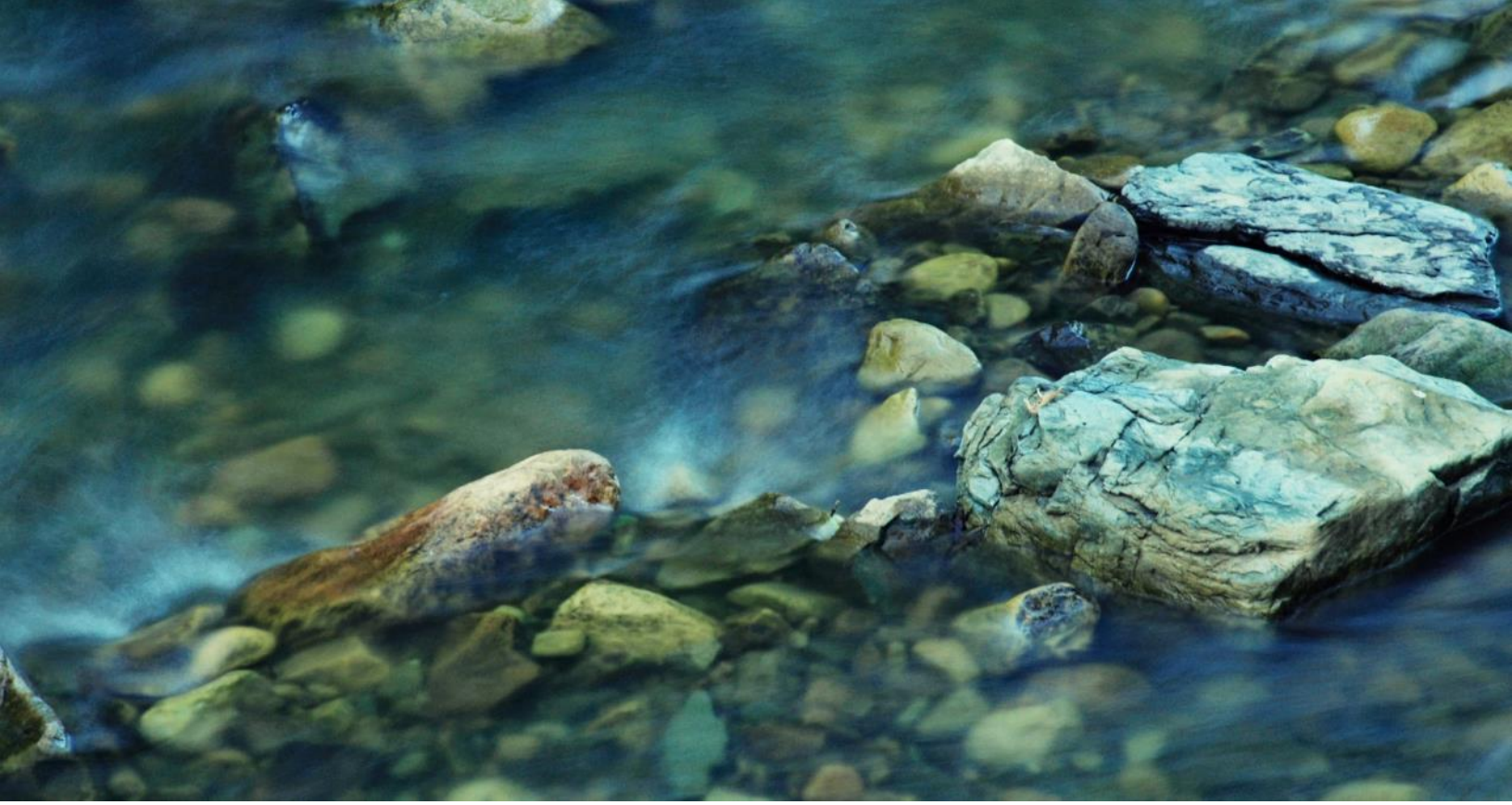

May 2021
Confluence Parkway Project

ANCHOR QEA

Ecosystems Technical Study

Prepared for City of Wenatchee

May 2021
Confluence Parkway Project

Ecosystems Technical Study

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ABBREVIATIONS

BA	biological assessment
BMP	best management practice
BNSF	Burlington Northern Santa Fe Railway
Chelan PUD	Public Utility District No. 1 of Chelan County
City	City of Wenatchee
CWA	Clean Water Act
DDE	dichlorodiphenyldichloroethylene
DPS	distinct population segment
Ecology	Washington State Department of Ecology
EO	Executive Order
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FERC	Federal Energy Regulatory Commission
LTAA	likely to adversely affect
NLAA	not likely to adversely affect
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Association
OHWM	ordinary high water mark
PCB	polychlorinated biphenyl
PGIS	pollution-generating impervious surfaces
PHS	Priority Habitats and Species
Project	Confluence Parkway Project
RCW	Revised Code of Washington
SPCC	Spill Prevention, Control, and Countermeasures
TMDL	Total Maximum Daily Load
UCR	Upper Columbia River
USFWS	U.S. Fish and Wildlife Service
WDFW	Washington Department of Fish and Wildlife

1 Introduction and Project Description

Ecosystems includes wildlife and aquatic species and habitat that are present and could be affected by the Confluence Parkway Project (Project). This technical study documents and describes wildlife and aquatic species and habitat in the Project area, and identifies potential impacts on these features. The Project is a proposed 2.5-mile bypass corridor that is intended to reduce vehicle congestion on SR 285/North Wenatchee Avenue. The Project extends from the U.S. 2/Euclid Avenue interchange, crosses the Wenatchee River on a new bridge, and extends south to the intersection of North Miller Street and SR 285/North Wenatchee Avenue. The Project area is primarily to the east of the Burlington Northern Santa Fe (BNSF) railroad tracks with a large portion adjacent to the Wenatchee Confluence State Park, including the Horan Natural Area. The Confluence Parkway Project will provide relief from the current North Wenatchee Avenue Bridge bottleneck and alleviate vehicle congestion in this area.

The Project is located in the City of Wenatchee (City) in Chelan County (Figure 1). Wenatchee is located in a valley in central Washington at the confluence of the Columbia and Wenatchee rivers. Currently, Wenatchee is the second largest city in central Washington, and is an urban hub for north-central Washington.

2 Regulatory Context

Federal, state, and local regulations related to ecosystems are identified in Tables 2-1, 2-2 and 2-3. These guiding regulations will be followed throughout the design and construction of the Project.

In addition to the regulations described in this section, there are regulatory considerations related the Federal Energy Regulatory Commission's (FERC) license for the Rock Island Hydropower Project. The Chelan PUD owns the Wenatchee Confluence State Park, including the Horan Natural Area as part of the Rock Island license. Any changes to these recreational resources will require FERC approval.

Table 2-1
Federal Regulations

Regulation	Description
Sections 404, 402, and 401 of the CWA	The CWA was developed to protect water quality in surface water and groundwater.
Section 7 of the ESA	Requires consultation with USFWS or NOAA Fisheries when undertaking a federal action to ensure the conservation of any ESA-listed animal species and critical habitat so as not to jeopardize the continued existence of any listed species.
Magnuson-Stevens Fishery Conservation and Management Act	The Magnuson-Stevens Fishery Conservation and Management Act is the primary law governing marine fisheries management in U.S. federal waters.

Regulation	Description
Bald and Golden Eagle Protection Act	Prohibits the take; possession; sale; purchase; barter; offer to sell, purchase, or barter; transport; export; or import of bald or golden eagles, including any part, nest, or egg, unless permitted under the authority of USFWS.
Migratory Bird Treaty Act	Prohibits the take of all migratory birds, their eggs, parts, or nests unless authorized by a permit under the regulatory authority of USFWS.
Protection of Wetlands, Presidential Executive Order 11990	Requires federal agencies to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out the agency's responsibilities.
Final Rule on Compensatory Mitigation for Losses of Aquatic Resources (2008)	Provides regulations governing compensatory mitigation for activities authorized by permits issued by the Department of the Army.
Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987)	Provides guidelines and methods to determine whether an area is a wetland for purposes of Section 404 of the CWA.
Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008)	Provides technical guidance and procedures for identifying and delineating wetlands in the arid west region that may be subject to regulatory jurisdiction under Section 404 of the CWA.

Table 2-2
State Regulations

Regulation	Description
Hydraulic code (Washington Administrative Code Chapter 220-110)	Serves to protect fish, shellfish, and their habitats by requiring all actions that use, divert, obstruct, or change the natural flow or bed of salt or fresh state waters to obtain a Hydraulic Project Approval from WDFW.
Shoreline Management Act (90.58 RCW)	Requires all counties and most cities with shorelines to develop and implement Shoreline Master Programs.
Protection of Wetlands, Governor's EO 89-10	Adopts a statewide goal of no overall net loss in acreage and function of Washington's remaining wetlands; directs state agencies to consider the benefits provided by wetlands, avoid activities that would adversely affect wetlands, and adequately mitigate when wetland impacts are unavoidable.
Protection of Wetlands, Governor's EO 90-04	Directs state agencies "to the extent legally permissible" to take various actions to protect wetlands.
Water Pollution Control Act, 90.48 RCW	Provides Ecology with the authority to regulate wetlands.
Wetland Mitigation in Washington State (Ecology et al. 2006)	Provides guidance to comply with environmental laws and policies and to improve the quality and effectiveness of wetland mitigation in Washington State.

Table 2-3
Local Regulations

Regulation	Description
City of Wenatchee Shoreline Master Program	The City's planning document that outlines the goals and polices for shorelines.
Wenatchee City Code Chapter 12.08, Critical Areas	Wenatchee City Code Chapter 12.08 provides guidance to protect critical areas and their functions and values.

3 Methodology

3.1 Project Area

The Project area includes an approximately 2.5-mile corridor through the City and includes a pedestrian bridge crossing the Wenatchee River (Township 23 North, Range 20 East, Sections 21, 28, 33, and 34) (Figure 1). As described in Section 3.2, the Project area boundary for the ecosystems analysis includes all areas within 250 feet of potential Project construction activities. Almost the entire Project area is composed of developed areas including existing roadways and commercial and industrial development. The Project area is shown in Figures 2a through 2e. The only undeveloped features within the Project area include the Wenatchee River itself, the associated riparian shoreline where the river crossing is proposed, and the Horan Natural Area located on the south side of the Wenatchee River. The Wenatchee River flows into the Columbia River approximately 0.3 mile downstream of the proposed new bridge crossing. Side channels of the Columbia River are located on the northeast edge of the Project area within the Horan Natural Area. Due to the lack of undeveloped areas within the Project area, the only wetland feature identified within the Project area, identified as Wetland A, is located within the Horan Natural Area. Vegetated areas within Walla Walla Point Park and Wenatchee Confluence State Park are limited to mowed grass areas and landscape trees and shrubs. Similar to within the Project area boundary, vegetated areas adjacent to the Project area are limited to mowed areas and landscape vegetation associated with parks and residential, commercial, and industrial land use. Parcels with agricultural crops are also located around the urban area. Aerial photographs of the Wenatchee River and undisturbed vegetated areas within the Project area are shown in Figures 3a through 3d.

3.2 Technical Approach

The technical approach for this Ecosystems Technical Study is to document and describe wildlife and aquatic species and habitat in the Project area, and identify potential impacts on these features. Analyses included reviewing existing information, performing an aerial photograph assessment, and conducting a site visit in April 2020. A 250-foot extent around potential Project construction activities was established for the ecosystems analysis to identify any critical areas or critical area protective

buffers that may be located within or near the footprint of proposed construction activities. As described in Section 3.1, the majority of the Project area is developed. Areas of the Project area with undisturbed vegetation communities and the aquatic habitats of the Wenatchee and Columbia rivers provide habitat for a variety of wildlife and aquatic species. Some of these wildlife and aquatic species are common and abundant, whereas others are threatened or endangered.

During the site visit, Anchor QEA scientists documented general information regarding habitats and dominant plant species and communities while walking through the Project area. All wildlife species, tracks, and other signs observed during the site visit were recorded. All observations were qualitative; no quantitative wildlife surveys were performed. One wetland, Wetland A, was delineated as part of the site visit investigation. In addition, the ordinary high water mark (OHWM) of the Wenatchee River and side channels of the Columbia River located within the Project area were delineated, and the results of the delineation are presented in the *Wetland and OHWM Delineation Report* (Appendix B). A biological assessment (BA) was also prepared as part of the Project and provides an analysis of potential Project impacts to Endangered Species Act (ESA)-listed species (Anchor QEA 2021a). A summary of information from the *Wetland and OHWM Delineation Report* and BA is provided in this technical study. Photographs were also taken to document vegetation and habitat conditions of the Project area (Appendix B).

3.2.1 Review of Existing Information

Anchor QEA scientists reviewed the following sources of information as part of the analysis for this technical study:

- Chelan County Public GIS Mapping (Chelan County 2020)
- City of Wenatchee GIS (City of Wenatchee 2019)
- Wenatchee City Code (City of Wenatchee 2020a)
- City of Wenatchee Critical Areas Maps (City of Wenatchee 2020b)
- Natural Resources Conservation Service Web Soil Survey (USDA 2020)
- North Central Washington Audubon Society (Audubon Society 2020)
- Cornell Lab of Ornithology eBird database (Cornell Lab of Ornithology 2020)
- U.S. Fish and Wildlife Service (USFWS) Wetlands Mapper for National Wetlands Inventory map information (USFWS 2020a)
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS) maps (WDFW 2020a)
- WDFW SalmonScape mapper (WDFW 2020b)
- WDNR (Washington Department of Natural Resources) Natural Heritage Program online map (WDNR 2020)
- Washington State Department of Ecology (Ecology) Water Quality Assessment & 303(d) List (Ecology 2020).

- *Upper Columbia Spring Chinook Salmon and Steelhead Recovery Plan* (Upper Columbia Salmon Recovery Board 2007)
- *Salmon, Steelhead, and Bull Trout Habitat Limiting Factors for the Wenatchee Subbasin (Water Resource Inventory Area 45) and Portions of WRIA 40 Within Chelan County (Squilchuck, Stemilt and Colockum Drainages)* (Andonaegui 2001)
- Washington Geospatial Open Data Portal Statewide Washington Integrated Fish Distribution (WGODP 2020)
- *Biological Assessment* (Anchor QEA 2021a)
- *Wetland and OHWM Delineation Report* (Anchor QEA 2021b)
- *Water Resources Technical Study* (Anchor QEA 2020c)
- *Air Quality Technical Study* (Anchor QEA, 2020d)
- *Confluence Parkway Project Preliminary Stormwater Report* (KPG 2020)
- *North Wenatchee Stormwater Drainage Improvements Project Wetland Delineation Report* (PACE Engineers, Inc. 2019)
- *Rare Plant and Vegetation Survey of the Wenatchee Confluence State Park* (Wooten and Morrison 2008)
- Aerial photographs publicly available via Google Earth

4 Affected Environment

The following sections describe the types of wildlife species and habitat (Section 4.1) and aquatic species and habitat (Section 4.2) found within the Project area. ESA-listed wildlife and aquatic species are discussed in Section 4.3.

4.1 Terrestrial Wildlife Habitat and Species

4.1.1 Terrestrial Wildlife Habitat

Wildlife rely on vegetation for food, shelter, and cover from predators. Wildlife diversity is generally related to the structure and composition of plant species within vegetative communities. In general, vegetation communities that contain few species or vegetative layers (herbaceous vegetation, shrubs, or trees) support a low diversity of wildlife, whereas vegetation communities that are more complex and contain a wide variety of plant species and vegetative layers can support a greater diversity of wildlife.

Almost the entire Project area is composed of developed areas including existing roadways and commercial and industrial development. The only undeveloped features within the Project area include the Wenatchee River itself, the associated riparian shoreline where the river crossing is proposed, and the Horan Natural Area located on the south side of the Wenatchee River. The only wetland feature identified within the Project area, identified as Wetland A, is located with the Horan

Natural Area. Disturbed vegetated areas within the Project area include mowed areas and landscape vegetation associated with parks and residential, commercial, and industrial land use. The following subsections provide a general description of wildlife habitat in the Project area based on existing vegetation communities. A list of plant species in the Project area identified during the April site visits is provided in Appendix C. Aerial photographs of disturbed and undisturbed vegetated areas within the Project area are shown in Figures 3a through 3d.

4.1.1.1 General Vegetation

Dominant vegetation within the Horan Natural Area includes Siberian elm (*Ulmus pumila*), narrow leaf willow, Himalayan blackberry (*Rubus armeniacus*), Woods' rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and reed canarygrass (*Phalaris arundinacea*). Grass fields within the Horan Natural Area and areas adjacent to the Apple Capital Recreation Loop Trail are composed of a mixture of native and nonnative grass and herbaceous species. Specific vegetation communities are described in the following subsections.

4.1.1.2 Park Vegetation

Vegetated areas outside the Horan Natural Area and shoreline areas are limited to Walla Walla Point Park and Wenatchee Confluence State Park. Vegetation in the parks is limited to mowed grass areas and landscape trees and shrubs. Small patches of mowed lawn and landscape vegetation associated with residential, commercial, and industrial land use are also present in the Project area.

4.1.1.3 Riparian Vegetation

The steepness of the Wenatchee River banks in the area of the proposed construction footprint provides for a narrow vegetated riparian corridor along the Wenatchee River between the Apple Capital Recreation Loop Trail and BNSF railroad bridge abutments. Along the right bank, riparian habitat within the Project footprint is approximately 400 feet in width. The left bank shoreline is not as steep and provides a vegetated riparian zone of approximately 300 feet. Riparian vegetation is present upstream and downstream of the pedestrian bridge and the BNSF bridge and along the Columbia River side channels located within the Project area.

Riparian habitat in the Project area typically has a dense tree canopy dominated by black hawthorn (*Crataegus douglasii*), black cottonwood (*Populus balsamifera*), yellow willow (*Salix lutea*), and narrow leaf willow (*Salix exigua*). Dominant understory vegetation includes red osier dogwood (*Cornus sericea*), Woods' rose, Himalayan blackberry, and reed canarygrass.

A delineation of the OHWM of the Wenatchee River and two short reaches of side channels of the Columbia River within the Project area was performed as part of the Project analysis. The Wenatchee River shoreline is located within the Project footprint, whereas the Columbia River side

channels are located outside the Project footprint. The OHWM delineation results are shown in Figures 3a through 3d and described in the *Wetland and OHWM Delineation Report* (Appendix B).

4.1.1.4 Wetlands

One wetland (Wetland A) was delineated within the Project area (Figures 3b and 3c). Wetland A is a Category I wetland under the City (2020a) and Washington State Department of Ecology (Ecology) wetland rating system (Hruby 2014). Wetland A is located within the Horan Natural Area and includes forested, shrub, and emergent vegetation communities. Dominant vegetation species include narrow leaf willow, red osier dogwood, reed canarygrass, and common cattail (*Typha latifolia*). At the time of the wetland delineation in April 2020, Wetland A had areas with standing water ranging in depth from a few inches to several feet deep. The depressions within Wetland A have silt and clay soil substrate and are filled with emergent vegetation with no evidence of flowing water (scouring). The source of water within Wetland A includes groundwater, precipitation, snow melt, and a series of culverts beneath the Apple Capital Recreation Loop Trail. There is one culvert beneath the Apple Capital Recreation Loop Trail that connects Wetland A to additional wetland habitat and then a second culvert beneath a trail that connects to a side channel of the Columbia River. Wetland A is located more than 200 feet from the Wenatchee River and more than 1,000 feet from the Columbia River side channels and does not appear to provide potential fish habitat. Wetland A buffer vegetation is mostly grass and herbaceous vegetation near the Apple Capital Recreation Loop Trail with trees and shrubs occurring near the wetland boundary. The results of the delineation of Wetland A are described in the *Wetland and OHWM Delineation Report* (Appendix B).

4.1.2 Wildlife Species

Vegetation communities within the Project area provide habitat for a variety of wildlife species common to populated communities in Chelan County and eastern Washington. Vegetated areas within the Project area provide habitat for native and nonnative bird, amphibian, reptile, insect, and small and large mammal species to breed, forage, and rest.

Although wildlife surveys were not performed as part of the Project analysis, a variety of native and nonnative bird, mammal, and reptile species were observed during the April 2020 site visits. In addition, the local community has performed monthly bird surveys for several years in the Horan Natural Area in association with the North Central Washington Audubon Society (Audubon Society 2020). Data from these monthly surveys are entered into the Cornell Lab of Ornithology eBird database (Cornell Lab of Ornithology 2020). The local community is also active on social media platforms providing descriptions and photographs of wildlife observations in the Horan Natural Area. A list of wildlife species in the Project area identified during the April site visits is provided in Appendix C. Appendix C also includes bird species commonly identified during the Audubon surveys.

The following subsections provide a description of wildlife species observed or likely to occur in the Project area.

Wildlife use of the riparian shoreline of the rivers and the Horan Natural Area includes a variety of native birds, large and small mammals, amphibians, and reptiles typical of a large undeveloped parcel within a populated area.

The Wenatchee River and the Columbia River side channels and associated riparian habitats and Wetland A provide habitat for still-water breeding, stream breeding, and upland breeding amphibian species. Reptiles are likely to occur in the Wetland A, riparian, and upland habitats of the Project area. Common garter snake (*Thamnophis sirtalis*) and western racer (*Coluber constrictor*) were observed in the Horan Natural Area during the April site visits.

Predatory bird species including the bald eagle (*Haliaeetus leucocephalus*) and osprey (*Pandion haliaetus*) were observed during the April site visits. Bald eagle and osprey nests were also observed within the Horan Natural Area and outside the Project area boundary. Other raptors such as northern harrier (*Circus cyaneus*) and red-tailed hawks (*Buteo jamaicensis*) commonly occur in similar forested habitat types. Snags and trees in the forested habitats provide perch sites for these species. Snags in forested habitats also provide potential nest sites for cavity-nesting birds such as great horned owl (*Bubo virginianus*), and species of woodpeckers including downy woodpecker (*Picoides pubescens*), northern flicker (*Colaptes auratus*), and pileated woodpecker (*Dryocopus pileatus*).

Horan Natural Area and riparian forested habitats provide foraging and nesting habitat for a wide variety of songbird species such as song sparrow (*Melospiza melodia*), bushtit (*Psaltriparus minimus*), Bewick's wren (*Thryomanes bewickii*), Steller's jay (*Cyanocitta stelleri*), spotted towhee (*Pipilo erythrophthalmus*), Swainson's thrush (*Catharus ustulatus*), winter wren (*Troglodytes hiemalis*), varied thrush (*Ixoreus naevius*), black-capped chickadee (*Parus atricapillus*), dark-eyed junco (*Junco hyemalis*), chestnut-backed chickadee (*Parus rufescens*), golden-crowned kinglet (*Regulus satrapa*), and red-breasted nuthatch (*Sitta canadensis*).

Upland herbaceous and grassland habitats are used by species like barn swallows (*Hirundo rustica*), tree swallows (*Tachycineta bicolor*), and white-crowned sparrows (*Zonotrichia leucophrys*).

River aquatic habitat and Wetland A habitat provide a variety of habitat for terrestrial birds, waterbirds, and waterfowl. Open water sections of Wetland A can be expected to provide habitat for belted kingfisher (*Megaceryle alcyon*) and wintering and migratory waterfowl, including gadwall (*Anas strepera*), American widgeon (*Mareca americana*), mallard (*Anas platyrhynchos*), ring-necked duck (*Aythya collaris*), greater scaup (*A. marila*), lesser scaup (*Aythya affinis*), American coot (*Fulica americana*), and green-winged teal (*Anas crecca*). Wetland A areas with grass and herbaceous vegetation provide habitat for red-winged blackbird (*Agelaius phoeniceus*), song sparrow, and marsh

wren (*Cistothorus palustris*), among other species including waterfowl such as mallard, green-winged teal, and American widgeon. Forested and scrub-shrub wetland habitat are commonly used by similar species as well as wood duck (*Aix sponsa*) and ring-necked duck. Waterbird species such as great blue heron (*Ardea herodias*) and pied-billed grebe (*Podilymbus podiceps*) also use many of these habitats.

Wildlife use of the park habitat and developed areas within the Project area is likely limited to disturbance-tolerant species like American crow (*Corvus brachyrhynchos*) and American robin (*Turdus migratorius*), waterfowl such as Canada goose (*Branta canadensis*), American Wigeon (*Anus Americana*), and mallard, and non-native species such as European starling (*Sturnus vulgaris*), rock dove (*Columba livia*), and house sparrow (*Passer domesticus*).

Small mammal species associated with forested habitats include shrew mole (*Neurotrichus gibbsii*), Townsend's vole (*Microtus townsendii*), masked shrew (*Sorex cinereus*), and striped skunk (*Mephitis mephitis*). Raccoon (*Procyon lotor*) and the non-native species Virginia opossum (*Didelphis virginiana*) also occur in these habitat types. Larger mammals such as mule deer (*Odocoileus hemionus*), and coyote (*Canis latrans*) have been observed in the Horan Natural Area. At the time of the April site visit, signs were posted notifying the public that a moose (*Alces alces shirasi*) was recently observed in the Horan Natural Area and moose tracks and scat were observed during the April site visits.

The Project area is surrounded by development, so vegetated corridors connecting habitat within the Project area to undisturbed habitats outside the Project area are limited to narrow patches of vegetation along the river shorelines.

4.1.2.1 WDFW PHS

The WDFW PHS database (WDFW 2020a) identifies the confluence of the Wenatchee River and the Columbia River and the associated riparian shoreline as breeding habitat for waterfowl, cavity nesting ducks, and the golden eagle (*Aquila chrysaetos*).

4.2 Aquatic Habitat and Species

4.2.1 Aquatic Habitat

The Project occurs just upstream of the confluence of the Wenatchee and Columbia rivers. Along the east side of the Project, side channels to the Columbia River provide shallow and slow-moving habitat outside of the mainstem of the river. The Wenatchee River also contains side channels within the Project area. Wetland habitat within the Horan Natural Area includes isolated, depressions of standing water in Project area, as described in Section 4.3.

In-channel conditions of the Wenatchee River in the vicinity of the Project footprint include cobble, gravel, sand, and silt substrate material. At the time of the April 2020 wetland and OHWM delineations, water depth in the river had a maximum depth of approximately 8 feet and an average

depth of approximately 4 feet. Based on the OHWM delineation results, flows are 2 to 3 feet higher during the spring/summer snow melt. There is a gravel and sandbar island within the channel in the area of the proposed new bridge crossing (Figure 3b). Vegetation on the island was primarily narrow leaf willow with some herbaceous species. The exposed area of the island ranges with variations in river flow conditions.

The Wenatchee River and the Columbia River are listed on the Ecology 303(d) list for a variety of parameters under state water quality assessment categories, shown in Table 4-1. In the Project area, both the Wenatchee River and the Columbia River are listed as a Category 5 water for dichlorodiphenyldichloroethylene (DDE) and polychlorinated biphenyls (PCBs), and the Columbia River is listed as a Category 5 water for temperature, dissolved oxygen, and pH (Ecology 2020). The 303(d) list represents the results of regular state water quality assessments that are designed to identify and clean up polluted waters. The assessments meet the requirements of Section 303(d) of the Clean Water Act, which requires that all states restore their waters to be "fishable and swimmable." The water quality assessments are a process of collecting and assessing the quality of surface waters in the state in order to satisfy the Clean Water Act.

Table 4-1
Water Quality Assessment Categories for the Wenatchee and Columbia Rivers in the Project Area

Category	Meaning	Listings in Area of the Project
Category 1	Meets tested standards for clean water. Category 1 means a water body meets the state water quality standards. Being placed in this category does not necessarily mean that a water body is free of all pollutants.	Wenatchee River: all areas of the river except the categories listed below Columbia River: all areas of the river except the categories listed below
Category 2	Waters of concern. Waters in this category have some evidence of a water quality problem, but not enough to show persistent impairment. These are waters where testing should continue.	Wenatchee River: None Columbia River: water column bioassay
Category 3	Insufficient data. There is insufficient data to place these waters in any of the other categories.	Wenatchee River: none Columbia River: none
Category 4	Impaired waters that do not require a TMDL. Waters that have impairment problems that are being resolved in one of three ways: • Category 4a: already has an EPA-approved TMDL plan in place and implemented. • Category 4b: has a pollution control program, similar to a TMDL plan, that is expected to solve the pollution problems. • Category 4c: is impaired by causes that cannot be addressed through a TMDL plan. Impairments in these water bodies include low water flow, stream channelization, and dams. These problems, while not pollutants, require complex solutions to help restore water bodies to more natural conditions.	Wenatchee River: 4a for pH and temperature Columbia River: none

Category	Meaning	Listings in Area of the Project
Category 5	Polluted waters that require a water improvement project. This is the list of impaired water bodies traditionally known as the 303(d) list. Starting with the 2004 Water Quality Assessment, Washington's 303(d) list of polluted waters were placed under Category 5 in the approved assessment. TMDLs or other approved water quality improvement projects are required for the water bodies in this category. If a water body is in this category it means that there are data showing that the water quality standards have been violated for one or more pollutants, and there is no TMDL—or pollution control program—in place.	Wenatchee River: DDE and PCBs Columbia River: DDE, PCBs, pH, temperature, dissolved oxygen

4.2.2 Aquatic Species

The Project area supports runs of ESA-listed species in addition to a variety of native and nonnative fishes. The ESA-listed species are discussed in Section 4.3.

The WDFW PHS Database (2020a) and Statewide Integrated Fish Distribution (SWIFD; WDFW 2020b) identify the lower reaches of the Wenatchee River and its confluence with the Columbia River as habitat for salmonids, native fishes, and nonnative fishes. Fish use the mainstem of the Wenatchee River year-round for rearing and migration, and spawning occurs upstream of the Project area for salmonids. The Columbia River, just downstream from the Project area, contains slow-moving pool habitat that supports additional species that are within 0.25 mile of the Project area. In addition to the ESA-listed evolutionarily significant units (ESUs) and distinct population segments (DPSs) of spring-run Chinook salmon, steelhead, and bull trout, Table 4-2 lists the fish species documented to occur within 0.25 mile of the Project area (WDFW 2020a and 2020b; TetraTech 2017; Douglas PUD 1998).

Table 4-2
Aquatic Species Known to Occur in the Project Area

Common Name	Species Name
Brook trout	*Salvelinus fontinalis*
Bull trout	*S. confluentus*
Chinook salmon (spring run and summer run)	*Oncorhynchus tshawytscha*
Coho salmon	*O. kisutch*
Brown trout	*Salmo trutta*
Mountain whitefish	*Prosopium williamsoni*
Pacific lamprey	*Entosphenus tridentatus*
Western brook lamprey	*Lampetra richardsoni*
Rainbow trout	*O. mykiss*
Sockeye salmon	*O. nerka*

Common Name	Species Name
Steelhead (summer run)	*O. mykiss*
Westslope cutthroat trout	*O. clarkii*
White sturgeon	*Acipenser transmontanus*

4.3 ESA-Listed Species and Critical Habitat

A BA was prepared for the Project to evaluate the potential effects on ESA-listed species and critical habitat in compliance with Section 7(a)(2) and Section 3(5)(A) of the ESA (Anchor QEA 2021b). Information from the BA is summarized in this report. Consultation with USFWS and the National Marine Fisheries Service (NMFS) is currently ongoing and these agencies will issue Biological Opinions at the conclusion of consultation. There are 10 ESA-listed threatened or endangered wildlife and aquatic species and critical habitats under the jurisdiction of the NOAA Fisheries (NOAA; 2020) and USFWS (2020b) addressed in the BA that may occur in the Project area. Table 4-3 presents the ESA-listed species and designated critical habitats identified in the BA as potentially occurring in the Project area and the ESA effect determination identified in the BA.

Table 4-3
ESA-Listed Species and Critical Habitat That May Occur in the Project Area and Effects Determinations

Species	Status	Agency	Critical Habitat	Effects Determination	Critical Habitat Effects Determination
Upper Columbia River spring-run Chinook salmon (*O. tshawytscha*)	Threatened (Upper Columbia River ESU)	NMFS	Designated	LTAA	LTAA
Upper Columbia River steelhead (*O. mykiss*)	Threatened (Upper Columbia River DPS)	NMFS	Designated	LTAA	LTAA
Columbia River bull trout (*S. confluentus*)	Threatened (Columbia River DPS)	USFWS	Designated	LTAA	LTAA
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened	USFWS	Designated, but none in Project area	No effect	No effect
Northern spotted owl *(Strix occidentalis caurina*)	Threatened	USFWS	Designated but none in Action Area	No Effect	No Effect
Yellow-billed cuckoo (*Coccyzus americanus*)	Threatened	USFWS	Proposed designated, but none in Project area	No Effect	No Effect[1]

Species	Status	Agency	Critical Habitat	Effects Determination	Critical Habitat Effects Determination
Canadian lynx (*Lynx canadensis*)	Threatened	USFWS	Designated, but none in Project area	No Effect	No Effect
Gray wolf[1] (*Canis lupus*)	Endangered[1]	USFWS	Designated, but none in Project area	No Effect	No Effect
Showy stickseed (*Hackelia venusta*)	Endangered	USFWS	Not designated	No Effect	Not Designated
Ute ladies'-tresses (*Spiranthes diluvialis*)	Threatened	USFWS	Not designated	No Effect	Not Designated

Notes:
LTAA: likely to adversely affect
1. Gray wolf was delisted on January 4, 2021.

