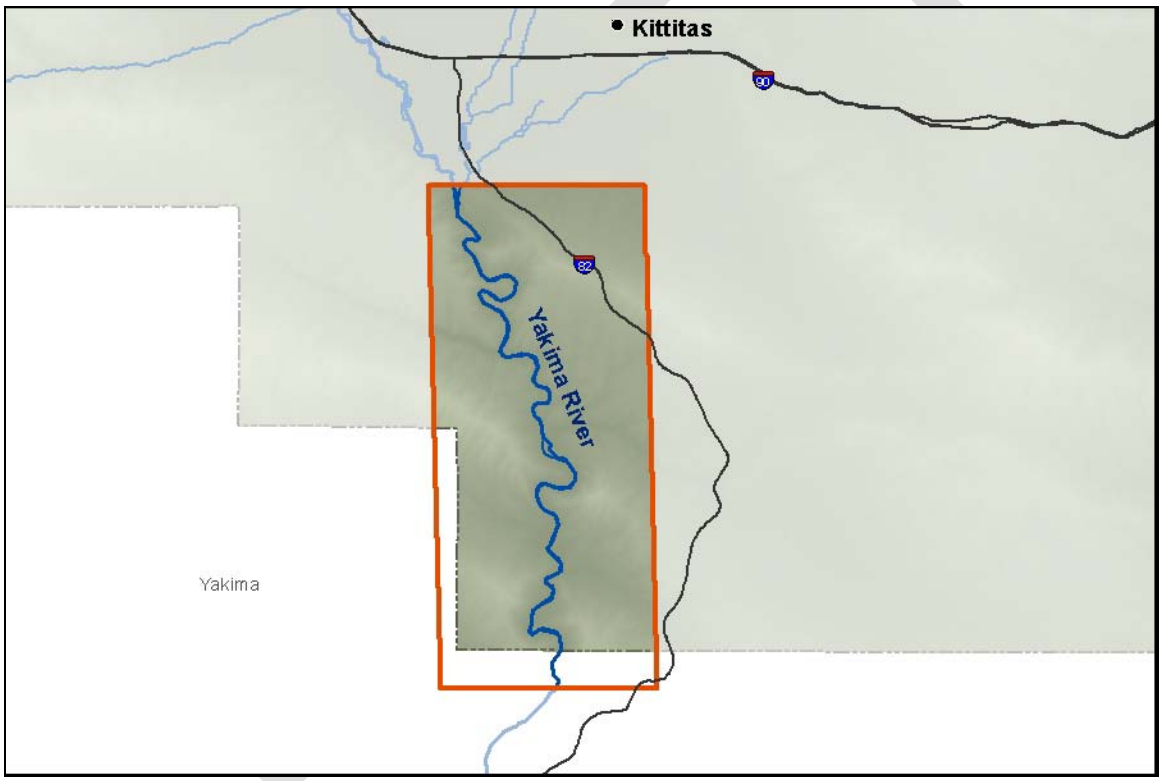
CHAPTER 5. YAKIMA CANYON AND LITTLE NACHES RIVER

This chapter describes the conditions within the shoreline inventory areas of the portions of the Yakima Canyon (Figure 5-1) and Little Naches River (Figure 5-2) that lie within Kittitas County. These stream 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.

