area is undeveloped and amenable to wildlife viewing. Future development should allow for a few “look but don’t touch” viewing trails in appropriate parts of the park.
- f) **Linkage and Amenities Constraints:** Because the park is owned and operated by the State Parks Department, the City of Pasco has limited influence over its development. As well, the Ainsworth town site is an historic site and may be difficult

to protect as an archaeological site, off-limits to scavenging. The northeast part of the old town site is swampy and any trail through the area may require footbridges or boardwalks to cross over the swamp areas.

g) RECOMMENDATIONS: (State of Washington Parks Department);

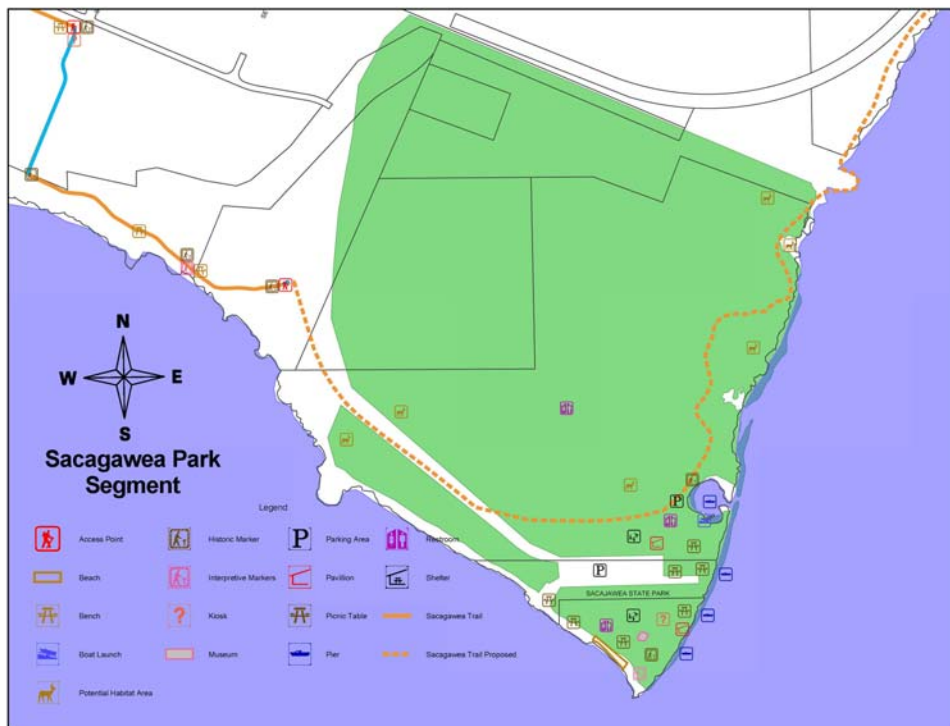
Short-Term Recommendations:

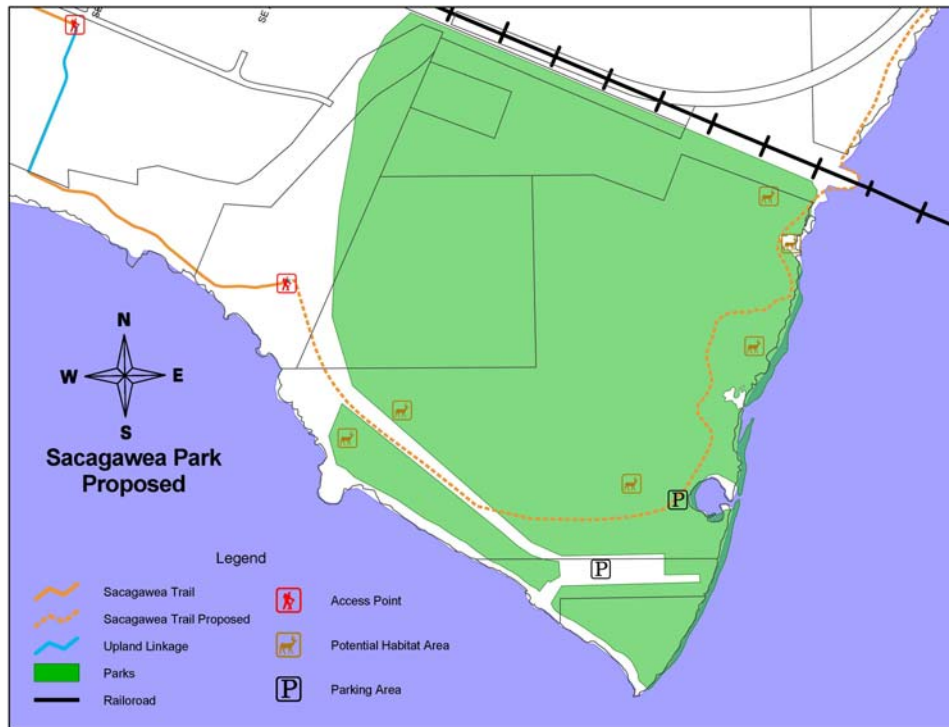
- i) Place drinking fountains, shade trees, and restroom facilities at strategic points;
- ii) Develop overnight camping areas throughout the park
- iii) Design a trail extension of the Sacagawea Trail through the Ainsworth Town site and beyond.
- iv) Develop trails in Sacajawea State Park for opportunities to learn about native wildlife, geological features and the Confluence Project
- v) Consider more summer fairs and activities and related food vendor opportunities