Three of the ten species are documented within the Project area: Upper Columbia River (UCR) spring-run Chinook salmon (*Oncorhynchus tshawytscha*), UCR steelhead (*O. mykiss)*, and Columbia River bull trout (*Salvelinus confluentus*). Suitable habitat for these species is present within the Project area. Seven of the ten species are terrestrial species identified by USFWS (2020a) as potentially occurring in the Project area including marbled murrelet *(Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), Canadian lynx *(Lynx canadensis),* gray wolf (*Canis lupus*), and northern spotted owl (*Strix occidentalis caurina*), and the plant species showy stickseed *(Hackelia venusta)* and Ute ladies'-tresses *(Spiranthes diluvialis)*. As described in the BA, these species have never been documented in or near the Project area, and/or suitable habitat for these species is not present within many miles of the Project area, and they are not considered to have a reproducing population in the Project area.

5 Impacts Analysis

5.1 Construction Impacts

5.1.1 Direct Impacts

Potential direct impacts on wildlife, aquatic, and ESA-listed habitat and species that could occur from temporary construction actions and the presence of Project features are removal and loss of habitat during construction of the roadway, paved trails, and new bridge, and demolition of the existing pedestrian bridge. Potential construction impacts could occur from land clearing, excavation, grading, and fill placement activities that permanently remove, fill, or otherwise change existing upland, wetland, or aquatic habitats.

Specific temporary effects could occur from noise disturbance from pile installation and removal and other construction activities, demolition of the existing pedestrian bridge, turbidity, loss of food resources and habitat, and stormwater runoff. Proposed construction activities are localized and temporary. Long-term effects could occur from the presence of overwater cover, permanent in-water bridge foundations, and disturbances to riparian vegetation.

5.1.1.1 Terrestrial Wildlife Habitat and Species

In general, the severity of direct construction impacts to wildlife species and habitat varies, depending on the type and quantity of affected vegetation. For example, losing plant communities that offer limited wildlife value or losing fragmented ornamental vegetation habitat in park settings results in less of an adverse effect than losing more complex vegetation associations, such as forested riparian areas and wetlands. Most of the Project footprint is composed of developed areas including existing roadways and commercial and industrial development. While vegetated areas comprise a relatively small portion of the overall Project area, some permanent impacts to Wetland A buffer and Wenatchee River riparian buffer habitat will occur.

Potential construction impacts on wildlife habitat and species include temporary and permanent removal or disturbance of vegetation or habitats during construction activities. Permanent impacts include vegetation removal during Project construction activities including the construction of permanent Project features.

Temporary impacts to Wetland A and Wetland A buffer and Wenatchee River riparian habitat have also been avoided where possible; however, some temporary impacts will occur. Temporary impacts to Wetland A and Wetland A buffer and Wenatchee River riparian habitat include vegetation removal during Project construction activities that will not result in permanent Project features, such as staging and stockpiling areas and access routes within and adjacent to these vegetated areas. Temporarily disturbed wetland, wetland buffer, and riparian habitats will be replanted following construction.

Wildlife habitat within the proposed Project footprint includes upland, wetland, wetland buffer, and riparian vegetation communities (Figures 3a through 3d). The majority of the upland habitat is mowed grass and landscape trees and shrubs associated with Wenatchee Confluence State Park. Upland habitat at the Horan Natural Area adjacent to the Apple Capital Recreation Loop Trail is primarily bluebunch wheatgrass (*Pseudoroegneria spicata*). One wetland exists within the Project footprint, Wetland A (Figures 3b and 3c). It includes forested, shrub, and emergent vegetation communities. Wetland A buffer vegetation is mostly grass and herbaceous vegetation near the Apple Capital Recreation Loop Trail with trees and shrubs occurring near the wetland boundary. Riparian vegetation includes forested, shrub, and grass and herbaceous riparian habitat next to the Wenatchee River where the new bridge is proposed. These vegetation communities would be

disturbed within the Project footprint (Figures 3a through 3d). Permanent and temporary impacts to Wetland A, Wetland A buffer, and riparian areas located within the Project footprint based on the current Project design have been identified.

Construction of the new bridge would include riparian vegetation clearing and fill on both sides of the Wenatchee River. Vegetation clearing and fill would also be required between the BNSF right-of-way and the top of the portion of roadway that borders the west edge of the Category I wetland (Wetland A) in the Horan Natural Area. This area includes a combination of existing developed areas and vegetated areas. Potential wildlife corridor movement along the Wenatchee River shoreline is currently inhibited upstream of the proposed new bridge in the location of the BNSF and SR 285/North Wenatchee Avenue bridge locations in addition to existing BNSF tracks, agricultural land use, and development upstream of the SR 285/North Wenatchee Avenue bridge.

Permanent construction impacts to Wetland A have been avoided. Permanent construction impacts to Wetland A buffer and Wenatchee River riparian habitat have been avoided where possible. A 100-foot distance from the OHWM is the protective riparian buffer width of the Wenatchee River based on the City of Wenatchee Shoreline Master Program regulations for the Urban Conservancy environment (City of Wenatchee 2014). This buffer is intended to protect ecological functions of the open space within the urban setting. Wenatchee River riparian habitat impacts are identified for 200 feet from the Wenatchee River OHWM to provide the vegetated width of the riparian habitat in addition to the local jurisdictional width. Wetland A buffer impacts include the vegetated areas from the Wetland A boundary to developed areas. Tables 5-1 and 5-2 summarize the permanent and temporary impacts to the riparian habitat of the Wenatchee River, respectively. Tables 5-3 and 5-4 summarize the permanent and temporary impacts to Wetland A and the Wetland A vegetated buffer, respectively.

Table 5-1
Summary of Permanent Impacts to Wenatchee River Riparian Habitat

Resource Category	Permanent Impact Area 0 feet to 100 feet from OHWM	Permanent Impact Area 100 feet to 200 feet from OHWM	Total Permanent Impact Area
Wenatchee River Riparian Habitat Left Bank	0.12 acre	0.42 acre	0.54 acre
Wenatchee River Riparian Habitat Right Bank	0.12 acre	0.25 acre	0.37 acre
Total	**0.24 acre**	**0.67 acre**	**0.91 acre**

Table 5-2
Summary of Temporary Impacts to Wenatchee River Riparian Habitat

Resource Category	Temporary Impact Area 0 feet to 100 feet from OHWM	Temporary Impact Area 100 feet to 200 feet from OHWM	Total Temporary Impact Area
Wenatchee River Riparian Habitat Left Bank	0.44 acre	0.18 acre	**0.62 acre**
Wenatchee River Riparian Habitat Right Bank	0.35 acre	0.18 acre	**0.53 acre**
Total	**0.79 acre**	**0.36 acre**	**1.15 acre**

Table 5-3
Summary of Permanent Impacts to Wetland A and Wetland A Buffer

Resource Category	Permanent Impact Area
Wetland A	0.00 acres
Wetland A Buffer	2.22 acres

Table 5-4
Summary of Temporary Impacts to Wetland A and Wetland A Buffer

Resource Category	Temporary Impact Area
Wetland A	0.10 acre
Wetland A Buffer	0.93 acre

Temporarily disturbed wetland, wetland buffer, and riparian habitats would be replanted with native species following construction. As there are no permanent wetland impacts identified based on the conceptual design, no wetland mitigation for permanent wetland impacts is required or proposed. The proposed mitigation provides compensatory mitigation for unavoidable permanent impacts to wetland buffer and riparian habitat associated with the Project in accordance with the City critical areas ordinance requirements (Wenatchee City Code 12.08.130). Mitigation for temporary and permanent impacts to Wetland A, Wetland A buffer, and riparian habitats are described in the *Wetland and OHWM Delineation Report* (Appendix B).

Clearing native vegetation for construction would eliminate and modify existing wildlife habitat of native wildlife species that use these areas to breed, forage, and rest. Such impacts to habitats would displace or eliminate wildlife that currently depend on this vegetation. Wildlife habitat within the Project footprint is located within a developed and populated area of Wenatchee. Most wildlife species (e.g., birds, raccoons, and coyotes) are able to move away from areas of disturbance.

Displaced animals with portions of their habitat cleared could potentially perish if nearby undisturbed habitats are at carrying capacity or suitable alternative habitat is unavailable. Small mammals, amphibians, and reptiles, however, could be directly affected by construction because of their limited mobility. Individuals of such species could perish during construction operations.

For more transient construction disturbances, such as increased noise levels from construction machinery, vehicle usage, and pile driving, some wildlife species would adapt to these disruptions (e.g., birds and mammals that are habituated to human disturbance), and some species would successfully relocate to other suitable habitat (e.g., larger mammals and birds). Some less mobile wildlife species (e.g., small mammals, amphibians, and reptiles) would be unsuccessful in adapting or relocating, and their ability to find adequate shelter and foraging and breeding habitat would be constrained. Elevated noise levels can cause a variety of stressors to wildlife including acoustic masking of vocalizations, reduced transmission distance of vocalizations, reduced ability to find prey or increased predation, and increased stress response. Heavy equipment use during road construction and pile driving during the new bridge construction are expected to cause the greatest audible and visual disturbance to wildlife.

Emissions from construction equipment may also cause direct effects to wildlife species. Air emissions generated by Project construction activities will consist of exhaust emissions from the operation of construction equipment and construction vehicles and fugitive dust particles from ground disturbance associated with construction of the Project. Given the landscape and open area of the Project area, emissions are anticipated to dissipate into the open air relatively quickly. The Project will be constructed in accordance with the Federal Clean Air Act, Emission Standards for Non-Road Diesel Engines, Washington Clean Air Act, and Washington Ambient Air Quality Standards to minimize the potential direct effects of emissions on wildlife (Anchor QEA 2020d).

5.1.1.1.1 ESA Threatened and Endangered Terrestrial Wildlife Species

The BA analysis determined that suitable habitat for ESA-listed wildlife species or plants is not present within miles of the Project footprint, and ESA-listed wildlife or plant species have not been documented and are unlikely to occur within miles of the Project footprint. The proposed Project effect determination for the wildlife and plant species addressed in the BA is no effect (Anchor QEA 2020b).

5.1.1.2 Aquatic Habitat and Species

Potential direct construction impacts to aquatic habitat and species could occur from noise disturbance from pile installation and removal and other construction activities below OHWM including turbidity, loss of food resources and habitat, stormwater runoff, fish exclusion, and disturbance. Construction of the bridge will include permanent bridge foundations below the OHWM of the Wenatchee River.

Exposing soil and removing vegetation could result in an increase in runoff, with the possibility of allowing pollutants to enter the aquatic habitat of the Wenatchee River. Greater runoff could have adverse effects on water quality in aquatic resources within the Project area and downstream aquatic habitats depending on the effectiveness of best management practices (BMPs). The *Water Resources Technical Study* (Anchor QEA 2020c) contains further information.

Aquatic species present within the Project area could be subject to behavioral disturbance and injury during impact and vibratory pile driving activity during new bridge construction. An example of a behavioral change for fish is turning away from the sound source (Popper and Hastings 2009). Fish could respond by delaying foraging and avoiding the Project footprint. Noise and disturbance resulting from vibratory and impact pile driving activities could potentially result in behavioral or injurious effects on fish (Popper et al. 2014; Popper and Hastings 2019).

Turbidity will temporarily increase during construction due to substrate disturbance from the bridge construction work and the demolition of the pedestrian bridge below OHWM. Appropriate conservation measures and BMPs will be used to minimize substrate disturbance and turbidity, including measures such as using silt curtains or other barriers to prevent the spread of turbid water. Additionally, water quality will be monitored during construction to comply with the Ecology 401 Water Quality Certification and other permit requirements. Once construction is complete, there should be no further causes of elevated turbidity associated with the Project.

During construction, the proposed Project would result in disturbances to the substrate and benthic community. Additional habitat modification would occur as a result of the temporary work trestle that will be needed for construction of the new bridge, placement of three permanent drilled shaft foundations, and demolition of the existing pedestrian bridge.

Construction of the bridge foundations would include construction and fill below the OHWM of the Wenatchee River. Temporary in-water construction impacts include the area of the temporary piles installed for the work trestle. Permanent in-water construction impacts include the area of the permanent casings for the drilled shaft foundations. Cofferdams are temporary casings that will be located around the permanent casings to enclose the shaft foundation work areas. In-water temporary and permanent excavation and fill activities for new bridge construction are presented in Table 5-5.

Table 5-5
Summary of New Bridge Construction Fill and Excavation within the Wenatchee River Below the OHWM

Project Element	Duration of Impact	Area of Wenatchee River Directly Affected (square feet)
New bridge work trestle construction	Temporary, installation in the first in-water work window and removal in the second in-water work window	2,520
New bridge foundation construction	Permanent	235
Cofferdam installation	Temporary, for one in-water work window	462

The existing pedestrian bridge would be demolished following completion of the new bridge construction so that pedestrian access across the river will remain unimpeded during the Project. If time allows, the pedestrian bridge demolition would occur during the second in-water work window, but a third in-water work window to perform the demolition may be necessary. Demolition of the existing pedestrian bridge would include construction below the OHWM of the Wenatchee River. Temporary in-water construction impacts include the area of the temporary piles installed for the work trestle and the area of the cofferdams for bridge support removal. The temporary work trestle, associated piles, and the cofferdams would be installed and removed during the second in-water work window if possible, unless a third in-water work window is necessary. In-water temporary excavation and fill activities for the pedestrian bridge demolition are presented in Table 5-6.

Table 5-6
Summary of Pedestrian Bridge Demolition-Related Construction Fill and Excavation within the Wenatchee River Below the OHWM

Project Element	Duration of Impact	Area of Wenatchee River Directly Affected (square feet)
Pile supports for temporary work trestle	Temporary, installation in the first in-water work window and removal in the second in-water work window if possible. A third in-water work window may be needed to allow for demolition of the pedestrian bridge.	2,331
Cofferdams for bridge support removal	Temporary, installation in the first in-water work window and removal in the second in-water work window if possible. A third in-water work window may be needed to allow for demolition of the pedestrian bridge.	1,200

5.1.1.2.1 ESA-Listed Aquatic Species

Although the Project is intended to be constructed during the time of year when the ESA-listed aquatic species Chinook salmon, steelhead, and bull trout are largely absent from the Project area, there could still be late migrating juveniles rearing in areas and adult fish present in the Columbia River. The BA analysis determined that elevated underwater sound pressure levels during in-water pile installation and removal construction activities could result in behavioral disturbances or injury to ESA-listed aquatic species. The proposed Project effect determination for the aquatic species addressed in the BA is that this Project may affect, and is likely to adversely affect ESA-listed aquatic species (Anchor QEA 2020b).

The BA analysis determined that the effect determination for Chinook salmon, steelhead, and bull trout critical habitat located in the Project area is that this Project may affect, and is likely to adversely affect critical habitat for these species.

5.1.2 Indirect Impacts

5.1.2.1 Terrestrial Wildlife Habitat and Species

Indirect impacts are potential effects that would be caused by the Project at a later time or farther distance, but are still reasonably foreseeable to occur. Indirect impacts may also occur through the implementation of mitigation measures for environmental impacts from other resources as part of this Project or through supporting projects that are not yet defined or considered part of the Project. The proposed Project includes road and new bridge construction within a developed and populated area of Wenatchee. No significant indirect impacts associated with the movement or migration of wildlife are identified. The only potential migratory corridors from the Project area to other undeveloped vegetated areas is the riparian habitat of the Wenatchee River. The vegetated riparian habitat is relatively narrow, ranging from about 200 feet wide to less than 50 feet wide. Existing bridges near the Project area include the BNSF rail bridge, Highway 2 bridge, and Apple Capital Recreation Loop Trail pedestrian bridge. In addition, the shoreline upstream of the Project area includes residential and agricultural land uses. No potential indirect impacts to wildlife habitat and species or ESA-listed wildlife species are identified.

5.1.2.2 Aquatic Habitat and Species

Indirect impacts from potential leaks or spills during hazardous material storage or use or due to fluid leaks from construction machinery during the construction process could travel downstream in the Wenatchee and Columbia rivers beyond the Project area and could potentially impact aquatic habitats and species. These potential impacts would be minimized with conservation measures and BMPs such as implementation of a Spill Prevention, Control, and Countermeasures Plan and a Temporary Erosion and Sediment Control plan.

5.2 Operational Impacts

5.2.1 Direct Impacts

5.2.1.1 Terrestrial Wildlife Habitat and Species

Potential operational impacts on wildlife habitat and species associated with the Project would be related principally to ambient noise levels associated with vehicle use of the new roadway and bridge. The new bridge and roadway will result in increased vehicle traffic closer to the Horan Natural Area. Wildlife species in the Horan Natural Area that are sensitive to increased traffic may avoid areas near the new bridge and roadway. Noise levels associated with operation after construction are expected to be generally consistent with current ambient noise levels. Within the Project area the BNSF rail tracks and industrial properties are currently located adjacent to the Horan Natural Area, and SR 285 is located about 500 feet from the Horan Natural Area.

Periodic maintenance activities associated with the Apple Capital Recreation Loop Trail, such as mowing adjacent to the trail, would be consistent with existing current conditions.

5.2.1.1.1 ESA-Listed Terrestrial Wildlife Species

No potential impacts on ESA-listed wildlife species associated with operation of the Project are anticipated.

5.2.1.2 Aquatic Habitat and Species

The quantity and quality of stormwater runoff could be affected by operation of the proposed Project because of the increase in impervious surfaces. This could result in impacts on aquatic habitat and species. Water quantity is not expected to significantly change due to the Project. There may be minor increases in peak flows due to an increase in approximately 7.5 acres of impervious area that drain to the Wenatchee River or the Columbia River, but these flows are likely minor relative to the flow in the rivers. Stormwater runoff management measures will include infiltration, treatment, and flow control, as described in the Project Preliminary Stormwater Report (KPG 2021). Infiltration facilities will collect stormwater runoff that does not discharge to the Columbia or Wenatchee rivers.

Stormwater runoff generated by the Project would enter surface waters and potentially cause deleterious effects on aquatic species receiving runoff. An increase of PGIS could cause an increase in pollutants in stormwater runoff, which could impact water quality in the Wenatchee and Columbia rivers. These impacts would be minimized through the construction of new stormwater facilities that will be installed along the entire Project corridor to treat stormwater runoff from Project PGIS using technology to remove sediments and associated pollutants as required by the August 2019 *Stormwater Management Manual for Eastern Washington* and Wenatchee City Code Chapter 9.20, as described in the Project Preliminary Stormwater Report (KPG 2021). Treated stormwater will be

discharged to the Columbia River and the Wenatchee River using existing outfalls. Incorporating water quality treatment measures at existing outfalls will likely have a positive overall effect on stormwater treatment by directing previously untreated surface runoff to these facilities. Short- and long-term stormwater effects to listed fish species are considered negligible. Table 5-7 summarizes the changes in impervious surface associated with the Project.

Table 5-7
Project Impervious Surface

New NPGIS	Replaced NPGIS	New PGIS	Replaced PGIS
2.57 acres	2.39 acres	6.77 acres	10.85 acres

NPGIS: non-pollution-generating impervious surface

Overwater shading could also result from the new bridge itself. The lowest point of the underside of the new bridge would be located at an elevation of about 635 feet, about 13 feet above the OHWM of the Wenatchee River and about 3 feet above the approximate Wenatchee River 100-year flood elevation of 632 feet. Table 5-8 summarizes the overwater cover of the new bridge over the Wenatchee River.

Table 5-8
Summary of Temporary and New Bridge Overwater Cover

Project Element	Duration of Impact	Area over Wenatchee River (square feet)
Work trestle	Temporary, installation in the first in-water work window and removal in the second in-water work window	17,850[1]
New bridge	Permanent	16,800[2]

Notes:

1. Trestle overwater cover: 475 feet by 30 feet plus three trestle extensions of 1,200 feet each for a total of 17,850 square feet
2. Bridge overwater cover: 32 feet wide by 525 feet long for a total of 16,800 square feet

Overwater coverage can discourage migrating juvenile fish from using shallow-water areas and promote refuges for piscivorous predators. Shading can also discourage benthic and epibenthic prey productivity, decreasing prey availability for juvenile fish. However, the reach of the Wenatchee River where the new bridge will be located is swiftly flowing river habitat with limited pool habitat for predators to have the opportunity to prey on juvenile fish, which generally migrate quickly through the Project area. The elevation of the new bridge would be approximately 13 feet above the OHWM at the lowest point of the new bridge. Potential overwater shading impacts to listed fish species or prey species from the new bridge structure are expected to be discountable.

Impacts resulting from accidental spills of hazardous materials could also affect aquatic habitat and species through degradation of water quality, but these potential impacts are not expected to be greater than the current potential for accidental spills. Operation of the new roadway and bridge would have negligible impacts on aquatic habitat and species if proper drainage and erosion control plans are implemented. The *Water Resources Technical Study* (Anchor QEA 2020c) contains further information.

5.2.1.2.1 ESA-Listed Aquatic Species

Potential stormwater runoff impacts on ESA-listed aquatic species associated with operation of the Project are described in the previous subsection for aquatic habitat and species.

5.2.2 Indirect Impacts

No indirect impacts to wildlife habitat and species, aquatic habitat and species, or ESA-listed wildlife and aquatic species associated with operation of the Project are anticipated.

5.3 Cumulative Impacts

Cumulative impacts on wildlife habitat and species, and aquatic habitat and species from the Project were determined by combining the Project's impacts with other past, present, and reasonably foreseeable future actions. As transportation corridors improve, access to occupied and vacant areas may increase per local land use plans and policies. This increase in access can lead to further development and concurrent impacts on wildlife and aquatic habitats as land is cleared for development of residential, industrial, and commercial properties. The proposed Project is located within a developed area of Wenatchee. Development in the vicinity of the Project area is likely to occur without the new road improvements proposed for this Project. Potential cumulative impacts are expected to be similar to those described in previous sections.

5.4 Mitigation

The following conservation measures and BMPs will be employed during construction of the Project that would minimize and mitigate for impacts to wildlife habitat and species and aquatic habitat and species:

- All applicable permits for the Project will be obtained prior to construction. All work will be performed according to the requirements and conditions of these permits.
- The contractor will be responsible for the preparation and implementation of a Spill Prevention, Control, and Countermeasures (SPCC) plan to be used for the duration of the Project. The plan will be submitted to the Project engineer prior to the commencement of any construction activities. A copy of the plan with any updates will be maintained at the work site by the contractor.

  - The SPCC plan will identify construction planning elements and recognize potential spill sources at the site. The plan will outline responsive actions in the event of a spill or release and will identify notification and reporting procedures. The plan will also outline contractor management elements such as personnel responsibilities, Project site security, site inspections, and training.
  - The SPCC plan will outline which measures the contractor will take to prevent the release or spread of hazardous materials either found on site or encountered during construction but not identified in contract documents, or any hazardous materials that the contractor stores, uses, or generates on the construction site during construction activities. These items include, but are not limited to, gasoline, oils, and chemicals. Hazardous materials are defined in the Revised Code of Washington 70.105.010 under "hazardous substance."
  - The contractor will maintain at the job site the applicable equipment and materials designated in the SPCC plan.
- Excess or waste materials will not be disposed of or abandoned waterward of the OHWM or allowed to enter waters of the state.
- No petroleum products, fresh cement, lime or concrete, chemicals, or other toxic or deleterious materials will be allowed to enter surface waters.
- Erosion control measures will be addressed in a Temporary Erosion and Sediment Control plan prepared by the contractor and adhered to during construction activities.
- Demolition and construction materials will not be stored where upland runoff can cause materials to enter surface waters.
- Cleared areas will be restored by replanting the areas with appropriate native herbaceous and woody species, as practicable.
- Clearing limits will be demarcated with orange barrier fencing wherever clearing is proposed in or near critical areas.
- All engine-powered equipment will be required to have mufflers that were installed according to the manufacturer's specifications.
- All equipment will be required to comply with pertinent U.S. Environmental Protection Agency equipment noise standards.
- All staging areas will be located outside of rivers, wetlands, and their buffers.
- Noise walls or earthen berms will be installed between the roadways and the Horan Natural Area, which will decrease operational impacts on ecosystems.
- Impacts to Wetland A, the Wetland A buffer, and riparian habitat will be mitigated as described in the *Wetland and OHWM Delineation Report* (Appendix B).

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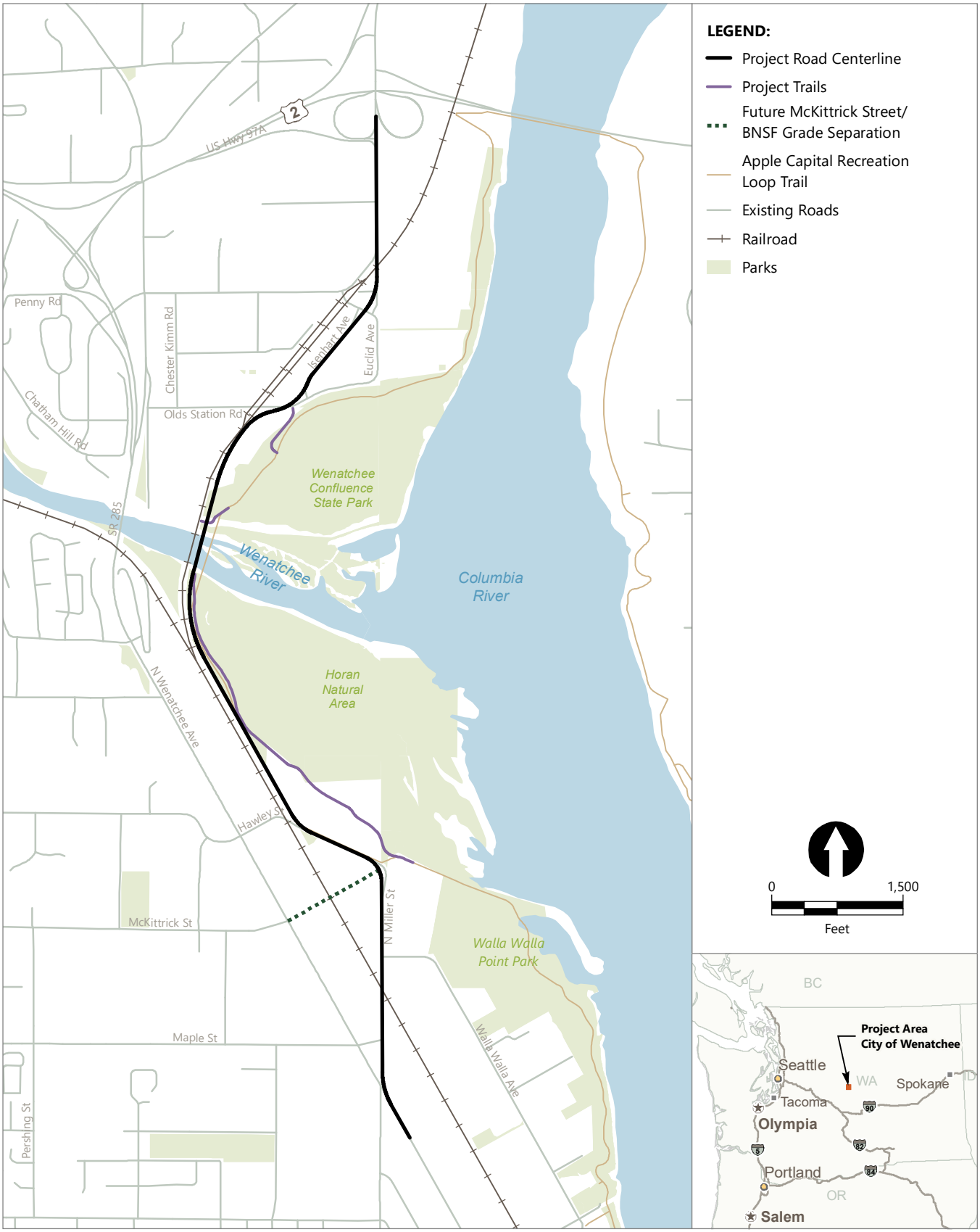

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Figure 1
Project Vicinity
Ecosystems Technical Study
Confluence Parkway Project

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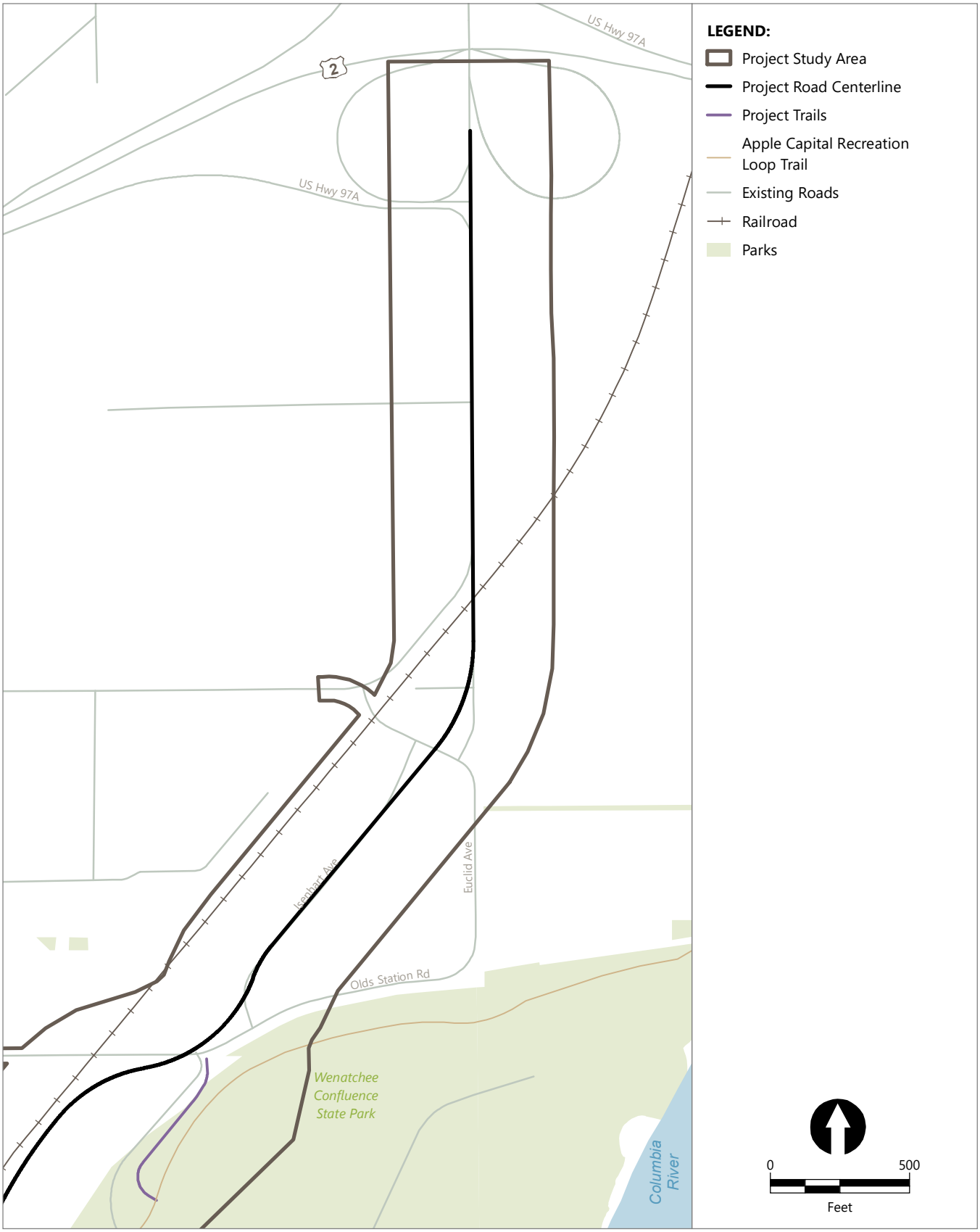

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Figure 2a
Project Study Area – Euclid/SR 2 Interchange to Wenatchee Confluence State Park
Ecosystems Technical Study
Confluence Parkway Project

