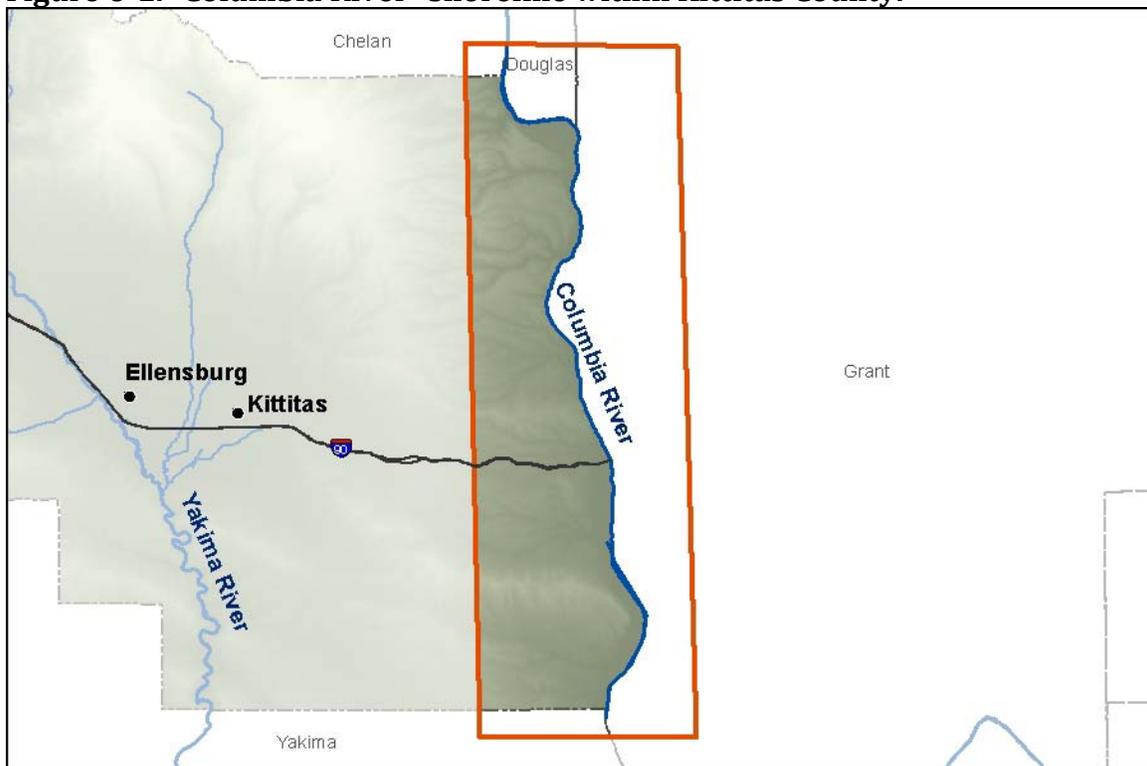


CHAPTER 6. COLUMBIA RIVER

This chapter describes the conditions within the shoreline inventory area of the portion of the Columbia River that lies within Kittitas County (Figure 6-1). These Columbia River reaches are described in terms of their physical characteristics, ecological conditions, and human environment/land use characteristics. Readers are encouraged to review Chapter 2 and the maps in Appendix A for additional context on the information presented here.

Figure 6-1. “Columbia River” shoreline within Kittitas County.



Characteristics for the three Columbia River reaches within the County are summarized on “reach sheets” included in this chapter. The information on the reach sheet is based upon available county-wide data sources that describe key physical, ecological, and land use characteristics. Appendix B describes the available data sources, including data limitations.

6.1 Columbia River

The headwaters of the Columbia River are located in the Rocky Mountains of British Columbia. The river flows, via a relatively steep gradient, approximately 1,243 miles to the Pacific Ocean at Astoria, Washington, after passing through 14 hydroelectric dams located on the mainstem. The Columbia River forms the eastern border of Kittitas County, flowing in a north to south direction from approximately river mile (RM) 448 to RM 405, a distance of approximately 43 miles. The river is designated as a “shoreline of statewide significance” because its mean annual flow exceeds 200 cubic feet per second.

For this analysis, the portion of the Columbia River that borders Kittitas County was divided into 3 reaches: Reach 1 (11.0 miles) extends from the southern County border to Wanapum Dam, Reach 2 extends from the Wanapum Dam to 8.9 miles upstream, and Reach 3 (22.9 miles) extends from 8.9 miles upstream of the Wanapum Dam to the northern County border.

6.1.1 Physical Characterization

The Priest Rapids Project on the Columbia River is owned and operated by Public Utility District No. 2 of Grant County (Grant PUD). The Priest Rapids Project includes two hydroelectric developments, Wanapum and Priest Rapids Dams. Wanapum Dam is located at RM 415 in Kittitas County, while Priest Rapids Dam is downstream. Wanapum Dam is 8,637 feet long and 187 feet high and is capable of generating over 4 million megawatt-hours per year. Wanapum Reservoir extends 38 miles upstream to the tailwater of Rock Island Dam. The reservoir impounds 693,600 acre-feet of water during normal maximum elevation (Grant PUD 2010a; Grant PUD 2011; Ecology Order No. 4219; FERC 2006).