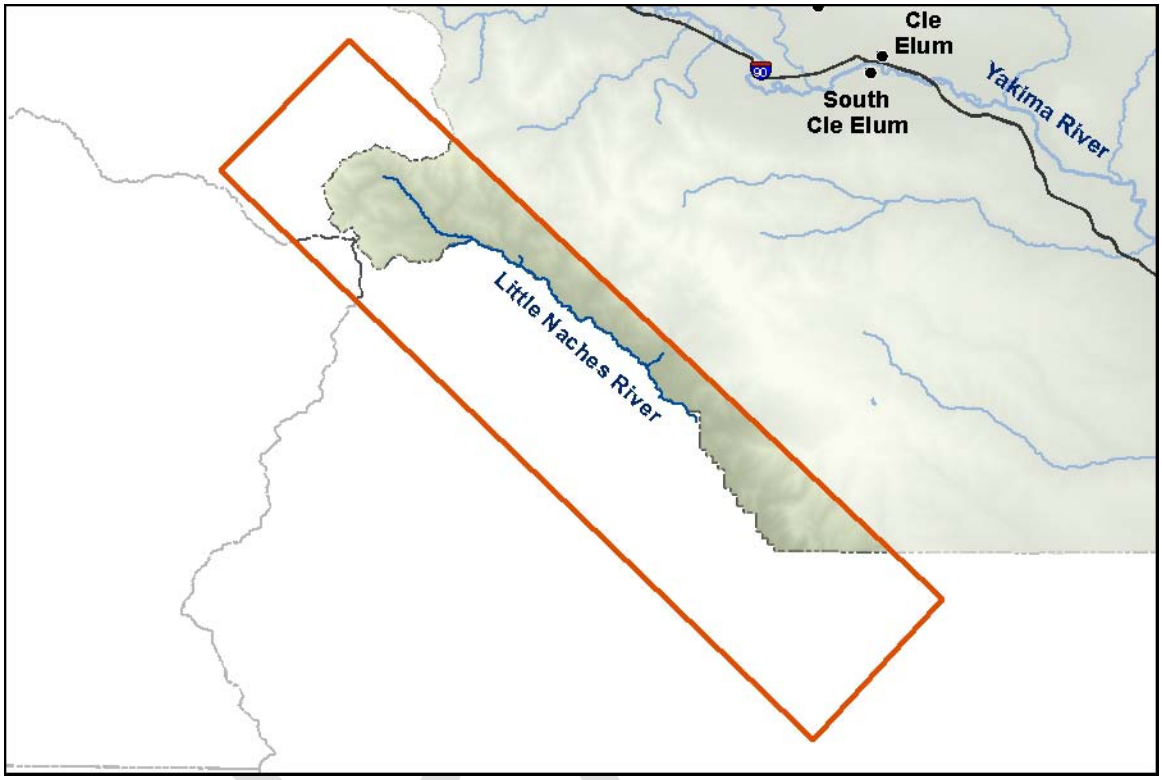
Figure 5-1. Yakima Canyon shoreline.



Characteristics for the shoreline reaches 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. A description of the available data sources, including data limitations, is presented in Appendix B. Shoreline reaches that are located entirely on federal lands (e.g., National Forest lands) and therefore are generally not subject

to shoreline jurisdiction do not have reach sheets and are only briefly described below.

Figure 5-2. Little Naches River shorelines.



5.1 Yakima Canyon

This section describes the portion of the Yakima River that flows through the Yakima Canyon, from the from the Wilson Creek confluence downstream to the Kittitas-Yakima County boundary (approximately 1.5 miles downstream from Roza Dam). The Yakima River is designated as a "shoreline of statewide significance" because it has a mean annual flow of more than 200 cubic feet per second.

5.1.1 Physical Characterization

The Yakima River flows generally from north to south through the canyon and is relatively sinuous compared to the upstream reaches of the river. The landscape in the Yakima Canyon is arid, with little agricultural land and the only appreciable tree cover located in the narrow riparian corridor of the river.

Only a few river crossings are located over this stretch of river, including two railroad bridges and the Umtanum pedestrian bridge. Limited residential development is located along the river; however, a railroad corridor and State Route 821 (Canyon Road) parallel the right and left river banks, respectively, along the canyon bottom. An irrigation canal borders the right bank of the river, extending downstream approximately 0.4 mile from Roza Dam. Several parking lots are located on the left bank of the river, providing access for campers, rafters, and boaters.

The steep, deep-walled canyon confines the river into a single channel, with no side-channel complexes and few islands or backwater areas. The canyon is a transport reach, with confinement limiting channel complexity (Haring 2001).

Much of the land adjacent to the river is mapped as steep slopes, which indicates the potential for erosion or landslide hazards. Although there are no formally mapped landslide hazard areas along these reaches (WDNR 2010; Kittitas County 2012), a significant rain event in 1998 resulted in over 30 landslides upstream of Roza Dam. Many of these landslides narrowed the river by up to half (Haring 2001).

Due to the moderate to steep canyon slopes and relatively narrow area between these slopes, the floodplain is confined within a portion of the inventory area for the majority of these reaches (FEMA 1996). At several locations, where tributary streams drain to the river, the floodplain extents out of the inventory area and upstream into the tributaries. The upstream, central, and downstream extents of Yakima River Reach 2 have potential for channel migration, with stretches between them exhibiting a more stable channel (Ecology 2011).

Roza Dam, which is located near the downstream end of this portion of the river, was built in 1941 to divert water from the Yakima River for irrigation purposes. The dam impounds approximately 100 acres of water behind a 67-foot-high concrete dam. The dam has a fish passage facility.