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Figure 2b
Project Study Area – Wenatchee Confluence State Park Vicinity
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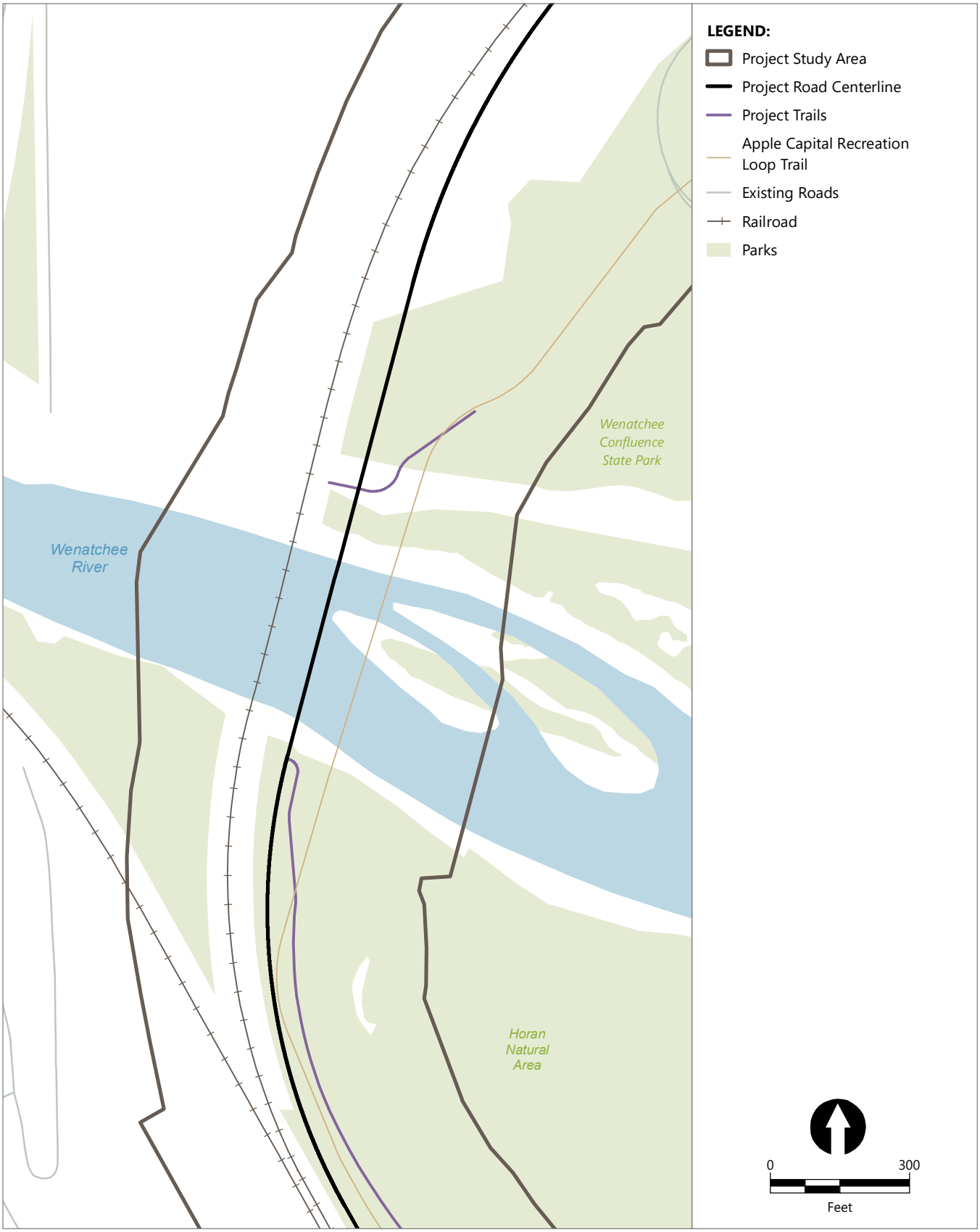

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Figure 2c
Project Study Area – Wenatchee River Crossing
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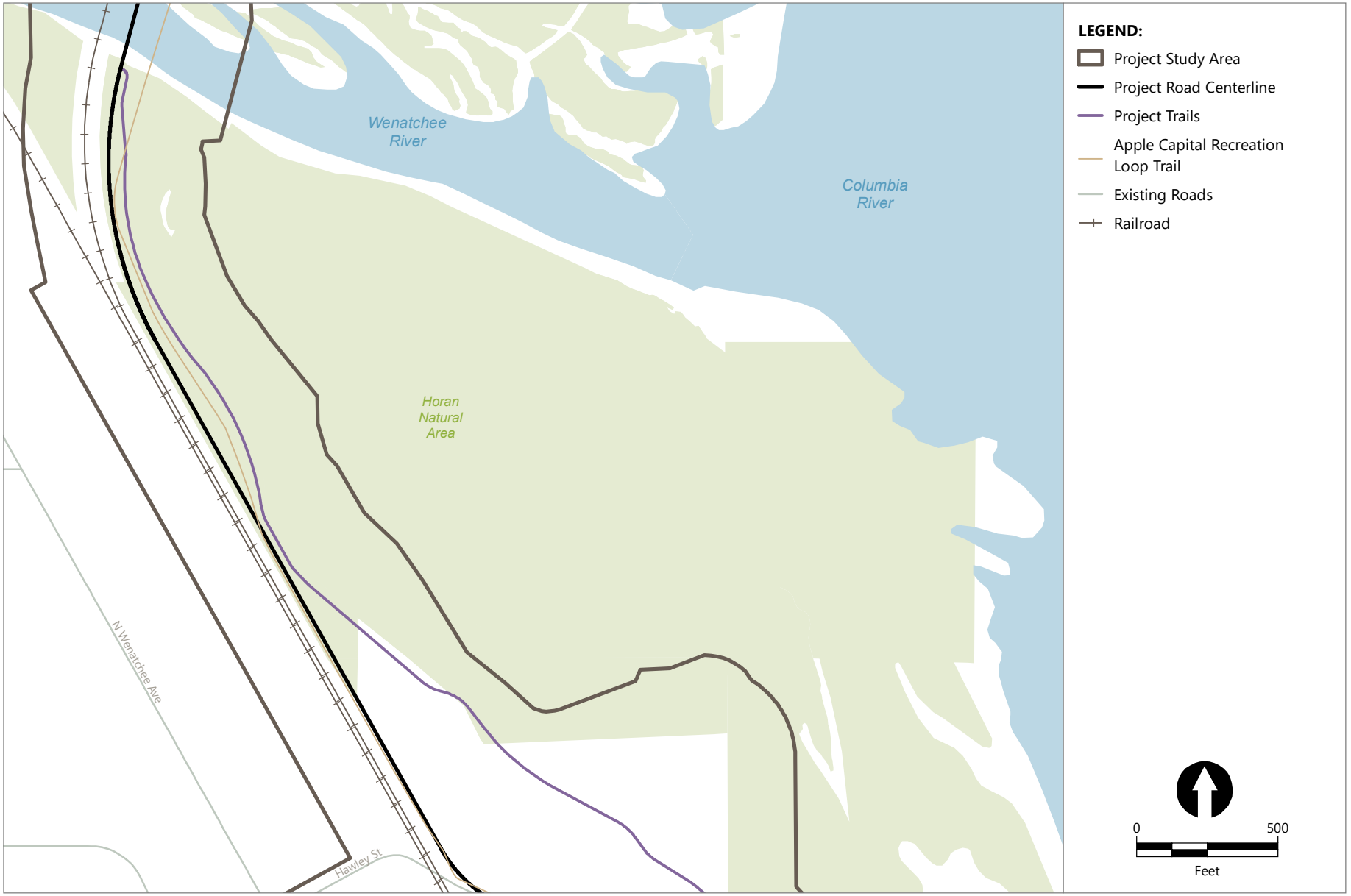

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Figure 2d
Project Study Area – Horan Natural Area Vicinity
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Confluence Parkway Project

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Figure 2e
Project Study Area – McKittrick Street to North Mission Street
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Confluence Parkway Project

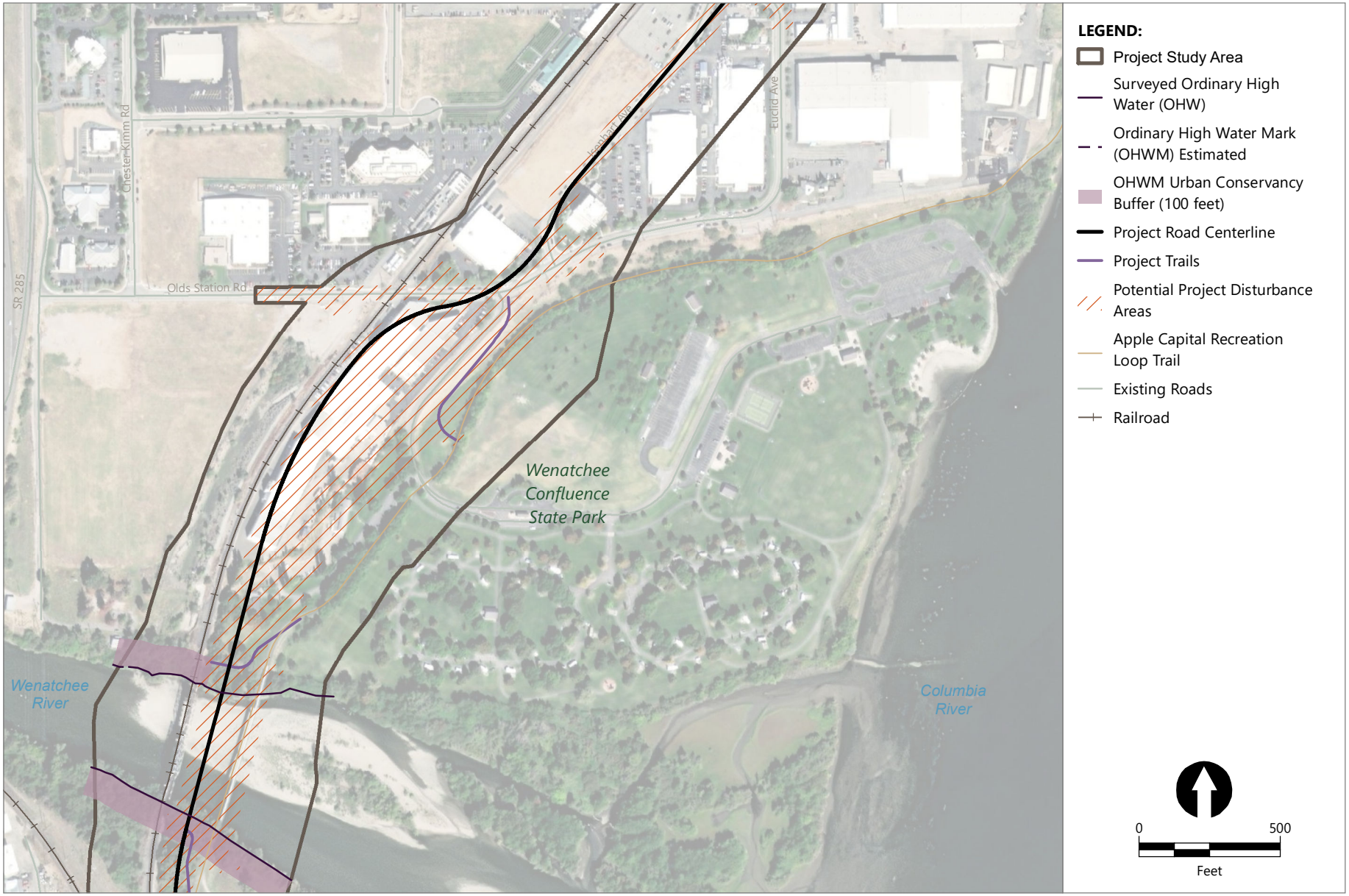

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Figure 3a
Aerial Photograph of Undeveloped Features – Wenatchee Confluence State Park Vicinity
Ecosystems Technical Study
Confluence Parkway Project

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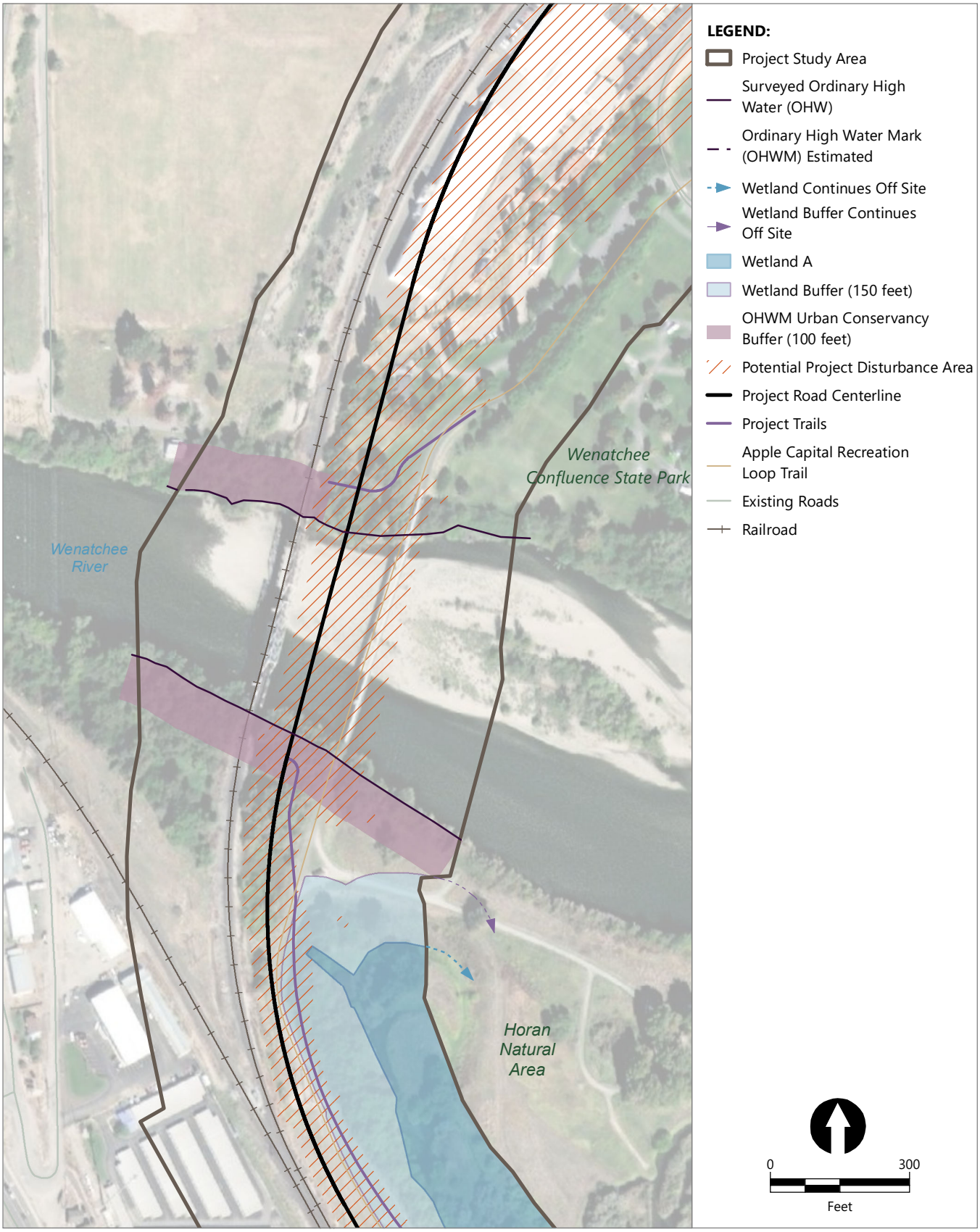

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Figure 3b
Aerial Photograph of Undeveloped Features – Wenatchee River Crossing
Ecosystems Technical Study
Confluence Parkway Project

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Figure 3c
Aerial Photograph of Undeveloped Features – Horan Natural Area Vicinity
Ecosystems Technical Study
Confluence Parkway Project

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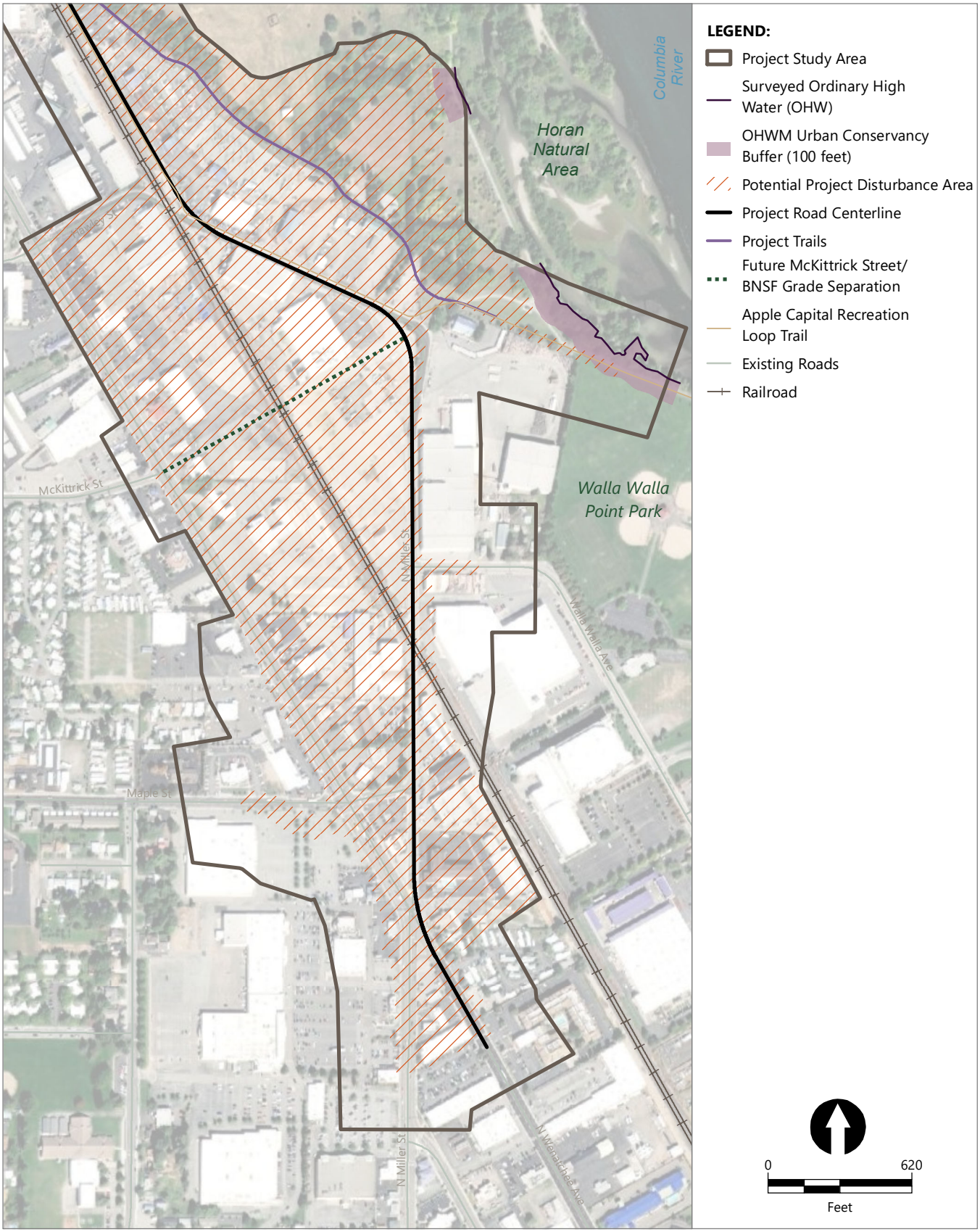

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Figure 3d
Aerial Photograph of Undeveloped Features – McKittrick Street to North Mission Street
Ecosystems Technical Study
Confluence Parkway Project

Appendix A
Project Description

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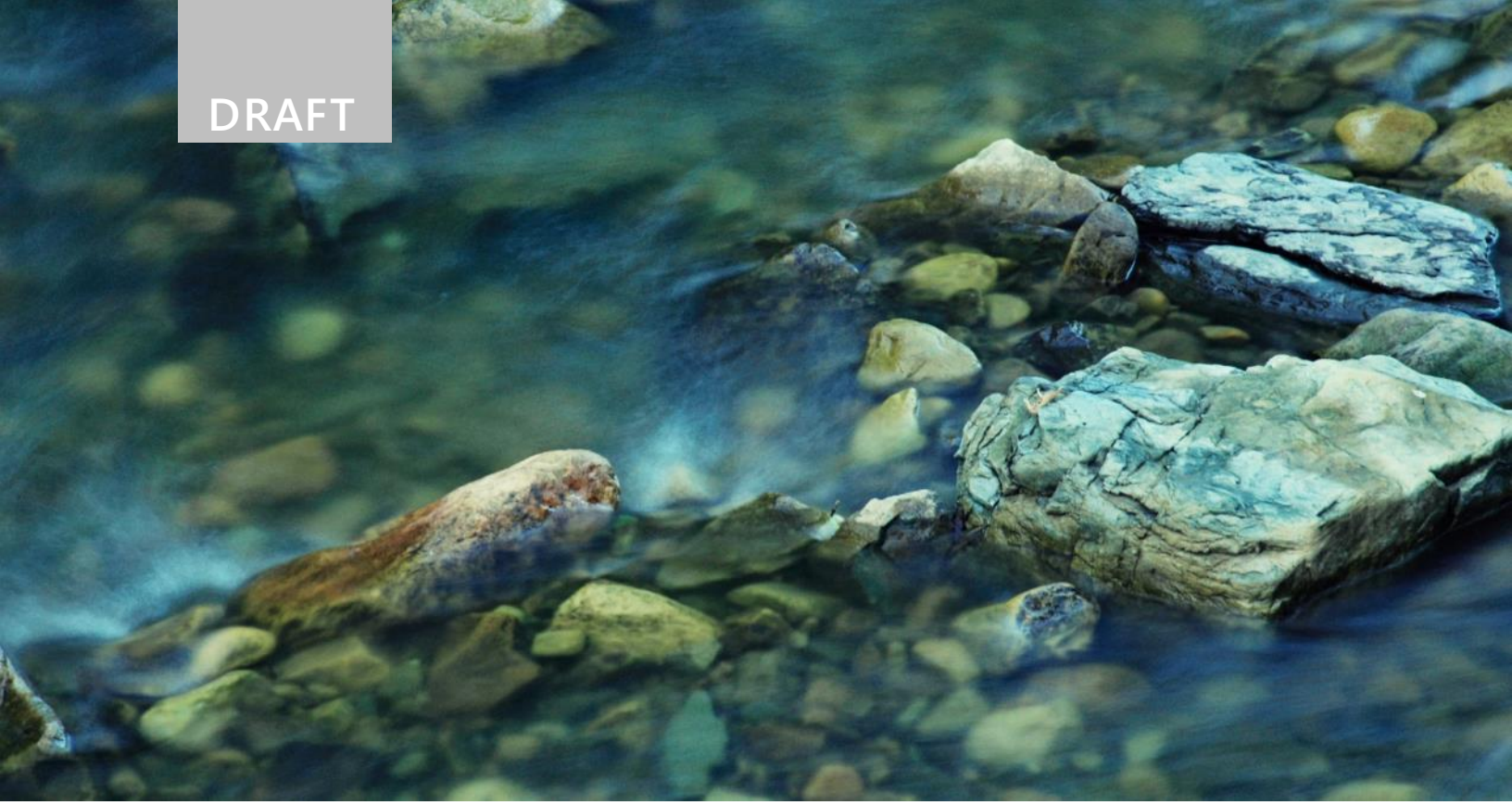

May 2021
Confluence Parkway Project

ANCHOR QEA

Project Description

Prepared for City of Wenatchee

DRAFT

May 2021
Confluence Parkway Project

Project Description

Prepared for
City of Wenatchee
1350 McKittrick Street, Suite A
Wenatchee, Washington 98801

Prepared by
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Wenatchee, Washington 98801

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FIGURES

ABBREVIATIONS

ADA	Americans with Disabilities Act of 1990
BNSF	Burlington Northern Santa Fe
Chelan PUD	Public Utility District No. 1 of Chelan County

1 Introduction

The Project is a proposed 2.5-mile bypass corridor that is intended to reduce vehicle congestion on SR 285/North Wenatchee Avenue. The Project is a part of a larger effort known as the Apple Capital Loop Project, which is a network of projects that, together, will complete an integrated highway, transit, and non-motorized trail loop that functions as the backbone of the Wenatchee Valley's transportation system. The Project will provide relief from the current North Wenatchee Avenue Bridge bottleneck and alleviate congestion in this area.

The Project connects the central downtown area with the U.S. 2/Euclid Avenue interchange on the north end of Wenatchee. The Project area is primarily to the east of the Burlington Northern Santa Fe (BNSF) railroad tracks with a large portion adjacent to the Wenatchee Confluence State Park, including the Horan Natural Area. The sections that follow provide a description of key Project elements and construction methods.

1.1 Location

The Project is located in the City of Wenatchee in Chelan County (Figure 1). Wenatchee is located in a valley in central Washington at the confluence of the Columbia and Wenatchee rivers. Currently, Wenatchee is the largest city in north-central Washington and is an urban hub for the region.

1.2 Project Elements

1.2.1 Roadway Alignment

Confluence Parkway would be a new two-lane arterial street that would begin at the existing U.S. 2/ Euclid Avenue interchange, cross the Wenatchee River on a new bridge, and extend south to the intersection of North Miller Street and SR 285/North Wenatchee Avenue. The corridor would have one vehicle travel lane and bicycle lane in each direction. Two-way left turn lanes would be included between Wenatchee Confluence State Park and the U.S. 2/Euclid Avenue interchange as well as south of the junction of Hawley Street and North Miller Street. All Project elements would meet current design standards, including compliance with the Americans with Disabilities Act of 1990 (ADA), where applicable. New traffic signals, illumination upgrades, and safety measures for at-grade railroad crossings would be part of the Confluence Parkway.

Traffic signals would be installed at, and other modifications made to, the existing U.S. 2/Euclid Avenue interchange to accommodate the additional traffic associated with the Confluence Parkway (Figure 2a). The new roadway would continue southwest along the existing Euclid Road alignment, cross the railroad tracks on a new at-grade railroad crossing at Euclid Avenue, and follow along the existing Isenhart Avenue alignment. The existing at-grade crossing at Penny Road would remain and the intersection of Confluence Parkway with Euclid Avenue would be upgraded from a three-leg to

four-leg intersection to accommodate the through movement on the Confluence Parkway. From there, the new roadway would continue south along the current alignment of Isenhart Avenue to Olds Station Road (Figure 2b). Olds Station Road would end on the west side of the railroad in a cul-de-sac and the at-grade railroad crossing would be removed.

South of Isenhart Avenue, the new road would turn slightly west and continue through the west side of the existing McDougall & Sons warehouses. The existing Wenatchee Confluence State Park entrance would remain in its current location. Modifications would be required to the southwestern portion of the park for the roadway. The existing Wenatchee Confluence State Park staff housing will be removed and replaced with a new housing facility within the park.

Confluence Parkway would cross the Wenatchee River on a new bridge approximately midway between the existing BNSF rail bridge and the Apple Capital Recreation Loop Trail pedestrian/bicycle bridge (Figure 2c). The bridge would be a combined two-level vehicle and pedestrian bridge. The top portion would consist of a vehicle travel lane and bike lane in each direction, and the bottom would consist of a shared use bicycle and pedestrian path that replaces the existing narrow and aging pedestrian bridge. The new bridge would include three piers in the water, which would likely be in the same alignment as those on the existing railroad bridge. The existing pedestrian bridge would be removed after the new bridge is open.

From the river crossing south to Hawley Street, Confluence Parkway would create a new roadway along the east side of the BNSF railroad tracks, which are east of and parallel to the existing alignment of North Wenatchee Avenue, requiring a portion of the western edge of the Horan Natural Area (Figure 2d). It would join the existing alignment of Hawley Street just south of where Hawley Street currently crosses the BNSF mainline at-grade. The at-grade crossing would be closed, with Hawley Street becoming a cul-de-sac west of the railroad tracks.

Confluence Parkway would follow the existing alignment of North Miller Street (Figure 2e). The existing North Miller Street at-grade railroad crossing would be replaced with a new railroad underpass. New signals would be installed at the Walla Walla Avenue and Maple Street intersections. The existing SR 285/North Wenatchee Avenue and Miller Street intersection would be reconfigured to accommodate the new traffic volumes associated with Confluence Parkway. Approximately 450 feet south of that intersection, a new street would connect Miller Street and North Wenatchee Avenue with traffic signals at each intersection. These improvements in the vicinity of the existing Miller Street/North Wenatchee Avenue intersection represent the southern end of Confluence Parkway.

1.2.2 Bicycle and Pedestrian Facilities

Confluence Parkway would include bicycle lanes in each direction along its entirety. Bike lane buffers would be provided in the more developed areas of the Project to the south of the existing Hawley Street railroad crossing.

Between the north end of the Project and the Wenatchee Confluence State Park entrance, there would generally be a planted buffer and sidewalk on both sides of the roadway. The Project does not propose sidewalks between the Wenatchee Confluence State Park entrance on the north and Hawley Street on the south because pedestrians will use the parallel Apple Capital Recreation Loop Trail along this stretch of roadway and there are no business or residential properties to generate a need for pedestrian access at the street. The sidewalk and planted buffer would continue between approximately Hawley Street and the southern extent of the Project at North Miller Street and North Wenatchee Avenue.

Connections would be provided between the roadway pedestrian and bicycle facilities and the Apple Capital Recreation Loop Trail at both Walla Walla Park and Wenatchee Confluence State Park. North of the Wenatchee River, pedestrians would connect from the sidewalk to the existing Apple Capital Recreation Loop Trail and would use the new combined vehicle and pedestrian bridge to cross the river.

On the north side of the Wenatchee River, the Apple Capital Recreation Loop Trail would largely remain in its current configuration. The trail would be rerouted slightly to align with the new combined vehicle and pedestrian bridge. A new connection from the street level to the trail will also be provided at the Wenatchee Confluence State Park entrance in order to separate non-motorized trail users from vehicular access to the park.

The trail would cross the Wenatchee River on a new combined vehicle and pedestrian bridge, with a travel lane for vehicles on the top deck and a bicycle and pedestrian lane below. On the south side of the Wenatchee River, the trail would converge with the roadway, running parallel on its east side with a vegetated berm separating the trail from vehicle traffic. Retaining walls would also be installed in this area where necessary to minimize impacts to the Horan Natural Area. At the north end of the Public Utility District No. 1 of Chelan County (Chelan PUD) maintenance yard, located between Hawley Street and Wenatchee Confluence State Park, the trail would diverge from the road alignment, continuing to the south between the Chelan PUD property and the Horan Natural Area. It would converge back with the existing trail near the intersection of Hawley Street and Miller Street and Walla Walla Point Park.

The existing pedestrian bridge would remain open to the extent possible. Portions of the trail may need to be temporarily rerouted during construction. The City of Wenatchee will provide notice to the bicycle commuters and recreational trail users in advance of trail closures or rerouting.

Demolition of the pedestrian bridge will be scheduled to occur after the new bridge is operational, if feasible.

1.2.3 Property Acquisition

The Project would require property acquisition in several areas along the alignment. All acquisitions and relocations would be compliant with the Uniform Relocation Assistance and Real Property Acquisition Act of 1970. A total of approximately 10 acres will be acquired. The acquisition process for most of these properties has not yet begun, except that the City has had preliminary conversations with the owners of the McDougall & Sons warehouses.

Key property acquisitions including those that require building demolition and/or relocations include the following:

- Three residential structures north of Euclid Court, which currently house commercial businesses, would be acquired and demolished to construct the upgrades to the Penny Road/Isenhart Avenue intersection. One additional residential structure in this area may need to be demolished, pending further design.
- The McDougall & Sons warehouses, which are used for apple packing, would be acquired, and most structures would be demolished. The existing office space on the north side of the property would be preserved.
- Approximately 1 acre of the Wenatchee Confluence State Park would be acquired between the park entrance and the new Wenatchee River bridge. The existing park staff housing would be relocated.
- Approximately 3 acres of the Horan Natural Area would be acquired for the Confluence Parkway alignment and the relocated Apple Capital Recreation Loop Trail. An additional 1.5 acres of Chelan PUD property between the railroad tracks and the PUD maintenance yard would also be acquired.
- The drive-through of the Taco Bell located on North Miller Street would be acquired. The property could be reconfigured with the drive through located on a different part of the property. Business relocation is not anticipated.
- The following properties would be acquired in their entirety. The buildings would be removed and the businesses would be relocated.
  - The Igloo bar and restaurant located on North Miller Street.
  - Denny's located on North Wenatchee Avenue.
  - Valley North Service Center gas station located on North Miller Street.

1.2.4 Utilities

Construction of the Confluence Parkway offers opportunities to consolidate utility corridors for sanitary sewer, water, electrical transmission and distribution, telecommunications service, and

natural gas. Portions of existing utility infrastructure would require relocation in coordination with roadway construction.

The existing sanitary sewer force main beneath the Wenatchee River would be relocated to the new Confluence Parkway Bridge and extend from the existing Olds Station Lift Station to the approximate location of the existing at-grade railroad crossing at Hawley Street. A portion of the 30-inch regional waterline would be relocated from its current location beneath the Wenatchee River to be suspended from the Confluence Parkway Bridge. Aerial electrical transmission, distribution, and telecommunications lines would be relocated parallel to and adjacent to the new roadway. Electrical distribution and telecommunications would be installed underground within the roadway right-of-way where feasible. Natural gas relocations are anticipated at some locations where they would otherwise conflict with new gravity stormwater facilities.

1.2.5 Stormwater

New stormwater facilities would be installed along the entire Project corridor. Conveyance and treatment facilities will be designed to meet the requirements of the August 2019 Stormwater Management Manual for Eastern Washington and Wenatchee City Code Chapter 9.20, as described in the Project Preliminary Stormwater Report (KPG 2021).

1.2.6 Relation to the McKittrick Street/BNSF Grade Separation

The McKittrick Street/BNSF Grade Separation is a planned project with independent utility and logical termini, located in the southern portion of the Confluence Parkway Project vicinity, at the intersection of Hawley and North Miller streets. McKittrick Street currently ends in a "T" intersection with North Wenatchee Avenue. It will be extended to the east as a grade-separated underpass of the railroad tracks. The extension will continue to a planned round-about at the intersection of Hawley and North Miller streets. The portion of the McKittrick Street project west of the railroad tracks is funded and scheduled for construction in 2021. The railroad undercrossing and the connection to North Miller and Hawley streets is currently unfunded. The City of Wenatchee is working to secure additional funds.

1.3 Construction Methods and Timing

1.3.1 Construction Methods

Confluence Parkway would include a combination of new road construction and upgrades to the existing roadway. The existing roadway would be preserved to the largest extent possible and will follow the existing alignment and profile. In many areas, construction would include grinding the roadway and placing asphalt in the travel lanes and constructing planters and sidewalks adjacent to the roadway. In other places, construction of the roadway would include the removal of existing

asphalt and concrete surfaces, clearing and grading of adjacent areas, and placing subgrade material to form a stable roadbed. New road surfaces would be primarily asphalt and concrete.

Fill would be required on both sides of the new bridge and in the area where the roadway would be constructed on a new alignment. Fill would also be required between the BNSF right-of-way and the top of the portion of roadway that borders the west edge of the wetlands in the Horan Natural Area. All fill would come from existing off-site, permitted sources.