Wanapum Dam began power generation in 1963. The Federal Energy Regulatory Commission (FERC) issued a new license for the Priest Rapids Project (including both dams) in 2008. The license will be valid until 2052. As part of the relicensing requirements, Grant PUD is required to prepare more than 50 management plans that document how the dam will be upgraded and operated while protecting natural, cultural, and recreational resources. Table 7-1 lists the major management plans and their status as of fall 2011. Many of the plans require ongoing monitoring and preparation of annual reports.

Table 6-1. Summary of Management Plans for Priest Rapids Project FERC Relicensing

Management Plan	Status (October 2011)
Aquatic Invasive Species Control & Prevention Plan	Approved by FERC in 2010.
Artificial Propagation Plans/Hatchery and Genetic Management Plans	Coho and Okanogan summer Chinook plans approved by FERC in 2011; other plans pending approval.
Avian Predation Control Plan	Approved by FERC in 2008.
Bald Eagle Perch/Roosting Protection	Approved by FERC in 2010.
Bull Trout Hydrologic Water Quality Study Plan	Approved by FERC in 2010.
Bull Trout Monitoring & Evaluation Plan	Approved by FERC in 2009.
Downstream Passage Alternatives Action Plan	Approved by FERC in 2009
Fish Ladder Water Supply Monitoring Study Plan	Approved by FERC in 2010.
Fisheries and Aquatic Resource Habitat Plan	Over \$17 million contributed toward projects to restore habitat for federally listed and non-listed anadromous fish in drainages affected by the Priest Rapids Project.
Gas Abatement Plan	Approved by FERC in 2011.
Hanford Reach Follow-up Monitoring Program Plan	FERC approval pending.
Hanford Reach Study Plan	Approved by FERC in 2011.
Implementation Feasibility Study Plan	FERC approval pending.
Memorandum of Agreement between Grant PUD and Wanapum Indians	Pending.

Management Plan	Status (October 2011)
Native Resident Fish Management Plan	Approved by FERC in 2009.
Northern Pikeminnow Removal Program	Approved by FERC in 2008.
Northern Wormwood Conservation	Approved by FERC in 2010.
Pacific Lamprey Management Plan	
Pollution and Erosion Control Plan	Approved by FERC in 2011.
Priest Rapids Dam Bypass Facility Total Dissolved Gas Study Plan	FERC approval pending.
Priest Rapids Fish Bypass	Fish bypass at Priest Rapids Dam to be completed by 2014.
Programmatic Agreement/Historic Properties Management Plan	Archaeological surveys and determinations of eligibility underway.
Quality Assurance Project Plans	Approved by FERC in 2009.
Rare, Threatened & Endangered Plant Monitoring	Baseline survey completed in 2011.
Recreation Resource Management Plan	FERC License approved 23 specific recreation projects. Amendment to plan submitted to FERC in 2010.
Shoreline Management Plan	FERC released environmental assessment in 2011.
Short-term monitoring in shallow Reservoir Habitat Plan	Approved by FERC in 2010.
Transmission Line Avian Collision Protection Plan	Measures to be installed at Wanapum in 2013 and 2014.
Wanapum Dam Turbine Installation Total Dissolved Gas Study Plan	FERC approval pending.
Wanapum Future Unit #11 Total Dissolved Gas Study Plan	FERC approval pending.

Management Plan	Status (October 2011)
Wanapum Interim Spill Regime Evaluation Plan	Approved by FERC in 2009.
White Sturgeon Management Plan	Approved by FERC in 2009.
Wildlife Habitat Management Plan	
Wildlife Habitat Monitoring & Information & Education	Approved by FERC in 2010.

Source: Grant PUD 2011b.

The Wanapum Reservoir has a lake-like or lacustrine component and a river-like or riverine component. The riverine section extends from about RM 434 to Rock Island Dam at RM 453. Water levels in the riverine section are dependent on flow and there is a prominent current. Water surface gradients of 10 to 15 feet may occur between the upper and lower reaches of the riverine section at high river flows (greater than 500,000 cfs). The lacustrine section extends downstream of the riverine section to Wanapum Dam. This area has a relatively flat water surface during most flow conditions (FERC 2006).

The town of Vantage and the I-90 crossing of the Columbia River are located on Wanapum Reservoir. The west side bridge abutment of Interstate-90 (I-90) extends from the shoreline to approximately the midpoint of the river, at which point the roadway transitions from being supported by fill material to bridge piers. The John Wayne Heritage Trail bridge is an abandoned railroad trestle supported by piers. In addition to the I-90 and trail bridges that span the river, a small bridge located parallel to the river crosses a shoreline inlet that is associated with the Gingko Petrified Forest State Park campground/boat launch at about RM 416. This bridge is a short expanse, approximately 100 feet long, but is supported by relatively long abutment fills (the north abutment is about 510 feet long; the south abutment is roughly 275 feet long).

Steep slopes are mapped at many locations along the western shoreline of the Columbia River, primarily between the mouth of Tekison Creek (RM 437) and Vantage (RM 421), and in the vicinity of Wanapum Dam (RM 415). The FEMA 100-year floodplain is mapped sporadically along much of the three Columbia River reaches. While the floodplain covers much of the reach inventory area lengths, it primarily occupies a small portion of this area. The shoreline south of the I-90 crossing exhibits the greatest extent of floodplain coverage (FEMA 1996). Only the upstream extent of the reach (at the Douglas and Grant County boundaries) has potential for channel migration (Ecology 2011).

No major tributaries empty to the river from the western shoreline; however, many smaller streams drain to the river.