Long-Term Recommendations:

- vi) Develop the Sacagawea Heritage Trail through park and towards the Columbia Plateau/Ice Harbor Dam trail linkage;













Ainsworth Town

- a) **Ownership:** US Government
- b) **Landscape & Natural Features:** steep slope areas, BNSF R-O-W with trestle bridge; overgrown with mostly non-native vegetation, salt deposits and marsh/swamp areas
- c) **Transportation:** There are no direct public access points to this point. An undeveloped, meandering path extends north from Sacagawea State Park to the site.
- d) **General Land Use Pattern:** Vacant with an undeveloped archaeological site from the former Town of Ainsworth.
- e) **Linkage and Amenities Opportunities:** The Ainsworth Town site could be developed as an historic site. The undeveloped path which winds through the site could easily be developed into an extension of the Sacagawea Trail as it converges with the Columbia Plateau trail along the Snake River.
- f) **Linkage and Amenities Constraints:** Much of the proposed Trail path lies in Railroad right-of-way. Any trail development would be dependent upon vacation of existing rail uses and cooperation of the railroad.

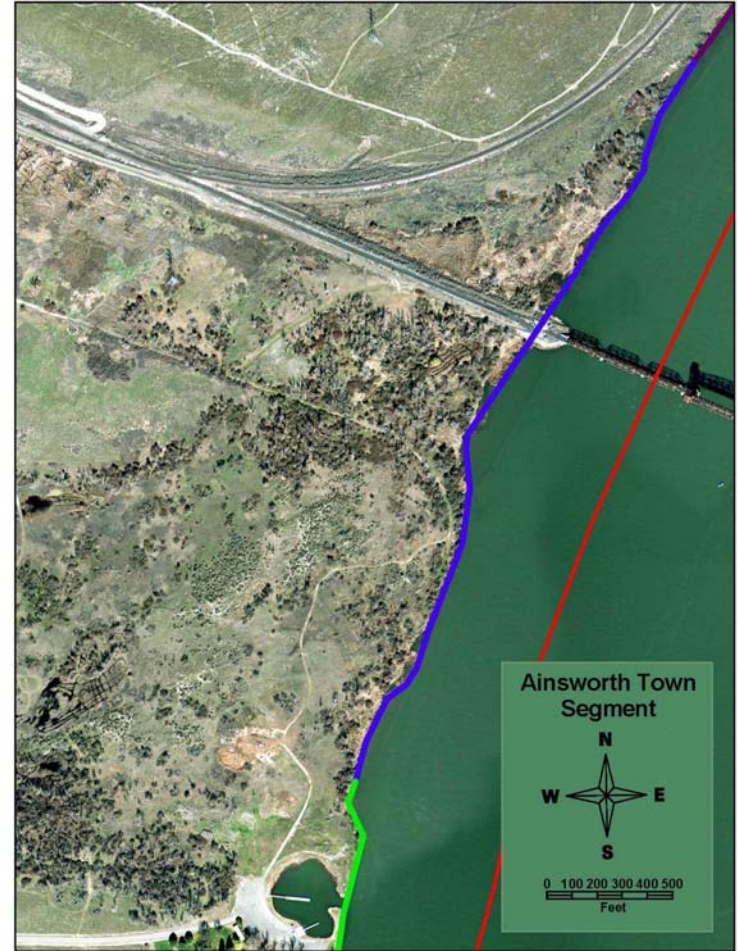
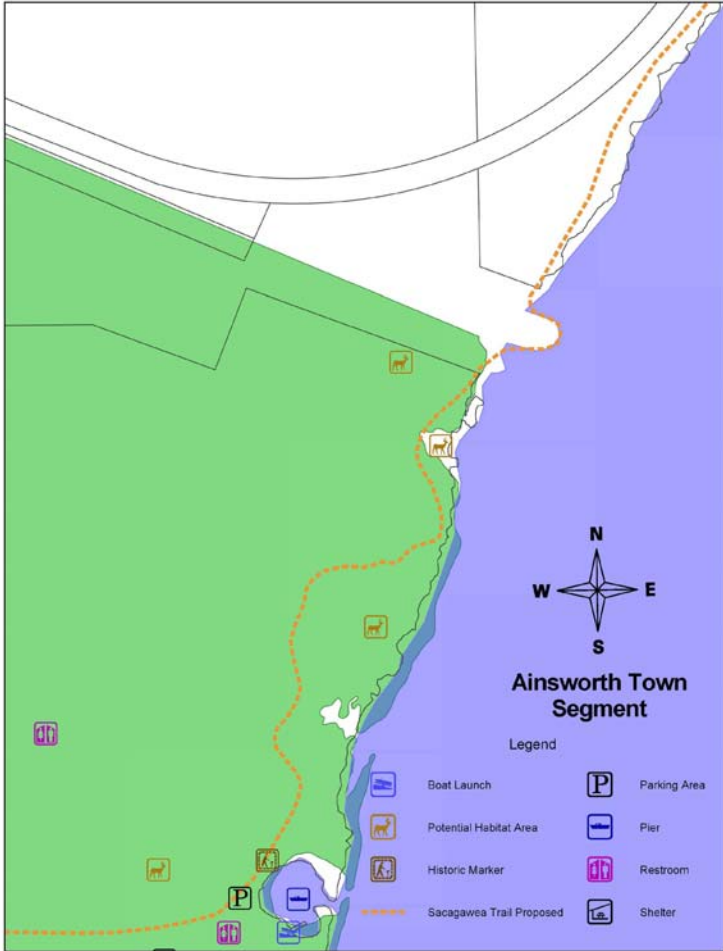
g) RECOMMENDATIONS:

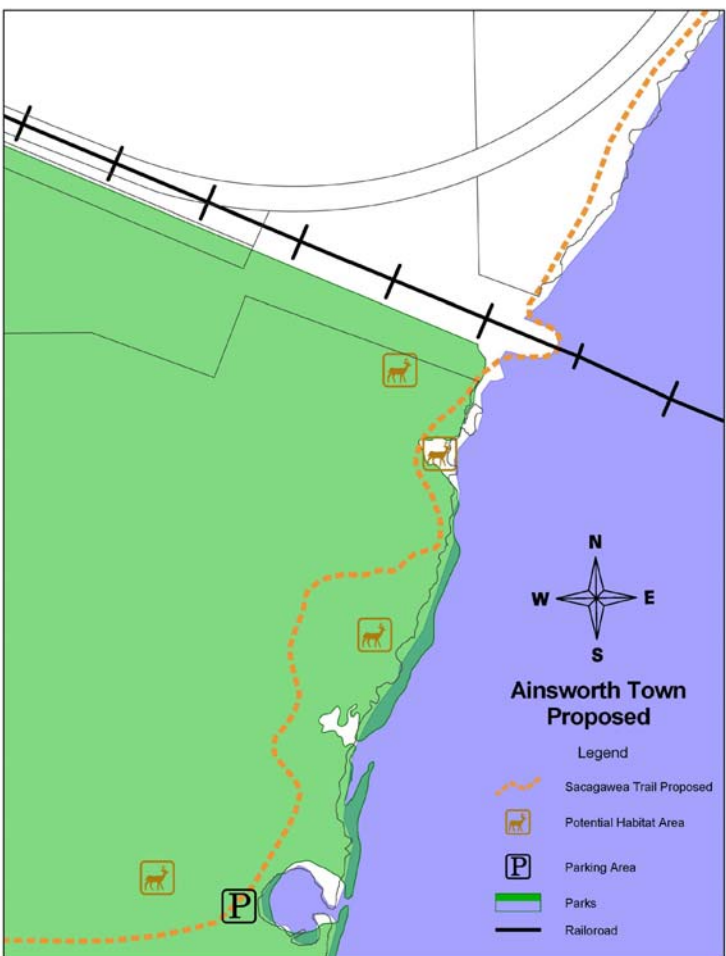
h) Short-Term Recommendations:

- i) Begin conversations with the State Park Service and BNSF Railroad.
- ii) Plan and design a Sacagawea Heritage Trail extension through the Ainsworth Town site.

i) Long-Term Recommendations:

- i) continue Sacagawea path towards Ice Harbor Dam trail linkage;
- ii) place drinking fountains, shade trees, and restroom facilities at strategic points;
- iii) Develop Town of Ainsworth archaeology site
- iv) Consider the possibility of a cantilevered pedestrian bridge built to the side of the BNSF bridge





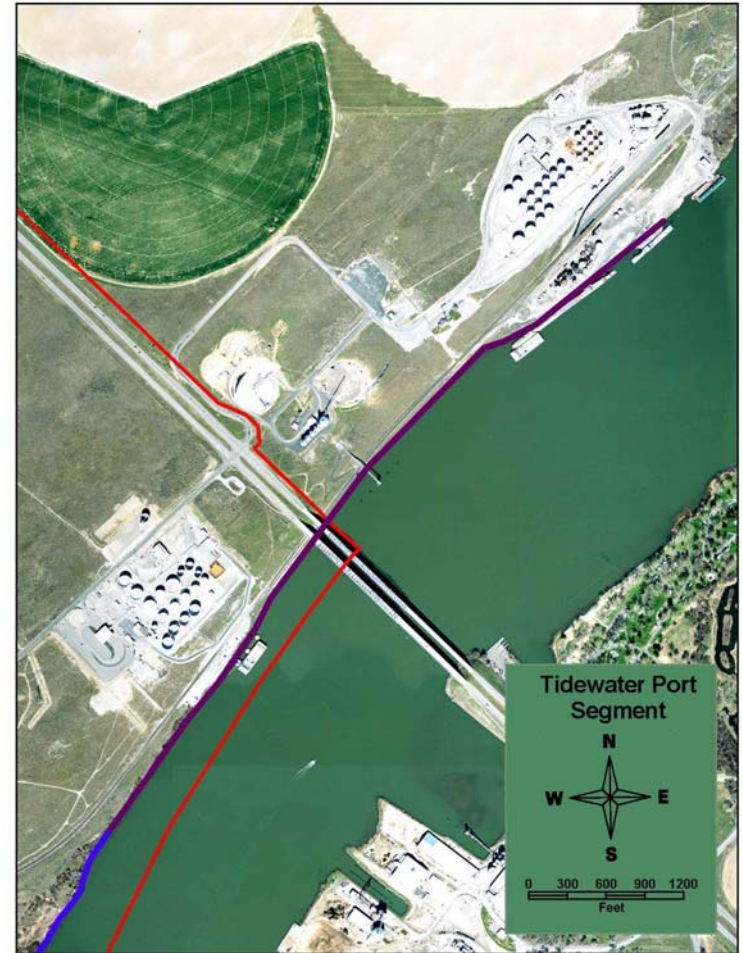
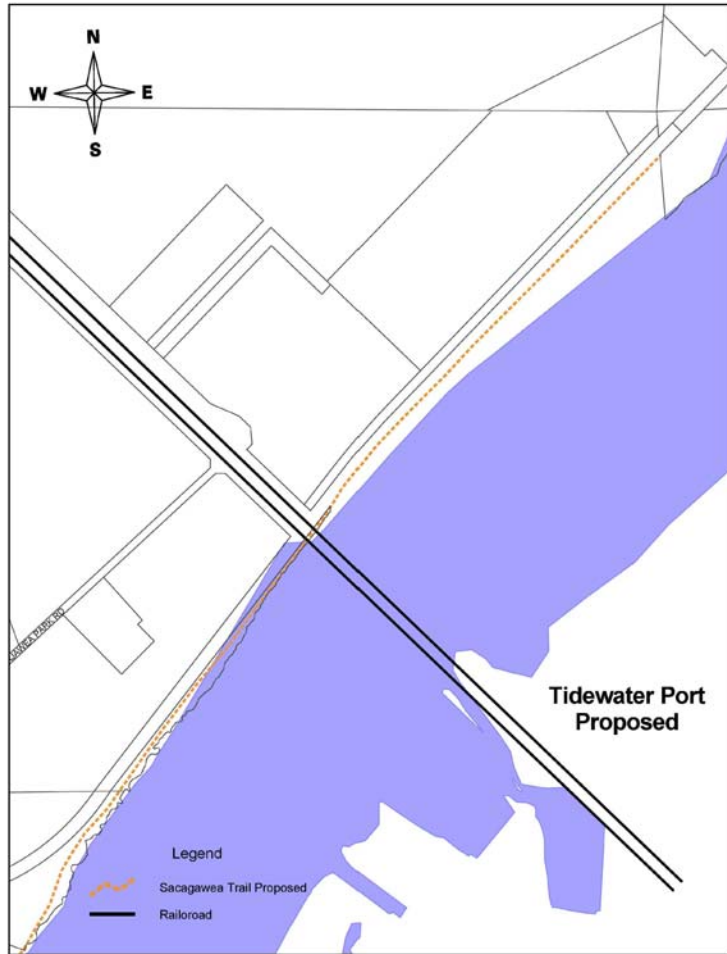
Tidewater Terminal