Construction equipment could include, but is not limited to, cranes, backhoes, excavators, front loaders, pavement grinders, jack hammers, drilling rigs, pile drivers, trucks, and concrete pumping equipment. Staging areas would be located within the right-of-way and adjacent City-owned parcels where possible to allow for parking, large equipment storage, and material stockpiles.

The new bridge across the Wenatchee River would likely be supported on drilled shaft foundations within the river. Drilled shafts are created by installing a steel casing, excavating the soil and sediment from within the casing, and placing steel and concrete within the excavated casing.

Construction of the bridge foundations, columns, pier caps, and girders would require the installation of a temporary, pile-supported work access trestle. The details would be developed as design progresses and would likely consist of driven steel pipe piles with steel framing that support timber decking. This trestle would allow for heavy equipment to access the foundation locations and for the delivery of construction materials. The bridge deck, barriers, and pedestrian walkway would likely be constructed without the need of the trestle. The existing pedestrian/bicycle trail would remain open during construction of the new bridge.

A large portion of Confluence Parkway, including the new bridge structure, would be constructed without requiring road closures or detours as it will be along a new roadway alignment. It is anticipated that Miller Street would be closed during constructing of the railroad underpass, with local access provided via Maple Street to the south and McKittrick Street to the north. Short-term local detours will be required as needed for improvements along existing roadways. The Apple Capital Recreation Loop Trail would be kept open to the extent possible during construction of the roadway and trail realignment.

1.3.2 Project Timing

Construction is anticipated to begin in 2025, depending on availability of funding, and will span multiple years. In-water work will be performed within the allowable in-water work windows established by regulatory agencies to minimize potential disturbance of sensitive fish and wildlife species. It is anticipated that the in-water work window will be from July 15 to September 30 of each year. The temporary work access trestle would remain in the water for a period of up to three in-water work windows.

2 References

KPG, 2021. *Confluence Parkway Project Preliminary Stormwater Report*. Draft Prepared for City of Wenatchee. February 2021.

Figures

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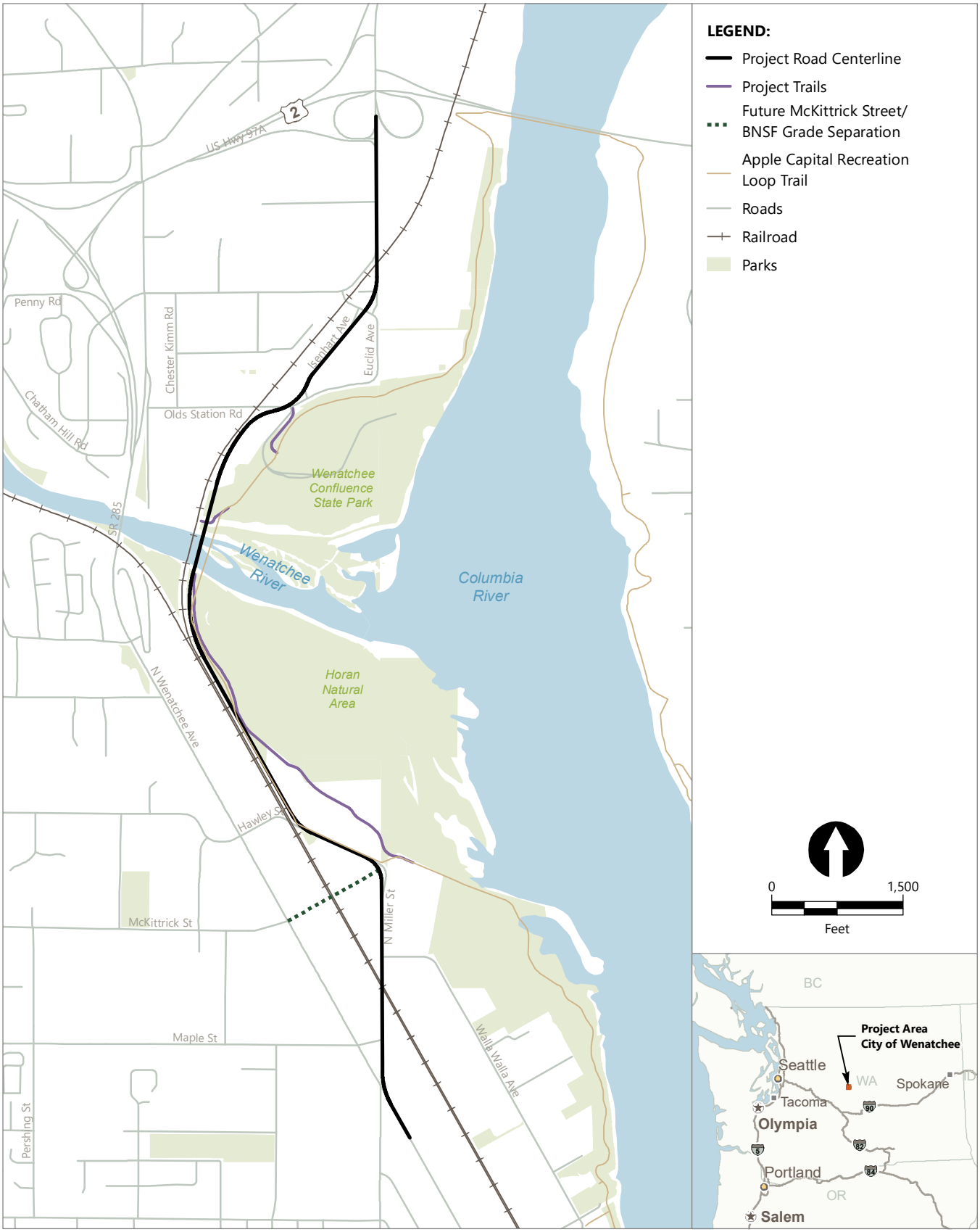

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ANCHOR QEA

Figure 1
Project Vicinity
Confluence Parkway, City of Wenatchee

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Figure 2a
Euclid/SR 2 Interchange to North of Wenatchee Confluence State Park
Confluence Parkway
City of Wenatchee

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Figure 2b
Wenatchee Confluence State Park Vicinity
Confluence Parkway
City of Wenatchee

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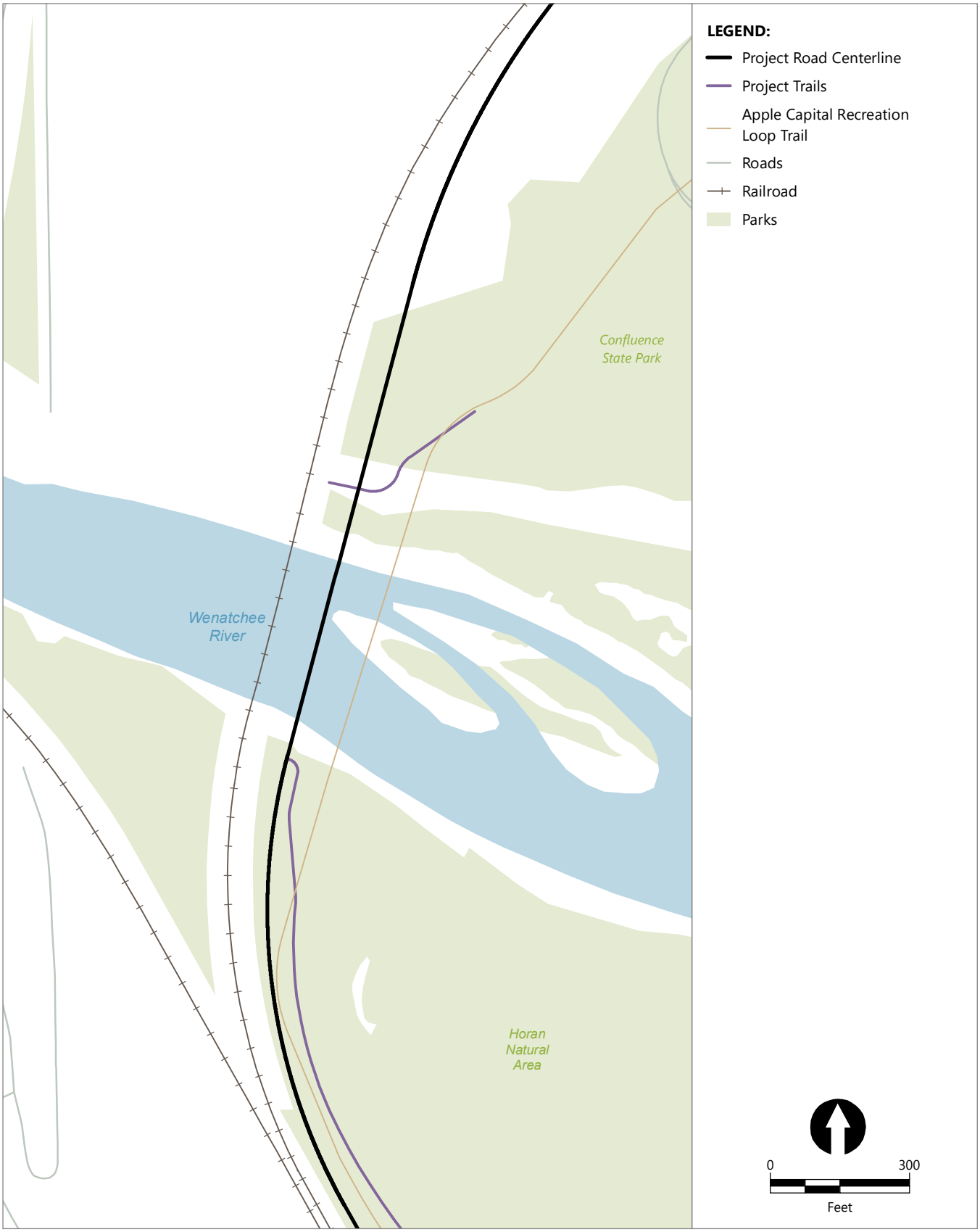

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Figure 2c
Wenatchee River Crossing
Confluence Parkway
City of Wenatchee

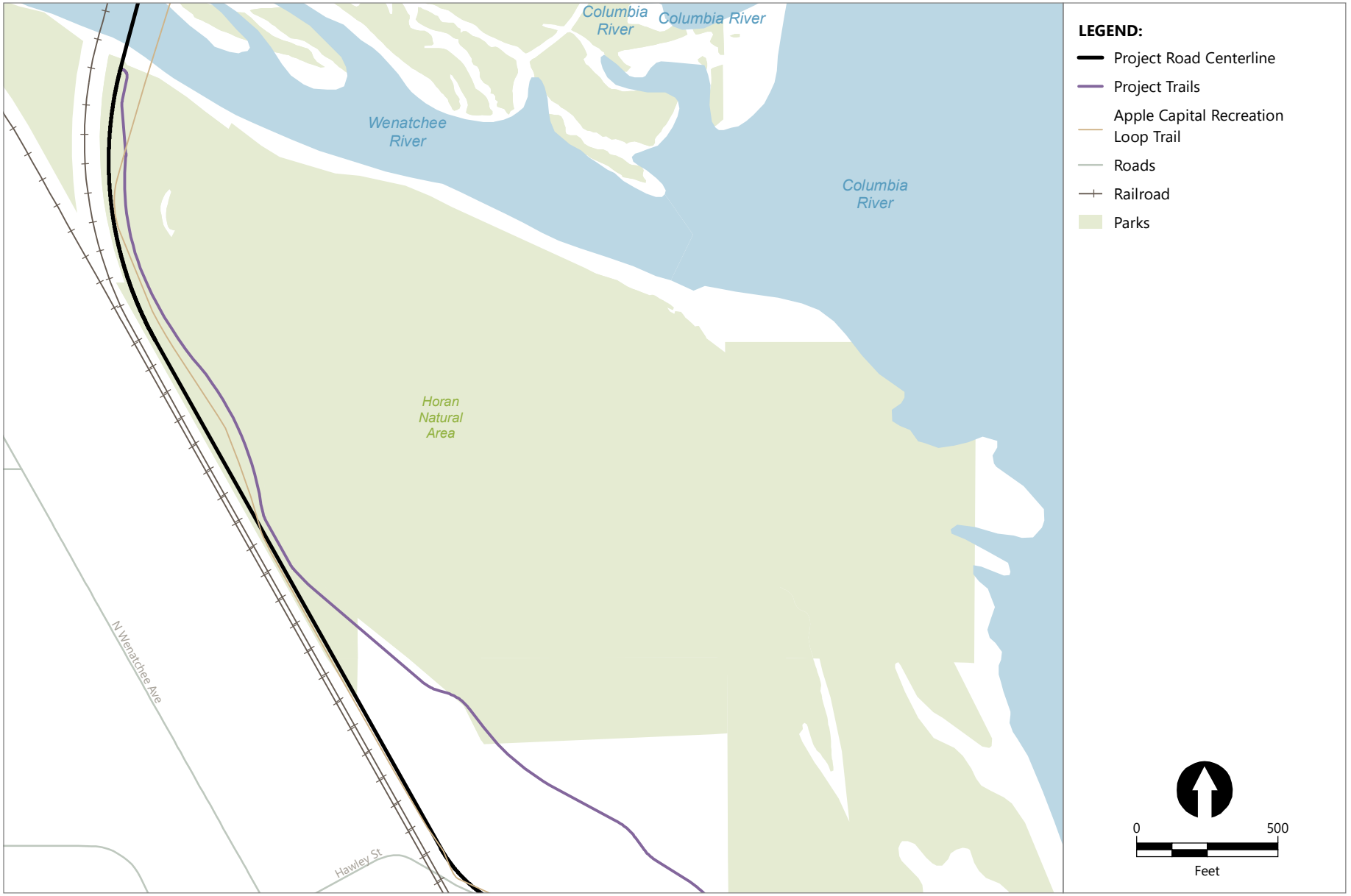

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Figure 2d
Horan Natural Area Vicinity
Confluence Parkway
City of Wenatchee

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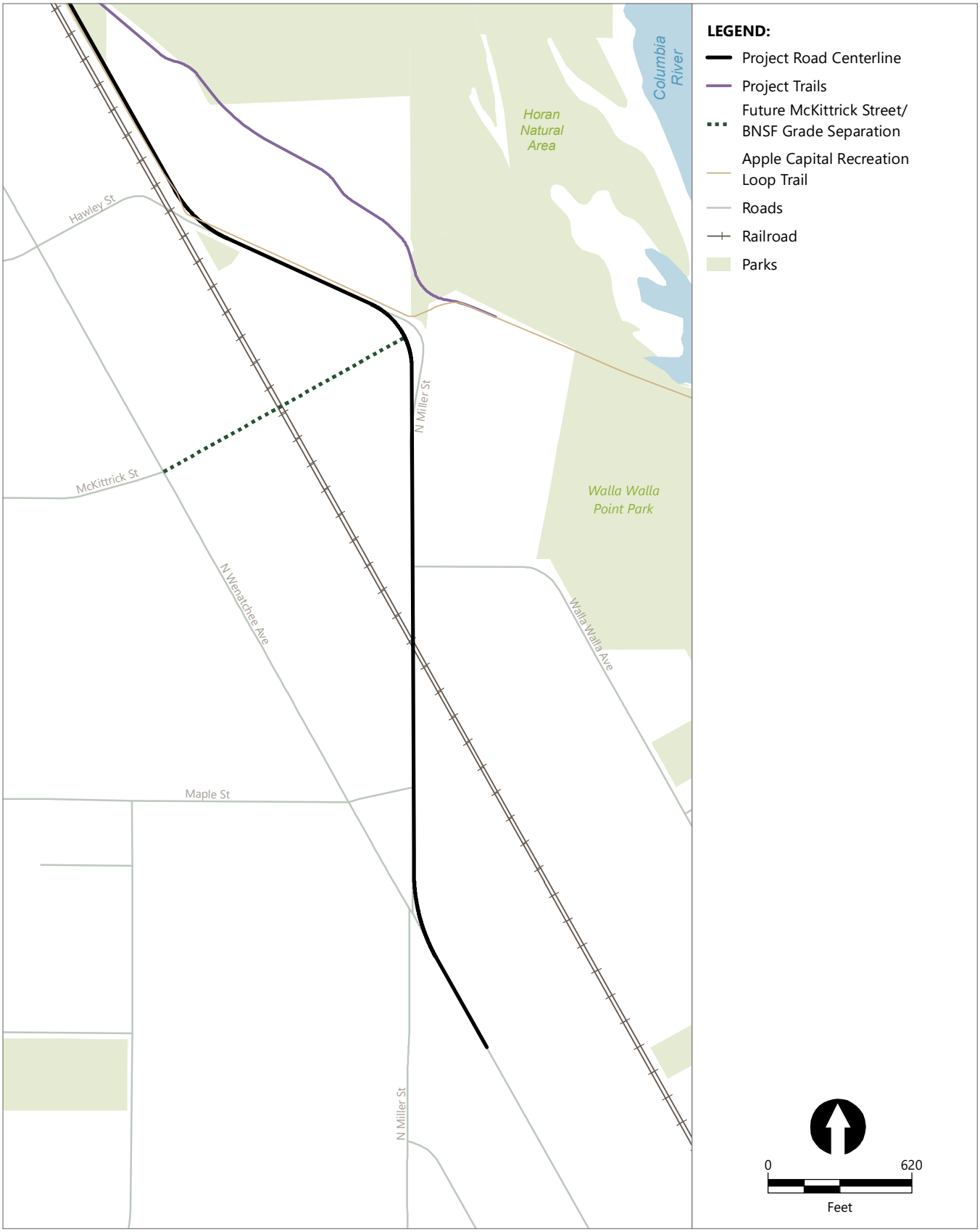

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Figure 2e
McKittrick Street to North Mission Street
Confluence Parkway
City of Wenatchee

Appendix B
Wetland and OHWM Delineation Report

May 2021
Confluence Parkway Project

ANCHOR QEA

Wetland and OHWM Delineation Report

Prepared for City of Wenatchee

May 2021
Confluence Parkway Project

Wetland and OHWM Delineation Report

Prepared for
City of Wenatchee
301 Yakima Street, Suite 301
Wenatchee, Washington 98801

Prepared by
Anchor QEA, LLC
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Project Number: 181879-01.01

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APPENDICES

ABBREVIATIONS

Ecology	Washington State Department of Ecology
HGM	hydrogeomorphic
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PEM	palustrine emergent
PFO	palustrine forested
POW	freshwater pond
Project	Confluence Parkway Project
PSS	palustrine scrub-shrub
SMP	Shoreline Master Program
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WCC	Wenatchee City Code
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area

1 Introduction

This report provides information regarding the presence of wetlands, streams, and rivers within the proposed Confluence Parkway Project (Project) area, in accordance with state and federal requirements and City of Wenatchee criteria, as defined in the Wenatchee City Code (WCC) Chapter 12.08 Critical Areas (City of Wenatchee 2020a). Field studies were completed by scientists from Anchor QEA, LLC, in April 2020. These field studies consisted of wetland delineations and ordinary high water mark (OHWM) delineations for the Wenatchee River and side channels of the Columbia River. Anchor QEA scientists also performed a wetland rating and functional analysis of wetland habitat delineated within the Project study area. Information from this report will be used to support the Project for permitting and land-use approvals.

The Project is a proposed 2.5-mile bypass corridor that is intended to reduce vehicle congestion on SR 285/North Wenatchee Avenue. The Project extends from the U.S. 2/Euclid Avenue interchange, crosses the Wenatchee River on a new bridge, and extends south to the intersection of North Miller Street and SR 285/North Wenatchee Avenue. The Project area is primarily to the east of the Burlington Northern Santa Fe (BNSF) railroad tracks with a large portion adjacent to the Wenatchee Confluence State Park, including the Horan Natural Area. The Confluence Parkway Project will provide relief from the current North Wenatchee Avenue Bridge bottleneck and alleviate vehicle congestion in this area.

The Project is located in the City of Wenatchee (City) in Chelan County (Figure 1). Wenatchee is located in a valley in central Washington at the confluence of the Columbia and Wenatchee rivers. Currently, Wenatchee is the second largest city in central Washington, and is an urban hub for north-central Washington.

The following sections of this report describe the methods used in the field investigation and Anchor QEA's findings. A description of the study area is included in Section 2. Wetland delineation methods, results, and wetland rating and functions analysis are included in Section 3. The OHWM delineation methods and results are included in Section 4. Photographs of wetland and OHWM features are provided in Appendix A. Wetland delineation field data forms are included in Appendix B. Washington State Department of Ecology (Ecology) Wetland Rating Forms are included in Appendix C. A list of plant species observed in the study area is included in Appendix D. Additional details of the wetland and OHWM delineation methods are described in Appendix E.

1.1 Review of Existing Information

As part of the analysis to identify wetlands, streams, and rivers in the study area, Anchor QEA scientists reviewed the following sources of information to support field observations:

- Chelan County Public GIS Mapping (Chelan County 2020)
- WCC (City of Wenatchee 2020a)

- City of Wenatchee Critical Areas Maps (City of Wenatchee 2020b)
- Natural Resources Conservation Service Web Soil Survey (USDA 2020)
- U.S. Fish and Wildlife Service (USFWS) Wetlands Mapper for National Wetlands Inventory (NWI) Map Information (USFWS 2020)
- Washington Department of Fish and Wildlife (WDFW) Priority Habitats and Species Maps (WDFW 2020a)
- WDFW SalmonScape Mapper (WDFW 2020b)
- Washington Geospatial Open Data Portal Statewide Washington Integrated Fish Distribution (WGODP 2020)
- Aerial photographs publicly available via Google Earth

2 Study Area Description

The study area includes an approximately 2.5-mile corridor through the City of Wenatchee and includes a crossing of the Wenatchee River (Township 23 North, Range 20 East, Sections 21, 28, 33, and 34) (Figure 1). The study area boundary includes all areas within 250 feet of potential Project construction activities. The 250-foot extent around potential Project construction activities was established to identify any critical areas or critical area protective buffers that may be located within or near the footprint of proposed construction activities. Almost the entire study area is composed of developed areas including existing roadways and commercial and industrial development. The study area is shown on Figures 2a through 2e.

The only undeveloped features within the study area include the Wenatchee River, the associated riparian shoreline where the river crossing is proposed, and the Horan Natural Area located on the south side of the Wenatchee River. Vegetated areas within Walla Walla Point Park located on the south side of the river and Wenatchee Confluence State Park located on the north side of the river are limited to mowed grass areas and landscape trees and shrubs. Aerial photographs of the Wenatchee River and vegetated areas within the study area are shown on Figures 3a through 3d.

Due to the lack of undeveloped areas within the study area, only one wetland feature was identified within the study area, Wetland A, located with the Horan Natural Area. The OHWM delineation includes the reach of the Wenatchee River and two reaches of side channels of the Columbia River.

2.1 Topography

The topography of the study area has relatively subtle elevation changes within the developed areas. The Horan Natural Area is relatively flat with some areas of moderate slopes, particularly along the eastern side of the existing Apple Capital Recreation Loop Trail. Moderate elevation changes are also located near the Wenatchee River and Columbia River. According to U.S. Department of Agriculture (USDA) soil data (USDA 2020), slopes in the study area range from 0% to 15% (Section 2.2).

2.2 Soils

The Natural Resources Conservation Service Web Soil Survey (USDA 2020) identifies 15 soil series within undeveloped portions of the study area: 1) Alluvial land; 2) Beverly fine sandy loam; 3) Burch fine sandy loam, 0% to 3% slopes; 4) Burch fine sandy loam, 3% to 8% slopes; 5) Burch fine sandy loam, 8% to 15% slopes; 6) Burch loam, 0% to 3% slopes; 7) Burch loam, 8% to 15% slopes; 8) Cashmere sandy loam, 0% to 3% slopes; 9) Cashmere sandy loam, 3% to 8% slopes; 10) Cashmont sandy loam, 0% to 3% slopes; 11) Ellisforde fine sandy loam, 3% to 8% slopes; 12) Quincy loamy fine sand, 0% to 15% slopes; 13) Wenatchee silt loam, 0% to 3% slopes; 14) Riverwash; and 15) Terrace escarpments. Soils in the undeveloped portions of study area are shown in Figures 4a through 4d.

In Section 3.2, Wetland Delineation Results, data plot soil profiles are described for Wetland A. Soils data collected at each data plot are provided in the field data forms in Appendix B. Soils observed in the data plots were generally consistent in texture, color, and soil profile with the mapped soil series.

2.3 Hydrology

The Project is located in the Wenatchee Basin Water Resource Inventory Area (WRIA) 45 (Ecology 2020a). The Columbia River forms the boundary between WRIA 45 and the Moses/Coulee Basin WRIA 44 to the east. Hydrologic characteristics in the study area are influenced by regional groundwater, direct precipitation, surface water runoff, the Wenatchee River, and the Columbia River.

The confluence of the Wenatchee River and the Columbia River is located within and to the east of the study area. The Wenatchee River bisects the study area, and side channels of the Columbia River are located along the east side of the study area. The main channel of the Columbia River is east of the study area. The OHWM of the Wenatchee River and side channels of the Columbia River were delineated within the study area. One wetland (Wetland A) was delineated within the study area and is located in the northwest portion of the Horan Natural Area. The depressions within Wetland A have silt and clay soil substrate and are filled with emergent vegetation with no evidence of flowing water (scouring). The source of water within Wetland A includes groundwater, precipitation, snow melt, and a series of culverts beneath the Apple Capital Recreation Loop Trail. There is one culvert beneath the Apple Capital Recreation Loop Trail that connects Wetland A to additional wetland habitat and then a second culvert beneath a trail that connects to a side channel of the Columbia River. Wetland A is located more than 200 feet from the Wenatchee River and more than 1,000 feet from the Columbia River side channels and does not appear to provide potential fish habitat. The delineations of Wetland A and the OHWM of the Wenatchee River and the Columbia River side channels in the study area are described in Section 3, Wetland Delineation, and Section 4, Ordinary High Water Mark Delineation.

Data plot hydrology is described for Wetland A in Section 3.2, Wetland Delineation Results. Hydrology data collected at each data plot are provided in the field data forms in Appendix B.

2.4 Vegetation

The area receives consistently low amounts of precipitation, so the climate and plant communities found in the study area resemble that of an arid environment. The total mean annual precipitation is approximately 9 inches (U.S. Climate Data 2020). The Horan Natural Area and the shorelines of the Wenatchee River and the Columbia River side channels are the only areas within the study area with undisturbed vegetation communities. Vegetation in other areas of the study area, where present, is limited to mowed grass areas and landscape trees and shrubs.

Wetland and upland vegetation for Wetland A is described in Section 3.2, Wetland Delineation Results. Vegetation data collected at each data plot are provided in the field data forms in Appendix B. A list of all plant species observed during the investigation are presented in Appendix D.

2.5 Existing Wetland Mapping

Within the study area the USFWS Wetlands Mapper for NWI Map Information identifies palustrine forested (PFO)/palustrine scrub-shrub (PSS) wetland habitat on the north side of the Wenatchee River. On the south side of the river, palustrine emergent (PEM) wetland habitat and freshwater pond (POW) habitat are mapped in the area where Wetland A was delineated (USFWS 2020). The NWI Map also identifies PEM wetland habitat southeast of Wetland A where no wetland features were identified during the investigation. PEM wetland habitat associated with side channels of the Columbia River is mapped within and outside the study area boundary. WDFW Priority Habitats and Species maps (WDFW 2020a) identify similar freshwater wetland habitat within the study area. Figures 5a through 5d show the NWI information for the study area.

3 Wetland Delineation

Anchor QEA scientists identified and delineated one wetland in the study area, Wetland A. This is a large wetland system that extends outside the boundary of the study area to the northeast. No streams or rivers flow within wetlands located within the study area. Streams and rivers are described in Section 4, Ordinary High Water Mark Delineation. The wetland delineation methods and results are described in the following sections.

3.1 Methods

This section provides a summary of the methodology used to perform the wetland delineation, including the review of existing information (described in Section 1.1) and field investigation procedures. These methods are consistent with current federal and state agency requirements, as well as local (City of Wenatchee) jurisdiction requirements, for performing wetland delineations, assigning wetland ratings, assessing wetland functions, and identifying protective wetland buffer widths. Additional details of the wetland delineation methods are described in Appendix E.

3.1.1 Regulatory Framework

Wetlands are regulated at the federal level by the U.S. Army Corps of Engineers (USACE) and the U.S. Environmental Protection Agency (through the Clean Water Act); at the state level by Ecology (through Section 401 of the Clean Water Act and the state Water Pollution Control Act); and at the local level by the City of Wenatchee and the WCC Chapter 12.08 Critical Areas (City of Wenatchee 2020a). These agencies require permits for certain types of activities affecting wetlands that are within their jurisdiction.

3.1.2 Wetland Boundary Determination

As specified by the WCC Chapter 12.08 Critical Areas (City of Wenatchee 2020a), the wetland delineation was conducted according to the methods defined in the *U.S. Army Corps of Engineers Wetland Delineation Manual* (USACE Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), and Ecology's *Washington State Wetland Identification and Delineation Manual* (Ecology 1997). Soil colors were classified by their numerical description, as identified on a Munsell Soil Color Chart (Munsell 2009).

USACE (USACE Environmental Laboratory 1987) defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." The method for delineating wetlands is based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. Hydrophytic vegetation is "the macrophytic plant life

that occurs in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present." Hydric soils are "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part." Wetland hydrology "encompasses all hydrologic characteristics of areas that are periodically inundated or have soils saturated to the surface for a sufficient duration during the growing season" (Ecology 1997). Data collection methods for each of these three parameters are described in Appendix E.

Six data plots were sampled and recorded, and each sample plot was identified numerically as either wetland or upland. Vegetation, soils, and hydrology information were collected at each of the plots and recorded on field datasheets. Wetland field data forms are provided in Appendix B. Wetland boundaries were determined based on plot data and visual observations of the wetland. Each wetland location, wetland boundary, and data plot location was flagged for survey.

3.1.3 Wetland Classifications

Wetland community types are discussed according to the USFWS classification developed by Cowardin et al. (1979) for use in the NWI. The three wetland classifications delineated during the investigation include: PFO, PSS, PEM, and POW. A description of the Cowardin system and the characteristics of Cowardin wetland community types is presented in Appendix E.

3.1.4 State Hydrogeomorphic Classification System

Scientists have come to understand that wetlands can perform functions in different ways. The way a wetland functions depends to a large degree on hydrologic and geomorphic conditions. To recognize these differences among wetlands, the hydrogeomorphic (HGM) classification was developed. It groups wetlands into categories based on the hydrologic and geomorphic characteristics that control many of the wetland's functions.

Wetland HGM classifications delineated during the investigation included depressional and slope systems. A description of the HGM characteristics and classification system is presented in Appendix E.

3.1.5 Wetland Ratings and Functions Assessment

The study area was evaluated for wetlands using the most current version of Ecology guidance in the *Washington State Wetland Rating System – Eastern Washington: 2014 Update* (Hruby 2014) and according the City of Wenatchee's requirements, as defined in the WCC Chapter 12.08 Critical Areas (City of Wenatchee 2020a). Ecology and the WCC classify wetlands into four categories (Categories I, II, III, and IV) based on a point system where points are awarded to three functional value categories (water quality improvement, hydrologic functions, and habitat). The functional values of wetlands are identified based on the rating scoring system. Additional information about the state rating system is

provided in Appendix E. Detailed scoring, based on Ecology wetland rating forms, is provided in Appendix C.

3.2 Wetland Delineation Results

Anchor QEA scientists identified and delineated one wetland in the study area, designated as Wetland A, located in the northwest portion of the Horan Natural Area. As described in the following subsections, Wetland A extends outside the study area boundary and no surface connections between Wetland A and the Wenatchee River or Columbia River were identified. Wetland delineation results are shown in Figures 3a through d. No wetlands were identified within the portions of the study area in Figures 3a and 3d; Wetland A is shown on Figures 3b and 3c. Photographs of the wetlands taken during the investigation are provided in Appendix A. A description of Wetland A is presented in the following subsections. A summary of delineated Wetland A including vegetation classes, HGM classifications, and HGM rating classification is presented in Table 3-1. When both depressional and slope HGM classifications are present, the rating is performed using the depressional classification.

Table 3-1
Wetland A Summary

Wetland Name	Wetland Area (acres)	Vegetation Classes	HGM Classifications	HGM Rating Classification
Wetland A	5.8[1]	PFO, PSS, PEM, POW	Depressional and Slope	Depressional

Note:
1. Wetland extends outside the study area boundary.

3.2.1 Wetland A

Wetland A has PFO, PSS, PEM, and POW vegetation classes and slope and depressional HGM classifications. Wetland A extends outside the study area boundary to the northeast. Approximately 5.8 acres of Wetland A were delineated within the study area boundary (Figures 3b and 3c). There are depressions located within Wetland A within and outside the study area boundary. At the time of the investigation most of the depressions were dry but appeared to contain standing water during parts of the year as described below. The depressions within Wetland A have silt and clay soil substrate and are filled with emergent vegetation with no evidence of flowing water (scouring). The source of water within Wetland A includes groundwater, precipitation, snow melt, and a series of culverts beneath the Apple Capital Recreation Loop Trail. There is one culvert beneath the Apple Capital Recreation Loop Trail that connects Wetland A to additional wetland habitat and then a second culvert beneath a trail that connects to a side channel of the Columbia River. Wetland A is located more than 200 feet from the Wenatchee River and more than 1,000 feet from the Columbia River

side channels and does not appear to provide potential fish habitat. Data were collected at six data plots: A-DP01 through A-DP06. Fifty-four flags were used to identify the Wetland A boundary. Photographs of Wetland A are presented in Appendix A.