Climatic conditions in the vicinity of this portion of the river, which are typically warm and dry, dictate vegetation communities adapted to desert-like conditions (e.g., sagebrush). Columbia River riparian conditions support more temperate tree and shrub vegetation communities along this stretch of the river, particularly at the mouths of the many small tributaries to the river.

6.1.2 Habitats and Species

6.1.2.1 Fish Use

The Columbia River in the vicinity of Kittitas County supports several native fish species, including bull trout; rainbow trout; cutthroat trout; spring, summer, and fall Chinook; summer steelhead; coho salmon; sockeye salmon; kokanee salmon; Pacific lamprey; mountain and lake whitefish; white sturgeon; and others such as sculpin, suckers, and dace. Three of these species are listed under the federal Endangered Species Act: bull trout (threatened), upper Columbia River spring Chinook (endangered), and upper Columbia River summer steelhead (endangered); others have special status at the state level (see Table 2-14 in Chapter 2). Only fall Chinook salmon are known to both spawn and rear within the Priest Rapids Project area, while the other salmon species migrate through the area (StreamNet 2010, FERC 2006).

Columbia River Summer Chinook, fall Chinook, and sockeye populations are relatively stable. Coho salmon were historically present, but the endemic stock was extirpated by the 1940s. Coho have been reintroduced through hatchery programs (Ecology Order No. 4219, FERC 2006).

In 2010, 14 bull trout were observed passing the fish ladder count stations at Priest Rapids and Wanapum Dams between April 15 and November 15 (Grant PUD 2011c).

This part of the river also supports numerous nonnative fish species, including American shad, largemouth and smallmouth bass, black bullhead, northern pikeminnow, black and white crappie, pumpkinseed, bluegill, brown trout, tench, channel catfish, walleye, common carp, and yellow perch, and others. American shad are currently restricted to the Columbia River below Priest Rapids Dam (Grant PUD 2010b; StreamNet 2010, FERC 2006).

Hydroelectric projects on the Columbia River have had major impacts on salmonid species. As required by the FERC license for the Priest Rapids Project, as well as the

401 Water Quality Certification and Endangered Species Act Biological Opinion, Grant PUD is undertaking numerous measures to protect fish and water quality. Major programs include the following:

- Construction and operation of juvenile fish bypasses at Wanapum Dam (completed in 2008) and Priest Rapids Dam;
- Installation and testing of advanced turbines and alternative spill measures;
- Control of northern pikeminnow and bird species that prey on juvenile fish;
- Measures to reduce total dissolved gas, which can injure fish;
- Prevention and control of aquatic invasive species; and
- A hatchery supplementation program for white sturgeon;
- A habitat management plan for Pacific lamprey.

Two organizations, the Priest Rapids Coordinating Committee and the Priest Rapids Fish Forum, are working with Grant PUD to achieve fish passage performance standards and meet state and federal requirements for the Priest Rapids Project. A fish bypass was completed at Wanapum Dam in 2008. In addition, turbines used to generate hydroelectric power are operated in specific modes to protect fish during the juvenile salmonid out-migration season (typically April through August) (Grant PUD 2010a).

Hydroelectric power facilities in the Columbia River basin have had negative impacts on white sturgeon. White sturgeon populations in the middle and upper Columbia River now reside in reservoirs between dams. These populations are subject to river regulation, flooding of historical critical spawning and rearing habitats, increases in predators due to habitat alteration, introduction of exotic species, and pollution. (Grant PUD 2009)

Grant PUD has performed surveys for white sturgeon in the Priest Rapids Project area. Resident white sturgeon populations are present in both Wanapum and Priest Rapids Reservoirs. Between 2000 and 2002, white sturgeon spawning was documented in the tailrace areas of Wanapum Dam (upper boundary of the Priest Rapids reservoir) and Rock Island Dam (upper boundary of Wanapum reservoir) (Grant PUD 2009).

As part of its FERC license for the Priest Rapids Project, Grant PUD is required to develop and implement a White Sturgeon Management Plan in consultation with the Priest Rapids Fish Forum. The plan includes a regional hatchery supplementation

program for the middle Columbia River. White sturgeon brood stock holding, gamete collection, fertilization, egg incubation, and juvenile rearing is expected to occur at the Yakama Nation's Marion Drain Facility (Priest Rapids Fish Forum 2011).

Pacific lamprey populations in the Columbia River basin have declined over the past four decades (FERC 2006). Mainstem passage is an urgent problem for lamprey in the basin. The *Tribal Pacific Lamprey Restoration Plan for the Columbia River Basin* (CRITFC 2011) includes several objectives and actions for Pacific lamprey, including Mainstem Passage and Habitat, Tributary Passage and Habitat, Supplementation/Augmentation, Contaminants and Water Quality, Public Outreach and Education, and Research, Monitoring and Evaluation.

Studies have suggested that predation by northern pikeminnow might account for most of the 10 to 20 percent mortality of juvenile salmonids in the Columbia River and Snake River reservoirs. Efforts to control northern pikeminnow in the Columbia River basin have been underway for over two decades. The basinwide pikeminnow control program is coordinated by the Pacific States Marine Fisheries Commission, Oregon Department of Fish and Wildlife, and Washington Department of Fish and Wildlife. One aspect of the program is providing a bounty to anglers for catching northern pikeminnow. In 2011, anglers harvested over 155,000 northern pikeminnow through the program (Porter 2011).