5.1.2 Habitats and Species

5.1.2.1 Fish Use

Table 2-14 in Chapter 2 shows the listing status of all fish species in Kittitas County. Within the Yakima Canyon, the river provides rearing habitat for summer steelhead (federally listed as threatened) and both spawning and rearing habitat for spring Chinook salmon. This part of the river is also used by coho salmon, Dolly Varden/bull trout (federally listed as threatened), fall Chinook, mountain whitefish, rainbow trout, and westslope cutthroat (StreamNet 2010).

The Yakima River steelhead recovery plan (Conley et al. 2009) describes Roza Dam as a potential bottleneck for outmigrating smolts during low runoff. Smolts that are delayed in the pool above the may experience mortality, residualization, or delayed arrival in the lower Yakima River until periods when low flow, high temperature, and increased predator activity reduce survival. Reclamation has been evaluating options to modify the spillway dam so that surface spill can take place at lower river flow.

A new fish ladder installed at Roza Dam in 1989 allows fish passage at minimum pool and full pool levels. However, the Yakima River steelhead plan (Conley et al. 2009) indicates there is no passage at water levels between these extremes, which occur while the pool is being drained or filled (a period of days for a few times each year).

The diversion of flow at Roza Dam has substantially altered the hydrologic regime downstream, with lower winter flows and higher flows during the summer irrigation season. Water is diverted from the river into the canal at Roza Diversion Dam and flows about 11 miles to the Roza Powerplant near Yakima. Flows return to the river below the powerplant. When power is being generated at the Roza Powerplant, there is a minimum flow target of 400 cubic feet per second (cfs) below Roza Diversion Dam. Power generation is terminated when the flow target cannot be met with the plant operating (Haring 2001, Reclamation and Ecology 2011a).

One measure proposed in the Yakima Basin Integrated Water Resource Management Plan is to further subordinate water diversions for power generation at Roza Dam to support outmigration of juvenile steelhead, Chinook, sockeye, and coho. Additional subordination would be subject to an agreement on mitigation and approval by the U.S. Bureau of Reclamation, the Bonneville Power Administration, and the Roza Irrigation District (Reclamation and Ecology 2011a).

Many other historic and ongoing events have contributed to the decline of Yakima basin fish populations, including land development, construction of storage dams in the upper watershed and on the Columbia River, and commercial fishing (Reclamation and Ecology 2011a).

Anadromous fisheries have improved in recent years as a result of better fisheries management, habitat and facility improvements, hatchery supplementation, and reintroduction efforts. Reintroduction of coho in the Yakima basin began in the mid-1980s. Summer Chinook reintroduction is currently being undertaken (Reclamation and Ecology 2011a). Efforts to restore coho salmon within the Yakima River basin rely largely upon releases of hatchery-produced fish. Natural reproduction of hatchery-reared coho salmon is now occurring in the Yakima River. The upper Yakima wild Chinook salmon population is supplemented with hatchery stock reared at the Cle Elum Supplementation and Research Facility (CESRF) and released

from three acclimation sites (Reclamation 2011, Reclamation and Ecology 2011a). The CESRF has been operating since 1997 and is managed by WDFW and the Yakama Nation.

The Yakima Basin Integrated Water Resource Management Plan (2011) recommends acquisition of 15,000 acres in the Yakima River Canyon, including the valley bottom and eastern slopes, from the Yakima River to I-82. This would provide an opportunity to protect a large swath of shrub-steppe habitat along with the Yakima Canyon riparian area. Additional efforts to improve fish habitat and populations in the Yakima basin include the following (Reclamation and Ecology 2011a):

- The Yakima/Klickitat Fisheries Project, managed by WDFW and the Yakama Nation, is aiming enhance salmon populations through supplementation along with habitat protection and restoration. Species currently being enhanced include spring, summer and fall Chinook salmon, coho salmon, sockeye salmon, and steelhead trout.

- The Yakima River Side Channels Project, also managed by WDFW and the Yakama Nation through the Yakima/Klickitat Fisheries Project, focuses on restoring habitat in the Easton, Ellensburg, Selah, and Union Gap reaches on the Yakima River and the Gleed reach in the lower Naches. Active habitat restoration actions include reconnecting structurally diverse alcoves and side channels, introducing large woody debris, fencing, and revegetating riparian areas.