- a) **Ownership:** BNSF Railway/Tidewater Terminal Company/Washington State Parks and Recreation Commission.
- b) **Landscape & Natural Features:** Steep slope; BNSF R-O-W ; industrial uses; US-12 highway and bridge
- c) **Transportation:** There are no public access points to any portion of this segment. Plans are being considered to connect Sacajawea State Park with the Columbia Plateau Trail (CPT). Currently two existing, off-site fuel tank farms prevent a direct link between CPT and the park. While the Washington State Parks and Recreation Commission owns the former BNSF Railroad ROW just north of the Tidewater terminal, the Southern part of CPT to Ice Harbor has yet to be developed and the trail still has railroad tracks and is used for railcar storage. The Washington State Department of Transportation (WSDOT) is scoping a project to build an interchange over highway 12. The current WSDOT plans include a bridge wide enough to include a bike lane. One potentially identified route would follow Sacajawea Park Road up to the bridge and a route would have to be identified to connect from the bridge to the Southern end of the Trail.
- d) **General Land Use Pattern:** this area is developed with two fuel storage tank facilities, with the balance of the land being vacant.
- e) **Linkage and Amenities Opportunities:** Plans are being considered to connect Sacajawea State Park with the Columbia Plateau Trail (CPT). The Washington State Parks and Recreation Commission owns the former BNSF Railroad ROW just north of the Tidewater terminal. WSDOT is scoping a project to connect Sacajawea Park to the CPT via Sacajawea Park Road up to an interchange over highway 12, including a bridge wide enough to include a bike lane.
- f) **Linkage and Amenities Constraints:** Two off-site fuel tank farms prevent a direct link between the Columbia Plateau Trail and the park. While the Washington State Parks and Recreation Commission owns the former BNSF Railroad ROW just north of the Tidewater terminal, the Southern part of CPT to Ice Harbor has yet to be developed and the trail still has railroad tracks and is used for railcar storage.

g) RECOMMENDATIONS:

Long-Term Recommendations:

- i) Continue the Sacagawea Trail/Columbia Plateau Trail towards the Columbia Plateau/Ice Harbor Dam trail linkage;
- ii) Install drinking fountains, shade trees, and restroom facilities at strategic points;
- iii) Consider the possibility of a cantilevered pedestrian bridge built to the side of the BNSF bridge



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APPENDIX D
AGENCY COMMENT/RESPONSE
SUMMARY TABLE

Agency Comment/Response Summary Table:
Draft Inventory, Analysis, and Characterization Report – March 2014 Draft
City of Pasco SMP Update

No.	Comment Section	Commenter	Page	Comment	Response
1	Map Folio	Angela San Filippo Ecology 5/29/14	Maps 9a&b and 10a&b	It would be helpful to see the subreach breaks on the zoning and land use maps as well. This would help to better understand the decisions on preliminary environment designations.	Reach and subreaches added to Map Folio's land use and zoning map (Maps 9 and 10).
2	Map Folio	Angela San Filippo Ecology 5/29/14	Map 10a and 10b	It is very difficult to differentiate between the two zones: RS-20 and RS-12.	Revised hatching color of RS-20 to help visually differentiate.
3	Map Folio	Angela San Filippo Ecology 5/29/14	Map 4	It would be helpful if [Geologic Hazards] identified on a map.	Added Geologic Hazard Areas to the Map Folio (Map 4 – Surficial Geology).
4	Section 4.1 – Land Cover Types	Angela San Filippo Ecology 5/29/14	Pg. 14, Table 8	Total Acreage Column - Should this number and the Table 9 total (25,763 + 577 = 26,340) add up to the total acreage in Table 6 (28,061)?	No revision necessary – correct as is. Table 8 includes the shoreline numbers summarized in Table 9. New note added to Table 8: <i>1 = Includes shoreline jurisdiction.</i>
5	Section 4.2.1 – Existing Land Use	Angela San Filippo Ecology 5/29/14	Pg. 15	<i>The City is part of the Tri-Cities Metropolitan Area in southeast Washington and includes 25,247 acres in the current incorporated City limits and an additional 5,433 acres within its associated UGA.</i> Based on my reading of this these numbers should reflect the numbers in the preceding tables. Since they don't, where are they coming from? I see, they are coming from Table 10, but I still don't understand why the numbers from the other tables	Data mismatch is explained in new introduction text to Section 4: <i>The summary of acreages provided in the Tables 6 through 12 are meant to illustrate the general distribution of ownership, land cover, and land use types within the City and its shoreline jurisdiction. The acre values are based on a variety of data sources and do not reflect the exact total acreage of land</i>

No.	Comment Section	Commenter	Page	Comment	Response
				aren't consistent with these.	<i>within the City or its shoreline jurisdiction. Data mismatch between the total acreages provided in Tables 6 through 12 are due to the data sources and the lack of zoning designations for UGA areas.</i>
6	Section 4.2.1 – Existing Land Use	Angela San Filippo Ecology 5/29/14	Pg. 16, Table 11	Total Acreage Column - Again, this number is different than the 577 acres of land in shoreline as presented in Table 9. I understand that there are uncertainties and it is difficult to obtain exact acreages but there should be some kind of explanation as to why different numbers are used to seemingly represent the same thing.	See Response to Comment 2.
7	Section 4.2.1 – Existing Land Use	Angela San Filippo Ecology 5/29/14	Pg. 18, Table 12	Total Acreage Column -Same comment with the numbers not being consistent throughout. This explains the difference between Tables 12 and 11 but not between Tables 12, 11, and 9.	See Response to Comment 2.
8	Section 4.7 – Geologic Hazards	Angela San Filippo Ecology 5/29/14	Pg. 25, Table 13	It would be helpful if [Geologic Hazards] identified on a map.	Geologic Hazard areas added to Map Folio, Map 4.
9	Section 5.1.3.2 – Water Quality Conditions in Pasco	Angela San Filippo Ecology 5/29/14	Pg. 35	This [section text] already been covered in the surface water quality section.	Repeated text deleted. Section now references description in Section 4.6.2.
10	Section 5.1.4.2.2 - Aquatic Habitat	Angela San Filippo Ecology 5/29/14	Pg. 42	<i>The aquatic habitat. Many ESA-listed anadromous salmonid species are found within the two rivers, including bull trout, steelhead, sockeye, and spring and fall Chinook salmon.</i> This sentence doesn't make a lot of sense. Delete "This aquatic habitat.." from the previous page or complete that sentence and split this into	Correct language is included in the Microsoft Word version. We will confirm missing language is there when creating a PDF of the final document. <i>The aquatic habitat supports numerous resident and anadromous fish, aquatic invertebrates, and numerous migratory bird</i>