6.1.2.2 Water Quality

Priest Rapids Lake and Wanapum Lake are on Ecology's 303(d) list for water temperature. In 1991, EPA published a TMDL for dioxin in the Columbia River. Chlorine bleaching pulp mills are the major source of dioxin; because several of these mills are located between the river mouth and the Canadian border, they have the potential to affect water quality in the entire river. Other sources of dioxin are thought to include wood treating industries that use pentachlorophenol, wastewater treatment plants, agriculture, industry, urban areas, and release from bottom sediments (EPA 1991).

The EPA and Ecology established a TMDL for total dissolved gas (TDG) in the mainstem of the Columbia River, from the Canadian border to the confluence of the Snake River. Water spilling from dams can elevate TDG levels, causing injury to fish (Pickett et al. 2004). Examples of measures being taken to reduce TDG at the Priest Rapids project include construction of spillway deflectors at Wanapum Dam (completed in 2000), construction of the Wanapum fish bypass (completed in 2008), construction of the Priest Rapids fish bypass (to be completed by 2016), and installation of new turbines at Wanapum Dam (scheduled for completion in 2012).

Grant PUD will also conduct biological monitoring for gas bubble trauma in fish (Ecology Order No. 4219; Keeler 2011a, 2011b).

Two species of aquatic invasive vegetation are currently known to occur within the Priest Rapids Project area: Eurasian watermilfoil and curly-leaf pondweed. When invasive aquatic plants form dense infestations, they can degrade aquatic habitat as well as interfering with recreation. The aquatic invasive species management plan for the Priest Rapids Project includes education, monitoring, and response elements to reduce the potential for new invasive species to be introduced into the area. Grant PUD is monitoring not only for invasive plants in aquatic and shoreline areas, but also for zebra/quagga mussels and New Zealand mudsnails (Grant PUD 2010b).

In 2004, the EPA analyzed sediment samples taken from Wanapum Dam downstream to McNary Dam (just downstream of the Kittitas County boundary). While the study did not identify any obvious hot spots or sinks for sediment contaminants, it did find cadmium and zinc at elevated concentrations relative to other areas within the basin. Several pesticides were also identified (generally at low levels). EPA states that the detection of the pesticides Ethyl chlorpyrifos and Malathion in a few of the samples "raises a concern about the potential impacts of currently used agricultural chemicals on the health of the Columbia Basin aquatic ecosystem." EPA also recommended additional investigation of polybrominated diphenyl ethers (PBDEs), which were found in over half of the samples. PBDEs are chemical flame retardants that are persistent, bioaccumulative, and toxic to humans and the environment (Watson et al. 2008; EPA 2012).

6.1.2.3 Riparian Habitat Conditions (Land Cover)

This portion of the Columbia River flows through a vast canyon of steep basalt cliffs where riparian vegetation is sparse. Tree and shrub cover is concentrated near stream mouths and in a few developed areas such as Vantage and the agricultural area south of the bridge crossing near Beverly. Based on GAP mapping data, less than 10 percent of the river's shoreline inventory area is forested and less than 10 percent is shrubland.

6.1.2.4 Wetlands

A very small portion of the shoreline inventory area is mapped as freshwater emergent wetland. West Bar, near the northern edge of Kittitas County, contains a shallow, semi-permanently flooded emergent wetland known as West Bar Slough (FERC 2006).

6.1.2.5 Wildlife Habitats and Species

The Columbia River shoreline inventory area provides habitat for bighorn sheep, Rocky Mountain elk, and mule deer. The river supports common loon and waterfowl concentrations. Other common bird species in the area include mergansers, geese, cormorants, great blue heron, chukar, California quail, red-tailed hawks, golden eagles, and great horned owls (FERC 2006).

West Bar, near the northern edge of Kittitas County, contains an extensive area of sand shrub-steppe habitat fringed by high cliffs (FERC 2006).

Approximately half of the shoreline inventory area along the Columbia River is mapped as shrub-steppe habitat (USGS 1993). Shrub-steppe habitat is dominated by perennial bunchgrasses and shrubs such as sagebrush (WDFW 2008). Kittitas County has several types of shrub-steppe communities with different combinations of plant species, as described in Section 2.3.2 in Chapter 2.

Shrub-steppe habitat supports numerous unique plant and wildlife species (Azerrad et al. 2011). For example, WDFW has mapped long-billed curlew, a bird species associated with shrub-steppe, near the Columbia River. The plant species Columbia milk vetch, Hoover's desert parsley, and Wormskiold's northern wormwood are shrub-steppe species also mapped near the river by the Washington Natural Heritage Program. While it was historically a common type of vegetation community in eastern Washington, shrub-steppe habitat has been largely converted to agriculture and is considered a priority habitat by WDFW (see Section 2.6.3.1).

6.1.3 Land Use

Limited development is associated with the western shoreline of the Columbia River within Kittitas County. The downstream end of the river shoreline is undeveloped and located within the Yakima Training Center (Department of Defense). Just to the north, across from the town of Beverly, the west bank of the river is used for agriculture. In addition, the John Wayne Heritage Trail crosses the river in this area.

From approximately 2.5 miles north of Wanapum Dam to the Vantage Airport near I-90, the river is bordered by generally undeveloped land zoned for forest and range, with the exception of Wanapum State Park and Getty's Cove (a day-use recreation area co-managed by Grant County PUD and Washington State Parks). Huntzinger Road directly parallels the shoreline between Wanapum Dam and Wanapum State Park.