- The Yakima Tributary Access and Habitat Program has numerous participants including the Kittitas Conservation District. The program seeks to restore fish passage to Yakima River tributaries that historically supported salmon and to improve habitat through measures such as fish screening and fish passage improvements, riparian plantings, fencing, and irrigation system improvements.

Pacific lamprey is another native fish species that has recently become a focus of restoration efforts. The Columbia River basin historically supported abundant Pacific lamprey populations, but the population has steeply declined and is virtually non-existent in the upper Yakima watershed. Major factors in the species' decline include fish passage barriers, poor water quality, floodplain degradation, and highly altered stream hydrology (CRITFC 2011; USFWS 2011).

5.1.2.2 Water Quality

During spring and summer, levels of organochlorine pesticides, turbidity, and suspended sediments in the Yakima River basin sometimes exceed state water

quality standards. In addition to concerns associated with turbidity in streams, suspended sediments also act as a transport mechanism for pesticides. Ecology completed an assessment of suspended sediment, turbidity, organochlorine pesticides, bacteria, and metals in the upper Yakima River basin in 1999, focusing on the mainstem river and major tributaries from Selah upstream to Cle Elum. A TMDL for suspended sediment, turbidity, and pesticides in the upper Yakima River and major tributaries was completed in 2002 (Creech 2003b).

The Department of Ecology has recently undertaken the Yakima River Watershed Toxics Study to evaluate levels of toxic contaminants in streams, rivers, reservoirs, and lakes from the Yakima River's headwaters near Snoqualmie Pass to its confluence with the Columbia River. Levels of toxic compounds in Yakima River fish were recognized as a concern in the 1990s. During 2006 - 2008, Ecology collected hundreds of samples of fish and water to evaluate current levels of toxic compounds such as DDT, PCBs, and several others, many of which were historically used in agriculture or utilities but have been banned in recent years. These compounds attach to soil particles which are then washed downstream by precipitation or irrigation. Although the compounds have not been applied in recent years, they can persist in the environment. Ecology's study found that fish in the upper Yakima River are currently meeting or close to meeting human health criteria for all toxic substances tested except PCBs. The level of toxics generally increases in downstream areas. The months of greatest concern for human-caused turbidity, suspended sediment loading, and pesticide transport are during the irrigation season, April through October. Storms or rain-on-snow events can also mobilize sediments and pesticides at any time of the year (Johnson et al. 2010; Ecology 2009; Joy 2002).

Ecology found that irrigation returns are the dominant cause of degraded water quality in the Yakima River and are the most important sources to control for reducing turbidity, pesticides, and PCBs. However, urban stormwater runoff from cities including Ellensburg also appears to be a significant source of these pollutants (Johnson et al. 2010).

The river within Yakima Canyon is on Ecology's 303(d) list for dioxin. However, dioxin was excluded from the Ecology 2006 water quality study due to budget constraints and because the fish tissue survey showed human health criteria were very close to being met (Johnson et al. 2010).

5.1.2.3 Riparian Habitat Conditions (Land Cover)

Riparian vegetation along the Yakima River within the canyon consists mainly of cottonwood and willow with scattered pine trees. Canyon Road and the railroad parallel the river leaving little space for natural riparian vegetation in some areas.

The steep canyon walls support sparse plant cover, with sagebrush and various grasses amid rock outcrops. Shrubs are the dominant land cover in this part of the Yakima River corridor.

5.1.2.4 Wetlands

Less than 1 percent of the Yakima River shoreline inventory area in the canyon is mapped as wetland along the river. The small amount of wetland area is due to the relatively arid conditions within the steep, confined canyon.

5.1.2.5 Wildlife Habitats and Species

Priority wildlife species mapped in the Yakima River Canyon include bighorn sheep, elk, golden eagle, and mule deer. The canyon provides cliff/bluff habitats and serves as a migratory corridor for many species of birds, reptiles, amphibian and mammals.

Shrub-steppe habitat is a dominant vegetation community in the Yakima River canyon (USGS 1993). This habitat type 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). In the Yakima River canyon, two plant species associated with shrub-steppe communities have been mapped by the Washington Natural Heritage Program: Hoover's desert parsley and pauper milk vetch. 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).

5.1.3 Land Use

From the Wilson Creek confluence downstream to Roza Dam, the Yakima River is bordered by Canyon Road along the east bank and a railroad along the west bank. The railroad crosses the river near the dam and borders its east bank, between the river and Canyon Road. Outside of the transportation corridors, the surrounding shorelands are undeveloped and zoned for agriculture and forest/range. Over half of the land area bordering the river is state and federal lands (WDFW and BLM, respectively).