3.2.1.1 Vegetation

Wetland A vegetation is dominated by narrow leaf willow (*Salix exigua*), red osier dogwood (*Cornus sericea*), reed canary grass (*Phalaris arundinacea*), and common cattail (*Typha latifolia*). The area identified on USFWS NWI maps as POW wetland habitat (Figure 3c) was inundated and covered with cattail and reed canarygrass vegetation with at the time of the investigation. Dominant buffer vegetation of Wetland A includes Siberian elm (*Ulmus pumila*), narrow leaf willow, Himalayan blackberry (*Rubus armeniacus*), woods rose (*Rosa woodsii*), golden currant (*Ribes aureum*), and reed canarygrass. The Wetland A buffer also includes grass and mowed grass areas adjacent to the Apple Capital Recreation Loop Trail.

3.2.1.2 Soils

Soils in Wetland A consisted of very dark gray (10YR 3/1), brown (10YR 3/2), and dark grey (10YR 4/1) clay loams to 18 inches. Redoximorphic features were yellowish brown (10YR 5/4) and strong brown (7.5YR 5/6). Upland soils were dark brown (10YR 3/3) to dark yellowish brown (10R 4/4) with no redoximorphic features.

3.2.1.3 Hydrology

In Wetland A data plots WetA-DP01 and WetA-DP05, there was no saturation or water table present to 18 inches; however, a high water table, ponding, and standing water is assumed to occur during the growing season based on the present hydrology indicators of oxidized rhizospheres along living roots, water stained leaves, and soil cracks. In the Wetland A data plot WetA-DP03, saturation occurred from 6 to 18 inches and there was inundation of 2 feet or greater within 30 feet of the data plot. About 30% of the delineated area of Wetland A had standing water ranging in depth from a few inches to several feet deep at the time of the delineation.

3.3 Wetland Classifications and Ratings

Vegetation and HGM classifications of the one wetland (Wetland A) within the study area are presented in Table 3-1. Per the WCC Chapter 12.08 Critical Areas (City of Wenatchee 2020a), wetland ratings are determined using Ecology's *Washington State Wetland Rating System – Eastern Washington: 2014 Update* (Hruby 2014) to evaluate the functions and categories of wetlands.

Table 3-2 lists the 2014 Ecology and local (City of Wenatchee) wetland ratings.

Table 3-2
Summary of Wetland Ratings

Wetland Name	Wetland Area (acres)	Ecology[1] and City of Wenatchee[2] Rating
Wetland A	5.8[3]	Category I

Notes:

1. Hruby, T., 2014. *Washington State Wetland Rating System for Eastern Washington: 2014 Update*. Publication 14-06-030. Olympia, Washington: Washington Department of Ecology.
2. City of Wenatchee, 2020a. City of Wenatchee Code. Accessed April 2, 2020. Available at: https://www.codepublishing.com/WA/Wenatchee.
3. Wetland extends outside the study area boundary.

For the 2014 Ecology wetland rating system (Hruby 2014), a low, moderate, or high rating is based on three functions: 1) Water Quality Improvement; 2) Hydrologic; and 3) Habitat. Within each of these three functions are three subfunction categories: 1) Site Potential; 2) Landscape Potential; and 3) Value. Each of these subfunction categories is rated as low, moderate, or high. Wetland functional values and scores for Wetland A under the 2014 Ecology rating system are shown in Table 3-3. The 2014 Ecology wetland rating forms are provided in Appendix C.

Table 3-3
Summary of Functions and Values 2014 Wetland Rating Scores

Wetland and Function	Water Quality Improvement	Hydrologic	Habitat	Total Functions Score[1]
Wetland A				
Site Potential	Moderate	High	Moderate	
Landscape Potential	Moderate	Moderate	High	
Value	High	High	High	
Score Based on Rating[1]	7	8	8	23

Note:

1. Potential total score per function is 9, for a potential total score of 27.

3.4 Wetland Functional Assessment

The following subsections provide a description of the functions of Wetland A based on the 2014 Ecology wetland rating system.

3.4.1 Water Quality Improvement Functions

Wetland A has a moderate function score for the site potential to improve water quality functions due to the characteristics of surface water outflows from the wetland and the relative area of depressions within the wetland that influences its ability to trap sediments during a flooding event.

Water within Wetland A is contained with no outflows identified. The characteristic of vegetation within the wetland to restrict flow and trap sediments and pollutants also contributes to the moderate function score.

Wetland A has a moderate function score for the landscape potential to support water quality functions of the study area because of the potential of the surrounding land uses to generate pollutants and discharge stormwater to the wetland. Wetland A is downslope of impervious surfaces, railroad tracks, and mowed areas.

Wetland A has a high function score to provide water quality improvement valuable to society because the wetland is in the vicinity of aquatic resources that are on the Ecology 303(d) list, the Wenatchee River and Columbia River (Ecology 2020a). The Wenatchee River watershed is also identified by Ecology as a water quality improvement project (Ecology 2020b).

3.4.2 Hydrologic Functions

Wetland A provides a high function score for potential to reduce flooding and erosion based on the absence of surface water outflow observed from the wetland and the depth of storage provided by the wetland during wet periods.

Wetland A provides a moderate function score in potential to support hydrologic functions in the study area based on the surrounding land uses to generate pollutants and discharge stormwater to the wetlands. Wetland A is downslope of impervious surfaces, railroad tracks, and mowed areas.

Wetland A has a high function score to provide hydrologic functions valuable to society because the wetland is located in a landscape where there is potential flow downgradient into areas where flooding has damaged human or natural resources. It has also been identified as important for flood storage or conveyance in a regional flood control plan, which contributes to its high function score.

3.4.3 Habitat Functions

Wetland A has a moderate function score for the potential to provide habitat due to the vegetative structure (number of Cowardin [1979] vegetation classes), the number of water regimes or hydroperiods, the plant richness, the habitat diversity, and special habitat features present.

Wetland A has a high score for the landscape potential to support habitat functions of the study area because of the characteristics of disturbed and undisturbed habitats surrounding the wetlands and the land-use intensity of the surrounding area.

Wetland A has a high function score to provide habitat functions valuable to society because of the proximity of WDFW priority habitats and species in the vicinity of the wetland, including biodiversity corridors, and riparian and instream habitats. The Wenatchee River and the Columbia River near the

study area also provide habitat for threatened and endangered fish species, as described in Section 4, Ordinary High Water Mark Delineation.

3.5 Regulated Wetland Buffers

Required wetland buffers have been identified according to the current WCC Chapter 12.08 Critical Areas (City of Wenatchee 2020a). The WCC identifies minimum protective buffer widths based on Ecology's wetland guidance in Alternative 3 in *Wetlands in Washington State – Volume 2: Guidance for Protecting and Managing Wetlands* (Granger et al. 2005). Under Alternative 3, protective wetland buffer widths are based on the wetland category, land use intensity impacts, and the Ecology habitat function-rating score. Habitat function-rating scores of 8 or 9 are considered high level of function. Wetland A has a high function-rating score of 8. The proposed Project elements adjacent to Wetland A include a paved trail so the proposed land-use impact intensity for Wetland A is moderate.

Per the 2014 Ecology and WCC wetland rating systems, Wetland A is a Category I wetland. Under the WCC, Wetland A requires a 150-foot buffer for a Category I wetland with moderate land-use impact intensity and a high habitat-function score (8 to 9). The Wetland A boundary and buffer are shown in Figures 3b and 3c. Table 3-4 summarizes WCC ratings and buffer widths based on the 2014 Ecology and WCC rating systems and includes the wetland vegetation classes and HGM classifications.

Table 3-4
Summary of Wetland Classifications, Ratings, Buffer Widths, and Stream Associations

Wetland Name	Vegetation Classes	HGM Rating Classification	Ecology[1] and City of Wenatchee[2] Rating	Proposed Land Use Intensity	Ecology Habitat Score	City of Wenatchee[3] Buffer Width (feet)
Wetland A[4]	PFO/PSS/PEM/POW	Depressional	Category I	Moderate (paved trail)	8	150

Notes:

1. Hruby, T., 2014. *Washington State Wetland Rating System for Eastern Washington: 2014 Update*. Publication 14-06-030. Olympia, Washington: Washington Department of Ecology.
2. City of Wenatchee, 2020a. Wenatchee City Code. Accessed April 2, 2020. Available at: https://www.codepublishing.com/WA/Wenatchee.
3. Granger et al. 2005. *Wetlands in Washington State - Volume 2: Guidance for Protecting and Managing Wetlands*. Washington State Department of Ecology. Publication #05-06-008. Olympia, Washington.
4. Wetland extends outside the study area boundary

3.6 Limitations

Wetland identification is an inexact science, and differences of professional opinion often occur between trained individuals. Final determinations for wetland boundaries and rating concurrence or adjustments to these are the responsibility of the regulating resource agency. Wetlands are, by definition, transitional areas; their boundaries can be altered by changes in hydrology or land use. In

addition, the definition of jurisdictional wetlands may change. If a physical change occurs in the basin, or if 5 years pass before the proposed Project is undertaken, another wetland survey should be conducted. The results and conclusions expressed herein represent Anchor QEA's professional judgment based on the information available. No other warranty, expressed or implied, is made.

4 Ordinary High Water Mark Delineation

Anchor QEA scientists identified and delineated the OHWM of the Wenatchee River and side channels of the Columbia River within the study area. The delineated OHWM features did not include any wetland habitat within the study area, as described in Section 3, Wetland Delineation. The OHWM delineation methods and results are described in the following sections.

4.1 Methods

To document the OHWM of aquatic habitats within the study area, Anchor QEA scientists reviewed existing information (described in Section 1.1), performed an aerial photograph analysis, and conducted site visits in April 2020. The OHWM delineation was completed by walking the river shorelines in chest waders and identifying the OHWM with flagging. The OHWM boundary of the Wenatchee River was marked with flags in parallel formation on both banks, as in LB-1 (left bank) and RB-1 (right bank), LB-2 and RB-2, etc. For the side channel of the Columbia River, only the right bank of the side channels was delineated. Flagging was then documented on an aerial photograph for survey. As described in the results section, some of the reaches of the Wenatchee River OHWM delineation were estimated based on the surveyed elevations, observations during the site visits, and aerial photograph analysis because when the survey was performed, the water level of the river had increased to depths that the downstream flags could not be safely accessed for survey.

Anchor QEA scientists identified the OHWM boundaries of the river systems in the study area consistent with Chapter 90.58 of the Revised Code of Washington and Chapter 173-22 of the Washington Administrative Code. The Washington Administrative Code defines the OHWM as follows:

> "Ordinary high water mark" on all lakes, streams, and tidal water is that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department.

The OHWM boundaries were field delineated using the Ecology guidance document *Determining the Ordinary High Water Mark for Shoreline Management Act Compliance in Washington State* (Ecology 2016). Additional information about the OHWM delineation methods is provided in Appendix E.

Protective riparian buffer widths of the Wenatchee River and the Columbia River are identified based on the City of Wenatchee Shoreline Master Program (SMP) regulations (City of Wenatchee 2014).

4.2 Ordinary High Water Mark Delineation Results

4.2.1 Wenatchee River

The Wenatchee River is a large system the flows into the study area from the west, flows beneath the BNSF railroad bridge and the Apple Capital Recreation Loop Trail pedestrian bridge, and then flows towards the Columbia River. A total length of approximately 1,600 feet of the Wenatchee River was delineated; about 780 feet of the left bank and 820 feet of the right bank. The OHWM on the right bank was marked with 24 flags and the OHWM on the left bank was marked with 28 flags. The lengths of the surveyed and estimated reaches of the Wenatchee River OHWM delineation are provided in Table 4-1. Photographs of the Wenatchee River are presented in Appendix A. OHWM delineation results are shown in Figures 3a through 3c.

Table 4-1
Summary of Wenatchee River OHWM Delineation

OHWM Delineation	Left Bank (feet)	Right Bank (feet)	Total (feet)
Surveyed	430	505	935
Estimated	350	315	665
Total	780	820	1,600

The slope of the delineated reach is relatively level with an approximate 1% grade. Shorelines within the study area are steep and heavily vegetated, creating limited access. The steepness of the banks within the study area have created some channel incision and bank undercutting in places. Both banks have been armored with large rip-rap boulders at the abutments of the railroad and pedestrian bridges.

In-channel conditions of the Wenatchee River in the study area include cobble, gravel, sand, and silt substrate material. The channel ranges in width, within the study area, from approximately 680 feet at the widest portion to about 435 feet at the narrowest portion. At the time of the April 2020 wetland and OHWM delineations, water depth in the river had a maximum depth of about 8 feet and an average depth of about 4 feet. Based on the OHWM delineation results, flows are 2 to 3 feet higher during the spring/summer snow melt. There is a gravel and sandbar island within the channel in the area of the proposed new bridge crossing (Figure 3b). Vegetation on the island was primarily narrow leaf willow with some herbaceous species. The exposed area of the island ranges with variations in river flow conditions.

4.2.2 Columbia River Side Channels

Two reaches of Columbia River side channels were delineated within the study area, both south of the Wenatchee River. The main channel of the Columbia River lies outside of the study area, flowing north to south. Only the right banks of the side channels are located within the study area. A total length of approximately 1,335 feet of the right bank side channels were delineated; approximately 100 feet of the shorter reach and approximately 1,235 feet of the longer reach. A total of 45 flags were used to delineate the side channel OHWM. Flags 1 through 6 were used to delineate the shorter reach and Flags 7 through 45 were used to delineate longer reach. Photographs of the Columbia River side channels are presented in Appendix A. OHWM delineation results are shown in Figure 3d.

Sediments of both delineated side channel reaches are dominated by fine sediments and some large cobbles.

4.3 Regulated River Buffers

Required river buffers have been identified according to the current City of Wenatchee SMP. The SMP provides shoreline development standards and environmental designations. The City of Wenatchee SMP designates the Wenatchee River shoreline and Columbia River side channels as Urban Conservancy requiring a 100-foot buffer. A small portion of the study area within the Wenatchee Confluence State Park is designated as Waterfront Park. The City of Wenatchee does not require a buffer for Waterfront Park designations on public property (City of Wenatchee 2014). Protective buffer widths for rivers in the study area, per the City of Wenatchee SMP, are provided in Table 4-2.

Table 4-2
City of Wenatchee SMP Standard River Buffer Distance

River System	City of Wenatchee SMP[1] Land Use Designation	City of Wenatchee SMP[1] Buffer Width (feet)
Wenatchee River	Waterfront Park	0
Wenatchee River	Urban Conservancy	100
Columbia River	Urban Conservancy	100

Note:

1. City of Wenatchee, 2014. City of Wenatchee Shoreline Master Program. October 2014. Available at: https://www.wenatcheewa.gov/government/community-and-economic-development/planning/long-range-planning/shoreline-master-program

5 Wetland and Riparian Impacts

This section provides a summary of potential impacts to wetlands and wetland buffers and Wenatchee River riparian habitat based on the conceptual design for the Project. As described previously, one Category I wetland, Wetland A, is located within the study area. Permanent construction impacts to Wetland A have been avoided. Permanent impacts to Wetland A buffer and Wenatchee River riparian habitat have been avoided where possible; however, some permanent impacts will occur. Permanent impacts to Wetland A buffer and Wenatchee River riparian habitat include vegetation removal during Project construction activities such as the construction of permanent Project features.

Temporary impacts to Wetland A and Wetland A buffer and Wenatchee River riparian habitat have also been avoided where possible; however, some temporary impacts will occur. Temporary impacts to Wetland A and Wetland A buffer and Wenatchee River riparian habitat include vegetation removal during Project construction activities that will not result in permanent Project features such as staging and stockpiling areas and access routes within and adjacent to these vegetated areas. Temporarily disturbed wetland, wetland buffer, and riparian habitats will be replanted following construction.

5.1 Wetland Impacts

5.1.1 Permanent Wetland Impacts

Permanent construction impacts to Wetland A have been avoided.

5.1.2 Temporary Wetland Impacts

A small portion of Wetland A will be temporarily disturbed by the Project. Wetland A is a large Category I wetland based on WCC (City of Wenatchee 2020a) and the 2014 Ecology wetland rating system (Hruby 2014). A summary of the classifications and permanent impacts to Wetland A is provided in Table 5-1.

Table 5-1
Temporary Impacts to Wetlands

Wetland Name	Wetland Area (acres)	Vegetation Classes	HGM Rating Classification	Ecology[1] and City of Wenatchee[2] Rating	Temporary Wetland Impact Area (acres)	Percent of Total Wetland Disturbance
Wetland A	5.8[3]	PFO, PSS, PEM, POW	Depressional	Category I	0.10	<0.02%

Notes:

1. Hruby, T., 2014. *Washington State Wetland Rating System for Eastern Washington: 2014 Update*. Publication 14-06-030. Olympia, Washington: Washington State Department of Ecology.

2. City of Wenatchee, 2020a. Wenatchee City Code. Accessed April 2, 2020. Available at: https://www.codepublishing.com/WA/Wenatchee
3. Wetland extends outside the study area boundary.

5.1.3 Permanent Wetland Buffer Impacts

Wetland buffers are vegetated areas surrounding a wetland boundary that protect wetlands from the effects of adjacent land use. Buffers help wetlands function by filtering storm runoff from surrounding developed land uses, trapping sediment, absorbing nutrients, attenuating high flows, and providing wildlife habitat. Buffers also physically separate wetlands from developed areas in order to lessen noise, light, chemical pollution, and other associated human-related disturbances. Due to the interconnectivity between a wetland and the surrounding uplands, impacts to the buffer can damage the ecological functions of the wetland.

Under the WCC (City of Wenatchee 2020a) and the 2014 Ecology rating system (Hruby 2014), Wetland A is a Category I wetland. Under the WCC, Wetland A requires a 150-foot buffer for a Category I wetland with moderate land-use impact intensity and high habitat-function score. The Wetland A buffer within the study area includes tree and shrub vegetation and grass and mowed grass areas adjacent to the Apple Capital Recreation Loop Trail, as described in Section 3.2.1.1 (Figure 3c). Wetland A buffer impacts include the vegetated areas from the Wetland A boundary to developed areas. A summary of permanent wetland buffer impacts under the Project is provided in Table 5-2.

Table 5-2
Permanent Impacts to Wetland Buffers

Wetland Name	Permanent Wetland Buffer Impact Area (acres)
Wetland A	2.22

5.1.4 Temporary Wetland Buffer Impacts

The Wetland A buffer where temporary impacts will occur includes tree and shrub vegetation and grass and mowed grass areas adjacent to the Apple Capital Recreation Loop Trail, as described in Section 3.2.1.1 (Figure 3c). A summary of temporary wetland buffer impacts under the Project is provided in Table 5-3.

Table 5-3
Temporary Impacts to Wetland Buffers

Wetland Name	Temporary Wetland Buffer Impact Area (acres)
Wetland A	0.93

5.2 Riparian Impacts

5.2.1 Permanent Riparian Impacts

A 100-foot distance from the OHWM is the protective riparian buffer width of the Wenatchee River based on the City of Wenatchee SMP regulations (City of Wenatchee 2014). Wenatchee River riparian habitat impacts are identified for 200 feet from the Wenatchee River OHWM to provide the vegetated width of the riparian habitat in addition to the local jurisdictional width. Construction of the Project will include permanent clearing of riparian buffer vegetation. The Wenatchee River riparian buffer where permanent impacts will occur includes tree, shrub, and understory grass and herbaceous vegetation (Figure 3b). Plant species in the riparian buffer include similar species to those identified for the Wetland A buffer described in Section 3.2.1.1 and presented in the plant list table in Appendix D. Riparian vegetation photographs are also presented in Appendix A. A summary of permanent Wenatchee River riparian habitat impacts under the Project is provided in Table 5-4.

Table 5-4
Permanent Impacts to Wenatchee River Riparian Habitat

Resource Category	Permanent Impact Area 0 feet to 100 feet from OHWM	Permanent Impact Area 100 feet to 200 feet from OHWM	Total Permanent Impact Area
Wenatchee River Riparian Habitat Left Bank	0.12 acre	0.42 acre	0.54 acre
Wenatchee River Riparian Habitat Right Bank	0.12 acre	0.25 acre	0.37 acre
Total	**0.24 acre**	**0.67 acre**	**0.91 acre**

5.2.2 Temporary Riparian Impacts

Construction of the Project will include the temporary clearing of riparian buffer vegetation. The Wenatchee River riparian buffer where temporary impacts will occur includes tree, shrub, and understory grass and herbaceous vegetation (Figure 3b). Plant species in the riparian buffer include similar species as described in Section 5.2.1. A summary of temporary Wenatchee River riparian habitat impacts under the Project is provided in Table 5-5.

Table 5-5
Temporary Impacts to Wenatchee River Riparian Habitat

Resource Category	Temporary Impact Area 0 feet to 100 feet from OHWM	Temporary Impact Area 100 feet to 200 feet from OHWM	Total Temporary Impact Area
Wenatchee River Riparian Habitat Left Bank	0.44 acre	0.18 acre	**0.62 acre**
Wenatchee River Riparian Habitat Right Bank	0.35 acre	0.18 acre	**0.53 acre**
Total	**0.79 acre**	**0.36 acre**	**1.15 acre**

6 Conceptual Mitigation Plan

This Conceptual Mitigation Plan provides information as the basis for required Project wetland and wetland buffer mitigation approvals by Ecology, USACE, and City of Wenatchee. The Conceptual Mitigation Plan proposes to mitigate all unavoidable wetland impacts associated with the Project. Under the WCC (City of Wenatchee 2020a), wetland and wetland buffer mitigation is performed based on the following guidance documents:

- *Wetlands in Washington State – Volume 1: A Synthesis of the Science* (Sheldon et al. 2005)
- *Wetlands in Washington State – Volume 2: Guidance for Protecting and Managing Wetlands* (Granger et al. 2005)
- "Selecting Wetland Mitigation Sites Using a Watershed Approach" (Hruby et al. 2010)

As there are no permanent wetland impacts identified based on the conceptual design, no wetland mitigation for permanent wetland impacts is required or proposed. The proposed mitigation provides compensatory mitigation for unavoidable permanent impacts to 2.22 acres of wetland buffer associated with the Project. Compensation for these unavoidable impacts to wetland buffer will be accomplished through on-site wetland buffer creation.

The proposed mitigation action also provides compensatory mitigation for unavoidable permanent impacts to 0.22 acres of Wenatchee River riparian habitat impacts associated with the Project. Compensation for these unavoidable impacts to riparian habitat will be accomplished through on-site riparian habitat creation.

Temporarily disturbed areas of Wetland A, Wetland A buffer, and Wenatchee River riparian habitat will be replanted with native plant species following construction.

The Conceptual Mitigation Plan will be implemented as a condition of City of Wenatchee shoreline permit approvals. Because no permanent impacts to Wetland A are proposed, Ecology water quality certification and the USACE Section 404 permit approvals for wetland impacts are not required.

6.1 Mitigation Sequencing

When a project proposes to impact wetlands or their buffers, applicable regulations require that the project proponent evaluate design modifications to avoid impacts to the wetland. If avoidance is not possible, measures to minimize impacts must be considered. Finally, if project will have unavoidable impacts, they must be mitigated. The following sections summarize the avoidance and minimization measures considered for the Project and conceptual compensatory mitigation impacts based on the current design plan.

6.1.1 Avoidance and Minimization of Impacts

Permanent impacts to Wetland A were avoided based on the conceptual design plan. Temporary wetland impacts and permanent and temporary wetland buffer impacts were minimized to the extent possible. Based on the conceptual design, avoiding permanent and temporary impacts to the Wenatchee River riparian habitat is not possible.

6.1.2 Compensatory Mitigation of Wetland Impacts

As there are no permanent wetland impacts identified based on the conceptual design, no wetland mitigation for permanent wetland impacts is required or proposed.

6.1.3 Mitigation of Buffer Impacts

To compensate for the estimated 2.22 acres of permanent wetland buffer impacts, the creation of high-quality buffers or enhancement of existing poor-quality buffer habitat of Wetland A is proposed. The wetland buffer creation and/or enhancement will be planted with native tree and shrub species.

Compensatory wetland buffer mitigation is assumed to occur within the Horan Natural Area. The WCC (City of Wenatchee 2020a) does not specify wetland buffer mitigation ratios. Wetland buffer mitigation creation and/or enhancement mitigation ratios will be identified in coordination with the City of Wenatchee, the Chelan PUD, and other entities with jurisdiction. When those details are available, a Mitigation Plan will be developed to replace, to the greatest degree feasible, the conditions and functions of the wetland buffer that will be permanently impacted by the proposed Project construction.

6.1.4 Mitigation of Riparian Buffer Impacts

To compensate for the estimated 0.22 acre of permanent riparian habitat impacts, the planting of currently unvegetated riparian areas or enhancement of existing poor-quality riparian habitat of the Wenatchee River is proposed. The riparian habitat planting and/or enhancement will include planting native tree and shrub species and removing nonnative plant species. The City of Wenatchee SMP regulations (City of Wenatchee 2014) and WCC (City of Wenatchee 2020a) do not specify riparian habitat mitigation ratios. Riparian habitat mitigation ratios will be identified during coordination with the City of Wenatchee.

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Figures

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Figure 1
Project Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway Project

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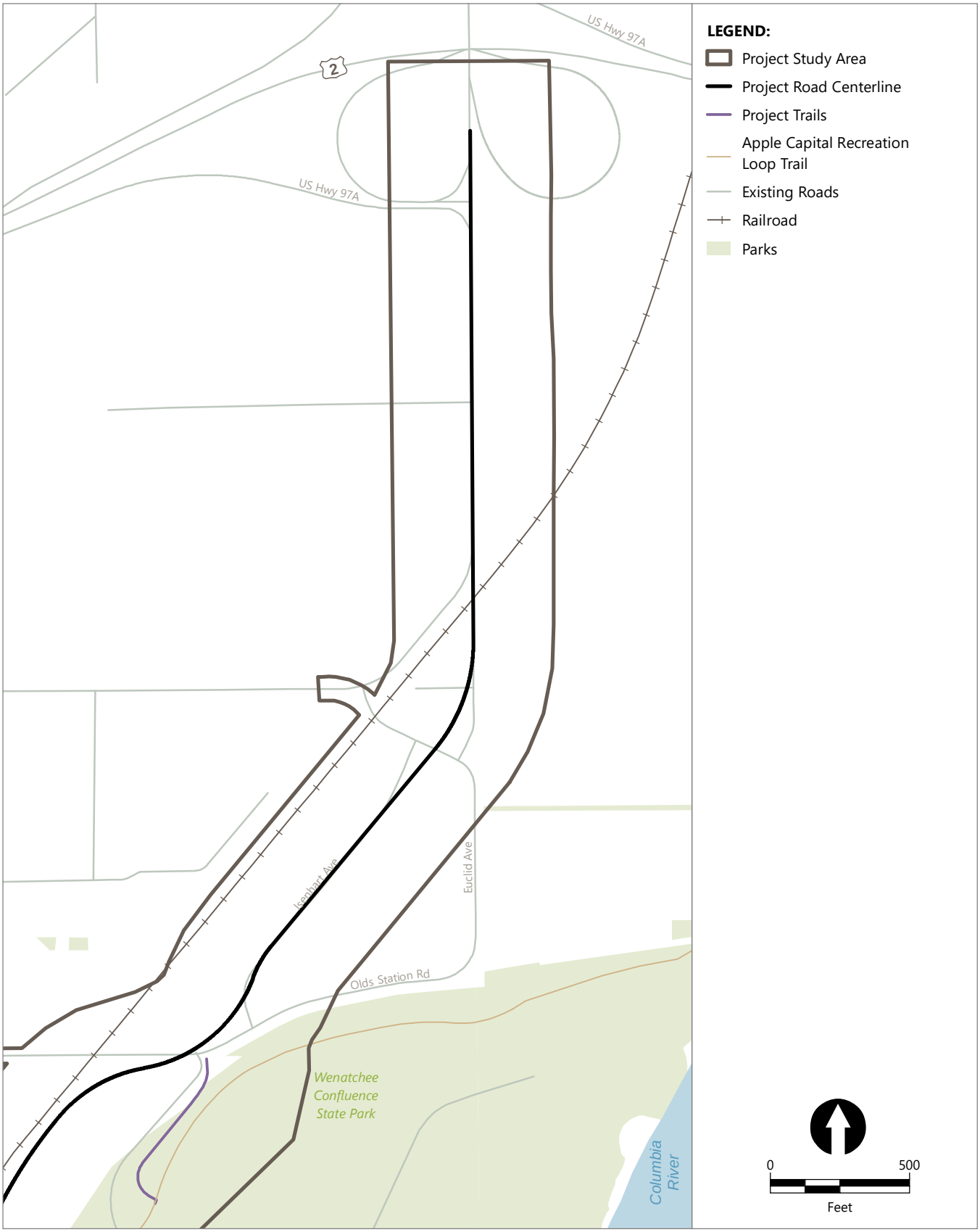

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Figure 2a
Project Study Area – Euclid/SR 2 Interchange to Wenatchee Confluence State Park
Wetland and OHWM Delineation Report
Confluence Parkway Project

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Figure 2b
Project Study Area – Wenatchee Confluence State Park Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway Project

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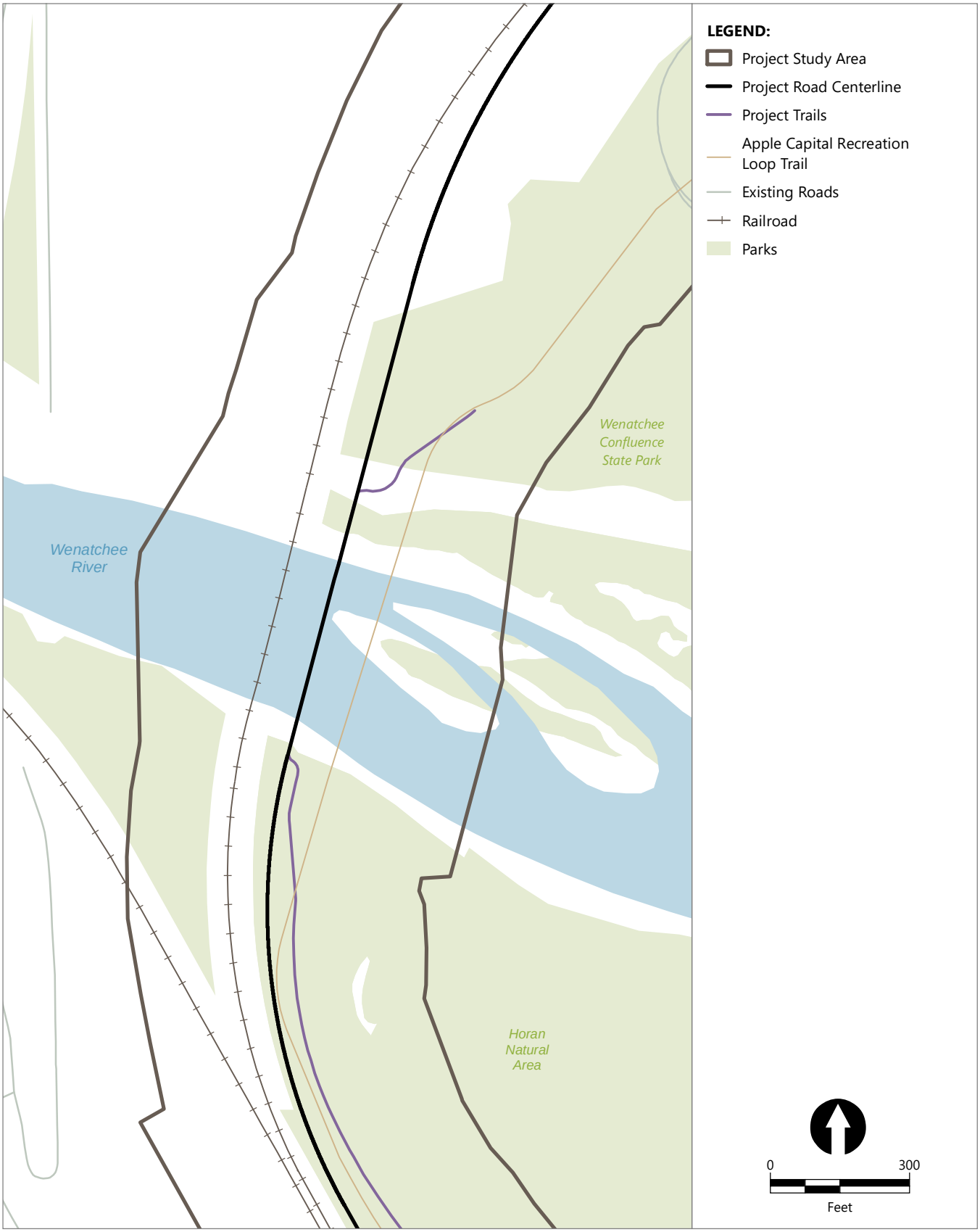

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Figure 2c
Project Study Area – Wenatchee River Crossing
Wetland and OHWM Delineation Report
Confluence Parkway Project