The community of Vantage is located north of I-90, and Gingko Petrified Forest State Park is located north of Vantage. North (upstream) of Gingko State Park to the

County boundary, the west bank of the river is generally undeveloped and lies within a “checkerboard” of public (primarily WDFW) and private lands. This area is zoned for agriculture and forest and range.

6.1.4 Public Access

Two mapped boat launches are located on Columbia River Reach 2. The Vantage boat launch provides river access at Boat Ramp Road adjacent to the I-90 crossing of the river, and the Wanapum Recreation Area boat launch, located approximately 2.5 miles downstream of the Vantage boat launch, also provides river access to the public. North of the Vantage boat launch and located in the Ginko Petrified Forest State Park, Recreation Drive provides access to the river. In addition, there are a number of unimproved roads that provide access to Yakima River Reach 3 and the upstream extent of Yakima River Reach 2. Huntzinger Road parallels the downstream portion of Reach 2 and Getty’s Cover Road, and associated boat launch, is also located here. The John Wayne Heritage Trail crosses the Columbia River across from the town of Beverly.

6.1.5 Reach Sheets

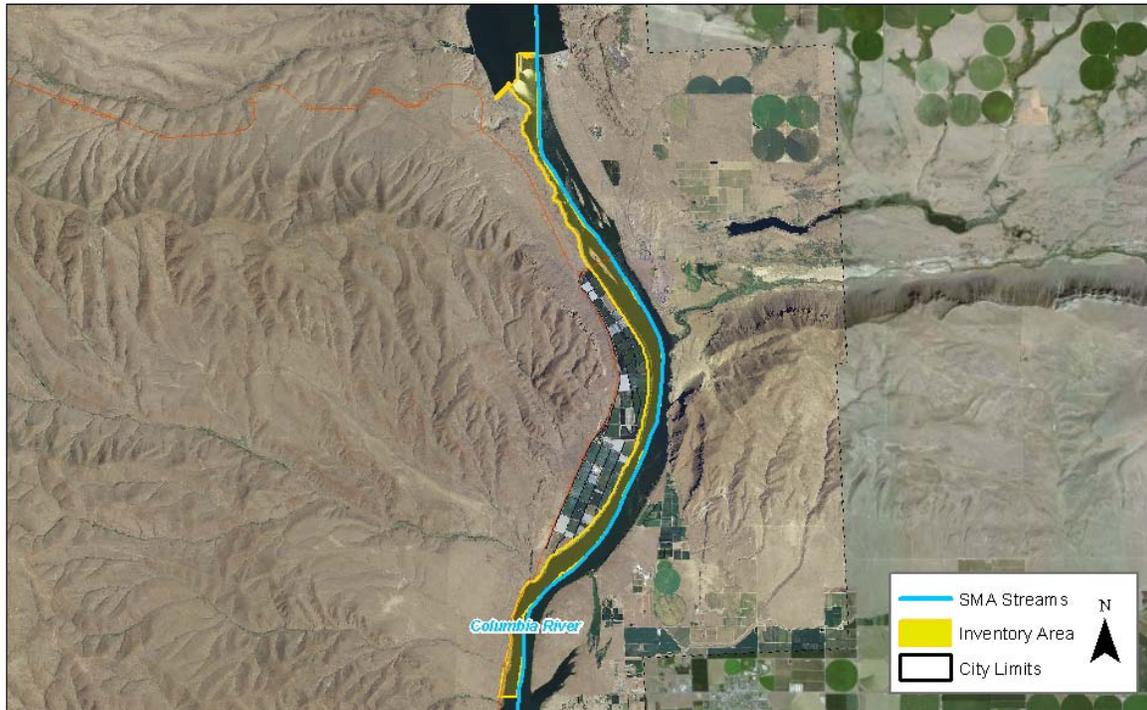
COLUMBIA RIVER-REACH 1

SHORELINE LENGTH:

11.0 Miles

REACH INVENTORY AREA:

1,625.9 Acres



PHYSICAL AND ECOLOGICAL FEATURES

CHANNEL CONFIGURATION

The single channel is located in a canyon with moderate to steep topographic relief. Wanapum Dam is located at the upstream end of the reach and the John Wayne Heritage Trail crosses the river further downstream. An agricultural area is located on a right bank floodplain terrace downstream of the trail crossing.

LAND COVER (MAP FOLIO #3)

The majority of this reach contains open water (72%); other land cover types include: shrubland (8%), forest (6%), other (6%), agricultural lands (4%), and developed lands (3%).

HAZARD AREAS (MAP FOLIO #2)

A limited area of the reach (20%) is located within the FEMA 100-year floodplain. No landslide hazard areas are mapped within the reach.

HABITATS AND SPECIES (MAP FOLIO #1)

WDFW maps the presence of the following fish species in the reach: brown trout, coho salmon, bull trout, fall Chinook, largemouth bass, mountain whitefish, rainbow trout, smallmouth bass, sockeye salmon, spring Chinook, summer steelhead, walleye, and white sturgeon.

WATER QUALITY

The reach is listed on the State’s Water Quality Assessment list of 303 (d) Category 5 waters for 4,4'-DDD, 4,4'-DDE, PCB, pH, and temperature. A TMDL has been implemented for total dissolved gas in this reach.

No wetland habitat is mapped in the reach. Priority common loon, long-billed curlew, and waterfowl concentrations are located along the downstream portion of the reach, in addition to mule deer.