5.1.4 Public Access

Three sites, which include boat launches, provide access to the Yakima Canyon: Lmuma Creek, Big Pines, and Roza Recreation areas (Kittitas County 2011). In addition to these facilities, boat launch facilities are located at the intersection of SR 821 and Roza View Drive, approximately 1,200 feet upstream of Big Pines, and at the Umtanum pedestrian bridge. In addition, SR 821 parallels the majority of the reaches, providing informal access and views of the river.

5.1.5 Reach Sheets

YAKIMA RIVER-REACH 1

SHORELINE LENGTH:
1.6 Miles

REACH INVENTORY AREA:
121.7 Acres

1

PHYSICAL AND ECOLOGICAL FEATURES

CHANNEL CONFIGURATION

The reach flows as a single channel through a canyon with moderate topographic relief. The upstream portion of the reach is confined by the Roza Dam, bordered by an irrigation canal and is crossed by a railroad. Downstream, the railroad and Canyon Road parallel the channel.

HAZARD AREAS (MAP FOLIO #2)

About half the reach area (49%) is located within the FEMA 100-year floodplain. No landslide hazard areas are mapped within the reach, although landslides have occurred on steep slopes bordering the canyon.

WATER QUALITY

The reach is not listed on the State Water Quality Assessment list of 303(d) waters.

LAND COVER (MAP FOLIO #3)

This reach contains shrubland (41%), open water (19%), grassland (15%), and riparian vegetation (13%). A number of other land cover types are also present, including: conifer-dominated forest (9%), developed lands (2%), and unvegetated lands (1%).

HABITATS AND SPECIES (MAP FOLIO #1)

WDFW maps show this reach provides spawning and known juvenile rearing habitat for summer steelhead and known spawning habitat for spring Chinook. The presence of coho salmon, Dolly Varden/bull trout, fall Chinook, mountain whitefish, rainbow trout, and westslope cutthroat is also mapped.

Limited wetland habitat is mapped along the river (<1% of the reach). Priority mule deer winter range, bighorn sheep winter range, elk winter range, cliffs/bluffs, and biodiversity areas and corridor are mapped along the reach. In addition, golden eagle is also mapped within the reach.

BUILT ENVIRONMENT AND LAND USE

SHORELINE MODIFICATIONS (MAP FOLIO #1)

Roza Dam is located at the upstream end of the reach, and a railroad borders much of the east shoreline of the river. An irrigation canal, originating at Roza Dam, is located along the western shoreline at the upstream end.

PUBLIC ACCESS (MAP FOLIO #4)

There is no public access to the reach, but SR 821 parallels the majority of the reach, providing views of the river.

EXISTING LAND USES AND OWNERSHIP (MAP FOLIO #4)

Land use along the reach is primarily rural (80%), with agricultural land (20%) at the upstream end of the reach. Land ownership is 56% private and 44% public (BLM).

CONTAMINATED SITES

No identified contaminated sites are located within this reach.

ZONING (MAP #5)

Lands within the reach are zoned for forest & range (57%), agriculture (20%), and other (23%) [right-of-way].

CULTURAL AND ARCHAEOLOGICAL RESOURCES

There are no recorded sites within the reach.

1

SHORELINE FUNCTION ANALYSIS

FISH HABITAT QUALITY

Medium: The reach provides spawning and juvenile rearing habitat for priority fish species (including spring Chinook salmon), but habitat is altered upstream by Roza Dam.

TERRESTRIAL HABITAT QUALITY

Medium: The eastern shoreline of the river is generally unaltered and connects to high-value habitat areas, but the western shoreline is altered by a railroad.

VEGETATION FUNCTIONS

Medium: The river is bordered by dense shrub cover, but vegetation has been altered along the eastern bank by a railroad.

HYDROLOGIC FUNCTIONS

Low: The Yakima Canyon functions primarily as a transport reach.