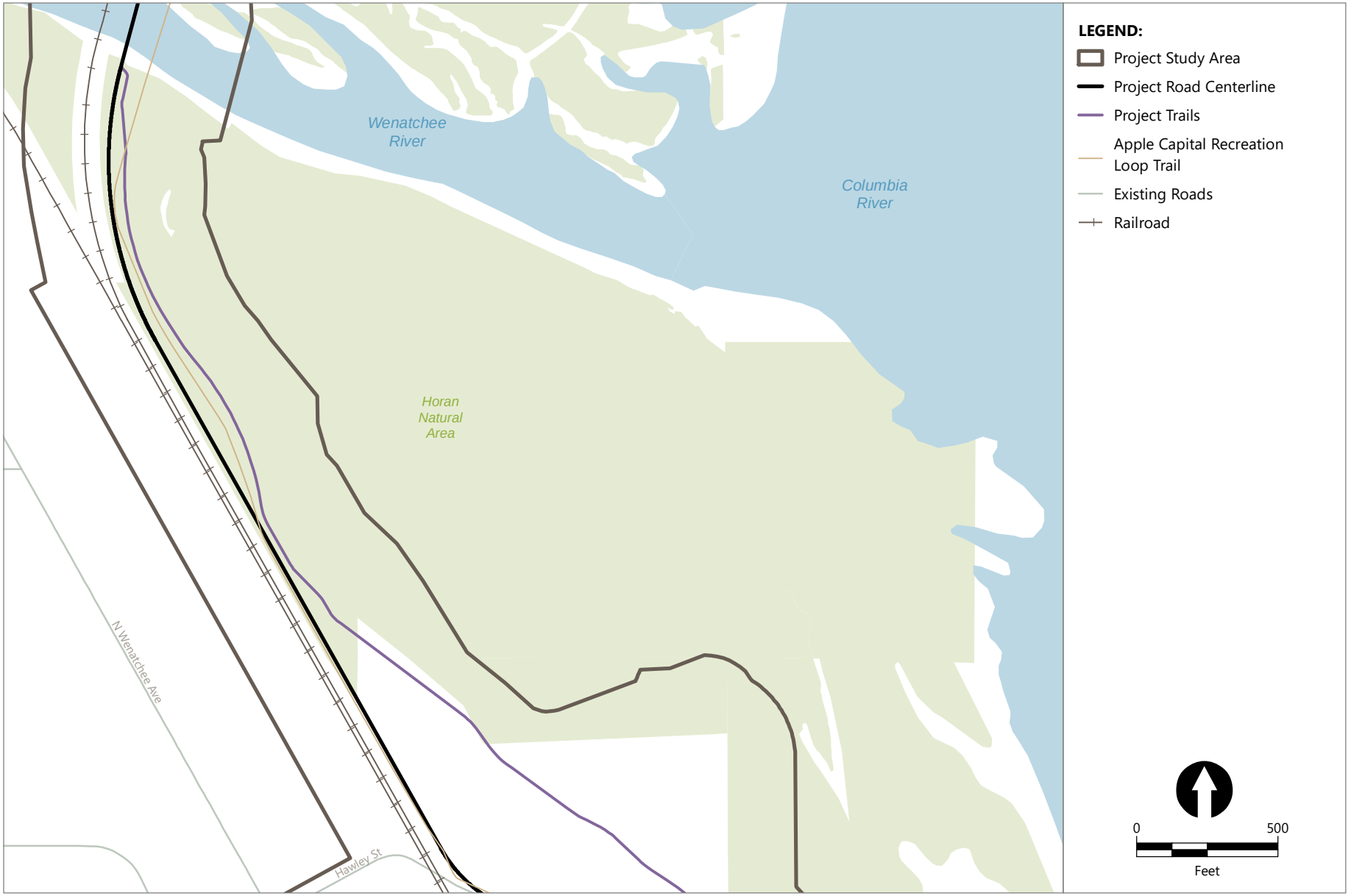

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Figure 2d
Project Study Area – Horan Natural Area Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway Project

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Figure 2e
Project Study Area – McKittrick Street to North Mission Street
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Confluence Parkway Project

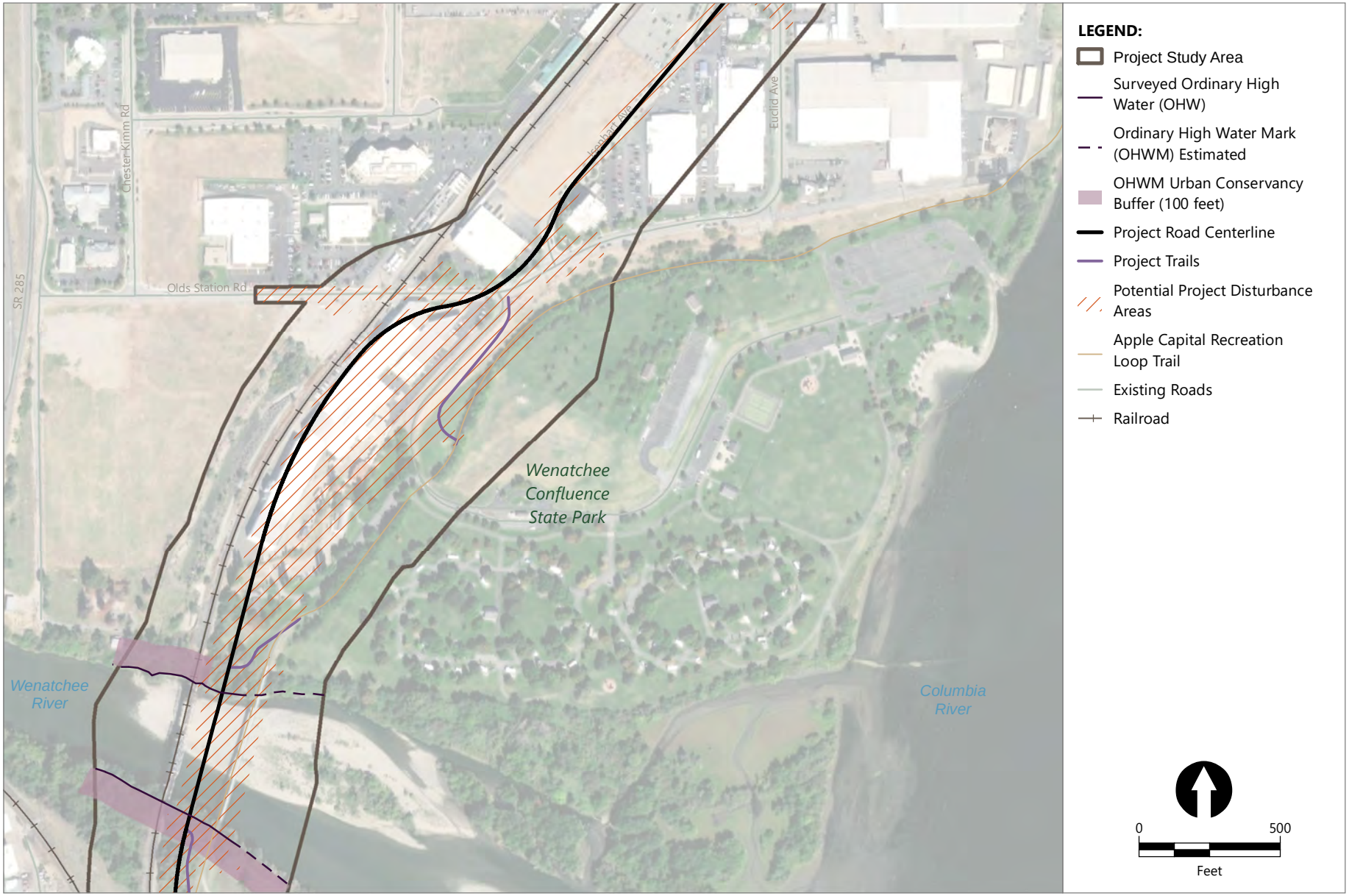

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Figure 3a
Aerial Photograph of Undeveloped Features – Wenatchee Confluence State Park Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway Project

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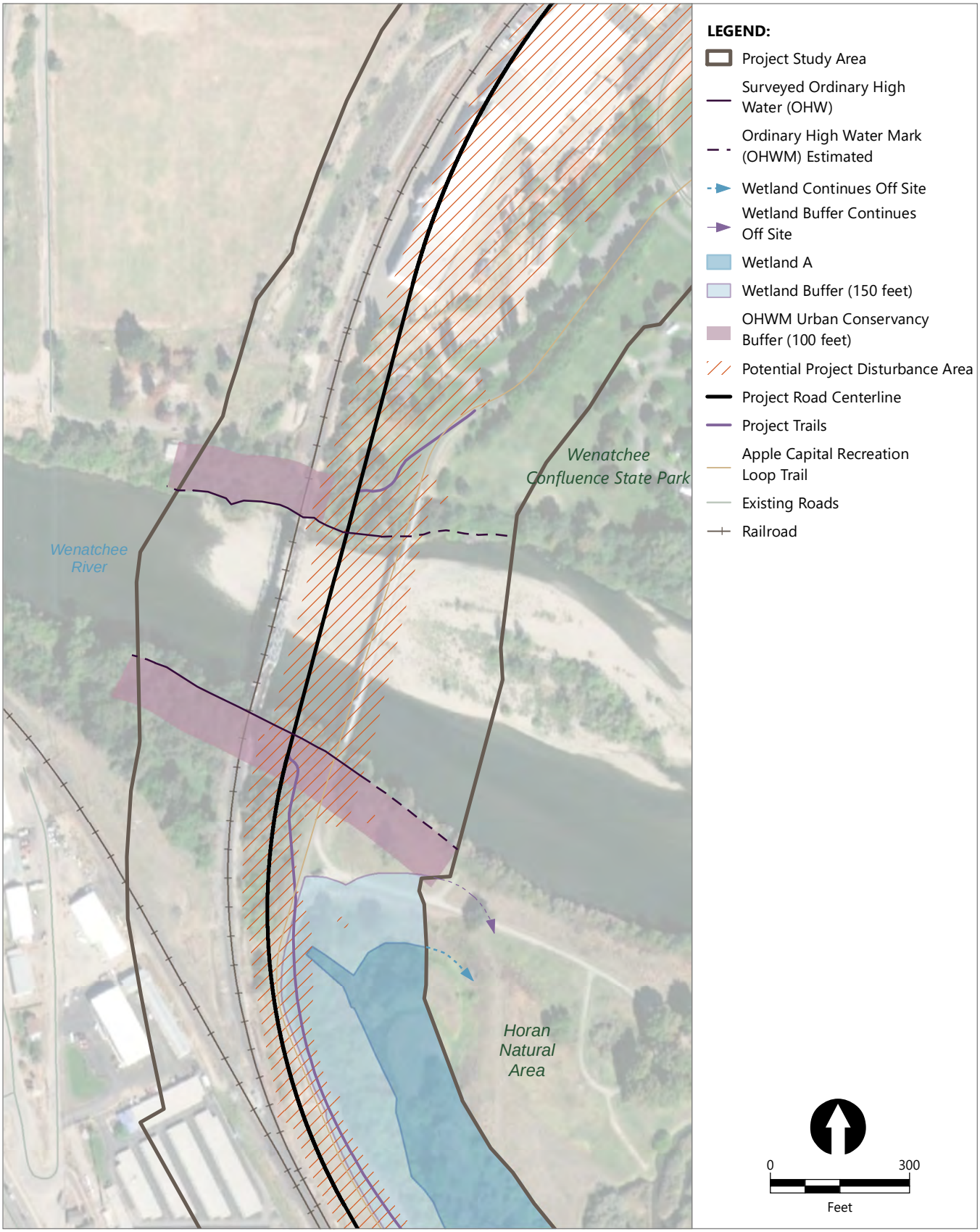

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Figure 3b
Aerial Photograph of Undeveloped Features – Wenatchee River Crossing
Wetland and OHWM Delineation Report
Confluence Parkway Project

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Figure 3c
Aerial Photograph of Undeveloped Features – Horan Natural Area Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway Project

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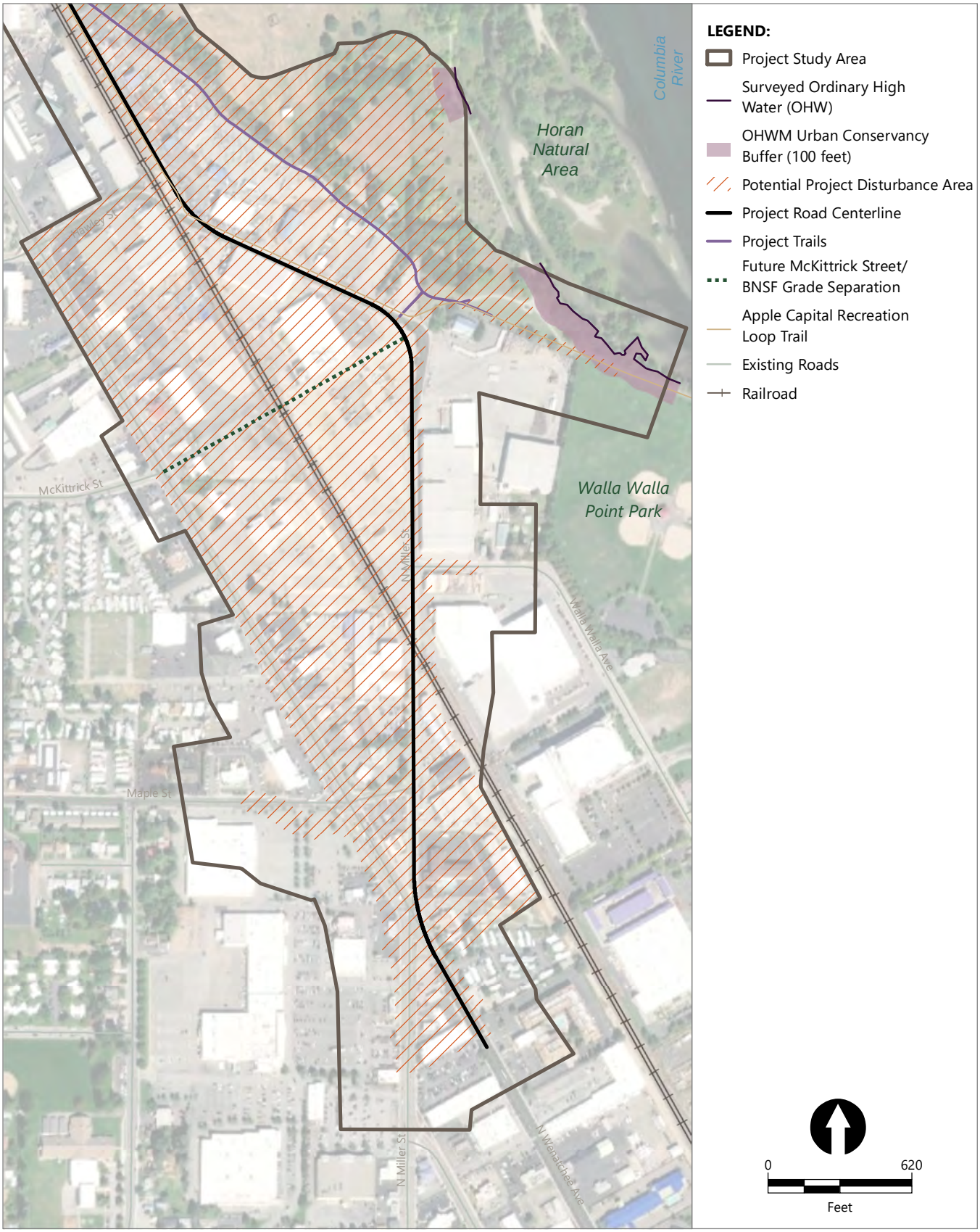

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Figure 3d
Aerial Photograph of Undeveloped Features – McKittrick Street to North Mission Street
Wetland and OHWM Delineation Report
Confluence Parkway Project

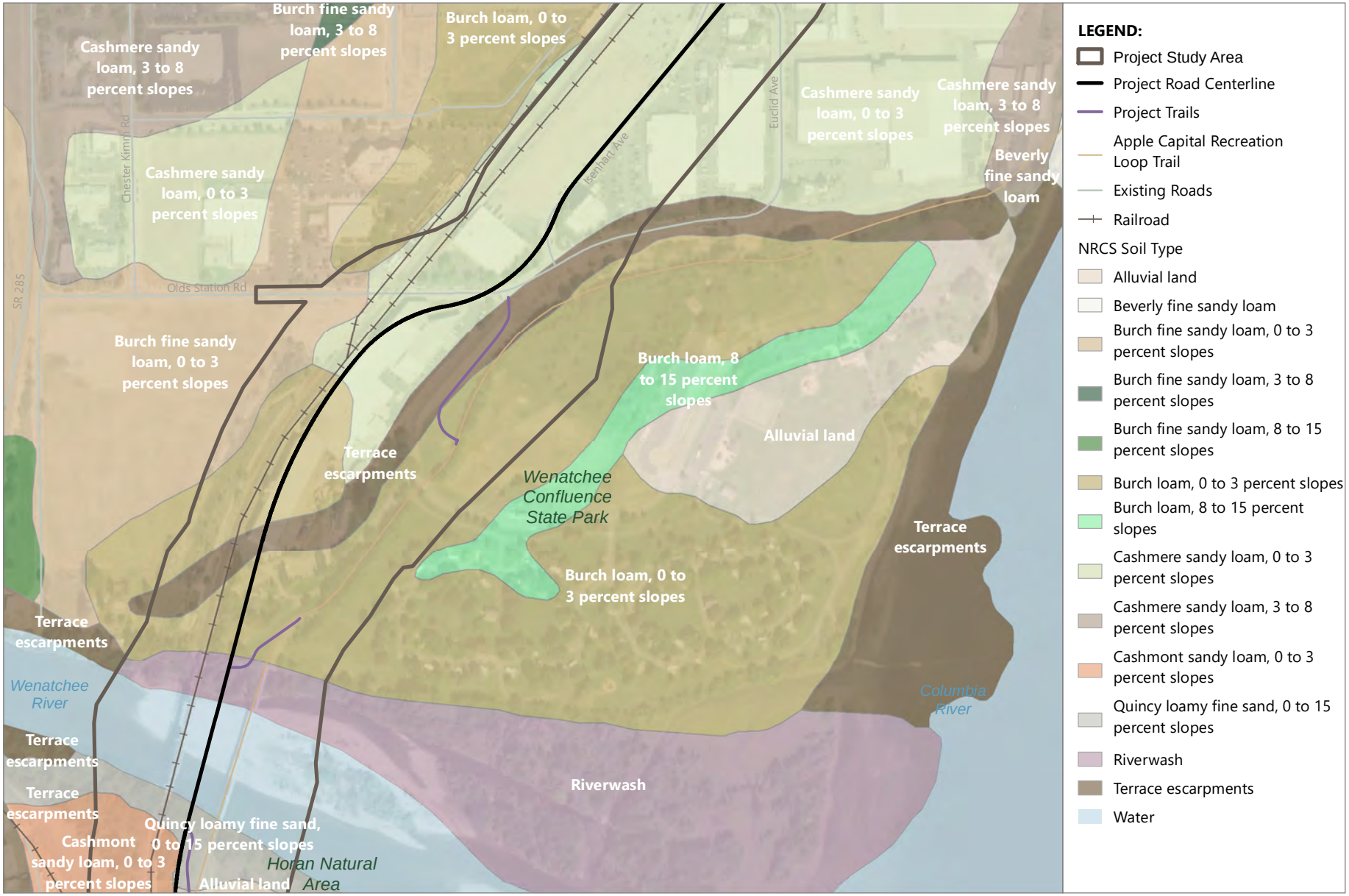

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Figure 4a
USDA Soil Map of Undisturbed Areas – Wenatchee Confluence State Park Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

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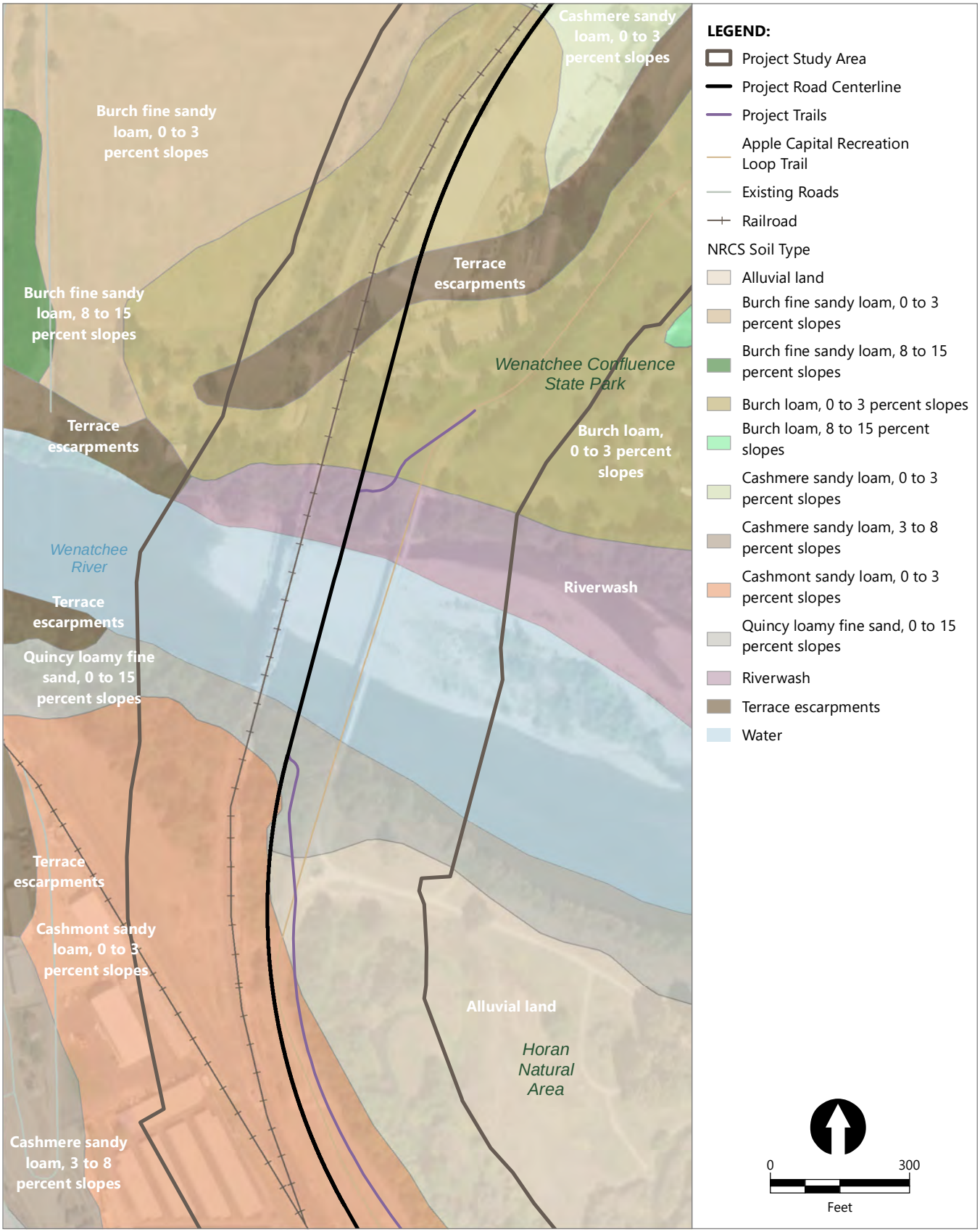

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Figure 4b
USDA Soil Map of Undisturbed Areas – Wenatchee River Crossing
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

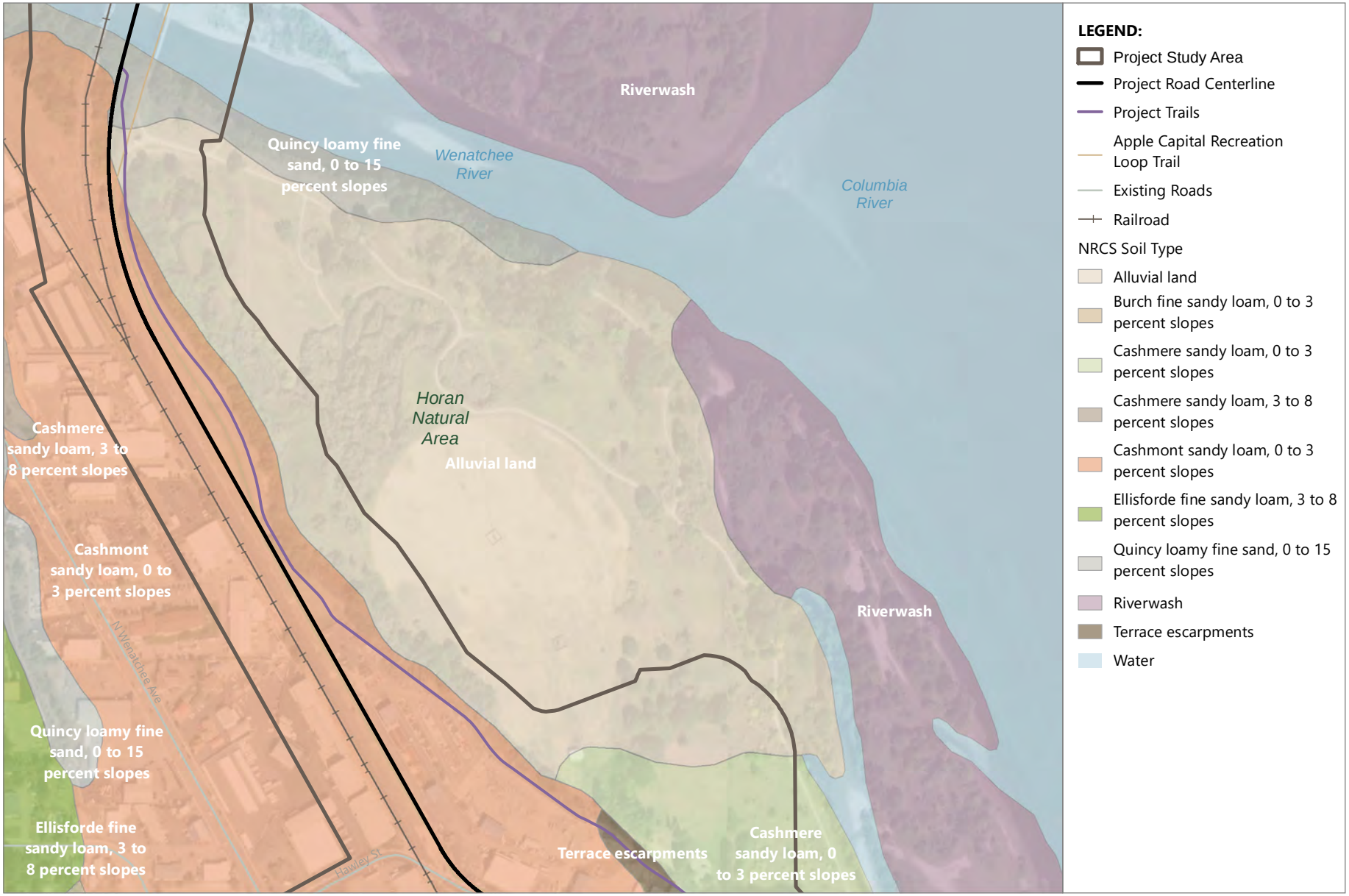

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Figure 4c
USDA Soil Map of Undisturbed Areas – Horan Natural Area Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

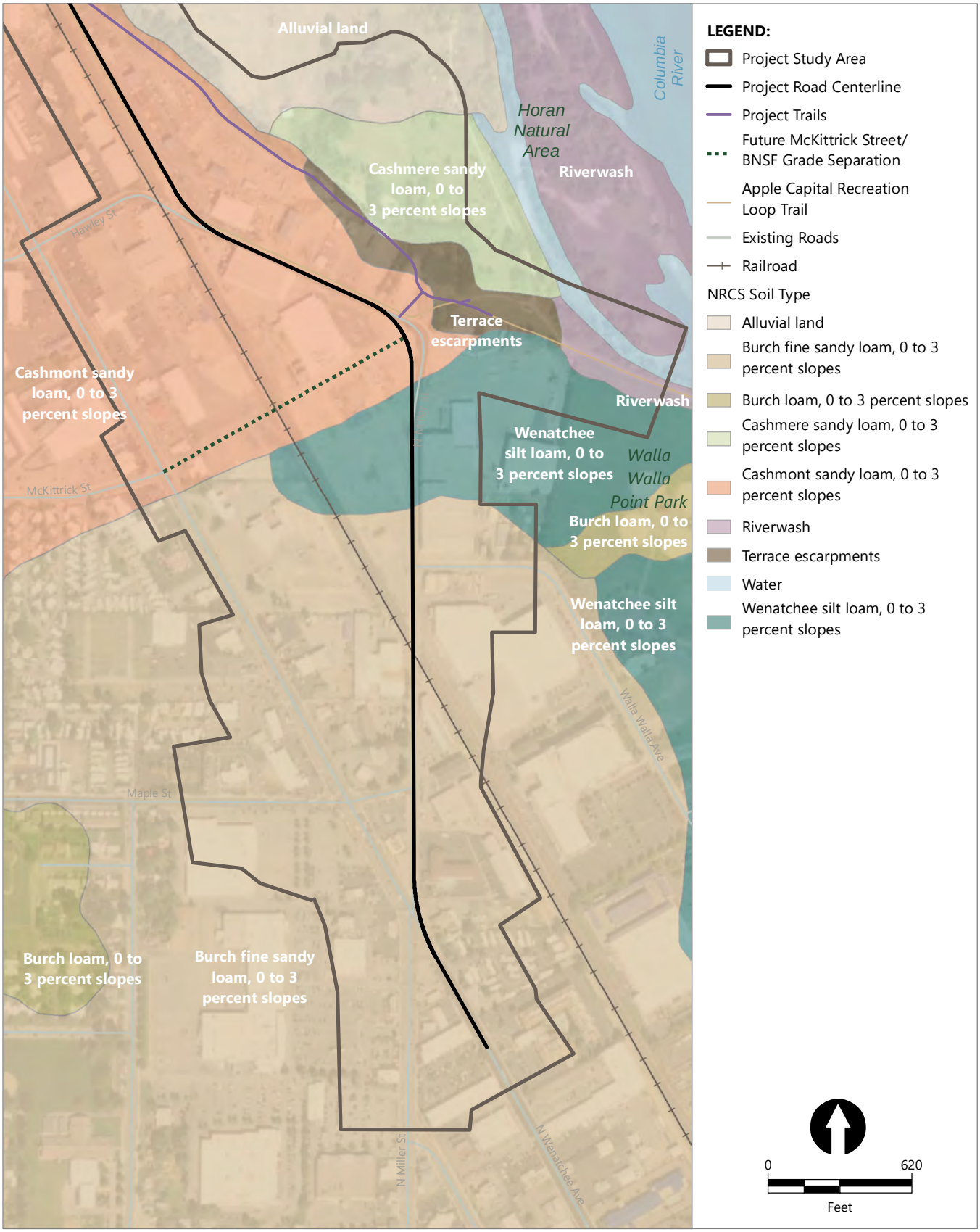

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Figure 4d
USDA Soil Map of Undisturbed Areas – McKittrick Street to North Mission Street
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

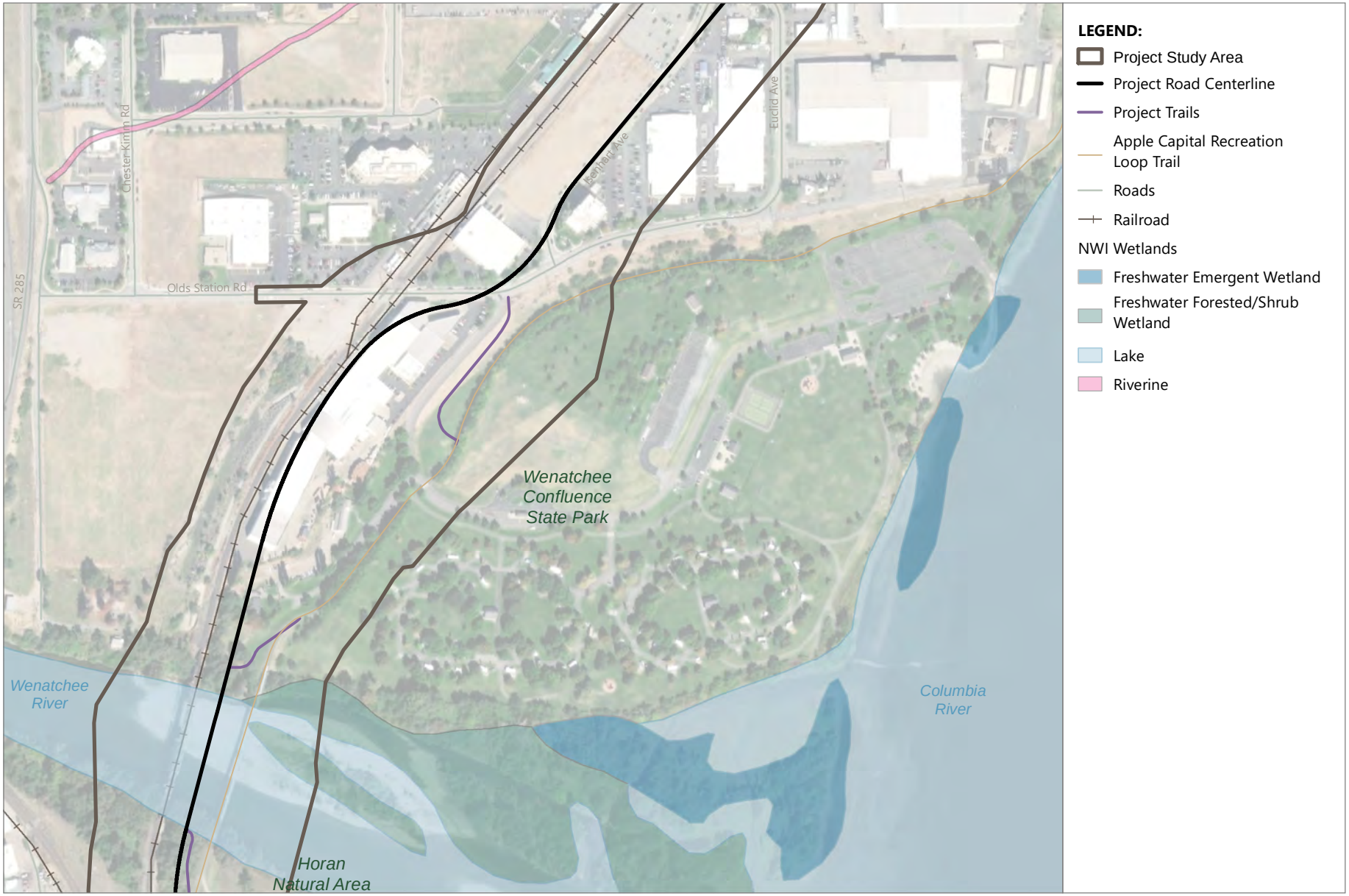

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Figure 5a
USFWS NWI Map of Undisturbed Areas – Wenatchee Confluence State Park Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