No.	Comment Section	Commenter	Page	Comment	Response
				two different sentences.	<i>species.</i> <i>Many ESA-listed...</i>
11	Section 5.3.4.2, Preliminary ED Considerations	Angela San Filippo Ecology 5/29/14	Pg. 56, Table 17	What about subreaches 5a, 5d, 6a, and 8a?	Table 17 has been revised to include missing subreaches.
12	Section 5.3.4.2, Preliminary ED Considerations	Angela San Filippo Ecology 5/29/14	Pg. 56, Table 17	<p><i>Chiawana, Wade, Riverview, Schlagel, and Sacajawea parks (SR 3a, 5c, and 6b and Reach 7)</i></p> <p>The parks themselves are considered high intensity? This seems counter intuitive, it would help if the map folio showed the subreaches in relation to the parks, existing zoning, and land use. Also the description of subreach 3a in the Reach Characterization appendix indicates this subreach is almost entirely encompasses Chiawana Park.</p>	<p>Subreaches added to Map Folio – Map for Ownership and Public Access, Land Use, and Zoning.</p> <p>Section 5.3.4.2 states: <i>The listing of these areas under the high intensity and other categories should not imply that this is what these areas will be designated in the SMP update process. Developing and applying environment designations in the City will occur with more detailed analysis of the information in this report, input from the City Planning Commission, Ecology, and from the public during the shoreline visioning process and other public forums.</i></p>
13	Section 5.3.4.2, Preliminary ED Considerations	Angela San Filippo Ecology 5/29/14	Pg. 56, Table 17	<ul style="list-style-type: none"> • <i>Consider a special designation area for leveed areas along the Columbia River, where limited ecological function and future development potential exists, and the areas are dedicated for public recreation as part of the regional trail system</i> • <i>Consider a recreation-based designation for the several park areas</i> 	Noted

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				Both great ideas and I highly encourage tailoring the environment designations to fit the City of Pasco's needs and future goals.	
14	Public Access	Stephanie Utter, BOR, 5/30/2014	N/A	The public land on which the CBP infrastructure is situated are not meant for public access due to the hazards and the possibility that there could be people and equipment present maintaining the facilities.	Noted
15	Public Access	Stephanie Utter, BOR, 5/30/2014	N/A	Reclamation has facilities (Pasco Pump Laterals PPL) in Reach 1 that terminate before the Columbia River, and an interest in the U.S. Army Corp of Engineers (USACE) facility that runs parallel to the Columbia River in Reaches 3 and 4. The PPL is a series of constructed facilities used to distribute irrigation water to farmers for agricultural purposes, and the USACE facility collects surplus drainage from agricultural lands in and around the Pasco area. Reclamation has management agreements with several agencies that operate and maintain land in and around shorelines throughout the CBP and Franklin County. Any upgrades to existing features on managed land, water, or facilities would be at the discretion of Reclamation and within Federal laws and regulations. At this time, Reclamation has no concerns with what has been proposed. However, we will continue to monitor the plan for concerns as it progresses through the process.	Noted
16	Shoreline Jurisdiction –	Michael Ritter, WDFW,	N/A	The IAC identifies that 1.2 miles of the Esquatzel Coulee are within the City's jurisdiction, but due to	No revision necessary. Copy of August 2014 Memo provided to Michael Ritter, WDFW.

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	Esquatzel Coulee	6/19/2014		justification provided in the Franklin County IAC and application of current SMP criteria, it should be removed as a shoreline of statewide significance for the current City of Pasco SMP update. It would be useful if this 1.2 mile section of the Esquatzel Coulee were shown on a map to better understand its relationship to development to either support the IAC that is should be deleted from the current SMP update or continued to be included as important shoreline habitat within the City of Pasco.	