2

3

KEY MANAGEMENT ISSUES AND OPPORTUNITIES

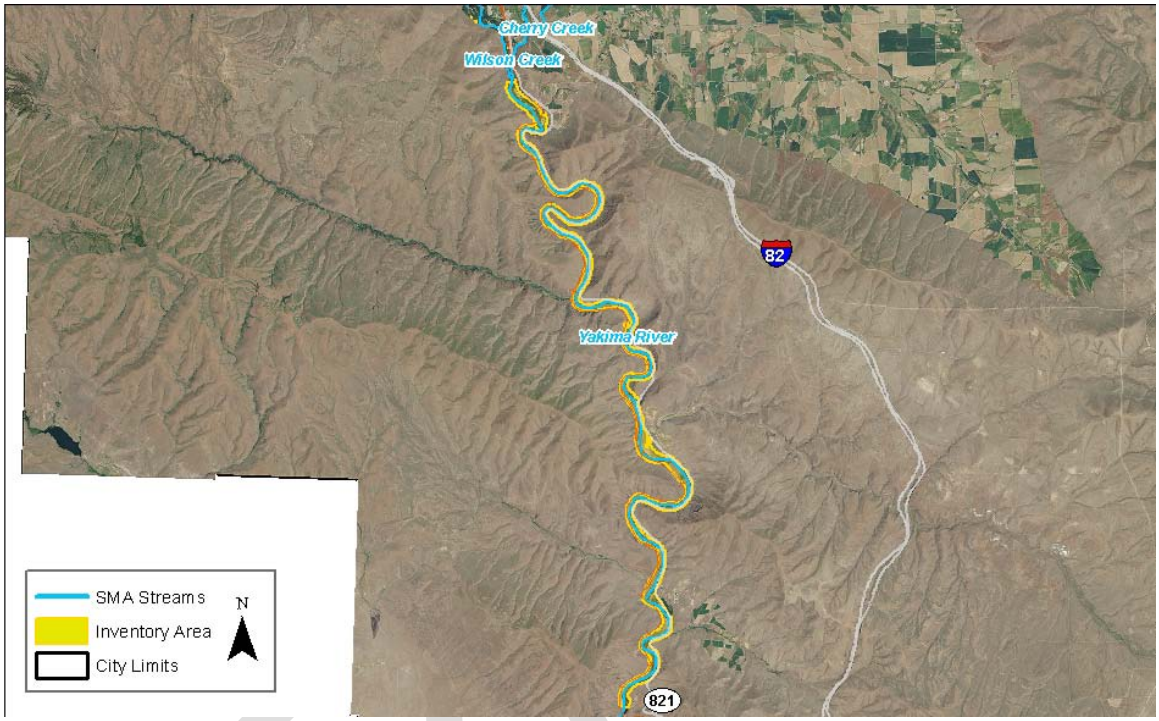
- Upstream fish passage at Roza Dam is periodically impaired during high and low water levels.
- The Integrated Plan for the Yakima Basin proposes acquisition of 15,000 acres in the Yakima River Canyon, including the valley bottom and eastern slopes, from the Yakima River to I-82. This area is a wildlife corridor and contains shrub-steppe habitat, a community type that is becoming increasingly rare.

4

YAKIMA RIVER-REACH 2

SHORELINE LENGTH:
19.1 Miles

REACH INVENTORY AREA:
1,650.2 Acres



1

PHYSICAL AND ECOLOGICAL FEATURES

CHANNEL CONFIGURATION

The reach primarily flows as a single channel through a confined canyon with moderate topographic relief, generally flowing north to south. Low floodplain terraces have limited distribution within the reach.

LAND COVER (MAP FOLIO #3)

This reach is dominated by shrubland (25%), riparian vegetation (18%), grassland (15%), open water (15%), and developed lands (10%). Agricultural lands (8%), conifer-dominated forest (7%), other (1%), and unvegetated lands (1%) are also mapped.

HAZARD AREAS (MAP FOLIO #2)

A large extent of the reach area (60%) is located within the FEMA 100-year floodplain. No landslide hazard areas are mapped within the reach, although steep slopes bordering the river may occasionally slide. The upstream, central, and downstream extents of the reach have potential for channel migration, with stretches between them exhibiting a more stable channel.

HABITATS AND SPECIES (MAP FOLIO #1)

WDFW maps show this reach provides spawning habitat for spring Chinook and rearing habitat for Chinook and summer steelhead. The presence of coho salmon, Dolly Varden/bull trout, fall Chinook, mountain whitefish, rainbow trout, and westslope cutthroat is also mapped.

Wetland habitat is mapped along the banks of the river and at multiple locations (9% of the reach). Priority mule deer winter range, bighorn sheep winter range, elk winter range, cliffs/bluffs, and biodiversity areas and corridor are mapped along the reach. In addition, golden eagle is also mapped within the reach.