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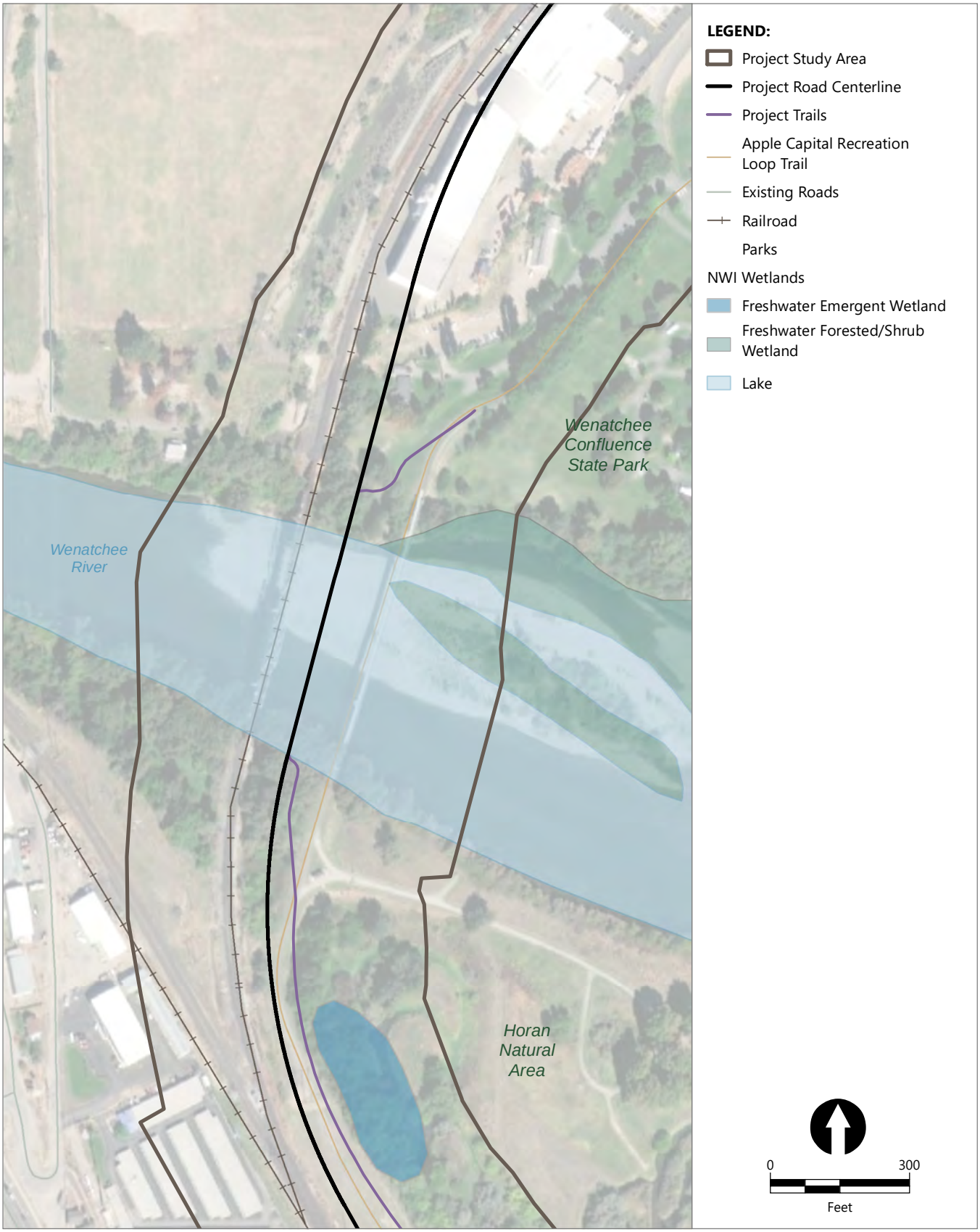

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Figure 5b
USFWS NWI Map of Undisturbed Areas – Wenatchee River Crossing
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

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Figure 5c
USFWS NWI Map of Undisturbed Areas – Horan Natural Area Vicinity
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

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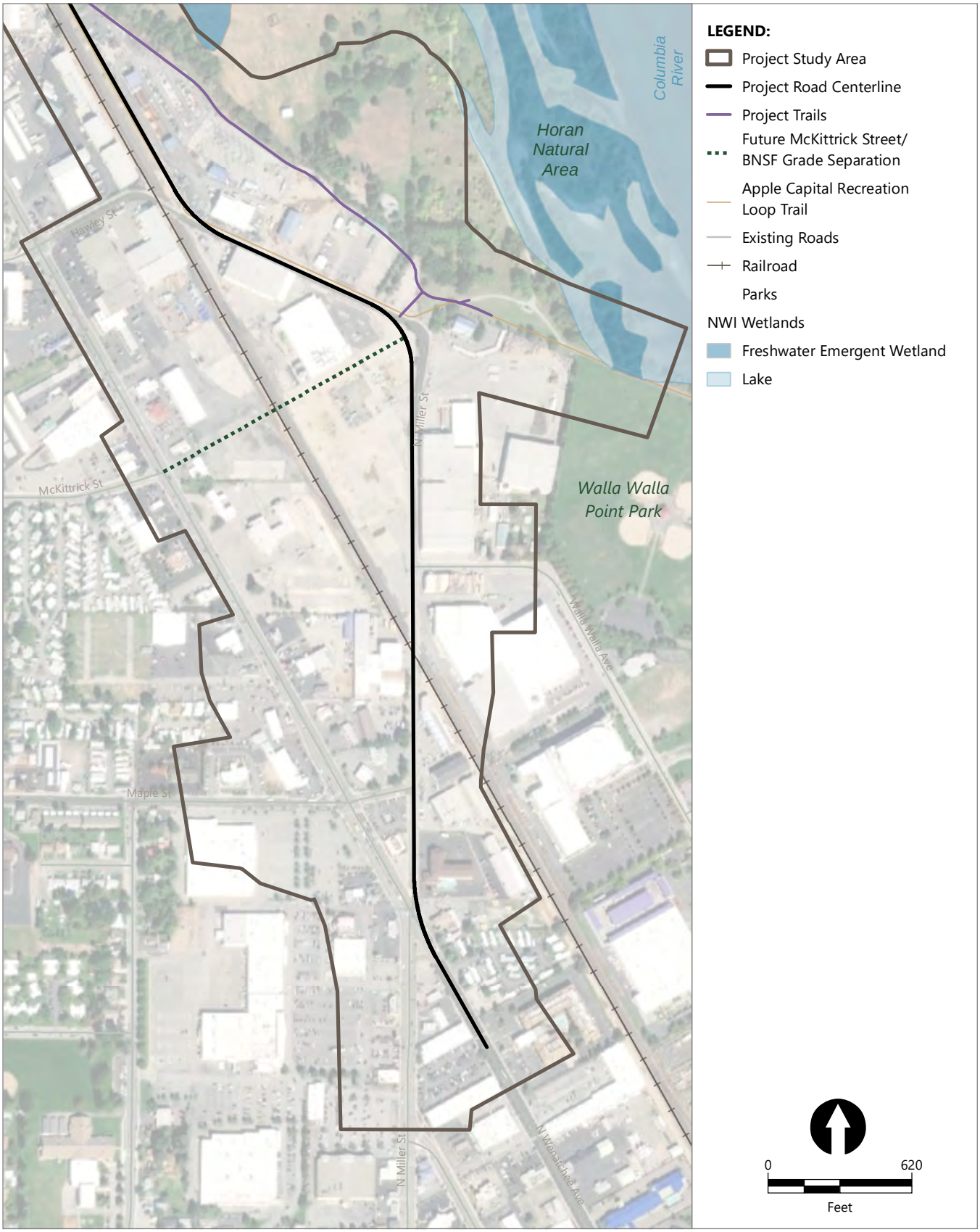

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Figure 5d
USFWS NWI Map of Undisturbed Areas – McKittrick Street to North Mission Street
Wetland and OHWM Delineation Report
Confluence Parkway, City of Wenatchee

Appendix A
Site Photographs

Photograph 1
Wetland A Channel, Saturated Soils, and Vegetation

Photograph 2
Wetland A Standing Water and Vegetation

Photograph 3
Wetland A Side Channel, Standing Water and Vegetation

Photograph 4
Wetland A Side Channel, Standing Water and Vegetation

Photograph 5
Wenatchee River Right Bank (looking upstream)

Photograph 6
Wenatchee River Right Bank (looking downstream)

Photograph 7
Wenatchee River Right Bank Downstream of Apple Capital Recreational Loop Trail Bridge

Photograph 8
Wenatchee River Right Bank Upstream of Apple Capital Recreational Loop Trail Bridge

Photograph 9
Wenatchee River Left Bank and Side Channel Downstream of Apple Capital Recreational Loop Trail Bridge

Photograph 10
Wenatchee River Left Bank and Side Channel Upstream of Apple Capital Recreational Loop Trail Bridge

Photograph 11
Wenatchee River Left Bank from Upstream Project Boundary

Photograph 12
Wenatchee River Left Bank from Downstream Project Boundary

Photograph 13
Wenatchee River Left Bank Vegetation

Photograph 14
Wetland A

Photograph 15
Upland Vegetation between BNSF and Apple Capital Recreational Loop Trail Bridges

Photograph 16
Wenatchee River Left Bank and Side Channel from Downstream Project Boundary

Photograph 17
Bank Armoring along Right Bank of Wenatchee River

Appendix B
Wetland Delineation Data Plot Forms

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenatchee | State: WA | Sampling Point: DP-01
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X** No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes **X** No	
Wetland Hydrology Present?	Yes **X** No	

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Ulmus pumila*	60	Yes	UPL
2. *Salix exigua*	30	Yes	FACW
3.			
4.			
5.			
50%= 45 20%= 18 Total Cover:	**90**		
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1. *Rubus armeniacus*	10	Yes	FAC
2.			
3.			
4.			
5.			
50%= 5 20%= 2 Total Cover:	**10**		
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Phalaris arundinacea*	95	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 47.5 20%= 19 Total Cover:	**95**		
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover:	**0**		

% Bare Ground in Herb Stratum **5** % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **75%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x1 =	**0**
FACW species	**125**	x2 =	**250**
FAC species	**10**	x3 =	**30**
FACU species	**0**	x4 =	**0**
UPL species	**60**	x5 =	**300**
Column Totals:	**195** (A)		**580** (B)

Prevalence Index = B/A = **3.0**

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: 75% FAC veg or wetter

SOIL

Sampling Point: DP-01

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	10YR 3/1	100	None	0			SiCL	
2-10	10YR 3/2	100	None	0			SiCL	
10-18+	10YR 3/2	70	10YR 5/4	30	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: 1 and 2 chroma with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- X Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- X Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No X Depth (inches): ___

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Evidence of standing water, hydrology assumed

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenathcee | State: WA | Sampling Point: DP-02
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Hydric Soil Present?	Yes	No **X**	
Wetland Hydrology Present?	Yes	No **X**	

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Ulmus pumila*	30	Yes	UPL
2. *Salix exigua*	10	Yes	FACW
3.			
4.			
5.			
50%= 20 20%= 8 Total Cover: **40**			
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1. *Rubus armeniacus*	30	Yes	FAC
2. *Cornus sericea*	15	No	-
3. *Rosa woodsii*	50	Yes	FACU
4.			
5.			
50%= 47.5 20%= 19 Total Cover: **95**			
Herb Stratum (Plot size: 5 ft x 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 0 20%= 0 Total Cover: **0**			
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover: **0**			
% Bare Ground in Herb Stratum **100** % Cover of Biotic Crust			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **2** (A)
Total Number of Dominant Species Across All Strata: **4** (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: **50%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**10**	x2 = **20**
FAC species	**30**	x3 = **90**
FACU species	**50**	x4 = **200**
UPL species	**30**	x5 = **150**
Column Totals:	**120** (A)	**460** (B)

Prevalence Index = B/A = **3.8**

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** **No X**

Remarks: 75% FAC veg or wetter

SOIL

Sampling Point: DP-02

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11	10YR 3/3	100	None	0			L	
11-18+	10YR 4/4	100	None	0			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks: 3 and 4 chroma with no redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): _____

Water table Present? Yes ___ No **X** Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydric features observed

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenatchee | State: WA | Sampling Point: DP-03
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X** No	**Is the Sampled Area within a Wetland?** **Yes X No**
Hydric Soil Present?	Yes **X** No	
Wetland Hydrology Present?	Yes **X** No	

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Salix exigua*	25	Yes	FACW
2.			
3.			
4.			
5.			
50%= 12.5 20%= 5 Total Cover: **25**			
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1. *Cornus sericea*	15	Yes	FACW
2.			
3.			
4.			
5.			
50%= 7.5 20%= 3 Total Cover: **15**			
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Phalaris arundinacea*	100	Yes	FACW
2. *Typha latifolia*	30	Yes	OBL
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 65 20%= 26 Total Cover: **130**			
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover: **0**			
% Bare Ground in Herb Stratum **0** % Cover of Biotic Crust			

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **4** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**30**	x1 = **30**
FACW species	**140**	x2 = **280**
FAC species	**0**	x3 = **0**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**170** (A)	**310** (B)

Prevalence Index = B/A = **1.8**

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: 100% FAC veg or wetter

SOIL

Sampling Point: DP-03

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	Organic/Detritus	100	None	0				Decomposing material
2-6	10YR 3/1	100	None	0			SiL	
6-18+	10YR 4/1	65	7.5YR 5/6	35	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks: 1 chroma with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 6

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No water table present; however, inundation of greater than 2 feet deep present within 30 feet of data plot

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenatchee | State: WA | Sampling Point: DP-04
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** Yes	No **X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Ulmus pumila*	40	Yes	UPL
2. *Crataegus douglasii*	50	Yes	FAC
3.			
4.			
5.			
50%= 45 20%= 18 Total Cover: **90**			
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1. *Ribes aureum*	30	Yes	FAC
2. *Rubus armeniacus*	10	Yes	FAC
3.			
4.			
5.			
50%= 20 20%= 8 Total Cover: **40**			
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Phalaris arundinacea*	15	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 7.5 20%= 3 Total Cover: **15**			
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover: **0**			

% Bare Ground in Herb Stratum **85** % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **4** (A)

Total Number of Dominant Species Across All Strata: **5** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **80%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**15**	x2 = **30**
FAC species	**90**	x3 = **270**
FACU species	**0**	x4 = **0**
UPL species	**40**	x5 = **200**
Column Totals:	**145** (A)	**500** (B)

Prevalence Index = B/A = **3.4**

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes **X** No

Remarks: 80% FAC veg or wetter

SOIL

Sampling Point: DP-04

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-18+	10YR 4/4	100	None	)			SL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** _____ **No** **X**

Remarks: 4 chroma with no redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No **X** Depth (inches): _____

Water table Present? Yes _____ No **X** Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes _____ No **X** Depth (inches): _____

Wetland Hydrology Present? **Yes** _____ **No** **X**

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydric features observed

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenatchee | State: WA | Sampling Point: DP-05
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: None
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X** No	**Is the Sampled Area within a Wetland?**	**Yes X No**
Hydric Soil Present?	Yes **X** No		
Wetland Hydrology Present?	Yes **X** No		

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1.			
2.			
3.			
4.			
5.			
50%= 0 20%= 0 Total Cover: **0**			
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1. *Cornus sericea*	100	Yes	FACW
2. *Rubus armeniacus*	10	No	FAC
3.			
4.			
5.			
50%= 55 20%= 22 Total Cover: **110**			
Herb Stratum (Plot size: 5 ft x 5 ft)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 0 20%= 0 Total Cover: **0**			
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
Total Cover: **0**			

% Bare Ground in Herb Stratum **100** % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **1** (A)

Total Number of Dominant Species Across All Strata: **1** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL species	**0**	x1 =	**0**
FACW species	**100**	x2 =	**200**
FAC species	**10**	x3 =	**30**
FACU species	**0**	x4 =	**0**
UPL species	**0**	x5 =	**0**
Column Totals:	**110** (A)		**230** (B)

Prevalence Index = B/A = **2.1**

Hydrophytic Vegetation Indicators:

- ____ 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤3.0[1]
- ____ 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- ____ 5 - Wetland Non-Vascular Plants[1]
- ____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X No**

Remarks: 100% FAC veg or wetter

SOIL

Sampling Point: DP-05

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	100	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5	10YR 3/2	100	None	0			SiCL	
5-18+	10YR 4/1	70	10YR 5/4	30	C	M	SiCL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- **X** Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** **X** **No** ___

Remarks: 1 and 2 chroma with redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- **X** Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- **X** Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- **X** Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- **X** Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): ___

Water table Present? Yes ___ No **X** Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): ___

Wetland Hydrology Present? **Yes** **X** **No** ___

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Evidence of ponding and matted leaves, hydrology assumed

WETLAND DETERMINATION DATA FORM – Arid West

Project/Site: Confluence Parkway | City/County: Wenatchee / Chelan | Sampling Date: 4/8/2020
Applicant/Owner: City of Wenatchee | State: WA | Sampling Point: DP -06
Investigator(s): Calvin Douglas, Stephen Lesky | Section, Township, Range: S28/T23N/R20E
Landform (hillslope, terrace, etc.): Terrrace | Local relief (concave, convex, none): Convex | Slope: 2
Subregion (LRR): Northwest Forests and Coast (LRR A) | Lat: 47.27.07 N | Long: 120.19.49 W | Datum:
Soil Map Unit Name: Alluvial Land | NWI Classification: PEM
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No (If no, explain in Remarks)
Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" Present? Yes X No
Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes **X**	No	
Hydric Soil Present?	Yes	No **X**	**Is the Sampled Area within a Wetland?** **Yes** **No X**
Wetland Hydrology Present?	Yes	No **X**	

Remarks: Wetland A is a large system with depressions and extends outside the study area boundary to the east. No surface connections to the Wenatchee or Columbia rivers were identified. Areas of the wetland outside the study area boundary were part of a wetland creation and enhancement project.

VEGETATION

Tree Stratum (Plot size: 30 ft x 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status?
1. *Crataegus douglasii*	20	Yes	FAC
2. *Populus balsamifera*	10	Yes	FAC
3.			
4.			
5.			
50%= 15 20%= 6 Total Cover: **30**			
Sapling/Shrub Stratum (Plot size: 15 ft x 15 ft)			
1.			
2.			
3.			
4.			
5.			
50%= 0 20%= 0 Total Cover: **0**			
Herb Stratum (Plot size: 5 ft x 5 ft)			
1. *Phalaris arundinacea*	100	Yes	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
50%= 50 20%= 20 Total Cover: **100**			
Woody Vine Stratum (Plot size:)			
1.			
2.			
Total Cover: **0**			

% Bare Ground in Herb Stratum **0** % Cover of Biotic Crust

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: **3** (A)

Total Number of Dominant Species Across All Strata: **3** (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: **100%** (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:
OBL species	**0**	x1 = **0**
FACW species	**100**	x2 = **200**
FAC species	**30**	x3 = **90**
FACU species	**0**	x4 = **0**
UPL species	**0**	x5 = **0**
Column Totals:	**130** (A)	**290** (B)

Prevalence Index = B/A = **2.2**

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- **X** 2 - Dominance Test is >50%
- **X** 3 - Prevalence Index is ≤3.0[1]
- 4 - Morphological Adaptation[1] (Provide supporting data in Remarks or on a separate sheet)
- 5 - Wetland Non-Vascular Plants[1]
- Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes X** **No**

Remarks: 100% FAC veg or wetter

SOIL

Sampling Point: DP -06

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 3/3	100	None	0			L	
10-18	10YR 3/4	100	None	0			SiL	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Muck Mineral (S1)
- ___ Sandy gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? **Yes** ___ **No** **X**

Remarks: 3 and 4 chroma with no redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Plowed Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No **X** Depth (inches): _____

Water table Present? Yes ___ No **X** Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ___ No **X** Depth (inches): _____

Wetland Hydrology Present? **Yes** ___ **No** **X**

Describe Recorded Data (Unnamed Tributary gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: No hydric features observed

Appendix C
Wetland Rating Forms

Wetland name or number A

RATING SUMMARY – Eastern Washington

Name of wetland (or ID #): Wetland A Date of site visit: 4/20

Rated by Calvin Douglas Trained by Ecology? X Yes ___ No Date of training 2007

HGM Class used for rating Depressional Wetland has multiple HGM classes? X Y ____N

NOTE: **Form is not complete without the figures requested** (*figures can be combined*).
Source of base aerial photo/map _____

OVERALL WETLAND CATEGORY I (based on functions X or special characteristics___)

1. Category of wetland based on FUNCTIONS

X **Category I** – Total score = 22-27

_____ **Category II** – Total score = 19-21

_____ **Category III** – Total score = 16-18

_____ **Category IV** – Total score = 9-15

FUNCTION	Improving Water Quality	Hydrologic	Habitat	
	Circle the appropriate ratings			
Site Potential	H **M** L	**H** M L	H **M** L	
Landscape Potential	H **M** L	H **M** L	**H** M L	
Value	**H** M L	**H** M L	**H** M L	**TOTAL**
Score Based on Ratings	7	8	8	23

Score for each function based on three ratings *(order of ratings is not important)*

9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

2. Category based on SPECIAL CHARACTERISTICS of wetland

CHARACTERISTIC	CATEGORY *Circle the appropriate category*
Vernal Pools	**II** **III**
Alkali	**I**
Wetland of High Conservation Value	**I**
Bog and Calcareous Fens	**I**
Old Growth or Mature Forest – slow growing	**I**
Aspen Forest	**I**
Old Growth or Mature Forest – fast growing	**II**
Floodplain forest	**II**
None of the above	X

Wetland name or number_____

Maps and figures required to answer questions correctly for Eastern Washington

Depressional Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	D 1.3, H 1.1, H 1.5	
Hydroperiods (including area of open water for H 1.3)	D 1.4, H 1.2, H 1.3	
Location of outlet (*can be added to map of hydroperiods)*	D 1.1, D 4.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	D 2.2, D 5.2	
Map of the contributing basin	D 5.3	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	D 3.1, D 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	D 3.3	

Riverine Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Ponded depressions	R 1.1	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	R 2.4	
Map of the contributing basin	R 2.2, R 2.3, R 5.2	
Plant cover of trees, shrubs, and herbaceous plants	R 1.2, R 4.2	
Width of wetland vs. width of stream *(can be added to another figure)*	R 4.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	R 3.1	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	R 3.2, R 3.3	

Lake Fringe Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	L 1.1, L 4.1, H 1.1, H 1.5	
Plant cover of trees, shrubs, and herbaceous plants	L 1.2	
Boundary of area within 150 ft of the wetland *(can be added to another figure)*	L 2.2	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	L 3.1, L 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	L 3.3	

Slope Wetlands

Map of:	To answer questions:	Figure #
Cowardin plant classes and classes of emergents	H 1.1, H 1.5	
Hydroperiods	H 1.2, H 1.3	
Plant cover of **dense** trees, shrubs, and herbaceous plants	S 1.3	
Plant cover of **dense, rigid** trees, shrubs, and herbaceous plants (*can be added to figure above)*	S 4.1	
Boundary of area within 150 ft of the wetland (*can be added to another figure*)	S 2.1, S 5.1	
1 km Polygon: Area that extends 1 km from entire wetland edge - including polygons for accessible habitat and undisturbed habitat	H 2.1, H 2.2, H 2.3	
Screen capture of map of 303(d) listed waters in basin (from Ecology website)	S 3.1, S 3.2	
Screen capture of list of TMDLs for WRIA in which wetland is found (website)	S 3.3	

Wetland name or number_____

HGM Classification of Wetland in Eastern Washington

For questions 1-4, the criteria described must apply to the entire unit being rated.

If the hydrologic criteria listed in each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-4 apply, and go to Question 5.

1. Does the entire unit **meet both** of the following criteria?
   ___The vegetated part of the wetland is on the water side of the Ordinary High Water Mark of a body of permanent open water (without any plants on the surface) that is at least 20 ac (8 ha) in size
   ___At least 30% of the open water area is deeper than 10 ft (3 m)

   NO – go to 2 **YES –** The wetland class is **Lake Fringe** (Lacustrine Fringe)

2. Does the entire wetland unit **meet all** of the following criteria?
   _X_ The wetland is on a slope (*slope can be very gradual*),
   _X_ The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks;
   _X_ The water leaves the wetland **without being impounded**.

   NO - go to 3 YES – The wetland class is **Slope**
   NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3 ft diameter and less than 1 foot deep).

3. Does the entire wetland unit **meet all** of the following criteria?
   ___ The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river;
   ___ The overbank flooding occurs at least once every 10 years.

   NO - go to 4 YES – The wetland class is **Riverine**
   NOTE: The Riverine wetland can contain depressions that are filled with water when the river is not flooding.

4. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. *This means that any outlet, if present, is higher than the interior of the wetland.*

   NO – go to 5 YES – The wetland class is **Depressional**

5. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a Depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-4 APPLY TO DIFFERENT AREAS IN THE WETLAND UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within the wetland unit being scored.

Wetland name or number_____

NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the HGM class listed in column 2 is less than 10% of the wetland unit; classify the wetland using the class that represents more than 90% of the total area.

HGM classes within the wetland unit being rated	HGM Class to use in rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine (the riverine portion is within the boundary of depression)	Depressional
Depressional + Lake Fringe	Depressional
Riverine + Lake Fringe	Riverine

*If you are still unable to determine which of the above criteria apply to your wetland, or if you have **more than 2 HGM classes** within a wetland boundary, classify the wetland as Depressional for the rating.*

Wetland name or number A_____

DEPRESSIONAL WETLANDS **Water Quality Functions** - Indicators that the site functions to improve water quality	Points (only 1 score per box)
D 1.0. Does the site have the potential to improve water quality?	
D 1.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet — points = 5 Wetland has an intermittently flowing outlet — points = 3 Wetland has a highly constricted permanently flowing outlet — points = 3 Wetland has a permanently flowing, unconstricted, surface outlet — points = 1	5
D 1.2. The soil 2 in below the surface (or duff layer) is true clay or true organic *(use NRCS definitions of soils)* YES = 3 NO = 0	0
D 1.3. Characteristics of persistent vegetation (Emergent, Scrub-shrub, and/or Forested Cowardin classes) Wetland has persistent, ungrazed, vegetation for > 2/3 of area — points = 5 Wetland has persistent, ungrazed, vegetation from 1/3 to 2/3 of area — points = 3 Wetland has persistent, ungrazed vegetation from 1/10 to < 1/3 of area — points = 1 Wetland has persistent, ungrazed vegetation < 1/10 of area — points = 0	5
D 1.4. Characteristics of seasonal ponding or inundation: *This is the area of ponding that fluctuates every year. Do not count the area that is permanently ponded.* Area seasonally ponded is > ½ total area of wetland — points = 3 Area seasonally ponded is ¼ - ½ total area of wetland — points = 1 Area seasonally ponded is < ¼ total area of wetland — points = 0	1
Total for D 1 — Add the points in the boxes above	11

Rating of Site Potential If score is:___**12- 16 = H** _X_**6- 11 = M** ___**0- 5 = L** *Record the rating on the first page*

D 2.0. Does the landscape have the potential to support the water quality function of the site?	
D 2.1. Does the wetland receive stormwater discharges? Yes = 1 No = 0	1
D 2.2. Is > 10% of the area within 150 ft of the wetland in land uses that generate pollutants? Yes = 1 No = 0	0
D 2.3. Are there septic systems within 250 ft of the wetland? Yes = 1 No = 0	0
D 2.4. Are there other sources of pollutants coming into the wetland that are not listed in questions D 2.1- D 2.3? Source Railroad tracks, mowed areas — Yes = 1 No = 0	1
Total for D 2 — Add the points in the boxes above	2

Rating of Landscape Potential If score is:___**3 or 4 = H** _X_**1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 3.0. Is the water quality improvement provided by the site valuable to society?	
D 3.1. Does the wetland discharge directly (i.e., within 1 mi) to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	1
D 3.2. Is the wetland in a basin or sub-basin where water quality is an issue in some aquatic resource [303(d) list, eutrophic lakes, problems with nuisance and toxic algae]? Yes = 1 No = 0	1
D 3.3. Has the site been identified in a watershed or local plan as important for maintaining water quality (*answer YES if there is a TMDL for the drainage or basin in which the wetland is found*)? Yes = 2 No = 0	1
Total for D 3 — Add the points in the boxes above	3

Rating of Value If score is: _X_**2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A

DEPRESSIONAL WETLANDS **Hydrologic Functions** - Indicators that the site functions to reduce flooding and erosion.	Points (only 1 score per box)
D 4.0. Does the site have the potential to reduce flooding and erosion?	
D 4.1. Characteristics of surface water outflows from the wetland: Wetland has no surface water outlet **points = 8** Wetland has an intermittently flowing outlet points = 4 Wetland has a highly constricted permanently flowing outlet points = 4 Wetland has a permanently flowing unconstricted surface outlet points = 0 *(If outlet is a ditch and not permanently flowing treat wetland as "intermittently flowing")*	8
D 4.2. Depth of storage during wet periods: *Estimate the height of ponding above the bottom of the outlet. For wetlands with no outlet, measure from the surface of permanent water or deepest part (if dry).* Seasonal ponding: > 3 ft above the lowest point in wetland or the surface of permanent ponding points = 8 Seasonal ponding: 2 ft - < 3 ft above the lowest point in wetland or the surface of permanent ponding points = 6 The wetland is a headwater wetland points = 4 Seasonal ponding: 1 ft - < 2 ft **points = 4** Seasonal ponding: 6 in - < 1 ft points = 2 Seasonal ponding: < 6 in or wetland has only saturated soils points = 0	4
Total for D 4 Add the points in the boxes above	12

Rating of Site Potential If score is: X **12-16 = H** ___**6-11 = M** ___**0-5 = L** *Record the rating on the first page*

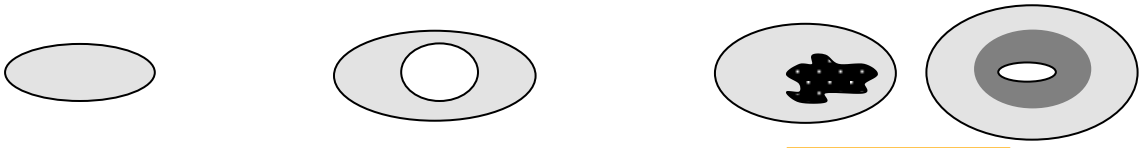
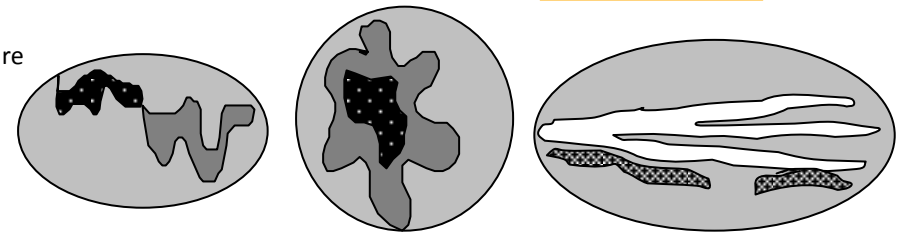
D 5.0. Does the landscape have the potential to support the hydrologic functions of the site?	
D 5.1. Does the wetland receive stormwater discharges? **Yes = 1** No = 0	1
D 5.2. Is > 10% of the area within 150 ft of the wetland in a land use that generates runoff? Yes = 1 **No = 0**	0
D 5.3. Is more than 25% of the contributing basin of the wetland covered with intensive human land uses? **Yes = 1** No = 0	1
Total for D 5 Add the points in the boxes above	2

Rating of Landscape Potential If score is: ___**3 = H** X **1 or 2 = M** ___**0 = L** *Record the rating on the first page*

D 6.0. Are the hydrologic functions provided by the site valuable to society?	
D 6.1. The wetland is in a landscape that has flooding problems. Choose the description that best matches conditions around the wetland being rated. *Do not add points. Choose the highest score if more than one condition is met.* The wetland captures surface water that would otherwise flow down-gradient into areas where flooding has damaged human or natural resources (e.g., houses or salmon redds), AND Flooding occurs in sub-basin that is immediately down-gradient of wetland **points = 2** Surface flooding problems are in a sub-basin farther down-gradient points = 1 The existing or potential outflow from the wetland is so constrained by human or natural conditions that the water stored by the wetland cannot reach areas that flood. *Explain why* _____ points = 0 There are no problems with flooding downstream of the wetland points = 0	2
D 6.2. Has the site has been identified as important for flood storage or flood conveyance in a regional flood control plan? **Yes = 2** No = 0	2
Total for D 6 Add the points in the boxes above	4