BUILT ENVIRONMENT AND LAND USE

<p>SHORELINE MODIFICATIONS (MAP FOLIO #1)</p> <p>The Wanapum Dam is located at the upstream end of the reach, and the John Wayne Heritage Trail bridge is located mid-reach.</p>	<p>PUBLIC ACCESS (MAP FOLIO #4)</p> <p>The John Wayne Heritage Trail crosses the Columbia River across from the town of Beverly. The Huntzinger Boat Launch is located below the dam.</p>
<p>EXISTING LAND USES AND OWNERSHIP (MAP FOLIO #4)</p> <p>Land use along the reach is primarily rural (61%) to the east and agriculture (39%) to the west. Land ownership is 89% private and 11% public (BL M).</p>	<p>CONTAMINATED SITES</p> <p>No identified contaminated sites are located within this reach.</p>
<p>ZONING (MAP #5)</p> <p>Lands within the reach are zoned for forest & range (58%) to the north and south and agriculture (42%) mid-reach.</p>	<p>CULTURAL AND ARCHAEOLOGICAL RESOURCES</p> <p>There are a total of 25 recorded precontact sites, 6 recorded historic sites, and 9 recorded sites that feature both precontact and historic components located within the reach. Several of the precontact sites are among the oldest recorded sites in the county and include rockshelters, burials, and petroglyphs.</p>

SHORELINE FUNCTION ANALYSIS

<p>FISH HABITAT QUALITY</p> <p>Medium: The reach provides habitat for a variety of priority fish species, but the river has several water quality impairments and is highly influenced by dam operations.</p>	<p>TERRESTRIAL HABITAT QUALITY</p> <p>Medium: The reach is connected to significant areas of undisturbed habitat, but a large portion of the shoreline is in agricultural production.</p>
<p>VEGETATION FUNCTIONS</p> <p>Low: Much of the shoreline is in agricultural production, and dense vegetation is generally absent from the shoreline.</p>	<p>HYDROLOGIC FUNCTIONS</p> <p>Medium: The reach but provides important hyporheic flow functions, but is highly influenced by dam operations</p>

KEY MANAGEMENT ISSUES AND OPPORTUNITIES

- There are many important archaeological resources located within the reach.
- Encourage use of agricultural best management practices to reduce erosion and transport of legacy pesticides.
- Project the high-quality wildlife habitat within the reach.
- The Wanapum Dam significantly alters the hydrology and fish habitat quality of the reach. Grant PUD is undertaking numerous management plans and studies to address fish, wildlife, and water quality issues related to management of the dam.

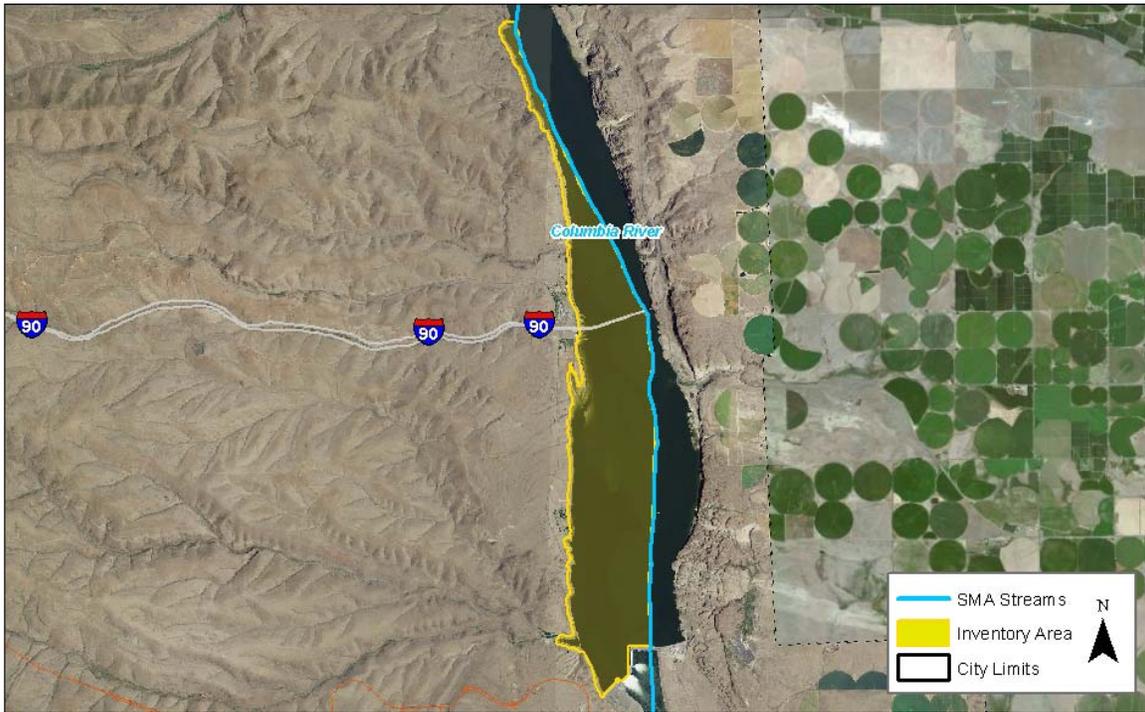
COLUMBIA RIVER-REACH 2

SHORELINE LENGTH:

8.9 Miles

REACH INVENTORY AREA:

4,228.0 Acres



PHYSICAL AND ECOLOGICAL FEATURES

CHANNEL CONFIGURATION

The single channel is located in a canyon with moderate to steep topographic relief. I-90 crosses the approximate mid-point of the reach and is supported by fill for roughly half of the crossing. Wanapum Dam forms the downstream extent of the reach.