WATER QUALITY

The reach is listed on the State Water Quality Assessment list of 303 (d) Category 5 waters for chlordane, dioxin, PCB, and temperature. TMDLs have been implemented for: 4,4'-DDE, 4, DDT, and dieldrin.

BUILT ENVIRONMENT AND LAND USE

SHORELINE MODIFICATIONS (MAP FOLIO #1)

A railroad parallels much of the right bank of the river within the reach and a Canyon Road parallels the left bank

PUBLIC ACCESS (MAP FOLIO #4)

Three sites, which include boat launches, provide access to the Yakima Canyon: Lmuma Creek, Big Pines, and Roza Recreation areas (Kittitas County, 2011). In addition to these facilities, boat launch facilities are located at the intersection of SR 821 and Roza View Drive, approximately 1,200 feet upstream of Big Pines, and at the Umtanum pedestrian bridge. In addition, SR 821 parallels the majority of the reaches, providing informal access and views of the river.

EXISTING LAND USES AND OWNERSHIP (MAP FOLIO #4)

Land use along the reach is rural (55%) and agricultural (45%). Land ownership is 40% private and 60% public (State, BLM, and WDFW).

CONTAMINATED SITES

One leaking underground storage tank is mapped mid-reach.

ZONING (MAP #5)

Lands within the reach are zoned for agriculture (60%), forest & range (23%), and other (17%) [right-of-way].

CULTURAL AND ARCHAEOLOGICAL RESOURCES

A total of 9 recorded precontact sites and 3 recorded historic sites are located within the reach. The recorded precontact sites feature lithic debitage in addition to talus pits.

SHORELINE FUNCTION ANALYSIS

FISH HABITAT QUALITY

Medium: The reach provides spawning and juvenile rearing habitat for priority fish species (including spring Chinook salmon), but has several listed water quality impairments and adjacent hydromodifications.

TERRESTRIAL HABITAT QUALITY

Medium: Portions of generally unaltered habitat remain along the river, but the river is separated from adjacent habitat areas by transportation corridors (Canyon Road and a railroad).

VEGETATION FUNCTIONS

Medium: The river is bordered by dense shrub cover, but vegetation has been altered in many areas by Canyon Road and a railroad.

HYDROLOGIC FUNCTIONS

Low: The Yakima Canyon functions primarily as a transport reach.

KEY MANAGEMENT ISSUES AND OPPORTUNITIES

- There is generally limited development potential within the reach. Potential new development should be set back an adequate distance from the shoreline to protect shoreline functions.
- Several important archaeological sites are present within the reach.
- The Yakima Canyon is a highly-used recreational area. There may be opportunities to restore riparian vegetation when recreational facilities are improved or redeveloped in the future.

5.2 Little Naches River and Tributaries

The Little Naches River flows from northwest to southeast in southwestern Kittitas County, forming the boundary between Kittitas and Yakima Counties. The Little Naches River is a right-bank tributary to the Naches River (in Yakima County). Tributaries within Kittitas County with mean annual flows greater than 20 cfs are the Middle and North Forks of the Little Naches River, Bear Creek, and Quartz Creek. Downstream of the Bear Creek confluence, the Little Naches River is identified as a "shoreline of statewide significance" because the mean annual flow exceeds 200 cubic feet per second. The Little Naches River and its tributaries are located almost entirely on National Forest lands, and are briefly described below.

5.2.1 Physical Characterization

The Little Naches River is located in the southwestern portion of the county and flows from the northwest to southeast. The river traverses the Kittitas County border with Yakima County, crossing the county lines multiple times. The river reach is largely undeveloped aside from forest service roads, camping, and logging activities that are located adjacent to the river. Forest Service roads cross the river eight times and the downstream extent of the river is paralleled by a Forest Service road. The majority of the riparian area contains evergreen forest that contributes significant woody material to the system. Topography is low to moderate with the single channel dominating the system.

The North Fork Naches River branches with the Middle Fork Naches River at approximately RM 19 of the Little Naches River. The topography and habitat along the north and middle forks are similar to that of the mainstem with little development and forested riparian corridors. Bear and Quartz creeks are left bank tributaries to the Little Naches River and both are crossed by a forest service road near their confluence with the Little Naches River. Bear and Quartz creeks have similar physical characteristics as the Little Naches River.

Much of the northern and southern extents of the river are flanked by mapped steep slopes. The entirety of the mainstem, North Fork, and Bear Creek are mapped as having potential for channel migration. Several segments of the Middle Fork also have potential for channel migration (Ecology 2011).