Rating of Value If score is: X **2-4 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A_____

These questions apply to wetlands of all HGM classes. **HABITAT FUNCTIONS** - Indicators that site functions to provide important habitat	(only 1 score per box)
H 1.0. Does the wetland have the potential to provide habitat for many species?	
H 1.1. Structure of the plant community: *Check the Cowardin vegetation classes present and categories of emergent plants. Size threshold for each category is >= ¼ ac or >= 10% of the wetland if wetland is < 2.5 ac.* ____Aquatic bed X___Emergent plants 0-12 in (0-30 cm) high are the highest layer and have > 30% cover ____Emergent plants >12-40 in (>30-100 cm) high are the highest layer with >30% cover X___Emergent plants > 40 in (> 100 cm) high are the highest layer with >30% cover X___Scrub-shrub (areas where shrubs have >30% cover) — 4 or more checks: points = 3 X___Forested (areas where trees have >30% cover) — 3 checks: points = 2; 2 checks: points = 1; 1 check: points = 0	3
H 1.2. Is one of the vegetation types Aquatic Bed? Yes = 1 No = 0	0
H 1.3. Surface water H 1.3.1. Does the wetland have areas of open water (without emergent or shrub plants) over at least ¼ ac **OR** 10% of its area during the March to early June **OR** in August to the end of September? ***Answer YES for Lake Fringe wetlands***. Yes = 3 points & go to H 1.4 No = go to H 1.3.2 H 1.3.2. Does the wetland have an intermittent or permanent, and unvegetated stream within its boundaries, or along one side, over at least ¼ ac or 10% of its area? *Answer yes only if H 1.3.1 is No*. Yes = 3 No = 0	3
H 1.4. Richness of plant species Count the number of plant species in the wetland that cover at least 10 ft^2. D*ifferent patches of the same species can be combined to meet the size threshold. You do not have to name the species.* *Do not include Eurasian milfoil, reed canarygrass, purple loosestrife, Russian olive, Phragmites, Canadian thistle, yellow-flag iris, and saltcedar (Tamarisk)* # of species ____ Scoring: > 9 species: points = 2; 4-9 species: points = 1; < 4 species: points = 0	1
H 1.5. Interspersion of habitats Decide from the diagrams below whether interspersion among types of plant structures (described in H 1.1), and unvegetated areas (open water or mudflats) is high, moderate, low, or none. *Use map of Cowardin and emergent plant classes prepared for questions H 1.1 and map of open water from H 1.3. If you have four or more plant classes or three classes and open water, the rating is always high.*  **None** = 0 points **Low** = 1 point **Moderate** = 2 points All three diagrams in this row are **High** = 3 points  Riparian braided channels with 2 classes	Figure__ 2

Wetland name or number A

H 1.6. Special habitat features *Check the habitat features that are present in the wetland. The number of checks is the number of points.* __X__Loose rocks larger than 4 in OR large, downed, woody debris (> 4 in diameter) within the area of surface ponding or in stream. __X__Cattails or bulrushes are present within the wetland. __X__Standing snags (diameter at the bottom > 4 in) in the wetland or within 30 m (100 ft) of the edge. __X__Emergent or shrub vegetation in areas that are permanently inundated/ponded. ____Stable steep banks of fine material that might be used by beaver or muskrat for denning (> 45 degree slope) OR signs of recent beaver activity ____ Invasive species cover less than 20% in each stratum of vegetation *(canopy, sub-canopy, shrubs, herbaceous, moss/ground cover)*	4
Total for H 1 — Add the points in the boxes above	13

Rating of Site Potential If score is: ___**15-18 = H** __X__**7-14 = M** ___**0-6 = L** *Record the rating on the first page*

H 2.0. Does the landscape have the potential to support habitat functions of the site?	
H 2.1. Accessible habitat (only area of habitat abutting wetland). If total accessible habitat is: *Calculate:* % undisturbed habitat 15 **+** [(% moderate and low intensity land uses)/2] 2.5 **=** 18 % > 1/3 (33.3%) of 1 km Polygon — points = 3 20-33% of 1km Polygon — points = 2 10-19% of 1km Polygon — points = 1 <10% of 1km Polygon — points = 0	1
H 2.2. Undisturbed habitat in 1 km Polygon around wetland. *Calculate:* % undisturbed habitat 20 **+** [(% moderate and low intensity land uses)/2] 15 **=** 35 % Undisturbed habitat > 50% of Polygon — points = 3 Undisturbed habitat 10 - 50% and in 1-3 patches — points = 2 Undisturbed habitat 10 - 50% and > 3 patches — points = 1 Undisturbed habitat < 10% of Polygon — points = 0	2
H 2.3. Land use intensity in 1 km Polygon: > 50% of Polygon is high intensity land use — points = (- 2) Does not meet criterion above — points = 0	0
H 2.4. The wetland is in an area where annual rainfall is less than 12 in, and its water regime is not influenced by irrigation practices, dams, or water control structures. *Generally, this means outside boundaries of reclamation areas, irrigation districts, or reservoirs* — Yes = 3 No = 0	3
Total for H 2 — Add the points in the boxes above	6

Rating of Landscape Potential If score is: __X__ **4-9 = H** ___**1-3 = M** ___**< 1 = L** *Record the rating on the first page*

H 3.0. Is the habitat provided by the site valuable to society?	
H 3.1. Does the site provide habitat for species valued in laws, regulations, or policies? *Choose the highest score that applies to the wetland being rated* Site meets ANY of the following criteria: — points = 2 __X__ It has 3 or more priority habitats within 100 m (see Appendix B) __X__ It provides habitat for Threatened or Endangered species (any plant or animal on state or federal lists) __X__ It is mapped as a location for an individual WDFW species __X__ It is a Wetland of High Conservation Value as determined by the Department of Natural Resources __X__ It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan Site has 1 or 2 priority habitats within 100 m (see Appendix B) — points = 1 Site does not meet any of the criteria above — points = 0	2

Rating of Value If score is: __X__ **2 = H** ___**1 = M** ___**0 = L** *Record the rating on the first page*

Wetland name or number A Type text here

CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS

Please determine if the wetland meets the attributes described below and circle the appropriate category. NOTE: A wetland may meet the criteria for more than one set of special characteristics. Record all those that apply. NOTE: All wetlands should also be characterized based on their functions.

Wetland Type *Check off any criteria that apply to the wetland. Circle the category when the appropriate criteria are met.*	**Category**
SC 1.0. Vernal pools Is the wetland **less than 4000 ft²**, and does it meet at least **two** of the following criteria? — Its only source of water is rainfall or snowmelt from a small contributing basin and has no groundwater input. — Wetland plants are typically present only in the spring; the summer vegetation is typically upland annuals. *If you find perennial, obligate, wetland plants, the wetland is probably NOT a vernal pool*. — The soil in the wetland is shallow [< 1 ft (30 cm)deep] and is underlain by an impermeable layer such as basalt or clay. — Surface water is present for less than 120 days during the wet season. Yes **–** Go to **SC 1.1** No = **Not a vernal pool** SC 1.1. Is the vernal pool relatively undisturbed in February and March? Yes **–** Go to **SC 1.2** No = **Not a vernal pool with special characteristics**	
SC 1.2. Is the vernal pool in an area where there are at least 3 separate aquatic resources within 0.5 mi (other wetlands, rivers, lakes etc.)? Yes = **Category II** No = **Category III**	**Cat. II** **Cat. III**
SC 2.0. Alkali wetlands Does the wetland meet **one** of the following criteria? — The wetland has a conductivity > 3.0 mS/cm. — The wetland has a conductivity between 2.0 and 3.0 mS, and more than 50% of the plant cover in the wetland can be classified as "alkali" species (see Table 4 for list of plants found in alkali systems). — If the wetland is dry at the time of your field visit, the central part of the area is covered with a layer of salt. **OR** does the wetland unit meet two of the following three sub-criteria? — Salt encrustations around more than 75% of the edge of the wetland — More than ¾ of the plant cover consists of species listed on Table 4 — A pH above 9.0. All alkali wetlands have a high pH, but please note that some freshwater wetlands may also have a high pH. Thus, pH alone is not a good indicator of alkali wetlands. Yes = **Category I** No= **Not an alkali wetland**	**Cat. I**
SC 3.0. Wetlands of High Conservation Value (WHCV) SC 3.1. Has the WA Department of Natural Resources updated their website to include the list of Wetlands of High Conservation Value? Yes – Go to **SC 3.2** No – Go to **SC 3.3** SC 3.2. Is the wetland listed on the WDNR database as a Wetland of High Conservation Value? Yes = **Category I** No = **Not a WHCV** SC 3.3. Is the wetland in a Section/Township/Range that contains a Natural Heritage wetland? http://www1.dnr.wa.gov/nhp/refdesk/datasearch/wnhpwetlands.pdf Yes **– Contact WNHP/WDNR and go to SC 3.4** No = **Not a WHCV** SC 3.4. Has WDNR identified the wetland within the S/T/R as a Wetland of High Conservation Value and it is listed on their website? Yes = **Category I** No =**Not a WHCV**	**Cat. I**

Wetland name or number A

SC 4.0 Bogs and Calcareous Fens Does the wetland (or any part of the wetland unit) meet both the criteria for soils and vegetation in bogs or calcareous fens? *Use the key below to identify if the wetland is a bog or calcareous fen.* ***If you answer yes you will still need to rate the wetland based on its functions.*** SC 4.1. Does an area within the wetland have organic soil horizons (i.e., layers of organic soil), either peats or mucks, that compose 16 in or more of the first 32 in of the soil profile? *See Appendix C for a field key to identify organic soils*. Yes – Go to **SC 4.3** No – Go to **SC 4.2** SC 4.2. Does an area within the wetland have organic soils, either peats or mucks, that are less than 16 in deep over bedrock or an impermeable hardpan such as clay or volcanic ash, or that are floating on top of a lake or pond? Yes – Go to **SC 4.3** No = **Is not a bog for rating** SC 4.3. Does an area within the wetland have more than 70% cover of mosses at ground level AND at least 30% of the total plant cover consists of species in Table 5? Yes = **Category I bog** No – Go to **SC 4.4** **NOTE:** If you are uncertain about the extent of mosses in the understory, you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 16 in deep. If the pH is less than 5.0 and the plant species in Table 5 are present, the wetland is a bog. SC 4.4. Is an area with peats or mucks forested (> 30% cover) with subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Engelmann spruce, or western white pine, AND any of the species (or combination of species) listed in Table 5 provide more than 30% of the cover under the canopy? Yes = **Category I bog** No – Go to **SC 4.5** SC 4.5. Do the species listed in Table 6 comprise at least 20% of the total plant cover within an area of peats and mucks? Yes = **Is a Calcareous Fen for purpose of rating** No – Go to **SC 4.6** SC 4.6. Do the species listed in Table 6 comprise at least 10% of the total plant cover in an area of peats and mucks, AND one of the two following conditions is met: — Marl deposits [calcium carbonate ($CaCO_3$) precipitate] occur on the soil surface or plant stems — The pH of free water is ≥ 6.8 AND electrical conductivity is ≥ 200 uS/cm at multiple locations within the wetland Yes = **Is a Category I calcareous fen** No = **Is not a calcareous fen**	**Cat. I** **Cat. I**

SC 5.0. Forested Wetlands Does the wetland have an area of forest rooted within its boundary that meets **at least one** of the following three criteria? (*Continue only if you have identified that a forested class is present in question H 1.1*) — The wetland is within the 100 year floodplain of a river or stream — Aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species — There is at least ¼ ac of trees (even in wetlands smaller than 2.5 ac) that are "mature" or "old-growth" according to the definitions for these priority habitats developed by WDFW *(see definitions in question H3.1)* Yes – Go to **SC 5.1** No = **Not a forested wetland with special characteristics**	
SC 5.1. Does the wetland have a forest canopy where more than 50% of the tree species (by cover) are slow growing native trees (*see Table 7*)? Yes = **Category I** No – Go to **SC 5.2**	**Cat. I**
SC 5.2. Does the wetland have areas where aspen (*Populus tremuloides*) represents at least 20% of the total cover of woody species? Yes = **Category I** No – Go to **SC 5.3**	**Cat. I**
SC 5.3. Does the wetland have at least ¼ acre with a forest canopy where more than 50% of the tree species (by cover) are fast growing species (*see Table 7*)? Yes = **Category II** No – Go to **SC 5.4**	**Cat. II**
SC 5.4. Is the forested component of the wetland within the 100 year floodplain of a river or stream? Yes = **Category II** No = **Not a forested wetland with special characteristics**	**Cat. II**
Category of wetland based on Special Characteristics *Choose the highest rating if wetland falls into several categories* If you answered No for all types, enter "Not Applicable" on Summary Form	NA

Appendix B: WDFW Priority Habitats in Eastern Washington

Priority habitats listed by WDFW (see complete descriptions of WDFW priority habitats, and the counties in which they can be found, in: Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 177 pp. http://wdfw.wa.gov/publications/00165/wdfw00165.pdf or access the list from here: http://wdfw.wa.gov/conservation/phs/list/)

Count how many of the following priority habitats are within 330 ft (100 m) of the wetland: ***NOTE:*** *This question is independent of the land use between the wetland and the priority habitat.*

— **Aspen Stands:** Pure or mixed stands of aspen greater than 1 ac (0.4 ha).

X **Biodiversity Areas and Corridors**: Areas of habitat that are relatively important to various species of native fish and wildlife (*full descriptions in WDFW PHS report*).

— **Old-growth/Mature forests:** Old-growth east of Cascade crest – Stands are highly variable in tree species composition and structural characteristics due to the influence of fire, climate, and soils. In general, stands will be >150 years of age, with 10 trees/ac (25 trees/ha) that are > 21 in (53 cm) dbh, and 1-3 snags/ac (2.5-7.5 snags/ha) that are > 12-14 in (30-35 cm) diameter. Downed logs may vary from abundant to absent. Canopies may be single or multi-layered. Evidence of human-caused alterations to the stand will be absent or so slight as to not affect the ecosystem's essential structures and functions. Mature forests – Stands with average diameters exceeding 21 in (53 cm) dbh; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80-200 years old west and 80-160 years old east of the Cascade crest.

— **Oregon White Oak:** Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (*full descriptions in WDFW PHS report p. 158 – see web link above*).

X **Riparian**: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.

X **Instream:** The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.

— **Caves:** A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice, or other geological formations and is large enough to contain a human.

— **Cliffs:** Greater than 25 ft (7.6 m) high and occurring below 5000 ft elevation.

— **Talus:** Homogenous areas of rock rubble ranging in average size 0.5 - 6.5 ft (0.15 - 2.0 m), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.

— **Snags and Logs:** Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of > 12 in (30 cm)in eastern Washington and are > 6.5 ft (2 m) in height. Priority logs are > 12 in (30 cm) in diameter at the largest end, and > 20 ft (6 m) long.

— **Shrub-steppe:** A nonforested vegetation type consisting of one or more layers of perennial bunchgrasses and a conspicuous but discontinuous layer of shrubs (see Eastside Steppe for sites with little or no shrub cover).

— **Eastside Steppe:** Nonforested vegetation type dominated by broadleaf herbaceous flora (i.e., forbs), perennial bunchgrasses, or a combination of both. Bluebunch wheatgrass (*Pseudoroegneria spicata*) is often the prevailing cover component along with Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), rough fescue (*F. campestris*), or needlegrasses (*Achnatherum* spp.).

— **Juniper Savannah:** All juniper woodlands.

Note: All vegetated wetlands are by definition a priority habitat but are not included in this list because they are addressed elsewhere.

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Appendix D
Plant Names and Indicator Status

Plant Names and Indicator Status

Scientific Name	Common Name	Indicator Status
Trees		
Acer macrophlyllum	Big Leaf Maple	FACU
Crataegus douglasii	Black Hawthorn	FAC
Elaeagnus angustifolia	Russian Olive	FAC
Pinus ponderosa	Ponderosa Pine	FACU
Pinus sp.	Pine sp.	FACU
Populus balsamifera	Balsam Popular	FAC
Prunus virginiana	Chokecherry	FACU
Robinia pseudoacacia	Black Locust	FACU
Salix exigua	Coyote Willow	FACW
Salix lutea	Yellow Willow	OBL
Ulmus pumila	Siberian Elm	UPL
Populus balsamifera L. ssp. Trichocarpa	Black Cotton Wood	FAC
Populus tremuloides	Quaking Aspen	FACU
Shrubs		
Amelnchier alnifolia	Saskatoon Serviceberry	FACU
Cornus alba	Red Osier	FACW
Rhus glabra	Smooth Sumac	UPL
Ribes aureum	Golden Currant	FAC
Ribes triste	Red Currant	OBL
Rosa woodsii	Woods' Rose	FACU
Grasses		
Festuca	Fescue sp.	FACU
Leymus cinereus	Basin Wild Rye	FAC
Phalaris arundinacea	Reed Canarygrass	FACW
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Secale L.	Rye Grass	UPL
Herbaceous		
Asclepias L.	Milkweed	FAC
Centaurea diffusa Lam.	Diffuse Knapweed	UPL
Centaurea stoebe L.	Spotted Knapweed	UPL
Cicuta maculata	Spotted Water Hemlock	OBL
Cirsium arvense	Canada Thistle	FAC
Cirsium vulgare	Bull Thistle	FACU
Kochia scoparia	Kochia	UPL
Mahonia aquifolium	Holly-leaf Oregon Grape	UPL
Spiraea sp.	Spirea sp.	FACW
Tanacetum vulgare	Common Tansy	FACU
Typha L.	Cattail	OBL
Verbascum thapsus L.	Common Mullein	FACU
Xanthium L.	Cocklebur	FAC

Appendix E
Methods for Delineating, Characterizing, and Rating Wetlands and OHWM

METHODS FOR DELINEATING, CHARACTERIZING, AND RATING WETLANDS AND OHWM

Delineating Wetland Boundaries

The method for delineating wetlands is based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetland hydrology. Anchor QEA scientists record data for each of these parameters at representative sample plots located in the wetland and the nearby uplands. Data collection methods for each of these parameters are described in the following subsections.

Vegetation

The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) states as follows regarding hydrophytic (wetland) vegetation:

> The Corps Manual defines hydrophytic vegetation as the assemblage of macrophytes that occurs in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to influence plant occurrence. The manual uses a plant-community approach to evaluate vegetation. Hydrophytic vegetation decisions are based on the assemblage of plant species growing on a site, rather than the presence or absence of particular indicator species. Hydrophytic vegetation is present when the plant community is dominated by species that require or can tolerate prolonged inundation or soil saturation during the growing season.

Plant species occurring in each plot were recorded on field data forms, with one data form per plot. Percent cover for each plant species was estimated in the plot, and dominant plant species were identified. At each plot, trees within a 30-foot radius, shrubs within a 15-foot radius, and emergent species within a 3-foot radius from the center of the plot were identified and recorded. Plant indicator status was determined using the *National Wetland Plant List* (USACE 2020), and a determination was made as to whether the vegetation in the plot was hydrophytic. To meet the hydrophytic parameter, more than 50% of the dominant species, with 20% or greater cover, must have an indicator of obligate wetland (OBL), facultative wetland (FACW), or facultative (FAC). Table F-1 shows the definitions for each wetland indicator status category.

Table F-1
Wetland Plant Indicator Status Definitions

Indicator Status	Description
Obligate Wetland (OBL)	Plant species occur almost always in wetlands (estimated probability greater than 99%) under natural conditions.
Facultative Wetland (FACW)	Plant species usually occur in wetlands (estimated probability 67% to 99%) but are occasionally found in non-wetlands.
Facultative (FAC)	Plant species are equally likely to occur in wetlands or non-wetlands (estimated probability 34% to 66%).
Facultative Upland (FACU)	Plant species usually occur in non-wetlands (estimated probability 67% to 99%) but are occasionally found in wetlands.
Obligate Upland (UPL)	Plant species occur almost always in non-wetlands (estimated probability greater than 99%) under natural conditions.

Source: Reed, P., 1988. National Wetland Inventory, U.S. Department of the Interior, Fish and Wildlife Service, St. Petersburg, Florida.

Soils

The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) states as follows regarding hydric (wetland) soils:

> The National Technical Committee for Hydric Soils (NTCHS) defines a hydric soil as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA Soil Conservation Service 1994). Most hydric soils exhibit characteristic morphologies that result from repeated periods of saturation or inundation for more than a few days. Saturation or inundation, when combined with microbial activity in the soil, causes the depletion of oxygen. This anaerobiosis promotes certain biogeochemical processes, such as the accumulation of organic matter and the reduction, translocation, or accumulation of iron and other reducible elements. These processes result in distinctive characteristics that persist in the soil during both wet and dry periods, making them particularly useful for identifying hydric soils in the field (USDA Natural Resources Conservation Service 2006b).

Soils were sampled in each plot and evaluated for hydric soil indicators. Soil pits were dug to a depth of 18 inches, unless prevented by impenetrable substrate. Soil colors were classified by their numerical description, as identified on a Munsell Soil Color Chart (Munsell 2009). Hydric soil indicators include low soil matrix chroma, gleying, and redoximorphic (or "redox") features. Redox features are spots of contrasting color that occur within the soil matrix (the predominant soil color). Gleyed soils are predominantly bluish, greenish, or grayish in color.

Hydrology

The *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008) states as follows regarding wetland hydrology:

> Wetland hydrology indicators are used in combination with indicators of hydric soil and hydrophytic vegetation to determine whether an area is a wetland under the Corps Manual. Indicators of hydrophytic vegetation and hydric soil generally reflect a site's medium- to long-term wetness history. They provide readily observable evidence that episodes of inundation or soil saturation lasting more than a few days during the growing season have occurred repeatedly over a period of years and that the timing, duration, and frequency of wet conditions have been sufficient to produce a characteristic wetland plant community and hydric soil morphology.

During the site visit, Anchor QEA scientists recorded indicators of wetland hydrology observed at each sample plot. Wetland hydrology indicators include the direct observation of surface water or groundwater during a site visit; evidence that the site is subject to flooding or ponding, although it may not be inundated currently (e.g., water marks, drift deposits, sediment deposits, and similar features); other evidence that the soil is saturated currently or was saturated recently (e.g., oxidized rhizospheres surrounding living roots, the presence of reduced iron or sulfur in the soil profile); and landscape characteristics and vegetation and soil features that indicate contemporary rather than historical wet conditions (USACE 2008).

Characterizing Wetlands

Cowardin Classification

Wetland community types are discussed according to the U.S. Fish and Wildlife Service (USFWS) classification developed by Cowardin et al. (1979) for use in the National Wetland Inventory. Published in 1979 by a team of USFWS scientists led by L.M. Cowardin, it bases the classification of wetlands on their physical characteristics, such as the general type of vegetation in the wetland (e.g., trees, shrubs, and grass) and how much, and where, water is present in the wetland. It provides a classification for every known wetland type that occurs throughout the United States. Table F-2 summarizes the characteristics of Cowardin wetland community types typically encountered in western Washington. Wetlands are typically assigned a "system" (e.g., palustrine or estuarine) that reflects hydrologic, geomorphologic, chemical, or biological factors, and a "class" that describes either the dominant type of vegetation or the substrate. Modifiers can also be added for hydrology. A single wetland can contain more than one community type.

Table F-2
Common Wetland Community Types of Eastern Washington

Community Type	Description
System	
Palustrine	Nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%.
Class	
Aquatic Bed (PAB)	Wetland has plants that grow principally on or below the surface of the water.
Emergent (PEM)	Wetland has at least 30% cover of erect, rooted, herbaceous plants.
Scrub-Shrub (PSS)	Wetland has at least 30% cover of woody vegetation that is less than 20 feet tall.
Forested (PFO)	Wetland has at least 30% cover of woody vegetation that is 20 feet tall or taller.

Hydrogeomorphic Classification

The hydrogeomorphic (HGM) classification developed by Brinson (1993) is used to describe a wetland's geomorphic setting, its source of water, and the movement of water in the wetland. Determining the HGM class of a wetland is integral to using the Washington State Department of Ecology's (Ecology's) *Washington State Wetland Rating System – Eastern Washington: 2014 Update* (Hruby 2014). The HGM classifications used in the Ecology rating system are summarized in Table F-3.

Table F-3
HGM Classifications Used in 2014 Ecology Rating System

HGM Class	Description (Hruby 2014)
Flats	Flats wetlands occur in topographically flat areas that are hydrologically isolated from surrounding groundwater or surface water. The main source of water in these wetlands is precipitation directly on the wetland itself. They receive virtually no groundwater discharge or surface runoff from the surrounding landscape.
Lake Fringe	Lake Fringe wetlands are on the water side of the Ordinary High Water Mark (OHWM) of lakes. Lake Fringe wetlands are separated from other wetlands based on the area and depth of open water adjacent to them. If the area of open water next to a vegetated wetland is larger than 20 ac (8 ha), and more than 6.6 ft deep (2 m) over 30% of the open water areas, wetland is considered to be Lake Fringe. The criterion here is 20 ac of open water without any aquatic plants.
Slope	Slope wetlands occur on hill or valley slopes where groundwater surfaces and begins running along the surface, or immediately below the surface. Water in these

HGM Class	Description (Hruby 2014)
	wetlands flows only in one direction (down the slope) and the gradient is steep enough that the water is not impounded.
Riverine	Riverine wetlands occur in valleys associated with stream or river channels. They lie in the active floodplain, and have important hydrologic links to the flows in the river or stream. Their proximity to the river facilitates both the rapid transfer of floodwaters in and out of the wetland, and the import and export of sediments. The distinguishing characteristic of Riverine wetlands in western Washington is that they are flooded by overbank flow from the river at least once every 2 years on average over a 10-year period.
Depressional	Depressional wetlands occur in topographic depressions where the elevation of the surface within the wetland is lower than in the surrounding landscape. The shapes of Depressional wetlands vary, but in all cases, the movement of surface water and shallow subsurface water is toward the lowest point in the depression. The depression may have an outlet, but the lowest point in the wetland is somewhere within the boundary, not at the outlet.

Wetland Ratings and Evaluating Wetland Functions

Wetland ratings were determined using the most current version of Ecology guidance in the *Washington State Wetland Rating System – Eastern Washington: 2014 Update* (Hruby 2014). The system developed by Ecology is used to differentiate wetlands based on their sensitivity to disturbance, the functions they provide, their significance in the watershed, their rarity, their ability to be replaced, and the beneficial functions they provide to society. The following three major functions are analyzed: 1) water quality improvement, 2) flood and erosion control, and 3) wildlife habitat.

Per Ecology's rating system, wetlands are categorized and scored according to the following criteria:

- Category I wetlands (23 to 27 points) represent a unique or rare wetland type, or are more sensitive to disturbance, or are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of function.
- Category II wetlands (20 to 22 points) are difficult, though not impossible, to replace and provide high levels of some functions, or perform most functions relatively well.
- Category III wetlands (16 to 19 points) have moderate levels of functions. They have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than Category II wetlands.
- Category IV wetlands (9 to 15 points) have the lowest levels of functions and are often heavily disturbed, but they perform important functions and also need to be protected.

Determining the Ordinary High Water Mark

The ordinary high water mark (OHWM) boundaries of waterbodies in the study area were field delineated using the Ecology guidance document *Determining the Ordinary High Water Mark for*

Shoreline Management Act Compliance in Washington State (Ecology 2016). Determining an OHWM is not a precise science; thus, the guidance documents allow for the consideration of multiple physical and biological features. Field indicators used for field delineation of stream OHWMs include the following:

- Sediment bars (usually below OHWM)
- Scour line (usually below OHWM)
- Clean cobbles or boulders (usually below OHWM)
- Exposed roots (usually below OHWM)
- Stratified sediment deposits (occur both above and below OHWM)
- Flood or overbank deposits (may be at OHWM)
- Top of bank (may be at or above OHWM)
- Water stains or marks (occur at or above/below OHWM)
- Sediment lines (at or above OHWM)
- Flood debris or wrack deposition (at or above OHWM)
- Drainage patterns/flattened vegetation (usually below OHWM)
- Toe of lowest terrace (at or above OHWM)
- Organic material or duff layer (usually above OHWM)

Field indicators used for field delineation of lake OHWMs include many of the same indicators as for streams, with the addition of the following:

- Vegetation changes at lake-upland transition
- Morphological adaptations (e.g., buttressed tree trunks)
- Plants on hummocks
- Topographic breaks
- Substrate changes
- Filamentous algal growth/crust

Appendix C
Plant and Wildlife Species

Vegetation Species Observed in the Project Area During April 2020 Site Visits

Scientific Name	Common Name
Trees	
Acer macrophlyllum	Big Leaf Maple
Crataegus douglasii	Black Hawthorn
Elaeagnus angustifolia	Russian Olive
Pinus ponderosa	Ponderosa Pine
Pinus sp.	Pine sp.
Populus balsamifera	Balsam Popular
Prunus virginiana	Chokecherry
Robinia pseudoacacia	Black Locust
Salix exigua	Coyote Willow
Salix lutea	Yellow Willow
Ulmus pumila	Siberian Elm
Populus balsamifera L. ssp. Trichocarpa	Black Cotton Wood
Populus tremuloides	Quaking Aspen
Shrubs	
Amelnchier alnifolia	Saskatoon Serviceberry
Cornus alba	Red Osier
Rhus glabra	Smooth Sumac
Ribes aureum	Golden Currant
Ribes triste	Red Currant
Rosa woodsii	Woods' Rose
Grasses	
Festuca	Fescue sp.
Leymus cinereus	Basin Wild Rye
Phalaris arundinacea	Reed Canarygrass
Pseudoroegneria spicata	Bluebunch Wheatgrass
Secale L.	Rye Grass
Herbaceous	
Asclepias L.	Milkweed
Centaurea diffusa Lam.	Diffuse Knapweed
Centaurea stoebe L.	Spotted Knapweed
Cicuta maculata	Spotted Water Hemlock
Cirsium arvense	Canada Thistle
Cirsium vulgare	Bull Thistle
Kochia scoparia	Kochia
Mahonia aquifolium	Holly-leaf Oregon Grape
Spiraea sp.	Spirea sp.
Tanacetum vulgare	Common Tansy
Typha L.	Cattail
Verbascum thapsus L.	Common Mullein
Xanthium L.	Cocklebur

Wildlife Species Observed in the Horan Natural Area

Scientific Name	Common Name	Observed During April 2020 Site Visits	Observed During Audubon Surveys[1]
Birds			
Agelaius phoeniceus	Red-winged Blackbird	x	x
Aix sponsa	Wood Duck	x	x
Anas americana	American Widgeon		x
Anas crecca	Green-winged Teal		x
Anas platyrhynchos	Mallard	x	x
Ardea herodias	Great Blue Heron	x	x
Bombycilla cedorum	Cedar Waxwing		x
Branta canadensis	Canada Goose	x	x
Bucephala albeola	Bufflehead		x
Bucephala clangula	Common Goldeneye		x
Buteo jamaicensis	Red-tailed Hawk		x
Calidris mauri	Western Sandpiper	x	x
Callipepla californica	California Quail	x	x
Carduelis tristis	American Goldfinch		x
Carpodacus mexicanus	House Finch		x
Charadrius vociferus	Killdeer	x	x
Colatpes auratus	Norther Flicker	x	x
Columba livia	Rock Pigeon	x	x
Corvus brachyrhynchos	American Crow	x	x
Corvus corax	Raven	x	x
Cyanocitta stelleri	Stellar's Jay	x	x
Dryobates villosus	Hairy Woodpecker	x	x
Fulica americana	American Coot		x
Haliaeetus leucocephalus	Bald Eagle	x	x
Hirundo rustica	Barn Swallow		x
Junco hyemalis	Dark Eyed Junko	x	x
Larus delawarensis	Ring-billed Gull		x
Lophodytes cucullatus	Hooded Merganser		x
Mareca americana	American Widgeon	x	x
Megaceryle alcyon	Belted Kingfisher	x	x
Melospiza melodia	Song Sparrow		x
Mergus merganser	Common Merganser	x	x
Mergus merganser	Common Merganser		x
Pandion haliaetus	Osprey	x	x
Parus articapillus	Black-capped Chickadee		x
Phalacrocorax auritus	Double-crested Cormorant		x
Phasianus colchicus	Ring Neck Pheasant	x	x
Picoides pubescens	Downy Woodpecker		x
Pipilo erythrophthalmus	Spotted Towhee		x
Podiceps nigricollis	Eared Grebe	x	x
Regulus calendula	Ruby-crowned Kinglet		x
Streptopelia decaocto	Eurasian-collared Dove	x	x

Wildlife Species Observed in the Horan Natural Area

Scientific Name	Common Name	Observed During April 2020 Site Visits	Observed During Audubon Surveys[1]
Sturnus vulgaris	European Starling		x
Tachycineta bicolor	Tree Swallow		x
Tachycineta thalassina	Violet-green Swallow		x
Troglodytes aedon	House Wren		x
Turdus migratorius	American Robin	x	x
Zenaida macroura	Morning Dove	x	x
Mammals			
Alces alces shirasi	Shiras Moose	x	
Canis latrans	Coyote	x	
Castor canadensis	Beaver	x	
Lontra candensis	River Otter	x	
Marmota ssp.	Marmot	x	
Mephitis mepthits	Skunk	x	
Odocoileus hemionus	Mule Deer	x	
Procyon lotor	Raccoon	x	
Reptiles			
Coluber constrictor	Western Racer	x	
Thamnophis sirtalis	Common Gartersnake	x	

1. Audubon Society, 2020. North Central Washington Audubon Society. Accessed April 2, 2020. Available at: http://www.ncwaudubon.org