LAND COVER (MAP FOLIO #3)

This reach contains primarily open water (92%). A number of other land cover types are also present, including: shrubland (3%), other (1%), agricultural lands (1%), forest (1%), developed lands (1%), and unvegetated lands (1%).

HAZARD AREAS (MAP FOLIO #2)

Less than half the reach area (41%) is located within the FEMA 100-year floodplain. No landslide hazard areas are mapped within the reach.

HABITATS AND SPECIES (MAP FOLIO #1)

WDFW maps known juvenile rearing habitat for summer steelhead in the reach. The presence of the following fish species is also mapped: coho salmon, bull trout, fall Chinook, Kokanee salmon, largemouth bass, mountain whitefish, rainbow trout, smallmouth bass, sockeye salmon, spring Chinook, summer steelhead, walleye, and white sturgeon.

WATER QUALITY

The reach is listed on the State's Water Quality Assessment list of 303 (d) Category 5 waters for temperature. A TMDL has been implemented for total dissolved gas in this reach.

Very limited wetland habitat is mapped along the river (2% of the reach). Priority mule deer winter range, bighorn sheep, elk winter range, and cliffs/bluffs are mapped along the reach; common loon and waterfowl concentrations are also mapped within the reach.

BUILT ENVIRONMENT AND LAND USE

SHORELINE MODIFICATIONS (MAP FOLIO #1)

The Wanapum Dam is located at the downstream end of the reach, and I-90 crosses the river mid-reach.

PUBLIC ACCESS (MAP FOLIO #4)

The Vantage boat launch provides river access at Boat Ramp Road adjacent to the I-90 crossing of the river, and the Wanapum Recreation Area boat launch, located approximately 2.5 miles downstream of the Vantage boat launch. North of the Vantage boat launch and located in the Ginko Petrified Forest State Park, Recreation Drive provides access to the river. In addition, there are a number of unimproved roads that provide access to the upstream extent of Yakima River Reach 2. Huntzinger Road parallels the downstream portion of Reach 2 and Getty's Cove Road, and associated boat launch, is also located here. There is also a fishing pier located above the dam.

EXISTING LAND USES AND OWNERSHIP (MAP FOLIO #4)

Land use along the reach is primarily rural (92%), with agricultural land (1%) at the upstream end and other (7%) [Vantage] near I-90. Land ownership is 63% private and 37% public (BLM, WDFW, and State Parks).

CONTAMINATED SITES

No identified contaminated sites are located within this reach.

ZONING (MAP #5)

Lands within the reach are zoned primarily for forest & range (82%), with areas of agriculture (1%), commercial (1%) urban/suburban residential (4%) and other (12%) [Vantage] zoning.

CULTURAL AND ARCHAEOLOGICAL RESOURCES

A total of 39 recorded precontact sites, 2 recorded historic sites, and 1 recorded site that features both precontact and historic features are located within the reach. Several recorded precontact sites include rockshelters, burials, and petroglyphs.

SHORELINE FUNCTION ANALYSIS

FISH HABITAT QUALITY

Medium: The reach provides habitat for a variety of priority fish species, but the river has several water quality impairments and is highly influenced by dam operations.

TERRESTRIAL HABITAT QUALITY

Medium: The reach is connected to significant areas of undisturbed habitat, and the majority of the reach is unaltered.

VEGETATION FUNCTIONS

Low: Most of the shoreline is unaltered, but vegetation coverage is naturally sparse.

HYDROLOGIC FUNCTIONS

Medium: The reach but provides important hyporheic flow functions, but is highly influenced by dam operations

KEY MANAGEMENT ISSUES AND OPPORTUNITIES

- There are many important archaeological resources located within the reach.
- The Wanapum Dam significantly alters the hydrology and fish habitat quality of the reach (see Reach 1).
- Manage recreational activity to reduce impacts on vegetation and subsequent erosion.
- Protect the high-quality wildlife and shrub-steppe habitat within the reach.
- Preventing and controlling invasive species infestations is a key management issue at boat launches.