5.2.2 Habitats and Species

5.2.2.1 Fish Use

Fish use within the Little Naches River and its tributaries is summarized in Table 5-1. Road development and timber harvest in the watershed have had a number of negative impacts on the quality of river habitat. Large quantities of fine sediment and a lack of riparian tree cover have resulted in increased embeddedness, lack of deep pools and habitat complexity, and high water temperatures. Timber harvest has reduced the available of large wood that can be recruited to the river along lower Bear Creek. Large wood was removed from the lower 10 miles of the river as part of "channel cleaning" efforts following floods in the 1970s. The lower part of the Little Naches below Salmon Falls has been degraded by road building and channelization (Haring 2001).

Despite these alterations, the upper part of the Little Naches (upstream of Salmon Falls) is considered to provide good fish habitat, with abundant spawning gravel, excellent riparian condition, adequate summer flows, and plentiful large wood and instream cover. Many forest roads have been repaired or decommissioned and fine sediment in spawning gravels has been reduced (Haring 2001).

Table 5-1. Fish Use in Little Naches River and Tributaries (Source: StreamNet 2010)

Species	Little Naches River	NF Little Naches	MF Little Naches	Bear Creek	Quartz Creek
Dolly Varden/Bull Trout	P/M				P/M
Rainbow Trout	P/M	P/M	P/M	P/M	P/M
Westslope Cutthroat	P/M	P/M	P/M	P/M	P/M
Eastern Brook Trout	P/M				P/M
Spring Chinook	R, S	S		R	R
Summer Steelhead	S	S	S	S	P/M

P/M = presence/migration; S = spawning; R= rearing

Installation of fish passage facilities at Salmon Falls (RM 4.4) in 1988 allowed anadromous fish to access approximately 18 miles of upstream habitat on the Little Naches River. There are no constructed barriers to migrating fish along any of the forks of the Little Naches River or the mouths of most tributary streams. A dewatered reach

along the North Fork, resulting from sediment loading, may inhibit access by spring Chinook (Haring 2001).

The Yakima Basin Integrated Water Resource Management Plan (Reclamation and Ecology 2011s) recommends acquisition of lands at the headwaters of the Little Naches River. Preservation of the upper reach is viewed as important maintaining for water quality, particularly cool temperatures for bull trout, as well as current or potential salmon and steelhead spawning grounds.

5.2.2.2 Water Quality

The North Fork Little Naches River is currently on Ecology's 303(d) list for high water temperatures. Removal of riparian vegetation and the subsequent lack of shade are likely the major reasons for high summer temperatures. A TMDL has been developed to address temperatures in the upper Naches River watershed (Brock 2008; Haring 2001).

As described above, excess sediment is also an issue for water quality in the Little Naches River. Erosion has resulted from timber harvest, road building, wildfires, debris flows, and recreational use (Haring 2001).

5.2.2.3 Riparian Habitat Conditions (Land Cover)

Riparian vegetation along the Little Naches River and its tributaries is mainly coniferous forest in various stages of succession and harvest. Upstream of Salmon Falls, riparian vegetation is in excellent condition with the exception of areas along forest roads and camping areas. Riparian vegetation has been severely degraded downstream of the falls to the river mouth as a result of highway construction and channelization of the stream. Natural meadows along Bear Creek limit potential shade levels (Haring 2001).

5.2.2.4 Wetlands

Approximately one-third of the Little Naches River and North Fork shoreline inventory areas are mapped as wetland. Less than a third of the Quartz Creek shoreline is mapped as wetland, and a very small amount of the Bear Creek shoreline contains wetland areas. Mapped wetlands are mainly forested and scrub-shrub communities.

5.2.2.5 Wildlife Habitats and Species

Priority habitats and species mapped along the Little Naches River and its tributaries include elk calving areas, northern spotted owl (federally listed threatened species), talus slopes, and harlequin duck.

5.2.3 Land Use

With the exception of a private inholding at its upstream end, the Little Naches River flows through National Forest land. The North and Middle Forks of the river flow through a checkerboard of private and National Forest lands. Bear and Quartz Creeks flow through National Forest land. The private inholdings are zoned for commercial forestry and are inaccessible from public roads.

5.2.4 Public Access

The middle portion of the Little Naches River within Kittitas County is accessible from a snowmobile trail that parallels much of its length. The snowmobile trail also crosses Quartz Creek near its confluence with the Little Naches River.