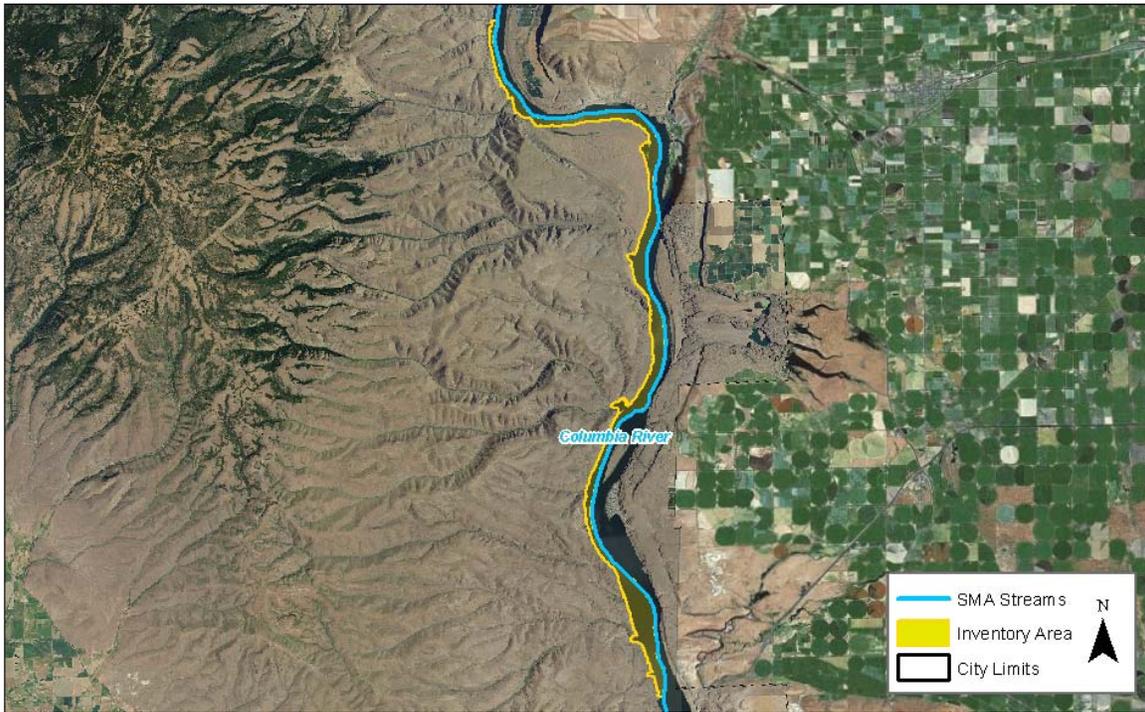
COLUMBIA RIVER-REACH 3

SHORELINE LENGTH:

22.9 Miles

REACH INVENTORY AREA:

3,723.0 Acres



PHYSICAL AND ECOLOGICAL FEATURES

CHANNEL CONFIGURATION

The single channel is located in a canyon with moderate to steep topographic relief. Two, wide floodplain terraces are located on the right bank of the river.

LAND COVER (MAP FOLIO #3)

This reach contains significant open water cover (84%). A number of other land cover types are also present, including: shrubland (6%), other (5%), unvegetated lands (3%), forest (1%), and grassland (1%).

HAZARD AREAS (MAP FOLIO #2)

25 percent of the reach area is located within the FEMA 100-year floodplain. No landslide hazard areas are mapped within the reach. Only the upstream extent of the reach (at the Douglas and Grant County boundaries) has potential for channel migration.

HABITATS AND SPECIES (MAP FOLIO #1)

WDFW maps record known spawning and known juvenile rearing habitat for summer steelhead. The presence of the following fish species is also mapped: coho salmon, bull trout, fall Chinook, Kokanee salmon, largemouth bass, mountain whitefish, rainbow trout, smallmouth bass, sockeye salmon, spring Chinook, summer steelhead, walleye, and white sturgeon. Very limited wetland habitat is mapped along the river (1% of the reach). Priority mule deer winter range, bighorn sheep, elk winter range, and cliffs/bluffs are mapped along the reach; common loon and waterfowl concentrations are also mapped within the reach.

WATER QUALITY

The reach is listed on the State's Water Quality Assessment list of 303 (d) Category 5 waters for temperature.

BUILT ENVIRONMENT AND LAND USE

<p>SHORELINE MODIFICATIONS (MAP FOLIO #1) No shoreline modifications are mapped within the reach.</p>	<p>PUBLIC ACCESS (MAP FOLIO #4) There are a number of unimproved roads that provide access to Yakima River Reach 3.</p>
<p>EXISTING LAND USES AND OWNERSHIP (MAP FOLIO #4) Land use along the reach is primarily agriculture (75%), with rural land (27%) at the upstream and downstream ends. Land ownership is 31% private and 69% public (BLM and WDFW).</p>	<p>CONTAMINATED SITES No identified contaminated sites are located within this reach.</p>
<p>ZONING (MAP #5) Lands within the reach are zoned for agriculture (63%) and forest & range (37%).</p>	<p>CULTURAL AND ARCHAEOLOGICAL RESOURCES A total of 153 recorded precontact sites, 10 recorded historic sites, and 18 recorded sites that feature both precontact and historic features are located within the reach. The precontact sites predominantly feature rockshelters, burials, and petroglyphs.</p>

SHORELINE FUNCTION ANALYSIS

<p>FISH HABITAT QUALITY Medium: The reach provides habitat for a variety of priority fish species, but the river has several water quality impairments and is highly influenced by dam operations (upstream and downstream).</p>	<p>TERRESTRIAL HABITAT QUALITY Medium: The reach is connected to significant areas of undisturbed habitat, and the majority of the reach is unaltered.</p>
<p>VEGETATION FUNCTIONS Low: Most of the shoreline is unaltered, but vegetation coverage is naturally sparse.</p>	<p>HYDROLOGIC FUNCTIONS Medium: The reach but provides important hyporheic flow functions, but is highly influenced by dam operations</p>

KEY MANAGEMENT ISSUES AND OPPORTUNITIES

- There are many important archaeological resources located within the reach.
- The Wanapum and Priest Rapids dams significantly alter the hydrology and fish habitat quality of the reach (see Reach 1).
- Manage recreational activity to reduce impacts on vegetation and subsequent erosion.
- Protect the high-quality wildlife and shrub-steppe habitat within the reach.
- This reach contains an area of sand shrub-steppe, a unique habitat type.